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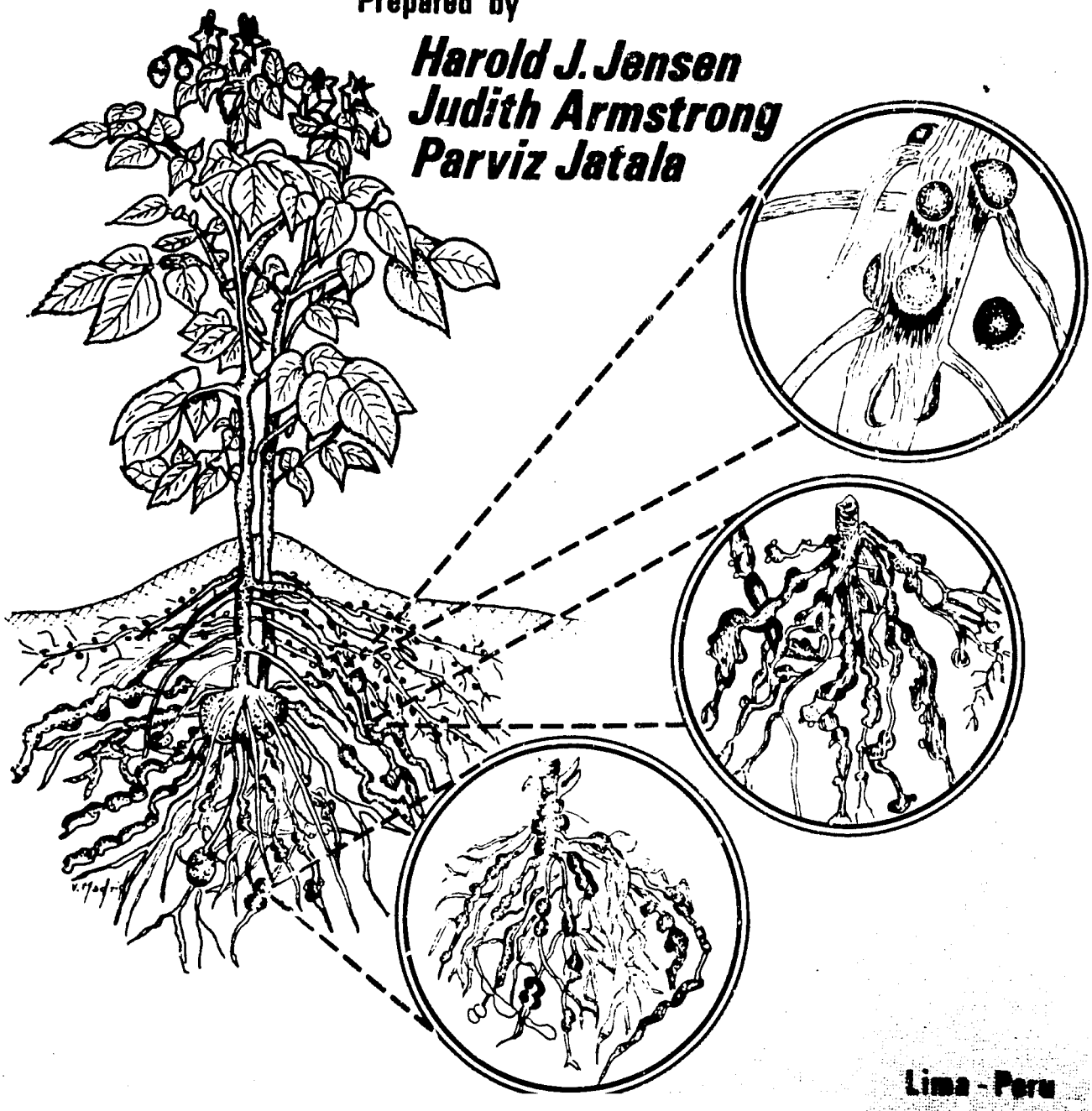

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ANNOTATED BIBLIOGRAPHY OF NEMATODE PESTS OF POTATO

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INTRODUCTION

Potatoes (Solanum tuberosum L) are among the world's most important food crops producing about 281 million metric tons annually. Production costs and yields vary greatly among the world's producers but may exceed US$2,500.00 per hectare in Oregon (USA), for example. Pest control, including use of disease- and pest-free seed, is a substantial portion of the total production cost. In 1970, the Society of Nematologists estimated the U.S. potato crop alone suffered an annual 10% loss to plant parasitic nematodes which amounted to US$58,732,800 in that year. Such data obtained from several sources and time intervals do not present a basis to estimate value or damage level on a world-wide basis. However, damage from nematode pests and efforts to control them cannot be ignored because of losses in quality and yield or also because of expensive control measures.

Since the early 1880's when recorded observations of nematode pests on potatoes first began to appear in the literature, scientists in nearly every country where potatoes are produced have made contributions. Consequently, as of October 1, 1979, a total of 1,798 citations have been found and included in this publication. Obviously, most attention has been given to Globodera rostochiensis (Woll.); however, an additional 67 species in 24 genera have also appeared in the literature. Several faunistic studies of potato soils also mention other genera and species. Evidence of pathogenicity, however is lacking for several nematodes, particularly, those mentioned in faunistic studies.

A vast range of subjects has been discussed relating to one or more of the nematodes. Typically, however, most citations are concerned with applied nematology (e.g. identification, distribution, pathogenicity, and control). In recent years, some authors also examined several specific phases of biology (e.g., parasite and host physiology, taxonomy, pathotype identification and interactions).

Citations concerned with applied nematology usually include discussions of control methods. Various aspects of plant breeding dominate control studies largely because of the extensive search for resistance to various pathotypes of Globodera rostochiensis and G. pallida. Fortunately, some attention has been given to obtaining resistance to Ditylenchus, Meloidogyne and Trichodorus. In addition to the search for resistance, other aspects of control have been examined with cultural and chemical control stressed about equally. Biological control has received far less attention than other methods. Many scientists are beginning to re-examine the strategy now emphasized in "integrated control" or "pest management programs" where several control alternatives may be applied against a pest.

The objective in developing this publication is to organize literature available about nematode pests of potato so that the user will have a major portion of the literature readily available. The cross-indexing in one or more subject area is designed to facilitate use of the publication. Undoubtedly some authors and contributions have been missed, which is regretable. There was no intention of withholding recognition of any contributor or contribution relating to nematode pests of potatoes.

NOMENCLATURE OF PRINCIPAL NEMATODE POTATO PESTS

Nomenclature of Principal Nematode Potato Pests

Aphelenchoides curiolis Gritsenko, 1971

Aphelenchoides fragariae (Ritzema Bos, 1891) Christie, 1932
Syn. Aphelenchus fragariae Ritzema Bos, 1891

Aphelenchoides solani Steiner, 1935 (now Aphelenchus avenae)

Belonolaimus longicaudatus Rau, 1958
Syn. Belonolaimus gracilis Steiner, 1949

Criconemoides onoense Luc, 1959

Criconemoides spp.

Ditylenchus destructor Thorne, 1945
'potato rot nematode'
'potato tuber nematode'

Ditylenchus dipsaci (Kuhn, 1957) Filipjev, 1936
Syn. Anguillula dipsaci Kuhn, 1957
Tylenchus dipsaci (Kuhn, 1957) Bastian, 1965
'potato stem nematode'

Ditylenchus solani Husain & Khan, 1975

Ditylenchus tenuidens Gritsenko, 1971

Ditylenchus spp.

Globodera pallida (Stone, 1973) Mulvey & Stone, 1976
Syn. Heterodera pallida Stone, 1973

Globodera rostochiensis (Wollenweber, 1923) Mulvey & Stone, 1976
Syn. Heterodera rostochiensis Wollenweber, 1923
Heterodera schachtii Schmidt, 1871
'Golden Nematode'
'Potato cyst nematode' or 'Potato cyst eelworm'

Globodera solanacearum (Miller & Gray, 1972) Mulvey & Stone, 1976
Syn. Heterodera solanacearum Miller & Gray, 1972

Globodera virginiae (Miller & Gray, 1968) Mulvey & Stone, 1976
Syn. Heterodera virginiae Miller & Gray, 1968

Globodera spp.
Syn. Heterodera

Helicotylenchus dihystera (Cobb, 1893) Sher, 1961
Syn. Helicotylenchus nannus Steiner, 1945

Hexatylus vigissi Skarbilovich, 1952 now Neotylenchus vigissi (Skarbilovich, 1952) Goodey, 1963

Hoplolaimus galeatus (Cobb, 1913) Sher, 1961
Syn. Nemonchus galeatus Cobb, 1913

Longidorus elongatus (de Man, 1876) Thorne & Swanger, 1936
Syn. Dorylaimus elongatus de Man, 1876

Longidorus leptocephalus Hooper, 1961

Longidorus nirulai Siddiqi, 1965

Macroposthonia peruensiformis Grisse, 1967

Macroposthonia onoense Grisse & Loof, 1965
Syn. Criconemoides onoense Luc, 1959

Meloidogyne arenaria Chitwood, 1949

Meloidogyne hapla Chitwood, 1949

Meloidogyne incognita Chitwood, 1949

Meloidogyne javanica Chitwood, 1949

Meloidogyne thamesi Chitwood, 1949

Meloidogyne spp.
Syn. Heterodera spp.

Meloinema spp.

Nacobbus aberrans (Thorne, 1935) Thorne & Allen, 1944
Syn. Anguillulina aberrans Thorne, 1935
Nacobbus serendipiticus Franklin, 1959
Nacobbus serendipiticus sub sp. bolivianus Lordello et. al., 1961

Nacobbus spp.

Nothotylenchus geraerti Kheiri, 1971

Nothotylenchus taylori Husain & Khan, 1974

Nothotylenchus tuberosis Kheiri, 1971

Nygolaimus solaniphilus Sabova, 1974

Paraphelenchus pseudoparietinus (Micoletzky, 1922) Micoletzky, 1925
Syn. Aphelenchus pseudoparietinus Micoletzky, 1922

Paratrichodorus allius (Jensen, 1963) Siddiqi, 1974
Syn. Trichodorus allius Jensen, 1963

Paratrichodorus minor (Colbran, 1956) Siddiqi, 1974
Syn. Trichodorus minor Colbran, 1956
Trichodorus christiei Allen, 1957

Paratrichodorus nannus (Allen, 1957) Siddiqi, 1974
Syn. Trichodorus nannus Allen 1957

Paratrichodorus pachydermus (Seinhorst, 1954) Siddiqi, 1974
Syn. Trichodorus pachydermus Seinhorst, 1954

Paratrichodorus teres (Hooper, 1962) Siddiqi, 1974
Syn. Trichodorus teres Hooper 1962

Paratylenchus elachistus Steiner, 1949
Syn. Paratylenchus minutus Linford in Linford, Oliveira & Ishii, 1949

Pratylenchus andinus Lordello et. al., 1961

Pratylenchus brachyurus (Godfrey, 1929) Filipjev & Stekhoven, 1941
Syn. Tylenchus brachyurus Godfrey, 1929
Pratylenchus leiocephalus Steiner, 1949
Pratylenchus steineri Lordello et. al., 1954

Pratylenchus coffeae (Zimmermann, 1898) Filipjev & Stekhoven, 1941

Syn. Tylenchus coffeae Zummermann, 1898
Tylenchus mahogani Cobb, 1920
Tylenchus musicola Cobb, 1919

Pratylenchus crenatus Loof, 1960

Pratylenchus leiocephalus (See P. brachyurus)

Pratylenchus loosi Loof, 1960

Pratylenchus penetrans (Cobb, 1917) Chitwood & Oteifa, 1952
Syn. Tylenchus penetrans Cobb, 1971

Pratylenchus pratensis (de Man, 1880) Filipjev, 1936
Syn. Tylenchus pratensis de Man, 1880

Pratylenchus scribneri Steiner, 1943

Pratylenchus teres Khan & Singh, 1975

Pratylenchus thornei Sher & Allen 1953

Pratylenchus spp.

Radopholus similis (Cobb, 1893) Thorne, 1949
Syn. Tylenchus similis Cobb, 1893
Tylenchus biformis Cobb, 1909

Rotylenchus uniformis (Thorne, 1949) Sher, 1961
Syn. Hoplolaimus uniformis Thorne, 1949

Rotylenchulus reniformis Linford & Oliveira, 1940

Rotylenchulus stakmani Husain & Khan, 1965

Trichodorus christiei (See Paratrichodorus minor)

Trichodorus cylindricus Hooper, 1962

Trichodorus primitivus (de Man, 1880) Micoletzky, 1922
Syn. Dorylaimus primitivus de Man, 1880

Trichodorus proximus Allen, 1957

Trichodorus similis Seinhorst, 1963

Trichodorus sparsus Szczygiel, 1968

Trichodorus or Paratrichodorus spp.

Tylenchorhynchus claytoni Steiner, 1937

Tylenchorhynchus dubius (Butschli, 1893) Filipjev, 1936
Syn. Tylenchus dubius Butschli, 1873

Tylenchorhynchus maraillatus Tobar, 1966

Tylenchorhynchus martini Fielding, 1956

Xiphinema coxi Tarjan, 1964

Xiphinema diversicaudatum (Micoletzky, 1927) Thorne, 1939
Syn. Dorylaimus diversicaudatus Micoletzky, 1927

Xiphinema index Thorne & Allen, 1950

SYNOPSIS OF NEMATODE PEST OF POTATOES

SYNOPSIS OF NEMATODE PEST OF POTATOES

Undoubtedly, farmers, consumers, and agriculturalists were aware of various imperfections on potato tubers - declining size and yields - long before scientists determined that some problems were caused by nematodes. Since the early 1880's, however, observers of potato diseases and pests began to suspect nematodes were associated with various distress problems although the specific cause or agent was not identified at the time. For example, Globodera (Heterodera) rostochiensis was probably observed in Germany about 1881 (K-109) but this was not confirmed until 1913 (F-43). Ditylenchus (Anguillulina) dipsaci (possibly D. destructor) was apparently observed in Germany about 1884 (K-110) and in France about 1888 (F-43). It is more difficult to determine a citation when Meloidogyne were first observed on potatoes but the first one found for inclusion here was by Neal in 1889 (N-7). In more recent years taxonomists have altered the names of many nematodes and others have been added to a growing number of potato pests. Currently 67 species of nematodes in 24 genera have been mentioned in the literature.

Many nematodes have been widely distributed through the world's potato production areas, however, more attention has been focused on those pests belonging to the general Ditylenchus, Globodera and Meloidogyne. Other genera such as Nacobbus, Pratylenchus, Paratrichodorus and Trichodorus have attracted attention in more recent times.

Globodera rostochiensis has, by far, received the most attention in world literature. Evidence is ample that this is the world's most important nematode pest of potatoes. Identification of pathotypes (some are now known as G. pallida) and breeding or screening cultivars for resistance has occupied most attention of investigators concerned with this pest. Through the years, other investigators have contributed much information on biology (ecology) distribution, host-parasitic relationships and control (chemical and cultural).

Currently, distribution of the nematode is well known with nearly all potato production areas reporting at least a minor occurrence. Infestations in some countries and production areas are regarded minor. Much information is available on pathotypes, unfortunately, the specific identity is often confused by regional coding systems. Attempts are being made to standardize coding of pathotypes on an international basis. Separation of the white and yellow female color into a separate species (G. pallida) has been a recent development. Biological and ecological investigations on behavior and survival of the parasite in the soil and plant environment continues to provide essential information needed for integrated pest management systems. Many investigators are concerned with methods of controlling the pest. Breeding and screening potato cultivars for resistance are

major undertakings nearly everywhere the pest exists. Consequently, many areas or countries now have their own cultivars. Chemical control has been effective, however, the cost of application and materials has influenced many investigators to seek other means of control.

Biological control is a popular approach, currently based on reductions caused by natural enemies such as algae, bacteria, fungi, and protozoa. Several parasitic associations have been reported and preliminary experiments conducted in the controlled conditions of a laboratory or greenhouse often cause a substantial reduction in nematode populations (K-66, 67, 68; L-1, 3; M-31; P-1; S-70; U-13, 14; W-5). Unfortunately, such associations usually become modified or altered in field trials so that significant reductions rarely occur and are still unpredictable. Research for this approach is needed and should be encouraged.

Also receiving much attention have been the various cultural practices of rotation with non-host crops, altering planting and harvesting dates, quarantine and precautionary sanitation measures which prevent movement of contaminated containers, plant parts, or soil. Rotation with non-host crops which also excludes weed hosts certainly reduces the population of nematodes. Depending on the number of cysts, eggs, or larvae in the soil and the area or country, recommendations between potato crops range from 3 to 6 years. Certain climatic areas favor reduction in plant injury and nematode numbers when potatoes are planted during certain times of the year and also when the crop is harvested early. Many sanitation measures such as washing potato seed pieces, and preventing movement of contaminated containers, machinery, plant debris, soil, and surface water certainly reduce spread and further contamination. Many countries and local areas enforce strict regulatory or quarantine measures to minimize opportunities for introduction or further spread.

Currently, the major research thrust in controlling G. rostochiensis as well as G. pallida continues to be the development of resistant potato varieties. To maximize this control alternative it is very important to know the identity and distribution of species and pathotypes in each production area.

Ditylenchus dipsaci and D. destructor are discussed in a very distant second portion of the world's literature concerning potato nematode pests. It is difficult to discuss as well as interpret literature relating to specific nematodes in the genus prior to 1945 when Thorne separated the two species (T-16). Prior to that date D. dipsaci was the primary species mentioned although subdivision of races and strains were mentioned on numerous occasions. Common names are also likely to become confusing, however, the portion of the plant attacked became a clue that identified the nematode species. Thus the "potato tuber nematode" is apparently D. destructor and the "potato stem nematode" is apparently D. dipsaci.

The "potato stem nematode" has been reported from numerous areas of temperate climate zones particularly from Eastern and Western Europe. It may occur elsewhere although the lack of economic damage or recognition of the

pest is evident by the number of literature citations. As the common name implies, most activity occurs in the foliage where symptoms show as leaves and petioles being shortened, thickened and generally malformed. Often infected plants appear stunted. Apparently this nematode also injures tubers, producing conical pits often accompanied by skin splitting. Such symptoms resemble those caused by the "potato tuber nematode" (Ditylenchus destructor) and thus identification should be verified. Apparently D. dipsaci directly injures the potato host without association with other pathogens with one exception. A report from The Netherlands in 1963 indicated the nematode increased the susceptibility of potato to Phoma solanicola (H-48).

Control has emphasized breeding and screening programs and a number of cultivars show resistance (K-87; L-20; M-91). Cultural control consists of crop rotation and removal of volunteers, use of soil additives (barnyard manure), early harvest, and sanitation (E-6; G-83). Chemical control reports are limited to a few disinfectants for seed piece treatment.

The potato-rot nematode (Ditylenchus destructor) would rank second as a nematode pest of potatoes. Consequently, many authors have contributed to the background of information available for this pest. Distribution is in most potato producing countries with most damage in temperate climate zones.

The potato tuber nematode (called potato-rot nematode in the USA) has an extensive host range among cultivated crops, weeds, and fungi. At least 33 citations deal with symptoms of potato where damage is usually confined to the tuber and rarely recognized until harvest or storage. Diseased tubers are readily recognized in advanced stages of infection when the surface is marked by sunken dark colored pits and skin cracks. Such advanced symptoms are rarely observed during the growing season but are often reported in tubers stored in the field before lifting or in tubers placed in storage sheds. Subsurface tissue will develop a brown matted wool-like appearance. Several studies of diseased host physiology indicate increased oxidation, dehydrogenase activity and ascorbic acid production (B-119, 120, 121). Diseased tissues also exhibit a loss of starch, total nitrogen and protein nitrogen (K-22). Associations of the potato tuber nematode with fungi have been reported to increase severity of host injury or to attract other pests such as mites and other nematodes (B-5; F-5; G-11).

Plant breeders and nematologists have cooperated to develop several cultivars resistant to the potato tuber nematode. Various cultural control programs also have successfully contributed to management of this pest. Crop rotation with non-susceptible hosts, increased fertilizer N, P, K or barnyard manure, selected seed sources and removal of volunteer potatoes are most often suggested (E-17; G-52, 53; I-32, 35; L-10; M-85, 87). Nematicides (fumigants and systemics) have given satisfactory control although their use is too expensive in many countries. Ethylene dibromide mixtures were reported to be very effective (V-5).

Meloidogyne spp. or root-knot nematodes also rank among the important nematode pests of potatoes in many production areas of the world. Distribution varies among the species although most prefer light sandy soils. Meloidogyne arenaria, M. incognita, M. javanica and M. thamesi usually prefer the warmer climates while M. hapla occurs in the cooler production areas. Most species exhibit similar biology and behavior patterns. The wide host range among agricultural crops and weeds of most species is an important factor to consider when developing a control program for these pests.

Meloidogyne hapla is an important potato pest in the Pacific Northwest (USA) and has also been reported in Northern Europe, West Pakistan and probably elsewhere. Although the first generation usually attacks the roots, most injury occurs on the tubers where quality is partly destroyed and yield is reduced. Yield symptoms are rarely seen before harvest and are most conspicuous during storage. Some attention has been given to a possible interaction with Verticillium wilt where some reports indicate earlier wilt symptoms and increased severity (J-3, 4). Other investigators have reported no measurable effect (H-101, 102).

Identification of resistant germplasm and development of varieties is currently receiving some attention. Fumigation is a standard chemical control. Most fumigant nematicides are effective although those containing dichloropropenes are most often used. Systemic nematicides have given encouraging experimental results although they are not as effective as fumigation. Recent studies indicate systemic phosphate seed piece dips have virtually eliminated the nematodes from the developing crop (B-1; H-36).

Meloidogyne incognita has drawn the most attention as a potato pest among the root-knot species. M. incognita prefers a warmer climate than M. hapla, otherwise the biology is very similar. Pathogenicity does not usually differ from the other species. Several studies indicate an association of this nematode and bacterial wilt (Pseudomonas solanacearum) where symptoms occur sooner and severity is increased to a point of death (F-12; J-12, 19). Later studies involving a screening for resistance to both organisms indicate a correlation of resistance applied to both pests.

Control of M. incognita depends upon the area and country involved and varies among several alternatives with chemicals and use of resistant varieties being most prominent. Breeding for resistance to root-knot nematodes, primarily M. incognita, is currently receiving major attention in Chile, India, Mexico, Peru, and U.S.A. Some varieties have been developed and released but performance data from large-scale usage has not been available. Cultural control depends on crop rotation to some extent in spite of the enormous host range of the pest. Other cultural alternatives include additional fertilization and irrigation, early or late planting times and heat treatment of seed pieces (48 hr at 45°C gave 98.9% control without host injury N-31). Chemical control by soil fumigation has provided satisfactory results for many years with mixtures containing ethylene dibromide or dichloropropenes most commonly

used. In recent years, systemic nematicides applied as dips or as granules at time of planting or later as a side-dress were effective. Populations were generally reduced, but not eliminated and yield was increased (F-40; R-2, 46, 47).

M. javanica like M. incognita is a pest that thrives in potato fields of areas having a sandy well drained soil and very warm temperatures such as Rhodesia and some Southern areas of the USA. During periods of drought, eggs are protected within the matrix and hatching is delayed (D-41). Pathogenicity is apparently similar to the other species with the first invasion taking place in the root system. Cultural control methods are somewhat diversified and include recommendations of a four-year grass rotation (M-82) or a warm water soak of seed pieces at 46°to 47.5°C (M-36). Unfortunately, only limited attention has been given to development of resistant varieties for this species (B-113). Soil fumigation with DD and EDB have given satisfactory control (N-31; S-63).

Several authors have studied various relationships of root-knot nematodes to potatoes but they have not designated a species or their contribution was made at a time when all root-knot nematodes were considered to be one species, Heterodera marioni. Although species are not designated, information contained in these contributions should not be overlooked as background material for teaching, research, and extension programs. Approximately 120 references are related to Meloidogyne spp. and most subject areas received attention.

Recently the genus Nacobbus has emerged as an important potato pest in South America, with Argentina, Bolivia, and Peru reporting occurrence. Losses ranging from 60% to 90% have been reported in Peru (G-72, 73). The nematode attacks both roots and tubers, producing symptoms resembling root-knot injury only on roots (I-23). Frequently this pest occurs in the same areas as root-knot and potato cyst nematodes making diagnosis difficult. As more information becomes available it is likely this nematode will be considered as major potato pest in South America.

Only a few references related to control have appeared thus far and most of these report preliminary screening for resistance (A-11, 12; G-73). One report indicated aldicarb gave promising chemical control (C-70).

Some references about N. serendipiticus may also apply to N. serendipiticus bolivianus, N. aberrans and Nacobbus spp. Thus interested investigators should refer to references in the various subject areas but keep in mind that earlier citations should be traced to the proper species.

There are numerous references of root-lesion, Pratylenchus spp., injuring potatoes in the world's literature. Approximately 10 species have been identified as potato pests although many are reported of more or less isolated instances in local areas. Three species Pratylenchus brachyurus, P. penetrans and P. pratensis have been reported most often and have a wider distribution. Several species only damage the root system. P. brachyurus, P. penetrans, P. pratensis and P. scribneri apparently are the only tuber parasites.

Pratylenchus brachyurus injures potatoes in Brazil, Rhodesia, South Africa, and southeastern USA. Tuber symptoms vary somewhat but have been described as sunken surface lesions or raised pustules varying in color from brown to black in early season to purple-brown after storage. Lesions are relatively shallow, rarely penetrating to a depth in excess of 1/2 mm (K-57). Lesions may only occur on tubers late in the growing season or after harvest. Control efforts include early lifting and storage at 5°C (K-57), a heat treatment of infected seed pieces at 50°C for 45 to 60 min (K-56) or by chemical control. Satisfactory control was achieved by soil fumigation with EDB (B-67) and dips with carbamate and phosphate nematicides reduced the population (R-46, 47).

Pratylenchus penetrans has received the most attention among the root-lesion nematodes associated with potatoes apparently because of its cosmopolitan distribution especially in Europe and North America. Various observers have indicated a growth decline of 50% to 70% (H-30) or yield declines of 10% to 50% (D-31; O-26). Although light sandy soils seem to be the preferred habitat of the nematodes, peat-type soils also were infested. As pest population increases in roots, rhizomes and tubers the soil population decreases and vice-versa (B-49). Nematodes apparently do not penetrate deeply beneath the tuber surface but remain in cortical tissue (D-32).

Several authors have investigated interactions of this nematode with other pathogens, particularly fungi, in potential disease associations. Verticillium wilt is a common disease frequently associated with P. penetrans. Some small scale experiments indicate that when both pathogens are present, lower tuber yields and less dry weight are apparent (M-97, 98) as compared with effects of either pathogen alone. Another condition sometimes reported is that wilt symptoms appear earlier when nematodes are present. In spite of positive or negative interaction data, many investigators suspect this nematode is an important partner in disease complexes involving bacteria and fungi.

Little attention has been given toward controlling this pest by cultural means. Crop rotation has been studied (F-8; G-167) and rye is not recommended as an alternate crop. This nematode has a very extensive host range thus selection of nonhost crops for a particular area may be difficult. Elimination of the pest from seed pieces with warm water (50°C for 30 min) has been suggested as a means of preventing introduction (Y-8). Although resistance studies have not developed on a large scale, some studies indicate commercial varieties such as Russet Burbank already possesses tolerance to large populations of the nematode (B-39). Additional screening of several commercial potato varieties in the USA indicated various levels of tolerance and the researcher concluded that resistance is already present in genotypes of Solanum tuberosum (D-49).

Chemical control is by far the most popular method of combating these pests as evident by the number of references and investigators concerned with this approach. Various soil fumigants have been effective in controlling this pest, however, many researchers are also concerned about controlling fungi (usually Verticillium wilt) at the same time (B-41; C-27; M-76;

S-148). In most instances wilt was not notably affected unless the fumigant was fungicidal as well as nematicidal. The effect of fertilizer on control efficiency has also been studied (B-51; N-43), however, nematode control and fertilization appear to be independent factors. Fumigation of infested soil should be applied each time potatoes are grown with applications made in the fall prior to a spring growing season (H-33; M-76).

In recent years, effects of systemic nematicides, primarily carbamates and phosphates, have been studied by several investigators. Aldicarb has been used most often and is regarded by several investigators as an efficient material (A-57, 58; C-23, 24; D-11; H-32; K-38). Aldicarb has been applied broadcast before planting, in furrow treatment at planting and after emergence, but is most efficient in furrow treatment (C-24, 25). Other carbamate and phosphate nematicides are usually effective soil treatments (B-51; C-25; M-78). Nematicidal dips with aldicarb and mercuric chloride (C-23, 49) or washing with water and mercury solutions (D-50) are reported to increase yield or reduce infection.

The remaining identified species or unidentified species of Pratylenchus have been discussed in potato pest literature as occasional inhabitants of roots, tubers, or soil from potato fields. Such citations are relatively few and studies are usually confined to biology, distribution and host associations and have not progressed to a point where control is suggested.

Since 1961 when stubby-root nematodes belonging to the genus Trichodorus were shown to transmit tobacco rattle virus (TRV) (S-99), potato researchers have been interested in these pests because many strains of the virus damage potatoes. "Corky ring spot" or "Spraing" of potatoes is transmitted by various stubby-root nematodes. Currently, 10 species of Trichodoridae and five species each belonging to two genera Paratrichodorus and Trichodorus have been associated with virus transmission in potatoes. Also there are several references of virus transmission listed as Trichodorus spp. where species were not identified. Very little attention has been given to a direct parasitic relationship even though these pests must feed on potato plants to transmit viruses.

Paratrichodorus pachydermus was shown to be the first potato virus vector (S-99) and, consequently, has been most often mentioned in the literature concerning virus vectors. P. pachydermus is primarily a pest in west Europe and has been the subject of several fundamental studies regarding virus acquisition, retention, and electron or scanning microscope studies on location of virus particles. Although several investigators have been concerned with basic virus studies, very few are listed here as this publication has been primarily directed toward virus resistance. The chemical control alternative has been the most popular method directed toward the nematode. Excellent results have been obtained with fumigants (C-66; J-62). Both carbamate and phosphate nematicides dramatically reduced the virus infection level (S-146).

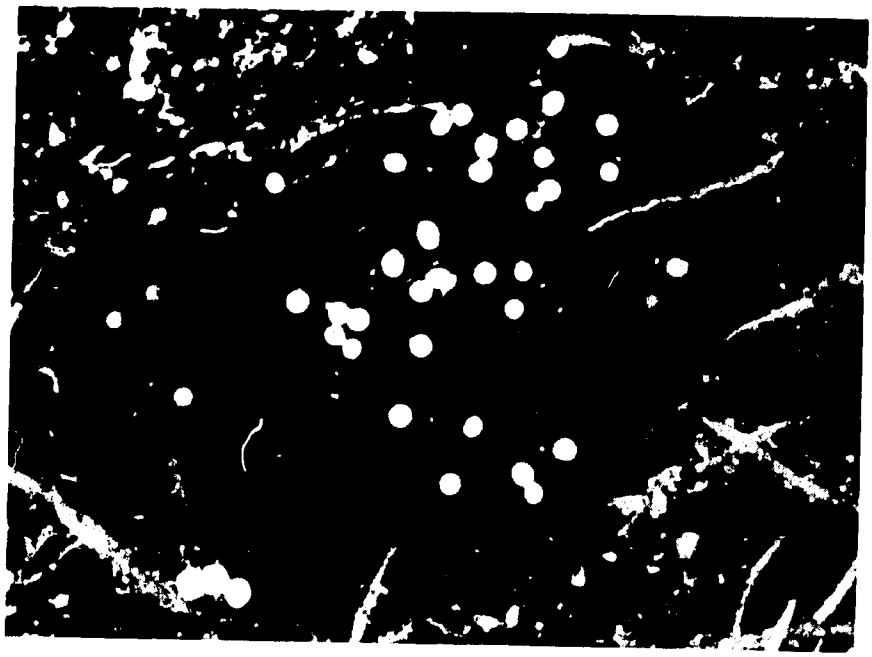
Trichodorus primitivus has been linked with tobacco rattle virus symptoms in potato in western Europe particularly in France (B-38), Scotland (C-64), and Sweden (P-29). Nematode-potato-virus relationships are similar to other species in the genera Paratrichodorus and Trichodorus. Apparently the only control alternative investigated was the chemical method. Both fumigants (C-66) and systemic nematicides (carbamates and phosphates) are effective (B-110; C-66).

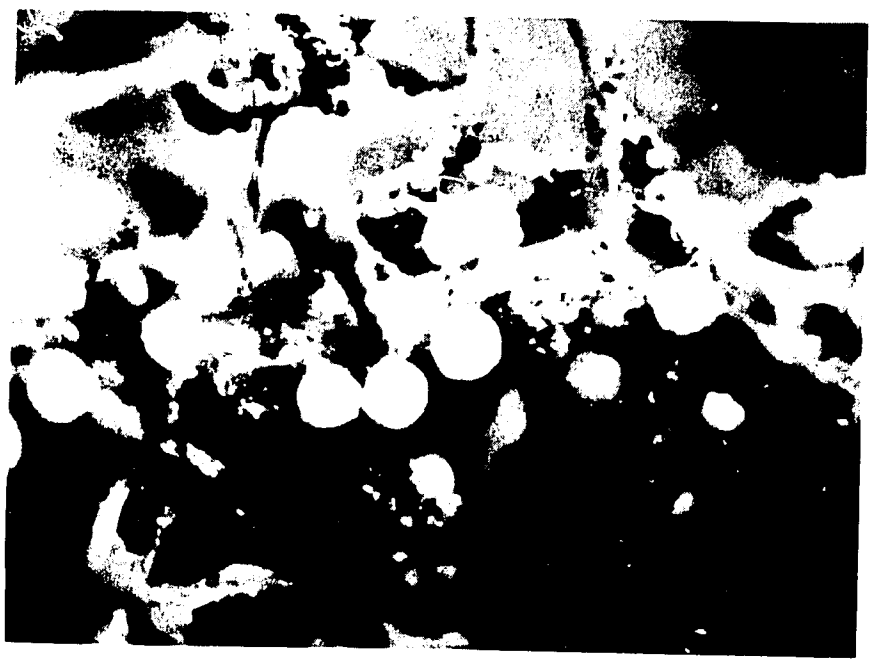
Many references listed as Trichodorus spp. relate cultural, breeding, and chemical control alternatives. Cultural alternatives are mostly directed toward weed control to eliminate alternate host and virus reservoirs (C-63; L-32). Two studies indicate that barley used as an indicator crop reduces the incidence of corky ring spot or spraing (F-46; M-2). One study recommended an early harvest in rainy growing seasons (S-167). Screening studies have been fairly successful in identifying varieties resistant to strains of the virus (E-29; H-18; S-64, 80). A great deal of information is available on chemical control of the vectors with fumigants and systemic nematicides (carbamates and phosphates) reported to be effective. A solution of 16 ppm cupric sulphate has been reported to reduce the vector population (G-140).

Other nematodes are considered potato pests but most have received little attention or lack direct evidence of pathogenicity. Some have a limited distribution, however, pathogenicity and control experiments may indicate that some nematodes are a threat to production in specific areas. Belonolaimus longicaudatus is considered a pest in Florida, USA (W-7, 8, 19) and control with fumigants and systemic nematicides has increased yield (W-7, 8, 9, 10, 12, 13, 19). Also in Florida, potatoes are injured by Criconemoides onoense and chemical control increases yield (O-49). Hexatylus vigissi invades leaves, stalks, tubers, and reduces yield by up to a half in the USSR (S-88). The pest also invaded healthy tubers in storage. Longidorus elongatus caused a 3 ton/ha yield loss in England (B-111). Meloinema spp. was shown to damage potato roots in a few areas of Peru (J-14). Radopholus similis infected sprouting potato tubers in Rhodesia (M-37, 38). Rotylenchulus reniformis, a root parasite of potatoes, caused a yield reduction and increased the pest population in greenhouse tests in the USA (R-17, 18). The nematode also damaged potatoes in India (S-169). Additional studies indicate a source of resistance in some potato varieties (R-19) and that chemical control will result in a yield increase (A-2). Xiphinema index has been shown to utilize potatoes as a host plant in controlled experiments in England (C-76). Xiphinema coxi will serve as a vector for two strains of Tobacco Ring Spot Virus from Peruvian potatoes (H-69).

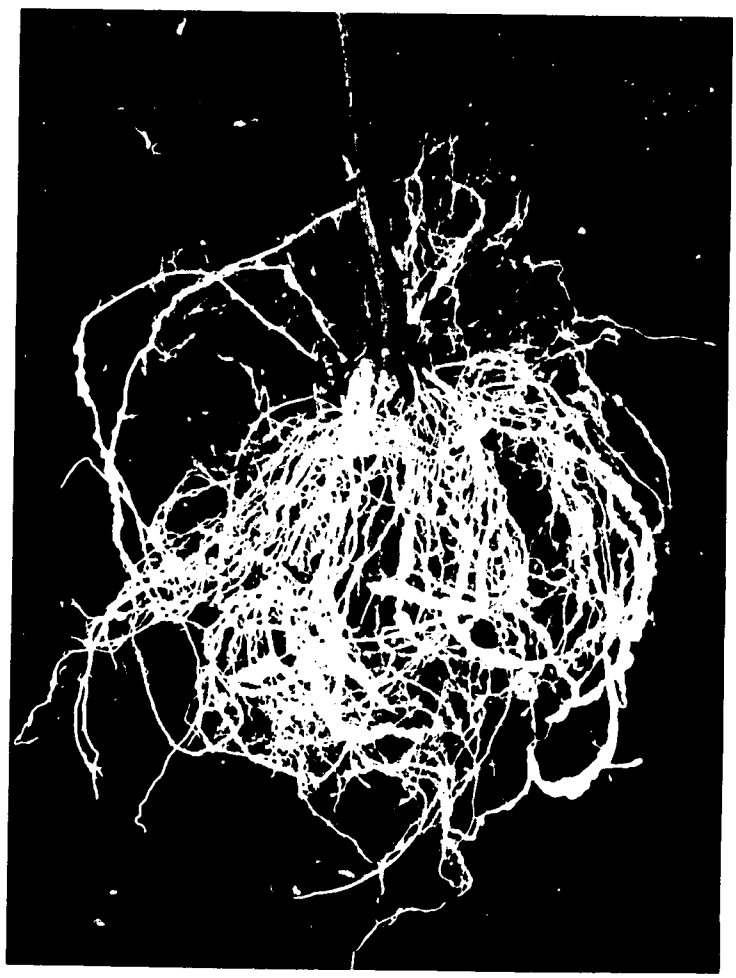
Additional nematodes have been discussed as potato pests although supporting data are generally lacking or circumstantial. Aphelenchoides fragariae have been reported from stored potatoes (N-10) and A. solani was reported from potatoes originating in Cuba (S-124). Helicotylenchus nannus was found in pustules on potato tubers (S-125; L-34) and Paraphelenchus pseudoparietinus is listed as a parasite of potatoes (C-77). Helicotylenchus dihystera (R-44, 45) and Tylenchorhynchus claytoni (M-74) populations are reduced and often associated with yield increase following chemical treatment.

There still remain many excellent contributions in the literature that are difficult to index in this synopsis because they refer to numerous nematodes in numerous subject areas (see -- General References) or because the nematodes are not specifically identified (see -- Unclassified References). Researchers should examine these references, however, because such contributions often provide excellent summaries on numerous subjects or detailed reviews on many aspects of nematode potato host relationships.





Infection of tubers (top) and roots (bottom) of potato by Globodera pallida.

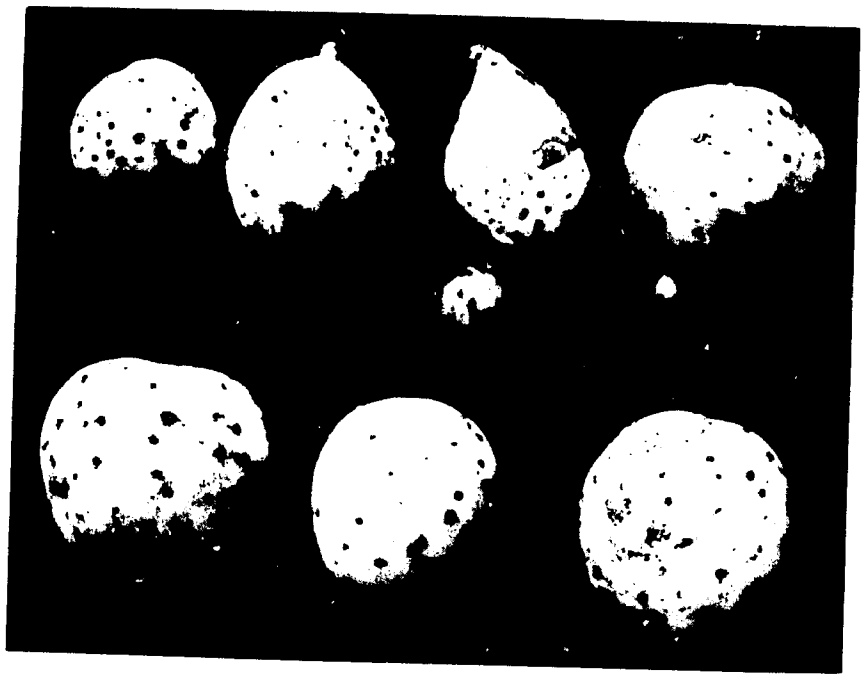


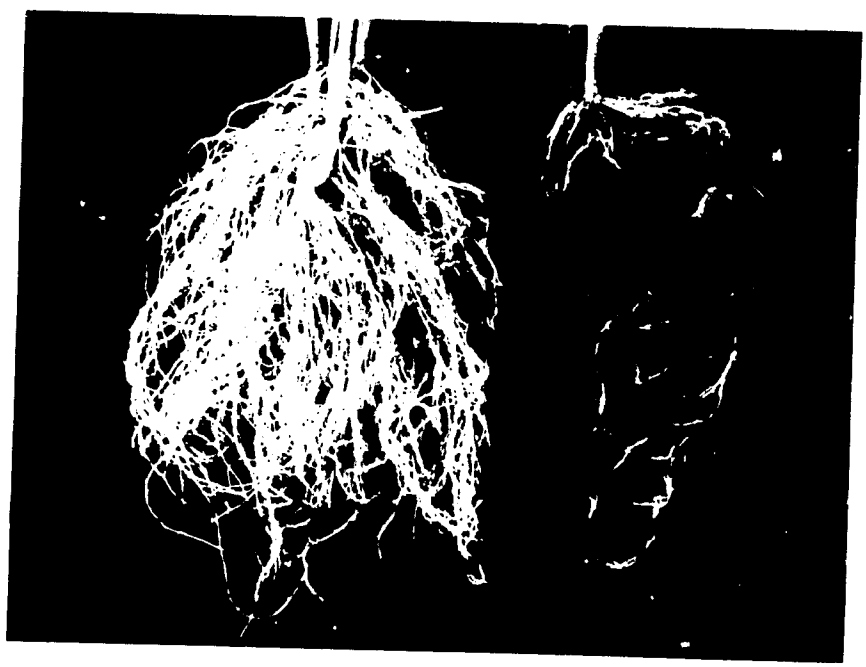
Infection of tubers (top) and roots (bottom) of potato by *Meloidogyne incognita*.

Potato roots infected by Nacobbus aberrans.
Note the occurrence of galls in bead like fashion and the absence of fibrous roots in the infected part.

Tubers attacked by Ditylenchus destructor.

external damage internal damage





Infection of tubers (top) by Pratylenchus pratensis. Healthy and P. pratensis infected roots (bottom).

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Instructions for Use of Index

The 1,798 literature citations included in the bibliography are indexed in several categories beneath the binomial name of the appropriate nematode. In many instances citation contents have been summarized. Depending upon the contents, a citation may be listed beneath one or more nematodes in one or more categories. Two other primary listing categories are, "General References Relating to Nematodes" and "Unclassified." General references usually refer to textbook, reference books and other extensive treatments where several nematodes are identified in discussions of numerous subject categories. Unclassified references are usually faunistic treatments where nematodes are considered as groups or where nematodes are not identified. Wherever possible such nematodes are related to subject categories.

The index citation is composed of an alphabetical letter and arabic number. The alphabetical letter refers to the first letter in the senior author's family name. The arabic number relates the alphabetical and chronological position of the reference. Thus if the reader wishes to search the literature for references concerning pathotypes of Globodera rostochiensis the following procedure is suggested.

1. Locate Globodera rostochiensis on the index page.

2. Search sub-headings to locate pathotype category under parasite.

3. Note there are several index numbers listed and the first one is A 23, an article by L. Ambrogioni in 1971 which discusses behavior of Italian populations on resistant potato lines.

Additional citations can be added after each alphabet letter if desired.

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Chemical Control: G 106; W 25
Fumigants: C 83; E 12; R 13
Non-fumigants:
Carbamates: C 70; G 105;
W 41
Miscellaneous Materials:
B 20 28
Dips & Soaks: K 52

GLOBODERA SPP. (continued)
Non-chemical Control:
Resistant Varieties: S 35
Screening Trials: B 20 21; J 15; S 45 157
Breeding & Genetics: G 51; H 27; K 4; S 44 67
Cultural Control: B 20; G 2; K 51
Biological Control: C 71; I 26; K 68
Regulatory Control: K 2
TECHNIQUES & METHODOLOGY: A 10; B 126; C 47; D 26; E 13; K 25; S 45 106; T 9
REVIEWS: A 43; D 38; G 45 136 138; K 48; R 3; S 69 106 157

HELICOTYLENCHUS DIHYSTERA
HOST RELATIONSHIPS
Pathogenicity: R 44
CONTROL
Chemical Control
Fumigants: R 44
Non-fumigants:
Miscellaneous Materials: R 44 45

HELICOTYLENCHUS NANNUS
HOST RELATIONSHIPS
Pathogenicity: L 34

HETERODERA PUNCTATA
SURVEYS & DISTRIBUTION: G 103

HEXATYLUS VIGISSI
HOST RELATIONSHIPS
Pathogenicity: S 88

HOPLOLAIMUS GALEATUS
CONTROL:
Chemical Control:
Non-fumigants:
Carbamates: R 48
Phosphates: R 46 47
Dips & Soaks: R 46 47 48

LONGIDORUS ELONGATUS
SURVEYS & DISTRIBUTION: E 4
HOST RELATIONSHIPS:
Pathogenicity: B 111
INTERACTIONS WITH OTHER PATHOGENS:
Viruses: G 143

LONGIDORUS LEPTOCEPHALUS
CONTROL:
Chemical Control:
Fumigants: G 134
Non-fumigants:
Carbamates: G 134

LONGIDORUS NIXULAI
SURVEYS & DISTRIBUTION: S 81

MACROPOSTHONIA PERUENSIFORMIS
SURVEYS & DISTRIBUTION: G 165

MELOIDOGYNE ARENARIA
BIOLOGY & ECOLOGY: D 12 41; M 35 40; N 7
HOST RELATIONSHIPS:
Pathogenicity: A 36; D 12; M 40
CONTROL: M 40
REVIEWS: W 49

MELOIDOGYNE HAPLA
BIOLOGY & ECOLOGY: B 115; F 7; G 47 160 162; J 1; M 40
SURVEYS & DISTRIBUTION: A 5; F 6; H 50
HOST RELATIONSHIPS:
Pathogenicity: A 36; C 4; G 161 163; J 32; M 40; O 16; W 59
PARASITE:
Population: W 59
INTERACTIONS WITH OTHER PATHOGENS:
Fungi: H 101 102; J 3 4
CONTROL: M 40
Chemical Control: S 14
Fumigants: D 3 4; J 4
Non-fumigants:
Phosphates: B 64; H 102
Miscellaneous Materials: G 47; I 15; J 4; S 15
Dips & Soaks: H 36
Non-chemical Control:
Resistant Varieties:
Screening Trials: B 113; H 100 101

MELOIDOGYNE HAPLA (continued)
Cultural Control: B 115
TECHNIQUES & METHODOLOGY: A 48; W 48
REVIEWS: H 120

MELOIDOYNE INCOGNITA
BIOLOGY & ECOLOGY: D 13 14; E 47; G 47; K 32; M 40; N 37 41; O 20 35; S 166; Y 1
SURVEYS & DISTRIBUTION: P 69
HOST RELATIONSHIPS:
Pathogenicity: A 1; D 19; M 40; N 40; R 44; S 63 87
Physiology: A 1; S 164 165
PARASITE:
Physiology: O 20
INTERACTIONS WITH OTHER PATHOGENS:
Bacteria: F 12; G 181; J 12 19 25 26; N 39
Fungi: J 60
CONTROL: I 19; M 40
Chemical Control: R 8
Fumigants: B 67; F 40; M 111; N 34; P 69; R 7 9 44; S 63
Non-fumigants:
Carbamates: A 1 2 58; F 40; O 35; R 2
Phosphates: A 2; F 40; R 2 46 47

MELOIDOYNE INCOGNITA (continued)
Miscellaneous
Materials: B 68; F 39; G 47; I 15; R 44 45 50
Dips & Soaks: R 46 47
Non-chemical Control:
Resistant Varieties: P 69
Screening Trials: A 40; B 113; D 9; F 36 38; G 77; J 27 28 29; K 32; N 35 38 40; O 19; S 83 100
Breeding & Genetics: A 32 51; F 2; J 12; K 32 47; S 83
Cultural Control: B 67; G 168; I 10; N 32 36; P 69; R 6; S 87 94
Biological Control: J 24; N 33; Y 1
TECHNIQUES & METHODOLOGY: N 40; S 84
REVIEWS: I 20 21 22 24 25; W 47

MELOIDOGYNE JAVANICA
BIOLOGY & ECOLOGY: D 13 14; G 47; M 40
HOST RELATIONSHIPS:
Pathogenicity: L 34 39; M 40; S 63
CONTROL: M 40
Chemical Control:
Fumigants: N 31; S 63

MELOIDOGYNE JAVANICA (continued)
Non-fumigants:
Phosphates: N 31
Miscellaneous Materials: G 47
Non-chemical Control:
Resistant Varieties:
Screening Trials: B 113
Cultural Control: M 36 82
REVIEWS: W 46

MELOIDOGYNE THAMESII
CONTROL:
Non-chemical Control:
Screening Trials: B 113

MELOIDOGYNE SPP. (HETERODERA MARIONI)
BIOLOGY & ECOLOGY: D 15 40; I 12 13; M 79 81; P 12 50; R 10
SURVEYS & DISTRIBUTION: B 26; C 79; D 37; E 1; J 13; K 41; R 10; T 8 15 28; U 7; V 2
HOST RELATIONSHIPS:
Pathogenicity: C 52 79; D 63; I 12 13 23; J 12 13; K 41; M 64; N 2; R 4 10; S 22; T 15; V 2; W 77
Physiology: D 29 38 39
PARASITE:
Physiology: D 29; W 5
Populations: W 77

MELOIDOGYNE SPP. (HETERODERA MARIONI) (continued)
INTERACTIONS WITH OTHER PATHOGENS: I 18; W 5
Amoeba: W 5
Bacteria: I 14; J 13 15
Fungi: J 13
Nematodes: M 39
CONTROL: I 19
Chemical Control:
Fumigants: B 65 66; G 87; I 8 14; M 38; W 14 15
Non-fumigants: D 15
Carbamates: D 17; S 12; W 14 15
Phosphates: W 15
Miscellaneous Materials: G 25 46; M 79; W 76
Dips & Soaks: S 36
Non-chemical Control:
Resistant Varieties: P 50
Screening Trials: B 100; H 35 40; I 17 18; J 15; K 31
Breeding & Genetics: A 32; B 101; F 3; G 46 178; H 27; I 17; N 4
Cultural Control: B 24; D 37; G 46 87; M 38; S 36; W 43
Biological Control: I 26; W 15
Regulatory Control: D 62

MELOIDOGYNE SPP. (HETERODERA MARIONI) (continued)
TECHNIQUES & METHODOLOGY: B 132; G 86
REVIEWS: A 26; D 38; G 45 109; H 52; L 29
MISCELLANEOUS: D 5

MELOINEMA SPP.
HOST RELATIONSHIPS:
Pathogenicity: J 14

NACOBBUS ABERRANS
BIOLOGY & ECOLOGY: C 33 73; J 23
SURVEYS & DISTRIBUTION: C 74; G 72; J 15 20
HOST RELATIONSHIPS:
Pathogenicity: B 92; I 23; L 9
Physiology: A 13
CONTROL: I 19
Chemical Control
Non-fumigants:
Carbamates: C 70
Non-chemical Control:
Resistant Varieties
Screening Trials: A 11 12
REVIEWS: C 75; I 20 21 22 25

NACOBBUS SERENDIPITICUS
TAXONOMY & MORPHOLOGY: L 36
BIOLOGY & ECOLOGY: C 1
SURVEYS & DISTRIBUTION: G 72 74
HOST RELATIONSHIPS
Pathogenicity: B 92; G 73; L 36

NACOBBUS SERENDIPITICUS (continued)
CONTROL:
Non-chemical Control
Resistant Varieties
Screening Trials: G 73

NACOBBUS SERENDIPITICUS BOLIVIANUS
SURVEYS & DISTRIBUTION: T 28

NACOBBUS SPP.
BIOLOGY & ECOLOGY: I 18; J 30
SURVEYS & DISTRIBUTION: J 15 20
HOST RELATIONSHIPS:
Pathogenicity: B 90; C 72
Physiology: D 38
CONTROL:
Non-chemical Control:
Resistant Varieties:
Screening Trials: I 17
Breeding & Genetics:
C 5; I 17
REVIEWS: D 38

NOTHOTYLENCHUS GERAERTI
SURVEYS & DISTRIBUTION: K 33

NOTHOTYLENCHUS TAYLORI
SURVEYS & DISTRIBUTION: H 125

NOTHOTYLENCHUS TUBEROSIS
SURVEYS & DISTRIBUTION: K 33

NYGOLAIMUS SOLANIPHILUS
SURVEYS & DISTRIBUTION: S 1

PARATYLENCHUS ELACHISTUS
SURVEYS & DISTRIBUTIONS: P 48

PARAPHELENCHUS PSEUDOPARIETINUS
HOST RELATIONSHIPS
Pathogenicity: C 77

PARATRICHODORUS SPP.
INTERACTIONS WITH OTHER PATHOGENS:
Viruses: A 17 18 20 21
CONTROL:
Chemical Control: A 17
Fumigants: A 20
Non-fumigants:
Carbamates: A 18 20 21
Phosphates: A 18 21

PRATYLENCHUS ANDINUS
TAXONOMY & MORPHOLOGY: L 36
HOST RELATIONSHIPS:
Pathogenicity: L 36

PRATYLENCHUS BRACHYURUS
TAXONOMY & MORPHOLOGY: C 67;
L 33 35
BIOLOGY & ECOLOGY: C 67; L 33
SURVEYS & DISTRIBUTION:C 67; K 41;
L 33
HOST RELATIONSHIPS:
Pathogenicity: C 52 67; D 63;
J 22; K 41 57; L 33
35
CONTROL:
Chemical Control:
Fumigants: B 67

PRATYLENCHUS BRACHYURUS (continued)
Non-fumigants:
Carbamates: K 59
Phosphates: R 46 47
Dips & Soaks: R 46 47
Non-chemical Control:
Resistant Varieties:
Screening Trials: J 22
Cultural Control: B 67; K 56

PRATYLENCHUS COFFEAE
BIOLOGY & ECOLOGY: G 89 90 91; Y 7
HOST RELATIONSHIPS:
Pathogenicity: A 55
REVIEWS: S 82

PRATYLENCHUS CRENATUS
BIOLOGY & ECOLOGY: D 31 32
SURVEYS & DISTRIBUTION: B 112; K 38 39; S 65
HOST RELATIONSHIPS:
Pathogenicity: D 31
CONTROL: K 39
Chemical Control
Non-fumigants:
Carbamates: K 38

PRATYLENCHUS DEIOCEPHALUS
HOST RELATIONSHIPS:
Pathogenicity: S 126

PRATYLENCHUS LOOSI
HOST RELATIONSHIPS:
Pathogenicity: C 28

PRATYLENCHUS PENETRANS
BIOLOGY & ECOLOGY: B 49 50; C 59; D 31 32; F 8; K 38 39; M 96 97; O 26; W 79
SURVEYS & DISTRIBUTION: B 112; K 50; M 74; S 64
HOST RELATIONSHIPS:
Pathogenicity: C 49; D 31; H 30 61; O 24 25 26; W 79
PARASITE:
Physiology: W 5
INTERACTIONS WITH OTHER PATHOGENS:
Amoeba: W 5
Fungi: B 41 127 128; C 24 27; G 92; H 30; M 76 97 98
Nematodes: G 167; M 39
CONTROL: K 39
Chemical Control: O 28
Fumigants: B 41 51; C 27; H 33; M 75 76 77; N 43; S 148
Non-fumigants:
Carbamates: A 57 58; B 51; C 23 24 25 26; D 11; H 32; K 38; M 78; N 42 43; O 42; R 79
Phosphates: B 51; C 25; M 78
Miscellaneous Materials: N 43

PRATYLENCHUS PENETRANS (continued)
Dips & Soaks: C 23 49; D 50
Non-chemical Control:
Resistant Varieties:
Screening Trials: B 39; D 49
Cultural Control: F 8; G 167; Y 8
Biological Control: W 5

PRATYLENCHUS PRATENSIS
BIOLOGY & ECOLOGY: S 38
SURVEYS & DISTRIBUTION: N 3; S 38 128; Y 6
HOST RELATIONSHIPS:
Pathogenicity: O 25; S 38 128; Y 6
REVIEWS: G 55

PRATYLENCHUS SCRIBNERI
SURVEYS & DISTRIBUTION: S 39
HOST RELATIONSHIPS:
Pathogenicity: D 53; S 126
INTERACTIONS WITH OTHER PATHOGENS:
Nematodes: G 167
CONTROL:
Non-chemical Control:
Cultural Control: G 167

PRATYLENCHUS TERES
SURVEYS & DISTRIBUTION: K 30

PRATYLENCHUS THORNEI
SURVEYS & DISTRIBUTION: K 50; O 32
HOST RELATIONSHIPS:
Pathogenicity: O 32
INTERACTIONS WITH OTHER PATHOGENS:
Fungi: G 164; K 102
CONTROL:
Non-chemical Control:
Cultural Control: G 164

PRATYLENCHUS SPP.
SURVEYS & DISTRIBUTION: B 112; L 38; S 21; V 2
HOST RELATIONSHIPS:
Pathogenicity: L 34; V 2
CONTROL: I 19
Chemical Control:
Fumigants: M 38
Non-chemical Control:
Resistant Varieties:
Breeding & Genetics: H 27
Cultural Control: M 38

RADOPHILIS SIMILIS
HOST RELATIONSHIPS:
Pathogenicity: M 37

ROTYLENCHUS UNIFORMIS
CONTROL:
Chemical Control:
Fumigants: S 55

ROTYLENCHULUS RENIFORMIS
BIOLOGY & ECOLOGY: L 28; R 18; V 9
HOST RELATIONSHIPS:
Pathogenicity: R 17 18; S 169
CONTROL:
Chemical Control:
Non-fumigants:
Carbamates: A 2
Phosphates: A 2
Non-chemical Control:
Resistant Varieties:
Screening Trials: R 17
Breeding & Genetics: R 19

ROTYLENCHULUS STAKMANI
SURVEYS & DISTRIBUTION: H 124

TRICHODORUS ALLIUS
INTERACTIONS WITH OTHER PATHOGENS:
Viruses: J 33; K 58

TRICHODORUS CHRISTIEI
BIOLOGY & ECOLOGY: H 26
HOST RELATIONSHIPS:
Pathogenicity: C 32
INTERACTIONS WITH OTHER PATHOGENS:
Fungi: W 16
Viruses: C 32; H 26
CONTROL:
Chemical Control:
Fumigants: W 9 16
Non-fumigants:
Carbamates: W 16
Phosphates: W 9 16

TRICHODORUS CYLINDRICUS
SURVEYS & DISTRIBUTIONS: C 64
INTERACTIONS WITH OTHER PATHOGENS:
Viruses: C 64 66
CONTROL:
Chemical Control:
Fumigants: C 66
Non-fumigants:
Phosphates: C 66

TRICHODORUS NANUS
SURVEYS & DISTRIBUTION: C 64
INTERACTIONS WITH OTHER PATHOGENS:
Viruses: C 64 66
CONTROL:
Chemical Control:
Fumigants: C 66
Non-fumigants:
Phosphates: C 66

TRICHODORUS PACHYDERMIS
SURVEYS & DISTRIBUTION: B 38; C 64; E 61; P 29
HOST RELATIONSHIPS:
Pathogenicity: D 6
INTERACTIONS WITH OTHER PATHOGENS:
Viruses: C 64 66; E 61; H 16; J 62; P 29; S 99
CONTROL:
Chemical Control:
Fumigants: C 66; J 62
Non-fumigants:
Carbamates: S 146
Phosphates: C 66; J 62; S 146

TRICHODORUS PRIMITIVUS
SURVEYS & DISTRIBUTION: B 38; C 64; P 29
INTERACTIONS WITH OTHER PATHOGENS:
Viruses: B 110; C 64 66; P 29
CONTROL:
Chemical Control:
Fumigants: C 66
Non-fumigants:
Carbamates: B 110
Phosphates: B 110; C 66

TRICHODORUS PROXIMUS
BIOLOGY & ECOLOGY: H 26
INTERACTIONS WITH OTHER PATHOGENS:
Viruses: H 26

TRICHODORUS SIMILIS
SURVEYS & DISTRIBUTION: E 61; P 29
INTERACTIONS WITH OTHER PATHOGENS:
Viruses: E 61; P 29

TRICHODORUS SPARSUS
SURVEYS & DISTRIBUTION: E 61
INTERACTIONS WITH OTHER PATHOGENS:
Viruses: E 61

TRICHODORUS TERES
INTERACTIONS WITH OTHER PATHOGENS:
Viruses: J 33: K 58

TRICHODORUS SPP.
BIOLOGY & ECOLOGY: C 65
SURVEYS & DISTRIBUTION: E 4
HOST RELATIONSHIPS:
Physiology: R 21; W 18
INTERACTIONS WITH OTHER PATHOGENS:
Fungi: B 52 70
Viruses: A 17 18 19 20 21; C 65; D 42; E 57; G 140; H 70; J 61; L 24 31 32; M 1 2; R 20 21; S 64 79 80 147 167 176 177; W 14 17 18
CONTROL:
Chemical Control: A 17
Fumigants: A 20; G 140; H 17; J 61; L 31; M 2; W 14 15 17
Non-fumigants:
Carbamates: A 18 19 20 21; S 146 147; W 14 15 17 18
Phosphates: A 18 19 21; H 17 65; R 20; S 146 147 177; W 15 18
Miscellaneous Materials: F 46; M 1; S 147
Non-chemical Control:
Resistant Varieties:
Screening Trials: H 18; S 64 80 177
Breeding & Genetics: E 29; S 167

TRICHODORUS SPP. (continued)
Cultural Control: C 65; E 29; F 46; M 2; S 167
TECHNIQUES & METHODOLOGY: L 32
MISCELLANEOUS: D 5

TYLENCHORHYNCHUS CLAYTONI
SURVEYS & DISTRIBUTION: M 74
INTERACTIONS WITH OTHER PATHOGENS:
Fungi: M 76
CONTROL:
Chemical Control: W 10
Fumigants: M 75 76; W 10
Non-fumigants:
Carbamates: R 48; W 10
Phosphates: R 46 47; W 10
Dips & Soaks: R 46 47 48

TYLENCHORHYNCHUS DUBIUS
BIOLOGY & ECOLOGY: K 115
CONTROL:
Chemical Control:
Non-fumigants: O 47

TYLENCHORHYNCHUS MARAILLATUS
SURVEYS & DISTRIBUTION: T 27

TYLENCHORHYNCHUS MARTINI
CONTROL:
Chemical Control:
Miscellaneous Materials: O 50
Non-chemical Control:
Cultural Control: O 50

XIPHINEMA COXI
INTERACTIONS WITH OTHER PATHOGENS:
Viruses: H 69

XIPHINEMA DIVERSICAUDATUM
INTERACTIONS WITH OTHER PATHOGENS:
Viruses: H 69

XIPHINEMA INDEX
HOST RELATIONSHIPS:
Pathogenicity: C 76

GENERAL REFERENCES RELATING TO NEMATODES
BIOLOGY & ECOLOGY: W 3 5
SURVEYS & DISTRIBUTION: C 44; O 31
HOST RELATIONSHIPS:
Pathogenicity: O 36
INTERACTIONS WITH OTHER PATHOGENS: W 5
Bacteria: P 70
Fungi: R 49; W 11
Viruses: L 7
CONTROL: T 19; W 3; Y 4
Chemical Control:
Fumigants: R 49; W 11
Non-fumigants:
Phosphates: R 49
Non-chemical Control:
Resistant Varieties: W 57
Breeding & Genetics: R 56; T 36; W 3
Biological Control: W 5

GENERAL REFERENCES RELATING TO NEMATODES (continued)

REVIEWS: K 44; N 46; O 3 36; P 10 77; R 56; S 33 40 105; T 36; W 2 5 57 75; Z 7

MISCELLANEOUS: N 1

UNCLASSIFIED

BIOLOGY & ECOLOGY: A 3 6 52; C 34 77; F 45; G 82; K 23 89; P 62

SURVEYS & DISTRIBUTION: B 22 23; F 45; G 174; P 54; R 57

HOST RELATIONSHIPS:

Pathogenicity: E 8; G 57 174; H 41; P 54 64 71

Physiology: K 34; M 56

PARASITE:

Pathotypes, races, strains, etc.: A 52; H 62

INTERACTIONS WITH OTHER PATHOGENS: N 28; P 49 71

Bacteria: A 51; P 72

Fungi: A 51; P 72 73

Nematodes: A 51

Viruses: A 51; E 68; K 24 86

CONTROL:

Chemical Control: G 78; P 20 21 22 23 26 27

Fumigants: A 56; C 63; K 63; S 53

Non-fumigants: A 56

Miscellaneous Materials: D 33; G 79; K 24

UNCLASSIFIED (continued)

Non-chemical Control: G 78; V 3

Resistant Varieties: P 64

Screening Trials: A 44 52; N 5

Breeding & Genetics: A 52; E 8 29; G 178; H 15; K 54; R 54; S 122; Y 5

Cultural Control: B 106; E 29; F 45; G 174; K 29; M 89; P 62

Biological Control: B 106; U 1

TECHNIQUES & METHODOLOGY: H 62

REVIEWS: B 46 47 78; N 28; P 20 21 23 26 27 49; S 53; T 10

MISCELLANEOUS: B 32

1

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3. Adylova, N. A. 1976. [The nematodes found in the soil of potato fields before planting and after harvest in the sovkhoz "Sokh" (USSR).] In: VIII Vsesoyuznoe soveshchanie no nematodnym boleznyam sel' skokhozyaistvennykh kul'tur. Tezisy dokladov i soobshchenii. Kishinev, USSR; Izdatel'stvo "Shtiintsa". p. 123.

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Author discusses distribution and spread of the parasite in Sweden. Notes larvae can survive at least one year without hosts. Also notes potatoes and tomatoes are hosts. Infected seed potatoes and transplants main sources of spread.

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A potato variety Sv 64130, resistant to Heterodera rostochiensis out yielded 'Bintje' even on uninfested land.

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14. Aleksandrov, Yu. 1974. [International conference on the use of dihaploids in breeding potato.] Kartofel' i Ovoshchi, 4:47-48.

Crosses of Solanum tuberosum dihaploids. Dihaploids of S. vernei or S. spegazzini produced hybrids (2x) resistant to Heterodera rostochiensis and H. pallida. Doubling their chromosome number did not increase resistance.

15. Aliev, A. A. 1960. [Stem nematode of potatoes under Azerbijan conditions. Preliminary Report.] Tr. Azerb. st. zashchity rost. I:78-80.

16. Allison, D. A., C. Sinclair and M. R. Smith. 1973. Oxamyl--a nematicide for potatoes, onions and sugar beet. In: British insecticide and fungicide conference (7th). Proceedings, Vol. 2 Research Reports, 393-399.

Small plot trials on potatoes to investigate control efficiency on Heterodera rostochiensis and H. pallida indicated a 5 lb a.i./A gave excellent yield increases. Broadcast treatment was more effective than in furrow treatment.

17. Alphey, T. J. W. 1977. Chemical control of TRV, tobacco rattle virus, transmitted by nematodes Trichodorus and Paratrichodorus, spraing in potatoes. In: Proceedings of a Symposium on Problems of Pest and Disease Control in Northern Britain, p. 37-39.

18. Alphey, T. J. W. 1978. Oxamyl sprays for the control of potato spraing disease caused by nematode-transmitted tobacco rattle virus. Ann. Appl. Biol. 32(4):75-80.

Field trials with D-D thiofanox and granules or foliar sprays of oxamyl were tested as a control for spraing (TRV) on potatoes. D-D was effective on all three sites tested; thiofanox was ineffective and oxamyl granules or foliar sprays decreased the amount of spraing. Sprays were more effective than granules.

19. Alphey, T. J. W., J. I. Cooper and B. D. Harrison. 1974. Chemical control of Trichodorus spp. and of transmission of tobacco rattle virus to potatoes. Potato Research 17(3):345.

Oxamyl, aldicarb, phenamiphos and D-D decreased the numbers of nematodes and reduced incidence of spraing from 14% in the control to 0.4%-3%.

20. Alphey, T. J. W., J. I. Cooper and B. D. Harrison. 1975. Systemic nematicides for the control fo trichodorid nematodes and of potato spraing disease caused by tobacco rattle virus. Plant Pathology 24(2):117-121.

DD sometimes killed the nematodes, but Aldicarb or oxamyl affected behavior of the nematode and gave more consistent results.

21. Alphey, T. J. W., J. L. Cooper and B. D. Harrison. 1975. Chemical control of trichodorids and of transmission of tobacco rattle virus. In: F. Lamberti, C. E. Taylor, J. W. Seinhorst (Editors). Nematode vectors of plant viruses. London, UK & New York, USA; Plenum Press 441 pp.

Oxamyl, aldicarb, phenamiphos and D-D were effective in reducing the nematode population and in reducing the incidence of spraing. Spraing in the control plants was 14%; in the treated its incidence was 0.4% (oxamyl) to 3% (D-D).

22. Ambrogioni, L. 1966. Prime osservazioni sulla resistenza di varieta ibride di patat ad alcune popolazioni italiane di H. rostochiensis Woll. Redia 50:75-88.

A population of the nematode from Acerra (Napoli) produced many cysts on potato variety Amaryl but not on Antinema (both varieties derived from S. andigena).

23. Ambrogioni, L. 1971. [On the behavior of some Italian populations of Heterodera rostochiensis Woll. 1923 on resistant lines of potato.] Redia 52:691-708.

Potato lines derived from Solanum andigenum, S. spegassini, S. kurtzianum and S. vernei, supported a large number of females and a great number of cysts developed.

24. Amelung, D. 1978. [A method for surface sterilization of nematode cysts.] Biologische Gesellshaft der DDR, Sektion Phytopathologie und Wilhelm. Pieck Universitat, Rostock, DDR:96-97.

25. Anderfield, A. 1973. [On potato breeding at Jogeva.] Kartuli sordiaretusest Joveval. Sotsialistlik Pollumajandus 28(13):586-588.

The emphasis is on the breeding of potatoes resistant to Heterodera rostochiensis.

26. Anderson, E. J. and J. Dodge. 1945. The eelworm disease of potatoes. Extension Circular 92, Wash. State Coll. 2 pp.

27. Anderson, R. E. and B. Brodie. 1972. Breeding for golden nematode resistance in the United States. In: E.R. French (Editor) International Symposium on key problems and potentials for greater use of the potato in the developing world, Lima, Peru, 17-19 July 1972. Centro internacional de la Papa. pp. 155-160.

A review of programs of resistance breeding to Heterodera rostochiensis in potato.

28. Andersson, S. 1967. Investigations on the occurrence and behavior of Ditylenchus destructor in Sweden. Nematologica 13:406-416.

Potatoes were severely attacked in southern Sweden. Important weed hosts were Mentha arvensis, Stachys palustris, Potentilla anseriona and Rumex acetosella.

29. Andersson, S. 1971. [The potato-rot nematode Ditylenchus destructor Thorne, as a parasite in potatoes.] Potatisrotnematoden, Ditylenchus destructor Thorne, som skadegorare i potatis. Dis. Agr. Col. of Sweden, Uppsala. 139 pp.

This intensive work describes the problem, distribution and host range including 9 weeds of which 5 are new hosts. Tests of 19 resistant varieties indicated 'Aguila', 'Elsa' and 'King Edward' more

tolerant than 'Bintje'. Rotting in storage increased with temperature.

30. Andersson, S. 1971. Kontrollen av potatiscystnematoden i utsadesod lingar av potatis. Vartskyddsnotiser 35:76-81.

31. Andersson, S. 1975. [Current notes on the potato cyst nematode--our important quarantine pest.] Vaxtskyddsnotiser 39(3):70-76.

32. Anisimova, G. L. and V. A. Knyazev. 1978. [Potato breeding in India.] N.-i institut kartofel'nogo Khozyaistva, Kraskovo, USSR. Selektsiya: Semenovodstvo, 3:66-67.

Clone VTn2 (Solanum tuberosum x S. vernei) is highly resistant to nematodes. Meloidogyne incognita, M. taconia and Heterodera pallida resistance was found in forms of S. vernei.

33. Anonymous. 1932. Eelworm is imperilling our potatoes. Smallholder Gardener 57:1 and 171.

Control of the nematode Heterodera schachtii in gardens is discussed. A solution of corrosive sublimate 4 oz to 50 pts of water should be applied at the rate of 2 gallons per square yard. Fallow ground for six weeks and do not plant potatoes for one year.

34. Anonymous. 1954. Notes from Auchincrieve VII. Scot. Agr. 33:216-219.

This article reports effects of D-D mixture upon Heterodera rostochiensis and potato yields. Effects upon nematodes believed three-fold:
a) lowers number of larvae in cysts.
b) lowers number of egg in cysts.
c) stimulates potato growth.

35. Anonymous. 1956. A new technique. Chemical control of potato root eelworm. Scot. Agri. 35:229.

Heterodera rostochiensis can be eliminated from soil in small plots and glass-houses with D-D mixture at the rate of 400 lb acre, raked and watered with 2 gallons per sq. yd. with solubilized xylenol 1 to 100. Plants were not tainted.

36. Anonymous. 1959. Potato--a root knot nematode (Meloidogyne arenaria). Cand. Pest Rev. 37:242.

Meloidogyne arenaria on potato tubers and weeds is reported from British Columbia. Tubers infected with M. arenaria did not show typical knots as shown with M. hapla.

37. Anonymous. 1960. [Tentative directions for studying potato crops for detecting the potato nematode in Byelorussian Soviet Socialist Republic.] Izd. Aked. S-Hk. nauk BSSR, Minsk:1-19.

38. Anonymous. 1964. Borba kartofelnoi nematodi (Drive against the potato nematode). Zashchita rost. ot vred i bolzen 10:50 (Agric. Chemicals 1962 17:12-14, 74).

39. Anonymous. 1965. Canada's golden nematode frightens U.S. growers. American Potato Journal 42:348-349.

Joseph F. Spears, USDA, reviews the history of the golden nematode in the U.S. and compares it to the current problem on Vancouver Island, British Columbia, Canada.

40. Anonymous. 1965. A hybrid resistant to root-knot nematode. Indian Potato J. 7(1):53.

H.C. 294, a potato hybrid resistant to Meloidogyne incognita is expected to produce well in shallow soils subject to drought.

41. Anonymous. 1968. Nematodresistente kartofelsorter. Meddr. St. Fors Virks. Pl. Kult. No. 842, 3 pp.

A two year trial resistant potatoes reduced the infestation level to 1/5 the initial number of eggs and larvae which was a much faster decrease than fallow. (H. rostochiensis).

42. Anonymous. 1971. India: crop protection in Madras. Span. 14:62-63.

In the Madras state of India, Heterodera rostochiensis resistance was found in 19 of 300 potato hybrids tested. Control by fallowing and nematicides (DD) was effective. Seed tubers were freed of nematodes by fumigation with formalin.

43. Anonymous. 1973. The cyst nematode or golden nematode of the potato. Revista Nacional de Agricultura, Bogota 66(793)44-46.

A general damage and economic report on Globodera spp. attacking potatoes.

44. Anonymous. 1974. [Potato varieties resistant to nematodes.] Sementi Elette 20(5)57.

45. Anonymous. 1975. [Nematode-resistant potato varieties.] Zemledelie 7:42.

Lists potato varieties from the Federal German Republic.

46. Anonymous. 1976. [Seed potatoes.] SAFA (Saatgutwirtschaft) 28(4):156.

Thirty-one nematode-resistant varieties are listed.

47. Anonymous. 1977. Nematode control. Indo-German Nilgiris development project. 10 years of Indo-German cooperation 1967-1977. 66 pp.

Chemical control trials with Temik (Aldicarb) on Globodera pellida and G. rostochiensis in potatoes is evaluated.

48. Anonymous. 1978. Nematodes. Potato experts advise grower to soil test for root-knot nematode. Potato Grower of Idaho, March 1978.

Growers are advised to test their soil for Meloidogyne hapla before planting potatoes.

49. Anscombe, F. J. 1950. Soil sampling for potato root eelworm cysts. A report presented to the Conference of Advisory Entomologists. Annals of Applied Biology 37:286-295.

Discusses field sampling, laboratory technique and statistical basis of the recommended technique.

50. Armenta, F. and C. Sosa Moss. [Genetic resistance of potato to nematode attack.] In: Avances en la ensenanza y la investigacion, 1975-1976. Chapingo, Mexico. pp. 94.

51. Armstrong, J. M., P. Jatala and H. J. Jensen. 1976. Bibliography of nematode interactions with other organisms in plant disease complexes. Western Regional Project W-56. Agricultural Experiment Station, Oregon State University, Corvallis. Station Bulletin 623. 109 pp.

