AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D. C. 20523
BIBLIOGRAPHIC INPUT SHEET

FOR AID USE ONLY

1. SUBJECT CLASSIFICATION

A. PRIMARY: Agriculture

B. SECONDARY: Pasture Crops

2. TITLE AND SUBTITLE

Pyrenochaeta terrestris, a root pathogen on creeping bentgrass

3. AUTHOR(S)

Meyer, W. A.; Sinclair, J. B.

4. DOCUMENT DATE	5. NUMBER OF PAGES	6. ARC NUMBER
1970	2 p.	ARC

7. REFERENCE ORGANIZATION NAME AND ADDRESS

Department of International Plant Pathology, University of Illinois, Urbana, Illinois 61801

8. SUPPLEMENTARY NOTES *(Sponsoring Organization, Publishers, Availability)*

(In Plant disease reporter, v. 54, No. 6, pp. 506-507

9. ABSTRACT

This paper reports the results of pathogenicity tests of isolates of P. terrestris from creeping bentgrass on that host. Creeping bentgrass ('Toronto') plants were propagated by planting single-node stolons into flats of autoclaved, sandy-loan soil. The plants were grown in the greenhouse at 25°C for six weeks and maintained at a cutting height of 5 cm. The plants were inoculated by a root-dip technique, then, in a second experiment, by means of a soil-infusion needle. Results of the tests showed that P. terrestris is a root pathogen on creeping bentgrass. To the authors' knowledge, this is the first report of this organism as a pathogen on A. palustris. The presence of P. terrestris may have been missed previously in isolation plates, because it is a slow-growing fungus. The use of a surfactant to retard the growth of fast-growing fungi in culture probably contributed to the recognition of this fungus in isolation plates. Since this fungus was isolated often from the thatch and soil layers associated with bentgrass, and, given the results presented here, it is evident that P. terrestris should be considered a root pathogen of creeping bentgrass.

10. CONTROL NUMBER

PN-AAB-863

11. PRICE OF DOCUMENT

12. DESCRIPTORS

Bentgrass?
Fungus diseases
Pyrenochaeta terrestris?
Roots
Turf grasses

13. PROJECT NUMBER

14. CONTRACT NUMBER

CSD-1922 211(d)

15. TYPE OF DOCUMENT

AID 590-1 (4-74)

CSD-1922
211(d)
PN-AAB-863

Literature Cited

1. HARROW, K. M. 1968. Hot water treatment for postharvest control of peach brown rot. Food Technol. New Zealand, March 1968 3(3): 12-13.
2. HEWITT, Wm. B., and L. D. LEACH. 1939. Brown rot Sclerotinias occurring in California and their distribution on stone fruits. Phytopathology 29: 337-351.
3. WILLETS, H. J. 1969. Cultural characteristics of the brown rot fungi (Sclerotinia spp.). Mycologia 61: 332-339.
4. WORMALD, H. 1954. The brown rot diseases of fruit trees. Tech. Bull. Min. Agr. Fish. Food, No. 3.

DEPARTMENT OF AGRICULTURE, PLANT DISEASES DIVISION, DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH, MT. ALBERT, AUCKLAND, NEW ZEALAND AND DEPARTMENT OF BOTANY, UNIVERSITY OF AUCKLAND

Page 506

PYRENOCHAETA TERRESTRIS, A ROOT PATHOGEN ON CREEPING BENTGRASS

W. A. Meyer and J. B. Sinclair[1]

Pyrenochaeta terrestris (Hans.) Gorenz, J. C. Walker, & Larson, causal agent of pink-root on onion (2), has been reported as a root pathogen of many members of the grass family (1, 6). In a study to determine the effect of fungicides on fungal populations in creeping bentgrass (Agrostis palustris 'Seaside') turf, P. terrestris was frequently isolated from thatch samples of turf that had been treated with various fungicides or left untreated (3).

Isolates were positively identified by comparing their cultural and morphological characteristics with the description for P. terrestris by Gorenz, et al. (2) and by comparing them with a known culture of the species. This paper reports the results of pathogenicity tests of isolates of P. terrestris from creeping bentgrass on that host.

Creeping bentgrass ('Toronto') plants were propagated by planting single node stolons into flats of autoclaved, sandy-loam soil. The plants were grown in the greenhouse at 25°C for 6 weeks and maintained at a cutting height of 5 cm.

