

PN-ABB-855

Weed Control Systems



**Annual
Report
1979-80**

Cover photo

Soepadiyo Mangoensoekarjo, Indonesian weed scientist, checks plot layouts while participating in a training program at Oregon State University in the USA.

Notes

In 1976 the Agency for International Development—Oregon State University weed control systems program was redefined into two closely linked contracts, research and technical assistance. The two activities function in a highly interrelated manner being virtually inseparable, and generate a synergistic effect. This report treats the contracts individually in the financial review section while also grouping relevant activities in the review section.

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In conducting the AID-OSU weed control systems program, the University broadly publicizes any professional opportunities with the program. All qualified candidates are, and will be, considered for any available position.

Report

This document was prepared by the International Plant Protection Center, Oregon State University, Corvallis, OR 97331 / USA, September 1980.

The views and interpretations in this publication are those of the International Plant Protection Center and should not be attributed to the Agency for International Development or to any individual acting in their behalf.

**Weed Control
Systems and
Systems Utilization
for
Representative Farms
in
Developing Countries**

**U.S. Agency for
International
Development
and
Oregon State
University**

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Project Profile

Technical Assistance

Research

Project title	Weed Control Systems Utilization for Representative Farms in Developing Countries	Weed Control Systems for Representative Farms in Developing Countries
Contract numbers	AID/ta-C-1303	AID/ta-C-1295
Principal investigator	Dr. Stanley F. Miller Director, International Plant Protection Center Oregon State University Corvallis, OR 97331 / USA (503) 754-3541	Dr. Stanley F. Miller Director, International Plant Protection Center Oregon State University Corvallis, OR 97331 / USA (503) 754-3541
Contract period (extension)	June 1, 1979 through May 31, 1982	June 1, 1979 through May 31, 1982
Period covered by this report	June 1, 1979 through May 31, 1980	June 1, 1979 through May 31, 1980
Total project expenditures and obligations for the report period	\$312,084	\$259,452
Accumulated expenditures for the contract period April 1, 1976 through May 31, 1980	\$1,269,409	\$946,271
Cooperating with	CATIE (Centro Agronómico Tropical de Investigación y Enseñanza), Turrialba, Costa Rica; Director, Dr. Santiago Fonseca M. NCPC (National Crop Protection Center), Los Baños, Philippines; Director, Dr. Fernando F. Sanchez.	

Summary

During the year weed control systems project activities were conducted within both technical assistance and research categories and in three main geographical regions: Southeast Asia, Central America, and Corvallis, OR.

A second weed science short course, held in conjunction with the Philippine National Crop Protection Center, concentrated classroom, field, and laboratory activities in 21 full-day sessions attended by 34 participants representing 17 public and private institutions.

The project linked with several Thai organizations to further assess the extent and socio-economic impact of *Mimosa pigra*, an invasive weed, in northern Thailand. A project economist designed and initiated an 18-month, on-site study to specifically document the various costs of controlling *M. pigra*.

At the request of USAID/Barbados, a project agronomist participated in a review of the Caribbean Small Farm Multiple Cropping Program and in two 1-week weed control workshops (in Grenada and Antigua). The activities were carried out jointly with the Caribbean Agricultural Research and Development Institute.

The project also participated in an FAO-sponsored 4-week weed control short course in Argentina. En route, the project representative visited Ecuador to informally review the national weed research effort and assess the project's residual impact.

A two-man project team responded to a request from USAID/Dar es Salaam by conducting a 3-week survey of weed problems in Tanzania.

Research in the Philippines confirmed earlier findings relating to alternative time- and cost-saving weed control techniques for small, upland rice farmers. Initial results from other, first year, plots suggested advantages for no-till systems in upland maize following rice.

Refinements in the weed control methods associated with the no-till systems practiced in the North Atlantic Zone of Costa Rica continued to show benefits including reduced losses due to insects (compared to plowed plots).

Two economists joined the project staff and accepted on-site assignments in Central America and Southeast Asia.

Additional project research focused on: use of a locally manufactured spray shield; using half rates of herbicides; and using one herbicide application to more effectively control weeds in young forest plantations.

The project maintained its worldwide information dissemination program. The periodical INFOLETTER marked the tenth year of publication.

The Project in Focus

The advancement of agricultural technology has had mixed blessings. For small and medium-sized farming enterprises in many developing countries, the increased emphasis on requisite inputs (fertilizer, improved seed, irrigation) and their associated costs placed dramatic production increases out of reach. Only the more affluent operators could stand the cost, not to mention the increased risk.