An indexed reference list concerning nematode interations with bacteria, fungi, viruses, other nematodes, protozoans, insects, other invertebrates and various crytogams.

52. Armstrong, J. M. and H. J. Jensen. 1978. Indexed bibliography of nematode resistance in plants. Western Regional Research Project W-134. Agricultural Experiment Station, Oregon State University, Corvallis. Station Bulletin 639. 227 pp.

For each nematode species included in the index, pertinent references, with abstracts, are grouped under the following: resistant plants, nature of resistance, inheritance of resistance, nematode development, and pathotypes and populations.

53. Atanasov, P. and C. A. Collingwood. 1962. Effects of metham sodium and other chemicals on potato root eelworm. Plant Pathology 12:153-157.

Describes a simple technique for testing soil sterilants against Heterodera rostochiensis.

54. Atkinson, J. H. and A. J. Ballantyne. 1977. The adenosine triphosphate content of cysts of Globodera pallida and G. rostochiensis as a possible quantitative estimate of field populations. Annals of Applied Biology 87(3):407-414.

ATP was measured by bioluminescence using a photometer. ATP content was significantly related to the number of juveniles that emerged when placed in root diffusate.

55. Australia, CSIRO Division of Horticultural Research. 1973. Report 1971-1973. Adelaide 148 pp. (Plant Nematology 46-47, 48-55).

The host range testing of Pratylenchus coffeae indicated a few individuals will go to potato.

56. Averre, C. W. (Editor). 1975. Results of 1974 Fungicide and Nematicide Tests. 30:209 pp.

Evaluation of available chemicals.

57. Averre, C. W. and K. R. Baker. 1979. Evaluation of some contact nematicides/insecticides on potatoes. 1978. Fungicide and Nematicide Tests 34:198.

Temik and Standak gave best control of Meloidogyne incognita, and produced good yields. Pratylenchus penetrans populations remained high, but the numbers parasitizing potato roots was reduced.

58. Averre, C W. and K. R. Barker. 1979. Evaluation of Temik 15G for nematode control on potatoes, 1978. Fungicide and Nematicide Tests 34:198-199.

Additional income to the grower due to increased yields after Temik treatment was ca $700/acre (ca a 1750% return).

59. Azizova, E. P. 1969. [On potato nematode bivulvarity.] Uz Biol. Zhur. 3:67-68.

1. Bachthaler, G. and P. Behringer. 1973. The effect of cyst-forming nematodes on yields of various field crops grown continuously in long-term experiments. Zeitsschrift fur Acker- und Pflanzenbau. 138(1):21-38.

Increased Heterodera rostochiensis infestation and decreased potato yield occurred during the last five years of a 20 year monoculture experiment. The change was more pronounced in plot treated with mineral fertilizers than in plot treated with mineral fertilizers plus farmyard manure.

2. Baeza, C. A. 1972. The golden nematode (Heterodera rostochiensis Woll.) in Columbia. Nematropica 2(1):1.

3. Baker, A. D. 1946. The potato-rot nematode, Ditylenchus destructor Thorne, 1945 attacking potatoes in Prince Edward Island. Sci. Agric. 29:138-139.

Author reports that this nematode was found in the 'Green Mountain' variety in one field.

4. Baker, A. D. 1948. Some notes on experimental infestation of potato tubers with the potato-rot nematode, Ditylenchus destructor Thorne 1945. Ent. Soc. Ontario (1947) 32-38.

Baker describes three experimental methods of infecting potato tubers with the pest. He also concludes that natural infections occur through the "eyes" and not the skin.

5. Baker, A. D., G. L. Brown and A. B. James. 1954. Relationships of fungi, mites and the potato rot nematode. Science. Lancaster, Pa 119:92-93.

Authors note that mites and nematodes compete for fungal hyphae in potato tuber flesh.

6. Bakhareva, S. N. and N. V. Tyktin. 1962. Characteristics of interspecific hybrids Solanum catarthrun resistant to the potato nematode (Heterodera rostochiensis Woll.). Scientific Conference All-Union Helminthological Soc. 2:18-19.

7. Balashev, N. 1965. Stem nematode of potato. Selsk. Khoz. Uzbekistana 2:43-45.

8. Barker, K. R. and J. N. Sasser. 1959. Biology and control of the stem nematode Ditylenchus dipsaci. Phytopath. 49:664-670.

Variation in susceptibility-resistance of selected plant species to several populations of stem nematode.

9. Bartlett, D. H. and R. J. Roscoe et al. 1973. Results of U.K. trials with coal based aldicarb on sugar beet, potatoes and bulb onions. British Insecticide and Fungicide Conference (7th) Proc. 2:401-407.

Comparison trials of 10% active ingredients of coal based aldicarb with corn cob-based aldicarb were used against Heterodera rostochiensis on potatoes. Both formulations were comparable.

10. Bashkardin, V. I. 1971. Control of Ditylenchus destructor infection on seed potatoes by the use of cuttings. Trudy Nauchno-Issledovatel'skogo Instituta Kartofel'nogo Khozuaistva 9:141-143.

Fifty tubers each of two varieties ('Volzhanin'-early and 'Lorkh'-late) infected with Ditylenchus destructor were sprouted to obtain cuttings. Cuttings were disinfected with alcohol and soaked in a 0.075% solution of Heterauxin for 7 hours to control the nematode.

11. Bazan de Segura, C. 1952. The golden nematode in Peru. Pl. Dis. Reptr. 36:253.

Heterodera rostochiensis has been found in the roots of Solanum andigenum.

12. Bazan de Segura, C. 1953. More about the golden nematode in Peru. Plant Disease Reporter 37:326.

Distribution and hosts of Heterodera rostochiensis is reviewed and brought up-to-date. In addition to infections of Solanum tuberosum subsp. andigenum infections on S. goniocalyx are also reported.

13. Bedi, A. S. 1968. A study of the variability in field populations of the potato cyst nematode (Heterodera rostochiensis Wall.) in relation to resistant potatoes. Ph.D. Thesis, Edinburgh University.

14. Bedi, A. S. 1974. Resistance of potato varieties to cyst nematodes. Proceedings of the Fourth Annual Conference of the Agronomy Society of New Zealand, 4:70-73.

Particular emphasis is placed on the pathotypes of Heterodera rostochiensis and on the use of resistant varieties. Resistance derived from Solanum vernei has shown long-term advantages over strain-specific resistance.

15. Behrens, E. 1971. Taxonomish verwerthbare merkmale zur differenzierung von Heterodera-arten. Probleme Der Phytonematologie, pp. 122-142.

16. Behrens, E. 1972. [Morphological investigation of Heterodera sp. on Solanum tuberosum. Probleme der Phytonematologie. Vortrage anlasslich der II. Tagung uber Probleme der Phytonematologie im Institut fur Pflanzenauchtung Gross Lusewitz der Akademie der Landwirtschartswissenschaften der Deutschen Demokratischen Republik am 2 Juni. pp. 76-85.

The most clear-cut difference between the populations studied was the form of the V-shaped mark on the cuticle at the anus. The two arms of the V are straight in H. rostochiensis but at least one arm was bent outward in the other species.

17. Behrens, E. 1973. [Investigations on the morphology of pathotype B of Heterodera rostochiensis] Vortrage der 12. Tagung uber Probleme der Phytonematologie, Gross Lusewitz 1:121-128.

Morphologically indistinguishable from H. rostochiensis race A, the population understudy can be separated from race A by its ability to infest Solanum andigenum. Its host range corresponds with that of the Dutch race B.

18. Behrens, E. 1974. [The influence of ecological factors on the morphometric values of males of Heterodera rostochiensis (pathotype A) and H. pallida (pathotype E).] Vortrage der 13. Tagung uber Probleme der Phytonematologie, Gross Lusewitz, 7. pp. 47-59.

Heterodera rostochiensis pathotype A and H. pallida pathotype E were examined on nine varieties of Solanum and Lycopersicon. Body length of both pathotypes varied with host plant suitability. Four treatments with dazomet caused considerable increase in size of males of H. rostochiensis.

19. Behringer, P. 1973. [The present situation in resistance breakdown by the potato cyst nematode (Heterodera rostochiensis) and its control in Bayern] Mitt Biol Bundesanst Land Forstwirtsch 151:296.

Pathotype A of Heterodera rostochiensis caused breakdown of resistance in 9 instances and another 40 suspected cases, in Bavaria. In 3 other cases H. pallida was probably involved in resistance breaking.

20. Behringer, P. 1975. [The control of potato nematodes in Bavaria from the standpoint of integrated plant protection.] Bayerisches Landwirtschaftliches Jahrbuch 52(2):140-142.

Crop rotation and chemical control of Heterodera spp. are not as economically feasible as control through use of resistant potato varieties (31 are now available).

21. Behringer, P. 1976. [On the control of potato nematodes in Bavaria.] Kartoffelbau 27(5):172-173.

A discussion of available potato varieties with resistance to Heterodera spp.

22. Beisova, T. K. 1970. [The nematode fauna of the potato in south-eastern Kazakhstan (USSR).] Seriya Biologicheskaya 4:60-63. Inst. of Zool., Acad. of Sci. of the Kazakh SSR, Alma-Ata, USSR.

23. Beisova, T. K. 1971. [Nematode fauna on potato in the south-east of Kazakhstan.] Seriya Biologicheskaya 2:53-57.

24. Beisova, T. K. 1976. [The effect of fertilizers on the numbers of Meloidogyne on potato] In (See Adylova, N. A. 1976 for source). pp. 96-97.

25. Belgium, Gembloux State Agricultural Research Center. 1973. [Annual Report, 1973] Centre de Recherches Agronomiques de l'Etat. Gembloux, Belgium. 165 pp.

Hybrids of Solanum vernei were used in breeding potatoes resistant to Heterodera rostochiensis.

26. Bell, F. H. and B. S. Alandia. 1955. Golden nematode and other potato diseases of Bolivia. Pl. Dis. Reptr. 39:407-408.

Heterodera rostochiensis was found the first time in Bolivia in the Lake Titicaca region at an altitude of 12,600-13,000 ft. Distribution substantiates that the pest is indigenous in the Andes. Meloidogyne sp. was also found in the same area.

27. Bello, A. 1968. [New focuses of Heterodera rostochiensis W., 1923 (Nematoda) in the Canary Islands.] An Edafol Agrobiol 27(11/12):903-919.

28. Belokurskaya, V. I. 1957. [Finding out ways for combating the potato Heterodera under conditions of Lithuanian Soviet Socalist Republic] All-Union Helminthological Society. Academy of Sciences, Moscow, I:33-34.

29. Belokurskaya, V. I. 1958. [Measures for the control of the potato-root eelworm.] Rabot. Gel'mint. 80-Let. Skrjabin. Moscow: Izdatelstro Akademii Nauk SSSR. pp. 59-62.

Heterodera rostochiensis in Lithuania is discussed. Crop rotations with cabbage, cucumber and garlic for 3 years reduced the nematode population by 71.8% and fallow reduced population by 76%. Dichlorethane at 1.5 kg per sq. m. reduced infection by 100% but the area had to be treated each time potatoes were planted.

30. Belokurskaya, V. I. 1959. [The use of crop rotation, preparation nr. 23 and dichloroethane in the control of the potato nematode.] Mater. S. Vses. Soveshch. Izuchen, Nematod, Samarkand: 13-14.

Tests carried out with still residues of dichloroethane for combating the potato nemtode. Results in brief of scientific research work carried out on plant protection North-west Zone of the USSR in 1954.

31. Belokurskaya, V. I. 1963. [Something new about investigations on the potato nemtode.] Zashchita rast. ot vred. i bolezn. 6:41-42.

32. Belokurskaya, V. I. 1965. [Information about phytonematodes in the Lithuanian SSR] In: Zashch. Rast. Vredit., Bolez. Sornyakov (Mater. 5 pribaltiiskoi nauch. Konf. Zashch. Rast) Vilnius:11-14.

33. Belokurskaya, V. I. et al. 1973. [Experimental control of the potato nematode, Heterodera rostochiensis by predaceous fungi (helminthosphages)] Byulleten Vsesoyuznogo Instituta Gel'mintologii im. K. I. Skryabina 11:21-28.

A two-year study of the effect of live and dead Arthrobotrys oligospora upon Heterodera rostochiensis indicated there were no statistically reliable data to support a reduction of cysts by the fungus.

34. Belova, O. D. 1939. [Results of observations and field experiments made with the stem nematode on potatoes.] Leningrad academy of Agricultural Sciences. Inst. Plant Protection. Collection works on nematodes of Agricultural Crops. edited by E. S. Kiryanova. Moscow and Leningrad. 247 pp.

Author notes Anguillulina dipsaci is a widespread parasite of potato tubers in the Ukraine. Disease free sets and use of resistant varieties recommended as control measures.

35. Belyaeva, O. P. 1953. [The potato nematode. Technical guide on the identification of the potato nematode. State inspection for quarantine of agricultural plants.] Petrozovodsk 8 pp.

36. Benec, E. and A. Florutiu. 1966. Nematodul cartofului (Heterodera rostochiensis) si preintimpinarea introducerii lui in tara. Probleme Agric. 109-113.

This article states that potatoes or tomatoes must not be replanted within 5 years nor within 10 km of an infested area. Nemagon recommended for control.

37. Berge, J. B., J. Faraut and M. Ritter. 1976. [Changes in enzyme activity in plants under the influence of nematode infection.] Annales de Phytopathologie 8(1):128-130.

Infected resistant plants showed strong peroxidase activity in necrotic cells, higher phenylalanine ammonia lyase activity and greater increase in tyrosine ammonia lyase activity than did the susceptible varieties.

38. Berlinski, K. 1975. [Protection of potato in France.] Ochrona Roslin 19:10-14.

The most important nematode pests of potatoes in France are; Heterodera pallida, H. rostochiensis, Trichodorus primitivus and T. pachydermus.

39. Bernard, E. C. and C. W. Laughlin. 1976. Relative susceptibility of selected cultivars of potato to Pratylenchus penetrans. Journal of Nematology 8(3):239-242.

Russet Burbank had highest tuber yields of the varieties tested but also supported the highest density of nematodes in its roots.

40. Bhaskaran, A. R. 1971. Control of the potato golden nematode (Heterodera rostochiensis Woll): campaign on the Nilgiris. Madras Agr. J. 58(9/10):800-808.

41. Biehn, W. L., A. Hawkins and P. M. Miller. 1971. Effect of 1,3-dichloropropene and a combination of 1,3,dichloropropene + chloropicrin on infection of potatoes by Verticillium albo-atrum. Pl. Dis. Reptr. 55:968-971.

Soil fumigation with 1,3,dichloropropene at 25 and 40 gpa and 1,3,dichloropropene and chloropicrin (15%) mixture at 20, 30 and 40 gpa delayed infection by the fungus. Yield, however, was similar for all plots. Pratylenchus penetrans was also controlled in all treatments and thus it is suggested nematode control delayed Verticillium symptom expression.

42. Bijloo, J. D. 1954. A new method for estimating the cyst content of the potato-root eelworm Heterodera rostochiensis Woll. J. Helminthology 28:123-126.

Stirring the cysts in a CEKA-homogenizer, type UM, 15,000 RPM for 3 minutes free all eggs and larvae from the cyst.

43. Bijloo, J. D. 1955. Proeven ter bestrijding van Heterodera rostochiensis door het wassen en ontsmetten van aardappelen. Tijdschrift over Plantenziekten 61:47-51.

Author discusses efficiency of washing machines to remove cyst on potatoes grown in sandy and heavy soils. Cysts in soils can be destroyed with a 0.5% solution of Aardison. Some varieties are severly injured, however, the material killed cyst contents.

44. Bijloo, J. D. and P. A. M. Boogaers. 1956. Population decrease of H. rostochiensis after DD treatment of the soil. Nematologica 1:16-30.

A study of developing larvae within the egg membrane indicated a high rate of kill from DD treatments.

45. Bilewicz-Pawinska, T. 1976. Heterodera on potatoes and the natural reduction of some bug populations and the effect of insecticides against Colorado beetle-Leptinotarsa decemlineata Say(Col. Chrysomelidae) Polskie Pismo Entomologiczne 46(3):503-525.

Chemical control of Globodera (Heterodera) rostochiensis on potatoes.

46. Bingefors, S. 1954. Resistens mot nematoder hos vara kulturvaxter Svensk Jordbruksforskning. pp. 174-180.

A review of the literature on agricultural crops resistant to nematodes.

47. Bingefors, S. 1971. Resistance to nematodes and the possible value of induced mutations. In: Mutation Breeding for Disease Resistance, Panel Proc. Ser., Int. atom. Energy. Ag., Vienna (1970):209-235.

48. Bingefors, S. 1973. Breeding for nematode resistance. Sveriges Utsadesforenings Tidskrift, 83 (Supplement) pp. 24-31.

The present situation in Sweden is reviewed with regard to breeding resistance in oats against Heterodera avenae, in potatoes and tomatoes against H. rostochiensis and in red clover and lucerne against Ditylenchus dipsaci.

49. Bird, G. W. 1977. Population dynamics of Pratylenchus penetrans associated with three cultivars of Solanum tuberosum. Journal of Nematology 9:265.

A seasonal population study of three potato cultivars ('Superior,' 'Onaway' and 'Russet Burbank') in sandy loam soil infested with Pratylenchus penetrans indicated several declines and increases in root populations. This pattern may be due to nematode generation times. When root populations increased--soil populations decreased and vice versa.

50. Bird, G. W., M. Sarette, C. Cooley and M. Dover. 1976. Nematology components of an on-line pest management system. Journal of Nematology 8(4):280.

Potato pest is included in heuristic on-line simulation of Pratylenchus penetrans population dynamics and potato growth and development

51. Bird, G. W. and M. L. Vitosh. 1978. Effects of chemical control of Pratylenchus penetrans on potato varieties grown at three levels of nitrogen fertilization. Journal of Nematology 10:281-282.

Three potato varieties were tested for control by nematicides and nitrogen fertilizers. The nematicides aldicarb, disulfaton and Vorlex (1,3 dichloropropene + methylisothiocyanate) or DD+MIC significantly reduced soil and root populations as well as yields. Three levels of nitrogen had no significant effect on nematode control.

52. Bjornstad, A. 1974. [Rust in potatoes.] Nor Landbruk 8:20.

53. Blodgett, E. C. 1943. Stem nema on potato: a new disease in Idaho. Plant Disease Reporter 29:658-659.

The nematode, causing a severe malady of potato is tentatively identified as Ditylenchus dipsaci.

54. Blodgett, E. C. 1945. Further survey for stem nematode on potatoes in Idaho. Plant Dis. Reptr. 29:58-60.

The author gives an account of the number of farms surveyed for this nematode in the vicinity of Aberdeen, Idaho. Six farms were infested. He also indicates this species is different than the stem nematode and will be described soon.

55. Bishop, D. 1953. Hatching the contents of cysts of Heterodera rostochiensis with alternating temperature conditions. Nature, London. 172:1108.

A temperature regime approximating that of the soil, rather than a constant temperature, is more conducive of hatching.

56. Blodgett, E. C. 1947. The emergency plant disease prevention project in Idaho. Pl. Dis. Reptr. Sup. 167:22-24.

Author reviews project to control Ditylenchus destructor in Idaho. Claims success for the project.

57. Blunk, H. 1933. Uber Moglichkeiten zur Eindammung der Kartoffel nematoden-Plage. Zeitschrift fur Pflanzenkrankheiten und Pflanzenschutz 58:68-77.

Author discusses the Heterodera schachtii problem in Germany; suggests growers become alert and restrict imports from infected countries.

58. Bogdanov, O. I. and V. M. Polozhenets. 1975. [The effect of various agrotechnical measures on the susceptibility of potato to stem nematode infection.] Kartoplyarstvo. Resp. Mizhvid. Temat. Nauk. Zb. 6:50-51.

Six potato varieties showed good resistance to Ditylenchus infection. Farmyard manure reduced the nematode population.

59. Bohm, O. 1951. Achtung auf das Kartoffelalchen. Pflanzenarzt. Vienna 4:1-2.

The first report of Heterodera rostochiensis in Austria. The subject is reviewed and an appeal made for information of possible infections. One of several papers on findings and distribution in Austria.

60. Bohm, O. 1956. Beobachtungen an osterrichischem Kartoffelalchenmaterial. Pflanzenarzt. Vienna 9:76-77.

Heterodera rostochiensis was grown at 3 moistures (air humidity:30-55%, 70-80% and 90-100%) and 3 temperature ranges (7-14, 10-18, 20-25°C). At lowest temperature infection was weakest and highest at middle temperature. Highest humidity also had fewest cysts. Development did not appear to be humidity related.

61. Boiko, Y. P. 1971. [A study of some species and hybrids of the potato as initial material in breeding for eelworm resistance.] Tr. NII Kartof. Kh-va 9:107-110. (Plant Breeding Abstracts 45, 4667).

15 hybrids (polyploids of S. chacoense, S. chacoensef. laplaticum and S. chacoense f. emmere) showed high resistance to Heterodera rostochiensis. None of the 118 samples of S. andigenum tested were resistant.

62. Boiko, Y. P. 1976. [Methods and results of breeding nematode-resistant varieties of potatoes for intensive production.] Moskva: VNIITEISKh, 49:1.

63. Boiko, Y. P., A. I. Kuchumov and B. P. Nazarenko. 1976. [Methods and results of breeding nematode-resistant varieties of potatoes for intensive production.] Obz Inf Vses Nauchno-Issled Inst Inf Tekh-Ekon Issled Sel'sk Khoz 929:51.

64. Bolander, W. J. and G. S. Santo. 1977. Elimination of Meloidogyne hapla in potato seed-pieces with a phenamiphos dip treatment. Plant Dis. Rep. 61(9):743-745.

Phenamiphos at 4.75 g a.i./l water consistently eliminated nematodes from potato pieces.

65. Boock, O. J. 1949. O fumigante 'Dowfume W-10' no controle aos nematoides da batatinha. Rev. Agri. Sao Paulo 24:25-42.

Author describes techniques and results of using 10% ethylene dibromide (in naphtha) at 30 gal/A.

66. Boock, O. J. 1951. Combate aos nematoides pelo aplicacao de fumigantes no solo. Efeito do DD e Dowfume W-40 no combate aos nematoides formadones de galhas, em tuberculos de batatinka. Bragantia. Campinas 11:13-18.

Sites fumigation work with DD and Dowfume W-40. Results were not spectacular as there was about the same growth of potatoes in treated as in fertilized soil. No population data was given for Meloidogyne.

67. Boock, O. J. 1959. Influencia da adubacao e da fumigacas do solo, na incidencia de nematoides em tuberculos de batatinka. Bragantia Campinas 18:327-335.

Fertilizer has no influence on infection of potato tubers by Meloidogyne incognita or Pratylenchus steineri. Fumigation with EDB gave good results.

68. Boparai, J. S. and N. G. M. Hague. 1974. The response of the potato cyst nematode, Heterodera rostochiensis, and the root knot nematode, Meloidogyne incognita to Dowco 275. Journal of Nematology 6:136.

Granules of Dowco 275 were applied to soil infested with Heterodera rostochiensis prior to planting. On 8 mg a.i./kg soil rate reduced the final population to a lower level than the beginning population. Rates of 2 and 4 mg a.i./kg soil also were effective against Meloidogyne incognita. Dowco 275 seems to effect the nematodes in the roots.

69. Boparai, J. S. and N. G. M. Hague. 1974. The effect of thioxamyl nematocide on the development and reproduction of the potato cyst nematode, Heterodera rostochiensis Woll. Meded Fac Landbouwwet Rijksuniv Gent 39(2, pt. 1):719-725.

Thioxamyl-(S-methyl-1-(dimethylcarbamoyl)-N-[(methylcarbamoyloxy)]thioformimidate). Soil drenches of Thioxamyl

at 8 ppm in pots containing infested soil delayed emergence of 2nd stage larva by 4 weeks and root invasion was greatly reduced. However, the larvae that did eventually penetrate developed normally.

70. Borchardt, G. 1975. [Testing potato varieties for tuber resistance to tobacco rattle virus necrosis.] Potato Research 18(1):146-147.

Methods of testing for resistance using infections Trichodorus are described.

71. Borchardt, G. 1977. [Demonstration of pathotypes of potato nematodes by a combination of the Fenwick and biotest methods] Mitteilungen aus der Biologischen Bundesanstalt fur Land- und Forstwirtschaft (Berlin-Dahlem) 178:133-134. (De) (Abstract)

Susceptible varieties Grata and Maritta and the resistant variety Cobra were used in tests of cysts of Heterodera rostochiensis from 18,000 soil samples. A nematode population different from pathotype A was indicated by cyst formation on Cobra.

72. Bordakova, M. V. 1961. [The stem nematode of potato.] Zashchita rost. ot vred. i bolezn 8:39.

73. Borovikova, A. N. 1974. [Reaction of susceptible and resistant varieties of potato to Heterodera rostochiensis infection.] Byulleten' Vsesoyuznogo Instituta Gel'mintologii im. K. I. Skryabina. 14:75-76.

74. Borovikova, A. N. 1976. [The development of Heterodera larvae in the roots of resistant and susceptible potato varieties.] Kishinev, USSR; Izdatel'stvo "Shtiintsa". pp. 45-46.

75. Borovkova, A. M. 1963. [Detection of the potato nematode by the method of soil samples.] State Inspection on Quarantine and Plant Protection. Ministry of Agriculture USSR 2:1-2.

76. Bosher, J. E. 1953. Potato rot caused by the iris bulb nematode in British Columbia. Pl. Dis. Reptr. 37:201-202.

The author reports that an iris bulb field formerly infested with a Ditylenchus sp. caused typical Ditylenchus destructor symptoms when planted to potatoes.

77. Bouwman, L. A. and H. Ross. 1972. Differentiation between Heterodera rostochiensis and an undescribed allied species by female color, morphometics and pathogenicity. Nematologica 18:265-269.

Comparative morphometics and pathogenicity of 15 Heterodera populations from Europe, India and Peru revealed two groups based on color of developing females. 6 had golden coloration and 9 white or creamy. Pathogenicity tests revealed the 9 white and creamy colored group had a much wider host range than the 6 golden colored group.

78. Bovien, P. 1955. Host specificity and resistance in plant pathology. Annals of Applied Biol. 42:382-390.

Host specificity and resistance is discussed, with examples drawn from Heterodera, Meloidogyne and Ditylenchus.

79. Bovien, P. and K. Lindhardt. 1953. Kartoffelalens forekomst; Danmark. Undersogelser 1950-1951. Tidsskrift for Planteavl. 56:592-600.

An account of the potato-root eelworm situation in Denmark.

80. Brande, J. van den. 1954. Aspecten van het onderzoek ter bestrijding van het aardappel-cystenaaltje. Parasit. Gembloux 10:1-5.

To control Heterodera rostochiensis use of an early potato variety; Eerstelingen is recommended. Yield response can be obtained by use of calcium cyanamide.

81. Brande, J. van den and J. D'Herde. 1964. Phenological control of the potato root eelworm (Heterodera rostochiensis Woll.). Nematologica 10:25-27.

An early variety of potato planted in infested soil (Belgium) in mid-March and harvested in mid-June reduced the nematode populatin to less than 10% of its original level after five years of consecutive cropping. With a 2 or 3 year interval between crops the level was reduced to 2%.

82. Brande, J. van den, R. H. Kips, C. Beheyt and J. d'Herde. 1951. [Chemical control of the potato nematode, Heterodera rostochiensis, Woll.] Mededelingen van de Landblouwhogeschool ende Opzoekingsstations van de Staat te Gent. 16:247-259.

D-D gave an 80% kill of nematodes and increased tuber yield. Calcium cyanamide and ammonium sulfate had no effect. Ethylene dibromide was extremely phytotoxic.

83. Brande, J. van den, R. H. Kips and J. d'Herde. 1953. [Chemical control of the potato root eelworm, Heterodera rostochiensis Woll.] Mededelingen van de Landbouwhogeschool en de Opzoekingsstations van de Staat te Gent. 18:350-363.

Chemical control of the potato root eelworm using O(2(ethylmercapto(ethyl) O.O.diethylthiophosphate (E.1059-Systox) and Octamethylpyrophosphoramide (OMPA, Schradan, Pestox III).

84. Brande, J. van den, R. H. Kips and J. d'Herde. 1954. [Influence of moisture in the chemical control of the potato root eelworm, Heterodera rostochiensis, Woll] Mededelingen van de Laudbouwhogeschool en de Opzoekingsstations van de Staat te Gent. 19:353-372.

Optimum results (100% kill) with chemical treatments can be obtained when the water content of the soil is 4.2% to 11.8%.

85. Brande, J. van den, R. H. Kips and J. d'Herde. 1954. Veldproeven in verband met de invloed van het watergehalte van de bodem en van de bodemtemperatuur bij de scheikundige bestrijding van het aardappelcyst-enaaltje, Heterodera rostochiensis Woll. Mededelingen van de Laudbouwhogeschool en de Opzoekingsstations van de Staat te Gent. 19:765-776.

Temperature of the soil (between 2.5°C-16.5°C) at time of treatment with D-D had no significant effect, but moisture content of the soil (10-12%) was significant.

86. Brande, J. van den, R. H. Kips and J. d'Herde. 1956. [Field trials with dichloropropane-dichloropropene for the control of the potato root eelworm.] Mededelingen van de Laudbouwhogeschool en de Opzoekingsstations van de Staat te Gent. 21:371-376.

A 99% kill of Heterodera rostochiensis can be obtained with the pall-injector and constant flow apparatus mounted on the plough. Water content of soil should be 10-12%.

87. Brande, J. van den, Kips, R. H. and J. d'Herde. 1956. Survey of the results of four years experiments on the chemical control of the potato root eelworm. Nematologica 1:81-87.

Moisture played an important role in nematicide action against cysts of Heterodera rostochiensis. Low temperatures apparently had little effect upon kill.

88. Brande, J. van den, R. H. Kips, J. d'Herde and L. van Mol. 1952. Onderzoek van aardappelvarieteiten en van Amerikaanse Solanum-soorten in verband met het aardappelcystenaaltje Heterodera rostochiensis Woll. Iste mededeling. Mededelingen van de Laudbouwhogeschool en de Opzoekingsstations van de Staat te Gent. 17:51-60.

None of the American Solanum species tested proved resistant to Heterodera rostochiensis. Tests also included other varieties and interspecific hybrids.

89. Bravo, B. J. 1976. Influencia de nematicidas en los incrementos y decrementos del nematodo del quist y los rendimientos en suelos fertilizados y residuales. XIX Convencion Nacional de Entomologia, Octo. 24-29, Huanuco, Peru. 84.

Chemical control of Globodera pallida

90. Bravo, J. 1977. [The differential pathogenicity of Nacobbus spp. from two locations (Puno and Mantare Valley) on two host plants.] Nematropica 7(2):3.

Although both populations were pathogenic, the Puno population produced more galling.

91. Bravo, B. J. 1977. [The effect of some nematicides on the population level of potato cyst nematode Heterodera pallida and on the yield in fertilized and residual soils.] Nematropica 7(2):3-4.

92. Bravo, B. J. and F. Medinac. 1976. Diferenciacion patogenica de Nacobbus serendipiticus Fr. (Puno)y Nacobbus sp. (Valle del Mantaro] en dos hospederos. XIX Convencion Nacional de Entomologia, Oct. 24-29, Huanuco, Peru. P. 19.

A differentiation of pathogenicity of two Nacobbus species (N. serendipiticus and N. sp. aberrans) on various hosts.

93. Bridge, J. 1975. [Plant parasitic nematodes from the Lowlands and Highlands of Ecuador.] Nematropica 5(2):19-20 (Es).

Large populations of Heterodera pallida occur on potato in the mountainous regions.

94. Brodie, B. B. 1974. The relationship of starlings to the spread of Heterodera rostochiensis. Journal of Nematology 6:136-137.

From cysts ingested by starlings and retained for more than 1.25 hours, no larvae emerged. Also, cysts in contact with excreta for more than 72 hours failed to hatch.

95. Brodie, B. B. 1976. Effects of birds ingesting Heterodera rostochiensis cysts on viability of eggs and larvae. Journal of Nematology 8(4):318-322.

Nematode cysts were fed to several kinds of birds and the amount of time required for complete evacuation varied from 3 to 6 hours. Cyst contents were non-viable if exposed to the alimentary tract of starlings for more than 1.5 hr., pigeons for 1 hr and other birds for 0.5 hr.

96. Brodie, B. B. 1976. Managing population densities of Heterodera rostochiensis. Journal of Nematology 8(4):280.

Concludes that a resistant potato cultivar or a non-host crop must be grown at least every other year, if nematode population densities are to be kept low.

97. Brodie, B.B. 1977. Relative effectiveness of management systems in suppressing densities of Heterodera rostochiensis. Nematropica 7(1):1.

98. Brodie, B. B. 1978. Relation of population density of Globodera rostochiensis in soil to its spread on potato tubers. Journal of Nematology 10:282.

Samples of potato tubers, harvested from nematode plants with various population densities, were thoroughly cleaned to obtain the adhering soil remaining on tubers after normal handling procedures. Cysts were collected from these samples and crushed to determine number of

viable eggs. Viable eggs or larvae were recovered from the remaining soil and the number recovered were related to the population density at harvest. It should be noted that nematodes can be spread with soil adhering to the tubers.

99. Brodie, B. B., R. E. Blow, N. L. Brace and J. H. King. 1976. A new technique for handling cysts of Heterodera rostochiensis during routine laboratory procedures. Plant Disease Reporter 60:936-938.

A filter sock (a cotton fiber filter used in the milk lines by the dairy industry) is modified to become a collection container to strain cysts collected on a 60-mesh sieve.

100. Brodie, B. B. and R. L. Plaisted. 1976. Resistance to root-knot nematodes in Solanum tuberosum spp. andigena. Journal of Nematology 8(4):280-281.

Families produced by crossing clones of S. tuberosum andigena showed reistance to Meloidogyne incognita, one family showed total resistance to M. incognita acrita, three families contained resistance to M. arenaria, M. javanica and M. hapla, and two families showed resistance to five Meloidogyne species.

101. Brodie, B. B. and R. L. Plaisted. 1977. Breeding for resistance to root-knot nematodes in potatoes. Nematropica 7(1):2.

102. Brodie, J. 1968. An apparatus for separating round cysts of the genus Heterodera, from dry float derbis. Pl. Path. 17:151-154.

Heterodera rostochiensis cysts were separated from dry float material by rolling the mixture down the inside of a specially constructed revolving cylinder. From 4.2 gm of dry float 85% of the cysts contained 91% of the larvae were removed from the soil.

103. Bromilow, R. H. 1973. Breakdown and fate of oximecarbamate nematicides in crops and soils. Ann. Appl. Biol. 75:473-479.

An aqueous solution of aldicarb at 16.8 kg ai/ha applied to grass land on sandy soil was present at 1% of applied rate 11 days later, when aldicarb sulphoxide and sulphone made up 30 and 4% respectively of the applied rate. In two months 98% of these residues disappeared and only traces of sulphore were found after 4 months. Aldicarb sulphoxide had a half-life of 2-weeks, and oxamyl also had a two-week half-life. Aldicarb incorporated as granules at 1.68 and 11.2 kg ai/ha in pots prevented Heterodera rostochiensis invasion for at least 11 weeks.

104. Brown, E. G. 1961. Assessing the damage caused by Heterodera rostochiensis Woll. Nature, London 191:937-938.

The yield of potatoes and the initial nematode population were linearly related over the range studied. The mean figure was a little more than 1 ton yield reduction per acre for every 20 eggs/gm.

105. Brown, E. B. 1961. A rotational experiment on land infested with potato root eelworm Heterodera rostochiensis Woll. Nematologica 6:201-206.

Author studied changes of nematode populations in various rotation schemes.

106. Brown, E. B. 1965. Cultural and biological control. In (See Southey 1965). pp. 219-237.

General discussion of crop rotation, prevention of spread, selection of healthy propagating material and biologic control.

107. Brown, E. B. 1969. Assessment of the damage caused to potatoes by potato cyst eelworm, Heterodera rostochiensis Woll. Ann. Appl. Biol. 63:493-502.

Average losses in England due to this pest was 1.2 tons per acre with cyst concentration 10 per 100 gm soil, 0.85 tons per acre with egg concentration 20 per gm soil.

108. Brown, E. B. 1970. The behaviour of populations of potato cyst eelworm Heterodera rostochiensis Woll. toward resistant potato varieties derived from Solanum tuberosum spp. andigena Juz and Buk. Ann. Appl. Biol. 65:377-383.

A general appraisal of various populations of H. rostochiensis and their behavior toward resistant varieties.

109. Brown, E. B. 1972. Potato cyst nematode: some practical considerations. Ann. Appl. Biol. 71:294-296.

Distribution of pathotype A and E of Heterodera rostochiensis in England indicate they are distinct species and cannot co-exist.

110. Brown, E. B. and G. B. Sykes. 1973. Control of tobacco rattle virus (spraing) in potatoes. Ann. Appl. Biol. 75:462-464.

Granular formulations of Nemacur P., Mocap, phorate aldicarb and oxamyl, thionazin and methomyl wettable powder all reduced incidence of spraing on potatoes. Aldicarb at 2 lb/ai/a and oxamyl and Mocap at 5 lb/ai/a were most effective. Dominate nema was Trichodorus primitivus.

111. Brown, E. B. and G. B. Sykes. 1975. Studies on the relationship between density of Longidorus elongatus and yield of barley and potatoes. Plant Pathology 24(4):221-223.

Loss of potato yield in Shifnal, Salop, England in 1972 was 3 ton/ha/100 Longidorus/200 g soil.

112. Brown, M. J. and R. M. Riedel. 1978. Pratylenchus spp. associated with Solanum tuberosum cv Superior in Ohio. Journal of Nematology 10:282.

The authors report the results of a general root and soil survey of 440 ha (1100 A) of potatoes in Ohio. Pratylenchus occurred in 65% of the soil samples and 81% of the roots. Some other genra were found but in much smaller numbers. Six species of Pratylenchus were found.

113. Brucher, H. 1967. Root-knot eelworm resistance in some South American tuber forming Solanum species. American Potato Journal 44:370-375.

A collection of 560 wild and cultivated primitive Solanums from Chile, Argentina and Bolivia were tested for resistance to four species of Meloidogyne (M. hapla, M. javanica, M. incognita and M. thamesii). The following species showed resistance; Solanum bijugum Bitter, S. commersonii Dun, S. chacoense Bitter, S. toscalense Brucher and on undescribed species from Fraile Pintado-chalican.

114. Bruel, E. van den. 1950. Le nematode done de la pomme de terre, Heterodera rostochiensis Woll. Rev. de L'Agri. Brussels 3:123-136.

Author discusses the problem and presents a review of all known aspects of the potato cyst nematode.

115. Brzeski, M. W. and A. L. Zepp. [Seasonal population fluctuations of Meloidogyne hapla Chitw.] Roczniki Nauk Rolniczych. Seria E-Ochrona roslin 7(1):181-185.

The infective potential of M. hapla decreases by 95-99% in one year of fallow or non-host crop. On potato, the nematode has one generation per year.

116. Buhr, H. 1961. Krankheiten und Schadlinge an Solanum aviculare und Solanum auriculatum in Deutschland. Tagungsberichte. Deutsche Akademie der Landwirtschaff wissenschaft zu Berlin. 27:249-254.

Heterodera rostochiensis attacks Solanum aviculare as readily as it does potatoes and develops normally. Hunger roots formed but it is not known whether yield was affected. H. rostochiensis did not develop on S. auriculatum.

117. Bukasov, S. M. (Editor). 1971. [Flora of cultivated plants in the USSR, edited by P. M. Zhukovski. Part 9 Potatoes] Leningrad, USSR, Izdatel' stavo (Kolos) Plant Nematology pp. 432-433.

Resistant variety of poatoes were evaluated for resistance to Heterodera rostochiensis and Ditylenchus destructor.

118. Bumbu, I. V. 1968. [The possibility of increasing the resistance of potato to Ditylenchus infection.] Mosocow: Nauka 4:215-219.

UV irradiation of potatoes (60 times per month for 10 min treatments) prior to planting increased the amount of glycoalkaloids 6 times and decreased nematode infectin by 10 times. Extracts of this material from treated tubers was detrimental to D. destructor.

119. Bumbu, I. V. 1970. [Dehydrogenase activity of plant tissue damaged by parasitic nematodes.] In [Parasites of animals and plants] Kishinev: RIO Adad. Nauk. Moldavskoi SSR 5:130-132.

Dehydrogenase activity is intensified in potatoes infected with Ditylenchus destructor. Intensification in oxidation activity favors disease development and is necessary for successful nematode feeding.

120. Bumbu, I. V. 1971. [Content of SH-groups and ascorbic acid in healthy and nematode infected plant tissue.] In Parazity zhivotnykh i rastenii. Kishinev: Izdatel' stov "Shtiintsa" 7:121-124.

An analysis of diseased (Ditylenchus destructor) and healthy potato tissue indicated an intensification of dehydrogenation processes and ascorbic acid production associated with infection was correlated with an increase in SH-groups. There was no definite correlation, however, between increased SH-groups and plant resistance.

121. Bumbu, I. V. 1971. [Pathogenesis of Ditylenchus and Meloidogyne infection of plants.] In Parazity zhivotnikh i rostenii. Kishinev: RIO Akademii Nauk Moldavskoi SSR 6:108-119.

Biochemical effects of Meloidogyne in cucumbers and Ditylenchus destructor in potatoes was studied. In potato changes were noted in carbohydrate metabolism.

122. Bumbu, I. V. and N. V. Mel'nik. 1975. [Enzymatic activity of protein fractions excreted by potato stem nematode Ditylenchus destructor. Parazity Zhivotnykh Rast 11:111-118.

123. Bumbulucz, L. 1970. Experiments with varieties resistant to different races of Heterodera rostochiensis. Triennial Conf (4th) Eur. Assn. Potato Res. Brest 1969. Proc. p. 210.

Biotypes A, B, C, D and E occur in Norway but only 1.8% are aggressive. Variety Amelio is resistant to biotype A of H. rostochiensis. In one year an 80-90% populations reduction occurred and after 5 years no aggressive race was found.

124. Bumbulucz, L. and J. Oydvin. 1976. [Population densities of yellow potato cyst nematode Heterodera rostochiensis Woll. and potato yields by repeatedly growing of susceptible and ex andigena cultivar with gene H1, 1963-70.] Res. Norw. Agric. 27(7);731-743.

Populations of the nematode increased from the initial 6 eggs and larvae/g soil to 1,327 epg in a seven year period in fields plant with susceptible cultivar Kerr's Pink. The susceptable cultivar means yield was 1809 kg/decare/year; for the resistant Amnelio, the mean yield was 3,665 kg/decare/year.

125. Bunt, J. A. 1972. The systemic action of D-1410, S-methyl 1-(dimethylcarbamoyl)-N((methylcarbamoyl)Oxy-)thioformimidate, against heterodera rostochiensis on potato and Pratylenchus on Rosa canina. Ghent Rijksfac Landbouwetensch Meded 37(2):798-807.

2.5 ppm foliar application of the chemical--or 1.25 ppm soil plus foliar application--gave good control of the nematodes and increased the potato yield.

126. Bunt, J. A. 1978. Comparison of different methods in assaying the efficacy of soil disinfection against Globodera spp. in potato Med. Fac. Landbouww, Rijksuniv Gent 43/2:727-737.

Various chemicals are evaluated for control efficiency against Globodera spp. on potatoes.

127. Burpee, L. L. and J. R. Bloom. 1974. Interaction of Verticillium albo-atrum and Pratylenchus penetrans on potato. Phytopathology 64(5):579.

The data suggest that infection of potato roots by the nematode and fungus results in a decreased incubation period for the fungus.

128. Burpee, L. L. and J. R. Bloom. 1978. The influence of Pratylenchus penetrans on the incidence and severity of Verticillium wilt of potato. J. Nematol. 10(1):95-99.

A Pratylenchus-Verticillium interaction was not evident within the cultivars tested. Nematode numbers were suppressed in the presence of Verticillium in Kennebec and Katahdin.

129. Burshtein, R. 1976. [Trials of resistant potato varieties and their influence on nematode population numbers.] Parazitologicheskie issledovaniya v Pribaltike. Riga, USSR; Izdatael'stvo "ZINATNE" 166-168.

Of 9 potato varieties tested, "Ameks," "Apis," "Maris Piper," "Ulsterglade" and "Prominent," were fully resistant to race A of Heterodera rostochiensis.

130. Burton, W.G. 1966. The potato. A survey of its history and of factors influencing its yield, nutritive value, quality and storage. 2nd Ed. H. Veeman, Wageningen, Holland. 382 pp.

Includes brief descriptions of the symptoms of infection by Heterodera rostochiensis and Ditylenchus destructor.

131. Buyauskas, A. [Bujauskas, A.] 1973. [A Lithuanian potato variety resistant to the potato cyst nematode.] In Materialy vseoyuznogo simpoziuma po borbe s Kartofel'noi nematodoi, Tartu 3-5.

'Meta,' a new potato variety resistant to Heterodera rostochiensis is a hybrid between 'Sagitta' (resistant) and 'Komtessa' (susceptible).

132. Byrd, D. W., Jr., H. Ferris and C. J. Nusbaum. 1972. A method for estimating numbers of eggs of Meloidogyne spp. in soil. J. of Nematology 4:266-269.

Egg masses were elutriated from the soil, gelatinous matrices of the masses were dissolved and the dispersed eggs were stained to facilitate counting.

133. Bzikova, Z. A. and A. N. Shcherbinin. 1973. [Resistance of potato varieties to Ditylenchus destructor in the Severo-Osetinsk ASSR] In Sbornik zoologicheskikh rabot. Ordzhonikidze, USSR; Severo-Osteinskii Gosudarstvennyi Universitet im. K. L. Khetagurova 75-79.

Resistance to Ditylenchus destructor was not found in any of the 15 potato varieties tested. The early varieties were found to be generally more susceptible than the late ones.

1. Caero, G. 1976. Estudios sobre el nematodo del"dalso nudo de la raiz" Nacobbus serendipticus. Cochabamba, Bolivia. Bolitin Experimental 00060 Agosto 1976, 5 pp.

Report of host range studies of Nacobbus serendipticus.

2. Camacho-Guerrero, J. S., C. E. Rodriguez and C. Sosa Moss. 1977. [Chemical control of golden nematode of potatoes, under greenhouse conditions.] Nematropica 7(2):4-5.

3. Canada, Department of Agriculture. 1952. Report Canadian Dept. Agric. 1951-1952. 10-23.

Surveys, quarantine enforcements, fumigation, resistant studies on Ditylenchus destructor were discussed.

4. Canada, Dept. of Agriculture. 1975. Research Branch Report 1974. Ottawa, Canada. xi+ 384 pp.

Brief reports of research concerning: chemical control of Heterodera rostochiensis, breeding resistant potatoes, and Meloidogyne hapla on potato.

5. Canahua Zaga, A., Q. W. Cornejo and S. V. Huanco. 1975. [Sources of resistance to the false root-knot nematodes (Naccobus sp.) among 50 potato clones.] Fitopatologia. 10(2):71.

6. Cannon, O. S. 1941. Heterodera schachtii found in a Long Island potato field. Pl. Dis. Reptr. 25:408.

Author reports considerable damage to a potato field in Nassau Co. Long Island, N.Y. due to a nematode of the Heterodera schachtii type.

7. Canto, M. and M. Mayer de Scurrah. 1975. Variability of potato cyst nematode (Heterodera spp.) in the Andean region. Nematropica 5:20

8. Canto, M. and M. Mayer de Schurrah. 1976. Identification de especeis del nematodo del quiste de la papa en poblaciones Andinas segun la secuencia de color de la hembra. Nematropica 6:1-9.

9. Canto Saenz, M. and M. Mayer de Scurrah. 1977. [Reproduction of eight potato cyst nematode populations in four Peruvian locations.] Nematropica 7(2):5.

10. Canto Saenz, M. A. and M. Mayer de Scurrah. 1977. Races of the potato cyst nematode in the Andean region and a new system of classification. Nematologica 23:340-349.

Three new pathotypes (P_1B, P_2A and P_3A) are described, and a new race classification scheme developed. Solanum vernei $(VT^n)^2$ 62.33.3 was an inefficient host of 32 populations. All 56 of the populations studied developed freely on the European host differentials and on six other clones derived from S. vernei and S. spegazzinii.

11. Carden, P. W. 1965. The relationship between cyst and egg counts in advisory sampling of potato root eelworm. Pl. Path. 14:129-137.

At least 77% of the time egg and cyst counts would be similar. Only 1% of the time would any difference serious for advisory purposes.

12. Carlsson, B. 1970. Tolernas hos olika mottagliga potatissorter mot potatiscystnematod--En orienterande undersokning. Vaxtskyddsnotiser, 34(2):29-33. [Eng. sum. p. 33].

The potato varieties tested varied markedly in their tolerance to Heterodera rostochiensis.

13. Carlsson, B. and G. Videgard. 1971. [Control of potato cyst nematodes by means of a trap crop.] Potatis, year 1971. pp. 30-32.

Small cull potatoes used as a trap crop reduced the population of Heterodera rostochiensis by 70% when the crop was ploughed under about one month after planting.

14. Carroll, J. 1933. A study of the potato eelworm (Heterodera schachtii) in the Irish Free State. Jour. Helminth. 11:137-156.

Author discusses distribution, ecology pot and field experiments with calcium cyanamide, crop rotation etc.

15. Carroll, J. 1952. Eelworm and insect pests. Agric. Ireland. 9:172-173. 9:201-203.

Two papers on Heterodera rostochiensis in Ireland.

16. Carroll, J. and E. McMahon. 1935. Potato eelworm (Heterodera schachtii) investigations. J. Helminth. 13:77-90.

Authors state that soil with a cyst count of 4 per cc may produce a severe form of diseasse. Also they note that if a plant becomes well established before infection it does not show severe symptoms although numerous cysts may develop.

17. Carroll, J. and E. McMahon. 1937. Potato eelworm (Heterodera schachtii); further investigations. J. Helminth. 15:21-34.

Retardation of hatching by sterilization of soil lasts only a few months. Late planting and trap cropping are discussed as control measures.

18. Carroll, J. and E. McMahon. 1939. Experiments on trap cropping with potatoes as a control measure against potato eelworm (Heterodera schachtii). J. Helminth. 17:101-112.

Trap cropping with potatoes is discussed. The first crop planted 3-4 months before the second crop, then destroyed, improved yield.

19. Carroll, J. and E. McMahon. 1944. A summary of research work carried out in Ireland on the potato root eelworm. J. of the Dept. of Agriculture of the Irish Free Stae. 41:220-228.

20. Carvalho, J. C. de, L. G. E. Lordello and O. J. Boock. 1953. Consideracaes acerca do nematoide dourado da balatinka. Biol. Sao Paulo 19:196-200.

Authors describe biology, distribution and life history of Heterodera rostochiensis. Ditylenchus destructor infection is noted.

21. Caubel, G., D. Mugniery and R. Rivoal. 1975. [Integrated control in potato and cereal plantings: the case of nematodes.] Sci. Agron. Rennes Bull. Sci. Tech. p. 101-106.

Potato variety Multa is more resistant than Roseval or Sirtema to Heterodera rostochiensis or H. pallida.

22. Ceron Diaz, W. 1963. [Study of the potato nematode and its control.] Bibliotecologia y Documentation, IICA/CIDIA (1972) No. 20, Abstract No. 204. Available on Microfilm from CIDIA, Turrialba, Costa Rica.

23. Cetas, R. C. 1970. Interaction of seed piece treatments and soil treatments of aldicarb and benomyl in the control of Verticillium - nematode complex of potatoes. Phytopath. 60:572.

Aldicarb (but not benomyl or seed piece treatment) reduced the population of Pratylenchus penetrans. Seed piece treatment increased yield 9 (Captan on Kennebec)-25 (Difolaton on Superior) cwt/acre, aldicarb increased yield 21 (Kennebec) - 40 (Superior) cwt/acre and benomyl increased yield 23 (Kennebec) - 54 (Superior) cwt/acre. Effects of seed piece treatment with Difolatan and soil treatments were additive.

24. Cetas, R. C. 1971. Evaluation of granular formulations of systemic nematocides for control of Pratylenchus penetrans on potatoes. Phytopath. 61:887.

Aldicarb gave the best nematode control and yields of seven materials tested as pre-plant, broadcast and post emergence side dress of potatoes in soil infested by the nematode and Verticillium albo-atrum.

25. Cetas, R. C. 1978. Pratylenchus penetrans control with granular nematicides, 1977. Fungicide and Nematocide Tests. 33:199.

All the nematicides tested (Furadan, Temik, Vydate, Mocap) reduced the number of P. penetrans larvae in roots and soil around the roots of potato. The greatest increase in tuber yield resulted from Temik 15G (5lb a.i./A) in in-furrow application.

26. Cetas, R. C. 1979. Nematicide evaluations for root lesion nematode control, 1978. Fungicide and Nematicide Tests. 34:199-200.

Temik produced the best nematode control and resulted in the greatest tuber yield of the five chemicals tested.

27. Cetas, R. C. and W. B. Harrison. 1963. Evaluation of fumigants for control of early maturity wilt of potatoes on Long Island. Phytopath. 53:347-348.

Pratylenchus penetrans, Verticillium albo-atrum and Fusarium spp. were isolated from potatoes suffering from early maturity. Vapam @ 50 gpa increased yield and decreased nematodes. Application through sprinklers was about as effective as injection. Vorlex and Telone @ 25 gpa and Trapex at 50 gpa were as good as Vapam. D-D @ 40 gpa controlled nemas but had no effect on wilt.

28. Ceylon. 1969. Tea Research Institute. Report for year 1968. Part II. Ceylon: Tea Research Institute. 183 pp.

Only "Arka' of five potato varieties was susceptible to Pratylenchus loosi.

29. Chamberlain, R. 1961. Potato root eelworm in the Canary Islands. Nature: London 189:773.

A report of finding Heterodera rostochiensis in the islands is thought to be the most southernly occurrence.

30. Chamberlain, R. 1964. The role of soil-sampling and regulatory measures in potato root eelworm control. Nematologica 10:21-24.

Author presents a review of sampling procedure for Heterodera rostochiensis in Northern Ireland.

31. Chapene, U. and A. Buyauskas. 1973. [Selection of nematode-resistant varieties of potato.] Kartofel i Ovoshchi (1973) No. 1, 13-14 Zoological Research Inst., Vokes, Lithuanian SSR.

Occurrence of resistance to pathotype A of Heterodera rosto[illegible]s in progeny of resistant X resistant and resistant X suscep[illegible]s reported.

32. Chargas, C. M. and M. M. Barradas. 1976. [Susceptibility of imported potatoes to a strain of tobacco rattle virus under experimental conditions.] Fitopatologia Brasileira. 1(1):39-41. [Pt]

Varieties Estima and Vokal are considered to be possibly susceptible under field conditions since Trichodorus christiel is a vector of the virus.

33. Chaves, E. J. 1978. Presencia del "Falso nematodo del nudo" Nacobbus aberrans (Thorne 1935) Thorne & Allen, 1944. en vidriera de la estacion experimental regional agropecuaria de Balcarce. III. Jornada Fitosanitarias Argentina Tomo 1. Mesa de Zoologia Agricola, Univ. Nacional de Tucuman. S. M. de Tucuman, 6, 7 y 8 de setiembre 1978. 455-458.

Nacobbus aberrans is reported to occur on potatoes in glasshouses.

34. Cherekova, D. S. 1965. [Nematodes on tomato and potato in the Odessa region, Ukrainian SSR] In Raboty po parazitofaune yugo-zapada SSSR. Kishinev; Inst. Zool. Akad. Nauk Moldavskoi SSR; Inst. Zool. Akad. Nauk. Ukrainskoi SSR. pp. 151-152.

35. Chernikova, M. F. and R. V. Cherepanova. 1974. [Evaluatin of some nematode-resistant varieties of potato for a number of characters.] Nauch. tr. NII kartof. kh.-va. No. 18:90-97. (Plant Breeding Abstracts 46, 10275.)

Thirty varieties with resistance to Heterodera rostochiensis were evaluated in terms of yield and resistance to disease.

36. Chitwood, B. G. 1946. Soil fumigation against the golden nematode. Phytopath. 36:684.

Chitwood gives an account of his fumigation trials against Heterodera rostochiensis of potatoes. Rates of 425,850 and 1,700 lb per acre gave 0.999, 0.996 and 0.999 percent control respectively.

37. Chitwood, B. G. 1951. The golden nematode of potatoes. Circular 875, U. S. Dept. Agric. 48 pp.

38. Chitwood, B. G. and E. M. Buhrer. 1945. Summary of soil fumigant tests made against the golden nematode of potatoes (Heterodera rostochiensis Woll.) 1942-1944. Proc. Helm. Soc. Wash. 12:39-41.

Authors report on efficiency of soil fumigation against the golden nematode on potatoes. Methyl bromide, chloropicrin, carbon disulphide and DD were used. The last two materials gave best results. They also concluded treatment though successful was not economically feasible.

39. Chitwood, B. G. and E. M. Buhrer. 1946. Life history of the golden nematode of potatoes (Heterodera rostochiensis Woll.) under Long Island, New York conditions. Phytopath. 36:180-189.

Authors give a historical account of this nematode since its discovery in 1941. Life history in days as it relates to temperature is also given. Ecological and varital effects are also discussed.

40. Chitwood, B. G. and E. M. Buhrer 1946. Further studies on the life history of the golden nematode of potatoes (Heterodera rostochiensis Woll.), season 1945. Proceedings of the Helminthological. Soc. of Washington 13:54-56.

Temperature affects larval attack of roots. Massive invasions occurred at 60°-61° F weekly mean temperature.

41. Chitwood, B. G., R. L. Clement and F. M. Gordon. 1942. Nematode disease of potatoes. Nassau County Farm and Home Bureau News. 28:2-3.

Yield reductions of 30 to 70% were reported in the Long Island area.

43. Chitwood, B. G., R. L. Clement, R. Morgen and R. Tank. 1942. Heterodera rostochiensis, the golden nematode, in New York State. Pl. Dis. Reptr. 26:390-391.

A survey of 4,841 acres of Long Island showed the nematode to be in a 1 1/2 by 1 mile (419 acres). It appeared to have started in the center of this area 10-14 years earlier. A brief account of life cycle, history, control is given.

44. Chitwood, B. G. and J. Feldmesser. 1948. Golden nematode population studies. Proc. Helminthol. Soc. Wash. 15:43-55.

A single potato plant rhizosphere contained 31,000 new cysts and 277,000 old cysts. Sex ratio is about 50%. Population multiplies slower in heavily populated area. A plant can only support about 40,000 cysts, more cause growth reduction.

45. Christie, J. R. 1959. Plant nematodes, their bionomics and control. Agricultural Experiment Stations, University of Florida, Gainesville. 256 pp.

45. Chukantseva, N. K. 1976. [Some results of nematicide trails on the control of Ditylenchus destructor on potato.] In (See following reference.) p. 89

Fostil at 0.025-0.05% solution was effective. Carbothion (1%) was effective, but phytotoxic.

46. Chukantseva, N. K. 1976. [Distribution and pathogenicity of the potato stem nematode, Ditylenchus destructor in the central non-chernozem zone of the RSFSR.] In VIII Vsesoyuznoe soveschanie no nematodnym boleznyam sel'skokhozyaistvennykh kul'tur. Tezisy dokladov i soobshchenii. Kishinev, USSR; Izdatel'stvo "Shtiintsa". 89-90.

47. Church, B. M., H. C. Gough and J. F. Southey. 1959. Soil sampling procedures for potato root eelworm cysts Rothamsted. Plant Pathology 8(4):146-151.

An analysis of sampling procedures and results is presented. Recommendations are that samples be drawn from 25 but preferably 50 points per field up to 10 acres. Samples should be taken on a grid rather than at random. Weight of sample should be at least 1,000 g preferably 2,500 g and at least 100 g but preferably 200 g be examined from the bulk sample.

48. Clarke, A. J. and R. N. Perry. 1977. Hatching of cyst-nematodes. Nematologica 23:350-368.

A comprehensive review of the literature since 1971. Includes physical factors that affect hatching, chemical stimulation, inhibition and the mechanism of hatching. Extensive references.

49. Cobb, N. A. 1917. A new parasitic nema found infesting cotton and potatoes. J. Agr. Res. 11:27-33.

A nematode, Pratylenchus (Tylenchus) penetrans was reported as causing pustules over the surface of potato tubers (Solanum tuberosum). Mecuric chloride and clean seed are suggested as control measures.

50. Cohen, M. 1949. Potato root eelworm in the Northern Province. NAAS Quart. Rev. London. 1:143-145.

Author discusses distribution, soil type, and cropping interval (once in 4 years). Also caution is suggested regarding Brassica plants as hosts.

51. Cohn, E., D. Nevo and D Orion. 1970. Status of the potato cyst nematode (Heterodera rostochiensis) in Isreal. J. Agric. Res. 20:55-57.

Damage is limited to an area where imported potatoes have been grown for several years. Nematodes failed to infect plants grown in summer. Preplanting fumigation increased yields.

52. Colbran, R. C. 1977. Nematodes and potatoes. Queensl. Agric. J. 103(5):477-479.

Briefly describes symptoms of infection by Meloidogyne spp. and by Pratylenchus brachyurus.

53. Cole, C. S. and H. W. Howard. 1957. The genetics of resistance to potato-root eelworm of Solanum tuberosum subsp. andigena, clone CPC 1690. Euphytica. Wagneingen. 6(3):242-246.

Resistance to Heterodera rostochiensis in Solanum tuberosum subsp. andigenum clones CPC 1690, CPC 1673 and CPC 1685 is due to a single dominant factor. The 3 clones have similarities in diffusate activity, larval invasion and subsequent larval development, and may, thus, contain the same genetic factor.

54. Cole, C. S. and H. W. Howard. 1958. Observations of giant cells in potato roots infected with Heterodera rostochiensis. J. Helminthol. 32:135-144.

The 'Majestic' potato was used to study giant cell formation. 14-day old roots showed enlargement of cells in cortex, endodermis, and pericycle. Giant cells were seen in those tissues in 21 days. No secondary xylem occured when giant cells were produced in the stele.

55. Cole, C. S. and H. W. Howard. 1959. The effect of growing resistant potatoes on potato-root eelworm (Heterodera rostochiensis Woll.) population. Nematologica, 4(4):307-316.

Suggestions are made for avoiding build-up of resistance--breaking biotypes.

56 Cole, C. S. and H. W. Howard. 1962. Further results from a field experiment on the effect of growing resistant potatoes on a potato root eelworm (Heterodera rostochiensis) population. Nematologica, 7(1):57-61.

Resistance to biotype A and susceptibility to biotype B was indicated in andigena clones, but in Solanum multidissectum and S. xjuzepczukki the condition was reversed. In plots where Majestic potatoes were grown, there was a continuous reduction in nematode population.

57 Cole, C. S. and H. W. Howard. 1962. The effect of growing resistant potatoes on a potato root eelworm population--a microplot experiment. Ann. Appl. Biol. 50:121-127.

This study was the effect of a four-year rotation of resistant potatoes, barley, seeds mixture, wheat and sugar-beet on Heterodera rostochiensis. Resistant varieties were used every year, every other year and every fourth year. Interval years used non-host crops. 80% reduction was achieved with resistant varieties in each of first and second years and only 1% remained after four years. Non-host crops reduced population 65% first year and less second and fourth years and 25% remained after 4th year.

58 Cole, C. S. and H. W. Howard. 1966. The effects on a population of potato-root eelworm (Heterodera rostochiensis) of growing potatoes resistant to pathotype B. Annals of Applied Biology 58:487-495.

Reduction in the egg population (pathotypes A, B &C) resulted from growth of clones bred from Solanum vernei. A clone from Andigena (gene H.) and S. multidissectum (gene H_2) had little effect on egg population but seemed to be more resistant than H_1 and H_2 would confer.

59 Coley, C., M. Sarette, E. Meister and G. Bird. 1975. Pest-crop ecosystem model for Pratylenchus penetrans and Solanum tuberosum. Sys. 843. Dept. Biochemistry & Microbiology, Michigan State University 53 pp.

A population of Pratylenchus penetrans was modeled in relation to the influence of soil temperature on nematode reproductive potential.

60 Colombia, Revista Nacional de Agricultura. 1973. [The cyst nematode or golden nematode of the potato.] Bogota. 66(793):44-46.

Recommendations for control are given in this popular account.

61 Conkle, H. J. 1949. Potato rot nematode survey. USDA Bureau of Entomology and Plant Quarantine. 17 pp.

Contains survey data from Western states for Ditylenchus destructor and also an inspection of the same samples for Heterodera rostochiensis.

62. Conkle, H. J. and C. H. Rothe. 1951. Potato rot nematode surveys 1946-1950. Pl. Dis. Reptr. 35:3-8.

Authors report on survey of Western States for Ditylenchus destructor. Outside of Idaho a tuber showing infection was found in Mount Vernon, Washington. This symptom, however, was not claimed to be caused by Ditylenchus destructor.

63. Cooke, D. A. and R. Hull. 1972. The effect of soil fumigation with D-D on the yields of sugar beet and other crops. Ann. of Appl. Bio. 71:59-67.

Yield of potato was increased for 1-2 years after treatment of soil containing Longidorus sp. and Pratylenchus sp.

64. Cooper, J. I. 1971. The distribution in Scotland of tobacco rattle virus and its nematode vectors in relation to soil type. Pl. Path. 20:51-58.

Tobacco rattle virus or spraing in potatoes has been associated with Trichodorus primitivus, T. pachydermus, T. cylindricus, T., nanus and T. sp. in Scotland.

65. Cooper, J. I. and B. D. Harrison. 1973. The role of weed hosts and the distribution and activity of vector nematodes in the ecology of tobacco rattle virus. Ann. Appl. Biol. 73:53-66.

Nine common weed species were infected with TRV. The incidence of TRV on potatoes in plots kept weed free was 3.4 times that of weedy plots even though nematode numbers were similar. Transmissions of TRV to cucumber seedlings was much greater at 20°C than at 24°C. Nematodes seemed to prefer interface area between top soil and subsoil with a moisture content of 15%.

66. Cooper, J. I. and P. R. Thomas. 1971. Chemical treatment of soil to prevent transmission of tobacco rattle virus to potatoes by Trichodorus spp. Ann. Appl. Biol. 69(1):23-34.

D-D applied before planting gave best control. Methomyl and dazomet controlled the disease in the first, but not in the second year.

67. Corbett, D. C. M. 1976. Pratylenchus brachyurus. C.I.H. Descriptions of plant parasitic nematodes. Set 6, No. 89. 4 pp.

68. Corbett, D.C. M. and G. A. Hide. 1971. Interactions between Heterodera rostochiensis Woll. and Verticillium dahliae Kleb. on potatoes and the effect of CCC on both. Ann. Appl. Biol. 68(1):71-80.

The nematode increased the severity of the fungal disease, the foliage symptoms of which measured the effects of the disease more precisely than did tuber yields. CCC, a growth suppressant, prevented the disease and decreased nematode reproduction.

69. Corbett, D. C. M. and G. A. Hide. 1971. Chemical control of Verticillium dahliae and Heterodera rostochiensis on potatoes. British Insecticide and Fungicide Conference (6th) Proc. Vol. 1 pp 258-262.

Aldicarb (6 lb acre) and benomyl (20 lb/acre) rotovated into soil pests infected with both pathogens were effective against specific pathogens. Methyl bromide 2 lb/100 sq. ft. applied under tarp and controlled both pathogens increasing potato yield more than the sum of increases by aldicarb and benomyl. Beneficial effects of Methyl bromide and aldicarb were noted in second year.

70. Cornejo Quiroz, W. 1977. [Chemical control of Nacobbus aberrans and Globodera spp.] Nematropica 7(2):6.

Aldicarb, A. C. 92100, A. C. 64475 and carbofuran applications at seeding showed promise of control of infections of variety Imilla Negra.

71. Cornejo Quiroz, W. 1977. [The cultivation of Tarwi (Lupinus mutabilis) as an antagonist to Nacobbus and Heterodera spp.] Nematropica 7(2):7.

The number of Heterodera females and root-galling of potato by Nacobbus were reduced when grown with or watered with root extracts of L. mutabilis.

72. Cornejo Quiroz, W. 1977. [The response of ten potato varieties to Heterodera and Nacobbus spp.] Nematropica 7(2):7.

73. Cornejo Quiroz, W. 1977. [Host range studies for Nacobbus aberrans]. Nematropica 7(2):14.

Crop potato good host for N. aberrans.

74. Costilla, M. A., S. G. de Ojeda and T. H. de Gomez. 1977. [A contribution to the study of the "false root knot nematode" Nacobbus aberrans]. Nematropica 7(2):7-8.

First recorded occurrence of N. aberrans in Argentina on cultivated and wild potatoes.

75. Costilla, M. A., S. G. de Ojeda, and T. H. de Gomez. 1978. El falso nematodo de nudo Nacobbus aberrans (Thorne 1935) Thorne y Allen 1944 (Nematodo: Nacobbidae) en cultivos de pap en Tucuman. III Jornadas Fitosanitarias Argentinas Tomo 1. Mesa de Zoologia Agricola, Univ. Nacional de Tucuman S. M. de Tucuman, 6, 7 y 8 de Setiembre 1978. p. 323-340.

Nacobbus aberrans as a parasite of potatoes is discussed as to pathogenicity, damage, distribution and life cycle.

76. Cotten J. 1974. Feeding behavior and reproduction of Xiphinema index on some herbaceous test plants. Nematologica 19:516-520.

Xiphinema index reproduced on Solanum tuberosum, S. nigrum and S. dulcamara in pot tests.

77. Crossman, L. and J. R. Christie. 1937. Lists of plants attacked by miscellaneous plant infesting nematodes. Plant Dis. Reptr. 21:144-167.

A general list of nematode pests and their host plants in the U.S. Paraphelenchus pseudoparietinus is listed as a parasite of potatoes.

78. Cunningham, C. E. et al. 1968. 'Wauseon', a new potato variety resistant to the golden nematode with good processing quality. Am. Potato. J. 45:146-149.

'Wauseon' a new variety (cross between Katahdin and USDA seedling B5149-8) is resistant to Heterodera rostochiensis and has acceptible dice and chipping ability.

79. Cunningham, H. S. 1932. Root-knot on Long Island potatoes. Pl. Dis. Reptr. 16:2.

The root-knot nematode Caconema radicicola is reported to cause severe damage to potatoes in two areas of Long Island, N. Y. (USA).

80. Cunningham, H. S. and W. F. Mai. 1947. Nematodes parasitic on the Irish potato. Cornell Extension Bulletin 712. 24 pp.

Gives a short account of Heterodera rostochiensis.

81. Cunningham, P.C. 1960. An investigation of winter dormancy in Heterodera rostochiensis. Scientific Proceedings of the Royal Dublin Society, Series B, I, pp. 1-4.

82. Cyprus, Agricultural Research Institute. 1976. Annual Report for 1975. Nicoria, Cyprus. 90 pp. (Plant Nematology pp. 45-47).

Thirty-nine percent of the potato fields examined at Xylophagon were infested with Heterodera rostochiensis.

83. Cyprus, Ministry of Agriculture and Natural Resources. 1974. Annual report of the Department of Agriculture for the year 1974. 151 pp. Plant nematology pp. 64, 65.

Nematicides DD, DBCP and Di-Trapex are being used in demonstration plots, and a survey for Heterodera spp. is continuing.

1. Dale, P. S. 1972. Potato cyst nematode at Pukekohe. New Zealand Journal of Agriculture 125:33, 35-36.

The first report of the nematode Heterodera rostochiensis in New Zealand.

2. Dallimore, C. E. 1960. Symptoms of Ditylenchus destructor, the potato rot nematode infection, and their development during storage. Phytopathology 50:83.

Infection is primarily on tubers, beginning with a discoloration beneath the periderm. Lesions increase in size, coalesce, and the periderm breaks, exposing diseased tissue beneath. Internal infection begins as pearly white spots that develop into dark loose woolly lesions. In advanced stages, such tissue has a brown matted wool appearance.

3. Dallimore, C. E. 1962. Control of root-knot nematode on potatoes by soil fumigation. Idaho Experimental Station Bulletin No. 380, 4 pp.

4. Dallimore, C. E. 1962. The effect of soil fumigation for control of root-knot nematode on the quality of Russet Burbank potatoes. Phytopathology 52:360.

Though no significant degree of controlling nematodes with various fumigants was found, EDB (W-85) and Telone were best when applied in fall and DD when applied in spring.

5. Dalmasso, A. 1972. [Nematodes of potatoes.] Les nematodes de ls pome de terre. Fiche d'Information, Institut Technique de la Pomme de Terre, Paris. No. 48, 4 pp.

Life history, damage and control of Heterodera rostochiensis, Meloidogyne ditylenchus and Trichodorus are summarized.

6. Dalmasso, A., J. Joubert and M. C. Munck-Cardin. 1971. [Notes on a potato disease] Comptes Rendus (Hebdomadoines) des Seances de l'academie d'Agriculture de France. 57:1427-1432.

Rattle mosaic disease of potato was transmitted by Trichodorus pachydermus. Four weed species also harbor the disease.

7. Dao, D. F. and J. A. Gonzalez. 1971. [Heterodera rostochiensis Woll. and its presence in the Venezuelan Andes.] Agron. Trop. (Maracay) 21(2):105-110.

First report of the nematode in Venezuela. Potato growing regions 2,000-3,000 meters above sea level have detectable levels of the nematodes. Some crop damage is reported.

8. Darling, H. H. 1957. Control of potato rot nematode in Wisconsin. Phytopathology 47:7.

A split application of ethylene dibromide (4 gal/A 1st treatment and 2 gal/A second) gave promising results for control of Ditylenchus destructor on potato.

9. Darling, H. M. 1959. Control of the potato rot nematode in Wisconsin. Plant Disease Reporter. 43:239-242.

Describes experimental plot work to control Ditylenchus destructor with Dowfume W-85, VC-13, Nemagan and DD application by split plowsole. Only W-85 gave clean tubers. Split applications of 4 g/A in June and 2 g/A in August gave complete control.

10. Darling, H. M., L. R. Faulkner and P. Wallendal. 1957. Culturing the potato rot nematode. Phytopathology 47:7.

Two culture techniques are described in which large populations of Ditylenchus destructor develop in 3 to 4 months: (1) culture on undifferentiated tissue of potato, carrot, clover or tobacco on modified Whites nutrient agar medium, and, (2) the nematode will develop large populations on 37 species of 15 fungi genera.

11. Davenport, J. and G. W. Bird. 1979. Control of root-lesion nematode in potato production, 1977. Fungicide and Nematicide Tests 1977. 34:200.

Temik, of the 10 treatments tested, gave greatest reduction of the nematode population, but Vorlex was the only treatment that significantly increased tuber yield.

12. Davide, R. G. 1979. Reactions of different crops to infection by Meloidogyne arenaria isolated from fig and the influence of temperature on development of the nematode. Plant Disease Reporter. 63(3):207-211.

The nematode caused moderate to severe root galling on potato. Mature females with eggs in egg sacs developed in the galls and in smaller galls on lateral roots. At 21-31°C, the life cycle was 31-38 days, compared to the 80 days required at 14-18°C.

13. Davide, R. G. and A. C. Triantaphyllou. 1967. Influence of the environment on development and sex differentiation of root-knot nematodes I. Effect of infection density, age of the host plant and soil temperature. Nematologica 13:102-110.

High density infection of Meloidogyne incognita and M. javanica on tomato plants increased the percent of males. Age of host plant did not substantially slow rate of development or sex ratio.

14. Davide, R. G. and A. C. Triantaphyllou. 1967. Influence of the environment on development and sex differentiation of root-knot nematodes. II. Effect of host nutrition. Nematologica 13:111-117.

Rate of development of Meloidogyne incognita was retarded in tomato plants receiving deficiency treatment of N, P, K. Percentages of males were higher in deficient plants.

15. Davide, R. G. and A. C. Triantaphyllou. 1968. Influence of the environment on development and sex differentiation of root-knot nematodes. III. Effect of foliar application of Maleic hydrazide. Nematologica 14:37-46.

Maleic hydrazide, sprayed on tomato or tobacco seedlings infected by Meloidogyne sp., reduced rate of development and sex ratio of developing larvae. Highest male numbers were reached upon spraying immediately after inoculation. Most effective rate of MH-30 was 12 mg/plant.

16. Davies, T. G. 1965. Chemical control of potato root eelworm in glasshouse soils using dazomet. Plant Pathology 14:101-104.

Dazomet dust at 3/4 lb/100 sq. ft. mixed with soil to 9 in. reduced the number of larvae hatching from cysts by 95%.

17. Delgado Sanchez, S. 1971 [Preliminary study on the effect of Aldicarb in controlling nematodes of the genus Meloidogyne spp. in potato plantings] Agric. Tec. Mex 3(2):70-73.

The degree of control was directly proportional to the amount of Aldicarb used. The highest dosage used reduced damage by 86%.

18. Demchenko, A. F. 1971. [Ditylenchus destructor, potato nematode in the Ukraine and its control. In International Congress of Entomology, 13th Moscow. 1968. Trudy 2:320-321.

19. Dement'eva, S. P. and V. T. Suvorov. 1968. [Resistance of some solanaceous plants to the root knot nematode.] In: Spasski, A. A., [Editor], [Plant nematodes of crops in Moldavia.] Kishinev: Akademiya Nauk Moldavskoi SSR, pp. 71-77.

One tobacco cultivar, Lycopersicon hersitum, L. h. glabratum, L. h. minutum, Nicotiana glauca, Solanum nigrum and S. dulcamara were heavily attached by Meloidogyne incognita but failed to produce any external symptoms of disease. L. peruvianum, L. p. humfusum and Physalis mexicana were practically resistant to Meloidogyne incognita.

20. Denmark, State Plant Pathology Institute. 1971. [Plant diseases and pests in Denmark in 1970. 87th Annual review collected by the State Plant Pathology Institute. Lyngby]. (Plant Nematology pp. 22-23, 29.)