Inoculum was prepared by using a technique similar to that described by Safir (4). Flasks containing 200 ml of Czapek's solution (5) were seeded with six mycelial plugs (6 mm in diameter) of the test fungus taken from the margin of 7-day-old, potato-dextrose agar (PDA) cultures. The flasks were then shaken for 6 days at room temperature (approximately 25°C). The resulting mycelial growth was separated from the growth medium by filtering through cheesecloth and then minced with 300 ml of sterile, distilled water in a Waring Blendor. Two methods of inoculation were used: 1) the root-dip, and 2) soil-infusion.

A root-dip technique was used for the first method of inoculation. The roots of 15, 6-week-old plants were dipped in the mycelial suspension of the test fungus and replanted into a flat of autoclaved, sandy-loam soil. Fifteen plants, used as controls, were treated by dipping their roots in sterile water before replanting. All flats were placed in the greenhouse at 25°C and maintained at a 5-cm cutting height.

Two inoculated plants were examined 10 days after inoculations, two inoculated and two noninoculated plants at 20 days, and all remaining plants were examined 30 days after inoculation. All plants were washed with tap water before examination. On all dates of examination roots of inoculated plants showed a red to pink discoloration on about one-fourth to one-half of the roots (Fig. 1). Tissue samples from these roots were surface sterilized with a .52% sodium hypochlorite solution for 2 minutes and plated on PDA. P. terrestris was isolated consistently from roots of inoculated plants. The pink discoloration was not observed on control plants, and P. terrestris was not recovered.

[1]Graduate student and Professor of Plant Pathology, respectively, Department of Plant Pathology, University of Illinois, Urbana 61801.
We wish to acknowledge Dr. J. W. Gerdemann for supplying a culture of P. terrestris.

FIGURE 1. Left -- Three plants inoculated with P. terrestris showing the red to pink discoloration of the roots. Right -- Check plant.

For the second method, a soil-infusion needle was used to inoculate the roots of 6-week-old bentgrass plants growing in a flat of autoclaved, sandy-loam soil. The inoculum was prepared as in the first inoculation experiment. Approximately 300 ml of the mycelial suspension was injected into the soil around the roots of 15 plants. The control plants were given the same treatment except that 300 ml of sterile water was used. The plants were then grown in the greenhouse and maintained as in the first experiment.

After 21 days, plants were removed from inoculated and noninoculated flats and washed with tap water. Twelve of the inoculated plants had a pink to red color on one-fourth to one-half of their roots. Most of the pink color was associated with the younger roots, while the older roots were reddish-brown in color. When these roots were surface sterilized and plated on PDA, P. terrestris was frequently isolated. The roots of all check plants were white and healthy and the fungus was not recovered.

These tests show that P. terrestris is a root pathogen on creeping bentgrass. To our knowledge, this is the first report of this organism as a pathogen on A. palustris. The presence of P. terrestris may have been missed previously in isolation plates, because it is a slow-growing fungus. The use of a surfactant to retard the growth of fast-growing fungi in culture (3) probably contributed to the recognition of this fungus on isolation plates. Since this fungus was isolated often from the thatch and soil layers associated with bentgrass (3) and from the results presented here, it is evident that P. terrestris should be considered a root pathogen of creeping bentgrass.

Literature Cited

1. CRAIG, JEWEUS, and BENJAMIN KOEHLER. 1958. Pyrenochaeta terrestris and Phaeocytosporella zeae on corn roots. Plant Disease Reptr. 42: 622-623.
2. GORENZ, A. M., J. C. WALKER, and R. H. LARSON. 1948. Morphology and taxonomy of the onion pink-root fungus. Phytopathology 38: 831-840.
3. MEYER, W. A. 1969. The microfungi isolated from creeping bentgrass turf plots subjected to different fungicide treatments. M. S. Thesis, University of Illinois. 28 pp.
4. SAFIR, G. R. 1968. Influence of vesicular-arbuscular mycorrhiza on the resistance of onion to Pyrenochaeta terrestris. M. S. Thesis, University of Illinois. 36 pp.
5. TUITE, J. 1969. Plant Pathological Methods, Fungi and Bacteria. Burgess Publishing Co., Minneapolis, Minnesota. 239 pp.
6. UNITED STATES DEPARTMENT OF AGRICULTURE. 1960. Index of Plant Diseases in the United States. Agriculture Handbook No. 165.

DEPARTMENT OF PLANT PATHOLOGY, UNIVERSITY OF ILLINOIS, URBANA, ILLINOIS