Advanced technology also contributed to the intensification of weed problems, both for adopters and non-adopters. Improved growing conditions for crops equated with improved conditions for weeds as well. And, it became evident that some of the newer, high-yielding cultivars did not compete with weeds as vigorously as did many native varieties.

Studies in some developed countries revealed that weed flora shifts occurred in regions with a history of herbicide use. Populations tended to shift from relatively controllable broadleaf varieties to more pernicious grassy species which, once established, became more difficult to control.

The international development community grew increasingly concerned over the need for weed control in developing countries:

- To what extent do weeds limit production, either by direct competition with crop plants for available nutrients, light, and water, or by demands for the factors related to control, land (the need for additional land to compensate for fields over-run with weeds), labor, and capital?
- What realistic levels of agricultural technology could, or should, be introduced for weed control given the prevailing economic, social, and political restraints?
- What is the inter-relationship of weed control technology with other advanced technology inputs and what priorities emerge as a result?
- How do various weed control systems—including the absence of any control—economically and socially affect the small farmer, his family, the associated labor pool, and the community?

These concerns resulted in the AID-Oregon State University weed control project (a contractual relationship originated in 1966) being encouraged to study the emerging implications of weed control technology. The formerly production-oriented AID-OSU research effort was restructured in 1973 to include a broader overview of peasant farm problems and to work toward evolving weed control systems for representative farms in developing countries.

Concurrently the project assumed the added dimension of attempting to assess the social and economic impact of weed control technology related to employment and income distribution. The restructured project undertook programs centered in Brazil (Northeast) and El Salvador. These

efforts were carried out in accordance with work plans and terminated in 1976. New project areas were identified in Central America and Southeast Asia and a series of multi-faceted programs launched in these two regions.

The project had become increasingly aware that aquatic weeds constituted a serious problem throughout the tropics and sub-tropics of the world, especially in developing countries. Since 1960



explosive growth of aquatic weed populations in major hydrological systems of several developing countries had reduced or restricted water availability. Where water systems serve multiple purposes, e.g., irrigation, transportation, cooking, sewerage disposal, and hygiene, in Southeast Asia, for example, loss of ready access to water would cause serious sociological problems.

Relative to agriculture, aquatic plants occupy space needed for water storage. Moreover, through transpiration, they accelerate the loss of water from a free water system three to eight times over that of a clear surface. This threat becomes especially pertinent for critically water-short regions such as the African Sahel.

To address aquatic weed problems, the AID-OSU weed program arranged for the University of Florida to conduct an aquatic weed activity under a sub-contract. An agreement was signed and work begun in April 1976. UF aquatic weed experts would offer technical assistance through short-term consultations with governments of developing countries as well as provide a reference and information center to the same group of nations.



Objectives

The AID-OSU weed program constitutes but one of many elements in the overall effort to raise food crop production levels in the world's less developed nations. It specifically aims for reduction of food crop losses due to weed competition to the extent that production gains are justified economically and socially.

The program endeavors to work in close collaboration with local, regional, national, and international entities through sensitivity to stated needs and integration of activities. The goal involves productive collaboration with non-project colleagues and counterparts to ultimately increase effectiveness of weed science and control.

Attempts to develop and weigh weed control technologies for representative farms in developing countries imply a special emphasis on smaller-sized, subsistence farms. Resulting technologies, or systems, are evaluated in terms of various societal goals and performance criteria, including economic efficiency, employment, and income distribution.

Other specific objectives include :

1. Training host country counterparts in appropriate weed control research methodology ;
2. Promoting only practical and safe usage of herbicides (and other pesticides) through educational programs ;
3. Encouraging evaluation of ecological and environmental aspects of weed control systems ;

4. Fostering continued development and maintenance of a worldwide communication-information network for weed control linking the institutions and individuals concerned.

Specific objectives of the aquatic weed component include :

5. Identifying biological and socio-economic problems of aquatic weeds in agricultural production and related non-agricultural situations ;

6. Providing short-term consultation for integrated weed control methods in developing countries ;

7. Establishing general criteria for the assessment of aquatic weed problems ;

8. Continuing to operate an extensive aquatic weed information and reference center and expand delivery of data therefrom.

9. Developing integrated control systems for important aquatic weeds.



Activities Review



Figure 1.
Project weed scientist C. E. Munroe
(right) helps a short course participant
calibrate a knapsack sprayer.

I. Technical Assistance

• Southeast Asia •

Second weed science short course held

The AID-OSU weed project spearheaded organization, coordination, and execution of a second 3-week intensive weed

science short course during January-February 1980, at the Philippine National Crop Protection Center (NCPC). The first course was held a year earlier and proved highly successful inspiring the holding of the 1980 event.