Resistance to Heterodera rostochiensis pathotype A was shown by a number of the potato clones tested.

21. Denmark, State Plant Pathology Institute. 1972. [Plant diseases and pests in Denmark in 1971. 88th annual review collected by the State Plant Pathology Institute, Lyngby.] 56 pp. (Plant nematology pp.22, 29).

Update of resistance tests of potato clones against Heterodera rostochiensis.

22. Denmark, State Plant Pathology Institute. 1973. [Plant diseases and pests in Denmark in 1972. 89th annual review collected by the State Plant Pathology Institute, Lyngby.] 53 pp.

Includes surveys for Heterodera rostochiensis and screening of potato plants for resistance to the same.

23. Denmark, State Plant Pathology Institute. 1974. [Plant diseases and pests in Denmark in 1973. 90th annual report] Lyngby, Denmark. 68 pp.

Routine testing for Heterodera rostochiensis resistance in potatoes continues. Some resistant varieties have shown retarded development due to penetration of nematode larvae.

24. Denmark, State Plant Pathology Institute. 1975. [Plant disease and pests in Denmark in 1974. 91st annual report.] Lyngby, Denmark. 77 pp.

H. rostochiensis pathotype A is still the only observed pathotype in Denmark. Potato breeding lines are still being tested for resistance.

25. Denmark, State Plant Pathology Institute. 1976. [Plant diseases and pests in Denmark 1975. 92nd Annual Report.] Lyngby, Denmark. 66 pp. (Plant nematology pp. 47, 62-64).

Tested new potato crosses for resistance to Globodera rostochiensis pathotype A, the only race observed in Denmark.

26. D'Errico, F. P. 1975. Two new methods for the extraction of cysts from agricultural soil, and their efficiency compared with the use of Erlenmeyer flasks. Bollettino del Laboratorio di Entomologia Agraria "Filippo Silvestri" Portici 32:22-36.

27. Deshmukh, M. G. and B. Weischer. 1970. Resistance in wild species of potato to populations of Heterodera rostochiensis Woll. from West Germany. Potato Res. 13:129-138.

Ten wild potato types from South America were tested for resistance against 3 Heterodera rostochiensis populations from West Germany. Two species were resistant to all three nematode populations No correlation was found between degree of resistance and activity of root diffusates.

28. Deshmukh, M. G. and B. Weischer. 1971. Effect of Temik 10G on populations of Heterodera rostochiensis from West Germany. Indian Phytopathology 24:366-368.

Susceptible 'Grata' and resistant 'Cobra' were infected with A and B pathotype populations in pot tests. It was indicated that the

highest dose of Temik (3 ppm) and a resistant variety were necessary to control this pest.

29. De Vay, J. E. and H. E. Adler. 1976. Antigens common to hosts and parasites. Annual Review of Microbiology. 30:147-168.

A review of common antigens and antigenic mimicry, mentioning common antigens between root-knot nematodes and their hosts.

30. Diaz, J. F., A. G. Garcia and A. R. Martin. 1962. Nematode dorado de la papa. Min. de. Agric. Servicio de Investigacion y. Promocion Agaria. Bol. Tec. 34. 12 pp.

31. Dickerson, O. J. 1961. Pathogenicity, life cycle, and morphology of certain Pratylenchus spp. on potato. Dissertation Abstracts 22:700.

Pratylenchus penetrans and P. crenatus were wide-spread in potato fields of Wisconsin. Only P. penetrans was associated with reduced yields, with nematodes increasing in roots, tubers and soil as the season progresses. In fall and winter, the population decreases but the percentage of adults increases. Optimum temperature for increase was 24°C on maize and 16°C on potatoes.

32. Dickerson, O. J., H. M. Darling and G. D. Griffin. 1964. Pathogenicity and population trends of Pratylenchus penetrans on potato and corn. Phytopath. 54:317-322.

P. penetrans and P. crenatus are common in potato fields of Wisconsin, USA, but only P. penetrans reduced yields. Neither soil type or variety influenced population density. P. crenatus only occurred in sandy soils. P. penetrans produced areas of poor growth; as season progressed numbers increased in roots, soil and tubers. Population fell in winter. P. penetrans entered and fed in the roots, rhizomes and tubers, but rhizomes were not severely attacked. The nematodes did not reproduce in tubers and only cortical tissues were attacked. Optimum temperature was 16°C.

33. Domurat, K., et al. 1974. [Investigations on the effect of chemical agents on soil and plant nematodes. I. The effect of Tritox on nematodes of potato fields. Zeszyty problemowe postepow Rolniczych. No. 154:457-464

The spraying of 'Tritox' extra 50 (trichloroacetonitrile) was not effective against nematodes.

34. Doncaster, C. C. 1964. The effects of D-D treatments applied during a five-course rotation on soil population of Heterodera rostochiensis Woll. Annals of Applied Biology 54:391-396.

D-D was applied at 400 lb/A as single injections for each year of cropping (1, 2, 3, 4, 5 injections in successive years). In plots receiving no injections there was a 50% nematode decline every year. In plots with 1 injection the population decline was like the untreated. In other plots there was a progressive decline per

treatment. In the 6th plant year, only plots receiving 4 & 5 injections were significantly lower in Heterodera rostochiensis than untreated plots.

35. Doncaster, C. C., C. D. Green and A. M. Shepherd. 1968. Behavior of Heterodera species through the life cycle (film). Rothamsted. Distributed by British Film Institute.

36. Doncaster, C. C. and A. M. Shepherd. 1967. The behaviour of second-stage Heterodera rostochiensis larvae leading to their emergence from the egg. Nematologica 13, 476-478.

The authors report a time lapse film study of the events that lead to the hatching of the nematode.

37. Doten, S. B. 1942. The potato eelworm. Nevada Agr. Exp. Sta. Bull. 158, 7 pp.

Author reviews problems of Heterdera marioni in Nevada and large areas of California that are unfit for potato production. Various control measures are discussed but only crop rotation was believed to have some value.

38. Dropkin, V. H. 1969. Cellular responses of plants to nematode infections. Annual Review of Phytopathology 7:101-122.

Presents a review of the whole range of plant cell responses to nematode infection.

39. Dropkin, V. H. 1972. Pathology of Meloidogyne-galling giant cell formation, effects on host physiology. OEPP/EPPO Bulletin 2:23-32.

40. Dropkin, V. H. and G. C. Martin. 1957. The inhibition of hatching of nematode eggs under moisture stress. Phytopathology 47:519.

The value for complete inhibition of larval emergence coincides with the moisture stress that brings on permanent wilting of plants.

41. Dropkin, V. H., G. C. Martin and R. W. Johnson. 1958. Effect of osmotic concentration on hatching of some plant parasitic nematodes. Nematologica 3:115-126.

Meloidogyne javanica, M. arenaria and Heterodera rostochiensis hatch inhibition in NaCl solutions was studied. The nematode egg response to moisture stress enables long periods of survival in drought conditions.

42. Duda, V. 1968. Viruses and virus diseases of potatoes in Latvian SSR. Tartu 1:18-21.

Discusses the possible transmission of the variegated stem virus of potatoes by Trichodorus.

43. Duddington, C. L., F. G. W. Jones and T. D. Williams. 1956. The effect of a predacious fungus upon the soil population of potato root eelworm, Heterodera rostochiensis Woll. Nematologica. 1:341-343.

Neither the fungus nor three types of organic matter had any effect on tuber yield or increase in the nematode population.

44. Duggan, J. J. and J. F. Moore. 1962. Host-range of tuber-rot eelworm (Ditylenchus destructor). Irish Journal of Agricultural Research 1:109-114.

A large variety of both cultivated plants and wild species were tested. The host-status and efficiency of the plants is discussed.

45. Duggan, J. J. and J. F. Moore. 1963. Observations on tuber-rot eelworm (Ditylenchus destructor, Thorne 1945). Irish J. Agr. Res. 2:75-86.

A general discussion of the pest is given. Seed may fail or plants become severely stunted. Underground stolons sometimes show dark (black) lesions. Tubers may appear healthy at harvest but break down in storage.

46. Dunn, E. 1954. Factors influencing the emergence of Heterodera rostochiensis larvae. Nature (Lond.), 173:780.

Fluctuating temperatures (25° and 15°C) accellerate hatching of the nematode.

47. Dunn, E. 1962. Pre-conditioning of the cyst contents of potato root-eelworm Heterodera rostochiensis Woll. by temperature and its effect on the subsequent emergence of the larvae in water and root diffusate. Nematologica 7:177-185.

Emergence of larvae from potato root eelworm cysts is affected considerably by temperature to which cysts have been held prior to the addition of root diffusate. Moisture content was also important during the temperature pre-conditioning period.

48. Dunn, E. and W. A. Hughes. 1967. Interactions of Oospora pustulans, Rhizoctonia solani and Heterodera rostochiensis on potato. Eur. Potato J. 10:327-328.

The three organisms alone reduced growth slightly. More severe checking occurred when all three organisms were together, however, most severe checking occurred when O. pustulans and R. solani were together.

49. Dunn, R. A. 1973. Resistance in potato (Solanum tuberosum) to Pratylenchus penetrans. In International Congress of Plant Pathology (2nd), Minnespolis, Minnesota, September 5-12, 1973. Abstracts of papers. St. Paul, Minnesota, USA. American Phytopathological Society Inc. No. 0860.

Three cultivars of potato (Solanum tuberosum L.) were compared in greenhouse tests as hosts for Pratylenchus penetrans. The data from greenhouse tests and field observations indicate that useful resistance to P. penetrans exists in known potato cultivars and that even higher levels may exist within the germ plasm of tuber-bearing Solanum species.

50. Dunnett, A. 1955. Eelworm-free seed potatoes. New process developed in Scotland to meet export demands. For. & Stock Breeder 69:51, 53.

A washing technique that frees seed potatoes from soil cysts and five fungus diseases. Potatoes are treated within 48 hours of harvest. Washing is accomplished with water jets 70 psi, then the tubers are soaked in a special mercury solution (15 min). Then they are jet washed again to remove mercury, dried and stored for export.

51. Dunnett, J. M. 1957. 'Embedded cysts' in relation to the utilization of potato root eelworm resistance. R. Scot. Soc. Res. Pl. Breeding year 1951. pp 50-56.

Cysts developed on tubers of resistant potato varieties, but not on roots. This was thought to be evidence of a resistance breaking biotype.

52. Dunnett, J. M. 1957. Variation in pathogenicity of the potato root eelworm (Heterodera rostochiensis Woll.) and its significance in potato breeding. Euphytica 6:77-89.

Reports of a population of H. rostochiensis which was able to produce cysts on resistant lines of potato. Solanum vernii had some resistance. 10% of the populations of H. rostochiensis from 113 sources contained a resistance-breaking strain.

53. Dunnett, J. M. 1959. Variation in pathogenicity of the potato root eelworm (Heterodera rostochiensis Woll): technique and results of testing wild potatoes for resistance. TagBer. dt. Akad. LandwWiss. Berl. 20:107-120.

Clones of a triploid potato (from S. juzepczukii) were resistant to pathotype B, but were susceptible to pathotype A.

54. Dunnett, J. M. 1960. Potato breeder's strains of root eelworm (Heterodera rostochiensis Woll.) Nematologica Supplement II. pp. 84-94.

After studying Heterodera rostochiensis resistance in Solanum verenei, S. sanotae rosae and S. multidissectum, the author concluded that the eelworm would eventually negate resistance. Eelworm strains are classified on aggressiveness to resistant varieties.

55. Dunnett, J. M. 1960. The role of Solanum vennei Bitt. et Wittm. in breeding for resistance to potato root eelworm (Heterodera rostochiensis Woll.). Rep. Scott. Pl. Breed. Stn. (1960): 39-44.

56. Dunnett, J. M. 1961. Inheritance of resistance to potato root eelworm in a breeding line stemming from Solanum multidissectum Hawkes. Rep. Scott. Pl. Breed. Stn. (1961):39-46.

57. Dunnett, J. M. 1962. Strains of potato-root eelworm. European Potato Journal 5:185-186.

Results of growing mixed populations of two strains of the nematode (Heterodera rostochiensis) on recessive potatoes suggest no interbreeding or recessive aggressiveness in at least one strain.

58. Dunnett, J. M. 1963. In Director's Report. Report of the Scottish Plant Breeding Station. pp. 19-21.

Resistance in Solanum tuberosum andigena and in S. multidissectum is due to major genes H_1 and H_2, respectively.

59. Dunnett, J. M. 1964. Suggested classification of the potato root eelworm (Heterodera rostochiensis Woll.) in relation to dominant resistance genes in potatoes. Nematologica, 10:78-79.

The different resistance genes could be numbered serially: nematode strain 1 breaks resistance due to gene H_1, strain 2 breaks resistance to gene H_2, strain 1.2 breaks resistance to genes H_1H_2, and so on.

60. Dunnett, J. M. 1968. Distribution of Heterodera rostochiensis pathotypes within fields (Abstract). 1. International Congress of Plant Pathology (London 1968).

61. Dunnett, J. M. and A. S. Bedi. 1970. A possible genetic mechanism promoting variability in populations of potato cyst eelworm. Zesz. probl. Postep. Wauk roln. 92:229-230. (Proc. 9. Int. Nematology Symp., Warsaw. 1967).

62. Du Plessis, S. J. 1955. Requirements for importation of potatoes and seed potatoes. Farm in So. Africa 30:239-242.

A detailed discussion of government requirements regarding imported potatoes which must be free of Heterodera spp. and Meloidogyne spp.

63. Dykstra, T. P. 1948. Production of disease-free seed potatoes. USDA Cir. 764:43-48 64 pp.

A comprehensive bulletin with short descriptions of nematode-caused potato diseases. The following nematodes are discussed: The root-knot nematode, Heterodera marioni; the golden nematode, H. rostochiensis; the potato-rot nematode, Ditylenchus destructor; Scribner's meadow nematode, Pratylenchus scribneri; smooth-headed meadow nematode, Pratylenchus leiocephalus.

64. Dzienia, S., K. Janowicz and B. Romek. 1972. [Effect of the intensification of potato culture on the occurrence of the nematode Heterodera rostochiensis] Ochrona Roslin 16(1):15-16.

1. Eddins, A. H. 1945. Studies relative to disease control of white (Irish) potatoes. 57th Florida Ag. Exp. Sta. Report. pp. 108-109.

Author states that several fields near Hastings, Florida were ruined by root-knot infections in 5-10% of the tubers. High temperatures were thought to contribute to the severity of infection.

2. Edinburgh School of Agriculture. 1972. Annual Report 1972. 98 pp. (Nematology pp. 59-60, 72).

Multiplication of Heterodera rostochiensis was reduced to unity and yield of poatoes was increased 100% when both oxamyl and aldicarb at 5.4 Kg a.i./ha were rotovated to a depth of 18-20 cm before planting.

3. Edinburgh School of Agriculture. 1975. Annual report, 1975. Edinburgh, UK 178 pp. [Plant Nematology pp. 114-116].

Report of effectiveness of three nematicides used with susceptible (Pentland Crown) and resistant (Maris Piper) potatoes. Heterodera rostochiensis (pathotype A) population reduction was greatest (91%) when dazomet was used with the resistant cultivar.

4. Edinburgh School of Agriculture. 1977. Annual Report, 1976, Edinburgh, UK. 203 pp. (Plant Nematology p. 24, 97, 115, 128).

Trichodorus was present in 2 samples and Longidorus elongatus was present in 17 samples.

5. Edwards, E. E. 1929. The control of a serious potato trouble. J. Min. Agr. 36:234-242.

Discusses development of cysts in tissues other than root tissue and noted cyst in roots and rhizomes.

6. Edwards, E. E. 1936. Investigations on the nematode disease of potatoes caused by Anguillulina dipsaci. J. Helminthol. 14:41-60.

Investigations on the nematode disease of potatoes caused by Anguillulina dipsaci. Author found a series of chemicals and fertilizers did not control the pest. All varieties tested were attacked. 'King Edward' and 'Majestic' were most tolerant. Early harvest lessens severity of attack.

7. Edwards, E. E. 1937. Field experiments on control of the "potato sickness" associated with the nematode Heterodera schachtii. J. Helminthol. 15:77-96.

Control experiments with potash, calcium cyanamide, paradichlorobenzene, ferrous sulphate, ferric oxide were established to control H. schachtii. Ferrous sulphate, ferric oxide, and heavy rates of calcium cyanamide were detrimental to plant growth.

8. Eenink, A. H. 1976. Genetics of host-parasite relationships and uniform and differential resistance. Netherlands Journal of Plant Pathology. 82(4):133-145.

The author presents a general discussion of nematode host parasitic relationships, including resistance genetics.

9. Efans, K., J. Franco and M. M. de Scurrah. 1975. Distribution of species of potato cyst nematodes in South America. Nematologica 21(3):365-369.

Populations (26) from Colombia, Ecuador, Peru and Bolivia were examined. Only H. pallida was found north of 15.6°S. latitude. South of 15.6°S the populations were of H. rostochiensis or a mixture of the two species. Possible explanations of the distribution are discussed.

10. Efremenko, T. S. 1961. [Comparative evaluation of the methods of utilizing soil samples for potato nematode cysts.] Tr. VIZR 16:163-165.

11. Efremenko, V. P. 1957. [Testing the types and seedlings of potato for resistance to the potato nematode (Heterodera rostochiensis Woll. 1923. and the development of agrotechnical and chemical methods of their control.] Vilnius: 137-138.

12. Efremenko, V. P. 1958. (Chloropicrin for disinfesting the soil from the potato nematode.) Zashchita rast. of vred. i bolezn 5:45-46.

13. Efremenko, V. P. 1960. [On the problem of development of a system of measures for fighting the potato nematode.] Acta Parasitol. Lithuanica 2:101-105.

14. Efremenko, V. P. 1961. [Agricultural and chemical methods of control against the golden nematode.] In: Nematode disease of vegetables and potatoes and their control Agriculture Press, Moscow.] pp. 93-115.

15. Efremenko, V. P. 1967. [Drive against the potato nematode in the USSR and abroad. In: Collection of nematode diseases of agricultural plants.] Kolos, Moscow. pp. 112-119.

16. Efremenko, V. P. 1976. [Biological control of Heterodera rostochiensis using a new resistant potato variety "Meta."] Parasitologicheski issledovaniya v Pribaltike. Vigis, Moscow, USSR. Publ: Riga, USSR; Izdatel'stvo "ZINATNE." 13-16.

The potato variety 'Meta' was resistant to Heterodera rostochiensis in that the females failed to develop. Planting this variety in infested soil greatly reduced the population of the pest.

17. Efremenko, V. P. and K. S. Burshtein. 1975. [Penetration routes of Ditylenchus destructor Thorne, 1945, into potatoes and agro-technical control of this infection.] Byulleten Vsesoynznogo Instituta Gel'mintologii im. K. I. Skryabina. 15:47-51.

The nematode enters potato through underground stems and stolons; only young tubers could be invaded through damaged skin or eyes. Monoculture with buckwheat, lupin or carrots for 3 years allowed uninfected crop in 4th year.

18. Efremenko, V. P. and T. S. Efremenko. 1961. [Resistance of various potato varieties and seedlings to Heterodera rostochiensis]. Trudi Vsesoyuznogo Instituta Zashchiti Rasteni 16:140-152.

Thirteen of 428 varieties and seedling potatoes were only slightly infected in Heterodera rostochiensis resistance tests.

19. Efremenko, V. P. and E. T. Klimakova. 1971. [Principles and development of an integrated method of control of Heterodera rostochiensis.] Byulleten Vsesoyuznogo Instituta Gel'Mintologii im. K. I. Skryabina. 6:13-21.

Cultivation of 'Sagitta' (a potato variety resistant to the nematode) reduced the number of viable cyst in four years from 38% to 1.1%. The susceptible variety, 'Vale' increased the number of cysts over the same period. An intregrated control of resistant varieties, chemical control, fallow or legumes reduced the nematode population.

20. Efremko, V. P. and E. T. Klimakova. 1972. [Testing of potato varieties and seedlings for resistance to potato cyst eelworm.] In Nematodye bolezni sel'skokhozyaistvennykh kul'tur i mery bor'by s nimi. Tezisy soveshchaniya Moskva, dekabr' 1972. USSR, VASHNIL. 80-81.

21. Efremenko, V. P. and E. T. Klimakova. 1973. [The prospect of using potato hybrids as a biological control of Heterodera rostochiensis] Byulleten Vsesoyuznogo Instituta Gel'mintologii im. K. I. Skryabina. 11:34-38.

New potato varieties (hybrids 362-61 and 11462, 23 have reduced Heterodera rosotochiensis larvae in the soil by 55.5 to 82.2 and 96.6% respectively. Crop yields of 294 cwt/hectar and 234 cwt/hectare are better than the resistant "Antinema" (171 cwt/ha) and 'Voltman' (91 cwt/ha).

22. Efremenko, V. P. and E. T. Klimakova. 1975. [The ontogenesis of the potato cyst nematode in the roots of susceptible and resistant potato varieties.] Byulleten Vsesoyuznogo Instituta Gel'mintologii im. K. I. Skryabina. 15:52-56.

Although Heterodera rostochiensis larvae penetrated the resistant potato variety 'Meta', only males developed to maturity (20 days). The number of males developing in this variety was 4X lower than in a susceptible variety.

23. Efremenko, V. P. and E. T. Klimakova. 1975. Comparative trials of new apparatus for the extraction of potato cyst nematodes from soil. Byulletin'Vsesoyuznogo Instituta Gel'mintologii im. K. J. Skryabina 15:57-62.

Three types of apparatus for extracting potato cyst (Globodera rostochiensis) nematodes from soil were compared for efficiency with the flotation-funnel method.

24. Efremenko, V. P. and E. T. Klimakova. 176. [Biological control of Heterodera rostochiensis, using a new resistant potato variety "Meta."] In Parasitologicheske irsledovaniya v Pribaltike. Riza, USSR, Iydatel'stoo "Zinatue." pp. 13-16. VIGIS, Moscow.

Meta reduced the nematode population by 84.8% in 2 years. Females did not develop.

25. Efremenko, V. P. and E. T. Klimakova. 1977. [Evaluating varieties and hybrids of potato for resistance to Heterodera rostochiensis.] In Metody fitopatol. i entomol. issled. v selektsii rast. Moscow, USSR, Kilos. 139-143. From Referativnyi Zhurnal (1978) 1.55.236.

Seven resistant hybrids, including five obtained from crosses of 'Sagitta' with 'Contessa,' 'Ora,.' 'Meringa' and 'Severnaya Roza' and others e.g., 'Olevx 363-104' and 'Spekula x 'Meringa' were tested.

26. Eglitis, V. and D. Kaktina. 1950. Petijumi par kartupelu nematodi (Heterodera rostochiensis). Latvijas PSR Zinatnu Akademijas Vestis 4:95-102.

The nematode was found in Latvia in 1949. 93% of cysts were found in the upper 20 cm. of soil; but some were found to a depth of 40 cm. Authors also make some comparisons of cyst numbers and potato yields.

27. Equiguren, R., A. Oleas and R. Silva. 1976. [Relationship between population density of Heterodera sp. and potato yields.] Nematropica, 1976. 6(1):9-12.

A Solanum phureja variety, Chaucha, supported smaller population than did the S. andigenum varieties tested.

28. Equiguren, R., A. Oleas and R. Silva. 1976. [Influence of various potato varieties on populations of cyst nematodes.] Nematropica 6(1):26-29.

Of the five varieties of Solanum andigenum and S. phureja, the S. andigenum variety Chaucha supported the lowest Heterodera spp. population. Chaucha's 180-190 day growth cycle allows only one generation of the nematode to develop.

29. Equiguren, R. F. and Y. G. Robalina Torres. 1979. Influencia del NPK sobre la dinamica poblacional de varios generos de nematodos en papa [Influence of NPK on the population dynamics of several nematode genes on potato] Nematropica 9:16-22.

A discussion of various nematode pests of potaoes (Trichodorus, Tylenchorhynchus, Criconemoides, Dorylaimes) and breeding strategy for resistance.

30. Ekhamaa, A. P. 1976. [The efficacy of various methods for the control of the potato eelworm.] In (See Adylova, N. A. 1976) p. 68

Use of Carbathion before planting resistant varieties was effective.

31. Ekholm, S. 1957. Nemalodbekampning och nematodforskning. Tidskrift for Lantman 38:37-38.

A popular article reviewing the potato root eelworm problem in Finland.

32. Ellenby, C. 1944. Influence of earthworms on larvae emergence in the potato-root eelworm, Heterodera rostochiensis, Wollenweber. Annals of Applied Biology 31:332-339.

Cysts collected from plant pots containing earthworms or collected from earthworm casts differed from the controlcysts: more larvae emerged, they emerged sooner, more cysts produced larvae and the number of emerging larvae increased with the number of earthworms.

33. Ellenby, C. 1945. Susceptibility of South American tuber forming species of Solanum to the potato root eelworm, Heterodera rostochiensis Woll. Empire Journal of Experimental Agriculture 13:158-168.

The South American forms were less susceptible than S. tuberosum.

34. Ellenby, C. 1945. The influence of crucifers and mustard oil on the emergence of larvae of the potato-root eelworm Heterodera rostochiensis, Wollenweber. Annals of Applied Biology. 32:67-70.

Root diffusates of cress (Lepidium sativum) suppressed the emergence of larvae, even when the cysts were placed in potato root diffusate. Similar effects were produced by mustard oil (allyl isothiocyanate) of black mustard seed.

35. Ellenby, C. 1945. Control of the potato-root eelworm (Heterodera rostochiensis) Wollenweber, by allyl isothiocyanate, the mustard oil of Brasica nigra L. An. Appl. Biol. 32:237-239.

Potato yield was increased by using allyl isothiocyanate especially when used in combination with peat. Effects upon nematodes not given.

36. Ellenby, C. 1946. The influence of potato variety on the cyst of the potato-root eelworm, Heterodera rostochiensis Woll. An. Appl. Biol. 33:433-446.

This is a detailed account of cyst numbers related to potato varieties and the percentage of hatch induced by variety root leachings.

37. Ellenby, C. 1946. Ecology of the eelworm cyst. Nature, London. 157:451-452.

A study of factors affecting emergence of larvae from cysts. Hatching larvae may produce a substance which inhibits unhatched larvae.

38. Ellenby, C. 1948. Resistance to the potato-root eelworm. Nature, Lond. 162:704.

The testing of the South American tuber-forming Solanum sp. for immunity and resistance to the potato-root eelworm. Strongly indicates that S. ballsii, through not completely immune, appears to be exceptionally resistant.

39. Ellenby, C. 1951. Mustard oils and control of the potato-root eelworm Heterodera rostochiensis Wollenweber: further field and laboratory experiments. Annals of Applied Botany 38:859-874.

Emergence of larva decreases with increasing concentration of oil. Six cc of oil per row (10 plants) increased yield by 50%.

40. Ellenby, C. 1952. Resistance to the potato-root eelworm, Heterodera rostochiensis. (Correspondence) Nature, Lond., 1952, 170:1016.

Confirms work reported in 1948.

41. Ellenby, C. 1954. Environmental determination of the sex ratio of a plant parasitic nematode. Nature, Lond. 174:1016.

The higher the intensity of attack, the higher the proportion of males. Also, lateral roots of potato supported 5 times more males per female than did primary roots.

42. Ellenby, C. 1954. Tuber forming species and varieties of the genus Solanum tested for resistance to the potato root eelworm Heterodera rostochiensis Wollenweber. Euphytica 3:195-202.

Tests for resistance to potatoworm have been carried out using the South American material of the Commonwealth potato collection. Here is given a list of all the material tested, about 1,300 forms belonging to over 60 wild and cultivated sp. All were susceptible except for a few tetraploids of S. tuberosum subsp. andigenum.

43. Ellenby, C. 1955. On a technqiue for infecting plants with the potato-root eelworm, Heterodera rostochinesis Wollenweber. Journal of Helminthology 29:77-80.

Stainless steel gauze baskets are used to contain cysts for infecting potatoes.

44. Ellenby, C. 1955. The seasonal response of the potato root eelworm Heterodera rostochiensis Wollenweber. Emergence of larvae throughout the year from cysts exposed to different temperature cycles. Annals of Applied Biology 43:1-11.

There was no evidence of any dormancy period. Cysts stored at room temperature had highest levels of larval emergence.

45. Ellenby, C. 1958. Day length and cyst formation in the potato root eelworm, Heterodera rostochiensis Woll. Nematological 3:81-90.

Author concludes growing conditions influence cyst numbers, size, egg concentration and hatching response. He investigated effect of day light exposures.

46. Ellenby, C. 1968. Desiccation survival in the plant parasitic nematodes, Heterodera rostochinesis Wollenweber and Ditylenchus dipsaci (Kuhn) Filipjev. Proceedings of the Royal Society B. 169:203-213.

As the cyst wall dries, it becomes increasingly impermeable to water, thus slowing the rate at which the enclosed larva dry.

47. Ellenby,C. 1974. Water uptake and hatching in the potato cyst nematode, Heterodera rostochiensis, and the root knot nematode, Meloidogyne incognita J. Exp. Biol. 61(3):773-779.

M. incognita juveniles have about 30% free space within the eggshell and are more active than H. rostochiensis juveniles, which fill their shells. Water content of the latter increases immediately on hatching. M. incognita juveniles are fully hydrated before hatch.

48. Ellenby, C. and L. Smith. 1967. Influence of temperature on polyphenol oxidase activity in three species of Heterodera. Comp. Biochem. Physiol. 21:51-57.

The enzyme is more active in Heterodera rostochiensis at low temperatures than in H. avenae and H. schachtii. This may be correlated with the probable orgin of the species in the high Andean regions of South America.

49. Ellenby, C. and L. Smith. 1967. Emergence of larvae fro new cysts of the potato-root eelworm, Heterodera rostochiensis. Nematologica 13:273-278.

Emergence of larvae from newly collected brown or yellow cysts after the addition of a hatching concentrate was studied. Larval emergence from yellow cysts was immediate and with numerous individuals emerging. Brown cysts usually liberated only a very few larvae, indicating larval dormancy progresses as cysts mature.

50. Ellenby, C. and L. Smith. 1968. South American origin of European pathotypes of the potato root eelworm, Heterodera rostochiensis Woll. Nematologica 14:597-599.

Peruvian cysts similar to European pathotype C suggests this pathotype may have originated in South America.

51. Ellenby, C. and L. Smith. 1975. Temperature adaptation in the potato cyst nematode, Heterodera rostochiensis Nematological 21(1):114-115.

Cysts of populations from Ayrshire, where the potatoes are planted and lifted early, hatch as well at 10°C as at 23°, whereas cysts from Newcastle had very poor hatch at the lower temperature and much slower development.

52. Ellis, P. R. 1966. The effect of different soil drying times on the extraction from soil and hatching of Potato-root eelworm. Plant Pathology 15:175-179.

A drying time of 4 hr was adequate to recover by flotation 91% of the cysts and 95% of the eggs from soil.

53. Ellis, P. R. and J. J. Hesling. 1974. Morphology of cysts of isolates of Heterodera rostochiensis and Heterodera pallida nematodes. Nematologica 20(2):226-241.

Vulval fenestra of cysts are circular in H. rostochiensis but oval in H. pallida. Cysts with fenestral length <19μm are likely to be H. rostochiensis. Pathotypes could not be distinquished by qualitative characteristics. Granek's ratio and perineal cyst wall pattern were not reliable for species differentiation.

54. El Shatoury, H. 1978. Genetic control of dormancy in the potato cyst-nematode. Experientia 34(4):448-449.

Early hatched parents produced F_1 progeny that hatched early, whereas late hatched parents produced offspring that showed dormancy. Genetic control of dormancy is suggested.

55. Engel, K. H. and H. Stelter. 1974. [The assessment of nematode resistance in potato breeding.] Archiv fur Zuchtungsforschung 4(4):269-278.

A mathematical approach to predicting Heterodera rostochiensis infestation. A larvae count of 500 is considered a threshold value between resistant and susceptible potato varieties.

56. Engel, K. H. and H. Stelter. 1976. [A model for recording the population dynamics of the potato root eelworm Heterodera rostochiensis Woll., Strain A. Arch Phytopathol. Pflanzenschutz 12(5):329-343.

57. Engsbro, B. 1976. [Investigations and experiments concerning soil-borne viruses. I. Rattle virus, continued investigations on potato 2.] Tidsskrift for Planteavl 80(3):404-410

Transfer of the virus from infected potatoes to soil containing Trichodorus spp. did not occur during the seven year study.

58. Erenfelde, E. 1970. [Comparison of the effects of DDB and the resistant potato variety "Spekula" on Latvian populations of the potato root nematode.] In Materialy 7 go Pribaltuskogo Soveshchaniya po Zashchite Rastenii, Part 1. Elgava, USSR; Ministerstvo Sel'skogo Khozyaistva Latviiskoi SSR. pp. 101-104.

59. Ericksson, K. B. 1971. [Studies on the stem nematode with reference to plant resistance.] (Abstract) Nordisk Jordbruksforskning 53(3):303-304.

60. Eriksson, K. B. 1972. Studies on Ditylenchus dipsaci (Kuhn) with reference to plant resistance. Dept. of Plant Pathology and Entomology Agricultural College of Sweden, 108 pp.

61. Eriksson, K. B. and B. Karlsson. 1974. [Nematodes as virus vectors in potato crops in Halland.] Hallands lans Hushallningssallskops Tidskrift 17:9-13.

Tobacco rattle virus is an important problem of potato culture in Southwestern Sweden. Three species of Trichodorus were found in the fields--T. pachydermus, T. similis and T. sparsus.

62. Erokhina, S., S. Chernikova and I. Yandovskaya. 1974. [Resistance to Phytophthora in potato varieties.] Kartofel' i Ovoshchi 1:40-41. (Plant Breeding Abstracts 44:5298)

Phytophora infestans and Hecerodera rostochiensis resistance are found in a late potato variety 'Prominent.'

63. Esser, R. P. and G. C. Smart, Jr. 1977. Potato rot nematode Ditylenchus destructor Thorne, 1945. Nematology circular, Division of Plant Industry, Florida Department of Agriculture and Consumer Service. No. 28, 2 pp.

Includes distribution, symptoms, transmission and control of the nematode, plus a list of resistant potato cultivars.

64. European Plant Protection Organization. 1951. The potato root eelworm. pp. 11, 15, 16.

One of several publications by this group on surveys and extent of Heterodera rostochiensis infections in Europe. Other reports discuss Ditylenchus destructor.

65. European Plant Protection Organization. 1956. Potato eelworm in Europe and the Mediterranean Basin in 1955. Paris. 18 pp.

An account of the known distribution of Heterodera rostochiensis in that particular area.

66. European Plant Protection Organization. 1971. Information on the distribution of dangerous plant pests and diseases and measures of their control in the USSR 1970. Publs Eur. Pl. Prot. Org., Ser. B., 70:3-8.

Results of survey of infestation of Heterdera rostochiensis in the USSR are given.

67. European Plant Protection Organization. 1974. Plant health Newsletter; survey on the following Quarantine pests and diseases: Heterodera rostochiensis; Hyphantria cunea; Leptinotarsa decemlineata; Quadraspidiotus perniciosus; Synchytrium endobioticum; Corynebacterium sepedonicum. European Plant Protection Organization Publications, Paris 77:61.

Results of questionaire put to 31 countries about control and quarantine of Heterodera rostochiensis.

68. European Plant Protection Organization. 1977. Seventh report of the panel on phytosanitary regulations, Paris, 9-10, November, 1977. European Plant Protection Organization Publications, Paris, C No. 52, iv. + 59 pp.

Possible transmission of potato black ring virus by nematodes is noted.

69. Evans, E. B. and D. P. Webley. 1970. A guide to the morphological differences between pathotypes of Heterodera rostochiensis larvae. Plant Pathology 19:171-172.

Descriptions and illustrations of the spears and dorsal oesophageal-gland ducts of pathotypes A and E.

70. Evans, K. 1969. Changes in Heterodera rostochiensis population through the growing season. Ann. Appl. Biol. 64:31-41.

A study during the growing season indicated that invasion occurred early in season at low temperatures. More larvae hatched near the roots. Males were seen in June and July when fertilization probably took place. In May and June most larvae were in the roots.

71. Evans, K. 1970. The effects of gamma radiation on Heterodera rostochiensis. Nematologica 16:284-294.

Irradiation killed some eggs but had no effect on the activity of second stage larvae. The F_1 generation development was impaired, however, with fewer cysts with fewer eggs, many of which lacked normal larvae.

72. Evans, K. 1970. Longevity of males and fertilization of females of Heterodera rostochiensis Nematologica 16:369-374.

Males remained active after root emergence 9-10 days regardless of female presence. Females secreted a sex attractant that influenced males 15 cm away. Females remained fertilizable 40 days beyond normal fertilization period. Some females fertilized as soon as 24 days after larvae invasion of roots. All females mated after 50 days. Young females could store enough sperm to fertilize all their eggs. Most females mated after rupture of root cortex.

73. Evans, K. and J. Franco. 1977. Morphological variation in some populations of potato cyst-nematodes from Europe and South America. Nematological 23(4):417-430.

Of the 147 populations studied, most were of Globodera pallida. Environmental effects on morphology and procedures for comparative morphological studies are detailed.

74. Evans, K. and J. Franco. 1979. Tolerance to cyst-nematode attack in commercial potato cultivars and some possible mechanisms for its operation. Nematologica 25:153-162.

Ten commerical potato cultivars (one resistant to Globodera rostochiensis Ro^1 and nine susceptible) were grown in infested and non-infested soil. The resistant 'Maris Piper' suffered the least yield loss; and the susceptible 'Maris Peer' the most. Degree of nematode attack was thought to be related to the amount of calcium accumulated in the dry matter.

75. Evans, K., J. Franco and M. M. de Scurrah. 1975. Distribution of potato cyst nematodes in South America. Nematological 21:365-369.

Only Heterodera pallida was found north of 15.6°S. Populations to the south were H. rostochiensis or a mixture of the two species.

76. Evans, K., K. J. Parkinson and D. L. Trudgill. 1975. Effects of potato cyst-nematodes on potato plants. III. Effects on the water relations and growth of a resistant and a susceptible variety. Nematologica 21(3):273-280.

The authors reported effects of water stress on susceptible and resistant potato varieties planted in Heterodera rostochiensis, and H. pallida soil. The resistant variety 'Maris Piper' tolerated water stress conditions better than 'Pentland Dell.'

77. Evans, K. and A. R. Stone. 1977. A review of the distribution and biology of the potato cyst-nematodes Globodera rostochiensis and G. pallida. PANS 23(2):178-189.

Includes morphology, life histories, pathotypes and distribution of the two species. Chemical control, crop rotation and use of resistant potato varieties are discussed. Also presents tabulated data on pathotype nomenclature systems.

78. Evans, K. and D. L. Trudgill. 1971. Effects of amino acids on the reproduction of Heterodera rostochiensis. Nematologica 17(4):495-500.

DL methionine, of the several amino acids tested, was the most toxic to the nematode and least toxic to the potato plants. Even large amounts, however, did not adequately control the nematode in field plots.

79. Evans, K., D. L. Trudgill, and N. J. Brown. 1977. Effects of potato cyst-nematodes Globodera pallida & Globodera rostochiensis on potato plants. V. Root system development in lightly- and heavily-infested susceptible and resistant varieties, and its importance in nutrient and water uptake. Nematologica 23(2):153-164.

Maris Piper is resistant to G. rostochiensis RO_1 and also tolerates attacks by G. pallida PA better than does Pentland Bell attacked by G. rostochiensis. Maris Piper has a more vigorous root system and thinner roots than does Pentland Bell and may therefore provide fewer transfer cell sites for nematode females per unit length.

80. Ext, W. and H. Foffart. 1942. 10 Jahre Kampf gegen den Kartoffelnematoden in der Provinz Schleswig-Holstein. Angewandte Botanik 24:1-16.

Measures of control over a ten year period show some success in controlling the nematode. A compulsory adoption of a 3 year rotation is recommended.

1. Farstad, C. W. 1962. Potato root eelworm, golden nematode (Heterodera rostochiensis Woll., 1923). Canadian Ins. & Pest Peview. 40:130-170.

The pest was found in Newfoundland in several sites.

2. Fassuliotis, G. 1975. Regeneration of whole plants from isolated stem parenchyma cells of Solanum sisymbriifolium. Journal of the American Society for Horticultural Science., 100(6):636-638.

The regenerated plants retained their resistance to Meloidogyne incognita.

3. Fassuliotis, G. 1976. Progress, problems and perspectives in breeding foodcrops for root-knot resistance. International Meloidogyne Project. Proceedings of the research planning conference on root-knot nematodes, Meloidogyne spp., 12-16 January, 1976, Raleigh, N. C., USA, pp. 81-93.

New breeding methods, including somatic hybridization between protoplasts, regeneration of the fused protoplasts into a callus and induction of organogenesis of the hybrid callus to produce a whole plant, are reviewed. A list of 7 cultivated crops, to which resistance to one or more Meloidogyne species has been introduced, is given.

4. Faulkner, L. R. 1959. Pathological histology, hosts and culture of the potato rot nematode. Diss. Abs. 20:838.

Author developed technique to isolate and maintain pure colonies of Ditylenchus destructor on Torula sp., potato, clover, carrot and tobacco callus. Four years of culture did not decrease pathogenicity to potatoes. The nematode was also cultured on numerous species of fungi.

5. Faulkner, L. R. and H. M. Darling. 1961. Pathological histology, hosts, and culture of the potato rot nematode. Phytopathology 51:778-786.

First report of alfalfa, parsnip and radish as hosts for Ditylenchus destructor. The severity of tuber rot of potato is markedly increased when both the fungus and nematode are present. Sixty-four species of fungi, on which the nematode can feed and reproduce, are listed.

6. Faulkner, L. R. and F. D. McElroy. 1964. Host range of northern root knot nematode on irrigated crop plants and weeds in Washington. Plant Disease Reporter. 48:190-193.

Meloidogyne hapla is widespread in irrigated areas. Economically, potato, carrot and sugar-beet are the most seriously affected.

7. Faulkner, L. R., C. B. Skotland and W. W. Heinemann. 1965. Survival of Meloidogyne hapla and Verticillium dahliae in plant tissues used for animal feed. Phytopathology 55:257-258.

Survival of Meloidogyne hapla in potato tubers was tested in passage through a beef animal, composting in manure, ensilage for 4 months, rapid freezing to -9°C for 48 hr., with and without precooling to 5°C for 48 hr. and alternate freezing and thawing. All treatments were lethal except rapid cooling to 5°C for 48 hours. Verticillium dahliae did not survive any of the treatments.

8. Fawole, B. and W. F. Mai. 1976. Population dynamics of Pratylenchus penetrans in a potato-rye crop rotation. Proceedings of the American Phytopathological Society (1975, publ. 1976) 2:97.

The advantages of a P. penetrans resistant potato cultivar are negated by a rye cover crop.

9. Fedorko, J. and K. Berlinski. 1976. [Reduction of potato cyst nematode populations by resistant potatoes, nematicides and crop rotation.] Prace Instytutu Ziemniaka. No. 5:20-26.

In two years, the initial population density was reduced to 2% by resistant varieties and to 17% by non-host crops. Vapam was best nematicide of the three tested.

10. Feldmesser, J. and G. Fassuliotis. 1950. Reactions of the golden nematode of potatoes, Heterodera rostochiensis Wollenweber, to controlled temperatures and to attempted control measures. J. Wash. Acad. Sci. 40:355-361.

11. Feldmesser, J., G. Fassaliotis and F. J. Spruyt. 1951. Investigations on the control of the golden nematode of potatoes. Plant Disease Reporter. 35:515-518.

Spring fumigation was more effective that autumn fumigation.

12. Feldmesser, J. and R. W. Goth. 1970. Association of a root knot with bacterial wilt of potato. Phytopathology 60:1014.

Exposure to Meloidogyne incognita and Pseudomonas solanacearum resulted in much earlier disease symptoms and death than did exposure to the bacterium alone.

13. Fenwick, D. W. 1949. Investigations on the emergence of larvae from cysts of the potato-root eelworm, Heterodera rostochiensis. I. Technique and variability. J. Helminth. 23:157-170.

Suggests that bulk (100) samples of cysts be used in hatch experiments.

14. Fenwick, D. W. 1950. Investigations on the emergence of larvae from cysts of the potato root eelworm Heterodera rostochiensis. II. The form of the hatching curve. Journal of Helminthology 24:75-86.

Probit analysis, in conjunction with total number of larvae liberated, enables complete comparisons to be made between different sets of hatching data.

15. Fenwick, D. W. 1950. Investigations on the emergence of larvae from cysts of the potato-root eelworm Heterodera rostochiensis. III. Larval emergence in soil under the influence of potato-root diffusate. Journal of Helminthology 24:86-90.

In soils treated with diffusate from Ulster Chieftain, 84% of the larvae emerged, compared to 50% in untreated soil.

16. Fenwick, D. W. 1951. On the varying nematicidal effects of different samples of D-D against the potato-root eelworm, Heterodera rostochiensis. J. Helminthol. 25:166-172.

Author tests for samples of DD at six rates and concludes some efficiency differences may be due to chemical mature of nematicide.

17. Fenwick, D. W. 1951. The effect of temperature on the development of the potato root eelworm Heterodera rostochiensis. Annals of Applied Biology 38:615-617.

Temperatures above 20°C reduced penetration of the root by larvae and greatly restricted their development.

18. Fenwick, D. W. 1957. Preliminary studies on the effect of ethylene dibromide fumigation on the hatchability of Heterodera rostochiensis (Woll.) Nematologica 2:242-249.

Fumigation of cysts with EDB reduced larval hatching and increased time necessary to attain the point of inflection on a growth curve.

19. Fenwick, D. W., B. G. Peters and R. P. Libbey. 1953. Effects of repeated field injection of D-D mixture against potato-root eelworm. Ann. Appl. Biol. 40:208-214.

Yield was increased in silt soil, but the treatment failed in black fen soil.

20. Fenwick, D. W. and E. Reid. 1953. Population studies on the potato root eelworm, Heterodera rostochiensis Woll. Journal of Helminthology 27:119-128.

Up to 80% of the larvae emerge within 5 weeks of planting potatoes. Considerable invasion of the roots occur before the shoots emerge from the soil. Initial nematode populations that are high result in lower multiplication rates than do low initial populations.

21. Ferris, J. M. 1956. A study of factors influencing the susceptibility of Solanum species to the golden nematode, Heterodera rostochiensis. Woll. Diss. Abstr. 16:2290-2291.

Root diffusates of S. dulcamara were more potent in stimulating larval hatch than were the diffusates of the other species tested (S. tuberosum, S. citrullifolium, S. integrefolium, S. nigrum, S. rostratum and S. xantii]. The life cycle was more rapid at 65°F than

at 75°. Maturity of the nematode was achieved in S. tuberosum, S. dulcamara, S. integrifolium.

22. Ferris, J. M. 1956. The effect of soil temperature on the life cycle of the golden nematode. Phytopathology 46(1):11-12.

Larvae entered the potato roots (and non-host roots) at all three experimental temperatures (65°, 75° and 85°). The larvae did not develop further in the non-host at any temperature and not in the potato at 85°F. Nematode development was more rapid at 65° than at 75°.

23. Ferris, J. M. 1957. Effect of soil temperature on the life cycle of the golden nematode in hosts and nonhost species. Phytopathology 47:221-230.

Heterodera rostochiensis was able to complete its life cycle in Solanum tuberosum at 65°F and 75°F, but not at 85°F. Periods at 85°F for longer than 5 days caused degeneration of nematodes.

24. Ferris, J. M. and W. F. Mai. 1956. Viability of encysted golden nematode larvae following seasonal temperature changes and drought. Plant Disease Reporter 40:966.

Seasonal changes in soil temperature and variations in rainfall were simulated, and potato plants in soil infested with the nematode were grown at 5° above or below the seasonal average. More larvae were produced in the plants grown at the lower temperature. The higher temperature appeared to be a retarding factor.

25. Flik H. M. 1949. Plantenziektenkundige bepokingen by de export van aardappelen. Landbouwkundig Tijdschrift 61:652-659.

Author explains various regulations of European countries against Heterodera rostochiensis and 'potato sickness.' The regulations discussed were Dutch, USA, Finland, Denmark and Sweden.

26. Food and Agriculture Organization. 1953. Plant Quarantine Announcements. FAO. Pl. Prot. Bull. Rome. 1:124-125.

Notification No. F 6-1/51, issued by India, states that Italy's potatoes would no longer be exempt from Golden Nematode Regulations.

27. Foot, M. A. 1977. Laboratory rearing of potato cyst-nematode; a method suitable for pathotyping and biological studies. New Zealand Journal of Zoology. 4:183-186.

On potato root systems grown in sand in plastic containers, the nematode's life cycle was 8-12 weeks (at 15-20°C). The multiplication factor, cyst-to-cyst, was 10-20 fold.

28. Foot, M. A. 1978. Temperature responses of three potato-cyst nematode populations from New Zealand. Nematologica 24:412-417.

Optimum temperature range for Globodera pallida Pa2 and Pa3 and for G. rostochiensis was 15°-20°C, with the latter species increasingly more rapidly than G. pallida. Only below 13-14°C did G. pallida have a more rapid increase than G. rostochiensis.

29. Foot, M. A. and F. H. Wood. 1976. Potato cyst nematode, Heterodera rostochiensis Wollenweber and Heterodera pallida Stone, life-cycle. DSIRC (Dept. of Scientific and Industrial Research) New Zealand, Information Series No. 105/22, 3 pp.

    Brief account of life history and distribution.

30. Franco, J. 1978. Electrophoretic protein patterns of different populations of Globodera pallida and G. rostochiensis. Journal of Nematology 10:287.

    British and Peruvian populations of Globodera pallida and G. rostochiensis were processed for electrophoretic protein patterns. Differences in British and Peruvian populations were noted for G. pallida but not G. rostochiensis. Also differences were noted between G. pallida and G. rostochiensis.

31. Franco, J. 1979. Disc electrophoresis of female proteins of British and Peruvian potato cyst-nematode populations, Globodera spp. Nematologica 25:32-35.

    Populations of G. rostochiensis were similar, but there were differences between British and Peruvian populations of G. pallida.

32. Franco, J. 1979. Effect of temperature on hatching and multiplication of Potato-cyst Nematodes. Nematologica 25:237-244.

    Five populations of potato cyst nematodes (G. rostochiensis and G. pallida) were studied. G. rostochiensis is more successful in hatching above 20°C, and G pallida reproduces more readily below 20°C.

33. Franco, J. and K. Evans. 1978. Multiplication of some South American and European populations of potato cyst nematodes on potatoes possessing the resistance genes H_1, H_2 and H_3. Plant Pathology 27(1):1-6.

    Most of the South American populations of Heterodera spp., but none of the European ones, were able to multiply on the resistant potatoes.

34. Franco, J. and K. Evans. 1978. Restoration of morphological features of Globodera pallida after storage in formalin. Journal of Nematology 10:370-372.

    The most effective dye treatment, potassium permanganate, makes most stylet tips visible by causing them to protrude. Hoopers ammonia treatment increased visibility but caused displacement of the medium bulb.

35. Franco, J. and K. Evans. 1979. Effects of daylength on the multiplication of potato cyst nematode (Globodera spp) populations. Nematologica 25:184-190.

Authors compared 16 and 12 hr daylengths on certain biological activities of nematodes. Invasion was greater in plants grown in 16 hr daylengths. Male-female ratio was not affected in G pallida but male larvae increased in G. rostochiensis.

36. Franco, P. J. 1971. Evaluation of potato, Solanum spp., resistance to the attack of the root knot nematode, Meloidogyne incognita (Kofoid & White) Chitwood, in Peru. (Abstrat) Nematropica 1(1):13.

Resistance occurs in hybrids of Solanum demissum.

37. Franco, P. J. 1971. [Chemical control of the golden nematode, Heterodera rostochiensis in the cultivation of potato plants]. Investigaciones Agropecuarias del Peru 1:48-56.

Chemical trials with DBCP, MIC + DD and fensulfothion indicated better control with DBCP as indicated by nematode mortality. Fensulfothion produced better growth and had fewer cysts on the roots.

38. Franco, P. J. 1972. [Response of potato varieties to attack by the root-knot nematode, Meloidogyne incognita (Kofoid & White) Chitwood, in the central coast region of Peru.] Investigaciones Agropecuarias 3:25-39 and Plant Breeding Abstracts 45:441.

'Inti Sipa,' a complex cross between several potato species, was the only one of 12 potato varieties that gave good resistance and commercial performance. Resistance may also be present in 'Huasahuasi Flat White' and Flat Black varieties. A relationship of starch and dry matter content to nematode attack is discussed.

39. Franco, P. J. 1974. [Preliminary trials with rooting potato leaves and folioles.] Invest Agropecu Peru 4(1/2):56-61.

Indolebutyric acid was used to control Meloidogyne incognita.

40. Franco, P. J. and N. Oshita. 1973. [Potato varietal response to chemical control of the root knot nematode, Meloidogyne incognita]. Fitopatologica 8:25-34.

Several nematicides (DD, Dazomet, Basamid-P-10%, Nemacur-40%, Lannate 90 WD and Di-Trapex) were tested against the nematode on three potato varieties. The best increase in yield of good quality tubers was on the variety 'Mantaro' treated with Basamid-P-10% with a yield three times the untreated control.

41. Franklin, M. T. 1939. The treatment of seed potatoes for the destruction of adherent Heterodera schachtii cysts. J. Helminthol. 17:113-126.

Author tried hot water and chemicals to kill cysts on seed potato tubers. Immersion of tubers in cold 5% formalin for 5-6 hours or in 1% formalin at 125°F for 20 minutes were the best treatments.

42. Franklin, M. T. 1940. The effect on seed potatoes of formalin treatment for the destruction of adherent eelworm cysts. J. Helminthol. 18:85-88.

Majestic seed potatoes were not injured in a 6 hr. 5% formalin treatment. Other varieties were damanged. A few eelworm cysts developed.

43. Franklin, M. T. 1951. The cyst forming species of Heterodera. Farnham Royal, England: Commonwealth Agricultural Bureaux. 147 pp.

Includes a chapter on H. rostochiensis (pp. 81-113).

44. Frazer, W. D. and C. D. Lindley. 1962. Field experiments with new organophosphorus nematicide against potato rot eelworm. British Insecticide and Fungicide Conference, Brighton November 6-9, 1961. Proc. 1:27-36.

Nemacur was applied in granular rates up to 16 lb/A to control Heterodera rostochiensis on potatoes. Best results were obtained by band applications in furrows at planting. Peat fen soils required higher rates. No detectable residue were found in potatoes at harvest after using an 8 or 12 lb rate.

45. French, E. R., P. Jatala and J. L. Turkensteen. 1977. Potato (Solanum spp.): fungi, bacteria and nematodes. In: W. B. Hewitt and L. Chiarappa (editors). Plant Health and Quarantine in International Transfer of Genetic Resources. CRC Press. pp. 225-231.

Discusses the origin and history of the potato, its pathogens, dispersal of the pathogens and techniques to prevent spread of the pathogens. Tabulates the principal nematode pests of potato, their distribution, transmission and other hosts.

46. French, N. and W. R. Wilson. 1976. Influence of crop rotation, weed control and nematicides on spraying in potatoes. Plant Pathology 25(4):167-172.

Number of pre-potato-crop barley crops was inversely correlated with percentage of diseased tubers. Weed control did not affect spraying incidence, but several nematicides were effective.

47. Frezal, P. 1954. Importance et repercussions de la contamination de l'Algerie par le nematode dore (Heterodera rostochiensis Woll). Comp. Rendus des Seances dul'Acad d. Agr. de France 40:71-74.

Notes the discovery of the pest in Algiers in 1953, results of surveys, and control (Crop rotation and frequency of planting).

48. Fritzsche, R. 1967. Untersuchungen zum Wirtspflanzenkreis und zur populationdynamik einer Zwiebel-Herkunft von Ditylenchus dipsaci Kuhn. Archiv fur Pflanzenschutz 3:11-25.

49. Fuller, J. M. and H. W. Howard. 1974. Breeding for resistance to the white potato cyst-nematode, Heterodera pallida. Annals of Applied Biology 77(2):121-128.

The resistance to H. pallida pathotype E of progeny bred from Solanum vernei and S. tuberosum andigena clone CPC 2775 as well as the influence of additional resistance derived from the wild species, S. multidissectum, was compared. The progeny of S. vernei and clone CPC 2775 showed variable resistance, such that it was often not possible to clearly designate "susceptible" and "resistant" lines. Incorporation of the H_2 gene for resistance from S. multidissectum enhanced the resistance of the S. vernei and CPC 2775 progeny. Resistance can be obtained by combining the factors of resistance from 2 andigena clones CPC 1673 (H_1) and CPC 2275 (H_3) and from S. multidissectum (H_2).

50. Fuller, J. M., H. W. Howard and A. R. Stone. 1977. A new pathotype of the potato cyst nematode Globodera pallida. Plant Pathology 26(23):135-138.

The previously unrecognized pathotype from Lincolnshire, UK necessitates a modification of the classification scheme of Kort, Ross and Rumpenhorst.

1. Gaur, P. C. 1973. Golden nematode in potato can be controlled. Indian Farming 23:24-25, 28.

Heterodera rostochiensis occurs in 15% of the potato growing area of Nilgiri Hills, India. Non-host crops, resistant varieties and the nematocide fensulfothion are recommended.

2. Gawronska-kulesza, A. 1975. [Potato cultivation in monoculture] Roczniki Nauk Polniczych, A. 100(1):89-100.

Farmyard manure and crop rotation reduced, by 50%, the Globodera spp. population.

3. Gemmell, A. R. 1940. Studies in the biology and control of Heterodera schachtii Schmidt. West of Scotland Agricultural Bulletin 139.

4. Gemmell, A. R. 1943. The resistance of potato varieties to Heterodera schachtii Schmidt, the potato-root eelworm. Annals of Applied Biology 30:67-70.

Doon star and Epicure supported smaller and fewer cysts than did cultivars Majestic and Golden Wonder.

5. Gemmell, A. R. 1944. The potato root eelworm. Scot. J. Agric. 24:223-229.

Losses in early potatoes were assessed at 10-15% in wet year and 50-60% in dry years. Use of calcium chloroacetate increased yield 50-90%.

6. Genet, R. A. and C. G. J. Spiers. 1977. PCN resistant cultivar trial. New Zealand Potato Bulletin No. 67.

In study of two thousand potato seedlings and 12 crosses, resistance to Globodera rostochiensis was controlled by a single dominant gene.

7. German, E. 1970. [Study of varietal resistance of potato to the stem nematode.] Materialy II nauchnoi konferentsii molodykh spetsialistov i aspirantov. (Tezisy dokladov). Kazakhskii NauchnoIssledovatel'skii Institut Zashchity Rastenii. 50-51.

All 36 potato varieties tested were susceptible to Ditylenchus destructor.

8. German, E. 1972. [Resistance of potatoes to the stem nematode.] Kartofel' i Ovoshchi. 10, 40 (Ru) Kazakhskii N.-i Inst. Zashchita Rastenii USSR. From Plant Breeding Abstracts 43, 3749.

64 potato varieties and hybrids were tested with Ditylenchus dipsaci. In eleven selections the infection rate was between 1.3 and 20%. The rest had infection rates above 20%.

9. German, E. 1972. [Control measures against the potato stem nematode] Vestnik Sel'shokhozyaistvennoi Nauki, Alma-Ata USSR 11:109-111.

10. German, E. V. 1976. [The damage caused by Ditylenchus destructor to potato in field conditions and during storage.] In VIII Vsesoyuzno soveshchanie no nematodnym boleznyam sel'skokhozyaistvennykh kul'tur. Tezisy doklador i soobshchenir. Kishinev, USSR Izdatel'stvo "Shtiintsa". 73-74.

11. German, E. V. 1977. [The nematode fauna of potatoes during storage.] Vestnik Sel'skokhozyaistvennoi Nauki Kazakhstana (Kazakstan Auyl Sharuashylyk Gylymynyn Habarshysy) 2:52-54.

Stored tubers infected with Ditylenchus destructor or other parasitic nematodes were more prone to invasion by saprophytic nematodes than were healthy tubers.

12. German Federal Republic. 1970. [Annual report, 1970, of the Federal Biological Institute for Agriculture and Forestry in Berlin and Braunschweig.] 136 pp.

Of 120 clones from wild South American potatoes, 18% were resistant to the Harmerz race of Heterodera rostochiensis.

13. German Federal Republic. 1973. [Annual report, 1973, of the Federal Biological Institute for Agriculture and Forestry in Berlin and Braunschweig.] 157 pp.

Seventeen potato varieties are registered as resistant to pathotype A of Heterodera pallida and one resistant to pathotype A and the Harmerz population of H. rostochiensis. Comarisons of pathotypes indicate that English B and E, Dutch D and E and German Frenswegen population are all M. pallida. H. pallida has been reported 15 times.

14. German Federal Republic. 1974. [Annual report, 1974, of the Federal Biological Institute for Agriculture and Forestry in Berlin and Braunschweig.] 153 pp.

In addition to pathotype A (Heterodera rostochiensis), two other grops have been noted, one able to form a few cysts on A resistant plants, the other forming numerous cysts.

15. German Federal Republic. 1975. [Annual report, 1975, of the Federal Biological Institute for Agriculture and Forestry in Berlin and Braunschweig.] 137 pp.

From extensive tests with all known pathotypes of Heterodera rostochiensis and H. pallida, eight potato clones have been selected which makes possible an internationally uniform characterization of the pathotypes.

16. German Federal Republic. 1976. [Annual report, 1976, of the Federal Biological Institute for Agriculture and Forestry in Berlin and Braunschweig.] 140 pp.

Of 30 newly bred potato varieties, 29 were resistant to all 5 races of Globodera rostochiensis. Responses of several Solanum species to the eight pathotypes are tabulated.

17. German Federal Republic. 1972. [17th Annual report of the German Plant Protection Service, 1970.] Publ: Braunschweig, GFR: Biologische Bundesaustalt fur Land-und Forstwirtschaft. 470 pp.

Some potato varieties in the Rhineland Palatinate show resistance to Heterodera rostochiensis.

18. German Federal Republic. 1973. [19th Annual report of the German Plant Protection Service, 1972] Publ. Braunschweig, GFR; Biologische Bundesaustalt fur Land-und Forstwirtschaft. 190 pp.

Heterodera rostochiensis forms able to break type A resistance have been found in Barvaria.

19. German Federal Republic. 1972. [Report of the Max Planck Instite of Breeding Research (Erwin Baur Institute) 1 Jan. 1970-31 Dec. 1971. Naturwissenschaften 59(2):642-645.

Morphometric studies indicate two species of potato cyst nematode. Tetraploidy has been induced in clones resistant to leaf roll virus, Phytophthora infestans and nematodes.

20. German Federal Republic. 1974. [Report of the Max Planck Institute of Breeding Research (Erwin Baur Institute)] Naturwissenschaften 61(12):675-679.

Solanum spegazzini's gene Fb inhibits cyst formation in all known populations of Heterodera rostochiensis; genes from S. vernei also inhibit some populations of H. pallida.

21. German Federal Republic. 1975. [German potato varieties, May 1975] Saatguterzeugergemeinschaft. 24 pp. From Plant Breeding Abstracts 47, 2424.

Resistance to Race A of Heterodera rostochiensis found in potato varieties Nausica, Granda, Renema Alexa and Miranda.

22. German Federal Republic. 1976. German potato varieties, May 1976. Saatfuterzeugergemeinschaft. 23 pp. (Plant Breeding Abstracts 47, 3423.)

Herold, Dextra and Pirola show resistance to Heterodera rostochiensis, race A.

23. German Federal Republic. 1977. German potato varieties, May 1977. Saatguterzeugergemeinschaft. 23 pp.

Eight potato cultivars with resistance to race A of Heterodera rostochiensis are described.

24. German Federal Republic. 1978. [Solanum evaluation results.] Institute fur Pflanzenbau und Saatgutforschung, Bundesforschungsanstalt fur Landwirtschaft Genbank-Informationsdienst. No. 6, 18 pp.

Presents tabulated data on the reactions of many wild and primitive samples of potato to several fungi, including Phytophthora. Reactions to Heterodera rostochiensis and H. pallida are given for some samples.

25. Gersdorf, E. and E. Lucke. 1965. Ein systemishes Nematizid? Nachr Bl. dt. PflSchutzdienst., Stuttg. 17:68-70.

The systemic nematicide Disyston did not prevent new infections of Meloidogyne, nor reduce infections already established in potato.

26. Gibel, Iu. 1963. [Effect of some soil fungi on the emergence of the potato nematode larvae from cysts.] Biol. Ochrony Roslin 21:157-160.

27. Giebel, J. 1967. [Studies on the influence of some soil fungi on the emergence of larvae from potato root-eelworm (Heterodera rostochiensis Woll) cysts.] Prace Naukowe Instytutu Ochrony Roslin. 9:67-116.

28. Giebel, J. 1967. Azydek sodu jako srodek nicieniobayczy. Pr. Nauk. Inst. Ochr. Rosl. 9:117-126.

Sodium azide at 1 ppm in vitro killed free-living forms of plant parasitic nematodes in 5 min. H. rostochiensis encysted eggs were killed in 10 hrs.

29. Giebel, J. 1970. Phenolic content in roots of some Solanaceae and its influence on IAA-oxidase activity as an indicator of resistance to Heterodera rostochiensis. Nematologica 16:22-32.

Resistant species on which cysts failed to develop were characterized by a high ratio of monophenols to polyphenols and with little IAA-oxidase inhibition.

30. Giebel, J. 1971. Influence of fungi metabolites of Pichia fluxuum, Trichosporon capitatum and Daedalea juniperina on hatching of potato root nematode, Heterodera rostochiensis, larvae. Poznan Inst. Ochrony Roslin Prace Nauk 12(2):151-160.

31. Giebel, J. 1973. Biochemical association between infection of Heterodera rostochiensis and development of Rhizoctonia solani on potato. Bulletin de L'Academie Polonaise des Sciences, Serie des Sciences Biologiques. 21(6):465-468.

32. Giebel, J. 1973. Phenylalanine and tyrosine ammonia-lyase activities in potato roots and their significance in potato resistance to Heterodera rostochiensis. Nematologica 19:1-6.

In Heterodera rostochiensis resistant potatoes, higher concentrations of phenylalanine ammonia-layase and tyrosine ammonia-lyase were found than in susceptible potatoes.

33. Giebel, J. 1974. Biochemical mechanisms of plant resistance to nematodes: a review. J. Nematol. 6(4):175-184.

A review of nematode resistance in plants including a discussion of Heterodera rostochiensis/potato relationships.

34. Giebel, J. 1976. beta-glucosidase activity in potato roots and its possible role in plant tissue response to Heterodera rostochiensis. Bulletin de l'Academie Polonaise des Sciences 24(1):37-42.

Beta-glucosidase activity increased 3.5-fold in the roots of susceptible potato varieties as opposed to 1.5-fold in resistant varieties after infection by Heterodera rostochiensis.

35. Giebel, J. 1976. Investigation on biochemical factors involved in potato resistance to Heterodera rostochiensis. Final technical report. Poznan: Institute for Plant Protection 72 p.

36. Giebel, J. and W. Jackowiak. 1976. Tryptophan decarboxylase in resistant and susceptible potato roots infected with Heterodera rostochiensis. Nematologica 22(4):462-466.

Tryptophan decarboxylase activity increased by 25% in the roots of susceptible potato varieties after invasion by H. rostochiensis, as compared with a decrease of 70-80% in resistant plants.

37. Giebel, J., N. Jackowiak and L. Krenz. 1977. Relationship between phosphatase activity and Heterodera rostochiensis infection of resistant and susceptible potato roots. Nematological 23(1):51-56.

After infection, acid and alkaline phosphatase activity in the roots increased in resistant strains and decreased in susceptible strains. No significant differences were found in the strains in localization of active ATP-ase.

38. Giebel, J. and J. Krenz. 1975. Role of amino acids in plant tissue response to Heterodera rostochiensis II. Effect of proline and hydroxyproline. Nematologia Mediterranea 3(1):49-53.

When treated with hydroxyproline or benzimidazole, susceptible roots responded to infection in a manner similar to response of resistant roots.

39. Giebel, J., J. Krenz and A. Wilski. 1970. The formation of ligninlike substances in roots of resistant potatoes under the influence of Heterodera rostochiensis larvae. Nematologica 16:601.

The strongest reactions for lignin were observed in cells adjacent to the head of the nematode and to its excretory pore, indicating

that substances secreted by the nematodes are involved in the process of lignin formation.

40. Giebel, J., J. Krenz and A. Wilski. 1971. Localization of some enzymes in roots of susceptible and resistant potatoes infected with Heterodera rostochiensis. Nematologica. 17:29-33.

Necrotic cells of resistant potato roots indicated a high activity of peroxidase, tyrosinase and beta-glucosidase. Susceptible varieties contained active tryosinase but not the other two.

41. Giebel, J., M. Piegat and A. Wilski. 1966. The influence of some exogenic enzymes on root tissues of potatoes susceptible and resistant to the golden nematode (Heterodera rostochiensis Woll.) Prace Naukowe Instytutu Ochrony Roslin. 8:205-211.

Beta-glucosidase introduced into potato roots by glass micro-capillaries caused necrosis in resistant plants and giant cells in susceptible ones.

42. Giebel, J. and M. Stobiecka. 1974. The role of amino acids in plant resistance to Heterodera rostochiensis. I. The protein proline and hydroxyproline content in roots of some solanaceous plants. Nematologica 29(4):407-414.

50% more hydroxyproline was found in un-infected roots of resistant solanaceous plants than in roots of susceptible ones.

43. Giebel, J. and A. Wilski. 1970. The role of IAA-oxidase in potato resistance to Heterodera rostochiensis. Proc. IX Int. Nematol. Symp. Warsaw 1967 pp. 239-245.

Extracts from susceptible varieties inhibit horseradish peroxidase, but do not inactivate added IAA, whereas extracts from resistant varieties do the reverse. In resistant potatoes, IAA oxidation is unimpaired or increased by nematode infection.

44. Giebel, J. and A. Wilski. 1973. Investigations on biochemical factors involved in potato resistance to Heterodera rostochiensis. Institute for Plant Protection UL. Miczurina 20, Poznan,Poland. 2:1-26.

45. Gill, J. S. 1974. Advances made in the potato nematology in India. Jour. of Indian Potato Association 1:51-54.

Author discusses current status of nematology studies (biology, distribution, resistance screening, and chemical control) of Globodera, Meloidogyne and Ditylenchus in India.

46. Gill, J. S. 1974. Nematode infection in potato. Indian Farming 24(9):26-28.

A discussion of chemical and cultural control methods is given for Meloidogyne spp. and Heterodera rostochiensis. Some experimental

lines with resistance are being used to incorporate resistance into commercial varieties.

47. Gill, J. S. and N. Krishnananda. 1977. In: Recent technology in potato improvement and production. B. B. Nagaich, editor. pp. 277-289.

Includes reports on the biology, culture and control of Meloidogyne hapla, M. incognita, M. javanica, Heterodera rostochiensis and H. pallida.

48. Giunchi, P. and R. Tacconi. 1973. [Control trail against the potato golden nematode (Heterodera rostochiensis Woll.)]. Atti Giornate Fitopalologiche, Istituto Patologia Vegetale dell Universeta di Bologna (Italia) 119-122.

Dazomet at 490 kg/ha and DD at 400 kg/ha and phenamiphos at 7.5 kg/ha were compared in trials against Heterodera rostochiensis in potato. Phenamiphos increased yield 71-89%, DD-159.14% and Dazomet 199.09%.

49. Gladkaya, R. M. 1973. [Elimination of foci of potato cyst nematode by a combination of control methods.] In Materialy vsesoyuznogo simpoziuma po bor'be s Kartofel'noi nematodoi, Tartu, Institut Zoologii i Botaniki Akademii Nauk Estonskoi SSR. 20-22.

A tiazon treatment of 270 kg/hectare combined with growing resistant variety 61-8/1 for 2 consecutive years eliminated Heterodera rostochiensis.

50. Gladkaya, R. M. 1976. [Trials of systemic nematicides for control of the potato nematode.] (Abstract) In VIII Vsesoyuznogo soveshchanie no nematodnym boleznyam sel'skokhozyaistvennykh dul'tur Tezisy dokladov i soobshchenii Kishinev, USSR; Izdatel'stvo "Shtiintsa." 48-49.

Systematic nematicides are evaluated for control of Ditylenchus destructor in potatoes.

51. Glendinning, D. R. 1975. Neo-Tuberosum; new potato breeding material. I. The origin, composition, and development of the Tuberosum and Neo-Tuberosum gene pools. Potato Research 18(2):256-261.

A discussion of the Tuberosum gene pool of South America is given.

52. Glez, V. M. 1971. [The effect of fertilizers on the reproduction of Ditylenchus destructor] Trudy Nauchano-Issledovatel'skogo Instituta Kartofel'nogo Khozyaistva 9:144-149.

Increased concentrations of fertilizer decreased rate of reproduction of the nematode.

53. Glez, V. M. 1973. [Influence of fertilizer on the pathogenicity of Ditylenchus destructor Thorne.] In Selektsiya i semenovodstvo kartofelya. Moscow. pp. 152-156.

Fertilizer levels of N360, P240 and K360 over 3 years gave lowest tuber loss during storage.

54. Glez, V. 1976. [The role of fertilizers in increasing the resistance of potato to Ditylenchus destructor] In (See Adylova, N. A. 1976) pp. 74-5.

55. Goffart, H. 1929. Observations on Anguillulina pratensis de man. Ztschr. Parasitenkunde 2:97-120.

Author gives a general account of nomenclature, distribution, host range, biology and control of this pest.

56. Goffart, H. 1930. Rassenstudien an Heterodera schachtii Schm. I. Variationsstatistische Untersuchungen an Ruben-, Hafer- und Kartoffelstammen von Heterodera schachtii. II. Untersuchungen uber das Verhalten von Ruben-, Hafer- und Kartoffelstammen von H. schachtii in parasitologischer Beziehung. Arb. Biol. Reichsanst. 18(1):83-100.

57. Goffart, H. 1933. Uber die Nematodenfauna der Kartoffel. Mitteilungen aus der Biologischen Reichsanstalt fur Landund Forstwirtschaft. No. 47, 30 pp.

Author reports three groups of nematode fauna associated with potatoes. Among the true parasites are Ditylenchus, Pratylenchus, Heterodera, and (Meloidogyne).

58. Goffart, H. 1934. Ufber die Biologie und Bekampfung des kartoffelnematoden (Heterodera schachtii Schmidt). Arbeiten aus der Biologischen Reichsanstalt fur Landund Forstwirtschaft 21:73-108.

Author discusses economic importance of potato sickness and gives a general account of the pest's biology.

59. Goffart, H. 1936. Fortschritte in der Bekampfung der Kartoffelnematoden. (Heterodera schachtii Schm). Nachrichtenblatt fur den Deutschen Pflanzenschutzdienst 16:38-40, 51-52.

Control of potato sickness by crop rotation, use of immune varieties and manurial and chemical treatments of the soil are discussed.

60. Goffart, H. 1939. Resistenzprufung von Kartoffelsorten gegenuber, Heterodera schachtii Schmidt. Zuchter 11:123-130.

Author tested a number of potato varieties for resistance and attack by H. schachtii. No direct relationship between attack and plant growth. Resistance is partly dependent on local conditions.

61. Goffart, H. 1951. Methoden zur Untersuchung von Boden auf Kartoffelalchen. Nach. des Deutschen Pflanzenschutzdienstes 3:25-26.

Author states cysts can only be found on roots during a limited time in the summer. A method is given to process soil samples for cysts. Samples can be washed through sieves of 3 mm, 1 mm and retained on a 0.25 mm sieve. Discussions and illustrations are given for identification of Heterodera cysts.

62. Goffart, H. 1954. Erfahrungen mit DD und mit P_4 bei der Bekampfung von Kartoffelnematoden (Heterodera rostochiensis Woll). Nachrichtenblatt des Deutschen Pflanzenschutzdienstes. 6(11):161-166.

63. Goffart, H. 1956. Nematodenforschung und Pflanzenquarantene. Nematologica 1:7-13.

A general discussion of nematodes and plant quarantine related problems (diagnosis, etc). Heterodera rostochiensis is the major nematode discussed.

64. Goffart, H. 1956. Ergebnisse einer Resistenzprufung Knollbildender Solanum-Arten gegenuber Heterodera rostochiensis Wr. International Congress of Zoology Proc. pp. 364-366. Copenhagen, August 1953.

S. vernei, S. andigenum and crosses between S. vernei and S. tuberosum showed resistance to H. rostochiensis and are considered as possible sources of resistance in breeding a resistant potato variety.

65. Goffart, H. 1957. [Progress report on the breeding of nematode-resistant potato lines.] Kartoffelbau 8:194-195.

An account of breeding potatoes for resistance to Heterodera rostochinesis. Solanum andigenum is a very common source of resistance. Resistance in this source is characterized as inability of nematodes to develop in roots, rather than reduced hatching.

66. Goffart, H. 1960. Populationsveranderungen des Kartoffelnematoden (Heterodera rostochiensis Woll.) beim anbau nematodenresistenter und nematodenfalliger Kartoffelsorten unter Berucksichtigung des Ouftretens aggressiver Biotypen. Nematologica Supplement II. pp. 76-83.

Potato variety 18/53 reduced population level of Heterodera rostochiensis by 90% in the first year. Resistant breaking biotypes consisting of 1.5% of population did not effect outcome. Root diffusates from 18/53 gave higher larvae emergence than other varieties of potato.

67. Goffart, H. 1961. Der Anbauuert nematoden resistenter Kartoffelsorten. Gesunde Pflanzen. Frankfurt 13:230-234.

A general discussion of growing resistant potatoes in Heterodera rostochiensis infested soil. A fodder variety reduces egg and larvae content of old cysts by 90-95% in one year and three years with a resistant variety will cause a 99.9% reduction.

68. Goffart, H. 1964. Erste Beobachtungen uber die kombinierte Wirkungschemischer und biologischer Verfahren zur Bekampfung des Kartoffelnematoden (Heterodera rostochiensis Woll.). Med. Land. Opzoek. Sta. Gent. 29:762-769.

Chemical control or control with resistant varieties by themselves are too costly for Heterodera rostochiensis in potatoes. Combined, however, such methods are practical with low amounts of chemical and resistant varieties.

69. Goffart, H. and H. Ross. 1954. Untersuchungen zur Frage der Resistenz von Wildarten der Kartoffel gegen den Kartoffelnematoden (Heterodera rostochiensis Wr). Zuchter 24:193-201.

Tested 21 wild species of Solanum for resistance to H. rostochiensis.

70. Golden, A. M. and D. M. S. Ellington. 1972. Redescription of Heterodera rostochiensis with a key and notes on closely related species. Helminthol. Soc. Wash. Proc. 39(1):64-78.

The nematode is illustrated by photomicrographs and drawings and types are designated. Included is a key to species of round cyst Heterodera.

71. Gomez, J. 1973. Behavior of some granular nematicides for control of the golden nematode Heterodera rostochiensis Woll. on potato. Nematropica 3(1):3.

72. Gomez, T. J. 1971. Estudios preliminares sobre el "falso nematode del nudo de la raiz" Nacobbus serendipticus Franklin. Congreso Latinoamericano de Entomologia, Cusco-Peru 4-1971 Rev. Per. Ento. 14:1.

An early report of a potato infestation in Pero an Huanuco, Peru by Nacobbus serendipticus.

73. Gomez, T. J. 1973. [Contribution to the study of infestation and dispersion of Cobb's false root-knot nematode, Nacobbus serendipiticus, Franklin, in Peru.] (Es) Nematropica 3:4.

The nematode causes 60-90% yield losses of potato in certain areas of Peru. All local varieties were susceptible. However, some Solanum andigenum hybrids were resistant in field conditions but susceptible in the laboratory.

74. Gonzaga L., E. Lordello, A. P. L. Zamith and O. J. Boock. 1961. Two nematodes found attacking potato in Cochabamba Bolivia. Escola superior de Agricultura Luiz de Queiroz Universidad de Sao Paulo. 33(2).

New species of Nacobbus were found on potatoes in Bolivia (N. serendipticus and N. serendipticus Bolivianus).

75. Gonzalez, J. A. and D. F. Dao. 1973. Presence of the golden nematode (Heterodera rostochiensis Woll.) in the Venezuelan Andes. Nematropica 3(1):4.

76. Gonzalez, J. A. and D. F. Dao. 1973. [Evaluation of clones and varieties of potato from the USA, Holland, Canada and Mexico for resistance to Heterodera rostochiensis] Nematropica 3(1):4-5.

Some of tested plants showed resistance to the nematode.

77. Gonzalez, R. H. and L. P. Accatino. 1974. [Preliminary study of performance and response of different potato varieties to root nematode (Meloidogyne incognita acrita) Chitwood, 1949. Agricultura Technica 34(3):177-181.

All 62 varieties showed infections ranging from slight to severe.

78. Good, J. M. 1972. Bionomics and integrated control of plant parasitic nematodes. Journal of Environmental Quality 1(4):382-386.

The author discusses beneficial aspects of nematicides, plant resistance, crop rotation and other management practices, biological control and integrated control.

79. Good, J. M. and A. L. Taylor. 1964. Chemical control of plant-parasitic nematodes. Agricultural Handbook 286. 28 pp. USDA.

Practical guide for growers.

80. Goodey, J. B. 1951. The potato tuber nematode Ditylenchus destructor Thorne, 1945; the cause of eelworm disease in bulbous iris. Annals of Applied Biol. 38:79-90.

Infestations have been reciprocally effected between bulbous iris, potato, Mentha arvensis, and Sonchus arvensis.

81. Goodey, J. B. 1956. The susceptibility of potato varieties to infestation by the eelworms Ditylenchus destructor and D. dipsaci. Ann. Appl. Biol. 44:16-24.

Many common varieties of potato (25) were invaded in pot tests with D. destructor. Occasionally stunting and leaf malformation occurred. Various races of D. dipsaci damaged short and leaf structure but only one race caused lesions on tubers.

82. Goodey, J. B., M. T. Franklin and D. J. Hooper. 1965. T. Goodey's "The nematode parasites of plants catalogued under their hosts." (3rd Editon). Farnham Royal, Commonwealth Agricultural Bureaux. 214 pp.

83. Goodey, T. 1935. Observations on a field plot experiment with Anguillulina dipsaci on potaoes. J. Helminthol. 13:91-102.

Author concludes from plot work dating from 1929-1934 that lifting infected potatoes each year reduces the infection.

84. Goodey, T. and J. B. Goodey. 1949. Tuber-rot eelworm of potato and its weed hosts. Journal of Helminthology. 23:89-90.

Corn sowthistle (Sonchus arvensis L.) found to be host for Dityilenchus destructor. The nematode was present in corn mint also.

85. Gooris, J. and C. J. D'Herde. 1962. Over het woorkommen van resistentiebrekende biotypes van Heterodera rostochiensis Woll. in Belgie. Mededelingen van de Landbouwhogeschool en de Opzoekinsstations van de Staat te Gent 27:738-753.

A resistance breaking biotype of Heterodera rostochiensis produced cysts on 18 resistant varieties of potato.

86. Gooris, J. and C. J. D'Herde. 1972. A method for the quantitative extraction of eggs and second stage juveniles of Meloidogyne spp. from soil. Ministry of Agriculture, Agricultural Research Administration, State Agricultural Research Centre-Ghent. pp. 1-36.

87. Goos, O. M. 1958. Root-knot eelworm of potatoes. J. Agr. West Aust. 7:638-640.

Heavy infections cause symptoms like common scab. Light infections may go unnoticed. Nematodes may be spread on implements, drainage water, infected seed tubers or seedling. Elimination of host plants and fumigation with DD or EDB is suggested.

88. Goswami, B. K. and H. J. Rumpenhorst. 1978. Association of an unknown fungus with potato cyst nematodes, Globodera rostochiensis and G. pallida. Nematologica 24:251-256.

The fungus was able to infect up to 70% of the eggs of various pathotypes of the two species. The fungus destroyed the larval contents of the eggs.

89. Gotoh, A. 1964. [The embryonic and larval development of Pratylenchus coffeae (Zimmermann)(Nematoda:Tylenchida).] Japanese J. Appl. Ent. and Zoo. 8:26-33.

Larval development was studied in water and potato tubers.

90. Gotoh, A. 1972. [Occurrence of the root-lesion nematode, Pratylenchus coffeae in reclaimed fields in Nagasaki Prefecture.] Japanese J. of Nematology 2:25-26.

Pratylenchus coffeae may appear in less than 6 years after reclamation and tuber rotting by nematodes may occur in 10 years.

91. Gotoh, A. and Y. Ohshima. 1965. [Studies on the ecology and control of the root-lesion nematode, Pratylenchus coffeae (Zimmermann) on potato.] Japan: Agr. For and Fishery Res. Con. and Nagasaki Agr. and For. Exp. Sta. Bull. 55:77.

Life cycle of P. coffeae on potato required 27 days in potato tubers at 25-30°C. Soil populations were greatest in summer. Nematodes survive in soil without host for 9-12 months.

92. Gould, M. D. 1974. The root lesion nematode--Verticillium wilt disease complex of potatos and pathogenicity studies of the lesion nematode on selected ornamental and cover crops. Dissertation Abstracts International. 35B(2):783.

Pratylenchus penetrans and Verticillium albo-atrum have additive pathogenic effect on Solanum tuberosum.

93. Grainger, J. 1951. The golden eelworm. Studies on the ecology and control of the potato root eelworm, H. rostochiensis. Bulletin 10 of the West Scotland Agricultural College, p. 71.

A general review of distribution, ecology and control of Heterodera rostochiensis.

94. Grainger, J. 1952. Population studies and successful control of the potato root eelworm. Eur. Potato J. 2:184-198.

Field methods to reduce the population to an acceptible level of 0.3 cysts per gram of soil are discussed. Population dynamics are discussed as well as chemical treatment with mercury dust.

95. Grainger, J. 1955. Climate, host and parasite in crop disease. Quar. J. Royal Meterol. Soc. 81:80-88.

Author discusses effects of early and late lifting on cysts of Heterodera rostochiensis and yield. Early lifting contributes a 30 to 40% loss; late lifting 80-100% loss.

96. Grainger, J. 1958. Disease control through intimate mixing of materials with soil. West Scot. Agric. Coll. Res. Bull. 25:1-46.

Discusses effect of mercury dust mixes on diseases, including potato eelworm.

97. Grainger, J. 1959. Disease control through intimate mixing of mercuric oxide with soil. Phytopath. 49:627-633.

Application of 13 cu. ft. per acre of a dust containing 5 lb of mercury six days prior to planting potatoes reduced Heterodera rostochiensis infection as well as that caused by several fungi and bacteria. Yield increases suggest economic feasibility.

98. Grainger, J. 1959. Population studies and successful control of the potao root eelworm. European Potato Journal 2:184-198.

Discusses effects of growing and not growing potatoes in Heterodera infested soil, and includes a chart of persistance of eelworm populations in a viable state.

99. Grainger, J. 1959. Variation in pathogenicity of the potato root eelworm Heterodera rostochiensis. Eur. Potato J. 2:293-294.

Author discusses resistance as a means of controlling this pest but acknowledges the importance of populations that may break resistance.

100. Grainger, J. 1962. Potato physiology and varietal efficiency in disease behaviour. Eur. Potato J. 5:267-279.

The potato variety 'Epicure' suffers only a 30% loss due to Heterodera rostochiensis due to its earlyness. Other varieties suffer 80-100% loss.

101. Grainger, J. and M. R. M. Clark. 1963. Interactions of Rhizoctonia and potato root eelworm. European Potato Journal 6:131-132.

In pot experiments, Rhizoctonia alone nor Heterodera rostochiensis alone (except at high levels) caused reduction in potato tuber yield.

102. Grainger, J. and M. R. M. Clark. 1965. Interactions of the fungus Rhizoctonia and the potato root eelworm. Eur. Potato J. 8:190 (Abstract).

When only one parasite was introduced to the pot, potato yield was not affected. When both were added yield was affected.

103. Granek, I. 1968. Occurrence of Heterodera punctata in Rhode Island. Pl. Dis. Reptr. 52:479.

This is the first record of H. punctata in Rhode Island where it was found in potato fields.

104. Granek, I. 1968. Keys to the Heterodera "groups" and species of the Heterodera rostochiensis "group." Plant Disease Reporter 52:827-828.

A simple key, designed primarily to separate and identify the specie H. rostochiensis.

105. Great Britain, Agricultural Development and Advisory Service. 1975. ADAS Science Service annual report 1974. London. HMSO. 233 pp.

Oxamyl gave potato tuber yield increases in Heterodera spp. infected soils.

106. Great Britain, Agricultural Development and Advisory Service. 1976. ADAS Science Service annual report 1975. London. HMSO. 329 pp.

Chemical control of Globodera (Heterodera) spp. on potatoes. pp. 72-75.

107. Great Britain, Agricultural Research Council 1968. Report of the Agricultural Research Council 1966-1967. London. HMSO, vii plus 111 pp.

'Maris Piper,' a new potato variety bred from Solanum tuberosum andigena CPC 1673 is resistant to pathotype A of Heterodera rostochiensis.

108. Great Britain, Agricultural Research Council 1974. Report of the Agricultural Research Council 1973-74. London, UK, HMSO, 90 pp. (Plant Nematology 14-16)

The initiation of international collaboration in standardization of nomenclature for pathotypes of Heterodera rostochiensis and H. pallida is proposed.

109. Great Britain, Commonwealth Institute of Helminthology. Meloidogyne on potato and other Solanum sp. Prepared from Helminthological Abstracts 1950-1974. No. 22, 12 pp.

110. Great Britain Glasshouse Crops Research Institute. 1975. Annual Report 1974. 176 pp. Publ. Littlehampton, UK.

Potato variety 'Craigs Red Royal' was not a favorable host to Heterodera rostochiensis and H. pallida.

111. Great Britain, Ministry of Agriculture, Fisheries and Food. 1960. Eelworm in potatoes. Advisory Leaflet No. 22, London 8 pp.

112. Great Britain, Ministry of Agriculture, Fisheries and Food. 1964. Potato Tuber Eelworm. Advisory leaflet No. 372. London. 3 pp.

113. Great Britain, Ministry of Agriculture, Fisheries and Food. 1970. Potato cyst eelworm. Advisory leaflet No. 284, 7 p.

114. Great Britain, Ministry of Agriculture, Fisheries and Food. 1973. Potato cyst eelworm on potato. Advisory leaflet No. 284 revised.

A distinction is made between Heterodera rostochiensis and H. pallida in the revised leaflet.

115. Great Britain, Ministry of Agriculture, Fisheries and Food. 1977. Cyst eelworms on potato. Advisory leaflet no. 284 revised 8 pp.

Contains information on recently released resistant varieties and new information on Heterodera spp. pathotypes.

116. Great Britain, National Institute of Agricultural Botany. 1966. Forty-sixth report of the council. Report of the National Institute of Agricultural Botany, Cambridge. 62 pp.

In fields moderately infested with Heterodera rostochiensis, Maris Piper and Ulster Glade had yields almost double that of the susceptible Majestic.

117. Great Britain, The North of Scotland College of Agriculture. Research investigations and field trials 1974-1975, Aberdeen vi + 301 pp. (Plant nematology pp. 276-277).

Phenamiphos, Aldicarb and Temik increased yield of Heterodera rostochiensis infected potato fields.

118. Great Britain, The North of Scotland College of Agriculture. 1977. Research investigations and field trials 1975-1975, Aberdeen vi + 241 pp. (Plant nematology p. 227-229).

Reports use of Aldicarb, Oxamyl, Carbofuran and Dazomat on susceptible and resistent potatoes grown in infected fields. Yield was not affected.

119. Great Britain, The North of Scotland College of Agriculture. 1977. Annual Report 1975-1976, Aberdeen vi + 134 pp. (Plant nematology p. 27, 28, 30.)

Continuing studies on distribution of and pathotypes of Heterodera rostochiensis and H. pallida, control through use of resistant cultivars and chemicals, and nematode transmission of viruses.

120. Great Britain, The North of Scotland College of Agriculture. 1978. Annual Report 1976-1977, Aberdeen v + 147 pp. (Plant nematology p. 29, 32).

Continued studies on virus transmission and potato cyst nematodes in potato.

121. Great Britain, The North of Scotland College of Agriculture. 1978. Research investigations and field trials 1976-1977, (Plant nematology p. 216).

Oxamyl and aldicarb retarded nematode populations in both resistant (Pentland Javelin) and susceptible (Maris Peer) cultivars and increased yields.

122. Great Britain, Northern Ireland Ministry of Agriculture. 1958. Agricultural Entomology Division. Report for 1957. Research and Experimental Record Ministry Agriculture Northern Ireland 7:157-165.

A progress report of screening for resistance against Heterodera rostochiensis. A rye-grass crop system maintained a 'O' population increase but susceptible potato gave a 10x increase.

123. Great Britain, Northern Ireland Ministry of Agriculture. 1959. Agricultural Entomology Division. Report for 1959. Research and Experimental Record Ministry Agriculture Northern Ireland 9(2):155-168.

Hybrids possessing eelworm-resistance factors have been produced by crossing established cultivated potato variety with wild potato varieties (Solanum tuberosum subsp. andigena or S. vernei.)

124. Great Britain, Northern Ireland Ministry of Agriculture. 1971. Annual report on research and technical work, 1969. Belfast. HMSO. 153 pp.

Work with resistant varieties continues. Twenty years without potato cropping seems to eliminate Heterodera rostochiensis from farm fields.

125. Great Britain, Northern Ireland Ministry of Agriculture. 1974. Annual report on research and technical work, 1974. 229 pp.

Some Solanum vernei hybrids show resistance to both Globodera rostochiensis and G.pallida.

126. Great Britain, Northern Ireland Ministry of Agriculture. 1976. Potato cyst nematode. Northern Ireland Advisory Service, Dept. Agric. Leaflet No. 117.

A summary and discussion of current knowledge pertaining to biology, resistant varieties or resistance screening and other control methods for Globodera rostochiensis.

127. Great Britain, Northern Ireland Ministry of Agriculture. 1976. Annual report on research and technical work, 1975. Belfast xxii + 224 pp. (Plant nematology pp. 45-48, 59, 98.)

Describes first four years of 8-year crop rotation experiment to control Heterodera rostochiensis.

128. Great Britain, Northern Ireland Ministry of Agriculture. 1977. Annual report on research and technical work, 1976. Belfast xxi + 250 pp.

Summarization of control measures used, resistance to Globodera rostochiensis and G. pallida, and tuber disinfestation.

129. Great Britain, Northern Ireland Ministry of Agriculture. 1978. Annual report on research and technical work, 1977. Belfast, Northern Ireland. (Plant nematology pp. 47-50, 102).

Reports results of chemical (oxamyl, aldicarb, sodium hypochlorite) and tests of resistance to Heterodera rostochiensis.

130. Great Britain, Plant Breeding Institute. 1973. Annual report 1972. Cambridge, UK. 178 pp.

The cross from Pentland Crown x Maris Piper is resistant to both streptomyces scabies and Heterodera rostochiensis; it is high yielding and good quality.

131. Great Britain, Plant Breeding Institute. 1974. Annual report 1973. Cambridge, UK. 192 pp.

Crosses of the potato varieties Pentland Crown with Maris Piper gave gene H1 for resistance to pathotype A of Heterodera rostochiensis. Some Andigena lines from the Wisconsin potato collection appear to have resistance to H. pallida.

132. Great Britain, Plant Breeding Institute. 1976. Annual report 1975. Cambridge, UK. 168 pp.

Discusses potato breeding for resistance to Heterodera rostochiensis and H. pallida.

133. Great Britain, Plant Breeding Institute. 1976. Annual report 1976. Cambridge, UK. 153 pp.

All selections from Pentland Crown x Maris Piper were resistant to Heterodera rostochiensis and field immune to virus X.

134. Great Britain Rothamsted Experimental Station. 1971. Report for 1971. Part 1. Harpenden, England. 409 pp. [Plant Nematology 158-159, 163-178, 257, 263, 267, 278-281.]

Longidorus leptocephalus, an ecto-parasite of potatoes, was subjected to chemical control by chloropicrin and aldicarb.

135. Great Britain Rothamsted Experimental Station 1974. Report for 1973. Part 1. Harpenden, Herts UK 412 pp. Plant Nematology pp. 149-166, 246, 265-266, 275, 278, 340-341.

This report cites work on population dynamics of various pathotypes of H. rostochiensis, differences between H. rostochiensis and H. pallida, and multiplication of H. solanacearum on potato.

136. Great Britain Rothamsted Experimental Station 1975. Report of 1974. Part 1. Harpenden, Herts UK. 336 pp. (Plant Nematology pp. 173-190.)

Summarization of the station's nematology work for the past six years, primarily work with Heterodera spp. and Ditylenchus dipaci.

137. Great Britain Rothamsted Experimental Station 1975. Report of 1974. Part 1. Harpenden, Herts UK. 371 pp. (Plant Nematology pp. 61-62, 74-75, 142, 191-212, 322.)

Support for separation of Globodera rostochiensis and G. pallida results from scanning electron microscopic and hatching rate studies. An internationally agreed scheme of pathotype nomenclature is proposed.

138. Great Britain Rothamsted Experimental Station 1975. Report of 1976. Part 1. Harpenden, Herts UK. 379 pp.

Brief reports of work in progress, including: occurrence, biology and pathotypes of Globodera spp., fertilizer and nematicide effects on potato yield, nematicide residues in potato.

139. Great Britain Rothamsted Experimental Station 1978. Report of 1978. Part 1. Harpenden, Herts UK.

A detailed discussion of all studied aspects of biology, control, resistance, populations, races, etc. of Globodera pallida and G. rostochiensis.

140. Great Britain, Scottish Horticultural Research Institute. 1970. 16th annual report for the year 1969. Invergourie. 70 p.

Spraing of potatoes caused by TRV and Trichodorus spp. were discussed in relation to copper deficient soils. Solutions of cupric sulphate were toxic to the nematodes in vitro at 16 ppm. Incidence of spraing decreased by applicatioins of DD and Lannate.

141. Great Britain, Scottish Horticultural Research Institute. 1975. 21st annual report for the year 1974. Invergowrie, UK. 102 pp,

Tests with resistant and susceptible potatoes indicated that all 24 Scottish populations tested are pathotype A of Globodera rostochiensis.

142. Great Britain, Scottish Horticultural Research Institute. 1976. 22nd annual report for the year 1975. Dundee, UK. 111 pp. (Plant nematology pp. 81-88).

Tests of control of Heterodera rostochiensis on potato by nematicides (aldicarb, oxamyl, dazomet) and by the resistant cv. Maris Piper are reported.

143. Great Britain, Scottish Horticultural Research Institute. 1977. 23rd annual report for the year 1976. Dundee, UK. (Plant nematology pp. 74-85, 87-94.)

Potato black ringspot virus is not transmitted by Longidorus elongatus. Also reports the effects of increased amounts of N, P and K on potato infested with Heterodera rostochiensis.

144. Great Britain, Scottish Plant Breeding Station. 1971. 50th annual report, 1970-1971. 90 pp.

Pentland Meteor, an early potato variety is resistant to pathotype A of Heterodera rostochiensis but not pathotype B.

145. Great Britain, Scottish Plant Breeding Station. 1974. 53rd annual report, 1973-74. Edinburgh, UK. 84 pp.

Reports on breeding potatoes with resistance to Heterodera rostochiensis (pathotypes A and E).

146. Great Britain, Scottish Plant Breeding Station. 1975. 54th annual report, 1974-1975. Edinburgh, UK. 82 pp.

The most resistant (to pathotype E of H. rostochiensis) potato clone had 83% fewer cysts than did susceptible variety Pentland Crown. Good resistance to race E appeared to be correlated with few cysts when grown in soil infected with race A.

147. Great Britain, Scottish Plant Breeding Station. 1976. 55th annual report, 1975-1976. Edinburgh, UK. 86 pp.

Clones with s. vernei field resistance inhibited hatching of Heterodera pallida. Breeding for resistance to H. pallida and H. rostochiensis continues.

148. Great Britain, Scottish Plant Breeding Station. 1977. 56th annual report, 1976-1977. Edinburgh, UK. 132 pp.

Reports breeding work for resistance to Heterodera rostochiensis (pathotype A) and H. pallida (pathotype E), using diploid and tetraploid crosses.

149. Great Britain, West of Scotland Agricultural College. 1956. Potato root eelworm. Rept. W. Scot. Agri. Col. year 1955-56. p 44.

Reports use of non-volatile materials to treat Heterodera rostochiensis infested soil. Treatment with yellow oxide of mercury gave about 75% control and doubled yield.

150. Great Britain, West of Scotland Agricultural College. 1973. Annual report, year ended 30th September, 1973. 151 pp. (Nematology pp. 67-68).

Oxamyl treatments of Heterodera rostochiensis showed no increase in yield for early harvest potatoes.

151. Great Britain, West of Scottish Agricultural College. 1975. Annual report, year ended 30th September 1975. Auchincruive, Ayr. 152 pp.

Brief description of trials of integrated control of Globodera rostochiensis.

152. Great Britain, West of Scottish Agricultural College. 1977. Annual report, year ended 30th September 1976. Auchincruive, Ayr. 166 pp. (Plant nematology pp. 71, 74, 77-78.)

Describes an experiment in control of potato cyst nematodes using resistant varieties and nematicides, but no results are given.

153. Great Britain, West of Scottish Agricultural College. 1978. Annual report, year ended 30th September 1977. Auchincruive, Ayr. 168 pp. (Plant nematology pp. 69, 75-76)

Studies show that Pentland Javelin (resistant potato cultivar) reduces nematode populations but it suffers damage and yields are lowered.

154. Green, C. D. 1971. The morphology of the terminal area of the round-cyst nemaodes, S. G. Heterodera rostochiensis and allied species. Nematologica 17:34-46.

E. M. examinations of the terminal areas of cysts of Heterodera and Globodera indicate a distinct area of transversely ridged cuticle containing the anus. Differences in size of this area divide the group into two genera.

155. Green, C. D., D. N. Greet and F. G. W. Jones. 1970. The influence of multiple mating on the reproduction and genetics of Heterodera rostochiensis and H. schachtii. Nematologica 16:309-326.

Males seemed to be able to inseminate up to 10 females and fecundity depended more on the age of females when taken from roots than the number of males that inseminated them.

156. Green, C. D. and S. Plumb. 1967. The effect of ultra-violet radiation on the invasion, survival and fertility of larvae of Heterodera rostochiensis. Nematologica 13:186-190.

Exposure of newly hatched larvae to 500 micro-W-min/cm^2 uv caused a decrease to one tenth in the number of larvae invading and establilshing in potato. The number to reach maturity (fertility) decreased proportionately.

157. Greet, D. N. 1972. Electrophoresis and morphometrics of the round cyst nematodes. Annals of Applied Biology 71:283-286.

Heterodera rostochiensis pathotypes A and E can be clearly separated by electrophoresis. Morphometrics of larvae and males of the two pathotypes and of H. tabacum, H. virginiae, H. mexicana and H. solenacearum are given.

158. Greet, D. N. 1974. The response of five round-cyst nematodes (Heteroderidae) to five artificial hatching agents. Nematologica 20:363-364.

The different species of Heterodera tested responded differently to artificial hatching agents. The responses might be useful as additional criteria for separating the species.

159. Greet, D. N. and J. Firth. 1975. Influence of the host plant on electrophoretic protein patterns of some round-cyst nematode females and use of larvae to obtain less ambiguous results. Nematologica 23:411-415.

Newly hatched 2nd stage larvae, that have not fed and are free of host-plant proteins, form less variable protein patterns, thus providing a more useful method of distinguishing species of Globodera.

160. Griffin, G. D. 1979. Importance of soil temperature on the pathogenicity of Meloidogyne hapla on potato. Phytopathology 69:916.

Russet potato plants inoculated with Meloidogyne hapla were grown at different temperatures to study symptoms and pest reproduction. Reproduction declined rapidly at temperatures above and below 25°C. Tuber galling reached a maximum at 25°C and declined above and below that temperature.

161. Griffin, G. D. and E. C. Jorgenson. 1969. Pathogenicity of the northern root-knot nematode (Meloidogyne hapla) to potato. Proc. Helminth. Soc. Wash. 36:88-92.

Russet Burbank potato roots were severely galled by M. hapla at 25-30°C. Tuber infection was not affected by plant age or tuber size at inoculation time. Roots and tubers were galled at all moisture levels between 25 and 100% field capacity. Optimum moisture for galling was 100% F.C.

162. Griffin, G. D. and E. C. Jorgenson. 1969. Life cycle and reproduction of Meloidogyne hapla on potato. Plant Dis. Reptr. 53:259-261.

No reproduction occurred at 15 and 35°C and was somewhat inhibited at 20 and 30°C. Optimum reporduction occurred at 25°C. Life cycle at 25°C required about 7 weeks.

163. Griffin, C. D. and G. L. Stoker. 1968. Susceptibility of eighteen potato varieties to Meloidogyne hapla. Pl. Dis. Reptr. 58:956-957.

All 18 potato varieties tested against this pest were susceptible, however, the amount of galling varied among species.

164. Grinsteinn, A., D. Orion, A. Greenberger and J. Katan. 1978. Solar heating of the soil for the control of Verticillium dahliae and Pratylenchus thornei in potatoes. International Congress of Plant Pathology (3rd), Munchen, GFR, 16-23 August, 1978. Abstracts of papers. p. 373.

Mulching with polyethylene sheeting resulted in an 80-100% reduction of P. thornei within a 31-day period.

165. Grisse, A. de. 1967. Description of fourteen new species of Criconematidae with remarks on different species of this family. Biol. Jaarl. 35:66-125.

Author describes Macroposthonia peruensiformis from around roots of potato from Santo Domingo, Venezuela.

166. Gritsenko, V. P. 1971. [Ditylenchus tenuidens n. sp. and Aphelenchoides curiolis n. sp. (Nematoda, Tylenchidae and Aphelenchoididae) from Kirgizia.] Zool. Zh. 50:1402-1405.

A. curiolis is described from the root system of potato and summer wheat. D. tenuidens also is described from the root system and surrounding soil of potato and winter wheat.

167. Gritsenko, V. P. 1975. [The species composition and population dynamics of nematodes on potatoes and the effect of different crop rotations.] In Gel'mintologicheskie issledovaniya v kirgizii. Frunze, USSR; Izdatel'stvo "ILIM." pp. 123-136.

Stable interspecific nematode relationships keep the numbers of pathogenic species level.

168. Gross, A. E. 1940. Controlling root knot nematodes in potato in the Klamath Basin by means of irrigation. Plant Disease Reptr. Suppl. 124:142.

Frequent irrigation lowers soil temperature, thus causing some reduction in external eelworm symptoms, but it is not an adequate means of control.

169. Guile, C. T. 1964. Control of potato root eelworm in a Lincolnshire fen soil. Plant Pathology 13:178-181.

Methyl isothiocyanate, metham-sodium and dazomet reduced the initial population by 90%. By the end of the growing season, however, the population had increased to dangerous levels.

170. Guile, C. T. 1965. The use of Dazomet for the control of potato root eelworm in a Lincolnshire fen soil. Plant patholgy 14:179-183.

All formulations of 200 lb per acre and above were effective. Spring dust treatments were phytotoxic, however, fall treatments were most effective.

171. Guile, C. T. 1966. Cyst chromogenesis in potato cyst eelworm pathotypes. Pl. Path. 15:125-128.

There is a correlation of cyst color and pathotypes was observed on resistant and commercial potatoes. Pathotype A cysts had a golden yellow color which lasted 4 weeks. Pathotype B&C remained white but eventually reached a peak yellow before turning brown.

172. Guile, C. T. 1967. On cyst color changes, bionomics, and distribution of potato cyst eelworm (Heterodera rostochiensis, Woll.) pathotypes in the East Midlands. Ann. Appl. Biol. 60:411-419.

Pathotype A showed marked cyst color differences from pathotype B and C. Pathotype A released 4 times as many larva as B and C without entering an immediate diapause. The latter produced larvae after 17-21 days of rest.

173. Guile, C. T. 1970. Further observations on cyst colour changes in potato cyst eelworm pathotypes. Plant Pathol. 19(1):1-6.

Unlike Heterodera rostochiensis, H. pallida females lack the yellow phase as they become cysts.

174. Guskova, L. A. 1966. [Distribution, pathogenicity, and control of nematode diseases of potato in the Byelorussian SSR.] Kartofel. Year 1966. pp 122-126.

All 29 varieties of potatoes tested wre susceptible but the varieties Zazerski,Pobels and Oktyabrenok showed some resistance. Chemical control not considered practical. Cultural or land management practices considered best alternatives.

175. Guskova, L. A. 1967. [A control method] Zashch Rast Vredit. Bolez. 1:36.

Thiazone application at a low rate to Sagitta, a potato resistant to Heterodera rostochienssi, decreased the nematode to the same level as Thiazone alone applied at a high rate (1,000 kg per hectare).

176. Guskova, L. A. 1973. Differential approach to the control of golden nematode (Heterodera rostochiensis). 2nd International Congress of Plant Pathology, Minneapolis, Minnesota. p 215.

Annihilation of the nematode population can be achieved by the complex of soil sterilization with Thiazon, growing of resistant potato varieties and crop rotation with cereal crops and grasses.

177. Guskova, L. A. and R. M. Gladkaja. Integrated approach to control of the golden nematode, Heterodera rostochiensis. J. of Nematol. 6(4):185-186.

Use of resistant potato hybrid 61-8/1 or Solanum andigenum cultivars 'Antinema' and 'Specula,' in concert with a nematicide and a following crop of cereal or clover, reduced the nematode population below the detection level.

178. Guskova, L. A., E. L. Krall, O. Z. Metlitskii. 1975. [Genetic resources and prospects for breeding plants for nematode resistance.] In Immunitet s.-kh rast. k boleznyam i vreditelyam. Moscow, USSR; Kilos. 52-58 (Ru) (Plant Breeding Abstracts 48, 1067).

Authors present data on genetic resources of crop plants for resistance to nematodes. Several nematodes are included.

179. Guskova, L. A. and S. A. Makovskaya. 1975. [Use of nematode resistant potato varieties for eliminating potato root nematode from soil.] Informatsionnyi Listok, Leningradskii Mezhothaslevoi Territorial'nyi Tsectr Nauchno-Tekhnicheskoi Informatsii i Propagandy 258-75, 3 pp.

The authors reported a 75 and 85% reduction in Heterodera rostochiensis cysts within 6 months with the resistant potato variety Specula and hybrid Specula x Fortuna + Oda.

180. Guskova, L. A., N. M. Sveshnikova and R. M. Gladkaya. 1969. [Combined control method.] Zashch. Rast. Vredit. Bolez. 8:7.

Control of Heterodera rostochiensis with resistant potato varieties and Tiazon (Dazomet) was studied during a two-year period. Dazomet and resistant varieties reduced the population by 83-84%.

181. Gutarra, L., P. Jatala and E. R. French. 1975. [Interactions between Meloidogyne incognita acrita and Pseudomonas solanacearum race 3 in potato.] Fitopatologia 10(2):75 (Es).

1. Haase, W. 1957. Feste Mientenplatze zur minderung der Kartoffelnematoden Verschleppung. Deutsche Landwirtschaft 8:399-400.

Seed potato clamp, in East Germany, soils were frequently infested with potato root eelworms. This was a source of frequent infection. Suggests concrete storage which can be more easily sterilized.

2. Hague, N. G. 1958. Emergence of encysted potato root eelworms responding to controlled and variable stimuli. Ph.D. Thesis, University of London.

3. Hague, N. G. M. 1959. Control of plant parasitic nematodes. I. Susceptibility of potato root eelworms and seed potato tubers to the vapor of sulphur dioxide. Nematologica 4:110-114.

Wet cysts of Heterodera rostochiensis are more susceptible to SO_2 fumigation than dry cysts. Such treatment is very phytotoxic in low concentrations, to air dry seed potatoes.

4. Hague, N. G. M. 1959. Control of plant parasitic nematodes. 2. Some aspects of the fumigation of the potato root eelworm, Heterodera rostochiensis Woll, with methyl bromide. Nematologica 4:115-121.

Author obtained dosage-response curves for methyl bromide fumigation of cysts. Low dosages of methyl bromide appear to stimulate emergence.

5. Hague, N. G. M. 1959. Effect of methyl bromide fumigation on the potato root eelworm. Plant Pathology 8:68-70.

Treating cysts with water prior to fumigation enhances penetration.

6. Hague, N. G. M. 1964. Water-dispersed nematicides as dips to control the potato root eelworm, Heterodera rostochiensis (Woll.). J. Sci. Fd. Agric. 15:531-532.

The addition of four nematicides to tuber wash water was evaluated as a control for Heterodera rostochiensis. Tested rate varied between 2.5 and 2500 ppm. Chlorobromopropene (CBP) was best at 360-600 ppm.

7. Hague, N. G. M. and J. S. Boparai. 1974. The response of the potato cyst nematode, Heterodera rostochiensis to non-volatile nematicides. In Simposio Internacional (XII) de Nematologia, Sociedad Europea de Nematologos, 1-7 Septiembre, 1974. Grandada, Spain 42.

In treatment of pot soil before planting potato seedlings, various effects on the nematode resulted. All three chemicals delayed larvae emergence from the cysts, but Dowco 275, though it affected larvae development in the roots, did not prevent root penetration as did CGA 12223 and thioxamyl.

8. Hague, N. G. M. and J. J. Hesling. 1958. Population studies on cyst-forming nematodes of the genus Heterodera. Proceedings of the Linnaen Society 169:86-92.

Very high initial populations may result in less than maximum final populations.

9. Hague, N. G. M., O. F. Lubatti and A. B. P. Page. 1964. Methyl bromide fumigation of nematodes in soil under gas-proof sheets. Horticultural Research 3:84-101.

Describes an apparatus for applying known amounts of methyl bromide under gas-proof sheets and a technqiue determining the chemicals concentration in interstitial spaces.

10. Hague, N. G. M. and A. M. Omidvar. 1962. Techniques for determining the efficacy of fumigants against the potato root eelworm, Heterodera rostochiensis Woll. Nematologica 7:219-230.

In determining efficacy of fumigants, final cyst population gave more reliable results than either hatching test or larvae invasion. Nemagon was the best soil fumigant.

11. Hague, N. G. M. and B. F. Pain. 1970. Some observations on the effect of Temik on the potato cyst eelworm, Heterodera rostochiensis Woll. Pl. Path. 19:69-71.

Temik drenches of encysted H. rostochiensis larvae had little effect upon hatching. Hatched larvae, however, were killed at 5 ppm or prevented from entering roots at 1 ppm. Treatment at 1 ppm (2 lb per acre) nearly doubled potato yield.

12. Hague, N. G. M. and B. F. Pain. 1973. The effect of organophosphorus compounds and oxime carbamates on the potato cyst nematode Heterodera rostochiensis Woll. Pesticide Science 4(4):459-465.

Aldicarb reduced number of larvae in soil and delayed larval emergence from the cysts. Organo-phosphates and oxime carbamates affected the larvae in the soil but not in the plants.

13. Hanschke, M., H. Borriss, and L. Kampfe. 1975. [The influence of the potato nematode Heterodera rostochiensis Woll. on the auxin content of infested potato roots.] Biol. Rundsch 13(4):235-237.

Auxin content of infected potato roots was 2 to 4 times greater than uninfected roots.

14. Hansmann, G. and R. Kuhn. 1975. [Potato varieties for industrial production in East Germany with resistance to potato nematodes (A race)]. Feldwirtschaft 16(9):424-426.

15. Hare, W. W. 1965. The inheritance of resistance of plants to nematodes. Phytopathology 55:1162-1167.

A review of the literature concening mechanisms of inheritance of resistance.

16. Harrison, B. D. 1968. Reactions of some old and new British potato cultivars to tobacco rattle virus. Eur. Potato J. 11:165-176.

Fourteen cultivars were tested in Trichodorus pachydermus (TRV infected) infested soil. Five old varieties rarely showed symptoms where as new varieties were more susceptible. Arran Pilot showed no symptoms and the roots resisted the nematode.

17. Harrison, B. D. 1971. Some recent work on fungus-transmitted and nematode-transmitted viruses. 6th British Insecticide and Fungicide Conference Proceedings. 3:751-757.

Spraing on potatoes transmitted by Trichodorus spp. may be controlled by DD, dazomet or methomyl. Autumn applications are more effective than those made in spring.

18. Harrison, B. D. and J. I. Cooper. 1975. Studies on the nature of the resistance of potato cultivars to tobacco rattle virus. Potato Research 17(3):348-349.

Five TRV-resistant potato cultivars exposed to a TRV-carrying Trichodorus spp. were rarely infected and no spraing developed.

19. Harrison, J. A. C. 1971. Association between the potato cyst-nematode, Heterodera rostochiensis Woll. and Verticillium dahliae Kleb. in the early-dying disease of potatoes. Ann. Appl. Biol. 67(2):185-193.

The effect of the nematode plus fungus is synergistic. Possible benefits to the fungus in the nematode-fungus complex are discussed.

20. Harrison, M. B. 1957. A new approach to evaluation of nematicides for control of the golden nematode. Phytopath. 47:523.

A nematicide PRD (3,4-dichlorotelrahydrothiophene 1,1-dioxide) added to pot cultures containing infested soil reduced number of immature females from 70 to 1.6 at 40 lb/a, 1.3 at 80 lb/a and 0.6 at 160 lb/a.

21. Harrison, M. B. 1957. Fumigation of encysted golden nematode eggs and larvae under controlled environmental conditions. Phytopathology 47:610-613.

Relative humidity at time of fumigation and humidity conditions of the cysts prior to fumigation affect the sensitivity of the cysts to the fumigants.

22. Harrison, M. B. 1968. The response of a population of H. rostochiensis to cropping rotations that include resistant potatoes. Nematologica 14:8.

Population data accumulated from a series of three year rotations indicated that planting resistant lines for two years will permit a susceptible line to be grown the third year without visible nematode dama

23. Harrison, M. B. 1970. Effect of Rindite on golden nematode. Pl. Dis. Reptr. 54:306-307.

Rindite (a mixture of 7:3:1 of 2 chloroethanol plus 1,2 dichloroethane plus carbon tetrachloride) applied in a fumigation chamber resulted in a 98-100% control of H. rostochiensis encysted larvae.

24. Harrison, M. B. 1974. Control of golden nematode (Heterodera rostochiensis) with systemic nematicides. Nematropica 4:1-2.

Control at the 99% level was achieved by foliar spraying with 2.24 or 8.96 kg/ha of carbofuran and 1.12, 3.36 or 6.72 kg/ha of oxamyl.

25. Harrison, M. B. and W. F. Mai. 1956. Fumigation of encysted golden nematode under controlled environmental conditions. Phytopathology 46:14.

Temperature (10°-30°C) did not affect the efficiency of the fumigants, but relative humidity was in direct proportion with degree of control.

26. Harrison, R. E. 1976. The corky ringspot disease of potatoes: biology of Trichodorus christiei and Trichodorus proximus and evidence for the existence of unstable tobacco rattle virus in corky ringspot potatoes. Diss. Abs. International 36B 5886.

Horizontal and vertical migration and survival of the two species was studied. Fresh weights of Sebago and Pungo potatoes were not significantly reduced.

27. Hartmann, R. W. 1976. Breeding for nematode resistance in vegetables. SABRAO Journal 8(1):1-10.

Resistance-breeding to species of Meloidogyne, Heterodera and Pratylenchus in tomato, eggplant, Capsicum, potato, soybean, cowpea, Phaseolus, cucurbits, sweet potato and maize is covered.

28. Hartwell, W. V., R. V. Dahlstrom and A. L. Neal. 1959. Crystallization of a natural hatching factor for larvae of the golden nematode. Phytopathology 49:540-541.

The light-amber resinous preparation was obtained by use of t-butanol as one of the solvents. Elemental analysis indicates a possible formula of $C_{13}H_2O_3$.

29. Hastings, R. J. 1940. Transfer of the bulb nematode Ditylenchus dipsaci from Tropaeolum polyphyllum a new host to potatoes. Scientific Agriculture 21:115-116.

Nematodes were transferred from the new bulb host to 11 varieties where nematodes caused a soft rot. One variety, Netted Gem, was not infected.

30. Hastings, R. J. and J. E. Bosher. 1939. A study of the pathogenicity of the meadow nematode and associated fungus, Cylindrocarpon radicicola. Wr. Canad. Jour. Res. 16:225-229.

In a general study of pathogenicity, Pratylenchus pratensis damaged potatoes to reduce growth by 50-75% in greenhouse tests.

31. Hawkes, J. G. 1945. The indigenous American potatoes and their value in plant-breeding. Empire Jour. Exp.Agric. 13:11-40.

Thus far no variety of potato is immune to Heterodera schachtii but cyst hatching did not take place in root leachings from Solanum depexum and S. fendleri.

32. Hawkins, A. and P. M. Miller. 1971. Row treatments of potatoes with systemics for meadow nematode (P. penetrans) control. American Potato Journal 48:21-25.

Both aldicarb and carbofuran were effective in controlling the nematode but aldicarb had a longer lasting effect. Yield of tubers was greater with aldicarb.

33. Hawkins, A. and P. M. Miller. 1971. Row fumigation with Vorlex for control of meadow nematode in potatoes. Amer. Potato J. 48(2):64-68.

Row fumigation with vorlex was effective for only one potato crop, increasing yield 10-14%.

34. Haynes, F. L. and H. A. Mendoza. 1977. The value of cultivated diploid species in breeding. Potato Research 20(3):250.

Solanum material with good resistance to Heterodera rostochiensis has been identified in North Carolina.

35. Heiser, C. B., Jr. 1971. Notes on some species of Solanum in Latin America. Baileya 18(2):59-65 (Plant Breeding Abstracts 42, 9323)

Meloidogyne resistance found in S. hirtum.

36. Helton, A. W. 1964. Chemotherapeutic control of the root-knot nematode (Meloidogyne hapla) with dimethoate under greenhouse conditions. Pl. Dis. Reptr. 48:881-885.

Immersion of potato seed pieces in 50, 200, 800 ppm dimethoate for 1 min, 1 hr and 24 hr reduced gall formation by M. hapla. 800 ppm for 24 hrs eliminated the nematodes. Spraying infected potato plants upon emergence also eliminated the nematodes. There was some phytotoxicity but yield was doubled.

37. Henderson, V. E. 1951. Some host relationships of the potato-rot nematode, Ditylenchus destructor Thorne, 1945. Nature, London. 167:952.

A large number of plants were found to be infested with the nematodes.

38. Hermsen, J. G. T. 1975. [Observations on breeding for resistance to potato cyst nematode.] Zaadbelangen 29(8):262-263.

The difficulties encountered in breeding for either monogenic complete resistance or partial polygenic resistance to individual pathotypes of Heterodera rostochiensis are presented.

39. Herrera, A. E. 1974. [Efficacy of various nematicides in the chemical control of Heterodera rostochiensis on potato.] In Simposio Internacional (XII) de Nematologia, Sociedad Europea de Nematologos, 1-7 Septiembre, 1974, Granada, Spain 45-46.

40. Herrera, A. E. 1977. [Progress in screening for resistance to root knot nematode in Peruvian potato germplasm.] Nematropica 7:8.

41. Herrera, A. E. 1977. [Nematological problems of potato cultivated in Peru.] Nematropica 7(2):10.

42. Hesling, J. J. 1959. The emergence of larvae of Heterodera rostochiensis Woll. from single cysts. Nematologica 4:126-131.

Grade B (size) cysts have less variability in hatching than other grades and make up 50-60% of field populations of Heterodera rostochiensis.

43. Hesling, J. J. 1961. Heterodera rostochiensis Woll. 1923 on Solanum demissum, a population study. Annals of Applied Biology 49:350-359.

Neither size-grade of inoculum cysts nor the level of infestation had any effect on the content or hatchability of the new cysts.

44. Hesling, J. J. and P. R. Ellis. 1974. The fenestralia of Heterodera rostochiensis and H. pallida. Nematologica 20(1):43-51.

Due to the great opportunities for inbreeding, morphological and other characters should be used with caution for species/pathotype diagnosis.

45. Hide, G. A. and D. C. M. Corbett. 1973. Controlling early death of potatoes caused by Heterodera rostochiensis and Verticillium dahliae. Ann. Appl. Biol. 75(3):461-462.

Brief review of the authors' experiments 1968-1971.

46. Hide, G. A. and D. C. M. Corbett. 1974. Field experiments in the control of Verticillium dahliae and Heterodera rostochiensis on potatoes. Annals of Applied Biology 78(3):295-307.

Pentland Crown produced greater yields than did 3 other cultivars on both infested and noninfested fields.

47. Higley, J. C. 1953. Some new uses for DD against eelworm. Grower, London 39:731, 733.

Author sites additional uses for DD including control of Heterodera rostochiensis.

48. Hijink, M. J. 1963. A relation between stem infection by Phoma solanicola and Ditylenchus dipsaci on potato. Neth. J. Pl. Path. 69:318-321.

A correlation between number of Phoma-infected potato plants and Ditylenchus dipsaci in soil before planting suggests the nematode increases susceptibility of potato to the fungus.

49. Hijink, M. J. 1972. An integrated approach in the control of potato root eelworm. EPPO Bull (Eur Mediterr Plant Prot Org) 7:41-48.

Crosses of Solanum vernii and S.tuberosum have produced seven varieties that are resistant to biotypes A, B and C of Heterodera rostochiensis. The seven varieties are used in combination with DD fumigation.

50. Hijink, M. J. 1974. Soil disinfection and potato growth in the Netherlands. Agric Environ 1(3):293-301.

Heterodera rostochiensis can be controlled with use of resistant varieties and chemical treatments. Fumigation methods and soil type are discussed.

51. Hijner, J. A., M. Oostenbrink and H. Den Ouden. Morfologische verschillen tussen de belangrijkste Heterodera-soorten in Nederland. Overdruk "Tijdschr. over Plantenz". 59:245-251.

A taxonomic and morphological study of Globodera spp. in the Netherlands.

52. Hodgson, W. A., D. D. Pond and J. Munro. 1974. Diseases and pests of potatoes. Canada Dept. of Agriculture, Publication 1492. 69 p.

A general discussion of potato nematode pests concerning life cycles, control and general biology of Heterodera rostochiensis, Meloidogyne spp. and Ditylenchus destructor.

53. Hodson, W. E. H. 1933. Eelworms III the potato eelworm. Estate magazine 33:449-451.

A general discussion of the potato strain of Heterodera schachtii is given. Longevity is thought to be at least 10 years and a rotation period of 7 to 8 years is recommended.

54. Hodson, W. E. H. 1934. Stem eelworm in potato. Estate magazine 34:275-276.

A brief account of Anguillulina dipsaci is given. No adequate control measures are known. Potatoes should no be regrown in an infected site for at least four years.

55. Hoestra, H. 1976. Effect of benomyl on the potato cyst nematode Heterodera rostochiensis. Neth. J. Plant Pathology 82(1):17-23.

Because of its persistance and side effects, Benomyl is not promising for use as a chemical control.

56. Hoestra, H. and H. Harshagen. 1978. Treatment of seed potatoes with oxamyl to control Globodera rostochiensis. International Congress of Plant Pathology (3rd), Muchen, GFR, 16-23 August, 1978. Abstracts of papers.

In glasshouse pot experiments with potato variety Bintje, oxamyl dip treatments reduced nematode populations to 25% of the controls.

57. Hof, J. 1974. [Gene banks treasure chambers for plant breeding]. Samen Sterk 3:3-4. (Plant Breeding Abstracts 44, 6525).

Wild and primitive potatoes, expected to be good sources for breeding resistances to Heterodera rostochiensis are kept at the German/Dutch gene bank at Braunschweig, Germany.

58. Hofmann, K. 1974. [Phytopathological situation in the altered ecological conditions in early potato culture under foil and conclusions for control measures.] Nachrichtenbl Dtsch Pflanzenschutzd 26(1):4-8.

The author reported on the effect of polyethylene sheets on the population dynamics of Heterodera rostochiensis. Higher air and soil temperatures and relative humidity than uncovered areas were recorded. Cyst numbers increased 49% without sheets and 416% with sheets. Eggs and larvae increased 145% and 1,055% respectively.

59. Hofmann, K. 1975. [Effects of nematicides on Heterodera rostochiensis in early potatoes under PE sheeting in relation to dose and varietal resistance.] Mitteilungen aus der Biologischen Bundesanstalt fur Landund Forstwirtschaft, Berlin-Dahlem 165:222-223.

Polyethylene film favored increase of the nematode with the susceptible cultivar Saskia. Curaterr was more effective than Temik, at the dose used, in controlling the nematode population.

60. Hofmann, K. and W. Kampe. 1973. [Phytopathological facts of changes in ecological conditions in the growing of early potatoes under polyethylene sheeting and their consequences on nematode control measures.] Mitt Biol Bundesanst Land Forstwirtsch 151:288-289.

Egg and larvae population of Heterodera rostochiensis increased by 150% and under a polythene sheet by 1000% on a susceptible potato variety. The population on a resistant variety decreased by 70%, with an without sheeting. Nematicides did not effect the population but increased yield.

61. Hogger, C. H. 1969. Comparison of penetration of potato roots by Pratylenchus penetrans grown in tissue cultures and from field populations. J. Nematol. 1(1):10.

Study indicates that nematodes grown on callus in the laboratory are as infective as those from greenouse or field culture.

62. Hollis, J. P. 1979. Mutagenic action on nematodes on plants. Abstract of paper presented Feb. 4-7, 1979, Southern Division, American Phytopathological Society. Pathology 69(1):1-A5.

Physiological selection pressure manifested as nutrient alteration in new root initials on nematode-infested root systems provides a model for the origin of countless new races of nematodes identifieable by host differentials.

63. Holmberg, C. 1945. Potatiskrafta och potatisol i Sverige ar 1944. Vaxtskyddsnotiser 1:12-13.

Eelworm infection of potato in Sweden has increased rapidly and now is considered to be the most serious problem of cultivated potatoes.

64. Holmquist, A. M. 1968. Forsok med formalin, anga och angtvattning mot potatiscystnematoden. Meddn St. Vaxsk Anst. 14:137-162.

A one hour treatment with 10% formalin did not eliminate Heterodera rostochiensis cysts from potato packing cases. Steam was very effective but required that the cases be washed clean before treatment.

65. Homeyer, B. 1973. Results with fenamiphos in potatoes and vegetable crops. 7th British Insecticide and Fungicide Conference. Proc. Vol. 2 Research Reports pp. 415-423.

Granular and emulsifiable concentrate formulations of fenamiphos were used to control Heterodera rostochiensis and Trichodorus spp on potatoes. Potato cyst nematode populations were reduced and yield increases of 10-100% were reported.

66. Homeyer, B. 1973. [The action of Curaterr against predators of roots and leaves by soil application.] 25th Int. Symp. Fytoform en Fytiat. Mededelingen Fakulteit Landbouwwetenscheppen Gent. 38:1231-1240.

The effect of Curaterr at 20 ppm was 100% effective in pot tests against Heterodera rostochiensis. In field trials on potato at 10 and 20 kg/ha (broad application) 92 and 98% effective respectively against the same nematode.

67. Homeyer, B. 1973. [Results of the application of Nemacur against nematodes in potatoes.] 25th Int. Int. Symp. Fytoform en Fytiat, Gent. Deel II. Mededelingen Fakulteit Landbouwwetenscheppen Gent. 38:1251-1257.

Dosages of 10 kg ai/ha of Nemacur gave good control of Heterodera rostochiensis in potato. A susceptible variety 'Grata' was 98-99% free from cysts. Before and after samplings of the population gave a reduction in treatments.

68. Homeyer, B. 1975. Curaterr, a broad spectrum root systemic insecticide and nematocide. Pflanzenschutz-Nachrichten Bayer 28(1):3-54.

The chemical, at 10 kg ai/ha, gave 95% control of Heterodera rostochiensis on potato, with a 50% yield increase.

69. Hoof, H. A. van. 1971. Viruses transmitted by Xiphinema species in the Netherlands. Netherlands J. of Plant Pathology 77:30-31.

Tobacco ringspot virus from Peruvian potatoes was transmitted by two populations of X. coxi, but was not transmitted by 3 populations of X. diversicaudatum.

70. Hoof, H. A. van. 1972. Soilborne viruses. In Bokx, J. A. de (Editor) Viruses of potato and seed-potato production. Wageningen, Netherlands 57:64.

Nematode transmission of viruses in potatoes are discussed. Longidorus is widespread and more important than Longidorus and Xiphinema.

71. Hooper, D. J. 1972. Ditylenchus dipsaci. C.I.H. Descriptions of Plant-parasitic Nematodes. Set No. 1. 4 pp.

Discussion of anatomy, biology, taxonomy, host range distribution, pathogenic associations and control of the nematode.

72. Hooper, D. J. 1973. Ditylenchus destructor. C.I.H. Descriptions of Plant-parasitic Nematodes. Set 2, No. 21. 3 pp.

Includes brief description of anatomy, biology, taxonomy host range, distribution and control of the nematode.

73. Hoopes, R. 1977. Internal response of resistant and susceptible potato clones to invasion by potato cyst nematode. Nematropica 7:8-9.

Expression of resistance by Solanum spp. to race A of Globodera rostochiensis often is a walling-off of the syncytium, limiting its expansion.

74. Hoopes, R. W., R. E. Anderson and W. F. Mai. 1978. Internal response of resistant and susceptible potato clones to invasion by potato cyst nematode, Globodera (Heterodera) rostochiensis. Nematropica 8:13-20.

Mechanisms of resistance involved vacuolation of the syncytial cytoplasm, necrosis and enclosure of the syncytium.

75. Hoppner, E. [The coming and going of potato varieties over 25 years (1950-1975)] Kartoffelbau, 27(8):240-242. (Plant Breeding Abstracts 47, 1349).

Potato varieties grown in the German Federal Republic during this period are reviewed. Potato varieties resistant to race A of Heterodera rostochiensis are included.

76. Howard, A. 1944. Cause and cure of potato eelworm. Gard. Chronicle 115:90.

Author suggests vegetable and animal wastes are the cheapest and most effective way of controlling the nematode.

77. Howard, A. W. 1955. Breeding potatoes for resistance to root eelworm (Heterodera rostochiensis). Heredity. London 9:150.

Resistance in some lines of Solanum tuberosum andigenum behaves as a dominant character. These plants produce a root diffusate and larvae invade roots but do not mature. S. t. andigenum is a short day type.

78. Howard, H. W. 1956. Progress in potato versus eelworm. Grower 45:275-277.

79. Howard, H. W. 1959. Biotypes of potato root eelworm in Great Britain. Tag. Ber. dtsch. Akad. LandwWiss. Berl. 20:95-106.

Suggests that biotype A (no cysts on andigena-bred resistant potatoes) can be distinguished from biotype B (many cysts on andigena-bred resistant potatoes).

80. Howard, H. W. 1959. Eelworm resistant potatoes--present position. Tech. Bul. Min. Agr. Fish and Food. London. No. 7:157-160.

An account is given of breeding potatoes resistant to Heterodera rostochiensis Woll. Resistance-breaking biotypes and genetics of resistance are also discussed.

81. Howard, H. W. 1960. Further results on the effect of growing eelworm resistant potatoes. Proceedings of the 3rd Conference of the European Association of Potato Research. pp. 288-289.

Suggests that eelworm resistance-breaking (biotype B) is recessive to non-resistance-breaking biotype A.

82. Howard, H. W. 1961. The production of hexaploid Solanum x Juzepczukii. Euphytica 10:95-100.

Colchicine-grafting method was used to produce hexaploids. Seeds were obtained from hexaploids with both an andigena-tuberosum hybrid and a tuberosum variety.

83. Howeard, H. W. 1962. The resistance of Solanum x Juzepczukii clones to Heterodera rostochiensis. European Potato Journal 5:186.

Some clones were resistant to pathotype B but not to pathotype A.

84. Howard, H. W. 1965. Eelworm resistant varieties. In: J. F. Southey (editor). Technical Bulletin of the Ministry of Agriculture, Fisheries and Food No. 7 (2nd Edition). London, 262-268.

Includes summary of resistance in potatoes and biotypes of potato root eelworm.

85. Howard, H. W. 1968. The relation between resistance genes in potatoes and pathotypes of potato-root eelworm (Heterodera rostochiensis), wart disease (Synchytrium endobioticum and potato virus X. I. International Congress of Plant Pathology. London.

86. Howard, H. W. 1968. The effect of inbreeding of potato-cyst nematode, Heterodera rostochiensis. Ann. Appl. Biol. 62:485-491.

Inbred populations of 6-7 generations of various populations of this nematode had various effects upon fecundity despite high populations.

87. Howard, H. W. 1969. Breeding potatoes resistant to cyst-nematode. British Insecticide Fungicide Conference (5th), Proceedings, Vol. I, pp. 159-163.

A brief review of resistance breeding from Andigena clones with gene H_1 resistance to pathotype A and gene H_2 to pathotype B.

88. Howard, H. W. 1970. Genetics of the potato, Solanum tuberosum. Logos Press Limited, London. 126 pp. (Potato Cyst Nematode pp. 53-57).

A brief review of the genetics of resistance to Heterodera rostochiensis is given, with discussions of pathotypes and distribution.

89. Howard, H. W. 1971. Nematode-resistant varieties of potatoes. Seed Potato 11:47-48.

Britain has about 50,000 acres of land infested with Heterodera rostochiensis Pathotype A. Too frequent growing of varieties resistant to pathotype A may cause other pathotypes to develop. Maris Piper is the main resistant variety available.

90. Howard, H. W. 1972. Pathotypes of potato cyst nematode. Ann. Appl. Biol. 71:263-266.

Pathotypes of Heterodera rostochiensis were recognized through programs of breeding potatoes for resistance to the pest.

91. Howard, H. W. 1972. Breeding potatoes for resistance to cyst nematodes. ADAS Quarterly Review 7:132-138.

Crosses of Solanum tuberosum spp. tuberosum with S. tuberosum spp. andigena (gene H.) are resistant to English and Dutch pathotypes A. All British pathotypes A are Heterodera rostochiensis and pathotypes B and E are Heterodera pallida.

92. Howard, H. W. 1973. Breeding potatoes for resistance to cyst nematodes. Seed Potato 13(1):68-72.

Breeding resistance to Heterodera rostochiensis and H. pallida is discussed.

93. Howard, H. W., C. S. Cole and J. M. Fuller. 1970. Further sources of resistance to Heterodera rostochiensis in the andigena potatoes. Euphytica 19:210-216.

British pathotypes B and C were used in testing andigena potatoes.

94. Howard, H. W., C. S. Cole, J. M. Fuller and G. J. Jellis. 1975. Plant breeding institute Cambridge reports. Seed Potato 15(3):77-81.

All the selections derived from the Pentland Crown x Maris Piper cross, carried the H_1 gene for resistance to Heterodera rostochiensis pathotype A. Solanum vernei has been used as a source of resistance to H. pallida and H. rostochiensis.

95. Howard, H. W. and J. M. Fuller. 1971. Resistance to the cream and white potato cyst nematodes. Pl. Path. 20:32-35.

A potato clone K 2/4 and clone AND 586/1 were tested against 3 white cyst populations (pathotype E). Resistance seems to be due to two genes, H_1 and H_3.

96. Howard, H. W. and J. M. Fuller. 1975. Testing potatoes bred from Solanum vernei for resistance to the white potato cyst-nematode, Heterodera pallida. Annals of Applied Biology 81(1):75-78.

3 clones of potato derived from Solanum vernei were tested for resistance to two populations of H. pallida. The degree of pathogenicity of the 2 populations varied, and it is suggested that the resistant clones would perform best when used in conjunction with nematicide treatment.

97. Howard, H. W., R. Johnson, G. E. Russell and M. S. Wolfe. 1970. Problems in breeding for resistance to diseases and pests. Report of the Plant Breeding Institute, 1969. (Cambridge, UK) pp. 6-36.

98. Howard, H. W., N. Krishnananda, N. Singh and M. J. Abraham. 1977. Potato cyst nematodes in the Nilgiri Hills, South India. Journal of the Indian Potato Association 4:68-69.

Populations of Heterodera (Globodera) rostochiensis, of H. pallida and of a mixture of the two species were shown to occur. Tests were made with nine clones of potato, with and without the resistant gene.

99. Howard, R. W. 1959. Cyst chromogenesis in potato cyst eelworm pathotypes. Plant Pathology 15:125-128.

Pathotype B of Heterodera rostochiensis [Globodera pallida] does not pass through a yellow stage.

100. Hoyman, W. G. 1974. Searching for resistance to Meloidogyne hapla. American Potato Journal 51:278.

A large number of cultivars of Solanum tuberosum and Solanum spp. were tested in soil infested with Meloidogyne hapla and Verticillium albo-atrum. No interaction between fungus and nematode was observed.

101. Hoyman, W. G. 1974. Reaction of Solanum tuberosum and Solanum spp. to Meloidogyne hapla. American Potato Journal 51:281-286.

218 clones of S. tuberosum and 238 accessions of 55 tuberous Solanum spp. were planted in M. hapla infested soil. Nearly 81% were free of root galls, no interaction with fungus was observed.

102. Hoyman, W. G. and E. Dingman. 1967. Effect of disulfoton on tuber nematode galls, Verticillium wilt and yield of Russet Burbank potato. Am. Potato J. 44:165-173.

Potato seed pieces infected with Meloidogyne hapla and Verticillium received a banded treatment of 3 lb disulfoton at planting and an equal amount side-dressed at various times during the growing season. Wilt symptoms were delayed. Treatments receiving banding and side-dressing were superior to those side-dressed only.

103. Huijsman, C. A. 1955. Breeding for resistance to the potato root eelworm. Euphytica 4:133-140.

Confirmed resistance in potato to Heterodera rostochiensis is controlled by single dominant gene. Showed at least one other type of resistance in S. tuberosum andigenum.

104. Huijsman, C. A. 1956. Breeding for resistance to the potato root eelworm in the Netherlands. Nematologica 1:94-99.

Numerous seedlings from intercrosses of the resistant Solanum andigenum were tested for resistance against Heterodera rostochiensis. Absence of cysts on roots was the criterion for resistance which appears to be due to a single dominant gene. Both resistant and nonresistant plants are invaded by larvae but none mature in resistant plants.

105. Huijsman, C. A. 1957. Veredeling van de aardoppel op resistentie tegen Heterodera rostochiensis Woll. Med. Stich. Plantenveredeling. Wageningen 14:1-85.

A progress report of breeding eelworm resistance in the Netherlands. Solanum adigenum lines are easily crossed with S. tuberosum; both are closely related to tetraploid species. Several hundred thousand crosses have been grown by Dutch workers. A warning is given that different biotypes may be present in the Netherlands as in Peru and Scotland.

106. Huijsman, C. A. 1958. Resistance to the potato root eelworm in S. tuberosum subsp. andigena and its importance in potato breeding. Neth. J. Ag. Sci. 6:39-46.

Heterodera rostochiensis resistance has been found in some clones of diploids. Solanum macoloe and S. famatina. Andigena clone C.P.C. 1763 is most widely used in breeding for resistance. Biotypes of the nematode are now known in Peru, England, Scotland and the Netherlands.

107. Huijsman, C. A. 1959. Nature and inheritance of the resistance to the potato root eelworm Heterodera rostochiensis Woll. in Solanum kurtzianum. Medelingen Landbouwhogeschool en de Opzoekingsstations van de Staat de Gent, 24 (3/4), 611-613.

Resistance in S. kurtzianum and S. indigenum is similar. It was suggested that the resistance is determined by two polymeric genes.

108. Huijsman, C. A. 1960. Some data on the resistance against the potato root-eelworm Heterodera rostochiensis Woll. in Solanum kurtzianum. Euphytica. Wageningen 9(2):185-190.

Resistant genes in S. kurtzianum are effective against race B of H. rostochiensis. A potato variety with resistance genes derived from S.tubereosum subsp. andigena CPC 1673 and from S. kurtzianum are resistant to both A and B races.

109. Huijsman, C. A. 1961. The influence of resistant potato varieties on the soil population of Heterodera rostochiensis Woll. Nematologica 6:177-180.

Resistant varieties of potatoes lowered the population of the nematode to a greater degree than an immune crop such as beans. Even after 6 years of a resistant potato varieties there was a residue infection and eradication was considered very unlikely with resistant varieties.

110. Huijsman, C. A. 1962. Physiological races in the potato root eelworm, Heterodera rostochiensis Woll. European Potato Journal 5:186

Presents evidence of six biotypes.

111. Huijsman, C. A. 1963. The influence of resistant potato varieties on the soil populations of Heterodera rostochiensis Woll. II. Nematologica 9:354-356.

Nematode population in a field infested with the pest decreased during the first 5 or 6 years then increased in the next two. Conclusions were that a few genes inducing aggressiveness were present, giving rise to an aggressive nematode race AB. This supports the theory that aggressiveness is a recessive character. In time the aggressive race may build up in numbers if such a potato is grown.

112. Huijsman, C. A. 1972. [Some aspects of breeding for resistance to potato root eelworm.] Landbouw en Plantenziekten 2:21-25.

Wild and primitive plants from S. America must be used more extensively in potato breeding programs.

113. Huijsman, C. A. 1972. Resistance as a means of control of the potato root eelworm. Bulletin Organization of European Plant Protection 7:27-30.

Breeding for varieties of potato resistant to Heterodera rostochiensis has been going on for 20 years. Mode of inheritance for resistance is simple but resistance breaking biotypes occur in 20% of the potato growing area of the Netherlands. Thus the useful life of resistant varieties is limited.

114. Huijsman, C. A. 1972. Wild and primitive Solanum species and potato root eelworm. Stichting voor Plantenveredeling, Wageningen, Netherlands. Zaadbelangen 26(10):228-229.

Solanum andigenum varieties are resistant to biotype A. Some S. vernei derivations are resistant to biotypes A, BC and D. Other species resistant to D are listed.

115. Huijsman, C. A. 1974. Host plants of Heterodera rostochiensis Woll. and the breeding for resistance. Bulletin OEPP 4(4):501-509.

A discussion of important aspects in potato and tomato breeding programs. The nature of resistance and mode of inheritance are also discussed. Distinguishes between tolerance and resistance.

116. Huijsman, C. A. 1975. Some aspects of breeding for resistance to the white potato cyst nematode. In Abstracts of Conference Papers of the 6th Triennial Conference of the EAPR. Miscellaneous Wageningen, Netherlands; European Association for Potato Research. pp. 136-137.

Using known numbers of cysts, eggs or larvae before and after growing season in pot experiments is a reliable predictor of field results.

117. Huijsman, C. A., C. H. Klinkenberg and H. den Ouden. 1969. Tolerance to Heterodera rostochiensis Woll. among potato varieties and its

relation to certain characteristics of root anatomy. Eur. Potato J. 12:134-147.

Tolerance of 118 potato cultivars to H. rostochiensis showed that the varieties 'Multa' and 'Panther' gave the highest yield. Anatomical studies indicated differences in necrosis among degrees of tolerance.

118. Huijsman, C. A. and H. Laberts. 1972. Breeding for resistance to the potato cyst-nematode in the Netherlands. In International Symposium on Key Problems and Potentials for Greater Use of the Potato in Dev. World, Lima, Peru. 161-171.

Review of the Netherlands' breeding program for resistance to Heterodera rostochiensis in potato.

119. Hunnius, W. and M. Scheidt. 1974. [A contribution to breeding for resistance to the potato nematode Heterodera rostochiensis Woll. based on S. spegazzinii.] Bayerisches Landwirtschaftliches Jahrbuch 51(3):294-303.

Higher proportions of progenies with resistance were obtained from S. spegazzinii-S. tuberosum backing crossing hybrids x S. andigena-S. tuberosum hybrids than were obtained from backcrossing with S. tuberosum. Using S. spegazzinii hybrids as the male parent reduced the number of progeny having resistance.

120. Hunt, O. J. 1973. Nematode resistance in plants: breeding problems and opportunities. Abstr. Pap. 2. Int. Congr. Pl. Path., Minneap., Minn. 0612.

A review (Meloidogyne hapla).

121. Hurst, R. H. and M. T. Franklin. 1938. A second series of field experiments in Lincolnshire on the chemical treatment of soil infected with Heterodera schachtii. J. Helminthol. 16:1-4.

Calcium cyanamide treatment prior to planting increased yield from 3.4 to 8.0 tons per acre. Treatment was only good for one season and should be applied 4 months before planting.

122. Hurst, R. H. and M. T. Franklin. 1938. Field experiments in Bedfordshire on chemical treatment of soil infected with potato eelworm Heterodera schachtii, during 1936-37. J. Helminthol. 16:33-46.

Treatments consisted of precipitated Fe_2O_3, levigated Fe_2O_3, crude Fe_2O_3, Fe powder and zinc oxide. Yield was reduced with all treatments.

123. Hurst, R. R. 1947. The potato rot nematode, Ditylenchus destructor, in Prince Edward Island. Proc. Cond. Phyto. Soc. 15:17.

Author mentions failure of seed treatments, 10 varieties of potato grown in area subject to injury, and that field mint Mentha arvenis was a host.

124. Husain, S. I., and A. M. Khan. 1965. On Rotylenchulus stakmani n. sp. with a key to the species of the genus (Nematoda: Tylenchida). Proc. Helminth. Soc. Wash. 32:21-23.

The new species is described from soil surrounding roots of potato at Aligarh, India.

125. Husain, S. I. and A. M. Khan. 1974. Three new species of neotylenchoid nematodes from North India. Indian Journal of Nematology 4:81-87.

Nothotylenchus taylori n. sp. was described from soil around roots of Solanum tuberosum.

126. Husain, S. I. and A. M. Khan. 1976. Four new tylenchid nematodes from North India. Indian Journal of Nematology 5(1):49-55.

Ditylenchus solani n. sp. from Solanum tuberosum grow in Hapur is described.

1. Ichinohe, M. 1973. [The ecology of Heterodera rostochiensis, nematode injurious to potatoes.] Shokubutsu Boeki 27(2):31-34.

2. Inagaki, H. 1974. [Infection of potato tubers by Heterodera rostochiensis Wollenweber in a greenhouse test.] Japanese Journal of Nematology 4:11-12.

Potato plants 'Benimaru' grown in pots were inoculated with 10^4 and 10^5 eggs. Foliage was removed at 72 days and tubers harvested 1 month later. A number of females and immature females were observed on and just below the skin of the tubers. Most nematodes were attracted to the 'eye' area.

3. Inagaki, H. and K. Kegasawa. 1973. Discovery of the potato cyst nematode, Heterodera rostochiensis Wollenweber, 1923. (Tylenchida: Heteroderidae) from Peru guano. Appl. Entomol. Zool. 8(2):97-102.

Heterodera rostochiensis cysts in Peru guano at the rate of 43 full cysts/100 gm. The eggs and larvae were viable and infective.

4. Inagaki, H. and K. Kegasawa. 1974. Vertical distribution of viable cysts of Heterodera rostochiensis Woll. in a field. (Hokkaido Nat. Exp. Sta. Sapporo, Japan, 061-01). Jap. J. Nematol. 4:57-58.

An ecological study of Heterodera rostochiensis cysts in the soil profile.

5. Inagaki, H. and K. Kegasawa. 1976. Viability of encysted larvae and eggs of potato cyst nematode Heterodera rostochiensis Woll., after being fed to hen or swine, and at their body temperature. Japanese Journal of Nematology 6:7-9. Also in Potato Abstracts, Oct. 1977, No. 1077.

Encysted larvae and eggs of Globodera rostochiensis defecated by 15 hens that had been feed 300 cysts each, were able to mature on potato roots.

6. Inagaki, H., K. Kegasawa and M. Tsutsumi. 1973. [Symptom development and damage in potato caused by the potato cyst nematode, Heterodera rostochiensis, under field conditions.] Japanese Journal of Nematology 3:25-29.

Above ground growth and yield were severely restricted. Mean height of untreated plants was 39.2 cm, top weight 217 gm, tuber weight 185 gm and yield was 2,444 kg/10 a. Corresponding weights of plants treated with 30 and 40 litres/10 a-DD were: mean height 59.1 and 60.5 cm, 343 and 437 gm top weight, 248 and 325 gm tuber weight and 3,216 and 3,448 kg/10 a of total yield.

7. Inagaki, H. and M. M. de Scurrah. 1976. The possibility of contamination of Peruvian guano by potato cyst nematode. Japanese Journal of Nematology 6:96-97.

Twenty samples of guano from four Peruvian islands and 31 soil samples from coastal areas of Peru where potatoes and other crops are grown, were sampled for nematode cysts. One cyst was found in a sample taken near nests of Guanay Cormorants on Mazorca Island and identified as Globodera but the identity of species could not be ascertained.

8. India. 1971. Report of the Indian Council of Agricultural Research 1967-1968. New Delhi. 163 pp.

DDT at 400 liters per hectare was effective in controlling Meloidogyne on potato.

9. India, Central Potato Research Institute. 1974. Scientific report, 1971-1973. Simla, India. 235 pp.

Resistance to Heterodera rostochiensis was indicated in clones of Solanum ehren bergerii, S. vernei, S., chacoence, S. phurega and S. demissum. Hybrid selection G2524 shows promise and is being considered for release.

10. India, Central Potato Research Institute. 1975. 25th scientific report for the year 1974. Delhi, India. 162 pp.

Root-knot nematode population levels and potato tuber yield vary with planting time. High yielding, nematode-free tubers were noted among those planted after October 3. Four hybrid clones show some resistance to Heterodera rostochiensis.

11. Ing, E. G. and T. Small. 1940. Potato root eelworm (Heterodera schachtii). Rapport du Directeur de la Ferme d'Experiences 'Howard Davis', Trinite, Jersey. Annee 1939, 35-43.

A survey of Jersey regarding extent of infection. Several acres were infected. Calcium cyanamide was used for patches at the rate of 2 lb per square yard. Various restrictions were placed on seed and infected fields.

12. Inoue, H. 1973. [Increase in numbers of root-knot nematode and reduction in yield caused by the successive cropping of spring and autumn potatoes.] 17th Annual meeting of the Japanese Society of Applied Entomology and Zoology. Nagaro, Japan. 135:854.

In monoculture of potato crops in spring and autumn, in the temporate zone, there was a gradual increase in root galling caused by Meloidogyne sp. Yield loss was noticeable and most severe in summer.

13. Inoue, H. 1974. [Damage by the root-knot nematodes of the spring and fall crops of potatoes. (2) On the number of the galled tubers.] Kyushu Agricultural Research 36:130-131.

14. Inoue, H. 1975. [Effects of chloropicrin application on root-knot nematodes, bacterial wilt and common scab in continously cropping potatoes.] Bulletin, Nagasaki Agricultural and Forestry Experiment Station, Section of Agriculture 3:48-59.

15. Inoue, T. 1974. [Field evaluation of granular DCIP. 2, 6-dichloropheno indophenol, for control of root knot nematodes, Meloidogyne incognita and Meloidogyne hapla in potatoes.] Proc Assoc. Plant Prot. Kyushu 20:48-49.

16. Inserra, R., G. D. Bene, T. Bleve-Zacheo and L. Tarantino. 1972. [Geographical distribution of Heterodera rostochiensis Woll. in Apulia]. Informatore Fitopatologico 22:9-12. [Ita].

Surveys in Apulia, Italy indicate that the pest is only distributed along the Adriatic coast.

17. International Potato Center. 1973. Control nematodes. Annual Report, International Potato Center, Lima, Peru. p. 43-48.

An annual progress report convering breeding and screening potato varieties for resistance to Globodera pallida, G. rostochiensis, Meloidogyne, and Nacobbus.

18. International Potato Center. 1974. Control of selected nematode pests. Annual Report, International Potato Center, Lima, Peru.

The annual report covered the progress that had been made during the current year on screening for resistance, biology, distribution and interaction with other pathogens for the major nematode pests studied at the center--Globodera spp., Meloidogyne spp. and Nacobbus spp.