Thirty four individuals representing 17 Philippine public and private institutions attended as participants. A committee with members representing NCPC, PCARR (the Philippine Council for Agriculture and Resources

Research, and the AID-OSU project screened applications.

Earlier the same committee met to establish dates, prepare announcements, and develop mutually agreeable support budgets, as well as plan for the other logistics.

The course comprised nearly 100 hours of lectures, laboratory exercises, demonstrations, field problems, and field trips spread over the 21-day period.

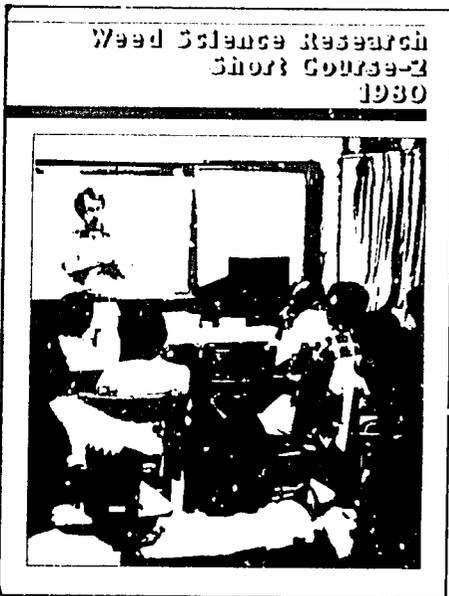
Thirteen people involved with instructing, guiding, and lecturing participants represented several Philippine institutions, plus IRRI (International Rice Research Institute), and the University of Hawaii, as well as AID-OSU project staff members from Oregon State University.

A broad selection of printed materials was provided each participant. The course was designed to meet the following objectives:

- Raise the level of overall weed science comprehension;
- Provide a learning experience in weed control research techniques and programs;
- Create a network of professional contacts among Philippine weed science workers; and,
- Help participants gain confidence in the selection and application of research apparatus and equipment.

Four parameters were used to suggest participant progress including an initial and final examination, plus repeated questions on both, and selected weighting of more difficult segments. A weed identification test was included. The average exam score improved 19% over the duration of the course.

Full details for the course, the participants, and the instructing group, along with a financial summary, have been published as WEED SCIENCE RESEARCH SHORT COURSE-2, 1980, IPPC document #32-C-80, available from IPPC.



Broad front of assistance continued

In the Philippines, project staff provided a variety of assistance activities including:

- reviewed all weed control-related proposals submitted to the Ministry of Agriculture by Regional Crop Protection Centers (RCPCs).
- discussed weed problems and research in the Philippines with Dr. Fred Tschirley, weed scientist with the Purdue University ICP (integrated control of pests) Planning Study Team for S.E. Asia; and,
- continued distribution of weed control publications to persons either working in weed control or interested in the topic.

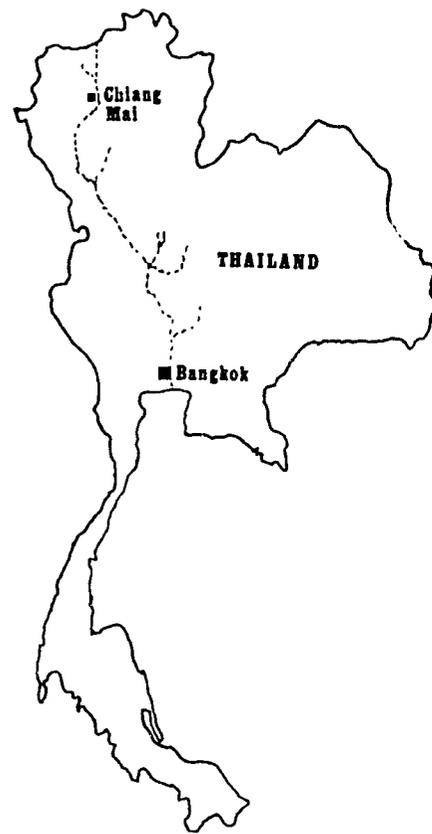
A major effort, spearheaded by project staff members J. L. Gingrich and C. E. Munroe, has been directed at assisting RCPC staff to improve capabilities in planning and conducting weed control field research. Specifics include discussion during planning plus assistance in securing necessary research materials, compounds, and research sites. Any resulting data will be shared with the project for ultimate incorporation into socio-economic/agronomic analyses.

• Aquatic Weed Program •

Project responds to *Mimosa pigra* threat

Project members G. E. Allen and F. S. Conklin visited Thailand in September 1979 to investigate establishment of an extensive aquatic weed economic impact study in cooperation with the National Research Council. During the visit the Thai Deputy Under-Secretary of Agriculture requested that the project team make an assessment of the *Mimosa pigra* L. problem in northern Thailand.