19. International Potato Center. 1974. Nematode control strategy. Report of the International Potato Planning Conference on nematode control. International Potato Center, Lima, Peru. 73 p.

A planning conference in which all biological and control activities were discussed for Globodera, Meloidogyne, Nacobbus and Pratylenchus spp.

20. International Potato Center. 1975. Control of selected nematode pests (Thrust No. 6). Annual report, International Potato Center, Lima, Peru p. 52-58.

The annual progress report discusses current research in progress and background information on four nematode pests of potato: Globodera pallida, G. rostochiensis, Meloidogyne incognita and Nacobbus aberrans. Topics include screening potato cultivars, nematode races, interactions, biology and distribution.

21. International Potato Center. 1976. Thrust VI, Control of important nematode pests of potato. Annual report, International Potato Center, Lima, Peru. p. 45-49.

This annual report contains the research activities of the major nematode pests: Globodera pallida, G. rostochiensis, Meloidogyne, sp. and Nacobbus aberrans. Such activities included studies of populations and races, screening and breeding for resistance,

distribution and host range studies. Meloidogyne interactions with other pathogens, particularly bacteria, are reported.

22. International Potato Center. 1977. Thrust VI, Control of important nematode and insect pests of potato Annual report, International Potato Center, Lima, Peru. p. 67-87.

This annual report contains current information on distribution, resistance screening programs, cultural control, taxonomy and general biology of four nematode pests or potatoes. The pests are Globodera pallida, G. rostochiensis, Meloidogyne incognita acrita and Nacobbus aberrans.

23. International Potato Center. 1977. Major potato diseases and nematodes. Lima, Peru. 68 p.

Descriptions and color photographs of diseases due to Heterodera spp., Meloidogyne spp. and Nacobbus aberrans.

24. International Potato Center. 1978. Potato cyst nematodes. CIP Circular Vol. VI, No. 7. International Potato Center, Lima, Peru.

An annual report report giving progress in breeding potatoes for resistance against Globodera pallida, G. rostochiensis and Meloidogyne incognita acrita. Additional information on general studies of nematode pests at the Center also is included.

25. International Potato Center. 1978. Thrust VI, Control of important nematode and insect pests of potatoes. Annual report. International Potato Center, Lima, Peru, pp. 33-41.

An annual report describing screening and breeding potato cultivars for resistance to Globodera, primarily G. pallida and Meloidogyne incognita acrita. A biology study of Nacobbus aberrans is also reported. A fungus parasite of Meloidogyne eggs is illustrated.

26. International Potato Center. 1979. Biological control of nematodes. CIP Circular Vol. VII, No. 3 International Potato Center, Lima, Peru.

A fungus, Paecilomyces lilacinus Thom. Samson, destroys eggs of Meloidogyne spp. Heterodera (Globodera) eggs are also destroyed.

27. Ireland. An Foras Taluntais. 1972. Annual Report 1971-1972. Dublin [Plant Nematology pp. 22, 39.]

All commercial varieties of potatoes were susceptible to the potato tuber nematode, Ditylenchus destructor. Survival in soil is due to crops like corn, mint and unharvested potatoes.

28. Ireland. An Foras Taluntais. 1973. Research report 1972. Dublin. 59 pp.

Oakpart Beauty is resistant to Phytophthora infestans and pathotype A of Heterodera rostochiensis. Other varieties are described.

29. Ireland. An Foras Taluntais. 1976. Annual Report 1975. Dublin. 48 pp.

Ditylenchus destructor was found in a number of ware crops.

30. Ireland, An Foras Taluntais. 1977. Annual report 1976. Dublin. 46 pp.

Most potato cyst populations were pathotype A. Control measures of alternating resistant and susceptible cultivars and oxamyl treatment were effective.

31. Ishibashi, N. 1970. Variations of the electrophoretic protein patterns of Heteroderidae (Nematoda: Tylenchida) depending on the developmental stages of the nematode and on the growing conditions of the host plants. Appl. Entomology Zool. 5:23-32.

32. Ismailov, G. M. 1967. [Ditylenchus destructor in western Azerbaidzhan and its control]. In [Nematode diseases of crops] N. M. Sveshnikova, Editor Moscow: Izdatelstvo "Kolos" pp. 138-144.

Chemical treatment was too expensive and did not eradicate the pest. Tuber sorting before planting was considered the best alternative.

33. Ismailov, G. M. 1976. [Ditylenchus destructor on potato and its control in the Azenbaidzhan SSR]. In [See: Adylova, N. A. 1976) p. 76

Dimethoate and carbathion were effective controls, but carbathion inhibited germination.

34. Ivanova, B. P. 1969. [Potato stem nematode in Byelorussia.] Zashch. Rost. Vredit. Bolez. p. 5.

35. Ivanova, B. P. 1971. [The role of selection in disinfection of potato from Ditylenchus destructor.] Byulletin' Vsesoyuznogo Instituta Gel'mintologii im K. I. Skryabina No. 6:27-31.

After examination of all production stages it was concluded that intensive sorting and selection with laboratory examination is an effective measure in the production of clean seed.

36. Ivanova, B. P. 1975. [Trials of selected potato varieties for resistance to Ditylenchus destructor.] Byulleten' Vsesoyuznogo Instituta Gel'mintologii im. K. I. Skryabina. 15:63-66. [Ru]

Extensive field test of Ditylenchus destructor resistance in Solanum species resulted in classifying 87 samples of 185 tested as resistant.

1. Jacob, J. J. 1960. [The influence of certain plants on the population of Meloidogyne hapla.] Nematologica (Suppl. II, 1960): 141-143.

Two field experiments show a strong influence of certain crops on the population of Meloidogyne hapla. Potatoes, carrots and leguminous plants are efficient hosts.

2. Jacobsen, B. 1972. [Nematode resistance in potato varieties] Landbonyf 26(3):149-150, 152-153.

3. Jacobsen, B. J. 1974. Interaction between Meloidogyne hapla and Verticillium albo-atrum in the Verticillium wilt of potatoes. Dissertation Abstracts International. 34B(11):5279.

Synergistic reaction was greater at 85°F than at 75°F.

4. Jacobsen, B. J., D. H. MacDonald and H. L. Bissonette. 1979. Interaction between Meloidogyne hapla and Verticillium albo-atrum in the Verticillium wilt disease of potato. Phytopathology 69(3):288.

Infection by the fungus occurred earlier in the presence of the nematode and nematode populations were higher (at 24°C, but not at 30°C). Several chemicals were used in control experiments, the results are tabulated for effect on yield of Nordland and Norgold potatoes.

5. Jakobsen, J. 1973. [Identification of Heterodera pallida from the Faroe Islands.] Manedsovers Plantesygd 473:54-56.

6. Jakobsen, J. 1973. [Potato cyst nematode--more than one species]. Ugeskrift for Agronomer og Hortonomer 2:602-604.

Heterodera rostochiensis was first reported in Denmark in 1928. Only pathotype A has been found except possibly H. pallida on the Faroe Islands.

7. Janke, C. 1974. [Studies on the effect of liquid nitrogenous fertilizers on Heterodera rostochiensis Woll. multiplication.] Arch Phytopathol Pflanzenschutz 3(10):187-196.

8. Janke, C., A. Heide and W.Lucke. 1972. [The effect of varied water supply and sprinkler irrigation on the population dynamics of Heterodera rostochiensis Woll. when growing resistant potato varieties.] Arch Pflanzenschutz 8(5):371-385.

9. Janke, C., C. Huttner, H. Hans and G. Goth. 1972. [The influence of supplemental sprinkling and varying water supply on the population dynamics of the potato root eelworm (Heterodera rostochiensis Woll.) when growing non-host plants]. Arch Pflanzenschutz 8(6):447-456.

10. Janzen, G. J. 1968. Flavianic acid as a hatching agent for Heterodera rostochiensis cysts. Nematologica 14:601-602.

Flavianic acid was more effective than potato root diffusate in stimulating hatching.

11. Jasinska, A. and P. Szulc. 1961. Wplyw nawozenia na wystepowanie matwika ziemniac-zanego (Heterodera rostochiensis Woll.) Prace Naukowe Instytutu Ochrony Roslin Warsaw. 3:145-160.

Fertilizer and other additives were added to soil and studied in pots and field experiments. Heterodera rostochiensis cyst in soil treated with calcium cyanamide were reduced by 4 to 24.6%. Manure, green manure, or compost gave better crops but cyst numbers increased by 2 to 4 times.

12. Jatala, P. 1975. Root-knot nematodes (Meloidogyne species) and their effects on potato quality. 6th Triennial Conference of the EAPR, 15-19 September 1975. Wageningen, Netherlands, p. 194.

A review of damage to potatoes by Meloidogyne spp. Also discussed was the Meloidogyne incognita acrita interaction with Pseudomonas solanacearum and a breeding program for resistance to the two pathogens.

13. Jatala, P. 1976. Importancia del nematodo de la nudosidad de la raiz, Meloidogyne spp. Memorias de la conferencia de trabajo sobre el proyecto internacional Meloidogyne, Regional II. International Meloidogyne Project, N. C. State University. p. 106-111.

A general discussin of Meloidogyne spp. on potato in regards to distribution and pathogenicity. Studies of interactioins of root-knot nematodes with bacteria and fungi are also included.

14. Jatala, P. 1977. A new nematode attacking potatoes in Peru. Nematropica 7(2):10.

Roots of potato cultivar Mariva were damaged by a nematode thought to be Meloinema (but similar to Nacobbusbodera).

15. Jatala, P. 1977. Nematodos que afectan el cultivo de papa. Segunda Reunion Latinoamericana de Coordinacion de Actividades de Investigacion y Produccion de Papa. Puerto Varas, Chile 9-15 Enero 1977. Centro Internacional de la Papa y ALAP Asociacion Latinoamericana de la Papa. p. 166-173.

Three genera of potato nematodes were discussed regarding the following topics: Globodera -classificiation, races, resistant potatoes and tolerance, Meloidogyne - resistance, screening and interaction with Pseudomonas, Nacobbus - distribution and dissemination.

16. Jatala, P., M. L. Arens and J. Christiansen. 1977. Effects of bitter potato root exudates on hatching of Globodera pallida and G. rostochiensis. Journal of Nematology 9:273.

Tubers of bitter potatoes. Solanum juzepezukii, Peruvian cultivars 'Pinaza,' 'Ruckii' and 'Parina.' and a table variety S. tuberosum andigena 'Renacimento' were exposed to both nematodes and root exudates of each potato cultivar. G. pallida hatched more readily on Renacimento and G. rostochiensis hatched more readily on bitter varieties.

17. Jatala, P., M. L. Arens and L. Pretel. 1977. [The first record of the potato-root nematode Ditylenchus destructor in Peru]. Nematropica 7(2):11.

18. Jatala, P., J. Franco et al. 1979. Nonsolanaceous hosts of Globodera in the Andes. Journal of Nematology 11:210-211.

The authors present a discussion on the possible origin of the Globodera spp in Peru highlands as well as solanaceous and nonsolanaceous hosts. Both G. pallida and G. rostochiensis occur in various localities and on various hosts in Peru.

19. Jatala, P., E. R. French and L. Gutarra. 1975. Interrelationships of Meloidogyne incognita acrita and Pseudomonas solanacearum on potatoes. Journal of Nematology 7(4):325.

Both resistant and susceptible (to Pseudomonas) potato cultivars showed wilt in 19 days when exposed to the bacterium. When exposed to the bacterium and the nematode, death occurred in all the susceptible and in 60-80% of the resistant plants within 42-56 days.

20. Jatala, P. and A. M. Golden. 1977. Taxonomic status of Nacobbus species attacking potatoes in South America. Nematropica 7(2):9-10.

Nacobbus aberrans, thought to be a species complex of at least two nematode forms, infested nearly all potato-growing regions in southern Peru and Bolivia.

21. Jatala, P., L. Gutarra, E. R. French and J. Arango. 1976. Interaction of Heterodera pallida and Pseudomonas solanacearum on potatoes. Journal of Nematology 8(4):289-290.

The interactions was synergistic in both resistant and susceptible potato cultivars.

22. Jatala, P. and R. Kaltenbach. 1978. Reaction of some Peruvian potato cultivars to Pratylenchus pratensis. Journal of Nematology 10:290.

Three Peruvian potato cultivars, 'Mariva', 'Revolucion' and 'Renacimiento', were exposed to Pratylenchus pratensis inoculum. After three months, roots and tubers of 'Revolucion' indicated a high infection rate although the other cultivars were also infected. A clone selection of Solanum sparsipilum (CIP 760147.7) did not show any infection in roots or tubers which may be a source of resistance in future breeding programs.

23. Jatala, P. and R. Kaltenbach. 1979. Survival of Nacobbus aberrans in adverse conditions. J. Nematol. 11:303.

Nacobbus aberrans survived in dry desiccated soil eight months and in frozen soil (-13°C) four months.

24. Jatala, P., R. Kaltenbach and M. Bocangel. 1979. Biological control of Meloidogyne incognita acrita and Globodera pallida on potatoes. J. Nematol. 11:303.

The fungus Paecilomyces lilacinus infected 70-90% of Globodera pallida eggs and 80-90% of Meloidogyne incognita acrita eggs. Entrance into cysts is usually through the vulva or broken neck regions and in Meloidogyne through anus or vulva.

25. Jatala, P. and C. Martin. 1977. Interactions of Meloidogyne incognita acrita and Pseudomonas solanacearum on field grown potatoes. Proceedings of the American Phytopathological Society Vol. 4:177-178.

Mortality rates of potatoes in plots having Pseudomonas solanacearum alone or in combination with Meloidogyne incognita acrita were higher than in other plots.

26. Jatala, P. and C. Martin. 1977. Interactions of Meloidogyne incognita acrita and Pseudomonas solanacearum on Solanum chacoense and S. sparsipilum. Proceedings of the American Phytopathological Society. Vol. 4:178.

Significantly fewer nematode-immune S.sparsipilum plants wilted when inoculated with both organisms. Nematode-resistant S.chacoense indicated some resistance to this synergism. It appears as though the mechanism for Meloidogyne resistance in these cultivars also confers resistance to Pseudomonas.

27. Jatala, P., H. A. Mendoza and F. L. Haynes. 1976. The reaction of some clones of diploid cultivated potatoes to infection by the root-knot nematode, Meloidogyne incognita acrita. American Potato journal. 53:395-396.

A screenhouse evaluation of 800 clones (selected from Solanum phureja and S. stenotomum populations) against Meloidogyne incognita acrita was reported. In a gall rating of 0-4 (none to severe) most clones were rated 3. However, 17 clones were rated 1.5, 10 clones 1 and only one clone "0".

28. Jatala, P. and P. R. Rowe. 1976. Reaction of 62 tuber-bearing Solanum species to the root-knot nematode, Meloidogyne incognita acrita. Journal of Nematology 8(4):290.

S. acroscopicum 'PI365315', S. gourlayi 'Oka 4532', S. megistacrolobum 'Oka 4460' and S. sparsipilum 'PI310933' were resistant (there was no galling nor reproduction of the nematode).

29. Jatala, P., P. R. Rowe and S. J. Turner. 1975. Reaction of some tuber-bearing Solanum species to the root-knot nematode Meloidogyne incognita acrita. American Potato Journal 52(8):246.

Seedling roots (from true seed) were exposed to Meloidogyne incognita acrita and evaluated for galling at 2 months after inoculation. Of the 19 cultivars tested, 12 indicated a high degree of resistance. Solanium chacoense and S. sparsipilum had the most resistant progeny. S. chacoense PI 197760 and S. sparsipilum PI 23052 produced highly resistant progeny.

30. Jatala, P., and M. M. de Scurrah. 1975. Mode of distribution of Nacobbus spp. in certain potato-growing areas of Peru and Bolivia. Journal of Nematology 7(4):324-325.

Infected tubers are an important source of dissemination of the nematode.

31. Jatala, P. and L. J. Turkensteen. 1977. Interrelationships of Globodera pallida with some Phoma spp. and Colletotrichum coccodes on potatoes. Journal of Nematology 9:272-273.

Tubers of Solanum tuberosum subsp. andigena cultivar 'Renacimiento' were inoculated with nematodes or fungi separately or in combinations. The fungi infected roots in presence of nematode and such combinations retarded nematode development.

32. Jeffers, W. F., C. E. Cox, R. A. Jehle, L. O. Weaver, O. D. Morgan and J. E. Moore. 1951. Notes on the occurrence of some plant diseases in Maryland during 1950. Plant Disease Reporter 35(8):385-386.

Meloidogyne hapla was formed on white potato (var. Pontiac) as small raised surface areas.

33. Jensen, H. J., P. A. Koepsell, and T. C. Allen. 1974. Tobacco rattle virus and nematode vectors in Oregon. Plant Disease Reporter 58:269-271.

Trichodorus allius and T. teres transmitted 3 isolates of TRV from potato in Oregon.

34. Johansson, F.and H. Niediech. 1963. Ett observandum angaende rotnematoden pa potatis. Vaxtskyddsnotiser 27:90-95.

Ditylenchus destructor is discussed as it occurs in Sweden.

35. Johnson, G.C. 1932. Potato Sickness. Gardener's Chronicle 91:88.

The field symptoms, gradual spread and presence of brown cysts are discussed.

36. Johnson, L. R. and H. W. Thompson. 1945. Potato root eelworm in Yorkshire. J. Min. Agric. London 52:266-270.

Authors discuss survey in sandy soils, effects of rotation on nematode population and importance of dissemination.

37. Johnson, L. R. and W. N. Townsend. 1949. The inhibition of hatching of potato root eelworm (Heterodera rostochiensis Woll) in partially sterilized soil. Ann. of Appl. Biol. 36:504-512.

38. Jones, F. G. W. 1954. First steps in breeding for resistance to the potato root eelworm. Ann. Appl. Biol. 41:348-353.

Discussion of the resistance of Solanum verni S. andigenum and S. tuberosum to potato-root eelworm. Resistance is believed to be controlled by a single dominant gene.

39. Jones, F. G. W. 1957. Resistance-breaking biotypes of the potato root eelworm (Heterodera rostochiensis Woll.) Nematologica 2:185-192.

Aggressive populations of H. rostochiensis found to be common in English soils (14 of the 20 populaions tested on Solanum tuberosum subsp. andigena and on seedlings bred from crosses subsp. andigena and subsp. tuberosum).

40. Jones, F. G. W. 1957. Breeding for resistance to potato root eelworm, Heterodera rostochiensis Woll. Proceedings of the S-19 Workshop in Phytonematology, University of Tennessee, July 1-6, 1957,17 pp.

The work on the breeding of potatoes resistance to H. rostochiensis is reviewed. Resistance in Solanum tuberosum subsp. andigena is controlled by a single dominant gene,however, since the plant roots produce a hatching factor, resistance is only partial and plants are heavily invaded by larvae. Resistance-breaking biotypes are also discussed.

41. Jones, F. G. W. 1958. Resistance-breaking populations of the potato root eelworm. Pl. Path. London 7:24-25.

Populations collected from all over England showed various feeding reactions to resistant varieties of potatoes. All populations of Heterodera rostochiensis were unable to multiply on Solanum vernei.

42. Jones, F. G. W. 1959. Resistance-breaking biotypes of potato root eelworm. Int. Congress of Crop. Protection (4th), Hamburg, Sept. 1957. Proc. Vol. I, pp. 591-594.

A review of the literature on Heterodera rostochiensis resistance-breaking biotypes, with hypotheses for population changes.

43. Jones, F. G. W. 1966. The population dynamics and population genetics of the potato cyst-nematode Heterodera rostochiensis Woll. on susceptible and resistant potatoes. Rep. Rothamsted exp. Stn. for 1965, pp. 301-316.

Suggests that the ability of larvae to overcome resistance is controlled by matched independent pairs of alleles.

44. Jones, F. G. W. 1967. Frequency of new females (cysts) in single-cyst cultures of Heterodera rostochiensis; their relevance to the inheritance of ability to overcome resistance and to the frequency of mating. Nematologica 13:469-472.

Field population of single cyst of Heterodera rostochiensis in pot cultures of potato plants contained about 4% larvae able to mature on resistant ex andigena hybrids.

45. Jones, F. G. W. 1970. The control of the potato cyst-nematode, Heterodera rostochiensis. Royal Soc. Arts. J. 117(5164):179-199.

A comprehensive review of all control aspects of Heterodera rostochiensis.

46. Jones, F. G. W. 1970. Species and pathotypes of the potato cyst-nematode. Report of the Rothamsted Experimental Station, 1970. pp. 149-153.

47. Jones, F. G. W. 1972. Pathotypes in perspective. Ann. Appl. Biol. 71:296-300.

Taxonomic history of Heterodera is reviewed. The origin of round cysts nematodes in South America and the introduction of H. rostochiensis into Europe is discussed.

48. Jones, F. G. W. 1972. Control of nematode pests, background and outlook for biological control. In Jones, D. P.; Solomon, M. E. (Editors) The 13th Symposium of the British Ecological Society, Oxford, 4-7 January 1972. Oxford UK; Blackwell Scientific Publications (1974) 249-268.

Although there are many enemies of nematodes living in the soil, control by combinations of crop rotation, resistant potatoes and nematicides is more effective.

49. Jones, F. G. W. 1974. Host parasite relationships of potato cyst-nematodes; a speculation arising from the gene for gene hypothesis. Nematologica 20(4):437-443.

The ability to induce syncytial transfer cells in potato roots is common to all individuals of all populations of Heterodera rostochiensis and H. pallida. The ability, however, can only be exerted when there is compatibility between the host cell and the saliva of the individual nematode.

50. Jones, F. G. W. 1976. Report on the golden nematode of potatoes in Cyprus. Rome, Italy; Food and Agriculture Organization. 21 pp.

Globodera rostochiensis race $R_0$1 (=British and Dutch pathotype A) is widespread, but populations are light.

51. Jones, F. G. W. 1978. Population dynamics, population models and integrated control. In Plant Nematology, J. F. Southey, editor. MAFF, ADAS Publication GD/1, London, HMSO, pp. 333-361.

In mixed populations Globodera pallida becomes dominant only when plants resistant to G. rostochiensis are grown.

52. Jones, F. G. W., et al. 1970. Potato cyst nematode: one species or two? Nature, Lond. 227:83-84.

Examination of three populations of Heterodera rostochiensis pathotype A, two of pathotype B and three of pathotype E. suggested (on the basis of

1. multiplication on resistant varieties
2. measurements of male and female
3. color of female (cysts)
4. electrophoretic protein band patterns
5. inability to cross breed)

that Pathotype A is different from the other two. Thus pathotype A= Heterodera rostochiensis and pathotype B & E are another species.

53. Jones, F. G. W. and D. M. Parrott. 1965. The genetic relationships of pathotypes of Heterodera rostochiensis Woll. which reproduce on hybrid potatoes with genes for resistance. Ann. Appl. Biol. 56:27-36.

Authors propose a hypothesis that major genes for nematode resistance in potatoes are matched by recessive genes in the nematodes that are able to break resistance. Plants with one dominant gene for resistance increases the proportions of the pathotype that can reproduce upon them and also increase the pathotype which can reproduce on plants with both genes.

54. Jones, F. G. W. and D. M. Parrot. 1969. Population fluctuations of Heterodera rostochiensis Woll. when susceptible potato varieties are grown continuously. Ann. Appl. Biol. 63:175-181.

Small plot observations of 7 susceptible potato varieties grown continuously indicated yield declines were proportional to number of larvae in the soil the first year only. The number of larvae in the soil at harvest fluctuated at first but became more stable in successive years.

55. Jones, F. G. W., D. M. Parrott and G. J. S. Ross. 1967. The population genetics of the potato cyst nematode, Heterodera rostochiensis: mathematical models to simulate the effects of growing eelworm resistant potatoes bred from Solanum tuberosum spp. andigena. Ann. Appl. Biol. 60:151-171.

Authors present a computer program to show three mathematical relationships and four parameters.

56. Jones, F. G. W., D. M. Parrott and T. D. Williams. 1967. The yield of potatoes resistant to Heterodera rostochiensis on infested land. Nematologica 13:301-310.

Yields were reduced when roots of a resistant potato variety were invaded by larvae of Heterodera rostochiensis. Larvae of this pathotype are unable to multiply in roots of a variety bred from Solanum tuberosum andigena. Yields were inversely proportional to pre-cropping density. Populations increased very slowly when resistant varieties were planted for the first 4-5 years--then increased rapidly.

57. Jones, F. G. W. and K. Pawelska. 1963. The behavior of populations of potato-root eelworm (Heterodera rostochiensis Woll.) toward some resistant tuberous and other Solanum species. Ann. Appl. Biol. 51:277-294.

Forty-seven British populations of H. rostochiensis were tested on plants with resistance derived from Solanum tuberosum subsp. andigena, S. multidissecturn, S. vernei, S. santae-rosae, S. famatinae and S. xjuzepczuki and S. nigrum, S. sarachoides and Nicotiana spp. There was much variation in the nematode populations infectivity. No cysts developed on Nicotiana.

58. Jones, J. M. 1973. Trials on the chemical control of the potato cyst eelworm in the Yorks and Lancs region. British Insecticide and Fungicide Conference (7th). Proc. Vol. 2. Research Reports 425-429.

Dazomet at 200 an 300 lb/A and dichloropropene at 24 gl/A gave good yield increases on mineral soils, but not peat in controlling Heterodera rostochiensis and H. pallida.

59. Jones, M. G. K. and D. H. Northcote. 1972. Nematode-induced syncytium: a multinucleate transfer cell. J. Cell Sci. 10(3):789-809.

The larva (Heterodera rostochiensis) controls the differentiation of unspecialized cells to cells with a specific physiological function. The occurrence of wall protuberances suggests that transfer cells form as a response to solute flow.

60. Joubert, J. and A. Dalmasso. 1972. [Possible interaction between Rhizoctonia solani and Meloidogyne incognita on potato] Annales de Phytopathologie 4(4):409.

61. Joubert, J. and A. Dalmasso. 1974. [Progress achieved in the investigation on the rattle virus. Control Methods.] In Commun. Journ. Etud. Probl. Phytosanit. Actual. Cult. Pomme de terre. 5 Mars 1974, Paris, France pp. 26-31.

Treatment with D-D or metam-sodium, followed by 3 years of potato culture, nearly completely eliminated Trichodorus spp.

62. Joubert, J., A. Dalmasso and M. C. Munck-Cardin. 1971. [Study and control of a pathological complex on potato in the Sarthe region.] Comptes rendus (Hebdomadaires) des Seances de l'academie d'Agriculture de France 57:1433-1444.

DD at 400 liters/hectar gave good control of the rattle virus vector, *Trichodorus pachydermus*. *Rhizoctonia* infection was also reduced. Metham sodium was also effective. Dazomet at 400 kg/hectare was also effective.

1. Kaai, C. and H. den Ouden. 1966. [The effect of some systemic nematicides on the attack by Ditylenchus dipsaci in onioins and by Heterodera rostochiensis on potatoes.] Mededelingen van de Landbouwhogeschoal en do Opzoekingsstations van de Staak te Gent. 31:650-665.

We 417 (3, 5 dimethyl-4 dimethylaminomethylphenyl N-methylcarbamate) was the most effective of the nematicides tested. Multiplication of H. rostochiensis was 4 times the initial density, compared with 24 times in the control.

2. Kabiersch, W. 1975. [Potato nematodes--a serious danger] Deutschen Landwirtschafts Gesellschaft 90(9):518, 521-522.

Discussion of Heterodera spp. damage to potatoes, regulatory measures and control.

3. Kalandadze, L. P. 1959. [A study of the potato stem eelworm in the Georgian SSR] Trudi Gruzinskogo Ordena Trudovogo Krasnogo Zanameni Selskokzyaistvennogo Instituta 51-52:195-213.

An account of the distribution of the potato stem nematode. Also, results of resistant variety tests were negative.

4. Kalnozols, A. E. 1963. [Selection of basic material and hybrids of potatoes resistant to the potato nematode.] [All-Union Institute of Plant Breeding.] 3:124-130.

5. Kalnozols, A. E. 1965. [New potato varieties resistant to the potato root nematode.] Zashch. Rast. Vredit. Bolez. Sornyak., Vilnius., pp. 36-38.

Potato varieties Sagitta and Spekula and new hybrids K-3774, K-3776, K-3777 resistant to Heterodera rostochiensis.

6. Kalnozols, A. E. 1970. A resistance and yield trial of four potato varieties against Heterodera rostochiensis is reported. [Biological control of the potato root nematode in the Latian SSR.] Materially 7go Pribaltiiskogo Soveshchaniva po Zashchite Rastenii, Part 1. Ministerstvo Sel'skogo Khozyaistva. Latviiskoi SSR pp. 81-83.

The results of trials on the resistance of potato species. Hybrids and varieties to Heterodera rostochiensis infection in the Latvian SSR are presented. On uninfected soils the resistant varieties "Specula" and "Sagitta" were among the most productive while "Intenso" and "Amaril" were highly productive even in infected soils.

7. Kalnozols, A. E. 1972. [Resistance of various potato varieties to Heterodera.] In Kratki doklady po voprosam zashchity rastenii. (VIII Pribaltiiskaya konferentsiya po zashchite rastenii. Part II.). Kaunas, USSR, Litovskii Nauchno-Issledovatel'skii Institut Zemledeliya 86-87.

8. Kalnozols, A. E. 1973. (Biological control of the potato root nematode in the Latvian SSR). In Materialy 7go Pribaltiiskogo Soveshchaniya po Zashchite Rastenii, Part 1. Elgava, USSR; Ministerstvo Sel'skogo Khozyaistva Latviiskoi SSR. also in Potato Abstract 1976 (March) No. 268.

Results of resistance trials of potato cultivars to Globodera rostochiensis are presented. The resistant, 'Specula' and 'Sagitta,' were among the better yielding varieties.

9. Kalnozols, A. E. 1973. [Economic evaluation of potato varieties resistant to the potato nematode.] In Materialy Vses. simpoz. po bor'be s kartofel'n. nematodoi. Tartu, Estonian SSR 34-35.

A discussion of potato varieties resistant to Globodera rostochiensis.

10. Kalnozols, A. E. 1976. [Study of interspecific nematode-resistant potatoes in the Latvian SSR] Zashchita S.-kh. kul'tur ot vreditelei, bolenei i sornyakov. V. Eglitis and others, editors. p. 91-99.

Resistance to Heterodera rostochiensis biotype A was tested in 396 varieties, wild species and interspecific hybrids of potato.

11. Kameraz, A. Y. 1975. [Problems of potato breeding in the nonchernozem region.] (Plant Breeding Abstracts 45, 10101.) Kartofel' i Ovoshchi, No. 1 pp. 6-8.

A discussion of problems involved with potato breeding to pests including Heterodera rostochiensis is given. A list of resistant varieties and species is given.

12. Kameraz, A. Y. 1975. [Present state and future prospects of breeding potato for resistance to the main diseases and pests.] In Immunitet S.-kh.rast. k. boleznyam i Ureditelyam. Moscow, USSR, Kolos. pp. 76-85. From Plant Breeding Abstracts 48, 1362.

Discussion of the production of potato varieties resistant to Ditylenchus dipsaci and Heterodera rostochiensis.

13. Kameraz, A. Y. 1976. [Ways of obtaining nematode resistant varieties of potato.] VIII Vsesoyuznoe soveshchani no nematodym boleznyam sel'skokhozyaistvennykh kul'tur. Tezisy dokladov soobshchenii. Kishinev. USSR; Izadatel'stvo "Shtiintsa."

Resistance to Heterodera rostochiensis and H. pallida through hybridizationof wild Solanum spp. in Belorussian SSR is discussed.

14. Kameraz, A. Y. 1977. [The main problems in potato breeding and ways of solving them.] Trudy po Prikladnoi Botanike, Genetike i Selektsii 59(3):157-163.

Useful forms of potato for breeding resistance to Heterodera rostochiensis and Ditylenchus dipsaci are listed.

15. Kameraz, A. Y. and V. V. Olefir. 1974. [Resistance to the stem nematode (Ditylenchus destructor Thorne) in different species and interspecific hybrids or potato.] Trudy po Prikladnoi Botanike, Genetike i Selektsii 53(1):216-231.

Resistance to Ditylenchus destructor in tests of 206 wild Solanum spp. indicated tht most of 50 selfed seedlings of S. andigenum were resistant. S. cartarthrum, S. bakasolvii; S. verni, S. infundibuliforme, S. ocaule, S. chacoense, S. commersonii, S. semidemissum and S. jamesii were also resistant.

16. Kameraz, A. Y. and I. Y. Ponin. 1974. [Initial material and proposals for using it in breeding potatoes for resistance to the potato nematode (Heterodera rostochiensis Woll.] Trudy po Prikladhoi Botanike, Genetike i Selektsii 53(1):199-215. (Plant Breeding Abstracts 46, 2578.).

Extensive tests of wild Solanum spp. cultivated varieties and their hybrids were screened for resistance to Heterodera rostochiensis. A clone of S. chacoense, F. subtilis combined resistance to H. rostochiensis, Ditylenchus destructor and Synchytrium endobioticum.

17. Kameraz, A. Y. and I. Y. Ponin. 1974. [The selection of initial material for breeding potatoes with combined resistance to the cyst and stem nematodes and wart.] Kartofelevodstvo, 2. Minsk, White Russian SSR; Uradzhai. pp. 35-36. (Plant Breeding Abstracts 47:1363.).

A series of Solanum crosses were found resistant to Heterodera rostochiensis and Ditylenchus dipsaci.

18. Kameraz, A. Y., I. M. Yashima and N. P. Sklyarova. 1974. [Genetics of the resistance of potato to the commonest diseases.] Genet, i selektsiya bolezneustoichivykh sortov kul't rast. Moscow, USSR Nauka, pp. 247-268. (Plant Breeding Abstracts 46:9182.).

The authors review breeding of Heterodera spp. for resistance to Heterodera rostochiensis, Phytophthora and virus diseases. A discussion of genetic basis for resistance is included.

19. Kampfe, L. 1962. Vergleichende Untersuchungen zur Autokologie von Heterodera rostochiensis Wollenweber und Heterodera schachtii Schmidt. Parasitologische Schriftenreibe 14:142-170.

20. Kampfe, L. 1962. Vergleichende untersuchungen zur Autokologie von Heterodera rostochiensis Wollenweber und Heterodera schachtii Schmidt sowie einiger anderer Nematodenarten ab weichender Lebensstatten. Parasit. Schr Reibe 14:205.

21. Kapitonenko, S. V. 1965. [Infestation of potato by stem nematode (Ditylenchus destructor) in Cis-Carpathia] Visnik Silskogosiod. Nauki 6:51-53.

22. Kapitonenko, S. V. 1965. [Control measures against Ditylenchus destructor] In [nematode diseases of crops], Sveshnikova, N. M. Editor. Moscow: Izdatelstov "Kolos' pp. 131-137.

Crop losses in western Ukraine, USSR were estimated to be about 157,180 tons per year. Ditylenchus destructor decreases the amount of starch, total nitrogen and protein nitrogen present. There is also an increase in amounts of monosaccharides. Starch granules less than 10 μ in diameter increased 4-10 times in number of infected tubers.

23. Kasimova, G. A. and R. A. Aliev. 1971. [Nematode fauna of potato in Sheki-Zakotal'sk zone of Azenbaidzhan.] Isvestiya Akademii Nank Azerbaidzhanskoi SSR No. 4. pp. 100-103.

The nema fauna of potato fall into 4 ecological groups. Fifty-two species were found associated with potato; 28 in roots, 25 in aerial parts, 9 in tubers and 27 in the rhizosphere.

24. Kavanagh, T. 1974. The influence of herbicides on plant disease. II. Vegetables, root crops, and potatoes. Science Proceedings. Royal Dublin Society, Series B. 3:251-265.

Herbicides reduce incidence of virus disease by reducing weed reservoirs.

25. Kegasawa, K., H. Inageki and M. Tsutsumi. 1973. [Investigations on the potato cyst nematode. Distribution of cysts in soil and injury to plants.]. In 17th Annual Meeting of the Japanese Society of Applied Entomology and Zoology, Nagano, Japan. 134 p.

Distribution of cysts in a potato field is uneven. A high correlation coefficient of r = -0.774 or r = -0.642 was obtained between potato yield and cyst population in rhizosphere at harvest.

26. Keyvadubskaia, L. R. 1971. Nucleic acid metabolism in potato infection by Ditylenchus nematodes. Minsk Belaruskaya Akad Navuk Vestsi Ser Biyalahichnykh Navuk 3:65-68.

27. Khaberman, E. 1972. [Study of the activity and the isoenzyne content of oxidizing enzymes in potatoes infected with Heterodera rostochiensis.] Esti NSV Teaduste Akadeemia Toimetised (Investiya Akademii Nauk Estonskoi SSR), Bioloogia 21(4):348-356.

During infection by Heterodera rostochiensis (Pathotype A) a study was made of polyphenoloxidase and peroxidase activities in resistant and susceptible potato varieties. Activity of both enzymes increased 2-3 times in infected roots of both varieties.

28. Khaberman, E. 1973. Changes of the phenol complexes of potatoes while infected with the potato nematode, Heterodera rostochiensis. Toim, Biol Eesti NSV Tead Akad 22(3):244-254.

Resistant variety Spekula and susceptible Sulev were infected with H. rostochiensis. Spekula showed a greater increase in synthesis of phenols and of phenols not found in healthy roots.

29. Khan, A. M. 1973. Use of soil amendments in an ecological approach to nematode control. 2nd International Congress of Plant Pathology, Minneapolis, Minnesota. No. 1025.

Application of organic amendments in form of oil-cakes increased the population of saprozoic nematodes and saprobic fungi and suppressed the population plant parasitic nematodes and root-infecting fungi.

30. Khan, E. and D. B. Singh. 1975. Five new species of Pratylenchus (nematoda: Pratylenchidae) from India. Indian Journal of Nematology (1974, publ. 1975) 4(2):199-211.

Describes P. teres from potato roots at Ludhiana.

31. Khanna, M. L. 1966. Multiple resistance to heat, drought, frost, charcoal rot and nematode in commercial potato. Curr. Sci. 35:494-496.

After testing 693 potato selections, HC 294 and HC 115 were selected for multiple resistance including Meloidogyne resistance.

32. Khanna, M. L. and K. K. Nirula. 1964. Breeding potatoes for resistance to root-knot nematode. Current Science, Bangalore, 33(10)314.

Only one of 101 lines of Solanum tuberosum cultivars tested was resistant to Meloidogyne incognita. HC 294 (also referred to as HC 194) obtained by crossing Kufri Red x ('Gladstone' x 'Taborky') confirmed in pot tests that only a few larvae penetrated the roots but none developed into mature females.

33. Kheiri, A. 1971. Two new species of Nothotylenchus Thorne, 1941 from Iran and a redescription of N. affinis Thorne, 1941 (Nematoda, Neotylenchidae) with a key to the species of the genus. Nematologica 16:591-600.

This taxonomic report indicates Nothotylenchus geraerti n. sp. and N. tuberosus n. sp. were found around potato roots in Iran.

34. Khiznyak, P. A. and V. P. Efremenko. 1956. [On nematode resistance of certain potato varieties.] Kartofel. 4:60-61.

35. Kiel, W. 1968. Fruchlfolgeversuche zur Populationsdynamik des Kartoffelnematoden (Heterodera rostochiensis Woll.) Nachr Bl. dt. PflSchutzdienst, Berl. 22:32-37.

A study of the population dynamics of this pest in several cropping systems indicates a 3 year rotation between potato or tomato is needed for effective control. The nematode population declines rapidly in a dry summer.

36. Kiel, W. 1969. Populationsdynamik des Kartoffelnematoden (Heterodera rostochiensis Woll.) bei nehrmaligem Anbau nematodenresistenter Kartoffeln zur Feststelung der Biotypenentwicklung. Nachr Bl. dt. Pfl Schutzdienst, Berl. 23:189-192.

A six year study of population dynamics of this nematode in resistant potato monoculture indicated a 94% reduction. An aggressive biotype B increased 3 or 4 fold every year after the 4th crop.

37. Kikas, L. 1969. [Potato stem nematode is a harmful pest.] Sotsialistlik Pollumajandus 24:637-639.

Potato tuber infection by Ditylenchus destructor ranged from 2-9% on Estonian farms. However, 80-90% of tubers from some farms became infected during storage.

38. Kimpinski, J. 1979. Root lesion nematodes in potatoes. American Potato Journal 56:79-86.

The dominant root lesion nematodes in potato roots or soil in Prince Edward Island, Canada were Pratylenchus penetrans and P. crenatuis. No nematodes were recovered from the tubers in from fields. Telone II, Telone C-17 and Temik reduced the number of nematodes in field plots.

39. Kimpinski, J. and R. Longmoore. 1977. Root-lesion nematodes in potatoes. Can. Agr. 22(1):20.

Pratylenchus crenatus (primarily on var. Sebago) and P. penetrans (most commonly on var. Kennebec and Superior) are reported in Prince Edward Island. Includes discussion of factors controlling levels of nematode populations.

40. Kinshakova, E. I. and V. G. Rogozhnikov. 1972. [A study of potato cyst eelworm.] Zashchita Rastenii 4:47.

A study of the vertical distribution of this pest in the soil indicated; highest populations at 0-10 cm depth and 10-20 cm. Few cysts were found at 40-50 cm and none at 50-60 cm. Infected potatoes had decreased air-dry matter ratios, starch, protein and vitamin C content.

41. Kirjanova, E. 1935. Nematode diseases of potato. Plant Protection 6:88-98.

Author discusses diseases of potato caused by: Heterodera marioni, H. rostochiensis, Tylenchus dipsaci, Neotylenchus abullosus and Tylenchus pratensis. H. rostochiensis is not believed to occur in Russian territory.

42. Kirjanova, E.S. et al. 1954. Recommendations on the control of the stem nematode of potato Ditylenchus destructor Thorne 1945. Tr. probl. i tematich soveshch. Zool inst AN SSR 3:253-255.

43. Kirjanova, E. S. 1959. [On the systematics of the nematodes belonging to the genus Heterodera Schmidt, 1871.] Zool. Zh. 38:1620-1626.

44. Kirjanova, E. S. and E. L. Krall. 1977. Parasitic nematodes of plants and their control measures. 1969. Translated from Russian for the U.S. Department of Agriculture by the Indian National Scientific Documentation Centre, New Delhi. 913 pp.

Presents an extensive bibliography of Soviet investigations published up to 1966, as well as important works from elsewhere. The review covers morphology, biology, ecology, distribution, economic significance, interactions with other plant pests, systematics and control measures.

45. Kiselev, E. P., A. K. Novoselov and L. A. Chirkova. 1976. [Results of a study of initial material for breeding potato varieties in the Far East.] Sib. vestn. s.-kh. nauki 1:37-43,122.

Main problems of breeding work are reviewed.

46. Kishore, H., K. K. Nirula, P. P. V. Menon and A. K. Sharma. 1969. Breeding potato varieties for resistance to golden nematode. All India Nematology Symposium, New Delhi,August 21-22, 1969. pp. 58-59.

47. Kishore, H., M. D. Upadhya and P.C. Gaur. 1977. Breeding and genetics of resistance to viral and mycoplasmal diseases and pests. In recent technology in potato improvement and production, B.B. Nagaich, editor. Central Potato Research Institute, Simla, India, pp. 18-22.

Resistance to Meloidogyne incognita is thought to be controlled by one or two genes (in Solanum tuberosum hybrid HC 294, S vereneii and S. spegazzinu.) S. multidissectum and S. verneii are being used against Heterodera rostochiensis.

48. Kjos, J. 1973. [An outline of the potato cyst nematode situation in Norway to January 1, 1973.] Aktuelt Landbruksdep Opplysningstjeneste. Norw. 2:81-84.

49. Kjos, J. 1973. [The potato cyst nematode in Norway] Gartneryrket 63(11):214-216.

50. Kleyburg, P. and M. Oostenbrink. 1959. Nematodes in relation to plant growth. The nematode distribution pattern of typical farms and nurseries. Neth. J. Agric. Sci. 7:327-343.

Four species mentioned in potato culture are Heterodera rostochiensis, Meloidogyne hapla, Pratylenchus penetrans and Pratylenchus thornei. Of these P. pratensis is noted to cause poor growth of potatoes in light sandy and peaty soils.

51. Kleynhans, K. 1975. The potato cyst eelworm in South Africa. Nematological Soceity of South Africa Newsletter No. 7:1042.

Pathotypes, egg viability and crop rotation are discussed.

52. Klimakova, E. T. 1976. [The possibility of chemically treating seed potatoes against adhering cysts of the potato root eelworm.] In VIII Vsesoyuznol soveschanie no nematodnym boleznyam selskokhozyaistvennykh kul'tur. Tezisy dokladov i soobschchenit. Kishinev, USSR; Izdate'stvo "Shtiintsa" pp. 51-52.

Germination was decreased with spring treatment (formalin or formalin and calcium hypochlorate) but autumn treatment was fully effective with high germination rate.

53. Klindic, O. 1973. Investigations of potato root-eelworm Heterodera rostochiensis Woll. from the point of view of the biological properties of the populations. Final research report. Institut za poljoprivredna istrazivanja, Sarajevo. 35 pp.

54. Klyukvina, Y. V. and Y. P. Laptev. 1970. [Theoretical bases of breeding potatoes for resistance to late blight.] Sel'.-khoz. Biol., 5:365-372.

Breeding potatoes for resistance to nematodes is included.

55. Knott, D. R. and J. Dvorak. 1976. Alien germ plasm as a source of resistance to disease. Annual Review of Phytopathology 14:211-235.

Problems in alien transfers and methods used are reviewed. Transfer of resistance to Heterodera spp. from wild Solanum species to S. tuberosum is discussed.

56. Koen, H. 1969. Thermotheropeutic control of Pratylenchus brachyurus in potato tubers. Phytophylactica 1:67-69.

The nematode P. brachyurus was eliminated from potato treated at 50°C for 45-60 min without affecting tuber viability. All stages of the nematode were killed. Mortality of 25% of immature and damaged tubers was reported.

57. Koen, H. and W. L. Hogewind. 1967. Symptoms and characteristics of Pratylenchus brachyurus infestation on stored potatoes. S. Afr. J.Agric. Sci. 10:543-549.

Pratylenchus brachyurus infected potatoes develop purple-brown lesions to a depth of 0.5 mm in the peel of tubers. Shape of lesion is circular 1-5 mm in diameter with depressed margins. Lesions appear on tubers 4-5 months after planting. Lesions may only develop after storage. Tubers that are lifted early and stored at 5°C do not develop lesions.

58. Koepsell, P.A., T. C. Allen and H. J. Jensen. 1974. Tobacco rattle virus in Oregon potatoes. Ext. Circ. Coop. Ext. Serv. Oreg. State Univ. 844:6.

Describes symptoms, spread and control of TRV in potatoes.

59. Kohler, H. and W. Kampe. 1969. [Effects and side effects of carbamoyloxim through the control of Heterodera rostochiensis.] Anz Schadlingsk Pflanzenschutz 42(8):113-118.

Anzieger fur Schadlingskunde PFlanzenschutz

60. Kojima, M. 1973. [Occurrence and control of Heterodera rostochiensis in Japan.] Shokubutsu Boeki 27(2):27-30.

61. Koliopanos, C. N. 1976. The golden nematode (Heterodera rostochiensis Woll.) one of the most dangerous pests of potatoes, in Greece; History distribution, economic importance, research and phytosanitary regulations. Bull OEPP (Organ Eur Mediterr Prot Plant) 6(5):385-390.

62. Kolterman, A. 1953. Lehren aus dem seinerzeitigen Ouftreten des Karloffelnematoden in Pommern. Pflanzenschutz. Munich 5:9-11.

Author reviews potato-root eelworm situation in Pomerania, and suggests potatoes not be planted more often than 3 years.

63. Komai, K. and S. Sato. 1976. [Difference in browning of potato tubers in some growing districts by nematicide (DBCP) treatment. Studies on the browning phenomenon of potato tubers by nematicides. Part II).] J. of Agr. Chem. Soc. Japan 46:607-612.

After intensive studies it was indicated that browning results from cellular damage by DBCP and that this effect is related to polyphenol oxidase levels.

64. Komarova, E. B. and M. K. Niklass. 1975. [Potato nematode in Latvia] Zashch Rast 12:45-46.

65. Komkova, M. N. 1977. [New varieties] Kartofel'i Ovoshchi 12:12.

Variety meta (Target) from Sagitta x Countess, is resistant to Globodera rostochiensis.

66. Kondakova, E. I. 1973. [A study of possible use of parasitic fungi in the control of Heterodera rostochiensis.] Biull Vses Ordena Tr Krasnogo Znameni Inst Gel'mintol 11:47-51.

Potato infection was reduced by soil inoculations from washings from agar cultures of Catenaria anguillulae and Cylindrocarpon radicicola by 41.4 and 24% respectively. Monotospora deleae reduced the number of cysts by 94.3% and C. radicicola by 26.1%. A mixture of fungi was usually more effective than single infection.

67. Kondakova, E. I. 1973. [Infection of Heterodera rostochiensis cysts with parasitic fungi in laboratory conditions] Biull Vses Ordena Tr Krasnogo Znameni Inst Gel'mintol 11:52-55.

Penetration and infection of cysts in vitro by several fungi was studied. Most effective were Fusarium oxysporum var. solami, F.

oxysporum var. longius, Monotospora deleae and Cylindrocarpon radicicola, 65.1 to 83.9 of cysts and 47.2 and 58.3% of encysted eggs were infected.

68. Kondakova, E. I. 1976. [Fungi developing in the cysts of nematodes of the genus Heterodera Schmidt] Miklogiya i Fitopatologiya 10(3):172-176.

A general summary of biological control of cyst nematodes by fungi.

69. Kondakova, E. I. and V. I. Belokurskaia. 1973. [Rates of infection of Heterodera rostochiensis with fungi.] Biull Vses Ordena Tr Krasnogo Znameni Inst Gel'mintol 11:43-46.

70. Korab, I. I. and E. F. Tereshchenko. 1954. [Systems of measures for controlling the potato stem nematode Ditylenchus destructor Thorne, 1945, in the grass-field crop rotations of the forest-steppe and wooded zones.] Trudi. Prab i Tematich. Sovesh. Akad. Nauk. SSSR 3:208-218.

Authors recommended control of Ditylenchus destructor by planting potatoes only every 3rd or 4th year, rotation with suitable grass crops, control of weeds, removal of potato haulms and other potato harvest remains and use of uninfected seed potatoes.

71. Kort, J. 1962. Effect of population density on cyst production in Heterodera rostochiensis Woll. Nematologica 7:305-308.

Heterodera rostochiensis in pot tests at low infestation levels on potatoes increased with initial density up to a maximum, after which the rate fell. This suggests that a negative density dependent factor came into play at higher levels.

72. Kort, J. 1962. De vermeerdering van biotypen van het aardappelcystenaaltje, Heterodera rostochiensis Woll., op verschillende Solanum species. Meded. Landbhoogesch, Opzoekstns Gent 27:754-759.

A number of Solanum spp. were tested for resistance to biotypes A, B and C of Heterodera rostochiensis. Various cultivars formed population increases of one biotype over the others.

73. Kort, J. 1962. The estimation of the proportion of resistance breaking biotypes in a potato cyst eelworm (Heterodera rostochiensis) population. Versl. en meded. Plaziekt. Dienst 138:190-193.

A discussion of races and biotypes of H. rostochiensis within various resistance breaking populations.

74. Kort, J. 1966. The occurrence of mixtures of pathotypes in Heterodera rostochiensis Woll. Meded Landbhoogesch Opzoekstns. Gent 31:601-608.

It may be easier to determine in a mixture of Heterodera rostochiensis pathotypes which ones are absent rather than those

present. Author suspects a mixture of pathotype larvae within a single cysts as eggs are heterogenous. Potato varieties that show identical characteristics as host plants for certain pathotypes behave differently for these mixtures.

75. Kort, J. 1969. Der Einfluss resistenter Kartaffeln auf Mischpopulationen von Heterodera rostochiensis Woll. 1923. Mitt biol. BundAnst. Ld-u Forstw 136:32-38.

In regard to resistance of potatoes of this nematode a single cyst indicated resistance was only partially inherited.

76. Kort, J. 1969. Resistenzprufung von Solanum verenei-Neuzuchtungen. Mitt. Biol. Bund. Anst. Ld-u. Forstw. 136:39-40.

77. Kort, J. 1970. [20 years of the TNO working party for the investigation of the control of potato root eelworm (WOBA).] Landbouwkundig Tijdschrift 82(12):435-442.

The Solanum species used as sources of resistance to pathotypes which can break down the D resistance of S. vernei CPC3000 are listed. Resistant seedlings from S. vernei have a less effective cleaning action than those from S. andigenum.

78. Kort, J. 1974. Identification of pathotypes of the potato cyst nematode. EPPO Bulletin. 4(4):511-518.

Heterodera rostochiensis British pathotype B and Dutch pathotypes C, D and F do not have corresponding representatives in other countries. British pathotype A and Dutch pathogen A are not identical. Dutch A and German Obersteinbach populations are similar as are Dutch D and German Harmesz populations. The British E, Dutch E, German Frenswegen and Swiss Chavornay populations are not distinguishable using present methods.

79. Kort, J. and C. P. Jaspers. 1973. Shift of pathotypes of Heterodera rostochiensis under susceptible potato cultivars. Nematologica 19:538-545.

A mixture of Dutch pathotypes A & D was cultured on three Solanum tuberosum cultivars for 3 successive years. A shift in pathotype ratio was observed in single cysts by culture on ex-andigera potatoes. Larval measurements from progenies of one cyst proved that hybridization occurred within the same cyst.

80. Kort, J., C. P. Jaspers and D L. Dijkstra. 1972. Testing for resistance to pathotype C of Heterodera rostochiensis and the practical application of Solanum vernei-hybrids in the Netherlands. Proc. Assoc. Appl.Biol., London 71:289-294.

Analysis of egg counts was indicated to be a more reliable measure of nematode increase than cyst count.

81. Kort, J., H. Ross, H. J. Rumpenhorst and A. R. Stone. 1977. An international scheme for identifying and classifying pathotypes of potato cyst-nematodes Globodera rostochiensis and G. pallida. Nematologica 23:333-339.

Proposes that pathotypes of G. (= Heterodera) rostochiensis and G. pallida be designated by Rol to Ron and Pal to Pan respectively. Necessity of adequate replication of tests and standardization of method are discussed.

82. Kostina, L. and Z. Zholudeva. 1971. [Varieties of potatoes resistant to nematodes] Kartofel Uvoshchi 10:36-37.

83. Kostina, L. and Z. Zholudeva. 1974. [Varieties resistant to potato nematode.] Kartofel' i Ovoshchi 8:39-42.

Results are given of new nematode resistant potato varieties tested against Heterodera rostochiensis in the USSR.

84. Kostina, K. and Z. Zholudeva. 1974. [Promising potato varieties.] Kartofel' i Ovoshchi 13:20-21.

Only Ali, Anett, Apla, Vanda, Poet, Fekula and Khorza were resistant to the nematode Ditylenchus destructor over 100 varieties or selections from Germany wre tested. Brief descriptions are given.

85. Kostina, L. and Z. Zholudeva. 1974. [Potato varieties resistant to Heterodera rostochiensis Woll.] Trudy po Prikladnoi Botanike, Genetike i Selektsii. 53(2):176-184. (Plant Breeding Abstracts 45, 7484.).

The authors present useful agronomically characters (starch,protein and ascorbic acid) of potato varieties resistant to Heterodera rostochiensis.

86. Kostiw, M. 1976. [Vectors of viruses and mycoplasma-like bodies in potatoes.] Biuletyn Instytutu ziemniaka 17:109-124.

87. Kostyuk, I. I. and V. M. Polozhenets. 1976. [Resistance of potato to Colorado beetle and stem nematode.] Kartofel' i Ovoshchi 9:39.

20 potato cultivars reported with resistance to Ditylenchus dipsaci.

88. Kotthoff, P. 1950. Kartoffelschaden durch Ditylenchus. Anzeiger fur Schadlingskunde 23:107-108.

Author describes symptoms of Ditylenchus dipsaci on shoots and tubers of potato. Leaf petioles and main veins show stunting and thickening; tubers develop conical pits and skin splits. Ditylenchus dipsaci is confined to tuber surface and does not effect petioles and leaves.

89. Kozlowska, J. and K. Domurat. 1977. The effect of nitrogen fertilizers on the soil nematodes fauna in potato field. Polish Ecological Studies 3:7-13.

The effect of N fertilizer on nema fauna in a potato field was not in evidence at the first sampling. At the second sampling (pre-harvest) the fertilized plots contained the most nematodes. At the third sample period there were twice as many plant parasites in the fertilized plots.

90. Krall, E. L., U. R. Riispere and A. Y. Riispere. 1973. [Effect of growing resistant and susceptible potatoes on the density of potato cyst nematode in soil cultures.] In Materialy vsesoyuznogo simpoziuma po bor'be s partofel'noi nematodi, Tartu 3-5 iyulya 1973. Tartu., Institut Zoalogii i Botaniki Akademii Nauk Estonskai SSR 54-57.

Two consecutive years of growing Spekula (a resistant variety) in a glasshouse experiment indicated that larvae failed to appear in 8 of 15 populations. Only 0.4-1.7% of the initial cysts still contained some viable larvae.

91. Kratzig, P. 1973. [Growing nematode-resistant varieties] Anbau nematodenfester Sorten. Kartoffelbau 24(5):127-128. (Plant Breeding Abstracts 43, 7038.)

Potato varieties resistant to Heterodera rostochiensis pathotype A are reported.

92. Kratzig, P. 1974. [Eighteen new potato varieties.] Kartoffelbau 25:140

Varieties Marion, Culpa, Elvira, Gitte, Vevi,Aula and Filli are resistant to biotype A of Heterodera rostochiensis and Cordia is resistant to both biotypes A and B.

93. Kratzig, P. 1975. [Now there are 131 permitted potato varieties.] Kartoffelbau 26(3):72.

Heterodera rostochiensis race A resistant Granola, Miranda, Renema and Alexa are added to West German's official list.

94. Kratzig, P. 1975. [Development and performance of high-starch varieties.] Kartoffelbau 26(3):100.

Includes resistance to Heterodera rostochiensis race A.

95. Kratzig, P. 1975. [The cultivation of nematode-resistant potato varieties.] Kartoffelbau 26(8):228. Plant Breeding Abstracts 46, 7255.

Tabulation of 30 nematode resistant varieties from Federal German list. All are resistant to Heterodera rostochiensis race A, with two of the varieties also resistant to the Harmery race.

96. Kratzig, P. 1976. [Five new potato varieties] Kartoffelbau 27(1):33. (Plant Breeding Abstracts 47, 467).

Juliver and Crista are resistant to race A of Heterodera.

97. Kratzig, P. 1976. [Now 126 potato varieties.] Kartoffelbau 27(3):94. (Plant Breeding Abstracts 47, 470).

Herold, Pirola and Dextra have resistance to race A of Heterodera.

98. Kratzig, P. 1976. [Cultivation of nematode-resistant potato varieties] Kartoffelbau 27(6):205.

The German Federal Republic list of potatoes includes 31 types with resistance to race A of Heterodera rostochiensis, two of the types were also resistant to the Harmerz race.

99. Kratzig, P. 1977. [Nine new potato varieties] Kartoffelbau 28(2):53

Describes four new varieties added to German Federal Republic list which are resistant to Heterodera rostochiensis race A.

100. Kratzig, P. 1977. [Now 133 potato varieties] Kartoffelbau 28(4):120-121.

Describes two new varieties resistant to Heterodera rostochiensis. Forty of the 133 listed varieties are nematode resistant.

101. Kratzig, P. 1977. [The cultivation of nematode-resistant potato varieties] Kartoffelbau 28(5):138-139.

On the list of potato cultivars of the German Federal Republic there are 40 varieties resistant to Heterodera rostochiensis race A. Three of them (Franzi, Cordia and Miranda) are also resistant to the Harmery population.

102. Krikun, J. and D. Orion. 1977. Studies of the interaction of Verticillium dahliae and Pratylenchus thornei on potato. Phytoparasitica 5(1):67.

The nematode alone did not appreciably lower potato yield, but in combination with the fungus, even Verticilliumtolerant varieties suffered losses of 30-40%.

103. Krilov, P. 1959. [The biology of Ditylenchus destructor Thorne, 1945] Helminthologia, Bratislava.

Methods of infection were studied by placing infested and non-infected tubers in a container. Conclusions were that some potatoes were infected through stolons and others through soil.

104. Krivodubskaya, L. R. 1976. [Morphological changes in the tissue of potato plants during Ditylenchus destructor infection.] In VIII Vsesoyuznoe soveshchanie no nematodnym boleznyam sel'skokhozyaistvennykh Kul'tur. Tezisy dokladovi Soobshcheniv. Kishinev, USSR. Izdatel'stvo'Shtiintsa. pp. 78-79.

105. Kryvadubskaia, L. R. 1971. [Total protein content in healthy nodules of potatoes and in those infected by the nematode Ditylenchus destructor Minsk Belaruskaya Akad Navuk Vestsi Ser Biyalahichnykh Navuk 4:64-66.

106. Kryvadubskaia, L. R. 1971. [State of carbohydrate metabolism in potato tubers infested by Ditylenchus destructor.] Minsk Belaruskaya Akad Navuk Vestsi Ser Biyalahichnykh Navuk 6:43-46.

107. Ksiazek, J. 1971. [The potato root eelworm (Heterodera rostochiensis Woll.) in Europe and countries of the Mediterranean Basin] Zeszyty Probl Postepow Nauk Roln 121:41-50.

108. Kuhn, H. 1958. Uber die Abwehrnekrose eines Kartoffelbastardes gegen den Kartoffelnemtoden, Heterodera rostochiensis Wr. m Solanum tuberosum subsp. andigena. Zeitschrift fur Pflanzenkrankheiten (Pflanzenpathologie) und Pflanzenshutz 65(8):465-472.

In resistant potatoes, necrosis of the plant cells deprives the nematode of nutrition.

109. Kuhn, J. 1881. Die Ergebnisse der Versuche zur Ermittelung der Ursache der Rubenmudigkeit and zur Erforschung der Naber der Nematoden. Ber. Physiol. Lab. Univ. Halle, 3-1-153.

Concerns Heterodera schachtii [rostochiensis] on potato.

110. Kuhn, J. 1884. Die Wurmfaulte, eine neul Erkrankkungsform der Kartoffel. Zeitschr. f. spiritus industrie. Jahrgang XI.

First recognition of a tuber rot incited by a nematode.

111. Kuhn, R. 1972. The hatching of larvae from cysts of the potato-root eelworm Heterodera rostochiensis and Heterodera sp. parasitizing Solanum tuberosum L. Inst. fur Pflanzenzuchtung Gross Lusewitz. Akad. dere Landwirtschaftswissenschaften, German Democratic Republic. 112-122.

Hatching occurred at different minimum temperatures for the two species and, at 20.5°C, H. rostochiensis hatched at a faster rate than did the unidentified species.

112. Kuhn, R. 1975. [The influence of storage of cysts on viability of cyst contents of Globodera pallida Stone 1973 (Race E)]. Biologische Gesellshaft der DDR, Sektion Phytopathologie und Wilhelm Pieck Universitat, Rostock, DDR 60-61.

Cysts of G. pallida can be stored in an air-dried state for several years.

113. Kumaraswami, T. 1966. Preliminary studies on the wind-borne dispersal of the cysts of the golden nematode of potato (Heterodera rostochiensis Woll.) in Nelgiris. Madras Agric. J. 53:41-42.

Only a few wind-blown cysts were found but all were full of eggs and larvae.

114. Kurt, L. 1976. Determination of the viability of the potato nematode Heterodera rostochiensis Woll. with the aid of luminescent microscopy and certain observations of its biology. In Parazitologicheski issledovaniia v Pribaltike; K. P. Lesin'sh, ed. 10-12.

115. Kyrou, N. C. 1969. Tylenchorhynchus dubius (Butschli, 1873) Filipjev, 1936; an injurious ectoparasite of potatoes. Eur. Potato J. 12:215-218.

A pot test of logarithmic series of inocula indicated after 10 weeks that the nematode multiplied and potatoes decreased in density according to the population. This evidence supported the conclusion that nematodes were parasites of potatoes.

116. Kyrou, N. C. 1971. [Heterodera rostochiensis Woll. on potato plants. Observations on nematode control.] Geoponika 199:79-81.

This nematode is an important pest of potatoes in Greece. Yield losses of 30% occur in sandy loam soil when egg count is 30/gram.

117. Kyrou, N. C. 1971. [Chemical control of Heterodera rostochiensis (golden nematode) in potatoes cultivated in the field.] Geoponika 199:82-83.

DD, EDB and Nemagon were used to control the pest in sandy loam soil. DD gave the best yields, Nemagon was phytotoxic.

1. Laan, P. A. van der. 1953. Een schimmel als parasiet van de cyste-inhoud van het aardappel cystenaaltje (Heterodera rostochiensis Wollenw.). Tijdschrift over Plantenziekten 59:101-103.

2. Laan, P. A. van der. 1954. Nader onderzoek over het aalljesvangende amoeboide organisme, Theratromyxa weberi Zwillenberg. Tijdschrift over Plantenziekten 60:139-145.

Observations on in-vitro culture, behavior, host range and economic importance of an amoeboid predator of Heterodera rostochiensis.

3. Laan, P. A. van der. 1956. Onderzoekingen over schimmels, die parasiteren op de cyste-inhoud van het aardappelcysten aaltje (H. rostochienssi Wollenw.). T. Pl.Ziekten 62:305-321.

A high proportion of the eggs in the cysts were diseased by Phialophora heteroderae (Jacq.) van Beyma)

4. Laan, P. A. van der. 1956. The influence of organic manuring on the development of the potato root eelworm, Heterodera rostochiensis. Nematologica 1:112-125.

The author suggests that physiological changes in the plant after treatment with organic materials result in slight resistance to the nematode.

5. Laan, P. A. van der and C. A. Huysman. 1957. [A record of the existance of physiologic races of the potato root eelworm, which multiply vigorously in resistant progeny of Solanum tuberosum subsp. andigena.] Tijdschr. Pl. Ziekten 63:365-368.

Peruvian populations of Heterodera are able to successfully attack potatoes previously thought to be resistant.

6. Ladigina, N. M. 1956. [The influence of temperature and humidity on stem nematodes of the potato and onion and on the beet eelworm.] Trud. 2. Nauch. Konf. Parazital. Ukrainskoi SSR, pp. 298-299.

7. Lamberti, F., C. E. Taylor and J. W. Seinhorst. (Editors) 1975. Nematode Vectors of Plant Viruses. London & New York. Plenum Press. 460 pp.

8. Langton, F. A. 1973. Investigations with 2x and vegetatively doubled 4x potato clones. Potato Research 16(4):323-324.

Hybrids from Solanum tuberosum dihaploids and wild and cultivated Solanum spp. have resistance to Heterodera rostochiensis and H. pallida and leaf roll virus. The resistance was associated with major genes and polygenes. There is indication that doubling the ploidy level does not increase resistance.

9. LaRosa, D. G. and P. Jatala. 1977. [The depth of penetration of Nacobbus aberrans in potato tubers] Nematropica 7(2):11

Penetration did not exceed 2 mm. Immature females and 3rd stage larvae were most common; males were not found.

10. Lazhaunikas, E. E. 1968. [Lowered eelworm infestation.] Zashch. Rost. Vredit. Bolez. Year 1968. p. 58.

A 4-10 day exposure of infected potato tuber (to Ditylenchus destructor) reduced infection significantly.

11. Lear, B. and W. F. Mai. 1952. Methyl bromide for disinfecting burlap bags and machinery to help prevent spread of golden nematodes of potatoes. Phytopath. 42:489-492.

Steam sterilization of implements and bags were not efficient in preventing spread Heterodera rostochiensis Methyl bromide under tarps (23 lb/1000 cu ft) was effective in a closed container. Treatment was effective at 50°F and 80°F.

12. Lear, B., W. F. Mai, J. Feldmesser and F. J. Spruyt. 1952. Soil fumigation experiments on Long Island, New York to control golden nematode of potatoes. Phytopathology 42:193-196.

The most effective control was a mixture of dichlorobutenes, but D-D was nearly as effective.

13. Lear, B., W. F. Mai, M. B. Harrison and H. S. Cunningham. 1954. Yields of off-flavor potatoes and carrots on plots receiving annual soil treatments. Phytopath. 44:493

Several materials were applied to soil over a 10 year period only DD and Dowfume N cause an off flavor of potatoes and carrots.

14. Lebedev, A. A. 1968. [Solanum vernei as the intial species for the production of potato forms with complex resistance] Zap.leningr. sel'.-khoz. Inst., 117(3):63-68.

Breeding material from Solanum vernei has been used in polypoid form in hybrids involving 6 species to develop resistance to Heterodera rostochiensis.

15. Lebedeva, D. V. 1977. [Potato nematode Heterodera rostochiensis in the Maritime Territory.] Zashch Rast 1:56-57

16. Lebedeva, N. A. and A. A. Lebedev. 1966. [Prospects of breeding potatoes for resistance to potato eelworm.] Genetika, Mosk., 7:90-99.

17. Legowski, T. J. and E. B. Brown. 1956. Reproduction of the potato root eelworm during the winter in a potato clamp. Nat. London 177:287.

Cysts containing eggs were found in a freshly opened clamp in early March. White and yellow cysts were found on roots of potato tubers.

18. Leiper, R. T. 1940. The potato eelworm problem of today. Jour. Roy. Agr. Soc. (England) 100:63-73.

19. Leiper, R. T. 1940. On preventing spread of 'potato sickness' to new land. Imperial Bureau of Agriculture Parasitology (Helminthology) Pamplet No. 1:7 pp.

A general treatment of Heterodera schachtii particularly dealing with seed and cyst spread in soil, bags and other containers.

20. Lekhnovich, V. S. and V. N. Pimskaya. 1976. [Introduction and quarantine work with potato at the Pavlovsk Experimental Station of the Institute of Plant Industry (VIR).] Byulleten' Vsesoyuznogo Ordean Lenina i Ordena Drezhby Narodov Instituta Rastenievodstva Imeni N. I. Vavilova. 61:53-58. From Plant Breeding Abstracts 47, 5540.

Those forms with best resistance to Ditylenchus dipsaci and Heterodera rostochiensis are listed.

21. Lewis, F. J. and W. F. Mai. 1957 Survival of encysted eggs and larvae of the golden nematode in alternating temperatures. Phytopathology 47:527

Greater losses of viability occurred in moist soils than in dry, under alternating temperatures (-5° and 75°F).

22. Lewis, S. 1965. The effect of chemical soil sterilants and an organophosphate compound on potato root eelworm. Pl. Path. 14:89-91.

Almost complete control fo Heterodera rostochiensis was achieved in pot tests with DD and Tridipam (N-N dimethylthiuram. disulphide). Thionazin was only slightly effective.

23. Lewis, S. and L. E. W. Stone. 1964. The use of Trapex for control of potato root eelwrom out-of-doors. Pl. Path. London. 13:110-111.

Trapex controlled Heterodera rostochienssi in small plots. When used with tarp, Trapex was phytotoxic.

24. Lihnell, D., H. Bang, K. Kvist and C. Nilsson. 1975. [Varieties and diseases in Swedish table potato crops.] Statens Vaxtsky ddsanstalt Meddelanden 16(168):149-213. (Sv).

Potato varieties and diseases were studied in 3-year inventory. Although Trichodorus and tobacco rattle virus are common in certain parts of Sweden, but the incidence of spraying is very low.

25. Lindhardt, K. 1959. Kartoffelelal. En samlet oversigt. Copenhagen: Statens Plantetilsyn Oplysende Skriftraekke, 52 pp.

A review is given of Heterodera rostochiensis biology, distribution, morphology, biology, plant symptoms in Denmark is discussed. Control is discussed along with rotation (every 4th year) resistance, and chemicals.

26. Lindhardt, K. 1966. Foranstaltninger mod kartoffelnematoden. Nord. Fordbr. Forsk. 48:309-311.

Resistant varieties offer best control alternatives, however, such control is hampered by nematode [H. rostochiensis) pathotypes. Pathotype A is the most common form in Denmark, Norway and Sweden.

27. Lindhardt, K. 1970. [The occurrence of the potato root nematode (Heterodera rostochiensis Woll.] in Denmark, Continued investigations 1964-1968. Tidsskr Planteavl 74(2):151-156.

During the 5-year period, only 0.1% of samples from potato fields showed infestation. Samples from nurseries showed infestation in 1% Preventive measures are discussed.

28. Linford, M. B. and F. Yap. 1940. Some host plants of the reniform nematode in Hawaii. Proceedings of the Helminthological Society of Washington 7:42-44.

Potato cultivar Bliss Triumph is suitable host for Rotylenchulus reniformis.

29. Link, G. K. K. and G. B. Ramsey. 1932. Market diseases of fruits and vegetables. USDA Misc. Pub. 98:62 pp.

The authors give brief accounts of occurrence, symptoms and effects of potato diseases found in the U.S. A short discussion of potato infections by Caconema radicicols including life cycle, spread and control is added.

30. Linnik, G. N. and A. I. Basova. 1954. [On developing measures for controlling the stem nematode on potato.] Trudi Prob. i Tematich. Sovesh. Akad. Nauk SSSR 3:198-207.

Control measures to eliminate Ditylenchus destructor when planting seed potatoes in the Ukraine are suggested.

31. Livingston, C. H., R. Lambert, M. Kaufmann and K. Knutson. 1976. Effects of soil fumigation with Telone-C on the field inoculum potential of tobacco rattle virus and potato yields. American Potato Journal 53(3):81-86.

Fumigation affected viruliferons nematodes (Trichodorus) in the uppermost layers of soil and increased the total potato yield.

32. Locatelli, E. A., T. C. Allen, P. A. Koepsell and A. P. Appleby. 1978. Diagnosis of tobacco rattle virus (TRV) and other viruses in weed and rotation crops in potato fields. Transmitted by nematode vector, Trichodorus Am. Potato J. 55(5):249-257.

Describes methodology for detection of the virus in weed species of potato fields.

33. Loof, P. A. A. 1974. Pratylenchus pratensis C. I. H. Descriptions of Plant-parasitic Nematodes. Set 4, No. 52:2 pp.

34. Lordello, L. G. E. and A. P. L. Zamith. 1956. Novas observacoes sobre as nematodes que parasitam a batatinka no Est. de S. Paulo. Rev. Agric. Sao Paulo 31:45-54.

Helicotylenchus nannus Steiner, 1945 is redescribed from potato where it occurred in pustules on tubers formed by Pratylenchus sp. Meloidogyne javanica subsp. bauruensis Lordell 1956 was also found in tubers. Control for root-knot is discussed.

35. Lordello, L. G. E., A. P. L. Zamith and O. J. Boock. 1954. Novo nematodes parasito da batatinka. Bragantia. Campinas 13:141-149.

A new nematode Pratylenchus steineri is described and illustrated. This nematode causes small pimples on potato tubers.

36. Lordell, L. G. E., A. P. L. Zamith and O. J. Boock. 1961. Two nematodes found attacking potato in Cochabamba, Bolivia. Anais da Academia Brasileria de Ciencias 33:209-215.

Nacobbus serendipiticus bolivianus n. subsp. and Pratylenchus andinus n. sp. are described; they were both obtained from potato roots.

37. Lownsbery, B. F. 1951. Larval migration from cysts of the golden nematode of potatoes Heterodera rostochiensis Wollenweber. Phytopathology 41:889-896.

Describes a method for assaying larval emergence which uses large numbers of cysts and leachings from potted potato plants. Large volumes of leachings were able to produce a 94% reduction in larval emergence potential.

38. Lownsberry, B. F., J. W. Lownsberry and W. F. Mai. 1951. Nematodes found in New York State fields with several different cropping histories. Am. Potato J. 28:681-686.

A general survey of nematodes was made and two species of Pratylenchus were very common.

39. Luc, M. 1959. Nematodes parasites on soupconnes de parasitisme envers les plantes de Madagascar. Bull. Inst. Res. Agron. de Madagascar. 3:89-101.

Meloidogyne javanica was a common species in the potato seed selection and multiplication center. All varieties were attacked with losses ranging from 10-20%.

40. Lumkes, L. M. and S. Meerman. 1973. [Preventive measures for control of diseases of stored potatoees begin with cultivation of the soil.] Bedrijfsontwikkeling 4(7/8):694-699.

41. Lus'kova, L. A., R. M. Gladkaya and I. Y. Ponin. 1972. [Study of potato varieties resistant to Heterodera rostochiensis] In Nematody rastenii. Voronezh, USSR: Tsentral'no-Chernozemnoe Knizhnoe Izdatel'stvo pp. 51-58.

1. Maas, P. W. T. 1974. Soil disinfection to prevent transmission of tobacco rattle virus to potatoes and flower bulbs. Agriculture and Environment 1:329-338.

Disinfection of soil is difficult because Trichodorus populations in undetectable numbers and at great depths (down to 120 cm) can remain as a reservoir of infection.

2. Maas, P. W. T. 1975. Soil fumigation and crop rotation to control spraing disease in potatoes. Neth. J. Plant Pathol. 81(4):138-143.

D-D fumigation controlled the vector nematodes but the tuber crop was not palatable until the second year after treatment. Disease incidence was lower after spring barley than after potato, sugar beet or maize.

3. Mabbott, T. W. 1960. Observations on the development of potato root eelworm, Heterodera rostochiensis Woll., on the potato tuber and importance of such development in the spread of this nematode on washed tubers. Eur. Potato J. 3:236-244.

Discusses development of nematodes on stolons and tubers. No female cysts have been found in tubers. Washed tubers pose little threat to the industry.

4. Mabbott, T. W. 1974. Distribution of potato cyst eelworm in Scotland. Bulletin OEPP 4:481-493.

Heterodera rostochiensis was first noticed in Scotland in 1912 and has been regarded as a serious pest since 1940. Sampling over a 22-year period suggests that long term rotation has reduced infection to a minimum. Two populations of H. pallida have been found.