As a result an aerial and ground survey of *M. pigra* infested areas of northern Thailand was



conducted in September 1979. Project staff members were joined by Dr. Banpot Napompet, Kasetsart University; Dr. Taval Maneewarn, Electrical Generating Authority of Thailand (EGAT); and Ms. Saowanee Thamasara, Royal Irrigation Department (RID) for the assessment.

The joint Thai-AID project team concluded that *M. pigra* could become a major problem in and around the Chiang Mai area in northern Thailand. The team prepared a report and submitted it to the Deputy Under-Secretary of Agriculture. The semi-aquatic herbaceous plant was introduced into Thailand by a farmer for prevention of soil erosion. However, it "escaped" and now ranks as a serious pest that threatens waterways and agriculture. Besides its rapid spread in northern Thailand, *M. pigra* has moved into Burma and the Mekong River system. Presence in the Mekong, one of Southeast Asia's major water systems, could readily lead to establishment of *M. pigra* in Laos, Cambodia, and Viet Nam.

As a result of the September assessment survey and the recommendations generated, the AID weed systems project agreed to redirect its aquatic plant effort and focus on the *M. pigra* problem in Thailand. Staff members G. E. Allen and F. S. Conklin, plus S. F. Miller, returned to Thailand in January 1980 to present and discuss a proposed cooperative program. The conclusion: the project, through the International Plant Protection Center, would: 1) assist in conducting an economic impact assessment of *M. pigra*; and, 2) lend technical assistance for developing short- and long-range control programs.

A feature article in the IPPC INFOLETTER stressed the need to contact other researchers worldwide with *M. pigra* data or experience. Scientists in Australia, Brazil, and FAO-Rome responded. Information they provided, plus a literature search conducted by AID-OSU project member A. S. Cooper, has produced an extensive information file for *M. pigra*.

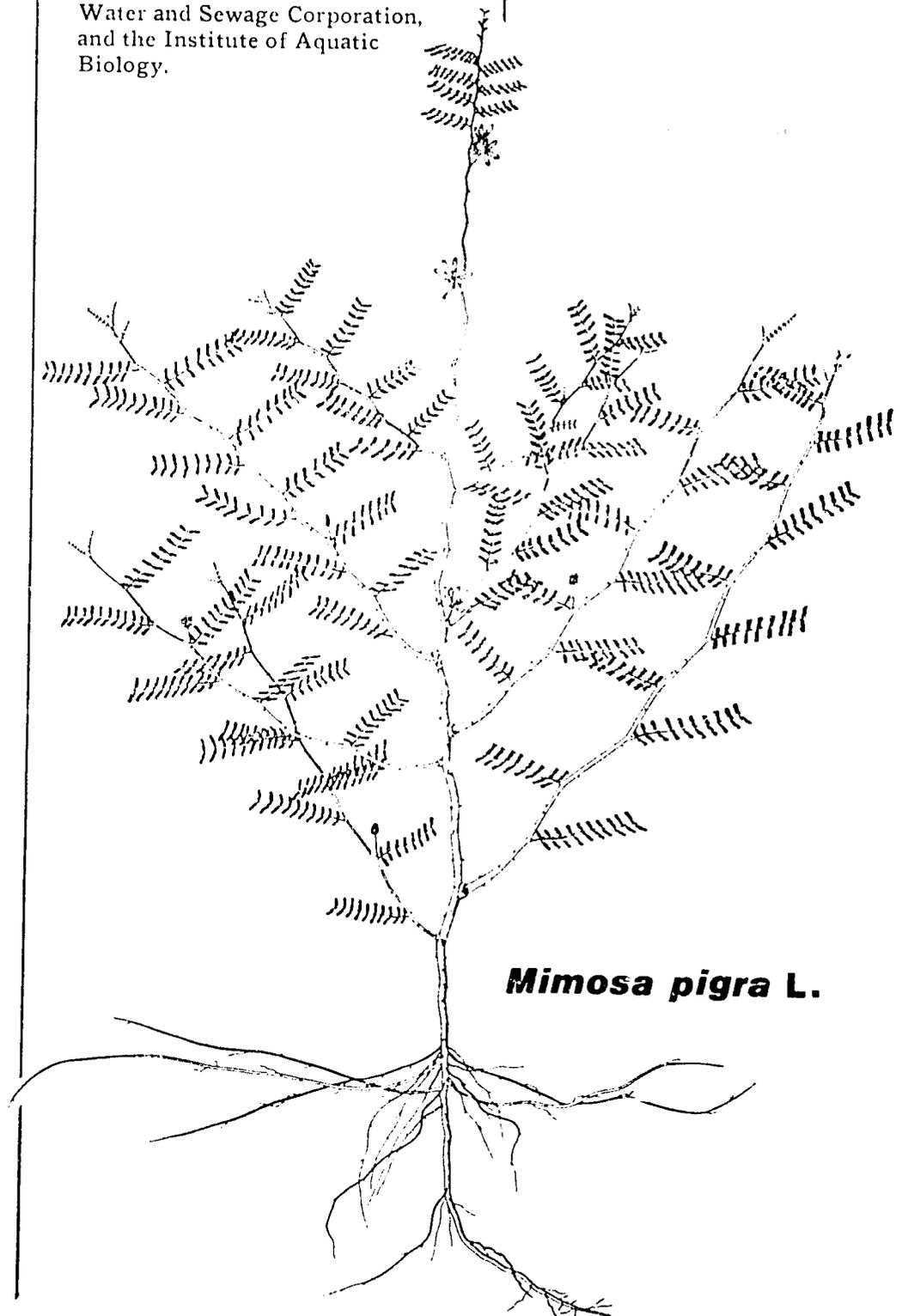
During spring 1980, arrangements were made to conduct an 18-month study of the economic impact of *M. pigra* and its control in northern Thailand. G. Lamar Robert, a Thai speaking Ph.D. candidate in resource economics at the University of Maryland, agreed to lead the study in cooperation with the existing Ford Foundation program at Chiang Mai University. The Foundation will contribute to in-country support and also furnish logistical assistance to the study which began in July 1980.