5. MacDonald, K. H. 1956. A comparison of cysts of Heterodera rostochiensis from roots of resistant and susceptible plants. Phytopath. 46(1):19.

Root diffusates of resistant potato lines Solanum andigenum, S. vernei and S. sucrense inhibited the hatching of larvae from Heterodera rostochiensis cysts.

6. Machmer, J. H. 1946. Golden nematode on commercial potatoes. Phytopath. 36:686.

Author discusses the importance and efficiency of cleaning seed potatoes by washing, brushing and jet washing.

7. Mackintosh, G. M., P. Osborne, R. M. Stewart and D. L. Trudgill. 1977. Control of potato cyst eelworm with a resistant cultivar and with nematicides in Scotland. In Proceedings of a symposium on problems of pest and disease control in northern Britain, 23-24 March 1977, R. A. Fox (Editor), University of Dundee. pp. 36-37.

None of the nematicides used were able to totally prevent Globodera rostochiensis population increase on susceptible potato (Pentland Crown) and did not greatly improve the control exerted by resistant potato (Maris Piper).

8. Magi, E. A. 1970a. [Investigations on diapause in potato root nematode.] Mater. Pribalt. Soveshch. Zast. Rast. Part 1:86-88.

Observed diapause commencing in July in Heterodera rostochiensis.

9. Mai, W. F. 1952. Temperature in relation to retention of viability of encysted larvae of the golden nematode of potato, Heterodera rostochiensis Wollenweber. Phytopathology 42:113.

The survival was greater in soils kept at temperatures equal to those of New York during the non-growing season, than of those kept at Florida temperatures.

10. Mai, W. F. 1954. Changes in the viable golden nematode population of the soil while growing potatoes every year. Phytopathology 44:497.

A decrease in living larvae was obtained in 9 plots and an increase in 3 plots. The percentage decrease was directly proportional to the number of cysts in the soil prior to cropping.

11. Mai, W. F. 1954. Toxicity of fungal and bacterial filtrates to encysted golden nematode larvae. Plant Disease Reporter 38:545-546.

None of the filtrates of 22 different fungi and bacteria were lethal to the larvae.

12. Mai, W. F. 1977. Worldwide distribution of potato-cyst nematodes Heterodera rostochiensis, and H. pallida and their importance in crop production. J. Nematol. 9(1):30-34.

Discusses crop loss, origin, distribution, spread and integrated control.

13. Mai, W. F. and W. H. Lantz. 1953. Relative resistance of free and encysted larvae of the golden nematode Heterodera rostochiensis Wollenweber, to D-D mixture and hot water. Proc. Helminth. Wash. 20:1-7.

Encysted larvae are less vulnerable to D-D and to hot water than are free larvae.

14. Mai, W. F. and B. Lear. 1952. Yearly D-D treatments and continuous potato production in relation to the golden nematode population of the soil. Phytopath. 42:481.

A four to 10 inch application of DD in the fall reduced the nematode population by 99%.

15. Mai, W. F. and B. Lear. 1953. The golden nematode. Cornell Extension Bulletin 870. 32 pp.

A general review, including host species.

16. Mai, W. F. and B. F. Lownsberry. 1948. Studies on the host range of the golden nematode, Heterodera rostochiensis. Am. Potato J. 25:55-56.

One hundred seventy-one species of plants were tested for susceptibility. 37 varieties of potatoes and 43 of tomatoes were severely infected.

17. Mai, W. F. and B. F. Lownsberry. 1948. Studies on the host range of the golden nematode of potatoes, Heterodera rostochiensis Woll. Am. Potato J. 25:290-294.

All North American varieties of potatoes and tomatoes tested were susceptible. The only other host was Solanum dulcamara L. (Bittersweet).

18. Mai, W. F. and B. F. Lownsberry. 1952. Crop rotation in relation to the golden nematode population in the soil. Phytopathology 42:345-347.

Three-year rotations of corn, green beans, red clover and perennial rye grass with potato significantly reduced the nematode population. Three-year rotations with grasses reduced the population by up to 82%.

19. Mai, W. F. and L. C. Peterson. 1952. Resistance of Solanum balsii and Solanium sucrense to the golden nematode, Heterodera rostochiensis Woll. Science 116:224-225.

Resistance derived from Solanum sucrense is variable in the progeny of crosses with standard potato varieties.

20. Mai, W. F. and J. F. Spears. 1954. The golden nematode in the United States. American Potato Journal 31:387-396.

A general review of symptoms, life history, host range, U. S. distribution, regulatory and survey methods of the golden nematode on Long Island, New York.

21. Mai, W. F., F. J. Spruyt, B. Lear and J. Feldmesser. 1951. Yields of green mountain and cobbler potato varieties grown on golden nematode infested soil. Am. Potato J. 28:617-625.

Green mountain variety (late) was more severely damaged than the cobbler variety.

22. Maine, M. J. de. 1978. Field resistance to late blight and potato root eelworm in group Tuberosum dihaploids. Euphytica 27:305-315.

A screening of 5 ex-vernei potato dihaploids and two from other H1 clones for resistance to Heterodera rostochiensis indicated most were immune.

23. Makovskaya, S. A. 1975. [Pale potato nematode.] Zashchita Rastenii 2:49.

Populations of potato cyst nematodes were differentiated by their effects on resistant and susceptible potato varieties. Two strains were found to be H. rostochiensis and one agreed morphometrically with H. pallida.

24. Makovskaya, S. A. 1976. [Analysis of Heterodera rostochiensis populations in the northwest of the Nechernozem zone of the RSFSR.] In VIII Vsesoyuznoe soveshchanie no nematodnym boleznyam sel'skokhozyaistvennuykh kul'tur. Tezisy dokladov i soobshchenii. Kishinev, USSR; Izdatel'stvo "Shtiintsa." 56.

A study of the pathotypes and populations of the nematode on potato.

25. Malec, K. 1972. [Potato varieties resistant to the nematode Heterodera rostochiensis.] Ochrona Roslin 16(4):10-11.

26. Malec, K. 1972. [The potato nematode and its control.] Ochrona Roslin 16(8/9):7-8.

27. Malec, K. 1973. [The results of potato root eelworm (Heterodera rostochiensis Woll.)] Biul Inst Ziemniaka 10:75-81.

Two Polish populations of the nematode were able to form cysts on resistant potatoes. One infected Specula (resistant to biotype A), the other infected Solanum nigrum (also resistant to biotype A), but not Specula.

28. Malec, K. 1977. [The problem of the control of potato root eelworm, Heterodera rostochiensis Woll.] Biuletyn Instytutu Ziemniaka 19:43-47.

The cheapest, simplest and most effective control of H. rostochiensis on potato is by breeding resistant varieties.

29. Mancini, G., G. Rameri, R. Villani and L. Russo. [Control trials against the golden potato nematode Heterodera rostochiensis Woll.] Annali della Facolta' di Scienze Agrarie, Universita di Napoli, Portici, IV(8):11.

None of the seven chemicals tested eradicated the nematode, but Nemacur and oxamyl were most effective.

30. Marcus, O. 1954. Deformationen an Augenstecklingen von Kartoffeln durch Befall mit Stengelakhen. Nach. des Deut. Pflan. Stuttgart 6:108-109.

Leaf and shoot deformation caused by Ditylenchus dipsaci is described.

31. Markula, M. 1976. Pests of cultivated plants in Finland in 1975. Coccinella septempunctata and Adalia bipunctata for biological control of aphids, the potato cyst nematode Heterodera rostochiensis. Ann Agric Fenn 15(3):263-266.

32. Marrewijk, G. A. M. van and O. M. B. de Ponti. 1975. Possibilities and limitations of breeding for pest resistance. (27th Int. Symp. Fytofarm. en Fytiat. Gent Deel I. Mededelingen van de Faculteit, Landbouwwetenschappen Rijksuniversiteit Gent 40(2/1):229-247.

Potato varieties resistant to Heterodera rostochiensis are mentioned.

33. Martin, A. R., et al. 1963. El nematode dorado de la papa. Est. Exp. Agric. La Molina, Bol. 6. Lima, Peru 20 pp.

Potato cyst nematodes have widespread distribution in highlands of Peru.

34. Martin, G. C. 1947. D-D as a means of controlling Heterodera rostochiensis Woll. Nature 160:720.

D-D was more effective and economic as a nematicide than were chloropicrin, ethylene dibiomide and Dowfume G. D-D is, however, phytoxic and the treated area should be left undistrubed for some time.

35. Martin, G. C. 1968. Survival and infectivity of eggs and larvae of Meloidogyne arenaria after ingestion by a bovine. Pl. Dis. Reptr. 52:99-102.

Infected Meloidogyne arenaria potato tubers were fed to a bovine for 7 days. Faeces collected on 5th and 7th days were mixed with soil and planted to tomato indicator plants. Plants later developed root galls.

36. Martin, G. C. 1968. Control of Meloidogyne javanica in potato tubers and M. hapla in roots of young roses by means of heated water. Nematologica 14:441-446.

Rhodesian trials of warm water temperatures between 46 and 47.5°C killed all stages of the nematode without materially injuring the potatoes.

37. Martin, G. C. 1971. Infection and reproduction of the burrowing nematode in potato. FAO Plant Protection Bulletin. 19(4):91-92.

In greenhouse pot tests, Radopholus similis infected sprouting potato tubers [variety Cedara]. The crop of tubers formed contained eggs, larvae and adult nematodes.

38. Martin, G. C. 1972. Potatoes and plant parasitic nematodes. Stocks and Crops 3:27, 29, 31, 38-39.

In Rhodesia Meloidogyne spp., Pratylenchus spp. and Radopholus similis (banana race) are discussed as parasites of potatoes. Control by crop rotation, summer fallowing, or fumigation is suggested.

39. Martin, G. C. 1978. Notes on Pratylenchus penetrans and other endoparasitic plant nematodes in relation to tubers of Solanum tuberosum growth in Southern Africa. Nematological Society of Southern Africa Newsletter. 10:5-8.

Presence of P. penetrans can be masked by Meloidogyne spp.

40. Martin, G. C. and A. M. Armstrong. 1975. Potatoes in Rhodesia. Part 3. Nematode Pests of potatoes. Technical Bulletin, Rhodesia Agricultural Journal 11:27-31.

Describes symptoms of infestation of roots and tubers of Meloidogyne javanica, M. arenaria, M. incognita-acrita and M. hapla. Includes discussion of dispersal and control of plant nematodes.

41. Mastenbroek, C. and P. Schelling. 1970. [Two new Cebeco varieties in the 1970 varietal list.] Samen Sterk 54:16-17.

Amigo, a productive, late-maturing variety, is resistant to Heterodera rostochiensis.

42. Matveeva, M. A. and T. N. Yakubovich. 1976. [The effect of crop rotation on the decrease in the numbers of Heterodera rostochiensis in foci of infection.] In VIII Vsesoyuznoe soveshchanie no nematodnym boleznyam sel'skokhozyaistvennykh kul'tur. Tezisy dokladov i soobshchenii. Kishinev, USSR; Izdatel'stvo "Shtiintsa." pp. 56-57.

43. Matveeva, M. A. and T. N. Yakubovich. 1977. [The ecology of the potato nematode.] Akademiya Nauk SSSR, Zoologicheskii Institut pp. 67-70.

A summary of ecology, distribution of cysts, extraction, losses and chemical control of Globodera rostochiensis is summarized from the literature. An infection rate of 10,000 larvae/100 ml soil may reduce yield of susceptible potatoes 24-94%.

44. Matveeva, M. A., T. N. Yakubovich and S. P. Popova. 1974. Sampling to detect potato root nematodes. Zashch Rast 8:42-43.

45. May, H. C. and R. Osborne. 1973. Experiments with dazomet for the control of potato cyst eelworm in potato crops. British Insecticide and Fungicide Conference (7th) Proceedings. Vol. 2 Research Reports pp. 409-413.

Dazomet at 227 or 395 kg/ha applied to soils infested with Heterodera rostochiensis and H. pallida in the fall was evaluated on a spring potato crop.

46. McCubbin, W. A. 1948. Present status of the golden nematode of potato. Am. Potato J. 25:131-133.

A progress report on survey, control and quarantine aspects of the pest on Long Island, New York.

47. McKenna, L. A., R. J. Willis and R. D. Winslow. 1964. Glass tube culture method for assessment of resistance of potatoes to potato root eelworm. Rec. Agr. Res. Min. Agr. Northern Ireland 13:29-32.

The glass tube culture method for testing Heterodera rostochiensis resistance is described. Young seedlings, small tubers, tuber pieces, shoot or leaf cuttings may be planted for innoculation.

48. McKenna, L. A. and R. D. Winslow. 1963. The effects of various infestation techniques on the development of the potato root eelworm, with observation on the length of the life cycle in a heated glasshouse. Research and experimental record of the Ministry of Agriculture, Northern Ireland 12:97-101.

49. McKenna, L. A. and R. D. Winslow. 1972. Differences in hatch and development rates of potato cyst nematode pathotypes. Ann. Appl. Biol. 7:274-278.

Authors conducted experiments to compare hatching and development of pathotypes A, B and E of Heterodera rostochiensis. Pathotype A hatched sooner and developed faster than other pathotypes. In a mixture of the 3 pathotypes, A was dominant and the others virtually disappeared from the culture.

50. McKenna, L. A. and R. D. Winslow. 1973. Resistance and infestivity of potato cyst nematode infestations of different ages. Record of Agricultural Research, Min. of Ag. Northern Agronomy 21:37-40.

A biological study of Globodera rostochiensis development on resistant potatoes concerning inoculation at different stages of host growth.

51. McKenna, L. A. and R. D. Winslow. 1973. Integrated control of potato cyst nematode, Heterodera rostochiensis. Record of Agricultural Research, Dept. of Agriculture for Northern Ireland 23:63-64.

Discusses use of crop rotation and resistant and susceptible potato cultivars, with and without nematicides.

52. McKenna, L. A. and R. D. Winslow. 1975. Short notes on findings from other research work: integrated control of potato cyst nematode heterodera rostochiensis. Rec. Agric. Res. North Ireland Dept. Agric. 23:63-64.

53. McKenna, L. A., R. D. Winslow and D. Kilpatrick. 1973. Persistence and infestivity of potato cyst nematode infestations of different ages. Record of Ag. Res., Min. of Agr., Northern Ireland 21:37-40.

A number of fields ranging from 0-23 years continuing potato crops were studied for infestation levels of Heterodera rostochiensis. Maximum nematode density occurs at infestation age of 10 years.

54. Meinl, G. and H. Stelter. 1963. Die Auswirkungen des Nematodenbefalles (Heterodera rostochiensis Woll.) auf Wachstum, Entwicklung und Producktivitat von anfalligen und resistenten Kartoffelsorten. Nematologica 9:553-566.

Early, susceptible potato variety Fruhbote, the late susceptible Gerlinde and resistant Spekula were observed. About fifty days after attack, the late susceptible were as tall as the control, the early variety did not recover.

55. Meinl, G. and H. Stelter. 1967. Eifluss unterschiedlicher Wasserversorgung auf Streckungswachstum und Stoffproduktion nematodenbefallener Kartoffelpflanzen sowie auf die Populationsdynamik des Parasiten. Biol. Zentralbl 86:723-734.

Effects of water contents in pot experiments on cyst numbers indicated highest numbers of Heterodera rostochiensis cysts and larvae occurred at 50% capacity in pot tests.

56. Meinl, G. and H. Stelter. 1971. Wachstums-, entwicklungs-und stoffwechselphysiologische probleme bei nematodenbefallenen kartoffelpflazen. Probleme der Phytonematologie. pp. 27-41.

57. Melard, V. 1970. [The new potato varieties on the Belgian list.] Les nouvelles varieties de pommes de terre de la list belge. Rev. Agric., Brux., 23(9):1275-1281.

The potato variety Marijke was resistant to Heterodera rostochiensis.

58. Melard, V. 1972. [Scaldia, a Belgian variety of potato resistant to golden nematode Heterodera rostochiensis Woll.] Revue de l'Agriculture 25:597-602.

Scaldia developed from Solanum andigenum is the first Belgium potato variety resistant to pathotype A of the golden nematode.

59. Melard, V. 1972. [Studies on the genetic improvement of the potato in Belgium.] Revue de' l'Agriculture 25:1073-1081.

Breeding work has been going on in Belgium since 1959 and approximately 2000 interspecific genotypes are tested for resistance to Heterodera rostochiensis annually.

60. Menon, P. P. V. and G. Logiswaran. 1972. Note on the biotypes of potato golden nematode Heterodera rostochiensis Woll. in the Nilgiris. Indian J. Agr. Sci. 42(11):1068.

From tests with Solanum tuberosum, S. andigenum, S. kurtzianum and S. vernei, the nematode population from Ootacamund appears to be pathotype D.

61. Menon, P. P. V. and D. Thangaraju. 1973. Effect of crop rotation on the population of the potato golden nematode Heterodera rostochiensis in the Nilgiris. Indian Journal of Agricultural Sciences 43:304-306.

Monoculture of potatoes cropped once or twice a year increased the pest population and decreased potato yields. Nematode populations were not reduced in a two-year rotation with bean and pea. However, a three-year rotation (potato-bean-pea) and a four-year rotation (potato-bean, pea, pea and pea) reduced the population from 630 larvae in 680/ml soil to 121 in 9 ml soil.

62. Metlitski, O. Z. 1968. [The use of morphometrics in recognition of different forms of stem nematodes.] Parazitologiya 2:527-534.

Ditylenchus dipsaci, D. fragariae, D. allii, D. floxidis, D. trifolii and D. destructor are all synonymous according to a comparative study of morphological variation.

63. Metsa, E. 1972. [Possibilities for controlling the potato tuber eelworm] Sotsialistlik Pollumajandus 27:157-159.

Clone selections infested with Ditylenchus destructor were less drought resistant than non-infected ones. Treatment of infected tubers in 1% Bi-58 for 10 min reduced number of infected tubers by 28 to 35%.

64. Middleton, J. T. 1940. Nematode injury to potatoes in California. Pl. Dis. Reptr 24:64-65.

Potatoes were severely damaged in a field where potatoes had not been grown before, however, the field had been in peaches infested with Heterodera marioni. In another field where potatoes were infected, the crop became progressively worse with monoculture. Autumn crops were most severely infected.

65. Migulin, A. A. and L. V. Tkhuet. 1974. [The influence of harvest time and mineral fertilizers on the rate of Ditylenchus destructor infection on potato.] Trudy khar'kovskogo sel'sko-khozyaistvennogo Instituta 182:74-76. (Ru)

66. Mildenberger, G. and H. Wartenberg. 1958. Histologische untersuchungen der nematodengallen in den Wurzeln der Kartoffelpflanze (Heterodera rostochiensis and Meloidogyne spp. in Solanum tuberosum L.) Zeitschrift fur Pflanzenkrankheiten (Pflanzenpathologie) und Pflanzenschutz 65:449-464.

Cell changes related to invasion of Heterodera rostochiensis and Meloidogyne spp. are described.

67. Miles, H. W. 1969. Potato root eelworm. Northern Ireland Min. Agr. Adv. Serv. Leafl 117:2-6.

A popular account of the nematode and its effect on potatoes.

68. Miles, H. W., V. E. Henderson and M. Miles. 1943. Field studies of potato-root eelworm, Heterodera rostochiensis Woll., 1938-40. Annals of Applied Biology 30:151-157.

The studies suggest that varietal differences of host plants influence the number of cysts formed.

69. Miles, H. W. and M. Miles. 1945. Potato root eelworm in Worcestershire. Western Agricultural Chronicle 13:129-131, 133, 135.

A general account of the nematode problems is given for the area. Importance of crop rotation and precautions to prevent spread is stressed.

70. Millard, W. A., S. Burr and L. R. Johnson. 1932. Potato sickness. Gardener's Chronicle 91:28-29.

Authors investigate combined fungi and Heterodera schachtii as a cause of potato sickness and conclude most damage is caused by nematode.

71. Miller, L. I. 1974. Effect of ethoprop for control of Heterodera solanacearum on yield of three varieties of Solanum tuberosum Virginia Journal of Science 25:51.

A yield reduction occurred with use of ethoprop.

72. Miller, L. I. and B. J. Gray. 1972. Heterodera solanacearum n. sp., a parasite of solanaceous plants. Nematologica 18:404-413.

Anatomical description of the nematode.

73. Miller, L. I., A. R. Stone, L. Spasoff and D. M. Evans. 1974. Resistance of Solanum tuberosum to Heterodera solanacearum. Proceedings of the American Phytopathological Society 1:153.

Solanum tuberosum is not susceptible to Heterodera solanacearum

74. Miller, P. M. 1970. Nematodes in Connecticut potato fields. Pl. Dis. Reptr. 54:995.

Small populations of Pratylenchus penetrans and Tylenchorhynchus claytoni were found in several potato fields.

75. Miller, P. M., L. V. Edgington and A. Hawkins. 1968. Effects of soil fumigation on Verticillium wilt, nematodes and other diseases of potato roots and tubers. Am. Potato J. 44:316-323.

Telone, Vorlex, Dowfume W-85 and DD were tested against Pratylenchus penetrans and Tylenchorhynchus claytoni on Kennebec and Katahdin potato varieties.

76. Miller, P. M. and A. Hawkins. 1967. Effects of fall fumigation on nematodes, early maturity disease, yields, and vascular discoloration of tubers of Kennebec and Katahdin potatoes. American Potato Journal 44:339.

Fall fumigation of soil with high populations of Pratylenchus penetrans and Tylenchorhynchus claytoni increased yields of the potatoes from 35% to 60%.

77. Miller, P. M. and A. Hawkins. 1969. Long term effects of preplant fumigation of potato fields. Am. Potato J. 46:387, 397.

Nematicides applied to potato fields increased yields and populations were lower for 3 years after application. P. penetrans kill was very good below 3 inches in the soil and poor in upper two inches.

78. Miller, P. M. and J. B. Kring. 1970. Reduction of nematode and insect damage to potatoes by band application of systemic insecticides and soil fumigation. J. Econ. Ent. 63:186-189.

Aldicarb and Telone reduced populations of Pratylenchus penetrans by 90% or more in soil to a depth of 30.5 cm.

79. Miller, P. M. and E. M. Stoddard. 1958. Increasing the hatching of eggs of cyst and rootknot nematodes with Nabam. Science, Lancaster, Pa. 128:1429-1430.

Combining Nabam with a nematicide controls rootknot better than a nematicide alone.

80. Miller, P. R. 1946. The potato rot nematode, Ditylenchus destructor. Int. Bull. Pl. Protection, Rome, 20:104.

Author describes the problem in Idaho and its present location. He also notes the pest has been found on Prince Edward Island, Canada. Host range is thought to be limited and crop rotation may be useful.

81. Mimz, G. and N. Gorodeiski. 1953. Sowing seed potatoes grown in nematode-infected soil. Hassadeh 34:166-167.

Authors noted that seed potatoes may contain internally situated Meloidogyne spp.

82. Mitchell, B. L., B. W. Blair and G. C. Martin. 1971. Potatoes in Rhodesia Part II. Pests on Potatoes. Tech. Bull. Rhodesia Ag. J. 11:25-31.

Meloidogyne javanica is best controlled on potato with four years of grass in rotation.

83. Montaldo, A. 1951. Fitomejoramiento para resistencia a la nematosis de la papa. Agric. Tech. Chile 11:64-85.

Heterodera marioni is widespread and causes severe damage in some areas. 896 varieties were tested for resistance.

84. Montaldo, A. 1974. Sources of resistance to the cyst nematode in Venezuela. Revista de la Facultad de Agronomia, Univ. Central de Venezuela 7(4):37-61.

Heterodera rostochiensis cysts from 2 localities in Venezula produced few cysts on potato varieties with the H1 gene for resistance, indicating the presence of pathotype A. Extensive bibliography is included.

85. Moore, J. F. 1971. Studies on the persistence of Ditylenchus destructor the potato tuber nematode, with different cropping treatment. Ir. J. Agric. Res. 10:207-211.

A micro-plot study of D. destructor persistence with three years of cropping with six different crops was evaluated the 4th year by a potato crop. The nematode was not persistent in red clover and mint plots, with 41 and 35% infection, respectively.

86. Moore, J. F. 1971. Potato varieties susceptible to Ditylenchus destructor, the potato tuber nematode. Ir. J. Agric. Res. 10:239-240.

Dutch varieties Rode Star and Zeeburger, fifteen other potato varieties and 4 lines of Solanum andigena were all susceptible to Ditylenchus destructor.

87. Moore, J. F. 1971. Effect of planting tubers infested with Ditylenchus destructor, the potato tuber nematode, and the effect of unharvested tubers on the persistence of the nematode. Ir. J. Agric. Res. 10:307-313.

Three levels of infected seed potatoes were planted with healthy seed pieces. Yield of potatoes decreased with innoculum increase. Farm yard manure added to some plots decreased external symptoms. Infection persisted and increased if an infested crop was left in the soil.

88. Moore, J. F. 1978. Susceptibility of Golden Wonder and King Edward potato cultivars to Ditylenchus destructor the potato tuber nematode. Irish Journal of Agricultural Research 17(2):213-216. (Correspondence)

External symptoms were more significant in Golden Wonder, whereas, in one of three years internal symptoms were significantly greater in King Edward.

89. Moreton, B. D. 1953. Rotation is the best defense against eelworm. Grower London. 40:1034-1035.

The author reviews the potato-root eelworm situation and the various control methods. Crop rotation for at least three years is suggested. Also a program to reduce self-sets volunteers is suggested, since they act as reservoir hosts.

90. Morgan, D. O. 1925. Investigations on eelworm in potatoes in South Lincolnsire. Helminthol. Jour. 3:185-192.

None of the chemicals used was effective against the nematode and all of the potato varieties tested were susceptible.

91. Morozova, E. 1973. [Resistance of tubers of Solanum andigenum to mechanical injuries and nematodes] Kartofel Ovoschi 12:9-10.

Twenty-seven varieties of Solanum andigenum resistant to Heterodera rostochiensis and 22 to Ditylenchus dipsaci are listed.

92. Morozova, E. 1975. [The use of Solanum andigenum in breeding potato.] Kartofel' i Ovoshchi 10:10-11. Plant Breeding Abstracts 46, 3482.

Lists are given of those forms of Solanum andigenum tested in Leningrad province, USSR, for resistance to Heterodera rostochiensis.

93. Morris, R. F. 1971. Distribution and biology of the golden nematode Heterodera rostochiensis in Newfoundland. Nematologica 17:370-376.

Found mostly in noncommercial gardens in the Southeastern area, the nematode completes its life-cycle in 50-58 days. Potato cultivars Arran Victory and Urgenta are productive in heavily infested fields.

94. Morris, R. F. and K. G. Proudfoot. 1973. The golden nematode. Can. Agric 18(2):11-13.

A popular account of the nematode's distribution, life history and control.

95. Morris, R. F. and K. G. Proudfoot. 1974. Chemical control of the golden nematode Heterodera rostochiensis: greenhouse observations on performance of granular insecticides-nematicides and the effect of cyst placement on inoculation. Can. Plant Dis. Surv. 54(3):77-80.

Of the several effective granular nematicides tested, Temik at 75 lb/acre was the most effective in reducing new cyst formation. Of five inoculation procedures on potted potato plants dispersing cysts throughout the soil was most effective.

96. Morsink, F. 1963. Penetration of roots of potato seedlings by Pratylenchus penetrans. Phytopath. 53:351.

Potato seedlings grown aseptically on 1% nutrient agar were inoculated with surface sterilized Pratylenchus penetrans. In 10 days after staining with bromophenal-blue 119 of 777 seedlings were invaded by nematodes. Other microorganisms were in tissue only if nematodes were present.

97. Morsink, F. 1967. Pratylenchus penetrans -- its interaction with Verticillium albo-atrum in the Verticillium wilt of potatoes and its attraction by various chemicals. Ph.D. Thesis, Univ. New Hampshire, 68 pp.

Lower tuber yields were obtained from the fungus-nematode treatment than from either fungus or nematode alone. Of the numerous chemicals tested, only lysine and thiamine were attractive to the nematode and only xylose was repellent.

98. Morsink, F. and A. E. Rich. 1968. Interactions between Verticillium albo-atrum and Pratylenchus penetrans in the Verticillium wilt of potatoes. Phytopathology 58:401.

Significant (5%) interactions were found for the fungus-nematode effects as expressed in dry weights of tubers and tops.

99. Mosiek, M. 1975. New potato varieties of the Institute for Potato Research, Bonin: Rys (Z49598). Ziemniak 2:269-271. Plant Breeding ABstracts 46, 11232, 11237.

A potato variety "Rys" (Lynx) bred from "Spekula" x 32089 and Epoka is resistant to Heterodera rostochiensis race A.

100. Moss, S. R., D. Crump and A. G. Whitehead. 1975. Control of potato cyst-nematodes, Heterodera rostochiensis and Heterodera pallida in sandy, peaty and silt loam soils by oximecarbamate and organophosphate nematicides. Ann. Appl. Biol. 81(3):359-365.

Incorporating the chemicals into the soil at a depth of 15 cm was more effective than at 7.5 cm.

101. Mugniery, D. 1975. [State of research work on potato cyst nematodes.] Pomme de Terre Francaise 37(370):5-7, 9-13.

A review of work in France (mostly); discusses pathotype, hosts, resistant potatoes and control.

102. Mugniery, D. 1975. [Importance of the damage caused by the potato cyst nematodes H. rostochiensis Woll. and H. pallida St.] Comptes Rendus des Seances de l'Academie d'Agriculture de France 61(11):636-644. (Fr).

Later harvest of Roseval resulted in higher yields. At the second harvest there was correlation between degree of infestation and percentage of undersized tubers.

103. Mugniery, D. 1976. [The constuction of a model of the population dynamics of Globodera pallida: application to a practical instance of integrated control. Annales de Zoologie; Ecologie Animale 8:315-329.

The population dynamics has been constructed for G. pallida to control the pest population by cultivation methods. Late harvestings gave larger nematode populations.

104. Mugniery, D. 1976. [Potato cyst nematodes] Cultivar 89:30-31.

105. Mugniery, D. 1978. [Development rates of Globodera rostochiensis and G. pallida in relation to temperature.] Revue de Nematologie 1(1):3-12.

Evolution of the nematode population can be predicted by summation of daily temperatures, and nematode control thus possible by harvesting before cyst maturation.

106. Mugniery, D. 1978. [Cultural methods for control of Globodera rostochiensis Woll. and G. pallida (St.) and outlook for integrated control]. Annales de Zoologie-Ecologie Animale 10:187-203.

Populations of both Globodera spp. could be reduced 40%/year when non-host crops and fallow cultivation was used.

107. Mugniery, D. and H. Zaouchi. 1976. [Critical study of the cyst nematode sampling in the soil and of the confidence of the various criteria for estimating the populations.] Ann Zool Ecol Anim 8(2):177-195.

108. Mugniery, D and H. Zaouchi. 1976. [Study of the different standard and mixed criteria for estimating the cyst nematodes populations in the soil. Use of a contamination criterion] Ann Zool Ecol Anim 8(2):197-210.

109. Mukhametshin, M. S. 1974. [Nematodes on potato in Bashkiriya (USSR)] Materialy Nauchnykh Konferentsii Vsesoyuznogo Obshchestva Gel'mintologov 26:167-174.

A review paper of nematode pests of potato, with a detailed discussion of Ditylenchus dipsaci.

110. Mukhametshin, M. S. 1976. [Study of resistance to Ditylenchus dipsaci in some potato varieties in Bashkiria.] In Biol. osnovy i ratsional'n. ispol'z. pochv i rastitel'n. resursov Bashkirii. Ufa, USSR 69-70 (Ru) From Referativnyi Zhurnal 11.55.697.

Potato varieties Lorkh and Berlichingen were the most resistant to Ditylenchus dipsaci.

111. Mukhopadhyaya, M. C. 1970. Effiency of DD, EDB, DBCP and V-C 13 in controlling plant parasitic nematodes. J. Res. Punjab Agric Univ. 7:659-662.

Meloidogyne incognita larvae numbers were reduced by 90% with DD (400 litres per hectar) and EDB (150 kg/ha) and by 70% with DBCP (45 liters/ha) as compared to a 65% increase in control plots.

112. Mulvey, R. H. and A. R. Stone. 1976. Description of Punctodera matodorensis n. gen., n. sp. (Nematoda: Heteroderidae) from Saskatchewan with lists of species and generic diagnoses of Globodera, Heterodera and Sarisodera. Canadian Journal of Zoology 54:772-785.

Places potato cyst nematodes and other nematodes with special cysts into a separate genus, Globodera.

113. Munoz, L., Y. Melo, D. Castillo and A. Cubillos. 1976. [Investigation of cysts of the potato nematode Heterodera rostochiensis Woll. in Cautin Province in 1975. Cienc Invest Agrar 3(4):201.

114. Murphy, H. J., et al. 1970. Potato variety trials for 1969. Bull. Me. Agric. Exp. Sta. No. 683, 68 pp.

Describes characteristic of the potato variety Peconomic, resistant to Heterodera rostochiensis.

115. Myagi, E. 1970 [Investigation on diapause in the potato root nematode.] In Materialy 7go Pribaltiiskogo Soveshchaniya po Zashchite Rastenii, Part 1. Elgava, USSR; Ministerstvo Sel'skogo Khozyaistva Latviiskoi SSR 86-88.

Results of tests on hatching time of Globodera rostochiensis larvae from cysts stored in different conditions (dry at room temperatures or damp at field temperatures).

116. Myagi, E. 1976. [Studies of the periods of survival of anabiotic and hatched larvae of the potato nematode.] In Parazitologicheski issledovaniia v Pribaltike; K. P. Lesin'sh, ed. p.178-180.

117. Mygind, H. 1964. Kartoffelalens forkomst i Danmark. Arsoversigter for jordproveundersogelser i 1959, 1960, 1961, 1962, og 1963. Tidsskrift for Planteavl. 68:145-152.

A progress report in surveying for Heterodera rostochiensis in Denmark.

118. Myuge, S. G. 1957. [On the trophic characteristics of the potato stem nematode.] Izvestia Akad Nauk. SSSR Seriya Biol. 3:357-359.

Ditylenchus destructor on potato was determined to be physiologically specific by enzymes excreted by the nematodes. Amylase and a proteolytic enzyme including sulph-hydryl groups were used as indicators.

119. Myuge, S. G. 1959. Chemical method of diagnozing the ditylenchosis of potatoes. Zashchita rast. ot vred. i bolezn 5:41.

1. National Academy of Sciences. 1968. Control of plant parasitic nematodes. Principles of Plant and Animal Pest Control, Volume 4. Publication 1696 National Academy of Sciences, Washington, D.C. 172 pp.

Includes biological, chemical and cultural control, interactions and resistance in plants.

2. Nattrass, R. M. 1942. Notes on plant diseases. Eelworm on potato tubers. East African Agr. J. 7:166.

The author describes the disease and nodules on potato.

3. Naude, T. J. 1947. Control of insect pests. Farming. So. Africa 22:1054-1072.

Pratylenchus pratensis was found on potatoes in South Africa.

4. Nayar, M. and K. K. Mirula. 1969. Breeding for resistance to root-knot nematode affecting potatoes. All India Nematology Symposium, New Delhi, 1969. pp. 57-58

5. Nazarenko, B. P. and Y. P. Boiko. 1972. [Some results of investigations of nematode resistant species and hybrids of potato] In Nematodyne bolezni sel'skokhozyaistvennykh kul'tur i mery bor'by s nimi. Tezisy soveshchaniya. Moskva,Dekabr' 1972. Moscow, USSR; VASHNIL. 79-80.

6. Nazarova, L. A. 1961. Testing of new chemical preparations for fighting the potato nematode. Sbornik studencheskikh nauchno-issledovatel'skika rabot TSKhA 10:241-244.

7. Neal, J. C. 1889. The root-knot disease of the peach, orange and other plants in Florida, due to the work of Anguillula. Bulletin 20, Division of Entomology USDA 31 pp. 21 pls.

An early record of root-knot nematode (Meloidogyne arenaria) on potatoes in Florida.

8. Nelmes, A. J. 1970. The behavior response of Heterodera rostochiensis larvae to aldicarb and its sulfoxide and sulfone. J. Nematol. 2:223-227.

Temik (aldicarb) is a very effective contact toxicant, inhibiting body activity and stimulating abnormal stylet movement. At 10 ppm H. rostochiensis larvae remained paralyzed, the toxic effect being irreversible.

9. Nematological Society of Southern Africa. 1977. Newsletter 9:4-6.

The nematode population has not increased in two years on soils growing potatoes. The soils, once heavily infested with Heterodera rostochiensis, had been planted the previous three years with non-host crops.

10. Netherlands, Laboratorium voor Bloembollenonderzoek, Lisse. [Yearbook 1966/1967 144 pp.][Plant Nematology pp. 47-53]

Aphelenchoides fragariae is reported on stored potatoes.

11. Netherlands, Nationaale Raad voor Landoubwkundig Onderzoek TNO. 1970/1971. [Report on agricultural research in the Netherlands in1970 and 1971.] 244 pp.

Some hybrid derivatives of Solanum vernei are resistant to Heterodera rostochiensis biotype D.

12. Netherlands. 1971. [Yearbook, 1971, Plant Disease Information Service] Wageningen, 146:93.

A method of testing for resistance in potatoes to pathotype C (Heterodera rostochiensis) is presented. Resistance to pathotypes A, B and C occurs in varieties Amalfy, Mara and Proton.

13. Netherlands. 1972. [Yearbook, 1972. Plant Disease Information Service.] Wageningen. 147:105.

Solanum andigenum, S.vernei clones were included in 6,204 potato clones studied for resistance. 53% were resistant to biotype A of Heterodera rostochiensis, and of 483 clones,109 were resistant to biotype C.

14. Netherlands, IVRO. 1973. [48th descriptive list of field crop varieties.] Plant Breeding Abstracts 43:7629, 7634.

The potato varieties Krostar and Procura are resistant to Dutch pathotype A of Heterodera rostochiensis and Amalfy and Mara are resistant to Dutch pathotypes A, B and C.

15. Netherlands. 1973. Annual report, 1973. Institute of Phytopathological Research. Wageningen. 57 pp.

The rate of development on susceptible potato variety differed for pathotypes A and ABCD, (Heterodera rostochiensis), but the rates were the same on six varieties.

16. Netherlands. 1975. [Yearbook of the Phytopathological Service, Wageningen, 1974] 149:96 (Plant Nematology pp. 32-39).

Results of 10-year experiment on effects of Solanum spp. (resistant to Heterodera rostochiensis pathotypes A and ABC) on nematode populations are briefly reported.

17. Netherlands, Commissie Voor de Samenstelling van de Rassenlijst voor Landbouwgewassen. 1975. [50th descriptive varietal list of field crops. 1975] Wageningen, Netherlands. 320 pp.

Mara,deried from Ehud x 22731, is resistant to Heterodera rostochiensis biotypes A, B and C.

18. Netherlands. 1977. [Potatoes (Solanum tubereosum L.)] 52e beschrijvende rassenlijst voor landbouwgwassen. Wageningen, Netherlands. pp. 200-257.

Descriptions of new varieties added to the Netherlands list. Varieties resistant to biotypes A and BC are Pansta, Fen Star and Proton, with the latter being also resistant to biotype D.

19. Newton, H. C. F. and C. M. G. Duthoit. 1954. Stem and bulb eelworm on potatoes. Pl. Path. London. 3:139-140.

Several varieties of potatoes and other crops are invaded by Ditylenchus dipsaci. No infection is found in tubers and the pest was probably of the oat strain.

20. New Zealand, Dept. of Scientific and Industrial Research. 1976. Report for the year ended 31 March 1976. Wellington, N.Z.; Government Printer. 72 pp. (Plant nematology p. 21-22.)

Sodium hypochlorite is useful as decontaminate of potato tubers and soil infested with Globodera spp.

21. Neye, W., H. Stelter, M. Herold and W. Ihle. 1964. Untersuchungen uber die Veranderungen von Nematoden populations (Heterodera rostochiensis Woll.) Typ A beim praktischen Feldanbau von nematodenresistenten Kartoffeln (Sol. andigenum x Sol. tuberosum). Nach. Deut Pflanzenschutzdienst. Berlin 18:64-65.

Effects of nematode-resistant plants on initial infestation was influenced by levels of infestation, cultivation, rigor of crop and biotypes. Resistant crop should not follow heavily attacked susceptible crop because excessive population may cause poor growth in resistant variety.

22. Niegolewski, Z. 1964. Hodowla odpornosciowa przeciw matwikowi ziemniaczanemu (Komunikat). Bint. Int. Hodowli Aklimat. Rosl., 4:85-88.

Hybrid potato crosses (S. tuberosum x S. andigenum) and two German varieties were tested for resistence to Heterodera rostochiensis.

23. Niegolewski, Z, M. Mosiek, J. Piorunski and K. Roguski. 1975. [The new potato variety Tarpan.] Warsaw,Poland; Wydzial Nauk Roiniczych iLesnych PAN. pp 310-311.

Tarpan is resistant to Heterodera rostochiensis and can cause up to 80% reduction in number of cysts in soil in which it is grown.

24. Nieto, L. E. 1975. [Behavior of some potato varieties in soils infested with the cyst nematode Heterodera spp.] Fitopatologia 10(1):3-4

Yields of resistant, tolerant and susceptible varieties with and without nematicide treatment in infested soils.

25. Nieto, L. E. and O. R. Barriga. 1976. [Chemical control trails of potato-cyst nematode Heterodera spp. in Narino, Columbia] Noticias Fitopatologicas 5(1):20-28. Also: Proceedings of the American Phytopathological Society 2:78.

Two varieties from Solanum tuberosum andigena were tolerant of the nematode. Several nematicides used were effective in increasing tuber yield.

26. Nieto, L. E. and R. Barriga. 1977. (Potato cyst nematode control.) Noticias Fitopatologicas 5:20-28.

Application of systemic nematicides to soil infested with potato cyst nematodes increassed vegetative growth and yield. Oxamyl, ethoprophos and fenamiphos were most effective.

27. New Zealand, Department of Scientific and Industrial Research. 175. Report for the year ended 31 March 1975. Wellington, New Zealand, Government Printer. 76 pp. (Plant Nematology p. 23) Also in Potato Abstract 1976 (March) No. 535.

A general account of host range investigations of Globodera rostochiensis.

28. Nigh, E. L., Jr., Editor. 175. Interactions of nematodes withother pathogens attacking plants in the Western States. Technical Bulletin 225. Western Regional Research Project W-56 (1963-1973) and Ag. Exp. Sta., University of Arizona, Tucson.

29. Nikitin, V. S. and B. E. Gushchin. 1976. [The efficacy of fostil used on resistant potato varieties.] In (See Adylova, N. A. 1976). pp. 59-60.

Used at wide concentration range, the chemical was effective in control of Heterodera spp.

30. Nikula, N. I. 1970. [An evaluation of some potato varieties as initial breeding material.] Tr. NII kartof. kh-va, 7:62-65.

Several varieties showed resistance to the stem nematode, Ditylenchus dipsaci.

31. Nirula, K. K. 1961. Control of root-knot nematodes. Indian Potato Journal 3:72-75.

Meloidogyne javanica on potato was controlled with 400 lb-DD, 200 lb-EDB and Nemagon 20 lb/acre. Parathione at 1 lb. acre gave the least control.

32. Nirula, K. K. and K. K. Bassi. 1965. Thermotherapy for root-knot nematode (Meloidogyne incognita)in potato tubers. Indian Potato J. 7:9-11.

Infested seed potatoes were incubated at 40, 45 and 50°C for 24, 48, 96, 144 and 192 hrs to determine best time temperature to eliminate nematodes and retain tuber viability. 48 hr at 45°C killed 98.9% of nematodes and left potatos 100% viable. A longer incubation period at 50°C killed all the nematodes but viability of tubers was severely reduced.

33. Nirula, K. K. and K. K. Bassi. 1965. Effect of French marigold as a trap crop on control of root-knot nematodes in potato fields. Indian Potato J. 7:64-68.

The number of nematodes (Meloidogyne incognita) in soil, roots and tubers was significantly reduced when Tagetes patula was grown with potatoes. Yield also was increased.

34. Nirula, K. K., K. K. Bassi and V. P. Malhotra. 1965. Efficacy of some soil fumigants in the control of root-knot nematodes in potato fields. Indian Potato J. 7(2):95-99.

Chemical control of Meloidogyne incognita in potato fields by soil fumigants is evaluated.

35. Nirula, K. K., C. L. Khushu and B. T. Raj. 1969. Resistance in tuber-bearing Solanum species to root knot nematode, Meloidogyne incognita. Am Potato J. 46:251-253.

Seven of 25 Solanum species showed resistance to the nematode.

36. Nirula, K. K., R. Kumar and K. K. Bassi. 1968. Heat treatment of infested potato fields for the control of root-knot nematodes. Am. Potato J. 45:262-263.

Open smouldering fires in potato fields controlled Meloidogyne incognita in the U.S.

37. Nirula, K. K. and B. T. Raj. 1969. The effect of seasonal variation on the vertical distribution of Meloidogyne incognita in potato fields. All India Nematology Symposium, New Delhi, August 21-22, 1969, pp. 3-4.

Ecology study of vertical distribution of Meloidogyne incognita in potato fields.

38. Nirula, K. K., N. M. Nayar,K. K. Bassi and G. Singh. 1967. Reaction of tuber bearing Solanum species to root-knot nematode, Meloidogyne incognita. Simla-India. American Potato Journal 44:66-69.

88 accessions representing 38 Solanum species were tested for resistance to Meloidogyne incognita. Solanum vernei was most resistant, however, a high degree of resistance was also observed in: S. acaule, S. raphanifolium and S. spegazzinii.

39. Nirula, K. K. and K. D. Paharia. 1970. Role of root-knot nematodes in spread of brown rot in potatoes. Indian Phytopathology 23(1):158-159.

40. Nirula, K. K. and Pushkarnath. 1966. A technique of screening tuber-bearing Solanum for resistance to the root-knot nematode. Euphytica 15:348-352.

Rooted leaflets grown in sterile soil in paper cups were inoculated with Meloidogyne incognita larvae. Incubation for 10 days at 25°C gave good conditions for infection and gall formation. Degree of galling on 12 commerical potato varieties and 10 Solanum species is recorded.

41. Nirula, K. K. and B. T. Raj. 1971. Vertical distribution of Meloidogyne incognita in potato fields. Indian Phytopathol. 24(2):375-378.

42. Noling, J. W. and G. W. Bird. 1979. Control of Pratylenchus pratensis associated with Solanum tuberosum production, 1978. Fungicide and Nematicide Tests. 34:201.

Vydate reduced the root and soil populations more quickly than did the other treatments.

43. Noling, J. and G. W. Bird. 1979. Joint action of nematicides and nitrogen fertilization on control of Pratylenchus pratensis and growth of Solanum tuberosum. J. Nematol. 11.

Three levels of nitrogen fertilization and four nematicides (aldicarb, DD-MIC, carbofuran and thiofanox) were evaluated to root-lesion nematode control and potato yields. No interaction was noted between nematode control and fertilization. Yields were highest in aldicarb and DD-MIC treatments at the higher nitrogen levels.

44. Nollen, H. M. and A. A. Mulder. 1970. A practical method for economic control of potato cyst nematode (Heterodera rostochiensis). Proceedings of the 5th British Insecticide and Fungicide Conference (1969). 3:671-674.

In a Netherlands experiment an 80% kill was achieved with D-D, fumigation. A control program is suggested: year 1 fumigation, year 2 non-host crop, year 3 resistant potatoes, year 4 non-host crop, and year 5 susceptible potatoes. This scheme leads to a steady decline of pathotype A.

45. Nolte, H. W. 1956. Beitrage zum problem der Aktivierung der Heterodera-Zysten. Nematologica 1:72-77.

Investigations on hatching of H. rostochiensis.

46. Nolte, H. W. 1962. Tierische Schadlinge. In: Die Kartoffel, R. Schick and M. Klinkowski, editors. VEB Deutscher Landwirtschaftsverlag, Berlin. pp. 1299-1349.

Includes discussion of potato problems due to Heterodera rostochiensis, Ditylenchus destructor, D. dipsaci, Meloidogyne spp. and Pratylenchus spp.

47. Norton, G. A. 1976. Decision making to spray or not to spray. Shell Agric. p. 3-4.

Gives formula for determining when to use D-D for economical control of Heterodera rostochiensis.

1. O'Brien, P. C. 1979. A localized experession of resistance in Hudson potato to Globodera rostochiensis. J. Nematol. 11:309-310.

Resistant (Hudson) and susceptible (Kennebec) potatoes were used to indicate resistance expression to Globodera rostochiensis in pot tests. In the resistant variety only localized lesions were found and very few larvae reached adult stage.

2. O'Brien, D. G. and E. G. Prentice. 1930. An eelworm disease of potatoes caused by Heterodera schachtii Schmidt. Scottish Journal of Agriculture. 13:415-432.

3. O"Brien, M. J. and A. E. Rich. 1976. Potato diseases, Agriculture Handbook, Agricultural Research Service, United States Department of Agriculture, 474:57-60.

Brief discussion of the biology, symptoms and control of Heterodera rostochiensis, Pratylenchus penetrans, Pratylenchus pratensis, Ditylenchus dipsaci and Meloidogyne.

4. O'Brien, P. C. 1978. Effect of carbofuran, aldicarb, and a resistant host on development of Globodera rostochiensis in potato. Journal of Nematology 10:296.

The potato cultivar Katahdin (susceptible) was exposed to aldicarb or carbofuran in infested soil. Chemical application was made in the furrow at planting at 5.5 kg ai/ha. Neither invasion or population was effected by carbofuran. Aldicarb delayed invasion for 30 days and then reduced the population to 50% of the untreated control. Development of the nematode on the resistant 'Hudson" did not indicate any effect until 4 weeks after planting, then the population declined. Population in the Hudson variety was 30-40% of the control and 20% developed into adults with all becoming males.

5. O'Connor, R. 1949. The potato eelworm. Agr. Ireland 6:197, 199, 201.

Heterodera rostochiensis was first observed in Ireland in 1922. At this time it is widespread and biological and chemical control measures are not likely to be practical in the field.

6. O'Eyduin, J. 1973. [Species and biotypes of potato cyst nematode in Norway.] Nordisk Jordbrugsforskning. 55(4):426-427.

Heterodera rostochiensis biotype A is most common; two populations of the species one like the Dutch biotype C. H. pallida populations correspond to the Dutch biotype D and British biotypes B and E.

7. O'Eydvin, J. 1975. [Nematode resistant potato varieties] Nordisk Jordbrugsforskning 57(2):487-492.

There are 6 resistance-breaking populations of Heterodera rostochiensis in Norway. Resistance-breaking races can develop during continuous cultivation of resistant cultivars, therefore controlled crop rotatation is advised. H. rostochiensis race A

accounts for 98% of potato cyst neamtodes in Norway, but other races and H. pallida also are present.

8. O'Eydvin, J. 1977. [Resistance and tolerance to potato cyst nematode Heterodera rostochiensis Woll. pathotype A among thirteen potato cultivars.] Res. Norw. Agric. 28(3):255-266.

9. Ogawa, Y., M. Nagano, T. Higuchi and M. Ichinohe. 1976. [A round nematode of Heterodera new to Japan sampled from potato growing area in Shimabara, Nagaskai. Proc. Assoc. Plant Prot. Kyushu.

10. Olefir, V. V. 1969. [Resistance to Ditylenchus destructor of some potatoes from a collection from the Ustimov Research Station.] Problemy Parazit. Year 1969. Pt. II pp. 320-322.

A number of wild potato cultivars of Solanum andigenum and S. tuberosum and hybrids of the 'Kameraz' type were tested for resistance to D. destructor. Five wild species and 3 S. andigenum varieties showed resistance.

11. Olefir, V. V. 1972. [Breeding of potato for resistance to potato tuber nematode.] Nematodnye bolezni sel'skokhozyaistvennykh kul'tur i mery bor'by s nimi. Tezisy soveshchaniya. Moskva dekabr' 1972. Moscow, USSR VASHNIL 101-103.

12. Olefir, V. V. 1974. Study of wild species of potatoes for resistance to stem nematodes. Kartopliarstvo 5:13-17.

Pot experiments during 1967-72 were developed to test resistance to 46 wild potato species for resistance to Ditylenchus destructor. Resistant clones were established.

13. Olefir, V. V. 1974. [Forms of potato resistant to stem nematode.] Kartofel' i Ovoshchi 10:34-36.

The results are presented of a study of 487 forms of Solanum andigenum and 22 seedlings from several diploid Solanum species. Lists are given of those forms which proved highly resistant to Ditylenchus dipsaci.

14. Olefir, V. V. 1975. [Resistance to stem nematode in wild potato species.] Kartofel' i Ovoshchi 2:40-41. (Plant Breeding Abstracts 45, 9122].

Solanum species showing a high degree of resistance to Ditylenchus dipsaci were: S. chacoense, S. catarthrum, S. semidemissum and S. sucreuse.

15. Olefir, V. V. and L. M. Turuleva. 1976. [Tests on the resistance of Chilean potatoes. Solanum chilotanum to Ditylenchus] All-Union Res. Inst. of Horticulture, Leningrad, USSR. Kishinev, USSR; Izdatel'stvo "Shtiintsa" pp. 83.

16. Olthof, T. H. A. and J. W. Potter. 1972. Relating nematode populations to crop losses. Canada Agriculture 17:18-19.

Micro-plots of several spring-grown vegetables indicated the northern root-knot nematode, Meloidogyne hapla reduced potato production when 300 nemas power lb soil were present.

17. Omidvar, A. M. 1961. On the effects of root diffusates from Tagetes spp. on Heterodera rostochiensis (Woll.). Nematologica 6:123-129.

Root diffusates of three Tagetes species had no effect on hatch.

18. Omidvar, A. M. 1962. The nematicidal effects of Tagetes spp. on the final population of Heterodera rostochiensis Woll. Nematologica 7:62-64.

Tagetes plants caused a slight reduction in the nematode population.

19. Omonte, A. W. and E. M. Torres. 1976. Comportamiento de ocho variedades de papa al "Nematodo del Nudo de la Raiz" (Meloidogyne incognita Chitwood) en el valle de Huanuco. XIX Convencion Nacional de Entomologia, Oct. 24-29. Huanuco, Peru. p 18.

A screening study of a number of potato varieties for possible resistance to a root-knot nematode, Meloidogyne incognita (acrita).

20. Onions, T. G. 1955. Distribution of hatching within the cyst of the potato root eelworm Heterodera rostochiensis. Quarterly Journal Micro. Sci. 96:495-513.

There was a tendency for eggs near the cyst wall to hatch sooner than those in the center of the egg mass. The tendency may be due to an oxygen tension gradient within the cyst.

21. Oostenbrink, M. 1950. Het aardsppelaaltje (Heterodera rostochiensis Woll.) een gevaarlijke parasiet voor de eenzijdige aardappelcultuur. 230 pp. Versl. Plziekt. Dienst, Wageningen. No. 115.

A comprehensive monograph of 'potato sickness' H. rostochiensis survey and research on this pest in Holland.

22. Oostenbrink, M. 1952. Heterodera rostochiensis: crop rotations in relationship to biology. Proceedings of the International Nematology Symposium and Training Course, Rothamsted Experiment Station. Sept. 3-14, 1951. pp. 43-45.

23. Oostenbrink, M. 1952. De monocyste-cultuur bij het waardplantenonderzoek van Heteroderas]. Tijdschrift over Plantenziekten. 58:84-7.

A description of the single plant-single cyst/container method for obtaining exact data on host plant ranges.

24. Oostenbrink, M. 1954. Over de betekenis van vrijlevende wortelaaltjes in landen tuinbouw. Versl. Plziekt. Dienst Wageningen 124:196-233.

Symptoms of sickness in potatoes due to the root infesting nematode Pratylenchus penetrans.

25. Oostenbrink, M. 1957. Der transport von Pratylenchus penetrans (Nematoda) mit Pflanzgut. Z. Pfl-Krankh. 64:489-490.

Author indicates Pratylenchus penetrans and P. pratensis are not parasites of potato tuber.

26. Oostenbrink, M. 1958. An inoculation trial with Pratylenchus penetrans in potatoes. Nematologica 3:30-33.

Pratylenchus penetrans innoculated into potato did not produce growth effects the first year. However, in the second year retarded growth was apparent. Symptoms were correlated with increased population of nematodes.

27. Oostenbrink, M. 1960. Tagetes patula L. als voorvrucht van enkele land- en tuinbouwegewassen op zand- en dalgrond. Meded. LandbHogeschool, Gent. 25:1065-1075.

Cysts of Heterodera rostochiensis were not harmed under Tagetes sp. crop.

28. Oostenbrink, M. 1961. Nematodes in relation to plant growth. III Pratylenchus penetrans (Cobb) in tree crops, potatoes and red clover. Neth. J. Ag. Sci. 9:188-208.

Nematicides give good control of Pratylenchus penetrans on potato but cost limits their use to lands growing valuable crops.

29. Oostenbrink, M. 1974. Reflections on Heterodera rostochiensis Potato cyst eelworm. Bull OEPP (Organ Eur Mediterr Prot Plant) 4(4):475-480.

The author presents a short review of recent studies and developments in control of the pest. The population of the pest can be greatly reduced with resistant varieties, use of nematicides and early harvest.

30. Orchard, W. R. 1965. Ocurrence of the golden nematode on Vancouver Island, British Columbia. Can. Pl. Dis. Surv. 45:89.

The nematode, Heterodera rostochiensis was found on potatoes in Vancouver Island.

31. Orion, D. 1975. Nematodes of vegetable crops and potatoes and their control. In Scientific Activities 1971-1974 of the Division of Nematology, Institute of Plant Protection, Bet Dagan, Israel. p. 131.

32. Orion, D., H. Krikun and E. Shlevin. 1976. [The nematode Pratylenchus thorni--a new pest in the northern Negev.] Hassadeh 56(6):1104-1106.

33. Osborne, P. 1973. The effect of aldicarb on the hatching of Heterodera rostochiensis larvae. Nematologica 19(1):7-14.

Aldicarb in concentrations greater than 1 ppm, causes temporary inhibition of hatching, but does not impair potential hatch. Aldicarb plus root diffusate, however, do reduce potential hatch. Practical implications are discussed.

34. Osoris, J. 1971. Outbreaks and new records. Venezuela. Golden potato cyst nematode. Pl. Prot. Bull. F. A. O. 19:46.

Heterodera rostochiensis is recorded for the first time in potatoes in Venezuela in the Venezulean Andes.

35. Oteifa, B. A. and T. B. Abdelrahman. 1973. Histopathogenesis of Meloidogyne incognita on roots of aldicarb treated potatoes. 2nd International Congress of Plant Pathology, Minneapolis, Minnesota. No. 1098.

Aldicarb treatment simultaneous with inoculation prevented development of the nematode. When treated 5-days after inoculation, development to the female stage was abnormal and no egg deposition occured.

36. Ou, S. H. 1972. Diseases caused by nematodes. Commonwealth Mycological Institute-Kew, Surrey, England. Pt. VII 325-351.

37. Ouden, H. den. 1960. A note on parthenogenesis and sex determination in Heterodera rostochiensis Woll. Nematologica 5:215-216.

Suggests that inoculations with single larvae produce more females than males.

38. Ouden, H. den. 1960. Periodicity in spontaneous hatching of Heterodera rostochiensis in the soil. Nematologica, Suppl. II. pp. 101-105.

39. Ouden, H. den. 1967. The influence of volunteer potato plants in oats on the population density of Heterodera rostochiensis. Nematologica 13:325-335.

Mathematical models were used to interpret results of influence of volunteer potato plants on larval hatch in a non-host crop. Author concludes there is probably a minor effect in a high density population, but a marked effect in a low density population.

40. Ouden, H. den. 1968. Bestrijding von het aardappelcystenaaltje met de systemische nematociden Temik (2-methyl-2-(methylthio) propionaldehyde O-(methylcarbzmoxl)oxim) en Lannate (methyl-O-(methylcarbamoyl thioacetahydroxamaat). Mededelingen Rijksfaculteit Landbouwwetenschappen Gent, 33:719-728.

In the Netherlands pot tests with 300 mg Temik per 12 kg soil increased potato yields and controlled Heterodera rostochiensis. A field test with Temik at 5 gm per sq mt also gave good control. Lannate was not as effective as Temik in pot tests.

41. Ouden, H. den. 1971. [The effect of some systemic nematicides within potato roots on penetrating or penetrated larvae of Heterodera rostochiensis] Ghent Rijksfac Landbouwetensch Meded 36(3):889-903. (23rd Int. Symp. Phytopharm. and Phytiat.)

Early treatment strongly decreased infection, but treatment eleven days after infection did not limit the number of larvae.

42. Ouden, H. den. 1974. The effect of aldicarb, superficially applied and mixed into the soil, on Pratylenchus penetrans and Heterodera rostochiensis in potatoes. In Simposio Internacional XII de Nematologica, Sociedad Europea de Nematologos, 1-7 Septiembre, 1974, Grandada, Spain. pp. 83-84.

43. Ouden, H. den. 1974. Chemical control of Heterodera rostochiensis Woll. (Organ Eur Mediterr Prot Plant) 4(4):519-521.

44. Ouden, H. den. 1974. The multiplication of three pathotypes of the potato root eelworm on different potato varieties. Netherlands Journal of Plant Pathology 80(1):1-6.

Pot experiments in which pathotypes A, AB, and ABCD were grown on several varieties of potato indicated significant differences between the rates of reproduction of the pathotypes.

45. Ouden, H. den. 1977. The effect of different ways of watering pots after the application of aldicarb on control of the potato cystnematode Heterodera rostochiensis. Neth. J. Plant Pathol 83(1):1-4.

Excessive watering reduced effect of aldicarb solutions.

46. Ouden, H. den and C. Kaai. 1963. Bestrijding van Heterodera rostochiensis en Ditylenchus dipsaci met o, o diethyl O-2 pyrazinylfosforothioaat en VB 744. Mededelingen vande Landbouwhogenschoolende van de Staat te Gent. 28:638-648.

Nemafos applied after planting was not effective in controlling Heterodera rostochiensis in potato VB, 744.

47. Ouden, H. den and J. W. Seinhorst. 1965. De invloed van eukele systemische nematiciden op de vermeerdering van Heterodera rostochiensis op aardappelen van Tylenchorhynchus dubius op stoppelknollen. Med. Landb. Hogesch en Opzoek Stna. Gent 29:810-817.

The systemic nematicides decreased both the maximum rate of increase and the equilibrium density of nematodes on the treated plants.

48. Ouden, H. den and R. F. Van de Veer. 1977. The effect of some systemic nematicides on the control of Heterodera rostochiensis in the field. Netherlands Journal of Plant Phytopathology 85(4):129-137.

The results of four experiments using nematicides were evaluated. The realtionships between effects of nematicides and nematode densities are discussed.

49. Overman, A. J., H. H. Bryan and R. W. Harkness. 1971. Effect of off-season culture on weeds, nematodes, and potato yields on marl soils. Proc. Florida State Hort. Soc. 84:135-139.

Results of mechanical and chemical following and summer cover crops of Sorghum on weed infestation, nematode numbers, and yield of potatoes was studied.

50. Overman, A. J., H. A. Bryan and R. W. Harkness. 1972. Effect of weed control on nematodes and potato (Solanum tuberosum L.) yield in marl types soils. Nematropica 2:8-9, 22.

Criconemoides onoensis and Tylenchorhynchus martini populations were affected by weed control in summer before planting potatoes.

51. Oydvin, J. 1973. [Potato cyst nematode species and races in Norway] Nordisk Jorbrugsforskning 55:426-427.

Heterodera rostochiensis in widespread in southern Norway whee infestations comprise 98% and 1.4% H. pallida.

52. Oydvin, J. 1973. The usefulness of some larvae dimensions to distinguish Heterodera rostochiensis and H. pallida. Nematologica 19:435-442.

Cyst nematodes in Norway are 98% pathotype A of H. rostochiensis. Details of distinguishing morphometric value of the two species (including H. pallida) are discussed.

53. Oydvin, J. 1973. [Species and races of potato cyst nematode in Norway.] Aktuelt Landbruksdep Opplysningstjeneste. Norw. 2:85-88.

54. Oydvin, J. 1975. [Nematode resistant potato varieties.] Nordisk Jordbrugsforskning 57(2):487-492.

The most promising cultivars to substitute for susceptible (to Heterodera spp.) cultivars are the Danish Octavia and Tertus.

55. Oydvin, J. 1977. [Resistance and tolerance to potato cyst nematode Heterodera rostochiensis Woll. pathotype A among 13 potato cultivars.] Forskning vg Forok i Landbruket 28(3):255-266.

Proton and Prevalent were slightly more tolerant than Saturna.

56. Oydvin, J. 1977. [Changes in ability to multiply in mixed populations of pathotype A and C of potato cyst nematode Heterodera rostochiensis

Woll. grown on susceptible, ex. andigena A-resistant and ex. vernie ABC-resistant potato cultivars.] Forskning og Forsok i Landbruket 28(4):409-416.

Cultivar Proton (A & C resistant) was the most effective in controlling the mixed population of the nematodes. Proton had greater resistance to pathotype A than did Saturna (A resistant).

57. Oydvin, J. and B. Hammeraas. 1973. Lethal low temperatures for the cyst content of the potato-root eelworms. Nematologica 19(4):568-569.

The results do not suggest any differences in lethal low temperatures between the Heterodera pallida and H. rostochiensis or pathotypes of the latter.

1. Paasuke, M. and E. Svensson. 1968. Tardigrader i fraston bekampar nematoder. Humus, Sosdala 2:4,5-11.

Tardigrades as biological control agents for Heterodera rostochiensis gave encouraging results. Density of tardigrades was increased when milled peat was worked into top soil. The greater the increase of tardigrades the lower the nematode population and increase in potato yields.

2. Padu, E. 1976. [Study of the activity and isoenzyme composition of dehydrogenases in potato in relation to infection with Heterodera rostochiensis) Eesti NSV Teaduste Akadeemia Toimetised, Bioloogia 25(3):229-236.

Dehydrogenase activity was higher in un-infected susceptible plants than in resistant plants, except for equal activities of glucose-6-phosphate dehydrogenase. When infected, the susceptible plants showed increased activity of glutamate and alcohol dehydrogenases, decreased activity of malate and lactate dehydrogenases. Infected resistant plants showed decreased activity of all dehydrogenases studied, except for glucose-6-phosphate dehydrogenase, which increased in activity.

3. Padu, E. 1977. [Effect of oxidase inhibitors on the host-parasite relationship of potato and potato nematode.] Eesti NSV Teaduste Akadeemia Toimetised, Bioloogia 26(3):185-186.

The oxidase inhibitors (hydroxylamine and sodium diethyl dithiocarbamate) suppressed development of Heterodera rostochiensis in both susceptible (Suliev) and resistant (Spekula) plants changes in physiology and root growth are discussed.

4. Padu, E. 1977. [The activity of phenylalanine-ammonia-lyase (KF 4.3.1.5) in potato plants infested with the potato nematode. Eesti NSV Teaduste Akadeemia Toimetised, Bioloogia 26(2):102-107.

Correlation between enzyme activity and resistance was not significant in either roots or leaves.

5. Pain, B. F. and H. G. M. Hague. 1971. The effect of organo-phosphate and carbomyl-oxime nematicides against the potato cyst eelworm, Heterodera rostochiensis Woll. Mededelingen van de Faulteit Landbouwwetenschappen Rijksuniversitest Gent. 36(1):161-173.

Pot tests with soil drenches of aldicarb, thioazin, methomyl, Mocap and phorate at 1, 2.5 and 5 ppm against the nematode numbers of larvae in roots at four weeks were much reduced with aldicarb. Only phorate increased yield in field trials.

6. Pantyyukhina, A. A. 1975. [Breeding potato varieties resistant to nematodes.] In Immunitet s.-kh rast. k boleznyam i vreditelyam. Moscow, USSR; Kolos. pp. 387-392.

Solanum demissium and wild species are being used to breed for resistance to Heterodera rostochiensis and Phytophthora infestans.

7. Pantyukhina, L. 1973. [Breeding nematode-resistant potato varieties of White Russia.] In. Egorova, G. (editor). The breeding and seed production of crop plants. Riga, Latvian SSR; Zinatne. pp. 120-123.

The highest quality and resistance (to Heterodera rostochiensis) resulted from crosses of 2 forms of Solanum demissum.

8. Pantyukhina, L. A. 1976. [Results and prospects of breeding nematode-resistant potato varieties.] Uradzhai Kartofelevodstvo 3:57-61.

Resistant to Heterodera spp. in the late variety. Ariadne bred from Solanum andigena.

9. Pantyukhin, L. A. 1977. [Selection of nematode-resistant potato varieties in Belorussia.] Izdatel'stvo Uradzhai. 112 pp.

The booklet describes breeding for resistant cultivars for use in Belorussia, where Heterodera rostochiensis is widespread.

10. Paramonov, A. A. and F. I. Bryushkova. 1956. The potato stem nematode (Ditylenchus destructor) and its control. Moscow: Izdatellstov Akademii Nauk SSSR. 112 pp.

A popular bulletin that deals with the more common plant parasitic nematodes. Has a special section on Ditylenchus destructor and other potato nematodes.

11. Pardee, W. D. and V. E. Gracen. 1976. Crops fight back. Breeding resistance into crop plants. Crops and Soils 28(8):15-16.

Resistance to Heterodera rostochiensis in Hudson potato derived from Solanum andigenum.

12. Parris, G. K. 1948. Influence of soil moisture on the growth of the potato plant and its infection by the root-knot nematode. Phytopath. 38:480-488.

The author grew potato plants and nematodes at three moisture levels (31-36%, 27-32% and 24-27%). Reduction in yield and nematodes was greater in dry soils. In fumigated soil yield was highest in wet soils. Nemas entered tubers through enlarged lenticles.

13. Parrott, D. M. 1968. Matings between like and unlike populations of potato cyst nematodes. Report of the Rothamsted Experimental Station 1967, p. 148

14. Parrott, D. M. 1972. Mating of Heterodera rostochiensis pathotypes. Ann. Appl.Biol. 271-273.

Cross-mating of pathotypes A & E indicate that there are two species involved. Author speculates that if a potato variety resistant to A

was grown repeatedly in a dominant A population with a trace of E, that A would decrease and E would rapidly increase.

15. Parrott, D. M. and M. M. Berry. 1974. Inheritance of ability to overcome resistance. Report of the Rothamsted Experiment Station for 1973, Part 1:152-153.

16. Parrott, D. M. and D. L. Trudgill. 1970. Variations in the resistance of Heterodera rostochiensis of potatoes developed from Solanum tuberosum spp. andigena and S. multidissectum. Ann. Appl. Biol. 65:385-391.

Variations in the resistance of andigena clones suggest the presence of more than a single gene for resistance.

17. Parrott, D. M. and D. L. Trudgill. 1972. The resistance of hybrids of Solanum tuberosum spp. andigena and S. multidissectum to Heterodera rostochiensis pathotype E. Plant Pathology 21:86-88.

Some F_1 progeny have resistance supplementary to that conferred by genes H_1 and H_2.

18. Paschalaki-kourtzi, N. and A. C. Antaphy[illegible]u. 1964. Reaction of resistant potato lines to Heterodera rostochiensis in field tests in Greece. Annls. Inst. Phytopath. Benaki, 7(1):46-54.

A resistance-breaking biotype reported on varieties I-3015 and I-2749 which were derived from Solanum tuberosum and S. tuberosum andigena.

19. Pavin, (et al). 1977. Nematode-resistant potato cultivars and methods of using them. Sel'skokkozyaistvennaya Biologiya No. 1, 123-129 from Referativnyi Zhurnal, 10, 391.

Tuber yields of susceptible varieties were decreased by 75-90% and 66-83% in resistant cultivars by potato cyst nematodes (Globodera rostochiensis).

20. Peachey, J. E. 1965. Chemical control. In (See Southey 1965) pp. 238-247.

Discusses plant and soil treatment, equipment and precautions. Numerous references.

21. Peachey, J. E. 1970. Chemical control of plant nematodes. Commonw. Bur. Helminth. Bibliogr. Suppl. Techn. Commun. 36 Supple. IV 35 pp. Abstracts from volume 37 (1968) of Helminthological Abstracts.

22. Peachey, J. E. and S. W. Ashan. 1968. Chemical control of plant nematodes. Commow. Bur. Helminth. Bibliogr. Supl. Techn. Commun. 36. Suppl. 3. 16 pp. Abstracts from Volume 36 (1967) of Helminthological Abstracts.

23. Peachey, J. E. and M. P. Chapman. 1966. Chemical control of plant nematodes. Commonwealth Bureau of Helminthology. Technical communication 36 120 pp.

A bibliography of relevant literature appearing in Helminthological Abstracts from 1932 to 1966.

24. Peachey, J. E., C. A. Collingwood and G. N. Rao. 1963. Control of potato root eelworm in a glasshouse soil with a formulation of methyl isothiocyanate. Pl. Path. 12:84-87.

A kill of 82-85% was achieved when a 20% formulation was added to infested soil. None of the treatments injured the tomato indicator plant.

25. Peachey, J. E. and D. H. Greet. 1965. Control of potato cyst nematode with dazomet. Pl. Path. 14:18.

Tetrahydrodimethylthiadiazine thione or Dazomet, at 350 lb/acre controlled potato cyst nematodes.

26. Peachey, J. E. and D. W. Larbey. 1966. Chemical control of plant nematodes. Commonw. Bur. of Helminth. Tech. Comm. 36. Supplement 1. 20 pp.

Contains all relevant abstracts from volume 34 (1965) of Helminthological Abstracts.

27. Peachey, J. E. and D. W. Larbey. 1967. Chemical control of plant nematodes. Commonw. Bur. Helminth. Bibliogr. Suppl. Techn. Commun. 36. Suppl. 2. 15 pp.

Abstracts from volume 35 (1966) of Helminthological Abstracts.

28. Peachey, J. E., G. N. Rao and M. R. Chapman. 1963. Field tests of experimental and commercial soil sterilants against the potato root eelworm, Heterodera rostochiensis Woll. Ann. Appl.Biol. 52:19-31.

Several fumigant nematicides were applied in field trials against this pest and methyl bromide was best. In order to produce a good yield of potatoes it is necessary to reduce the nematode population by 90%.

29. Persson, S. 1968. Nematoder av slaktet Trichodrous i sydsvenska akerjordar och deras formaga att overfora rattlevirus. Meddn. St. Vaxtsk Anst., 14:167-199.

A southern Swedish survey during 1964-1966 indicated Trichodorus spp. are fairly common; especially in light soils. T. pachydermus was most common. T. primitivus and T. similis were also present.

30. Peters, B. G. 1948. Potato root eelworm, D-D and soil sterilization. II Results for 1946. J. Helminth. 22:123-138.

Nemas had no effect on potato yield. Steam sterilization and DD had beneficial effects even when nemas were not present. DD killed most of the eelworms.

31. Peters, B. G. 1952. Pot tests of nematicides against potato-root eelworm. Pilot tests and methods. Annals of Applied Biology 39:447-456.

DD mixture and ethylene dibromide were effective against Heterodera rostochiensis.

32. Peters, B. G. 1952. Heterodera rostochiensis: chemical control methods. Proceedings of the International Symposium and training course, Rothamsted Experimental Station Sept. 3-14, 1951. pp. 32-42.

33. Peters, B. G. 1953. Vertical migration of potato root eelworm. J. Helminth. 27:107.

Describes a simple apparatus for measuring vertical migration. Migration is inhibited in water-logged soil.

34. Peters, B. G. 1953. Changes in potato root eelworm population with time and depth. Journal of Helminthology 27:113-118.

Most of the population increase occurred 13-19 weeks after inoculation. The population changes are slowest in the topmost soil.

35. Peters, B. G. 1953. The golden nematode in Britain. American Potato Journal 30:226-230.

A brief discussion of the biology, economic importance and contorl of the nematode.

36. Peters, B. G. 1953. Trial of ammoniacal gas liquor against potato root eelworm. Pl. Path. London 2:65-67.

Author uses an excessive amount of ammoniacal gas liquor in pot test (9,000 gal/A) gave a 45% eelworm kill. In a subsequent crop weight and size of tubers was greatly increased and cyst numbers were 3-1/2 times greater than control.

37. Peters, B. G. 1955. The combined use of nematicidal soil fumigants and solubilised chemicals. J. of Helminthology 29:81-86.

Treatment with the fumigant DD leaves active nematodes in the upper 2 inches soil. Surface treatment of the surface with a micellar solution of P-M cresol eliminates the survivors.

38. Peters, B. G. 1961. Heterodera rostochiensis populations density in relation to potato growth. J. Helminthol. R. T. Leiper Sup.pp. 141-150.

Studying the effects of various inoculum levels on potato grown, the author concluded that longer shoots, greater weight of larger tubers occurred in plants exposed to the lowest inoculum level. Multiplication factor of 10X accompanied highest yield. Highest nematode population level resulted from a moderate cyst inoculum.

39. Peters, B. G. and D. W. Fenwick. 1949. Field trials with DD mixture against potato root eelworm. Ann. Appl. Biol. 36:364-382.

Authors report yield increases and population decreases with this material. Also treatment is only useful for one year and heavier soils are more difficult for good results than light sandy soil. Spring applications often leave a taste taint in potatoes treated with this material.

40. Peterson, L. C. and R. L. Plaisted. 1966. Peconic, a new potato variety resistant to the golden nematode. Am. Potato J. 43:450-452.

Resistance to Heterodera rostochiensis in Peconic potato is derived from andigens subsp. The potato was developed and tested in New York for 8 years prior to release. It may only be resistant to the biotype found in Long Island.

41. Petherbridge, F. R., W. A. R. Dillon Weston. 1945. Potato root eelworm. J. Minst. Agric. London 52:264-265.

Authors give a general account of the nematode (Heterodera rostochiensis) and potato problems. Crop rotation and clean seed are the recommended control measures.

42. Philis, J. 1978. Effect of DD, EDB and Dazomet on potato cyst nematode control in clay soils of Cyprus. Nematologica Mediterranea 6:77-81.

Various materials were used to control Globodera rostochiensis in different soils at different moisture levels. Yields were increased 20% at a moisture level of 18% but no increase occurred at 25% moisture.

43. Piegat, M. 1963. [Results of preliminary anatomical-cytological investigations on resistance of potatoes to the potato nematode Heterodera rostochiensis Woll.] Biul. Inst. Ochrony Roslin 21:137-0144.

44. Piegat, M., J. Giebel and A. Wilski. 1966. Buffer capacity and changes in root tissues of susceptible and resistant potatoes invaded by golden nematode (Heterodera rostochiensis Woll.) larvae. Pr. Nauk. Inst. Ochr. Rosl. Warszawa 8:197-204.

In necrotic cells where pH is low, beta-glucoisdase is more active than in giant cells where pH is higher.

45. Piegat, M. and Z. Szozotka. 1965. Porownanie zmian histologicznych obserwowaych w korzeniach ziemniakow pod wplywen zerowania larw matwika ziemniaczanego(Heterodera rostochiensis Woll.) oraz dzialania homogenatu larw i ich evydzielin. Biul. Inst. Ochron. Rosl. 28:189-203.

Nematode larvae, homogenates and secretions of them were compared for histological effects on susceptible and resistant potato roots. Nematode learvae and homogenates caused typical symptoms when injected into roots of susceptible and resistant potatoes. Secretions introduced similar but slighter changes.

46. Piegat, M. and A. Wilski. 1963. Changes observed in cell nuclei in roots of susceptible and resistant potato after their invasion by potato root eelworm (Heterodera rostochiensis Woll.) larvae. Nematologica 9:576-580.

Nuclei in meristematic region of roots of susceptible and resistant potato varieties near heads of invading larvae were observed. Increased mitotic division occurred one or two days after invasion of the susceptible variety. This was after accompanied by enlargement of nucleus and by presence of a number of nucleoli in each nucleus. By the 4th day cavities developed in many nuclei. In resistant plants none of these changes took place.

47. Piegat, M. and A. Wilski. 1965. Cytological differences in root cells of susceptible and resistant potato varieties invaded by potato root eelworm (Heterodera rostochiensis Woll.) larvae. Nematologica 11:109-115.

Susceptible plant roots the cells adjacent to larvae showed a more dense appearance of the cytoplasm than roots not invaded.

48. Pinochet, J. and D. J. Raski. 977. New records of nematodes from Korea, including Partylenchus pandus n. sp. (Paratylenchidae: Nematoda) J. of Nematology 9(3):243-247.

P. elachistus was recovered from potato soil.

49. Pitcher, R. S. 1965. Interrelationships of nematodes and other pathogens of plants. Helminthological Abstracts 34:1-17.

A review article with numerous references, interactions with fungi, bacteria and viruses are discussed, as well as a section on plant responses to parasitism.

50. Pitman, H. A. J. 1946. Eelworm scab of potatoes. J. Dept. Ag. Victoria 44:581-584.

Author gives an account of eelworm scab of potatoes due to Heterodera marioni in various districts of Victoria. Life cycle, host range, control, spread are also discussed. The variety "Snowflake" did not show damage although nematodes invaded the roots.

51. Plaisted, R. L. 1977. Andigena as a source of genetic diversity. Potato Research 20(3):248-259.

One selection of potato has resistance to pathotype A of Heterodera rostochiensis and to root knot nematodes.

52. Plaisted, R. L., M. M. de Scurrah and M. L. Harrison. 1972. Resistance to the potato nematode Heterodera rostochiensis Woll. in clones derived from Solanum vernei. American Potato Journal. 49(9):364.

None of the tetraploid clones derived from Solanum vernei had the range of resistance to Heterodera rostochiensis as the original diploid S. vernei.

53. Plaisted, R. L., H. D. Thurston, L. C. Peterson, et al. 1973. Hudson: a high yielding variety resistant to golden nematode. American Potato Journal 50(6):212-215.

The cultivar is resistant to Heterodera rostochiensis, the resistance due to a dominant gene that is duplex at that locus.

54. Pogosyan, E. E. 1954. [Results of a study of the plant parasitic nematodes of the potato in Armenian, SSR.] Trudi Prob i Tematich. Sovesh. Akad. Nauk SSSR. 3:186-195.

Thirty-five species of nematodes are listed as parasites of potatoes. Ditylenchus destructor is the most serious causing 10-20% loss of crop.

55. Polozhenets', V. M. 1977. [Re-infection of potato plants by bacterial diseases and stem nematode in relation to the area of nutrition.] Kartoplyarstvo 8:38-40. From Referativinyi Zhurnal (1977) 10.55.1273.

No re-infection of potato by Ditylenchus dipsaci by ring rot and black leg was observed on soddy-podzobic soil in the Ukrainian woodlands as a result of alternating diseased and healthy tubers in the row or using different spacing.

56. Polozhenets, V. M. 1978. [Possibility of transmission of bacterial diseases and stem nematode potatoes] Kartopliarstvo 9:89-92.

57. Ponin, I. Y. 1967. [Evaluation of the resistance of wild species and hybrids of potato to Heterodera rostochiensis In: Sveshnikova, N. M. (Editor) (Nematode diseases of crops) Moscow: Izdatelstvo "Kolos", pp. 120-123.

58. Ponin, I. Y. 1971. [Means of controlling the potato nematode, depending upon the degree of soil infections (USSR)]. In Materialy Vsesoyuznogo Koordinatsionnogo soveshchaniya po kharantiny rastenii. Moscow. 59-61.

59. Ponin, I. Y. 1971. [Best nematode-resistant varieties and hybrids of potato.] Puti povysh. urozhainosti polevykh kul'tur. Mezhved. temat. sb 2:140-142. From Plant Breeding Abstracts 45, 2889.

Varieties Antinema, Amaryl, Intenso, Sagitta and Specula are resistant.

60. Ponin, I. Y. 1972. [Study of the self-pollinating lines of nematode-resistant wild potato species.] In Kratkie doklady po voprosam zashchity rastenii (VIII Pribaltuskaya konferentsiya po zashchite rastenii. Part II). Kaunas, USSR, Litovskii Nauchno-Issledovatel'skii Institut Zemledeliya 90-02.

Solanum chacoense f. gibberulosum K-2740 and S. microdontum K-4429 are recommended as sources for breeding resistance to Heterodera rostochiensis.

61. Ponin, I. Y. 1972. [The potato root eelworm in Belorussia. Heterodera rostochiensis] Zashch Rast 4:46-47.

62. Ponin, I. Y., et al. 1976. [Potato parasitic nematodes and the regulation of their numbers.] In (See: Adylova, N. A. 1976) pp. 61-62.

A 10-year-old potato monoculture contained 22 genera, including Ditylenchus destructor and Heterodera rostochiensis.

63. Ponin, I. Y. and R. M. Gladkaya. 1973. [Threshold of pathogenicity of the potato cyst nematode.] Tartu; Institut Zoologii i Botaniki Akademii Nauk Estonskoi SSR 37-38.

Yield losses of 83, 89 and 84% were caused by 50,000 Heterodera rostochiensis larvae in 100 cm^3 soil to resistant potato 61-8/1, susceptible 'Aquila' and susceptible tomato 'Pobeda.'

64. Ponin, I. Y. and R. M. Gladkaya. 1974. [The loss of resistance to nematodes by potatoes.] Zashch Rast 10:53.

65. Ponin, I. Y., L. A. Guskova and R. M. Gladkaya. 1971. [Effect of a soil infestation by the potato cyst nematode on the yield of a resistant potao hybrid 61-8/1] [Bulletin of the All-Union Scientific Research Institute of Plant Protection] 20:33-34.

A potato hybrid (61-8/1) resistant to Heterodera rostochiensis gave excellent yields on uninfested soil but was severely reduced by nematodes in infested soil.

66. Ponin, I. Y., L. A. Pantyukhina and N. N. Timofeev. 1973. [The selection of Heterodera-resistant varieties in Byelorussia.] In Materialy vsesoyuznogo simpoziuma po bor'be s kartofel'noi nematodoi, Tartu, 3-5 iyulya 1973. Tartu; Institut Zoologii i Botaniki Akademii Nauk Estonskoi SSR. 33.

Crosses of susceptible Byelorussian potato varieties with the resistant German varieties Antinema and Spekula have resulted in the development of clones which have resistance to Heterodera rostochiensis.

67. Ponin, I. Y., V. A. Voinilo, R. M. Gladkaya and N. N. Timofeev. 1977. [Nematode-resistant potato varieties and ways of using them] Sel'skokhozyaistvennaya Biologiya 12(1):123-129.

Discussion of the differences in content of phenolics, flavonoids and other organic compounds in un-infected and infected, (Heterodera rostochiensis) potato varieties Ogonek (susceptible) and Ariadne (resistant).

68. Popham, W. L. 1947. Use of chemicals to control golden nematode. Ag. Chem. 2:30-33 & 69.

A brief account of the effect upon Heterodera rostochiensis by soil fumigants. The materials used were DD, carbon disulphide, chloropicrin and 90% propylete dichloride with 10% methyl bromide and none erradicated the nematode.

69. Pratella, G. . 1959. Meloidogyne incognita var. acrita sui tuberi di patata in Italia. Annali della Sperumentozione Agraria 13: Suppl.

Potatoes were badly infected with this parasite in Rovigo, Italy. Control with resistant crops, flooding on use of DD is suggested.

70. Protopopov, G. A. 1970. [Nematodes of potato infected with 'black leg.'] Byulleten Vsesoyuznogo Instituta Gel'mintologii im K. I. Skryabina 4:107-110.

This report deals with an investigation of a relationship of nematodes and the causal agent of black leg.

71. Protopopov, G. A. 1971. [The influence of nematodes and other pathogens on potato yield.] Byulletin Vsesoyuznogo Instituta gel'mintologii im. K. I. Skryabina 6:57-63.

72. Protopopov, G. A. 1971. [The nematode fauna of potato infected with fungi and bacteria in the Karelian ASSR and the Moscow region.] Byulletin Vsesoyuznogo Instituta gel'mintologii im. K. I. Skryabina 6:65-72.

73. Protopopov, G. A. 1972. [Comparative analysis of the nematodes of potato infected by Phytophthora.] In: A. S. Lutta (Editor), Biologicheskie osnovy barby s transmissibnymi i parazitarnymi zabolevaniyami na Severe. Helminthological Institute, Moscow. 73-78.

74. Proudfoot, K. G. 1970. The present status of breeding lines resistant to potato wart and golden nematode in Newfoundland. 4th Conf. Euro. Potato Research, Brest. Proceedings 139-140.

Heterodera rostochiensis pathotypes A & B are widely distributed in Newfoundland, Canada.

75. Proudfoot, K. G. 1977. Breeding varieties resistant to wart and golden nematode for use in Newfoundland. American Potato Journal 54:469-470.

Attempts to combine wart and golden nematode resistance have produced some selections, however, late blight has been a problem with the new selections. Since more than one pathotype occurs in the area, the breeding problem becomes more complex.

76. Proudfoot, K. G. and R. F. Morris. 1972. Chemical control of the golden nematode, Heterodera rostochiensis, greenhouse observations on the use of DPX 1410 as a potato seed piece treatment. Canadian Plant Disease Survey 52(3):105-106.

Heterodera rostochiensis populations were reduced when potato seed pieces were dipped two minutes in oxamyl at 2 and 66/gm/litre. Such treatment was toxic to some varieties.

77. Puente, F. C. de la. 1977. Avances y logros obtenidos para el proyecto peruano de investigacion en papa. Segunda Reunion Latinamericana de Coordinacion de Actividades de Investigacion y Produccion de Papa, Puerto Varas, Chile. Centro Internacional de la Papa y Asociacion Lationoamericana de la Papa. 75-89.

An over-all discussion of the various nematodes associated with potato production.

78. Pupavkina, G. M. 1969. [Method of accumulating Ditylenchus-infected potato tubers] Byll. vses Inst Gel'mint K. I. Skryabina 3:87-89.

Ditylenchus destructor infected stock was obtained by various methods.

79. Pupavkina, G. M. 1971. [A method of culturing Ditylenchus destructor on plant tissue] Byulleten Vsesoyuznogo Instituta Gel'mintologii im. K. I. Skryabina 6:77-78.

Ditylenchus destructor can be cultured on slices of carrot on potato according to the method described.

1. Quanjer, H. M. 1927. Een Aaltjesziekte van de aardappelplant, de aantastingswijze en de Herkomst van Haar Oorzaak, Tylenchus dipsaci Kuhn. Tijdschrift over Plantenziekten. 33:137-172.

2. Quevedo, A., J. E. Simon and H. J. Toxopeus. 1956. Estudios de resistencia a'la "anguilula dorado" de la papa. Inf. Estac. Exp. Agric. de la Molina 30:347, 10-15.

1. Raddatz, E. 1961. Nematoden bekampfung durch resistente Kartoffelsorten. Kartoffelbau. Hamburg. 12:112-114.

'Antinema' a resistant variety to Heterodera rostochiensis begins a new era in the control of the pest. One crop of Antinema in infested soil reduced the infection by 96%, 2 crops by 99% and 3 by 99.9%

2. Radewald, J. D., O. A. Harvey, F. Shibuya and J. Nelson. 1975. A progess report on the control of the root-knot nematode on White Rose potato with granular nematicides. Calif. Agric 29(8):8-9.

Nematicides tested reduced tuber infection to 1-20%. Infestation was reduced to 10-16% (42% infection in controls).

3. Radziwinowicz, J. 1963. Niektore zagadnienia nicieni rodziny Heteroderidae Skarbilowicz 1947. Biuletyn Instytutu Ochrony Roslin. Poznan 21:209-228.

The author gives a general discussion of the family Heteroderidae and the more important species of Heterodera and reviews the positions as regards control, particularly by chemicals and breeding for crop resistance.

4. Raeder, J. M. 1944. Disease of potato in Idaho. Idaho Agr. Exp. Sta. Bull. 254:1-39.

Author notes 1,155 species of plants are attacked by this nematode. Dandelion is mentioned as a host plant. Author also notes that stem nematode Ditylenchus dipsaci only attacks potatoes in a few Idaho fields.

5. Ragozina, I. I. and Z. G. SHepshelev. 1972. [On infection of potato varieties by potato tuber nematode.] In Nematodnye bolezni sel'skokhozyaistvennykh kul'tur i mery bor'by s nimi. Tezisy soveshchaniya. Moskva, dekabr' 1972. Moscow, USSR VASHNIL 103-104.

6. Raj, B. T. and K. K. Nirula. 1969. Effect of crop rotation on nematodes in potato fields. All India Nematology Symposium, New Delhi, August 12-22, 1969 p. 60.

Control of Meloidogyne incognita with a crop rotation program.

7. Raj, B. T. and K. K. Nirula. 1969. Trial on the eradication of root-knot nematodes from potato fields with D-D. All India Nematology Symposium, New Delhi, August 21-22, 1969, 51-52.

Chemical control of Meloidogyne incognita on potato with D-D.

8. Raj, B. T. and K. K. Nirula. 1970. Soil treatment for the control of root-knot nematode on potato (Solanum tuberosum L.). Indian J. Agric. Sci. 40:878-882.

Meloidogyne incognita on potato was controlled by various nematicides during a 3-year assessment period. Several materials significantly reduced the population.

9. Raj, B. T. and K. K. Nirula. 1971. Erradication of root-knot nematode with DD in potato fields. Indian Phytopathology 24:155-158.

800 litres of DD per hectare effectively reduced the population of Meloidogyne incognita and was much more effective than a 200 litres rate.

10. Ramirez, A. H. and O. R. Barriga. 1969. Nematodos asociados con el cultivo de la papa en Columbia. Proc. Soil Crop Sci. Soc. Fla 28:286-292.

Meloidogyne greatly reduced potato yields. Large populations were found at 2,200 and 2,500 m in altitude. None were found above 3,000 m.

11. Rao, G. N. and J. E. Peachey. 1964. Estimating kill of potato-root eelworm. Extracted from Experimental Horticulture No. 11.

An evaluation method to determine Ditylenchus destructor control by chemicals.

12. Rao, G. N. and J. E. Peachey. 1965. The effects of adding larvae of potato cyst nematode to potatoes grown in pots. Pl. Path. 14:15-18.

Inoculation of potato cyst nematode larvae before, at or after planting. Proportion of larvae invading tissue increased as inoculum was increased, but more became cysts when added to pots at plnting or two weeks after planting. Root weights were greatest when larvae were added before planting.

13. Rasche, K. 1961. Über die Wirkungdes Nematizids Trapex auf den Inhalt van nematodencysten. Abstracts of papers given at VIth International Nematology Symposium, Gent. July 24-28, 1961. p. 105.

14. Rasinya, B. P. 1961. [Observations on Heterodera rostochiensis Woll. in Latvian SSR] Trudi Vsesoyuznogo Instituta Zashchili Rasteni 16:116-139.

Discussion of biology and control of Heterodera rostochiensis. Larvae would migrate a maximum of 30 cm toward a potato root. Numerous control materials were used but only Forbiat, carbathion and preparation 23 gave best results.

15. Rasinya, B. P. 1972. [Effect of degree of soil infestation by the pototo cyst eelworm on the intensity of infection of nematode-resistant potato varieties.] In Nematodnye bolezni sel'skokhozyaistvennykh kul'tur i mery bor'by s nimi. Tezisy soveshchaniya. Moskva, dekabr' 1972. Moscow, USSR, VASHNIL 86-87.

16. Rasinya, B. P. 1972. [Results of Basudin and Zinophos treatments in controlling nematodes of the potato.] In Kratkie doklady po voprosam zashchity rostenii. (VIII Pribaltuskaya konferentsiya po zashchite rastenii. Part II). Kaunas, USSR, Litovskii Nauchno-Issledovatel skii Intitut Zemledeliya 92-94.

Neither material was effective against Heterodera rostochiensis. However, 10% Basudin at 22.5 and 67.5 g/m^2 reduced Ditylenchus destructor populations by 37 to 48%.

17. Rebois, R. V., B. J. Eldridge and R. E. Webb. 1974. Reniform nematode effect on tuber yields of four potato cultivars under greenhouse conditions. Journal of Nematology 6:149-150.

There was considerable suberization and yield reduction of the cultivar tubers. Red Pontiac was the most tolerant; it had the highest nematode population, highest total tuber yield and lowest (No. 1) tuber yield reduction.

18. Rebois, R. V., B. J. Eldridge and R. E. Webb. 1978. Rotylenchulus reniformis parasitism of potatoes and its effect on yields. Plant Disease Reporter 62(6):520-523.

After 3.5 months, the nematode populations has increased 3- to 19-fold with cultivars Peconic Katahdin, Red Pontiac and Yampa. The nematode developed on roots, not tubers, but reduced the tuber yield significantly.

19. Rebois, R. V., R. E. Webb and B. J. Eldridge. 1978. Reniform nematode Rotylenchulus reniformis resistance in potatoes, Solanum tuberosum. Proc. Am. Phyto. Soc. 4:218.

Resistance to the remiform nematode was found in potato cultivars. The gene for resistance to R. reniformis is not the same as for resistance to Globodera rostochiensis.

20. Reepmeyer, H. 1973. [Experimentation with phosphoric acid esters at appearance of infection in potatoes and the transfer of tobacco rattle virus.] Meded FAc Landbouwwet Rijksuniv Gent 38(3):1655-1662.

No large distruction of Trichodorus spp. could be observed with nemacur at 0.5 to 4 g ai/m^2. The reduction of spraying, however, was from 40% in control to 4% in treated plots.

21. Reepmeyer, H. 1974. [Research into the effects of the phosphoric acid esters found in bitter pit of potatoes and infection with tobacco-rattle virus.] Int Symp Fytofarm Fytiat 25(2):1655-1662.

22. Rehak, V. 1972. [The use of resistant potato varieties on areas infested by nematodes] Uroda 20:375-376.

Six foreign potato varieties wre tested for resistance to Heterodera rostochiensis. Reduction of cyst numbers in the soil were not significant among the varieties. Best yields came from the varieties Amva and Kiva.

23. Reinmuth, E. 1929. Der Kartoffelnematode (Heterodera schachtii Schmidt). Beitrage zur Biologie und Bekampfung. Ztschr. Pflanzenkrankh. 39:2410276.

Discusses the development of the potato cyst nematode and possibilities for its control.

24. Reinmuth, E. 1955. Zur Biologie und Okologie des Kartoffelnematoden sowie Grundsatzliches zu seiner Bekampfung. Dent. Landwirtschaft 6:336-341.

Author reviews some biological aspects of Heterodera rostochiensis. He finds lower population in soil leads to a higher rate of attack as shown by coefficient of increase of nematodes.

25. Reimuth, E. and J. Schmidt. 1959. Fragen der Populationsdynamik von Heterodera rostochiensis sowie der okologischen Beeinflussung des Kartoffelnematoden-Befalles. Deutsche Akademi der Landwirtschaftswissenschaften, Berlin. Tagungsberichte 20:33-48.

26. Renius, W. 1959. Nematodenbekampfung durch Fruchtfolge. Kartoffelbau. Hamburg. 10:170-171.

Rotation with certain crops effectively decrease Heterodera rostochiensis populations. Four and five year rotations are recommended along with elimination of volunteer potatoes.

27. Riispere, U. R. and A. Yu. Riispere. 1973. [Exogenous influences on the development and sex differentiation of Heterodera rostochiensis.] In Materialy VI Priballiiskoi Nauchno-Koordinatsionnoi Konferentsii po Voprosam Parazitologii, 21-22 iyunya 1973. Vilnius USSR. pp. 135-138.

A high concentration of Robbins' solution shifted the nematode population toward male predominance. In resistant potato the effect was not as great. Differentiation is discussed.

28. Riispere, A. Yu. and U. R. Riispere. 1976. [Comparative study of the reaction of the potato and clover nematodes to the inhibition of the metabolism of their hosts.] In VIII Vsesoyuznoe soveshchnie no nematodnym boleznyam sel'skokhozyaistvennykh kul'tur. Tezisy dokladov i soobshchenii. Kishinev, USSR, Izdatel'stvo "Shtiintsa." 63-64.

Effects of Globodera rostochiensis and G. trifolii on inhibition of host metabolism (potato and clover respectively) are reported.

29. Rimkute M. 1958. [Some investigations into the potato-root eelworm and its control in Lithuania]. Moscow. Izdatelstvo Akademii Nauk. SSSR pp. 287-292.

Host range studies of 96 plants indicated only Solanaceae were hosts. All 100 varieties of potatoes were susceptible in some degree.

30. Riss, R. G. 1956. [The source of infection and means of entry of the potato stem eelworm] Problemi Parazitologii (Trans. Sci. Conf. Para of Ukranian SSR) pp. 302-303.

Chief sources of Ditylenchus destructor are infected seed potatoes and tubers which remain in soil after harvest. After one year without harvest a few immature males were found in cucumber plants but none in several weeds.

31. Riss, R. G. 1962. [Potato stem eelworm and its control.] Kiev: Izdatelstvo Ukrainskoi Akademii Selskokozyaistrennikk Nauk 120 pp.

A monograph on Ditylenchus destructor offers a comprehensive review of all aspects of the subject in and outside the USSR.

32. Ritter, M. 1949. Sur la presence en France de deux petits foyers de nematode dare (Heterodera rostochiensis) espice attaquant les pommes de terre. Comp. Rendus Hebdomadaires des Seances de l'Academie d'Agriculture de France 35:473-475.

Author states the pest is discovered in France.

33. Ritter, M. 1956. Espoirs donnes par la selection de varieties resistantes dans ia lutte contre l'anguillule des racines de la pomme de terre. Phytriatrie-Phytopharmacie. Paris 5(1):41-51.

A review of the American, British, Dutch and German literature on resistance in Solanum spp. to Heterodera rostochiensis and on the breeding of eelworm-resistant potato varieties.

34. Ritzema Bos, J. 1888. L,Anguillule de la Tige (Tylenchus devastatrix Kuhn), et les maladies des plantes dues a ce Nematode. Arch. Mus. Teyler, ser II, T. 3:161-348, 545-88.

This report is one of the earliest regarding Ditylenchus dipsaci symptoms of leaves, stems and malformed top growth of potatoes.

35. Roberts, J. G. 1932. Potato sickness. Gardenere Chronicle 91:129-130.

The author discusses the disease in Scotland caused by Heterodera schachtii. Notes also differences in field and greenhouse symptoms.

36. Roberts, P. A. and A. R. Stone. 1979. Globodera host-ranges in the genus Solanum J.Nematol. 11:313.

35 populations of six Globodera spp. were inoculated on 22 accessions of 19 wild Solanum subgenus Leptostemonum spp. from Old World and the Americas.

37. Robertson, D. 1937. Observations on the potato eelworm Heterodera schachtii. Scottish J. of Agric. 20:264-272.

Author describes growth results from the nematode in various soil types. Yields suggest varietal resistance by Eclipse and Kerr's Pink.

38. Robertson, D. 1939. Varietal resistance of potatoes to the effects of eelworm infestation. Scottish Journal of Agriculture. 22:172-174.

The variety Epicure, Duke of York and Sharpe's Express were the best yielding of the early potato varieties and Kerr's Pink and Golden Wonder were best yielders among late varieties.

39. Robinson, T. and A. L. Neal. 1959. The influence of certain mineral elements on emergence of golden nematode larvae. Proceedings of the Helminthological Society of Washington 26:60-64.

When added to root diffusate from which cations had been removed, a mixture of sodium, potassium, magnesium and calcium caused greater stimulation than did whole diffusate.

40. Rode, H. 1969. [On the behaviour and sensitivity of potato-root eelworm larvae to thermal gradient stimuli within the superoptimal temperature zone.] Nematological 15(4):510-524.

Temperatures above 30°C resulted in marked decrease of locomotion. At 42°C all movement ceased.

41. Rode, H. 1971. [The influence of different temperatures and alternating stimulus on the hatching of the potato nematode larvae.] Pedobiologia 11(2):143-158.

Compared with constant temperatures of 18° or 24°C, alternating temperatures of 18° and 24°C for four day periods did not affect hatch.

42. Rodriquez [illegible], E. 1973. [Preliminary study on the Dorodo nematode of the pota[illegible] Heterodera rostochiensis Woll. in Mexico.] Series Esceuela Nacional de Agricultura Thesis 1973 No. 99. Monograph.

43. Rodriquez Chapa, E. and C. Sosa Moss. 1976. [Studies on the biotype, speed of population increase and pathogenicity of the golden cyst nematode of potato.] In Avances en la ensenanza y la investigation, 1975-1976. Chapingo, Mexico 94.

44. Rodriquez-Kabana, R., P. A. Backman and P. S. King. 1974. Effect of fungicide-nematicide combinations for control of soil-borne diseases in Alabama potato fields. Journal of Nematology 6:150.

Irish potato severely infested with Meloidogyne incognita, Helicotylenchulus dikystera and Rhizoctonia solani (cause of stem canker) were treated with PCNB, sodium azide, and DD.

45. Rodriquez-Kabana, R., P. A. Backman and P. S. King. 1975. Applications of sodium azide for control of soilborne pathogens in potatoes. Plant Disease Reporter 59(6):528-532.

Use of NaN_3 alone would obviate the use of PCNB alone or in combination with nematicides.

46. Rodriquez-Kabana, R. and E. Ingram. 1976. Potato seed-piece treatment with the systemic nematicide phenamiphos for control of plant parasitic nematodes. Nematropica 6(2):81-85.

The lowest used concentration of the nematicide was the only one non-phytotoxic. The degree of control at that concentration (1.8 g/l) ranged from 67-100%, depending on the nematode species.

47. Rodriguez-Kabana, R. 1977. Treatment of potato seedpieces with oxamyl for control of plant parasitic nematodes. Plant Disease Reporter 61(1):29-31.

Seed pieces soaked for 5 min in aqueous solutions oxamyl then planted in pots infested with Meloidogyne incognita, Pratylenchus brachycerus, Tylenchorhynchus claytoini and Hoplalaimus galeatus.

48. Rodriguez-kabana, R. and E. G. Ingram. 1977. Treatment of potato seed-pieces with oxamyl for control of plant-parasitic nematodes. Plant Disease Reporter 61(1):29-31.

The treatment resulted in about 74% fewer of the Tylenchorhynchus claytoni and Hoplolaimus galeatus in the soil than in the control.

49. Rodriguez-Kabana, R. and P. S. King. 1974. Evaluation of fumigant and contact nematicides for control of plant parasitic nematodes in Alabama potatoes. Auburn University Agricultural Experiment Station Highlights of Agricultural Research 21:14.

Of the granular nematicides tested, only nemacur 15G approximated the yield response with DD. Part of the effectiveness of DD is in reducing fungal growth.

50. Rodriguez-Kabana, R. and P. S. King. 1975. Use of sodium azide for control of soil borne pathogens in potatoes. Proceedings of the American Phytopathological Society 2:139.

Root-knot nematode larvae were reduced 59-95% by preplant application of the chemical. Post-emergence increased tuber yield 16.6%.

51. Roebuck, A. 1944. Notes of the economic zoology of Lincolnshire during 1943. Trans. Lincolnshire Nat. Union 36-40.

H. rostochiensis and Anguillulina dipsaci cause damage to potato tubers. Damage continues to spread.

52. Roediger, H. 1960. Zum auftreten des nematoden Ditylenchus destructor (Thorne) an Kartoffeln in Sudwurttemberg-Hohenzollern. Gesunde Pflanzen. Frankfurt 12:221-224.

A review of Ditylenchus destructor pest-host relationships on potato. Transmission is by surface contact and by planting in infested soil.

53. Roer, L. 1973. [Nematode resistant potato varieties.] Aktuelt Landbruksdep Opplysningstjeneste 2:89-94.

54. Roer, L. 1975. [Plant resistance--potato. Survey of the situation in the Scandianavian countries.] Nordisk Jordbrugsforskning 57(5):1065-1068.

Recent work in breeding potatoes for resistance to nematodes is included.

55. Roguski, K. 1973. [The history of potato breeding in Poland and changes in methods introduced since the second world war.] Zaklad Hodowli Eksperymentalnej IZ, Bonin, Poland Biuletyn Intytutu Ziemniaka 11:7-21.

Wild Solanum species have been used in breeding for resistance to Heterodera rostochiensis.

56. Rohde, R. A. 1972. Expression of resistance in plants to nematodes. Annu. Rev. Phytopathol. 10:233-252.

Review of literature dealing with unfavorable host-parasite relationships that lead to resistance. Resistance mechanisms that occur both before and after parasitism are discussed.

57. Romero, M. D. and M. Arias. 1969. [Nematodes of solanaceous plants cultivated in the southern Spanish Mediterranean area]. Boletin de la Real Sociedad Espanola de Historia Natural 67:121-142.

A 121 soil sample survey of crops (including potato) revealed infestation with 29 nematode species.

58. Ronsen, K. 1975. [Variety trails with potatoes at lower areas of Hedmark and Oppland 1967-1973] Forskning og Forsk i Landbruket 26(1):71-92.

Variety trials indicate cv. Saturna is resistant Pathytype A of Globodera rostochiensis.

59. Ross, G. J. S. and D. C. Trudgill. 1969. The effect of population density on the sex ratio of Heterodera rostochiensis; a two dimensional model. Nematologica 15:601-607.

A model was based on the hypothesis that second stage larvae of H. rostochiensis arrived at feeding sites within host plants at random and become females only when they have room to produce large groups of giant cells.

60. Ross, H. 1962. Uber die Vererbung der Resistenz gegen den Kartoffelnematoden in Kreuzungen von Solanum famatinae Bitt. et Wittm. mit Solanum tuberosum L. und mit S. chacoense Bitt. Zuchter 32(2):74-80.

Resistance to Heterodera rostochiensis in Solanum famatinae is carried by 2 independent dominant genes; one is probably identical with the H_1 gene for resistance in S. andigena, the other appears to carry resistance to both common and resistance-breaking races of H. rostochiensis.

61. Ross, H. 1966. Die Zuchtung resistenter Sorten. Proceedings of the 3rd Triennial Conference of the European Association for Potato Research pp. 71-81.

The author considers that Heterodera rostochiensis resistance in Solanum vernei is do to about four major genes specific to pathotype, plus a number of polygens.

62. Ross, H. 1966. The use of wild Solanum spp. in German potato breeding of the past and today. American Potato Journal 43:63-80.

A review of the history and discussion of current problems in potato breeding.

63. Ross, H. 1969. Zuchtung von Kartoffelsorten mit Resistenz gegen Heterodera rostochiensis Woll. Mitt. biol. Bundesanst. Ld-u. Forstw. Berl.-Dahlem 136:59-64.

Resistance in Solanum vernei clones due to a complex of major and minor genes.

64. Ross, H. 1972. Mejoramiento de la papa en Alemania para resistencia a las dos especies de nematodo del quiste. Prospect for the potato in the developing world. International Potato Center, Lima, Peru p. 181-190.

A progress report on breeding potatoes resistant to Globodera rostochiensis.

65. Ross, H. 1972. [Improvement of the potato in Germany for resistance to the two species of cyst nematode.] In French, E. R. (Editor) International Symposiumon key problems and potentials for greater use of the potato in the developing world, Lima, Peru, 17-19 July 1972. Centro International de la Papa 181-190.

A detailed account of work in Germany on breeding resistance in potato to Heterodera rostochiensis and H. pallida.

66. Ross, H. 1976. [Research and potato breeding] Kartoffelbau 27(7):213, 216-217, 219.

A review of genetics of disease resistant potatoes. Includes mention of genes for resistance to Heterodera rostochiensis and white cyst nematode.

67. Ross, H., L. A. Bouwman and P. Behringer. 1974. The action of the resistance genes H1, in potato cultivars ex S. andigena CPC. 1673 and Fb in breeding clones ex S. spegazzinii EBS 510 on cyst formation

in various populations of the potato eelworm Heterodera rostochiensis Woll. Zeitschrift fur Pflanzenzuchtung 71(2):179-184.

68. Ross, H. and C. A. Huijsman. 1969. Uber die Resistanz von Solanum (Tuberarium) arten gengen europaische Rassen des Kartoffelnematoden Theor. appl. Genet. 39:113-123.

Tests of race A and eleven B and mixed B races of Heterodera rostochiensis of different origin revealed that each race had a distinct host range and a distinct aggressivity number.

69. Roth, V. 1973. Die Mechanisierung der bodenprobeentnahme fur die untersuchung auf nematoden-zysten, insbesondere auf zysten des Kartoffel-nematoden (Heterodera rostochiensis Woll.). Akademie der Lanwirtschaftswissenschaften der Deutschen Demokratischen Republik. pp. 101-108.

70. Rothacker, D. 1957. Beitrage zur Resistenzzuchtung gegen den Kartoffelnematoden. I. Prufung von Primitiv-und Wildkartoffeln auf das Verhalten gegenuber dem Kartoffelnematoden. Zuchter 27:124-132.

Many wild and primitive potatoes were tested for resistance to Heterodera rostochiensis. All forms were susceptible except Solanum vernei.

71. Rothacker, D. 1958. Beitrage zur Resistenzzuchtung gegen den Kartoffelnematoden Heterodera rostochiensis Woll. III Untersuchungen uber den einfluss unterschiedlicher Kreuzungspartner auf die Ausloildung verschiedener Knolleigenschaften bei Kartoffelkrenzungen, zugleich ein Beitrag zur zuchtungmethodik. Zuchter 28(3):133-143.

In emphasizing the need to broaden the source of resistance from which resistance to Heterodera rostochiensis is drawn in the resistant lines of Solanum andigena. Rothacker gives data on seed productivity and nematode resistance of various crosses of the nematode-resistant, diploid species, S. vernei with tetraploid S. tuberosum.

72. Rothacker, D. 1960. Arbeiten und Ergebnisse uber die zuchterische Losung phytopathologischer Fragen bei der Kartoffel. Mededelingen Landbouwhogeschool en de Opzoekingsstations van de Staat te Gent 25(3/4):1076-1086.

Crosses of the Solanum subsp. andigena with S. tuberosum have produced clones which gave good yield in infested soil. Nematode populations reduction in the soil ws greater than that found under oats and fallow.

73. Rothacker, D. 1968. Sortiment wilder und kultivierter Kartoffelspecies. des institutes fur Pflangenzuchtung Grob-Lusewitz. Part 2, Investigation results 233 pp.

Tabulation of potato species and their degree of resistance to Heterodera rostochiensis pathotype A.

74. Rothacker, D. 1970. Erfolge, Aussichten und Probleme der Resistenzzuchtung gegen den Kartoffelnematoden Heterodera rostochiensis. NachrBl. dt. PflSchutzdienst, Berl 24(1):18.

Problems in the development of nematode-resistant potato plants are considered.

75. Rothacker, D. 1971. [Development and tendencies in resistance-breeding against the potato nematode Heterodera rostochiensis Woll.] In Probleme der Phytonematologie. Vortrage anlasslich der 10 Tagung uber Probleme der Phytonematologie im Institut fur Pflanzensuchtung Gross-Lusewitz der Deutschen Akademie der Landwirtschaftswissenschaften zu Berlin am 11 Juni 1971. 69-93.

The work in breeding potatoes for resistance to H. rostochiensis is reviewed at length. Tables of wild species and cultivar with resistance to H. rostochiensis are given.

76. Rothacker, D. and H. Stelter. 1957. Beitrage zur Resistenzzuchtung gegen den Kartoffelnematoden Heterodera rostochiensis Woll. II. Untersuchungen uber die Vererbung der Nematodenresistenz bei den Arten S. vernei Britt und Zuchter 27(7):341-350.

The nature of Solanum tuberosum subsp andigena may be due to a single dominant gene. The resistance found in S. vernei appears to be different and is probably polygenic.

77. Rothacker, D. and H. Stelter. 1959. Beitrage zur Resistenzzuchtung gegen den Kartoffelnematoden Heterodera rostochiensis. IV. Das Verhalten von resitenten Bastardklonen aus der Kreuzung zwischen. 29(5):241-251.

Resistant crosses of Solanum tuberosum subsp. tuberosum x S. tuberosum subsp andigenum suffered a temporary growth check due to invasion by Heterodera rostochiensis larvae.

78. Rothacker, D. and H. Stelter. 1971. [Solanum tuberousm spp. andigenum as a source of resistance in breeding for resistance to nematode.] In Probleme der Phytonematologie. Vortrage anlasslich der 10 Tagung uber Probleme der Phytonematologie im Institut fur Pflanzensuchtung Gross-Lusewitz der Deutschen Akademie der Landwirtschaftswissenschaften zu Berlin am 11 Juni 1971. 52-68.

The results of testing Central and South American strains of Solanum tuberosum subsp. andigenum for resistance to pathotypes A and E of Heterodera rostochiensis are given and the use of the strains in breeding for resistance is reviewed.

79. Rowe, R. C. and R. M. Reidel. 1977. Vegetable crop disease reports. S. F. Jenkins, Section Editor. Fungicide and nematicide tests. Results of 1976 32(70):70-133.

Temik 10 G and Vydate 10G were used to reduce populations of Pratylenchus penetrans in potato fields.

80. Rumpenhost, H. J. 1973. [Studies on the occurrence of pathotypes of the potato cyst nematodes in the Federal Republic of Germany] In Probleme der Phytonematologie. Mitteilungen aus der Biologischen Bundesanstalt fur Land- und Forstwirtschaft, Berlin-Dahlem 151:294-295.

Only one pathotype apart from pathotype A has been identified. The discovery of H. pallida has complicated the pathotype studies.

81. Rumpenhorst, H. J. 1975. [Potato nematode pathotypes.] Kartoffelbau 26(9):270-272.

Discussion of designation of H. pallida as a separate species, pathotype classification systems and indentifying German pathotype populations.

82. Rumpenhorst, H. J. 1975. [On the classification of pathotypes of the potato cyst nematodes Heterodera rostochiensis and H. pallida present in the Dederal Republic of German. Nachrichtenbl Dtsch Flanzenschutzd 27(10):145-149.

Pathotypes A and others were found on 33 collection sites.

83. Rumpenhorst, H. J. 1978. [Potato nematodes] Veroff Land- Hauswirtsch Auswertungs- Informationsdienst 432:24.

84. Ryss, R. G. 1962. [Stem nematode of potato and measures for its control.] UKR Akad. s.-kh nauk. Kiev 119 pp.

1. Sabova, M. 1974. Nygolaimus solaniphilus sp.--A new Nygolaimus species from Czechoslovakia. Biologia Bratislava, B (Zoologia 1) 29:101-103.

Nygolaimus solaniphilus was described from soil adjacent to potato roots.

2. Saenz, C. and M.M. de Scurrah. 1975. [Species and races of the potato cyst nematode in the Andean zone]. Fitopatologia 10(2):72.

Heterodera pallida is only species encountered north of 12° latitude. Two new races are described.

3. Saenz, C. and M.M. de Scurrah. 1975. [Morphometrics in the distinction of species and races of the potato cyst nematode]. Fitopatologia 10(2):72.

4. Saenz, M.C. and M.M. de Scurrah. 1976. [Species identification of potato cyst nematodes in andean populations according to the female color sequence]. Nematropica 6(1):1-9.

5. SAFA. 1976. [Seed potatoes]. 28(4):156.

Thirty-one registered varieties are resistant to Heterodera.

6. SAFA. 1977. [The new potato varieties Franzi and Freia]. 29(4):170.

"Franzi" is resistant to race A and the Harmery race of Heterodera rostochiensis.

7. Safyanov, S. 1966. [Fertilizers and stem eelworm]. Zoshch. Rost. Vredit. Bolez. 3:53-54.

Ammonium sulphates 550-600 kg/ha, ammonium nitrate @ 300-350 kg/ha and 400-450 kg/ha has increased potato yield and reduced Ditylenchus destructor population from 7% to 0.2-0.05%.

8. Safyanov, S.P. and M.C. Belyaeva. 1966. [Effect of Ditylenchus destructor on the content of carbohydrate and nitrogenous substances in potato tubers]. Zool. Zh. 45:1875-1877.

Tubers infected with Ditylenchus destrutor contained less water and starch and more dry substance, monosaccharide, disaccharide and nitrogen than did healthy tubers.

9. Saigusa, T. and K. Kesasawa, et al. 1972. [Distribution of Heterodera rostochiensis in Makkari and Rusutsu districts of Hokkaido]. Jap. Jour. Nematology 2:45-46.

Authors present results of an extensive survey for the pest of potatoes in Japan.

10. Saigusa, T. and Y. Kuramochi. 1976. [Soil and plant sampling methods for golden nematode cysts during the florescence with emphasis on the sampling spot of soil.] Res. Bull. Plant Prot. Serv. Jap. Shokubutsu Beoki-Sho, Yokohama 13:11-18.

Results indicate that counts of cysts in roots may be substituted for soil sampling sites.

11. Samuel, G.G. 1948. The potato crop III. The control of potato diseases. Journal of the Royal Agricultural Society of England 109:118-127.

Root eelworm potentially most serious potato pest in Britain. Clear seed, cropping intervals of 4-5 years best treatments.

12. Sanchez, S.D. 1972. [Control of nematodes of the genus Meloidogyne in potatoes with aldicarb]. Fitopatologia 7:15-19 (Es).

Temik 10 g was applied in Mexican potato fields at 0.150 kg/ha at planting, at this rate at planting and 40 days after planting, and double rates for all methods and timing. No significant yield increases were obtained; however, there were differences. Tubers at double rates showed 44.7 and 21% damage and at lower rates at 77.5 and 71.7% respectively.

13. Sand, P.F. 1976. The golden nematode program. Journal of Nematology 8(4):302.

New control methods can eradicate the nematode from host crop land by 1980.

14. Santo, G.S. 1978. Control of Meloidogyne hapla on potato, 1976. Fungicide and Nematicide Tests 33:200-201.

Of twenty-five nematicide treatments, various concentrations and/or combinations of eight granular nematicides applied in various ways, there was no significant difference between any of the treatments.

15. Santo, C.S. 1979. Control of Meloidogyne hapla on potatoes, 1977. Fungicide and Nematicide Tests 34:201.

Nematode populations were reduced by all treatments, but Agramine caused some stunting of plant growth and yield was not significantly higher than control.

16. Sarakoski, M.L. 1976. The distribution of the potato cyst nematode, Heterodera rostochiensis Wollenweber, in Finland. Ann. Agric. Fenn. 15(1):111-115.

First record of the nematode in Ostrobothnia. The survey indicates widespread distribution, including one occurrence north of the Arctic circle.

17. Sarakoski, M.L. 1976. Potato cyst nematode in Finnish Lapland. Nematologica 22(2):223-224.

H. pallida has not been found in Finland and few populations of H. rostohiensis occur in the northern sections. Day-length may effect the distribution.

18. Sarakoski, M.L.. 1977. Cleaning nematode-infested potatoes with sodium hypochlorite, NaClO. Annales Agricultural Fenniae 16(2):137-140.

Sodium hypochlorite with 1% available chlorine was effective in cleaning tubers of Globodera rostochiensis.

19. Sarvari, I., Z. Nagy, and I. Saruari. 1977. [Preliminary results on the production of high-protein potato varieties]. Novenytermeles 26(1):3-10.

From crosses of cultivated varieties and several other species (including Solanum andigenum), some forms were found to have resistance to Heterodera rostochiensis.

20. Sasser, J.N., J. Feldmesser, and G. Fassuliotes. 1951. Control of golden nematode of potatoes with an organic phosphate insecticide. Phytopath. 41:31-32.

A 1% Systox spray (E-1059) did not reduce new cyst formation although exposure of cysts and larvae in direct contact was lethal.

21. Sasser, J.N., F.E. Manser, M.T. Hilborn, and P.N. Mosher. 1976. Plant parasitic nematode populations in Maine. Res. Life Sci. 23(14), 4 p.

Surveys in 1956-58 and 1969 indicate Pratylenchus spp. was the most common, but levels of infestation were low. There were indications of a Pratylenchus-Verticillium association. No evidence of Heterodera rostochiensis was found.

22. Sasser, J.N. and F.W. McLaughlin. 1959. The influence of root-knot infected seed pieces and infested soil on potato production. Phytopath. 49:319.

Yields indicated seed piece was of little importance when planted in root-knot infested soil. Previously infested tubers increased infection.

23. Savchuk, N.A. and O.E. Savchuk. 1972. [The effect of damage to agricultural produce by plant nematodes on the physiological condition of animals]. IN: Nematodnye bolezni sel'skokhozyoistvennykh kul'turi mery bov'by Srimi Tezisy soveshchaniya. Moskva dekabv 1972. Moscow, USSR; Vashnil 31.

When Ditylenchus destructor infested tubers or injected extracts from such tubers were fed or applied to animals, intensity of antibody production was reduced by one half or more and phagocytic activity of leucocytes and the cholesterol content of blood was also reduced.

24. Scheer, E. 1964. Erfahrungen mit dem Anbau der Kartoffelsorte 'Antinema'. Mitt. Biol. Bundanst. Ld-u. Forstiv. 111:29-31.

An appraisal of growing the resistant variety Antinema in Heterodera rostochiensis infested soil is given. In general the continuous growing of this variety gradually reduced the nematode population.

25. Scheibe, K. 1956. Zur Nematodengefarh im Kartoffelbau. Mit. Deutch. Land. Gesellschaft 71:4-6.

A general account of damage, symptoms, life history and control of Heterodera rostochiensis. The only practical control is said to be crop rotation

26. Schick, P. and H. Stelter. 1959. Das Auftreten aggressiver formen des Kartoffelnematoden in der Deutschen Demokratischen Republik. Tagungsber-d. Dtsch. Akad. d. Lanwirtsch. Wiss. 20, pp. 121-130.

27. Schluter, K. 1975. [The potato nematode in Moroco, Heterodera rostochiensis Woll: its distribution and economic importance]. Hommes Terre Eaux 4(16):97-101.

One year interruption of potato culture by maize reduced the nematode population and increased yield by 35%. Fensulfothion increased yield by 23%.

28. Schluter, K. 1976. The potato cyst eelworm Heterodera rostochiensis Woll. in Morocco: its distribution and economic importance. Zeitschrift fur Pflanzenkrankheiten und Pflanzenschutz 83(7/8):401-406.

Heterodera rostochiensis was first observed in Morocco in 1973; it is restricted to the Tetouan and Casablanca areas. In infected fields left fallow or planted with non-hosts, there is a 95% reduction in the nematode population within seven months. A second year of non-host crops can eliminate the nematode. Yield was increased with use of fensulfothion.

29. Schmidt, J. 1954. Zur populationsdynamik des Kartoffelnematoden. Wiss. Z. Univ. Rostock, Math. Naturw. Reibe 4:187-190.

Population increase of Heterodera rostochiensis is less at high than at low of medium initial infestation levels.

30. Schmidt, O. 1961. Moglichkeiten der kartoffelnematodenbekampfung mit Hilfe von Trapex. Kartoffelbau. Hamburg 12:110-112.

Trapex (20% methyl isothiocyanate in xylol) is used to kill Heterodera rostochiensis. Information on application and behavior in soil is included.

31. Schmiediche, P. 1977. Evaluation of clones of Solanum acaule for resistance to Heterodera pallida and H. rostochiensis. Nematropica 7(1):6-7.

32. Schmitt, C.G. 1948. Chemical control of the golden nematode of potatoes. Phytopath. 38:23.

In pot tests at 23 gal. per acre, allyl bromide, D-D mixture, trimethylene bromide, ethylene dibromide, and Iscobrome D were

evaluated against cysts of H. rostochiensis. At 76 gal/A ethylene dibromide and Iscobrome D were said to erradicate this pest.

33. Schneider, J. 1971. [Nematodes of field crops. Potato Nematodes]. IN: Les nematodes des cultures. Journees franciases d'etudes et d'information, Paris (ACTA) 327-348.

An acount of Heterodera rostochiensis dealing with morphology, biology, pathogenicity on potatoes is given. Also subjects of population dynamics, distribution and control are discussed, and brief notes on Ditylenchus destructor, Meloidogyne sp., Pratylenchus penetrans and Trichodorus pachydermus are included.

34. Schonbeck, H. 1974. [The potato root nematode (Heterodera rostochiensis Wollenweber)]. Flugbl. Bundesanst Pflanzenschutz Landwirtsch Bakteriol. Versuchsanst 79, 4 p.

35. Schramm, G. 1975. [Notes from German Federal Republic Resistance to potato nematodes]. Sementi Elette 21(3):45.

Describes 27 resistant potato cultivars registered in the German Federal Republic.

36. Scott. R.A. 1946. Some treatments for seed potatoes. Tasmania Journal of Agriculture 17:229-234.

Hot water of seed potatoes 125°F for 14 minutes is the recommended treatment for Heterodera marioni for all stock introduced into Tasmania.

37. Scotto La Massese, C. and P. Roussel. 1975. [Action of carbofuran and phenamiphos on the rate of multiplication of Heterodera rostochiensis and on the yields of a crop of early potatoes]. Phytiatr. Phytopharm. 24(1):25-36.

Marketable tubers increased from 73.3% in controls to 88.3-90.8% in treated plots.

38. Schander and Krause. 1910. Studium einer Blattfleckenkrankheit an Getreide. Mitt. Kaiser-Wilhelm-Institut Landwirtschaft Bromberg 4:49-52.

An early report of Pratylenchus (Anguillulina) pratensis damage to potatoes (Solanum tuberosum) thought to come from Germany.

39. Scribner, F.L. 1889. Diseases of the Irish Potato. Tenn. Agr. Expt. Sta. Bull. 2:27-43.

Possibly the first report of Pratylenchus in potato tubers by P. scribneri Steiner, 1943.

40. Scurrah, M.M. de. 1972. Prospects for the potato in the developing world. Centro Internacional de la papa. La Molina, Peru, pp. 172-181.

41. Scurrah, M.M. de. 1972. Variability in Heterodera attacking the potato in Peru. IN: French, E.R. (Editor) International Symposium on key problems and potentials for greater use of the potato in the developing world, Lima, Peru, 17-19 July 1972. Lima, Peru; Centro Internacional de la Papa 172-180.

Resistance was broken in all 13 tetraploid clones from U.S.A. and Europe that were tested with nematode populations from Huancayo and Otuzco. The population from Cuzco overcame resistance in all but 5 of the clones. Of 47 diploid clones, only one was resistant to all 3 populations, but there were even fewer cases of resistance in tetraploid lines.

42. Scurrah, M.M. de. 1972. The inheritance of resistance to Heterodera rostochiensis Woll. from Long Island and Peru in S. tuberosum clones with reistance from S. vernei and other species. Dissertation Abstracts International 33B(3):979.

Resistance in clones derived from Solanum vernei was conferred by one dominant gene. Clones from S. vernei and S. andigena were susceptible to Peruvian populations of the nematode, though resistance to one or more of the populations was shown by diploids of S. vernei, S. spegazzinii and S. sanctae rosae. Andean populations of the nematode seem to have much greater genetic variability than do European populations.

43. Scurrah, M.M. de. 1974. Resistance in potato cyst nematode for the Andean region. [58th Annual Meeting of the Potato Asociation of America, Abstract]. American Potato Journal 51(8):280.

Of 10 tetraploid clones tested, none showed resistance to more than one of the four nematode populations (3 Heterodera pallida, 1 H. rostochiensis). The triploid S. juzepczukii clones had good resistance to as many as 3 of the nematode populations.

44. Scurrah, M.M. de. 1977. [Breeding for resistance to the potato cyst nematodes for the Andean region]. Nematropica 7(2):11-12.

45. Scurrah, M.M. de. 1977. [Screening for tolerance to potato cyst nematode]. Nematropica 7(2):12.

46. Scurrah, M.M. de, W.F. Mai and R.L. Plaisted. 1973. More about the potato nematode, Heterodera rostochiensis Woll, in Peru. Amer. Potato J. 50(2):58-61.

Plant reactions and morphometric measurements of the Peruvian nematodes studied indicate a similarity to pathotype E from England.

47. Scurrah, M.M. de, R.L. Plaisted and M.L. Harrison. 1973. Resistance to the potato nematode Heterodera rostochiensis Woll. in colonies derived from Solanum vernei. Amer. Potato J. 50(1):9-18.

Crosses between tetraploids from resistant Svernei EBS181 and tetraploids with resistance from andigena CPC1673 indicate that one of the genes from EBS181 segregates at the same locus as the one from CPC1673.

48. Seale-Hayne Agric. College. 1934. The spread of potato eelworm in consignments of seed potatoes. Report Dept. Pl. Path. Pamphlet No. 42, 5-6.

Spread of cysts were noted in soil, sacks and soil on tubers. Hot water treatment 110° for 20, 30, 60 and 90 minutes was discussed. Potatoes treated for 20 minutes were most vigorous.

49. Sedivy, J. 1969. [Control of Heterodera rostochiensis Woll. by using resistant varieties and nematicides]. Ochrana Rostlin, Prague 5:237-244.

Control results against larvae (biotypes A & B of H. rostochiensis) of the nematode with grass fallow, resistant varieties and chemicals were reviewed. Nematin, Nemagon, sodium salt of DNOC and calcium cyanamide were used in a field averaging 57.7 cysts/100 gm soil. Nematin at 200 g/m^2 applied in fall was most effective. Population level after 3 years with chemical treatment was about the same as that obtained with 3 yrs of resistant varieties.

50. Sedivy, J. and F. Pohojda. 1954. Hadatko bramborove - novy skudce v CSR. Z. Soial. Zemed. Prague 4:1060-1065.

The first occurrence of Heterodera rostochiensis in Czechoslovakia is reported.

51. Seinhorst, J.W. 1949. Stengeloaltjes en knollenaaltjes bij aardappelen. Landbovwkundig Tijdschriff 61:638-641.

Author discusses the symptoms of potato tuber caused by Ditylenchus dipsaci as compact areas with whitish areas extending throughout the tuber. Although firm in texture they later become brown and spongy. D. destructor tubers, however, are superficial infections that appear whitish to dirty brown patches or cavities of soft spongy texture. D. dipsaci often invades leaves but D. destructor does not.

52. Seinhorst, J.W. 1957. Some aspects of the biology and ecology of the stem eelworms. Nematologica 2 (Supplement):355-361.

Discusses host range, races and population dynamics of Ditylenchus dipsaci.

53. Seinhorst, J.W. 1973. Dosage of nematicidal fumigants and mortality of nematodes. Netherlands J. of Plant Pathology 97:180-188.

Data in the literature suggest a linear relation between log dosage of dichloropropene and probit mortality of plant parasitic nematodes. Experiments with dazomet, metamnatrium and methyl isothiocyanate also suggest such a relation.

54. Seinhorst, J.W. and den Ouden. 1971. The relation between density of Heterodera rostochiensis and growth and yield of two potato varieties. Wageningen Nematologica 17:347-369.

Potato varieties "Multa" and "Libertos" were used as indicators in pot tests to investigate inoculation densities effects upon growth. At medium inoculation densities growth was reduced particularly the root system resulting from necrosis of root tips. At higher densities growth was checked almost completely and few tubers were produced.

55 Seinhorst, J.W. and H. den Ouden. 1973. A comparison of the sensitivities of Rotylenchus uniformis and eggs of Heterodera rostochiensis to dichloropropane-dichloropropene mixture. Nematologica 19:394-398.

To kill 50-100% of the H. rostochiensis eggs required 1.7 times as high a dosage of DD as was needed to kill the same percentage of active R. uniformis.

56. Seinhorst, J.W., H. den Ouden, and C.H. Klinkenberg. 1970. Two growth reducing effects of Heterodera rostochiensis on the potato plant. Proc. IX Int. Nem. Symposium (Warsaw, 1967).

In some experiments the relation between density of Heterodera rostochiensis and total weight, weight of stems or weight of tubers was not correlated with the simple relationships expressed by Seinhorst's equation.

57. Sembdner, G. 1959. Uber das Eindringern der Kartoffelnematoden-Larven und ihre Weitrentwicklung in pflanzlichen Geweben. Tagungsberichte Deutsche Akademie der Landwirtschafts Wissenschaften zu Berlin 20:53-55.

Author studies larval development and host tisue reactions in numerous plants.

58. Sembdner, G. 1962. Anatomische Untersuchungen uber die Reaktion von Organen der Kartoffelpflanze auf Begall durch den Nematoden Heterodera rostochiensis Woll. 7 Mitteilung uber Heterodera Arten. Kulturpflanze Berlin 10:383-411.

Heterodera rostochiensis larvae inoculated into various parts of potato plants invaded tubers, stems, stolons, petioles and leaves. Cysts were formed in tubers, stolons and above-ground stems. Giant cell systems developed in roots, stolons and tubers. In above ground stems, however, larvae go straight to vascular strands.

59. Sembdner, G. 1963. Anatomische Untersuchungen uber Reaction von Solanum demissum, Solanum vernei und Solanum andigenum auf Befall durch den Kartoffel nematoden, Heterodera rostochiensis Woll. Zuchter 33(3)97-109.

Physiological reactions of the roots of S. demissum, S. vernei and S. andigenum hybrids inoculated with biotypes A and B of H. rostochiensis were studied. Resistance in these wild potato species include: resistance to entry of larvae, encystment of larvae in the periderm, and interuption of larval development.

60. Sembdner, G. 1964. Anatomische Veranderungen in den Wurzeln einiger Solanaceen nach Befall durch den Kartoffelnematoden Heterodera rostochiensis Woll. Die Kulturpflanze 12:489-517.

61. Semenov, I.A. 1964. [Control of stem nematodes]. Sadi Ogorod. Moscow 6:42-43.

Author presents a popular article on stem eelworm of potatoes. Conducted experiments to prove late planted varieties were less affected by eelworm than early plantings.

62. Semenov, I.A. 1959. [The stem nematode of potato and measures for its control]. Kartofel 2:53-54.

63. Sem, A.K. 1960. Preliminary studies on parasitic nematodes on vegetable crops in Bihar. Indian Agriculturalists 4:113-116.

Meloidogyne jaranica and M. incognita and their effect upon potatoes are discussed. DD gave best field results of four materials tried. Apparently Heterodera rostochiensis was recovered from potato fields in one district.

64. Seppanen, E. 1972. The resistance of some potato varieties to spraing caused by tobacco rattle virus. Maataloustietellinen Aikakauskirja 44:76-82.

65. Sewell, R. 1973. Plant parasitic nematodes from Canada and abroad, 1971. Canadian Plant Disease Survey 53:34-35.

A list of nematodes found in materials submitted to the Nematology section of the Entomology Research Institute during 1971, it includes Heterodera rostochiensis from Newfoundland and British Columbia, Pratylenchus crenatus (Prince Edward Island), and P. penetrans (P.E.I. and New Brunswick).

66. Shapoval, N.M. and Nagva Abdel'Khamed. 1976. [Comparative study of some mycotoxins, bacteriotoxins and nematicidal plant extracts on Ditylenchus destructor]. In (see: Adylova, N.A. 1976).

Substances extracted from Compositae were highly effective in controlling the nematode, but did not harm the potato.

67. Shcherbakov, V.K. 1975. [Problems of immunity in plants]. Vestnik Sel'skokhozyaistvennoi, Nauki, Moscow. No. 3 (231), pp. 77-89.

The resistance of potato to Heterodera is mentioned. Two hybrids (Safitta x Contessa) and (Sagitta x Ora) are given as resistance lines.

68. Sheperd, A.M. 1959. The invasion and development of some species of Heterodera in plants of different host status. Nematologica 4, 253-267.

A general discussion of Heterodera including H. rostochiensis development in different hosts.

69. Sheperd, A.M. 1962. The emergence of larvae from cysts in the genus Heterodera. Tech. Comm. No. 32, Commonw. Bur. Helminth. St. Albans, Herts, 90 pp. Commonw. Agric. Bur., Farnham Royal, Bucks.

A review of factors affecting hatching. Includes extensive reference list.

70. Sheperd, A.M., S.A. Clark and A. Kempton. 1973. An intracellular micro-organism associated with tissues of Heterodera spp. Nematologica 19(1):31-34.

A bacterium-like organism was found in H. rostochiensis from Bolivia. It was abundant in the reproductive system but did not prevent production of fertilized eggs.

71. Sheperd, A.M. and P.M. Cox. 1967. Observations on periodicity of hatching of eggs of the potato cyst nematode, Heterodera rostochiensis Woll. Ann. Appl. Biol. 60:143-150.

Cysts of Heterodera rostochiensis collected from the field at monthly intervals during summer and fall were studied. More eggs hatched in cysts taken from air dried soil than moist soil. Storage of cysts at 30°C caused eggs to hatch sooner than any other storage temperature.

72. Shepshelev, Z. G. 1968. [The potato tuber nematode (Ditylenchus destructor)]. Kartofel'Ovoshchi 13:36-37.

73. Shepshelev, Z.G. 1976. [Complex methods for protecting potato against Ditylenchus destructor (USSR)]. In (see Adylova, N.A. '76), pp. 91-92.

74. Shepshelev, Z.G., Afanaseva, Yu and V. Chikov. 1968. [Cleaning potatoes of stem nematodes by close selection]. Kartofel'Ovoshchi 13:39-40.

75. Shepshelev, Z.G. and N.F. Chernikova. 1971. [Varietal differences in the resistance of the potato to stem eelworm] From: Plant Breeding Abstracts 45, 2150.

Complete resistance to Ditylenchus dipsaci was not found in any of the 79 varieties and 100+ hybrids of potatoes tested. Earliness and resistance were negatively correlated.

76. Shepshelev, Z.G. and N.F. Chernikova. 1975. [The resistance of breeding material to Ditylenchus dipsaci]. Nauch. tr. NII kartof. Kh-va No. 21, pp 151-153. From: Plant Breeding Abstracts 47, 8602.

Solanum chacoense and S. rybinii produced larger numbers of resistant forms than did S. andigenum.

77. Shepsheleva, Z.G. and V.M. Glez. 1975. [The role of fertilizers in reducing damage by the potato stem nematode]. Nauchnye Trudy Nauchno-Issledovatel'skogo Instituta Kartofel'nogo Khozyaistva No. 18:200-207.

78. Shepshelev, Z.G. and V.M. Glez. 1978. [Measures of potato stem nematode control in elite seed tuber production]. In: Zashchita ovoshchnykh bakhchevykh kul'tur i kartofelia ot vreditelei boleznei i sorniakov, p. 129-133.

79. Shmyglya, V.A. 1975. [Zoovectors of viruses and mycoplasmas affecting potatoes]. Zashchita Rasteniy No. 7:39-40.

Rattle virus transmitted by Trichodorus spp.

80. Shumaker, J.R., D.P. Weingartner, J. Watts and R.E. Webb. 1975. Promising potato cultivars for north Florida. Soil and Crop Science Society of Florida. Proceedings 34:167-169.

Varieties Pungo, Hudson, Superior, B7600-26 and B7629-1 were resistant to Corky ringspot, which is transmitted by Trichodorus spp. Wauseon was moderately resistant.

81. Siddiqui, M.R. 1965. Longidorus nixulai n.sp., a parasite of potato plants in Shillong, India; with a key to species of Longidorus (Nematoda:Dorylaimoidea). Proc. Helminth. Soc. Wash. 32:95-99.

This nematode was described from soil about the roots of potato plant.

82. Siddigi, M.R. 1972. Pratylenchus coffeae. CIH Descriptions of Plant-parasitic Nematodes Set 1, No. 6, 3 pp.

83. Sikka, L.C., K.K. Nirula and H.S. Chauhan. 1969. Nature of resistance to Meloidogyne incognita in potato seedling H.C. 294. All India Nematology Symposium, New Delhi, August 21-22, 1969, p. 48.

84. Sinha, S.K. 1964. Leaf culture as a tool in potato breeding. Indian Potato Journal 6:57-58.

A dependable method for screening large populations for root-knot resistance within a short time.

85. Sinijarv, K. 1970. [A complex system for controlling Heterodera rostochiensis]. Sotsialistlik Pollumajandus 25:969-971.

Recommended control of this pest in Estonian SSR is crop rotation and in small plots where rotation is not practical potato culture should be avoided.

86. Sinijarv, K. 1971. [Possibilities for improvement of the quality of seed potatoes in agricultural farming]. Sotsialistlik Pollumajandus 26:778-780.

Seed potato quality has deteriorated because of Ditylenchus destructor and Heterodera rostochiensis. The German variety "Spekula" resistant to H. rostochiensis has been recommended for infested areas in Estonia.

87. Sitterly, W.R. and G. Fassuliotis. 1965. Potato losses in South Carolina due to the cotton root-knot nematode, Meloidogyne incognita acrita. Pl. Dis. Reptr. 49:723.

A severe infection of potatoes is reported if planting is delayed to late March instead of mid-February.

88. Skarbilovich, T.S. 1959. [Hexatylus infection of potatoes.] Trudi Vseoyuznogo Inst. Gelmintholgii im K.I. Skryabina 6:395-400 (Ru).

Leaves, stalks and potato tubers were infected with Hexatylus vigissi. Plants withered and yield was reduced 1/3 - 1/2 normal by the pest. Healthy tubers stored with diseased tubers became infected.

89. Skorik, V. 1972. [Instructions on examining agricultural land for the potato cyst eelworm]. Kurak, USSR: Ministerstvo Sel'skogo Khozyaistva SSSR; Gosudorstvennaya Inspektsiya po Karanitnu Rostenii MSKh SSR po Kurskoi Oblasti, 6 pp.

A popular brochure for agriculturalists describing the disease and symptoms of potatoes caused by Heterodera rostochiensis. Techniques for field irspection and sample analysis is discussed.

90. Skorikov, V.P. 1974. [Control of the potato nematode Heterodera rostochiensis]. Zashch Rast 10:49.

91. Skuhravy, V. and V. Rasocha. 1973. [Problems of the fight against potato pests]. Agrochemia (Bratislava) 13(1):7-119.

92. Small, T. 1955. Report from Jersey 3. Island's battle against the potato root eelworm. Grower London 43:1309,1311,1313.

Heterodera rostochiensis is widespread, however, early potatoes do well. DD-mixture at 45 gpa is profitable but produces a "taint".

93. Smart, G.C., Jr., and B.B. Brodie. 1977. Reaction of Hudson potato to Heterodera rostochiensis. Nematropica 7(1):7.

94. Smart, G.C., Jr. and B.B. Brodie. 1977. Reaction of Katahdin and breeding line M-905-1-1 potato to Meloidogyne incognita. Nematropica 7(1):7.

95. Smith, J. 1977. Integrated control of potato cyst nematode. Int. Pest Control 19(1):6-7, 21.

Pre-cropping soil sampling, rotation, nematicides and resistant and susceptible potatoes are used to control populations of Heterodera rostochiensis.

96. Smith, J. and R.H. Bromilow. 1978. Incorporation of granular nematicides in peat soils for control of potato cyst-nematode (Heterodera rostochiensis, Woll.). Exp. Husb. 33:98-111.

97. Smith, J. and A.G. Whitehead. 1975. The effect of dazomet on potato cyst nematode (Heterodera rostochiensis Woll.) and on King Edward potatoes grown in severely infested peaty loam. Exp. Husb. 29:89-96.

Control was poor and yields low.

98. Smith, L. and C. Ellenby. 1967. Some biological changes in the contents of the cyst of Heterodera rostochiensis during its maturation

The free amino acids present in developing cysts change in proportion (and decrease in quantity) during development. L-glutamine alanine transaminase is most active in the yellow stage. L-glutamine aspartic transaminase is less active and the activity decreases throughout maturation.

99. Sol, H.H. and J.W. Seinhorst. 1961. The transmission of rattle virus by Trichodorus pachydermus. Tijdschr. PIZiekt. 67:307-309.

Only T. pachydernaus, of the four dorylaimoids tested, was able to transmit the rattle virus. One specimen is able to infect a tobacco plant.

100. Soovali, K. 1967. Kartuli-kidurissi levikust ja torjest meie vabariigis. Sotsialistlik Pollumajandus 22:1117-1119.

The potato-cyst nematode, Heterodera rostochiensis, is widespread in Estonia. Carbathion gave 96.6% control when used at the rate of 250 gm in 15 liters of water.

101. Sosa Moss, C. and C. Juerez. 1976. [Pathogenicity of Meloidogyne incognita to potato]. In: Avances en la ensenanya y la investigacion, 1975-1976, Chapingo, Mexico, pp. 95-96.

Cultivar Alpha is very susceptible to M. incognita.

102. Sosa Moss, C., L.I. Miller and A. Stone. 1974. [Studies on cyst nematodes of wild potatoes and other cultivated and noncultivated Solanaceae]. In: Avances en la ensenanza y la investigacion en el Colegia Ppostgraduados, 1973. Chapingo, Mexico, p. 165.

103. Sosa Moss, C. and E. Rodriguez Chapa. 1974. [Identification of the biotypes, rate of population development and evaluation of damage to potato by the golden nematode (Heterodera rostochiensis)]. In: Avances en la ensenanza y la investigacion en el Colegio de Postgraduados, 1973. Chapingo, Mexico, p. 164.

104. Sosa Moss, C. and E. Rodriguez Chapa. 1974. [Evaluation of the behaviour of 14 Dutch potato varieties in relation to the biotype A of the golden nematode (Heterodera rostochiensis)]. Avances en la ensenanza y la investigacion en el Colegio de Postgraduados, 1973. Publ: Chapingo, Mexico, p. 167.

105. Southey, J.F. 1965. Plant Nematology (2nd Edn.), J.F. Southey (Ed.), Technical Bulletin of the Ministry of Agriculture, Fisheries and Food, No. 7, London, 282 pp.

Contains sections on Ditylenchus spp., Meloidogyne spp. and Heterodera spp. A general review of potato root eelworm and several chapters on control.

106. Southey, J.F. 1974. Methods for detection of potato cyst nematodes. Bull. OEPP (Organ Eur Mediterr. Prot. Plant) 4(4):463-473.

107. Southey, J.F. 1978. Plant Nematology (3rd Edn.), J.F. Southey (Ed.). First published 1960 (as Technical Bulletin 7). Ministry of Agriculture, Fisheries and Food. London, 440 pp.

Extensively revised with new chapters on soil-plant environment, nematode interactions with other pathogens, and population dynamics, models and integrated control. The 1965 special section on cyst nematodes in agriculture has been omitted (to be published as Crop Pest Bulletin 187).

108. Southey, J.F. and K.R. Glendining. 1966. The effect of mesophilic anaerobic digestion of sludge on potato root eelworm cysts. J. of Proceedings of the Institute of Sewage Purification, pp. 186-189.

109. Spears, J.F. 1953. Chemical control of the golden nematode. Ag. Chem. Baltimore 8:52-54, 111, 113.

Authors discuss methods and procedure of fumigating infested land with the DD mixture or ethylene dibromide. He also mentions the finding of a potato-root eelworm cyst in New Jersey.

110. Spears, J.F. 1968. The golden nematode handbook, survey laboratory, control and quarantine procedures. United States Department of Agriculture, Agriculture Handbook No. 353, 81 pp.

A review of the history of the nematode as an agricultural pest, its biology and control. Includes extensive discussion of world distribution of the nematode.

111. Spears, J.F. 1968. The golden nematode invades western New York state. Am. Potato J. 45:264-265.

Heterodera rostochiensis was found in western New York which is the first US report outside of Long Island.

112. Spears, J.F. 1969. Golden nematode found in Delaware. Plant Disease Reporter 53:243.

Reports detection of Heterodera rostochiensis in New Castle County, Delaware, the fifth area of North America known to be infested.

113. Spears, J.F., W.F. Mai, and D.O Betz. 1956. A case history of the persistence of Heterodera rostochiensis Woll. in a treated field. Pl. Dis. Reptr. 40:632-634.

A field planted to potatoes in 1944 was fumigated with D-D in 1946 then annually until 1955. The level of viable cysts dropped from 26% before fumigation to 7% in 1947 and none in 1955.

114. Spiers, J.G.C. 1976. Control of the potato cyst nematode by breeding resistant cultivars. Crop Res. News N Z Dep. Sci. Ind. Res. Crop Res. Div. 18:5-9.

A review of breeding for resistance. Some information is given on monogenic and polygenic resistance (Solanum andigena clones and wild Solanum spp.), pathotypes and mechanisms of resistance.

115. Spiers, J.G.C. 1977. Host resistance to the potato cyst nematode. In: Proceedings of the 30th New Zealand Weed and Pest Control Conference, 8-10 August, 1977, Johnsonville, N.Z., pp. 56-60.

Type of soil affected reduction of number of Globodera rostochiensis eggs in resistant Maris Court potato cultivar: reduction was greater in silt soil than in peat soil. Similarly the nematode grown with susceptible Ilam Hardy, increased more in silt than in peat soil.

116. Sprau, F. 1960. Einige Bemerkungen uber Ditylenchus destructor, Thorne, den Erreger der Alchenkratze on Kartoffeln, und sein verstorktes auftreten in den Jahnen 1959 & 1960. Pflanzenschutz Munich 12:151-153.

A review of Ditylenchus destructor on potatoes. It was found that only 16% of the crop from infected seed was clean. Symptoms of D. dipsaci on potato are also described.

117. Sprau, F. 1961. Uber Versuche mit nematodennesistenten Kartoffelstammen und Versuche zur Bekampfung des kartoffelnematoden (Heterodera rostochiensis Woll.) mit chemischen Mitteln in extremen Moorboden. Eur. Pot. J. 4:260-272.

In peat soil Mylone gave better control than Trapex, Vapam or DD. After treatment author suggests the use of resistant material for planting.

118. Sprau, F. 1966. Vergleich verechiedener Methoden zur Feststellung des Kartoffelnematoden (Heterodera rostochiensis Woll.) im Boden. Meded. Rijksfac. Landl. Wet. Gent 31:572-600.

The nematode was found in soils that had been 15 yrs in pasture.

119. Sprau, F. 1967. Untersuchungen uber Methoden zur Prugung auf Nematoden resistenz vof Kartoffelneuzuchtungen. Meded. Rijksfac. LandbWet. Gent 32:476-488.

This paper compares various methods of testing potatoes for resistance to Heterodera rostochiensis. More cysts were formed in pots than in the field and more were formed in greenhouse pots than those placed outside.

120. Sprau, F. 1972. A comparison of the effect on the hatching of Heterodera rostochiensis of resistant potato varieties and stock/scion combinations of resistant and susceptible varieties. XIth International Symposium of Nematology, Reading p. 67 (abstract).

121. Staniland, L.N. 1956. Solubilized chemicals for control of plant nematodes. Nature, London 177:97.

Watering with various solubilized chemicals 2 gal per sq yd to wet top 2-3 inches gave a high degree of control of Heterodera rostochiensis in upper soil layers. The most suitable detergent was a long-chain alky sulphate type.

122. Startseva, L.I. 1973. [Problems in potato breeding and seed production]. Selektsiya i semenovodstvo kartofelya, ovoshch., plod. kul'tur i vinograda. Moscow, USSR: Kolos, pp. 3-7.

Includes a brief review on the work in breeding potatoes for nematode-resistance.

123. Stefan, K. 1968. Wyniki wstepnych badan nad odpornoscia odmian ziemniakow na porazenie przez wegorks ziemniaczaka Ditylenchus destructor Thorne. Biul. Inst. Ziem No. 1 pp. 65-71.

Only Dorssel, Pimpernel and Rode Star were resistant to D. destructor and had good agricultural qualities of the 92 varieties tested.

124. Steiner, G. 1935. Opuscula nematologica II. Proc. Helminth. Soc. Wash. 2:(2) 104-110.

Circumstantial evidence indicated Aphelenchoides solani was a parasite of Irish potato from Cuba. Experimental proof was not available.

125. Steiner, G. 1946. Distribution, host range, character, and significance of the golden nematode as a disease agent. Phytopath. 36:688.

Author discusses the world-wide distribution of this pest, its early discovery, host range, life history and effects upon potato.

126. Steiner, G. 1949. Plant nematodes the grower should know. Proc. Soil Soc. Fla. (1942) 4-B, 72-117.

Pratylenchus leiocephalus Steiner 1949 found and described from surface lesions on potato tubers. Also discussed were the surface lesions caused by P. scribneri which may reach 12,000-15,000 in one tuber.

127. Steiner, G. 1956. The problem of the taxon in the nematode genus Ditylenchus and its agricultural implications. Proc. XIV International Congress of Zoology, Copenhagen, 1956, pp. 377-378.