The aquatic weed program of the AID project will provide short-term consultants during the next 2 years to assist an interagency Thai coordinating committee in designing short- and long-range management programs for *M. pigra* in northern Thailand. The first meeting between project members and Thai planners is scheduled for July 1980.

Ghana short course rescheduled for 1980

A 2- to 3-week short course in aquatic weed identification and control was planned for West Africa during the reporting period, but failed to develop because of political changes in Ghana, the proposed site of the course. Plans are being formulated to conduct the short course in Accra, Ghana, in November 1980, or February 1981, in cooperation with the Ghana Water and Sewage Corporation, and the Institute of Aquatic Biology.

The purpose of the course will be to train key individuals from West African countries in available aquatic weed control techniques. The course will be limited to 20 participants and will comprise a mixture of lectures and field studies. The latter will be conducted on Barekese and Weija reservoirs, sites of serious *Pistia stratiotes* (water lettuce) infestations.



***Mimosa pigra* L.**

The course instructors will include five U.S., two African, and two British scientists. The British scientists will be supported by the British Overseas Development Authority.

Aquatic plant information service

The aquatic plant information bank established at the University of Florida and supported by the AID-OSU project, contains material from an estimated 1,900 journals, reports, proceedings, and other publications. With the addition of information regarding 27 plant species during the report year, the total number of documented aquatic plant species in the system now stands at 4,370. Nearly 700 items were catalogued in 1970-80.

During the reporting period project staff processed 51 requests for reference lists. Since the system came on-line in April 1978, a total of 256 requests have been answered and 115 different computer-generated bibliographies retrieved. Some of the most popular topics are *Hydrilla*, *Myriophyllum*, spp., chemical control, ecology, *Eichhornia crassipes*, *Salvinia* spp., and biological control. A variety of organizations have requested bibliographic literature searches. Distribution of requests appears in Appendix 3.

Other aquatic program activities

Based on the 1978 weed project-conducted assessment of *P. stratiotes* infestations in the Chanian reservoirs, the World Bank has awarded a 2-year contract to an international consulting firm to perform an environmental impact study of the two systems. This project aquatic weed program has agreed to assist in the study.

The project was contacted by the Canadian International Development Research Center concerning the possible arrangement of a 1-year program for an Indian scientist, Mr. Ramaprabhu Tumular, to study aquatic weed control practices. Arrangements have been made for Mr. Ramaprabhu to conduct his study with the Aquatic Plant Research Center at the University of Florida.

• Central America •

Project supports Caribbean effort

At the joint request of USAID/ Barbados and the Caribbean Agricultural Research and Development Institute (CARDI), the AID-OSU weed project participated in a review of the CARDI/USAID Caribbean Small Farm Multiple Cropping Program and in two 1-week weed control workshops.



Figure 2. John Hammerton, CARDI weed scientist.

Project weed specialist M.D. Sherk spent 4 days with CARDI's Dr. John Hammerton visiting small farms in Barbados and St. Lucia in mid-April, 1980. The subsequent workshops, in Grenada and Antigua, drew 26 and 22 participants representing both CARDI and Ministry of Agriculture staff. Ten territories were represented: Trinidad-Tobago, St. Lucia, St. Vincent, Barbados, Grenada, Dominica, St. Kitts-Neves, Antigua, Belize, and Monserrat.