128. Steiner, G. and E.M. Buhrer. 1933. Recent observations on diseases caused by nematodes. Pl. Dis. Reptr. 17:172-173.

Authors report Anguillulina pratensia has been found in lesions of Irish potato from South Carolina.

129. Stelter, H. 1958. Untersuchungen uber den Kartoffelnematoden, Heterodera rostochiensis Wollenweber. IV. Der einfluss von Mais (Zea mays) auf den Kartoffelnematoden. NachrBl. dtsch. Pfl. SchDienst. Berl. 12:133-135.

No disinfecting qualities of economic consequence can be expected from growing sweet corn as a rotation crop on infested potato fields.

130. Stelter, H. 1963. Weitere Beobachtungen uber den Befall der Bastarde von C.P.C. 1673 und C.P.C. 1685 durch eine Herkunft vom Typ B des Kartoffelnematoden, Heterodera rostochiensis Woll. Nematologica 9:97-100.

High populations of Heterodera rostochiensis type B increased on potato varieties 'Aquila' and 'Sagitta'. 'Spekula' is a biotype A resistant potato. 'Aquila' is a biotype A susceptible.

131. Stelter, H. 1970. Nachweis der Rasse B des Kartoffelnematoden (Heterodera rostochiensis Wollenweber). Nachr. Bl. dt. PflSchutzdienst, Berl. 24:14-15.

Potato varieties 'Tunika' and 'Aquila' were used to attract nematode race B in a soil containing mixture of A & B.

132. Stelter, H. 1970. Eine populations-dynamische Studie uber Typ A des Kartoffelnematoden (Heterodera rostochiensis Wollenweber). NachrBl. dt. PflSchutzdienst, Berl. 24:27-32.

Population dynamics of H. rostochiensis biotype A is discussed in terms of potato and other crops. Populations increase when susceptible potatoes are grown every 6th year; thereafter every crop increases population. Neutral crops reduce population 40-45% in first year to 20-25% in fifth year.

133. Stelter, H. 1971. [Potato nematode (Heterodera rostochiensis Wollenweber]. Series: Deutsche Akademie der Landwirtschaftswissenschaften, Berlin. Wissenschaftliche Abhandlungen, No. 59, Monograph.

In four year study of H. rostochiensis populations from England, Scotland, East Germany and the Netherlands, pathotypes A, B and E were found.

134. Stelter, H., E. Behrens and R. Kuhn. 1977. [Globodera rostochiensis V., 1923 and G. pallida Stone, 1973 - morphology, crossing experiments and host plants]. In 3 Vortragstagung zu Aktuellen Problemen der Phytonematologie am 2.6 1977 in Rostock. Manuskriptdruck der Vortrage 33-58.

Presents a system for formal registration of pathotypes of Globodera spp. on potato. The system is based on host-parasite reactions.

135. Stelter, H. and K.H. Engel. 1975. [Host plants of Heterodera rostochiensis Woll. (race A) and Heterodera pallida (race E) from the family Solanaceae]. Archiv fur Phytopathologie und Pflanzenschutz, 11(3):233-234.

100 species of Solanaceae were tested for susceptibility to Heterodera rostochiensis race A and H. pallida race E. Of over 200 plants tested 136 were shown to be hosts of H. rostochiensis race A and 167 were hosts for H. pallida race E. The reactions of all the plants tested are listed.

136. Stelter, H. and P.C. Gaur. 1969. Beziehung zwischen Zystenvolumen and Zysteninhalt bei Heterodera rostochiensis Wollenweber. Biol. Zentralbl. 88:85-90.

Relationships between cyst volume and cyst contents of Heterodera rostochiensis appear to be parallel factors influenced by nutritional conditions of female.

137. Stelter, H. and G. Meinl. 1962. Die Bermehrung des Kartoffelnematoden Heterodera rostochiensis Woll. bei Berwendung von Zysten verschiedenen Alters und unterschiedlecher Vorbehandlung. Nematologica 8:59-65.

Heterodera rostochiensis cyst increase was studied ove[illegible]iod of years. Cysts at each age reached a maximum of increa[illegible]ay and June then declined in autumn. Same increase pattern existed regardless of cyst storage temperature of room temperature or 4°C. This author concludes rate of increase is an inherent factor only partly influenced by environment.

138. Stelter, H. and G. Meinl. 1967. Die Auswirkungen des Befalls mit Heterodera rostochiensis und Rhizoctonia solani auf Entwicklung und Knollen-entrag von Kartoffelpflanzen in Gefassen. Z. PflKrankh. Pfl.Path. Pfl.Schutz 74:671-675.

Both pathogens together caused growth reductions in potato plants. The nematode was the more serious pathogen. Fungus alone caused no damage. Nema-infected plants required more water per gm of dry matter than healthy plants.

139. Stelter, H. and G. Meinl. 1969. [The influence of infection with Heterodera rostochiensis (Woll.) on the ash-content of potato plants]. Biol. Zentralbl. 88(5):575-582.

With increasing infection the total dry matter decreased but the ash content increased (due to decrease in tuber production).

140. Stelter, H. and G. Meinl. 1974. [On the effets of different levels of osl infestation with Heterodera rostochiensis Woll. on the development and yield of a late potato variety. Arch Pflanzenschutz 10(1):35-41.

141. Stelter, H. and A. Raeuber. 1959. Untersuchungen uber den Kartoffelnematoden (Heterodera rostochiensis Woll.). V. Die Veranderung einer Nematoden-population unter dem Einfluss widerstandsfahiger Kartoffel-Varietaten in einfahrigen Topfriersuchen. Zeitschrift fur Pflanzenkrankheiten (Pflanzenpathologie) und Pflanzenschutz 66:572-582.

Seasonal population levels in pot cultures of resistant and susceptible potatoes were studied. Final levels of larva per gm soil were: susceptible Aquila 657; susceptible crosses 134; resistant crosses 16, 14, 11.

142. Stelter, H. and A. Raeuber. 1960. Untersuchungen uber den Kartoffelnematoden (Heterodera rostochiensis Wollenweber). VIII. Weitere untersuchungen uber die Veranderung einer nematodenpopulation under dem Einfluss wiederstandsfahiger und anfalliger Kartoffel-varietaten in Topfersuchen. Biol. Zbl. 79:454-463.

Population changes of the nematode in pot experiments with resistant and susceptible potato varieties.

143. Stelter, H. and A. Raeuber. 1968. [On the harmfulness of Heterodera rostochiensis]. Biologisches Zentralblatt. 87(1):91-96.

Potato yield reductions in plots with differing densities of the nematode were not linearly related to initial populations.

144. Stelter, H. and A. Raeuber. 1971. [The methodoloy of the resistance-test to Heterodera rostochiensis and the significancy of the results]. Biologisches Zentralblatt 90(3):357-363.

The pot ball test is an effective method. In two years of testing 764 potato breeding lines, only 3.4% of the resistant lines were incorrectly estimated.

145. Stelter, H. and J. Vogel. 1961. Untersuchungen uber den Kartoffelnematoden. VI. Die Beeinflussung der Bodenverseuchung und des Knollen-ertrages durch Sorten verschiedener Reifezeit. Zeitschrift fur Landwirtschaftliches Versuchs und Untersuchungswesen. Berlin 7:5-10.

Low degrees of infection were associated with short growing periods. Potato yields of different varieties were related to degree of nematode infestation and to length of vegetative period of host plant.

146. Steudel, W. 1969. Untersuchungen zur Wirkng einiger Nematizide auf Trichodorus spp. Mitt biol. BundAnst. Ld-u Forstw. No. 136, pp. 77-86.

Aldicarb and metaphenamiphos (Nemacur?) reduced the population of Trichodorus spp. (mostly T. pachydermus) in the upper 20 cm of soil. Treatment could reduce a 40% infection to 5%.

147. Steudel, W. 1974. [Experimental results on the effect of some systemic nematicides on the occurrence of potato corky ring spot caused by tobacco rattle virus]. Nachrichtenblatt des Deutschen Pflanzenschutzdienstes 26:165-167.

Nemacur, Vydate and Curaterr applied at planting reduced the virus effectively.

148. Stevenson, W.R., R.J. Green and G.B. Bergeson. 1976. Occurrence and control of potato black dot root rot in Indiana. Plant Dis. Rep. 60(3):248-251.

Colletotrichum coccodes was not controlled by either of the two chemical mixtures, DD mixture (1,3-dichloropropene, 1,2-dichloropropane and other related chlorinated hydrocarbons) and DD MENCS (DD mixture plus methyl isothiocyanate). Both mixtures, however, greatly reduced or eliminated Pratylenchus penetrants.

149. Stoen, M. 1977. [The potato nematode, pest of potatoes and carrots]. Gartneryrket 67(36):1034-1036.

150. Stone, A.R. 1971. Effect of procesing on measurements of Heterodera rostochiensis larvae. Nematologica 17:167-171.

Commonly used methods of processing larvae for microscopic examination may cause changes in body and stylet size greater than differences between pathotypes. Heat and cold formalin, cause the least changes and should be the standard killing and fixing methods.

151. Stone, A.R. 1972. The round-cyst species of Heterodera as a group. Annals of Applied Biology 71(3):280-283.

Contains table of differential hosts of 3 British pathotypes of H. rostochiensis. Anatomical differences offered as additional evidence for division of the nematodes into two species. H. rostochiensis sensu stricto (pathotype A) and a second species (pathotype B and E).

152. Stone, A.R. 1972. Heterodera pallida n.sp. (Nematoda:Heteroderidae), a second species of potato cyst-nematode. Nematologica 18:591-606.

Pathotypes of Heterodera rostochiensis Woll., 1923 with white or cream colored females are described as H. pallida; subgenus Globodera Skarbilovich, 1959. It has larger larvae having larger speare than H. rostochiensis.

153. Stone, A.R. 1973. Heterodera rostochiensis. C.I.H. Descriptions of Plant-parasitic nematodes. Set 2, No. 17. 2 pp.

Anatomy, distribution, life history and control are discussed.

154. Stone, A.R. 1973. Heterodera pallida. C.I.H. Descriptions of Plant-parasitic Nematodes. Set 2, No. 17. 2 pp.

Includes anatomical description plus brief notes on the host range, distribution and biology of the nematode.

155. Stone, A.R. 1975. Taxonomy of potato cyst-nematodes. Rothamsted Exp. Sta., Harpenden, UK. European Plant Protection Organization Bulletin 5(2):79-86.

Schemes for identifying pathotypes of Heterodera rostochiensis and H. pallida.

156. Stone, A.R. 1977. Recent development and some problems in the taxonomy of cyst-nematodes with a classification of the Heteroderoidea. Nematologica 23(3):273-288.

A review of changes in taxonomy, new techniques and occurrence of pathotypes of Globodera and Heterodera. Presents a revised classification of the superfamily.

157. Stone, A. 1977. Cyst-nematodes--most successful parasites. New Scientist 76(1077):355-356.

Brief report of habit and general ecology. The importance of the production of resistant cultivars is stressed.

158. Stone, L.E.W. 1956. On the control of potato root eelworm (Heterodera rostochiensis Wollenw.) by chlorinated phenol and p-m cresol in solubilized form. Annals of Applied Biology 44(2):292-306.

The chemicals killed half the nematodes in the top 8 inches of soil. The nematicides with rotavation, doubled the potato yield. Soil moisture content was shown to be important in nematicide effectiveness.

159. Stone, L.E.W. and D.P. Webley. 1975. The effect of heat on the hatch of potato cyst eelworms. Plant Pathology 24:74-76.

Cysts of Globodera pallida are more sensitive to high temperatures than are cysts of G. rostochiensis.

160. Stone, L.E.W., D.P. Webley, S. Lewis and E.B. Evans. 1973. The persistence of potato cyst eelworm (Heterodera pallida Stone) under different non-host regimes. Plant Pathol. 22(4):181-183.

Using several cropping regimes with various non-host crops, more than one-third of the original population remained after five years. The evidence indicates the population to be pathotype B.

161. Sturhan, D. 1964. Kreuzungsversuche mit biologischen Rassen des Stengelalchens (Ditylenchus dipsaii). Nematologica 10:328-334.

Though there are remarkable genetic differences between the races, interbreeding in at least ten combinations of nematodes from various crops indicates the races are all of one species.

162. Sturhan, D. 1970. Bemerkungen zum Status der pathotypen des Kartoffelnematoden (Heterodera rostochiensis). Z. Pfl. Krankh. Pfl. Schutz. 77:132-134.

Various data discussed suggest that pathotypes A and B/E represent two similar species.

163. Sushinskaite, D.I. 1970. [Effect of Heterodera infestations on some enzymatic and growing proceses in potatoes]. Esti Pollumojanduse Akadeemia Teaduslike Toode Kogumik. (Sbornik Nauchnykh Trudov Estonskoi Sel'skokhozyaistvennoi Akademii) No. 70:147-148.

Auxins in roots of Heterodera rostochiensis infected potatoes increased about 1 and 1/2 times that of healthy roots. Catalase activity was also greater in roots and leaves of diseased plants.

164. Susinskaite, D. 1976. [Growth and development of galls in relation to the host plant infested with the phytonematode Meloidogyne incognita]. Acta Parasitol. Litu 14:61-65 (Ru).

165. Susinskaite, D. 1976. [Growth and development of giant cells in relation to the host plant infected with larvae of the phytonematode Meloidogyne incognita]. Acta Parasitol. Litu 14:67-71.

166. Sushinskaite, D. and Yu Shlepetene. 1974. [The influence of the host plant on the nematode fauna in the rhizosphere in the presence of Meloidogyne]. Acta Parasitologica Lithuanica 12:211-217.

Meloidogyne incognita larvae were present in largest numbers in potato rhizospheres where they remained the longest time.

167. Svensson, L. 1974. [Spraing disease of potatoes]. Vaxtskyddsnotiser 38:8-14.

The TRV in potatoes is of great concern in southwestern Sweden where it occurs in light sandy soils. British Queen potato is very susceptible. Bintje was most resistant. No further symptom development ocurred in storage. The recommendation for control was to harvest early in rainy years.

168. Sveshnikova, N.M. 1951. [A study of the potato nematode (Heterodera rostochiensis Woll.) in the Soviet Union]. Trudi Zool. Inst. Aka. Nauk. SSSR 9:583-591.

A review of Heterodera rostochiensis on potato.

169. Swarup, G., R.P. Nath and C.L. Sethi. 1967. The plant parasitic nematode genus Rotylenchulus in India. India Phytopathology 20:118-123.

R. reniformis found on potato.

170. Swedish Seed Association. 1970. [Annual Report of the work of the Swedish Seed Association in 1969]. Sveriges Utsadesforenings Tidskrift. 80(2/3),71-139.

Potato varieties resistant to Heterodera rostochiensis are listed.

171. Swedish Seed Association. 1973. [Annual Report of the Swedish Seed Association, 1972]. Sveriges Utsadesforenings Tidskrift 83(2/3):91-146.

Potato varieties Sv68135 and Sv69120 are resistant to eelworm.

172. Swedish Seed Association. 1974. [Annual report of the Swedish Seed Association, 1973]. Sveriges Utsadesforenings Tidskrift 84(2/3):71-141

Potato variety Sv69120 is resistant to virus Y, Phytophthora infestans and pathotype A of Heterodera rostochiensis.

173. Swedish Seed Association. 1975. [Annual reprt of the Swedish Seed Association, 1974]. Sveriges Utsadesforenings Tidskrift (1975) 85(2/3)67-138.

Resistance to Heterodera rostochiensis (biotype A), virus Y and Phytophthora infestans reported for industrial potato variety Sv69120 and four culinary forms.

174. Swedish Seed Association. 1976. [Annual Report of the Swedish Seed Association, 1975]. Sveriges Utsadesforenings Tidskrift 86(3/4):117-201.

Potato variety Stina (formerly SV68120) has resistance to Heterodera rostochiensis and to late blight.

175. Swedish Seed Association. 1977. [Annual Report of the Swedish Seed Association, 1976/77]. Sveriges Utsadesforening Tidskrift 87(4):145-224.

Heterodera (Globdera) rostochiensis resistant potato varieties have bee isolated in Sweden. Varieties also resistant to virus Y and Phytophthora.

176. Switzerland, Changins Federal Agronomic Research Station. 1974. [Report for 1972/1973]. Landwirthschaftliches Jahrbuck der Schweiz 88 (3/4):437-536.

Brief reports on distribution and control of Heterodera rostochiensis, H. pallida and the Trichodorus spp. association with tobacco rattle virus.

177. Sykes, G.B. 1975. The effect of phorate, a wide-spectrum pesticide, on the occurrence of spraing in twelve cultivars of potato. Plant Pathology 24.2, 71-73.

The pesticide reduced spraing necrosis. Ranking of susceptible varieties was not changed significantly.

178. Szczotka, Z. and A. Wilski. 1963. Badania nad wnikaniem i rozwojem larv maturika ziemniaczanego (Heterodera rostochiensis Woll.) w Korzeniach podatnych i odpornych roslin ziemniaka. Biuletyn Instytutu Ochrony Roslin Poznan 21:145-155.

Authors studied larva of Heterodera rostochiensis increase in pot tests with susceptible and resistant varieties.

1. Tacconi, R. and A. Ugolini. 1971. [Investigation and control of Heterodera rostochiensis Woll. on potatoes. Inform Fitopatol 21(17):5-11.

2. Tarte, R. 1968. First record of the occurrence of Heterodera rostochiensis in Panama. Pl. Dis. Reptr. 52:587-588.

A first occurrence record of this pest in Panama.

3. Tarte, R. 1970. [Actual situation of the golden nematode of potatoes in some farms of Cerro Punta.] Facultad de Agronomia, Panama Universidad. 8 pp.

4. Tarte, R. and R. Rodriquez. 1976. [Evaluation of the injuries caused by the nematode Heterodera rostochiensis Woll. to potatoes with emphasis on the development of an integrated system of control.] In Investigationes Agropecuaris 1974/1975, Facultad de Agronomia, Universidad de Panama. pp. 285-340.

Proposes an integrated system of control using nematicides and resistant varieties and susceptible or tolerant ones.

5. Tarte, R. and R. Rodriguez. 1977. [Integrated approach to the control of Heterodera rostochiensis in Panama.] Nematropica 7(1):9.

6. Tarte, R. and R. Rodriquez. 1977. [Evaluation of the resistance of potato cultivars and use of nematicides in the control of Heterodera rostochiensis in Panama.] Nematropica 7(1):9-10.

7. Tarte, R. and R. Rodriguez. 1977. [Relative susceptibility of potato cultivars Alpha and Red Pontiac to attack by Heterodera rostochiensis.] Nematropica 7(1):10-11.

8. Taylor, A. L. 1944. Nematodes on potatoes in the Hastings section of Florida. Plant Disease Reptr. 28:403.

The nematode Heterodera marioni has been found on some sandy fields in Florida.

9. Taylor, A. L., J. Feldmesser and G. Fassuliotis. 1952. An improvement in the method of searching for Heterodera cysts. Plant Disease Reptr. 36:269.

The difficulty in separating cysts from organic debris in wash water has prompted the authors to stain the cysts in Janus green, brilliant green, malachite green and gentian violet.

10. Taylor, C. E. 1977. Nematological Chapter 1, Section 1, Plant health problems of a general nature. In: W. B. Hewitt and L. Chiarappa (Eds.) Plant Health and Quarantine in International Transfer of Genetic Resources. CRC Press. pp. 17-23.

A general discussion of nematode dispersal, establishment, quarantine and plant genetic resources transfer.

11. Tereschchenko, E. F. 1956. [Results of a study of Ditylenchus destructor conducted by the Nemeshaer Experimental Station.] Problemi Parazitologii (Trans. Sci. Conf. of Parasit. of Ukrainian SSR) pp. 307-308.

This pest causes considerable damage in the Ukraine. Considerable control can be achieved by using summer crops (more resistant than spring crops), by an early harvest and by use of healthy seed potatoes.

12. Thompson, H. W. 1949. The potato eelworm in Yorkshire. Yorkshire Agricultural Society Journal. 100:36-43.

13. Thompson, H. W. 1949. The potato eelworm Heterodera rostochiensis Woll. in the United Kingdom. Empire Journal of Experimental Agriculture 17:60-71.

Author gives a review of the nematode problem, biology, locatities, control efficiency, cropping programs, and field sampling of populations.

14. Thompson, H. W. 1959. Potato root eelworm. Technicl Bulletin Ministry Agriculture, Fish and Food, London 7:89-95.

An uptodate account of Heterodera rostochiensis on potatoes in Great Britian, including descriptions of symptoms, spread, and control discussion.

15. Thorne,G. 1942. Distribution of root-knot nematode in high ridge plantings of potatoes and tomatoes. Phytopath. 32:650.

Root-knot nematodes were severe in irrigated fields of Western Nevada. Some correlation with water retention time and severity of infection was indicated.

16. Thorne, G. 1945. Ditylenchus destructor n. sp., the potato rot nematode, and Ditylenchus dipsaci Filipjey, 1936, the teasel nematode. Proceeding Helminth. Soc. Washington. 12:27-34.

The two nematodes once considered to be Ditylenchus dipsaci were separated.

17. Thornley, J. H. M. and J. J. Hesling. 1972. Models describing sex ratio data in Heterodera rostochiensis. 1. Environmentally Determined Sex. Nematologica 18:563-570.

The model is based on the assumption that sex of a larva is irreversibly determined by nutrition at an early phase. It suggests useful approaches to further experimentation.

18. Thornely, J. H. M. and J. J. Hesling. 1972. Models describing sex ratio data in Heterodera rostochiensis. II. Genetically determined sex. Nematologica 18:511-579.

The predictions of the model have reasonable agreement with actual data.

19. Thurston, H. D. 1978. Potentialities for pest control management in potatoes. In Pest Control Strategies, E. H. Smith and D. Pimentel (Eds.). Academic Press, Inc., pp. 117-135.

Discusses control through use of chemicals, crop rotation, and resistant cultivars. Resistance to Heterodera spp., Meloidogyne spp. and Pratylenchus penetrans is known.

20. Titkin, N. V. 1958. [The resistance of potato to the potato nematode Heterodera rostochiensis Woll.] Dokladi Vsesoyuzoni Ordena Lenina Akademii Selskokhozyaistvennikh Nauk Imeni V. I. Lenina. 9:24-28.

Solanum ballsii was fully resistant to Heterodera rostochiensis as were hybrids obtained on cross pollination with mixed pollen of S. phureja and S. schreiteri. S. catarthum and one of its hybrids was also highly resistant.

21. Tiktin, N. V. 1958. Control of the potato root eelworm by the development of resistant varieties. Papers on Helminthology presented to Academician K. I. Skryabin on his 80th birthday. Moscow: Izdatelstvo Akademii. Nauk SSSR, pp. 371-375.

136 varieties of wild and cultivated potato species were tested for resistance to Heterodera rostochiensis. Resistance was found in Solanum ballsii, S. catarthum and hybrids of both with cultivated species. S. andigenum resistance varied over a wide range.

22. Tiktin, N. V. 1959. [Resistance to the potato nematode.] Kartofel. 4(1):47-49.

Tests showed that Solanum ballsii and S. catarthum possessed high resistance which was transferred to hybrid progeny. Individual plants of S. andigenum showed some resistance.

23. Tiktin, N. V. 1960. [Resistance of potatoes to Heterodera rostochiensis.] Tezisi Dokl. Nauchnoi Konf. Vses. Obshch. gelm. Dec. 15-20. 1960,pp. 142-143.

Study of resistance involves the hybridization of Solanum andigenum, S. vernei and S. catarthrum.

24. Tiktin, N. V. 1961. [Study of the resistance of potatoes to Heterodera rostochiensis.] Trudi Vsesoyuznogo Instituta Zashchiti Rasteni, 16:153-162.

Resistance to H. rostochiensis was highest in Solanum ballsii. Some clones and seedlings of S. tuberosum andigena and interspecific hybrid crosses between S. catarthum with selected varieties were resistant.

25. Time, E. K. 1972. [Resistant potato varieties in the fight against eelworm.] Bonde Vennen 20:64-65.

The following potato varieties were listed as resistant to pathotype A. of Heterodera rostochiensis.

26. Timofeev, N. N. and I. Y. Ponin. 1975. [The effect of various orders of anti-nematode rotation of crops with resistant potato varieties on the numbers of Heterodera rostochiensis.] Byulleten' Vsesoyuznogo Instituta Gel'mintologii im. K. I. Skryabina 15:98-101.

A 90% reduction of infection in the soil resulted from 1st year lupin, 2nd year winter wheat and 3rd year resistant potatoes.

27. Tobar Jimenez, A. 1966. Tylenchorhynchus maraillatus n. sp. componente de la microfauna de los suelos andaluces. Revta iber. Parasit 26:163-169.

The new species was found in sandy soil in Cadiz, Spain around roots of Solanum tuberosum.

28. Torres, H., E. R. French and L. W. Nielsen. 1970. Potato diseases in Peru, 1965-1968. Plant Disease Reptr. 54:315-318.

A general survey of potatoes in Peru indicated the following pests were involved: Heterodera rostochiensis, Nacobbus serendipiticus bolicianus and Meloidogyne spp.

29. Toxopeus, H. J. 1953. On the significance of multiplex parental material in breeding for resistance to some diseases in the potato. Euphytica. Wageningen. 2(2):139-146.

Resistance genes appear to be dominant, but the situation is complex in the tetraploid potato.

30. Toxopeus, H. J. 1954. De huidige stand van het kweken op resistentie tegen aardappel-moeheid. Lard. Tijdschrift 66(8):537.

A preliminary resistance report of Solanum andigenum crosses with local varieties produces resistance varying from 50-80% against Heterodera rostochiensis.

31. Toxopeus, H. J. 1956. Some remarks on the development of new biotypes in Heterodera rostochiensis that might attack resistant potato clones. Nematologica 1:100-101.

Author notes the possibility of biotype development and discusses conditions necessary for development. He also encourages a broader search for resistant varieties.

32. Toxopeus, H. J. 1958. Over de aard van de resistentie tegen het aardappelcystenaaltje en over het nieuw opgetreden ras van deze parasiet. Zaadbelangen. 's-Gravenhage, 12(5):68-71.

In this lecture Toxopeus discusses the influence of a resistant potato grown in infested soil on the size of the nematode population present. He also includes a discussion of resistance-breaking types found in Scotland, Holland and Peru and suggests possible ways of overcoming the problems resulting from their occurrence.

33. Toxopeus, H. J. and C. A. Huijsman. 1952. Genotypical background of resistance to Heterodera rostochiensis in Solanum tuberosum, var. andigenum. Nature 17-:1016.

In crosses between S. tuberosum and S. tuberosum var. andigenum, the resistance in some progenies was determined by one dominant gene with tetrasomic inheritance. In other progenies it was assumed that resistance was caused by occurrence of two genes.

34. Toxopeus, H. J. and C. A. Huijsman. 1953. Breeding for resistance to potato root eelworm. I. Preliminary data concerning the inheritance and the nature of resistance. Euphytica 2:180-186.

Intercrossing of Solanum andigenum gave a progeny segregating for resistance in accordance with a simple dominant factor and tetraploid inheritance.

35. Trentini, L. 1975. [Preliminary studies of the behaviour of a Heterodera rostochiensis population in the Forli area toward resistnat lines of Solanum.] Informatone Fitopatologico 25(11):13-19.

Varieties derived from S. tuberosum andigena and from S. vernei proved to be the most resistant. No pathotypes were found in the local population capable of overcoming this resistance.

36. Trantaphyllou, A. C. 1973. Nematode genetics in relation to breeding for plant resistance. Department of Genetics, N. C. State University, Raleigh, N.C. 27607. In International Congress of Plant Pathology (2nd), Minneapolis, Minn. , Sept. 5-12, 1973.

37. Triffitt, M. H. 1929. Preliminary investigations on mustard as a factor inhibiting cyst formation in Heterodera schachtii. Journal of Helminth. 7:81-92.

Growing mustard in soil immediately before planting potatoes limits the nematode infection of the potatoes.

38. Triffitt, M. J. 1929. Observations on the incidence of Heterodera schachtii at the Ormskirk Potato testing station. J. of Helminth. 7:93-98.

Greatest crop failure occurred in plots where the nematode and rhizoctonia were both present. Cysts were not viable after passage through the digestive tract of young pigs.

39. Triffitt, M. J. 1930. On the bionomics of Heterodea schachtii on potatoes with special reference to the influence of mustard on the escape of larvae from the cysts. J. Helminthol. 8:19-48.

Mustard roots produce an inhibitory effect on formation of cysts in potatoes, and also inhibit larval emergence from mature cysts.

40. Triffitt, M. J. 1932. Potato sickness and the eelworm Heterodera schachtii. Imperial Bureau of Agricultural Parasitology. Notes and Memoranda.

The history of this parasite in Great Britian where potato sickness dates back to 1904.

41. Triffitt, M. J. 1934. Experiments with the root excretions of grasses as a possible means of eliminating Heterodera schachtii from infected soil. J. Helminth. 12:1-12.

Root exudates of grasses were not as effective at stimulating hatch as was potato root exudate, but under continuous grasses cultivation, the nematode population decreased continuously.

42. Trudgill, D. L. 1967. The effect of environment on sex determination in Heterodera rostochiensis. Nematologica 13:263-272.

Only second stage larvae with giant cells of a sufficient size and nutrient content can become females. Increasing nematode density increases proportion of males.

43. Trudgill, D. L. 1968. The effect of environment on sex determination in Heterodera rostochiensis. Ph.D. Thesis, University of London, UK. 188 pp.

44. Trudgill, D. L. 1970. Survival of different stages of Heterodera rostochiensis at high temperatures. Nematologica 16:94-98.

Potato plants infected by H. rostochiensis exposed to temperatures above optimum of nematode development for 24-96 hrs. decreased the number of larvae that became adults with temperature increase.

45. Trudgill, D. L. 1972. Mechanisms of damage to potatoes by Heterodera rostochiensis. XI th International Symposium of Nematology, Reading. p. 77.

46. Trudgill, D. L., K. Evans and D. M. Parrot. 1974. Changes in the growth, salt uptake and water retnetion of potatoes infested with potato cyst nematode and the influence of soil fumigation. Potato Research 17(3):349.

Stunted growth (smaller leaves, stems and root systems), and lowered salt uptake occurred in infested fields. Dazomet treted fields also had stunted growth but the tuber yield was increased.

47. Trudgill, D. L., K. Evans and D. M. Parrot. 1975. Effects of potato cyst-nematodes on potato plants. I. Effects in a trial with irrigation and fumigation on the growth and nitrogen and potassium contents of a resistant and a susceptible variety. Nematologica 21(2):169-182.

Nematode infested plants contained less potassium in their foliage but the percentage of nitrogen in the haulm dry matter was little affected.

48. Trudgill, D. L., K. Evans and D. M. Parrot. 1975. Effects of potato cyst-nematodes on potato lants. II. Effects on haulm size, concentration of nutrients in haulm tissue and tuber yield of a nematode resistant and a nematode susceptible potato variety. Nematologica 21(2):183-191.

Roots of infected plants on a dry weight basis had decreased concentrations of N, K, P and Mg, but on a fresh weight basis only K and P were markedly decreased with a corresponding increase in Ca and Na concentrations.

49. Trudgill, D. L., G. M. Mackintosh, P. Osborne and R. M. Stewart. 1978. Control of potato cyst nematode by nematicides and a resistant potato cultivar at four sites in Scotland. Annals of Applied Biology 88(3):393-399.

Dazomet was the most effective chemical used, but none gave complete control: In combination with the resistant cultivar, Maris Piper, the nematocide did not further decrease the population.

50. Trudgill, D. L. and D. M. Parrott. 1969. The behaviour of nine populations of the potato cyst nematode Heterodera rostochiensis toward three resistant potato hybrids. Nematologica 15:381-388.

Larval development of this pest varied with resistant variety tested in terms of number and sex ratio. Sex is probably determined by size of giant cell formation.

51. Trudgill, D. L. and D. M. Parrott. 1972. Disc electrophoresis and larval dimensions of British, Dutch and other populations of Heterodera rostochiensis as evidence of the existence of two species each with pathotypes. Nematologica 18:141-147.

Various host tests, measurements, morphological features of larvae, females and cysts and electrophoresis indicate that Heterodera rostochiensis should be split into two species.

52. Trudgill, D. L. and D. M. Parrott. 1973. Effects of growing resistant potatoes with gene H' from Solanum tuberosum spp. andigena on populations of Heterodera rostochiensis British pathotype A. Ann. Appl. Biol. 73(1):67-75.

Pure pathotype A only produced a few females on andigena hybrid potatoes with the H_1 gene for resistance. The proportion of larvae developing to females was not increased on the same host after 3 years.

53. Trudgill, D. L., D. M. Parrott, K. Evans and F. V. Widdowson. 1975. Effects of potato cyst nematodes on potato plants. IV. Effects of

fertilizers and Heterodera rostochiensis on the yield of two susceptible varieties. Nematologica 21(3):281-286.

Although increased NPK fertilizer increased yield, the proportion of loss due to nematodes was unchanged. Pentland crown was better host than was Record.

54. Trudgill, D. L., D. M. Parroth and A. R. Stone. 1970. Morphometrics of males and larvae of ten heterodera rostochiensis populations and the influence of resistant hosts. Nematologica 16:410-416.

Resistant hosts decrease mean body and stylet length. The study indicates that two or more species are present in British populations.

55. Trudgill, D. L., J. M. Webster and D. M. Parrott. 1967. The effect of resistant solanaceous plants on the sex ratio of Heterodera rostochiensis and the use of the sex ratio to assess the frequency and genetic constitution of pathotypes. Annals of Applied Briology 60:421-428.

On some resistant plants only males developed on others both males and females developed. On potato hybrid developed from Solanum tuberosum andigena the number of females increased with each succeeding generation. Results, however, varied with some populations.

56. Turpo, B. S. and F. A. Alcocer. 1975. [Souces of resistance to the potato golden nematode Heterodera sp.] Fitopatologia 10(2):81.

1. Uhlenbroek, J. H. and J. D. Bijloo. 1958. Investigations on nematicides. 1. Isolation and structure of a nematicidal principle occurring in Tagetes roots. Reculil des Travaux Chimiques Pays-Bas. 77:1004-1009.

Highly nematicidal polythienyls were extracted from the roots of Tagetes erecta plena. One of the effective compounds was identified as a-terthienyl.

2. Uhlenbroek, J. H. and J. D. Bijloo. 1959. Investigations on nematicides. 2. structure of a second nematicidal principle isolated from Tagetes roots. Recueil des Travaux Chimiques des Pays Bas 78:382-390.

A second nematicidal compound was identified as 5-(3-buten-1-ynyl)-2.2'-bithienyl.

3. Umaerus, M. and V. Umaerus. 1976. [The potato breeding programme at the Swedish Seed Association.] Sveriges Utsadesforenings Tidskrift 86(1/2):9-26.

Attempts are being made in potato breeding programs to combine resistance to Heterodera rostochiensis pathotype A with resistance to potato virus Y.

4. Umaerus, M. and V. Umaerus. 1976. [Svalof's Rosamunda potato.] Sveriges Utsadesforenings Tidskrift 86(1/2):27-39.

The new Swedish potato variety Rosamunda which is fairly resistant to Spraing but not resistant to potato cyst nematode.

5. Umaerus, M. and V. Umaerus. 1977. [Svalof's Stina, an industrial potato.] Sveriges Utsadesforenings Tidskrift 87(5/6):329-342.

Heterodera rostochiensis resistant variety Stina has higher protein content than Prevalent or Daniella. On nematode infested soil it has higher tuber and starch yield than Daniella.

6. Umaerus, V. 1966. Foradling for nematodresistens i Svalov. Potatis, Yr. 1966. pp. 49-51.

It is important in breeding for resistance to Heterodera rostochiensis to use other species of Solanum in addition to S. tuberousm andigena to guard against damage by different pathotypes.

7. United States Department of Agriculture. Bureau of Entomology and Plant Quarantine. 1944. Golden nematode of potato-cooperative survey, 1944. 20 pp.

The survey covered potato growing areas in 19 northern states. Heterodera marioni was widely spread.

8. United States Department of Agriculture. 1946. Golden nematode of potato. Report for 1945. 11 pp.

Discusses work carried out by the Bureau of Entomology and Plant Quarantine during 1945.

9. United States Department of Agriculture. 1949. Nematodes infesting potatoes.

United States Buireau of Entomology and Plant Quarantine Report - one of several annual reports.

10. United States Department of Agriculture. 1974. The golden nematode Heterodera rostochiensis of potatoes and tomatoes. 4 p.

A popular description of the symptoms of infection and methods of control.

11. United States Department of Agriculture. 1975. The potato-breeding program, USA, 1974. United States Department of Agriculture, Beltsville, MD 207 pp.

Clone B6987-56 is resistant to biotype A of Heterodera rostochiensis.

12. United States Department of Agriculture. 1976. Notice to potato seed growers of the release of Atlantic, a new potato variety combining high quality, pest resistance, and wide adoptation. American Potato Journal 53(11):428-430.

Atlantic is highly resistant to race A of Heterodera rostochiensis.

13. Untiveros, O. D. 1974. [Studies of fungi parasitic on the golden nematode Heterodera rostochiensis of potato in the Peruvian Central Sierra] Investigaciones Agropecuarias 4(1/2):28-34.

Investigations of biological control of H. rostochiensis by a fungus (Ulocladium spp.)

14. Untiveros, D. D. 1976. [Finding of fungi that are parasites of the golden potato nematode Heterodera rostochiensis Woll. in the central mountains of Peru. Invest Agropecu Peru 4(1/2):28-34.

15. Usmanova, A. Z. 1972. [Ditylenchus destructor, a serious parasite of potatoes.] In Gel'minty pishchevykh produktov. Tezisy dokladov mezhrespublikanskoi nauchnoi konferentsii, 22-25 Dekabrya 1972 Goda. Samarkand, USSR pp. 69-70.

High rates of infection are reported.

16. Ustinov, A. A. and V. G. Zimovev. 1958. [On some biochemical change in tissues of plants infected by eelworms.] Moscow. Izdatelstov Akademii Nauk SSSR pp. 376-379.

Potato tubers infected with Ditylenchus destructor near the end of the infection and growing period, had increased amounts of ammonia, water and monosaccharides. Later the quantity of all substances decreased with ensuing cellular necrosis.

1. Vainila, V. A. 1975. Phenolic compounds in potato leaves and the change in their quantitative mount when infested by the potato nematode Heterodera rostochiensis. Izv Akad Nauk BSSR, Ser Biol Nauk 6:49-52.

2. Valdez, R. B. 1978. Nematode pests of potato in the tropics. Second regional symposium on pathogens and pest of the potato in the tropics Baguio City, Philippines 9-16.

A general discussion of nematode pests damaging potatoes in the tropics. Meloidogyne and Pratylenchus are discussed in detail.

3. Van Gundy, S. D. 1972. Nonchemical control of nematodes and root-infecting fungi. In: Pest Control Strategies for the future. National Academy of Sciences. pp. 317-329.

A review, covering crop rotation, environmental manipulation and integrated control systems.

4. Vasilevskii, V. N. 1970. [Testing the effect of preceeding crops and carbathion on the potato stem nematode in Uzbekistan.] Trudy nauchno-Issledovatel'skogo Instituta Oroshchevatchevykh kul'tur i kartofelya, USSR, 11:137-141.

Rice and lucerne, of the crops tested, gave best results in controlling Ditylenchus. Carbathion gave good results.

5. Vasilkova, A. K. 1955. [Combating the potato stem nematode.] Sad i Ogorod. Moscow 4:39-40.

Only formalin, of five chemicals tested againt Ditylenchus in potatoes, removed the infection. Author recommends that potatoes, should be dipped in a solution of 1 kg of 40% formalin in 200 litres of water for 5 minutes. Covered with a damp formalin solution wet cloth for 2 hrs then dried. 50 kg of potatoes requires 30 litres of solution.

6. Vasudeva Menon, P. P. and G. Logiswaran. 1972. Note on the biotypes of potato golden nematode Heterodera rostochiensis Woll. in Nilgiris. Indian Journal of Agricultural Sciences 42:1068.

Tests with various Solanum spp. indicate the biotype of the nematode found in the area is "D".

7. Vavilova, M. A. and N. A. Zhitlova. 1976. [Wild potato species in breeding for resistance to Heterodera rostochiensis.] Kartofel' i Ovoshchi. No. 7:35-36. (Plant Breeding Abstracts 47, 475.)

Best resistance was obtained from hybrids of Solanum famatinae or of S. canasense. Highest yields were obtained from hybrids of S. famatinae or S. vernei.

8. Vavilova, M. A. and N. A. Zhitlova. 1976. [Search of wild potato species for selection for resistance to nematode infection.] VIII

Vsesoyuznoe soveshchanie no nematodnym boleznyam sel'skokhozyaistvennykh kul'tur. Tezisy dokladov i soobshchenii. Kishinev, USSR; Izdatel'stvo "Shtiintsa." p. 46

Wild Solanum spp. were tested for resistance to H. rostochiensis and some were selected for further work in hybridization studies.

9. Verman, S. K. and S. K. Prasad. 1969. The reniform nematode, Rotylenchulus reniformis Linford and Oliveira, 1940. 1. Bioecological studies. Indian Journal of Entomology. 31:36-47.

The nematode occurs on potato.

10. Veselovskii, I. and M. Bokhonova. 1975. [The evaluation of nematode-resistant potato varieties.] Kartofel' i Ovoschi, No. 1, pp. 38-39. (Plant Breeding Abstracts 45, 10105.)

12 varieties of potatoes resistant to Heterodera rostochiensis, the Dutch variety Ehud was considered the best, judged on such characteristics as yield, tuber size, starch content and earliness.

11. Videgard, G. 1967. Angrepp av potatoiscystnematoden syns ej alltid ovan jord. Vaxtskyddsnotiser 31:21-22.

Potato yield losses by H. rostochiensis may reach 40-60% by the time above ground symptoms appear.

12. Videgard, G. 1967. Nematodangreppets inverkan pa potatisskorden. Potatis Yr. 1967. pp. 51-53.

Infected potato plants by Heterodera rostochiensis have smaller tubers but numbers are not affected.

13. Videgard, G. 1968. Rasinventering av potatiscystnematod. Vastskyddsnotiser 32:73-76.

14. Videgard, G. 1969. Nematodresistents sorter-saneringseffekt och faran for resistensbrytare. Potatis, Year 1969. pp. 26-28.

Heterodera rostochiensis can be controlled with resistant varieties in Sweden. Only one resistant-breaking population has been found in 600 tested.

15. Vidner, J. 1968. Prisperek k problematice zkousek vzdornosti brambor proti had' atku bramborovemu (Heterodera rostochiensis Woll.) Genetika a Slechteni,Brno. 4:49-58.

16. Vidner, J. 1968. [The genetic consititution and the cleavage ration of certain varieties of potatoes resistant to the potato root eelworm.] Geneticke zalozeni a stepne pomery nekterych odrud brambor vzdornych hadaktu bramborovemu. Genetika a Slechteni, Brno 4(2):125-132.

The genetic mechanisms of resistance to biotype A of Heterodera rostochiensis study.

17. Vidner, J. 1970. Vysledky informacnich zkousek vzdornosti planych brambor proti hadatku bramborovemu (Heterodera rostochiensis Woll.) Ved. Pr. vyzk. Ust. brambor. Havlick Brode, No. 4, pp. 37-44.

In tests for resistance to Heterodera rostochiensis biotype A, the following were not invaded: 21 lines of Solanum andigenum, 3 of S. acaule, 2 lines of S. demissum and S. stoloniferum, and 1 line each of S. acroscopium, S. antipoviczii, S. araccpapa, S. brachycarpum, S. schreiteri and S. tanijense.

18. Viglierchio, D. R. 1971. Race genesis in Ditylenchus dipsaci. Nematologica 17:386-392.

A garlic isolate of Ditylenchus dipsaci was polyphogous, increasing population density on Medicago sativa, Solanum tuberosum etc. It also increased on fungi including Verticillium theobromae and Cladosporium spp.

19. Vinitokas, Z. V., and M. R. Rimkute. 1960. Some investigations on the potato nematode and measures for combating it. Acta parasital. Lithuanica 2:107-114.

20. Vinogradskaya-Pupavkina, G. M. 1976. [Immunological diagnosis of Ditylenchus destructor infection on potato.] In (See: Adylova, N. A. 1976). pp. 72-73

Antigens of the nematode were present in extracts from infected potatoes.

21. Vitukevich, F. and M. Serdiuk. 1966. The stem nematode of potato. Khliborob Ukraini, 12:20-23.

22. Voinilo, V. A. 1975. [Phenol compounds in leaves of potatoes and changes in their contents as affected by nematode infection.] Vvestisi Akademii Navuk BSSR, Biyalagichnykh Navuk, No. 6, pp. 49-52. (Field Crop Abstracts 29, 4975.)

It is concluded that immunity to Heterodera rostochiensis is related to the metabolism of phenol compounds in the roots and leaves. Higher concentrations of phenol compounds, flavonoids and water- and alkali-soluble phenols were found in the leaves of resistant plants than in the leaves of susceptible plants.

23. Voinilo, V. A. and I. Y. Ponin. 1976. [Link between the resistance of potato to Heterodera infection and phenol metabolism.] VIII Vsesoyuznoe soveshchanie no nematodnym boleznyam sel' skokhozyaistvennykh kul'tur. Tezisy dokladov i soobshchenii. Kishinev, USSR; Izdatel'stvo "Shtiintsa." p. 47.

24. Volkov, V. D. and G. V. Dan'ko. 1972. [The use of chemical mutagens to obatain initial material for potato breeding.] Moscow, USSR; Nauka 277-280.

Improved resistance to Ditylenchus destructor was found in some seedlings from hybrid seeds treated with 0.025 and 0.05% N-nitroso-N-ethylurea.

1. Wallace, H. R. 1960. Movement of eelworms. VI. The influences of soil type, moisture gradients and host plant roots on the migration of the potato-root eelworm Heterodera rostochiensis Woll. Annals of Applied Biology. 47:131-139.

There was no linear relationship between rate of flow and velocity of the eelworm. The eelworm velocity increases as pore size (in sand) increases. Velocity approaches zero when the eelworm length is greater than four times the pore diameter.

2. Wallace, H. R. 1963. The biology of plant parasitic nematodes. pp. VIII + 280. Arnold, London.

3. Wallace, H. R. 1973. Nematode ecology and plant disease. 228 pp. Edward Arnold, London.

Contains sections on resistance in plants and control measures.

4. Walsh, J. A. 1979. An intracellular microorganism in tissues of the potato cyst nematode Globodera rostochiensis and the pea cyst nematode Heterodera goettingiana. J. Nematol. 11:317.

Intracellular bacterium-like micro-organisms were passed transovarially from generation to generation. Microorganisms were found in the reproductive tract of infected females.

5. Weber, A. P., L. O. Zwillenberg and P. A. van der Laan. 1952. A predacious amoeboid organism destroying larvae of the potato root eelworm and other nematodes. Nature, London, 169:834-835.

The organism was found in the form of spherical, single-walled hypocysts clinging to the outer surface of cysts of Heterodera rostochiensis from Groningen, Holland.

6. Webley, D. 1970. A morphometric study of the three pathotypes of the potato cyst eelworm Heterodera rostochiensis recognized in Great Britain. Nematologica 16(1):107-112.

Pathotype A has significantly shorter larval length, spear length and distance between the crecentic valves of the median bulb and the excretory pore, than do pathotypes B and E.

7. Weingartner, D. P. 1978. Nematode control on potatoes in large plots, 1977. Fungicide and nematicide tests. 33:201-202.

Telone II, Temik 15G, Mocap 10G and Furadan 10G singly and in combinations of the latter three with Telone II, was applied at time of planting. Cost benefits ratio are given for each treatment.

8. Weingartner, D. P. 1979. Nematode control in large plots, 1978. Fungicide and nematicide tests. 34:202.

Results similar to 1977 experiments.

9. Weingartner, D. P. 1979. Nematicide general efficacy experiment, 1978. Fungicide and nematicide tests. 34:202-3.

Telone II applied at planting was phytoloxic. Telone II applied 4 weeks before planting and Nematak increased yield above that of the control.

10. Weingartner, D. P. and D. W. Dickson. 1971. Nematode control on potatoes by soil fumigation, band and in-furrow applications of contact nematicides. Proceeding of the Florida State Horticultural Society, 1970. 83:154-161.

The authors studied effects of DD, Telone, Vorlex and EDB-W-85 fumigants and Mocap, Dasnit, Furadan, Nemacur, Vydate upon yields of Sebago potato. Granular applications also reduced nematode populations and improved tuber quality.

11. Weingartner, D. P., D. W. Dickson and J. D. Dilbeck. 1974. Early dying disease on potatoes in North Florida. Plant Dis. Reptr. 58:374-378.

Microsclerotial and mycelial forms of Verticillium were found in several northern Florida potato fields. Fumigation with D-D at 10 gal per acre in the row, reduced nematode populations, Verticillium levels and increased yield suggesting a nematode fungus interaction.

12. Weingartner, D. P. and J. R. Shumaker. 1978. Nematicide general efficacy experiment, 1977. Fungicide and Nematicide Tests. 33:202.

There was no significant difference in tuber yields from four nematicides, but greatest yield (Telone + Temik) was associated with lowest population of Belonolaimus longicaudatus.

13. Weingartner, D. P. and J. R. Shumaker. 1978. Application of Vydate 2L to foliage for nematode control, 1976. Fungicide and Nematicide Tests. 33:202-203.

On soil heavily infested with Belonolaimus longicaudatus and other nematodes, 5 nematicides were applied ~~to~~ the soil in conjunction with 0,1-5 foliar treatments with Vydate.

14. Weingartner, D. P., J. R. Shumaker, D. W. Dickson, and C. G. Smart, Jr. 1974. Improving the quality of potato tubers through use of nematicides.

Nonvolatile chemicals cimproved tuber quality better than did soil fumigants. Aldicarb was the most consistently effective.

15. Weingartner, D. P., J. R. Shumaker, G. C. Smart and D. W. Dickson. 1975. A new nematode control program for potatoes grown in Northeast Florida. Proceedings of the Florida State Horticultural Society 88:175-182.

Authors review progress in chemical control of Meloidogyne and Trichodorus on potatoes. Aldicarb or ethoprop was more effective than 1,3 dichloropropene or DD.

16. Weingartner, D. P., J. R. Shumaker and G. C. Smart, Jr. 1975. Chemical control of corky ringspot disease on potatoes in Florida, USA. In Lamberti, F., C. E. Taylor and J. W. Seinhorst (Eds.). Nematode vectors of plant viruses. Plenum Press; London, UK and New York, USA. pp. 443-444.

From studies of several chemical treatments, it was concluded that use of carbofuran, Aldicarb or ethoprop at planting or with 1,3-D or DD can give control of CRS in Trichodorus christiei infected potato fields.

17. Weingartner, D. P., J. R. Shumaker and C. G. Smart, Jr. 1975. Incidence of corky ringspot disease on potato as affected by different fumigation rates, cultivars, and harvest dates. Proc. Soil Crop Sci. Soc. Fla. 34:194-196.

Treatment with carbofuran plus 1,3-dichloropropene reduced incidence of corky ringspot to less than 1% in sebago tubers. Pungo tubers were free of infection even when no treatment was given.

18. Weingartner, D. P., J. R. Shumaker and R. E. Webb. 1976. Failure of systemic insecticide-nematicides to affect total glycoalkaloid content of harvested potato tubers in northern Florida. American Potato Journal 53(7):247-252.

The severe symptoms of Corky ringspot were observed on many tubers, but were not correlated with total glycoalkaloid levels.

19. Weingartner, D. P. et al. 1978. Nematode control on Irish potatoes in northest Florida using a soil fumigant and a nonvolatile nematicide both alone and in combination. Journal of Nematology 10:307.

Aldicarb at 3.36 kg ai/ha in the row and 1,3-dichloropropene at 51.5 ai/ha were evaluated for control of nematodes and associated disease on potatoes.

20. Wellington, R. 1938. Potato eelworm and its spread. Need for seed certification. Fruit Grower, Fruiterer, Florist and Market Gardener. 85:233-234 and 238.

Author discusses increase in Heterodera schachtii distribution and discusses the importance of seed potatoes in spread.

21. Werner, E. 1970. [Haploids of potato and their use in breeding.] Instytut Ziemniaka, Bonin k/Koszalina, Poland. Publ: Poznan, Poland 9-47. (Plant Breeding Abstracts 43:2843)

Progeny of haploids x Solanum phureja were all susceptible to Heterodera rostochiensis, race A. Progeny of haploids x S. vernei contained resistant individuals in ratio of 1:2.

22. White, J. H. 1953. Wind-borne dispersal of potato root eelworm. Nature, London. 172:686-687.

Results of the study indicate that wind dispersal, in areas experiencing dust storms, is of considerably greater importance than spread by implements or seed potatoes.

23. Whitehead, A. G. Cyst-nematodes of potatoes and sugar-beet biology and control. (Shell Publ Health Agr. News) 15(3):114-117.

In potatoes, resistance to H. rostochiensis biotypes is limited to pathotype A and British pathotype B.

24. Whitehead, A. G., D. J. Tite, J. E. Fraser and E. M. French. 1973. Control of potato cyst-nematode, Heterodera rostochiensis in silt and peat loams by ten pesticides applied to the soil at planting time. Ann. Appl. Biol. 73(2):197-201.

Aldicarb, Tirpate, DuPont 1410 and Nemacur were effective in both soil types, but Thionazin was effective only in the peat loam.

25. Whitehead, A. G. 1973. Control of cyst nematodes Heterodera spp. by organophosphates, oximecarbamates and soil fumigants. Annals of Applied Biology 75:439-453.

A review of methods of assessing nematicide control of cyst-nematodes, nematicide treatments, factors affecting control by nematicides and mode of action of non-fumigant nematicides.

26. Whitehead, A. G. 1973. Integrated control systems are the answer to potato eelworm. Arable Farmer Veg. Grower 4(7):74-76.

27. Whitehead, A. G. 1975. Chemical control of potato cyst-nematode. Research Review 1(1):17-23.

A comprehensive review of work in England.

28. Whitehead, A. G. 1976. The effect of formalin on potato cyst-nematode Heterodera rostochiensis. Ann. Appl. Biol. 84(1):97-99.

Concludes that the chemical is not effective as field nematicide.

29. Whitehead, A. G. 1977. Vertical distribution of potato, beet and pea cyst nematodes Globodera, Heterodera in some heavily infested soils. Plant Pathol. 26(2):85-90.

Globodera rostochiensis and G. pallida in heavily infested soil in England were often as common 20-40 cm deep as at 0-20 cm deep. They were uncommon below 40 cm.

30. Whitehead, A. G. 1977. Control of potato cyst-nematode, Globodera rostochiensis Ro^1, by picrolonic acid and potato trap crops. Annals of Applied Biology 87(2):225-227.

The artificial hatching agent did not increase hatch except in soil in which potatoes had been grown for four weeks.

31. Whitehead, A. G. and S. N . Ahmed. 1972. Effect of Dowco 275, a new organophosphorus nematicide, on the potato cyst nematode. Plant Pathology 21:155-157.

This material was tested in pots against pathotype A of Heterodera rostochiensis. One gm of the nematicide in 300 ml soil reduced the pest egg count from 1,511 to 103 eggs/ml in 10 weeks.

32. Whitehead, A. G., R. H. Bromilow, K. A. Lord, S. R. Moss and J. Smith. 1975. Incorporating granular nematicides in soil. In British Insecticide and Fungicide Conference (8th), Brighton, 17-20 November, 1975. Proceedings, Volume 1, London, UK; British Crop Protection Council. 133-144.

Control experiments with Globodera rostochiensis and G. pallida on potato indicated better results by mixing Aldicarb or oxamyl in top 15 cm of soil than in the top 7.5 cm.

33. Whitehead, A. G., J. E. Fraser and G. Storey. 1972. Chemical control of potato cyst-nematode in sandy clay soil. Ann. Appl. Biol. 72:81-88.

Field tests with 28 chemicals against Heterodera rostochiensis on potatoes in sandy clay soil indicated; Aldicarb, diazinon, disulphoton, fensulphothion, isolan and thionazin increased yields and prevented nematode multiplication. DBCP prevented multiplication but was phytotoxic.

34. Whitehead, A. G., D. J. Tite and J. E. Fraser. 1973. Control of potato cyst-nematode Heterodera rostochiensis in sandy loam by Du Pont 1410 (S-methyl 1-(dimethylcarbamoyl)-N-.(methylcarbamoyl) osyl thioformimidate) applied to the soil at planting time. Ann. Appl. Biol. 73(3):325-328.

When applied at planting time to heavily infested sandy soil, 5 ppm of DuPont 1410 in the field controlled the nematode and increased the yield of susceptible potatoes. Neither shoot dip nor foliar spray increased control.

35. Whitehead, A. G., D. J. Tite, J. E. Fraser and E. M. French. 1972. Control of potato cyst-nematode, Heterodera rostochiensis, in pesty loam soil by DD, Aldicarb, and a resistant variety of potato. Ann. Appl. Biol. 72:307-312.

5.2 or 10.3 kg Aldicarb/hectare incorporated prior to planting potatoes gave better results than 384, 764 or 1153 kg DD/hectare. Nematodes were controlled on susceptible as well as resistant Maris Piper.

36. Whitehead, A. G., D. J. Tite, J. E. Fraser and E. M. French. 1973. Treating potato ridges in spring with Aldicarb, DD or Dazomet to control potato cyst-nematode Heterodera rostochiensis in sandy clay and peat loam soils. Ann. Appl. Biol. 73:203-210.

Small amounts of Aldicarb (10.3 kg/ha) applied to potato ridged soil before planting controlled the nematode better than 466 kg/ha Dazomet or 102-43 g kg/ha DD.

37. Whitehead, A. G., D. J. Tite, J. E. Fraser and E. M. French. 1973. Effects of D-D, Telone, or Dazomet applied to potato ridges in spring on potato cysts nematode Heterodera rostochiensis in sandy loam and silt loam soils. Ann. Appl. Biol. 74:105-111.

Dazomet at 329 or 439 kg/ha applied to potato ridge soil before planting potatoes controlled the nematode more effectively than DD at 359 or 488 kg/ha.

38. Whitehead, A. G., D. J. Tite, J. E. Fraser and E. M. French. 1973. Control of potato cyst nematode Heterodera rostochiensis in three soils by small amounts of Aldicarb, DuPont 1410, or Nemacur applied to the soil at planting time. Ann. Appl. Biol. 74:113-118.

Oxamy and Aldicarb applied to infested soil at 2.6-11.2 kg ai/ha during planting time controlled the nematode and greatly increased yield of susceptible potatoes.

39. Whitehead, A. G., D. J. Tite, J. E. Fraser and E. M. French. 1973. Control of potato cyst-nematode Heterodera rostochiensis in sandy, peaty and silt loam soils by Dazomet and Telone applied in different ways. Ann. Appl. Biol. 75:257-265.

Dazomet applied in ridges of soil infested with H. rostochiensis is more effective in sandy and peaty loam than Telone. Spring and fall applications were equally effective.

40. Whitehead, A. G., D. J. Tite, J. E. Fraser, E. M. French and J. Smith. 1975. Incorporating granular nematicides in soil to control potato cyst-nematode Heterodera rostochiensis. Ann. Appl. Biol. 80(1):85-92.

Vydate or nemacur P at 11.2 kg ai/ha incorporated in soil controlled the nematode to 20 cm depth; also a split application of 5.6 kg incorporated in winter before plowing plus 5.6 kg incorporated in the seedbed was effective.

41. Whitehead, A. G., et al. 1975. Incorporating granular nematicides in soil. In British Insecticide and Fungicide Conference (8th), Brighton, 17-20 November, 1975. Proceedings Volume 1. British Crop Protection Council, London. pp. 133-144.

Mixing Aldicarb or oxamyl in top 15 cm of soil gave better control of Heterodera spp. than in top 7.5 cm of soil.

42. Widdowson, E., C. C. Doncaster and D. W. Fenwick. 1958. Observations on the development of H. rostochiensis Woll. in sterile root cultures. Nematologica 3:308-314.

The life history of Heterodera rostochiensis was studied in vitro after inoculation on excised tomato roots. Adult females were produced 42 days after inoculation.

43. Widjaja, W. W. and W. A. Windrich. 1974. Studies on nematological problems in horticulture. In Research Reports, Agricultural Cooperation project, Indonesia/The Netherlands. Section II: Technical Contributions. Jakarta pp. 393-402.

When planted on fields (infested with Meloidogyne) in which had grown various crops, the potato yield was best on fields that had been fallow or planted in marigolds.

44. Willcox, J. and H. T. Tribe. 1974. Fungal parasitism in cysts of Heterodera. I. Preliminary investigations. Transactions of the British Mycological Society 62:585-594.

Ten to twenty percent dead eggs were found in cysts of 19 populations of H. rostochiensis.

45. Wille, J. E. and C. B. De Segura. 1952. La anguilula dorada Heterodera rostochiensis una plaga del cultivo de las papas, recien descubierta en el Peru. Est. Exp. Agric. La Molina Bol. Lima, Peru. No. 48, 17 pp.

H. rostochiensis and H. pallida are widely spread in the Peruvian highlands.

46. Williams, K. J. O. 1972. Meloidogyne javanica. (see Williams, 1975). Set 1, No. 3, 4 pp.

47. Williams, K. J. O. 1 973. Meloidogyne incognita. (See Williams 1975) Set 2, No. 18, 4 pp.

48. Williams, K. J. O. 1974. Meloidogyne hapla. (See Williams 1975) Set 3, No. 31. 4 pp.

49. Williams, K. J. O. 1975. Meloidogyne arenaria. C.I.H. Descriptions of plant parasitic nemaodes. Set 5, No. 62, 4 pp.

Brief descriptions of the anatomy, biology, taxonomy, hosts, distribution, pathogenic interactions and control of the nematodes.

50. Williams, T. D. 1956. The resistance of potatoes to root eelworms. Nematologica 1:88-93.

Eelworm resistance in potatoes may be due to hatching factors most resistant plants produced strongly active diffusates. All plants are invaded by nematodes but very few develop into mature females.

51. Williams, T. D. 1957. Development of isolated female larvae of the potato-root eelworm Heterodera rostochiensis Woll. Nature 180:1000.

Giant cells were present in the tuber tissue associated with the cysts, but the cysts did not pass through the yellowing stage and they did not contain eggs.

52. Williams, T. D. 1958. Potatoes resistant to root eelworm. Proc. Lin. Soc. London 169:93-104.

Solanum vernei does not possess hatching-stimulating diffusates for Heterodera rostochiensis cysts as does S. andigenum.

53. Williams, T. D. 1963. The development of females of the potato root eelworm Heterodera rostochiensis Woll. on tuber pieces of susceptible and resistant potatoes. Euphytica. Wageningen. 12:277-284.

A testing technique to determine degree of Heterodera rostochiensis resistance is described. All tuber eye tissue is removed to prevent sprouting.

54. Willis, R. J. and R. D. Winslow. 1964. The effects of cropping with eelworm-resistant and eelworm-susceptible potatoes on the level of potato root eelworm in a Northern Ireland garden soil. Rec. Agr. Res. Min. Agr. Northern Ireland 13:67-74.

Population trends of Heterodera rostochiensis in soil planted to resistant varieties indicated a steady decrease until no new cysts were formed after 7 consecutive years. Decrease was greater than on fallowed ground.

55. Wilski, A. 1954. [Attempt to breed potato varieties to Heterodera rostochiensis Woll.] Postepy Nauk Rolniczych 6:40-45.

56. Wilski, A. 1955. [Investigations of the potato root nematode Heterodera rostochiensis Woll. carried out at the Plant Protection Institute and their present stage.] Roczniki Nauk Rolniczych. Seria A. Roslinna. 71:337-341.

Best time to examine potatoes for cysts is at flowering season. Several chemicals were used for control but only forbiat at the rate of 1 ton per hectare prevented infection of potatoes but did not kill nematodes in the soil.

57. Wilski, A. 1967. Obecny stan badan nad nicieniami szkodliwymi w rolnictwie i ich zwalczaniem w Polsce. Biul. Inst. Ochron. Rosl., 37:145-158.

A review of major nematode problems in Poland with a discussion on various plants resistant to Heterodera rostochiensis, H. schachtii, Ditylenchus dipsaci, Aphelenchoides fragariae and A. ritzemabosi.

58. Wilski, A. 1968. Wstepne doswiadczenia poletkowe nad przydatnoscia dwoch nematocydow: WN-12 i Basamidu do zwalczania matwika ziemniaczanego Heterodera rostochiensis Woll. i nicieni swobodnie poruszajacych sie w glebie. Pr. nauk. Inst. Ochr. Rosl. 9:249-255.

Vorlex (Wn-12) and Dazomet (Basamid-Pulver) controlled H. rostochiensis on potato and increased yield. High rates changed the flavor of potatoes.

59. Wilski, A. 1972. [Pot experiments on the influence of infestation with root-knot nematode, Meloidogyne hapla, on potato tuber yield.] Prace Nauk Instytutu Ochrony Roslin 13:191-194.

M. hapla reduces both tuber and root weight, the reduction being influenced by initial soil population of the nematode.

60. Wilski, A. 1972. [Preliminary field experiments on potato root eelworm Heterodera rostochiensis control with Thimet.] Builetyn Instytutu Ochronyu Roslin 54:185-190.

Thimet 10 G at 100 and 150 kg/ha increased potato yield but did not prevent increase in nematode populations.

61. Wilski, A. 1972. [Control of potato rot eelworm Ditylenchus destructor Thorne, in potato tubers by dipping in Nemafos.] Builetyn Instytutu Ochrony Roslin 54:191-197.

A 1% dip of potato tubers in Nemafos 46 EC for 1 hr controlled the nematode and resulted in a yield of nematode free tubers. Lower rates did not control the pest. Phytoxicity was observed in fall treated tubers but not in a spring treatment.

62. Wilski, A. 1975. [Preliminary field experiments on the use of Nefusan (Dazomet) in potato root eelworm control. Pr Nauk Inst. Ochr. Rosl. (Warsaw). 16(1):179-184.

63. Wilski, A. and J. Giebel. 1966. B-glucosidase in Heterodera rostochiensis and its significance in resistance of potato to this nematode. Nematologica 12:219-224.

Heterodera rostochiensis larvae contained B-glucosidase. Two biotypes were tested; biotype A (which does not break resistance in Solanum andigenum) and biotype B which does.

64. Wilski, A. and J. Giebel. 1971. The destruction of indoleacetic acid in roots of potatoes susceptible and resistant to Heterodera rostochiensis Bull. Acad. Pol. Sci., Ser. Sci. Biol. 19:815-819.

When plant tissues are damaged by nematodes, a system which favors IAA accumulation is stimulated in susceptible plants, but in resistant plants, a system which destroys IAA is formed.

65. Wilski, A., J. Radziwinowicz and Z. Szczotka. 1964. Doswiadczenia poletkowe nadprzydatnoscia Trapexu i Terracuru w zwalczaniu matwiks ziemniaczanego Heterodera rostochiensis Woll. Biul. Inst. Ochrony Roslin. Poznan 27:89-94.

Microplot experiment to control Heterodera rostochiensis in potatoes with Trapex and Terracur indicated Trapex as more effective.

66. Winfield, A. L. 1965. Potato root eelworm in Holland, Lincolnshire. NAAS of Rev. 67:110-117.

A general discussion and review of Heterodera rostochiensis in the district is given. Distribution, spread, rotations are discussed in detail.

67. Winfield, A. L. 1972. Potato cyst eelworm--film. Agricultural Development and Advisory Service, Government Buildings, Cambridge, UK.

68. Winigar, F. A. 1978. [Swiss varietal list for potato growing.] Kartoffelbau 29:206-207.

Twenty varieties resistant potato varieties are listed for Heterodera rostochiensis.

69. Winslow, R. D. 1954. Provisional lists of host plants of some root eelworms Heterodera spp. Ann. Appl. Biol. 41:591-605.

Lists ten species of Lycopersicon and Solanum as H. rostochiensis hosts.

70. Winslow, R. D. 1955. Experiments on the control of the potato-root eelworm by trap cropping with black nightshade. Plant Pathology 4:139-140.

In the first year of planting nightshade on infested plots there was a 40-50% reduction in eggs and larvae. In the second year there was little or no reduction.

71. Winslow, R. D. 1956. Seasonal variations in the hatching responses of the potato root eelworm Heterodera rostochiensis Woll. and related species. J. Helminth. 30:157-164.

Winter dormancy is more pronounced in H. rostochiensis than in some other Heterodera species. The dormancy may be induced by previous conditions but is not dependent on immediate environmental conditions.

72. Winslow, R. D. 1973. Effects of frequency of potato cropping on cyst numbers in plots artifically infested with potato cyst nematode. Record of Agricultural Research, Ministry of Agriculture, Northern Ireland 21:9-12.

Potato plots artificially inoculated with Heterodera rostochiensis were observed for nematode multiplication in continuous potato cropping.

73. Winslow, R. D. and L. A. McKenna. 1972. Comparative rates of development of strains of potato cyst nematodes Heterodera rostochiensis in outdoor pot experiments. Record of Agricultural Research Ministry of AGriculture, N. Ireland 20:17-20.

A susceptible potato variety was added to soils containing pathotypes A, B or E. Females of pathotype A matured more quickly than B or E.

74. Winslow, R. D. and T. D. Williams. 1957. Amoeboid organisms attacking larvae of the potato root eelworm Heterodera rostochiensis Woll. in England and the beet eelworm H. schachtii Schm. in Canada. Tijdschr. Plzieke. 63:242-243.

The amoeboids may be the same as the one described by Zwillenberg from the Netherlands.

75. Winslow, R. D. and R. J. Willis. 1972. Nematode diseases of potatoes. In Webster, J. M. (Ed.) Economic Nematology, London UK, Academic Press. pp. 17-48.

An extensive review of nematode pests of potatoes is presented by the authors.

76. Wisnuwardana, A. W. 1978. [Control of root-knot nematodes Meloidogyne spp. on potatoes with Terracur P 10 G.] Bull. Penelitian Hortik 6(2):9-16.

77. Wisnuwardana, A. W. 1978. [Relationship between preplanting densities of root-knot nematodes Meloidogyne spp. and yield losses in potatoes.] Bull. Penelitian Hortik 6(2):29-42.

78. Witowski, T. 1971. Numerosity changes in the population of the potato root eelworm Heterodera rostochiensis Woll., during the growth period of potato plant. Zeszytt Naukowe Uniwersytetu mikoleja Kopernika w Toruniu Nauki Matematyczno-Przyrodnicze. No. 29 Biologia XIV, 105-118.

A 10-day interval soil sampling of producing potato fields indicated cysts and free larvae were low in numbers from March to June.

79. Wong, K. Y. and J. M. Ferris. 1968. Factors influencing the population of Pratylenchus penetrans in soil. III. Host plant species. Phytopahtology 58:662-665.

Water suspensions of nematode inoculum introduced into the root zones of Mentha piperita, potato and onion--indicated that onion was the poorest host.

80. Wood, F. H. and M. A. Foot. 1975. Treatment of potato tubers to destroy cysts of potato cyst nematode. New Zealand Journal Exp. Agric. 3(4):340-350.

Immersing tuber in sodium hypochlorite plus wetting agent for two hours destroyed cysts.

81. Wood, F. H. and M. A. Foot. 1977. Decontamination of potato tubers grown in soil infested with potato cyst nematodes. New Zealand Journal of Experimental Agriculture 5(4):315-319.

Sodium hypochlorite destroyed cysts within 45 minutes and did not damage tubers with mature skins when rinsed after treatment.

82. Wood, J. 1946. Potato root eelworm--a survey in Holland (Lincs). Kirton Ag. J. 11:43-48.

Author suggests 20% of arable land in Holland is badly infested. Soil should not be replanted for 6 years after infection.

83. Woolcott, E. R., E. M. Torres. 1976. Comportamiento de algunos nematicidas para el control del nematodo dorado Heterodera rostochiensis Woll. XIX Convencion Nacional de Entomologia, Oct. 24-29, Huanuco, Peru. p. 59.

Chemical nematicide control of Globodera rostochiensis.

84. Wouts, W. M. 1976. Identity and biological race of a population of potato cyst nematode from Pukekohe, New Zealand. N. Z. J. Zool. 3(1):31-34.

The popoulation, when tested against differentially resistant clones of Solanum spp., was identical to Dutch race D.

85. Wu, L. Y. 1960. Comparative study of Ditylenchus destructor Thorne 1945, from potato, bullous iris and dahlia with a discussion of de Man's ratios. Can. J. Zoo. 38:1175-1187.

Author transferred nema from potato to dahlia and carrot and from bulbous iris to dahlia and potato. Transfers had some effects on length and general morphology. Populations from these hosts freely interbreed.

1. Yadav, B. S. 1970. Tests for the nematocidal properties of some weed plants on Meloidogyne incognita. Proceedings of the India Science Congress Association. 57:551.

Only 4% of the larvae emerged when exposed to a root exudate of Euphorbia hirta, 33% E. microphylla, 64% Trienthema portulcustrum and 65% Osimum basilicum. Hatching and egg development were totally inhibited in an aqueous extract of E. hirta.

2. Yamada, E., S. Takakura and H. Tezuka. 1972. On occurrence of the potato cyst nematode, Heterodera rostochiensis, Woll. in Hokkaido, Japan. Japanese J. of Nematology. 2:12-15.

Authors report the discovery of the pest in Japan. The nematode is believed to be pathotype A.

3. Yashchuk, A. P. and E. F. Tereshchenko. 1950. [Control of potato stem eelworm.] Sad i Ogorod. Moscow year 1950. pp. 32-34.

Disinfectants gave unsatifactory control in soil. Propagation of early harvested seed resulted in healthy stock within 2 years.

4. Yershov, V. S. and V. P. Efremenko. 1975. Prophylaxis and quarantine of phytohelminthiasis. In International Congress of Plant Protection (8th), Moscow, August 21-26, 1975. Papers at sessions, Volume III, Section VII, Moscow. pp. 177-181.

Description of Russian methods of control.

5. Yllo, T. L. 1968. [Nematode-resistant potato varieties.] Nematodiresistentit perunalajikkeet. Koetoiminta Kaytanto, 25:7.

6. Yokoo, T. 1956. On the occurrence of the root-lesion nematode, Pratylenchus pratensis, as a tuber parasite of the potato in Japan. Agr. Bull. Saga Univ. 4:141-168.

7. Yokoo, T. and Y. Kuroda. 1966. [On the relationships between invasion and multiplication of Pratylenchus coffeae in the host plants and the soil temperature.] Agric. Bull. Saga Univ. No. 22, pp. 93-103.

In pot tests in Japan the optimum temperature for invasion of potatoes by P. coffeae was 25-28°C.

8. Yokoo, T. and K. Matsunobu. 1957. [On thermal death point of the potato tuber lesion nematode Pratylenchus pratensis] Ag. Bull. Saga University 5:97-102.

Thermal death point of Pratylenchus pratensis was tested by emersing nematode in water at various temperatures and innoculating treated water to nema free wheat. Authors suggest that immersion of infected potato tubers at 50°C for 30 minutes would eliminate the nematodes.

9. Yuhara, I. 1973. [On the detection of cysts of the potato cyst nematode from the soil.] Jap. J. Appl. Entomol. Zool. 17(3):162-163.

10. Yuhara, I. 1975. Detection of the plant injury caused by cyst nematodes using infrared photography and the multi-spectral method. Res. Bull. Hokkaido Natl. Agric. Exp. Stn. 111:91-98.

Infected potato fields were photographed from 600 m altitude. Analysis of the multi-spectral photographs showed differences between fumigated and non-fumigated fields.

11. Yuksel, H. S. 1978. Potato rot nematode Ditylenchus destructor in Erzurum Province. J. Turk. Phytopathol. 7(1):19-22.

1. Zadina, J. 1977. [Twenty years' work at the Velhartice potato breeding station.] Vestnik ceskoslovenske Akademie Zemedelske 24(12):571-572.

Have produced varieties with resistance to Heterodera rostochiensis.

2. Zhitlova, N. A. 1976. [Forms resistant to nematode and Phytophthora.] Selektsiya i Semenovodstvo, No. 1:38-30. (Plant Breeding Abstracts 46, 7250.)

The interspecific hybrids (Solanum canasense x S. famatinae) showed highest resistance to Heterodera rostochiensis.

3. Zingstra, H. 1970. [Potato breeding work in 1969.] Zaadbelangen, 24(17):400-402.

In resistance tests of numerous samples of potato varieties in the Netherlands, plant breeders found 44.9% free from Heteroderae rostochiensis.

4. Zingstra, H. 1978. [Area and destination of 47 potato cultivars between 1972 and 1977.] Zaadbelangen 32(4):118-120.

Gives information on Netherland areas where cultivars resistant to Heterodera rostochiensis biotype A are grown.

5. Zingstra, H. and W. Scheigrond. 1976. [List of parents for potato varieties, 1975/1976.] Wageningen, Netherlands; COA 173 pp.

Resistance to Heterodera rostochiensis biotype A was found in cultivar Tertus from Denmark.

6. Zocchi, R. 1970. [Phytopathological considerations on the problem of Heterodera rostochiensis Woll.] Annali dell'Istituto Sperimentale per la Zootecnia Agraria 1:207-221.

A general discussion of the nematode: susceptible, tolerant and resistant hosts, pathotypes, life cycles, ecology and distribution.

7. Zuckerman, B. M., W. F. Mai and R. A. Rhode (Eds.) 1971. Plant parasitic nematodes. Volumes 1 & 2. Academic Press. 345 pp. and 347 pp.

Volume I contains sections on morphology, anatomy, taxonomy and ecology. Volume II covers genetics, cytology, host-parasite interactions, biochemicstry, physiology and the action of nematicides.

8. Zwillenberg, L. O. 1953. Theratromyxa weberi, a new proteomyxean organism from soil. Anthonie v. Leeuwenhoek. 19:101-116.

Description of the amoeboid predator of Heterodera rostochiensis.