The workshops included a series of country papers presented by participants. The primary conclusion from these: weeds do constitute a serious constraint to agricultural production in the Caribbean. Also, most of the currently practiced smaller farm weed control involves manual methods, though chemical methods are becoming more prevalent.

It was observed that relatively little weed research is being conducted by national institutions in the Caribbean thus making CARDI's weed control efforts highly important. Dr. Hammerton, as leader of the CARDI weed research effort, is in a position to lend useful guidance for the development of CARDI-MoA weed research programs appropriate to small farm/multiple cropping situations.

Project agronomist assists Argentine short course

A 4-week, comprehensive weed control short course proposed by the Instituto Nacional de Tecnología Agropecuaria (INTA), Argentina, and supported by FAO, took place during October-November, 1979, at the San Pedro agricultural experiment station. AID-OSU weed specialist M. D. Sherk served as one of the lecturers during the event.

Mr. Sherk presented a variety of material including strategies for practical application of weed control methods in agricultural production systems. He also participated in field exercises.

The project, through IPPC, also assisted FAO personnel in the initial stages of organizing the course and in contacting individuals outside Argentina for participation as lecturers. IPPC supplied several publications (in Spanish, or bilingual) in sufficient quantity to provide copies to each of the 28 participants.

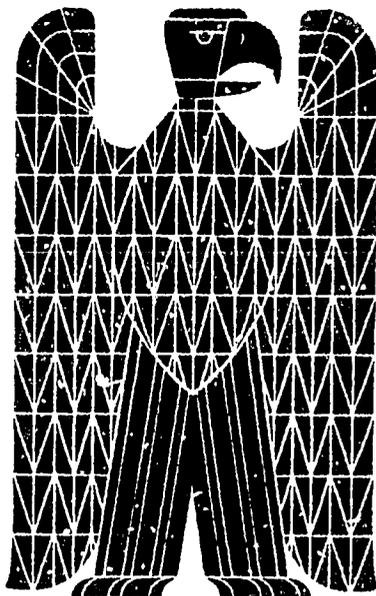
Ecuador revisited

On route to Argentina from Costa Rica, M. D. Shenk stopped in Ecuador to conduct an informal review of the Ecuadorian national weed research program at the request of program leaders. He also made an assessment of the effect the AID-OSU project had through its presence in Ecuador (1969-73). Several Ecuadorian counterparts to the program at that time have provided the bulwark of experience and competence for the ongoing effort. His visit served as an opportunity to bring together all 12 full-time weed control specialists for the first time in several years.

A specific assessment of personnel revealed that members of the program averaged 4.5 years with INIAP (Instituto Nacional de Investigaciones Agropecuarias) generating significant research continuity. Of the individuals trained in INIAP since 1969, 82% are still working (to varying degrees) in weed control. One has an MS (from Oregon State Univ.) and another is completing an MS (Oklahoma State Univ.). Several have acquired training at CIAT (Cali) including the AID-OSU intensive short course of several years ago.

Weed control recommendations have been published for 11 crops with several other categories in preparation. However, five manuscripts for additional publications, prepared in 1975, have not been printed and, with some relatively simple updating, were found to be still valid.

Short courses and training activities have tapered off in the last 5 years, though weed team members have participated in courses organized for specific commodity groups. There has been active involvement with weed control classes in local universities.



According to the report, INIAP personnel insist that the AID-OSU connection "has been the key element in the establishment of the weed control team in INIAP." They voiced concern too that CIAT no longer has a weed specialist and no longer offers specialized training in weed science. Project trained personnel have been active within Ecuador, the report noted, and project produced literature is well regarded, and utilized, by individuals as well as several libraries.

Recommendations emerging from the visit included investigating the possibility of receiving one or two INIAP trainees per year at CATIE for in-service training which could be of joint benefit to INIAP, CATIE, and the AID-OSU program. Also, an annual visit to Ecuador by project personnel would be both welcomed and potentially useful in sharing results of ongoing weed research.

• Corvallis •

Team assesses weed situation in Tanzania

IPPC staff members S. F. Miller and L. C. Burrill, plus a Tanzanian Ministry of Agriculture agronomist, carried out a 3-week survey and assessment of weed problems in Tanzania during April 1980.

The review, requested by USAID/Dar es Salaam, was geared to assess current weed control practices and to observe and define weed-related problems. The team visited several agricultural research institutes, MoA seed farms, National Agricultural and Food Corporation farms, and private farms in various regions of Tanzania.

Recommendations offered by the team, based on findings, included increased weed science training for Tanzanian officials, establishment of a more formalized nation-wide weed research program, and increased commitment/funding for support of an expanded weed control effort.

Suggestions for specific methods of more effectively controlling several of the most pernicious weed species were presented in the team's report, **WEED CONTROL PROBLEMS IN TANZANIA**. For implementing and evaluating control strategies, the team emphasizes the need to consider the entire socio-economic matrix of the Tanzanian small farm operator.



The team also recommended initiation of research efforts in minimum tillage, stubble planting, and stale seedbed methods. Further, increased consultation and literature acquisition were advocated. A listing of appropriate titles was appended to the team's report.

Project produces several major publications

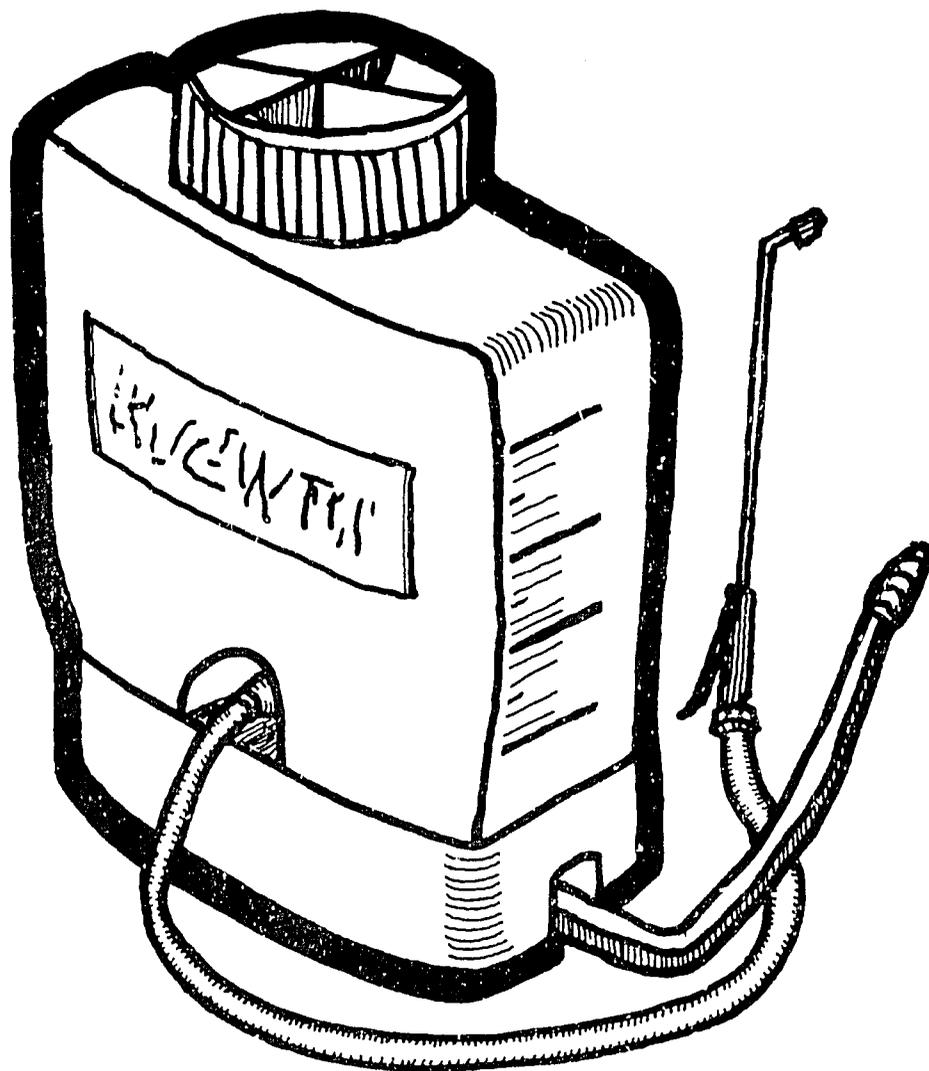
Several major publications were published by the project during the year including WEED-CROP COMPETITION, A REVIEW, by R. L. Zimdahl; KNAPSACK SPRAYERS: USE, MAINTENANCE, ACCESSORIES, by F. G. Fraser and L. C. Burrill; and two other illustrated reports.

Dr. Zimdahl's work comprises a detailed review and comprehensive survey of contemporary world literature for weeds' competitive influence on crops.



The 198-page work offers an historical overview while providing a single in-depth reference for relevant research published through 1978. It includes over 700 citations categorized under two main headings: competition, and studies of weed biology.

The text reviews other writers' numerous attempts over the years to define competition between plants. An early chapter discusses the influence of competition on plants. A subsequent section concerns the effect of weed density on each of several major crops.



Dr. Zimdahl, a Colorado State University weed scientist with an international outlook, constructed extensive tables to compare the various impacts of competition duration by crop. Also, the primary elements competed for—nutrients, light, and moisture—each receive individualized treatment.

Burgeoning interest in use and application of knapsack sprayers worldwide, and for weed research work both within and outside of the AID-OSU project, prompted staff members F. G. Fraser and L. C. Burrill to prepare a technical publication on the subject.

Over 75 photos and illustrations were used to describe various functions of knapsack sprayers and, in particular, to present details for constructing a variety of multi-nozzle booms for use in conjunction with manually operated hydraulic sprayers.

The publication, 31 pages, in paperback, offers guides for application as well as safety in usage, handling, and storing pesticides. The focus throughout is on herbicides and weed control.

A document reporting the second major intensive weed science short course held in conjunction with the National Crop Protection Center at Los Baños, Philippines, was issued during the year. Visual materials were used extensively in an effort to create a graphically appealing format. The objective was to produce a document that served two purposes: report on the short course, and, additionally, have residual use as an information piece describing the sort of training that IPPC can provide.

A report of an assessment team that visited Tanzania for 3 weeks in April 1980 was issued as WEED CONTROL PROBLEMS IN TANZANIA, IPPC document #34-A-80, in June 1980. The report detailed visits to various production and research facilities, reviewed major weed species, and offered a series of recommendations for addressing current rampant weed problems in Tanzania.

Literature collection organization completed

All back cataloging was completed and a number of improvements instituted as the IPPC-project technical literature collection reached a new plateau of development.

Project staff member A. S. Cooper, building on an established base, expanded the range of subject headings to 467. He also reviewed and cataloged-in over 500 entries.

The collection's system of cross referencing permits retrieval by author, title, or subject. This feature assists searches for specific data as performed by Corvallis staff. The literature collection stands as a resource for USAID missions seeking information regarding weeds, weed control, equipment, chemicals, or other topics.



Figure 3. IPPC's Kay MacQuaid conducts a search through the Center's weed literature collection.

INFOLETTER marks 10th year of publication

Issue number 43 of the IPPC INFOLETTER, dated January/February 1980, marked the publication's 10th anniversary. INFOLETTER, published by IPPC, receives major financial support through the AID-OSU technical assistance weed control systems contract.

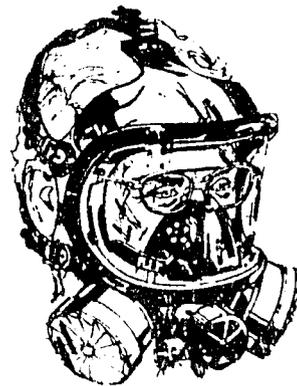
Since commencement in 1970, the INFOLETTER recipient list has grown from 300 to 4,600 scattered through more than 140 nations. A table of country-by-country distribution appears in Appendix 2.

A sampling of news items that appeared in the four issues of INFOLETTER published during the report year includes:

- Parasitic weeds*
- British Crop Protection Council Profile*
- Amphibious vehicle described*
- Squirt, wipe, and zap: new generation of herbicide applicators*
- Spreading weed menaces North Thai agriculture*
- Weed scientists receive honor*
- Weed control: value for the 80s*
- Weed cost hikes compared*

Each issue of INFOLETTER also contained both "In Print" and "Dates and Events" sections presenting information judged to be of interest to the international weed science community. The former listed 55 publications from 46 sources in 15 nations. Each item included an address to contact and, when available, a per copy cost.

Three of the four issues ran an "Equipment" section with a total of 12 items featured including: a hand-pushed, ground actuated sprayer; a full face-piece



respirator; new design pressure regulators; an amphibious walk-behind power tiller; powerized knapsack applicator; horizontal boom for a small mistblower; spray banding kits; a line of motorcycle trailers and side carts; a basic no-till equipment package (tiller, seeder, cart, and spinning disc herbicide applicators); tool-mounted spring hoe; tillers for 10-20 horsepower tractors; and a lightweight tracked vehicle.

During the year IPPC received 164 separate inquiries from 43 countries requesting information about 47 equipment items mentioned during the period 1975 to 1980. Each inquiry received a response from the project.

INFOLETTER equipment section surveyed

For several years INFOLETTER has included an "equipment" section in most issues that presented photos or drawings, plus brief technical descriptions, of items deemed to be both potentially interesting and useful to an international audience. Informal comment suggested that the featured was well received and

performed a useful service. However, a need to formally ascertain the section's value was apparent and so a survey was conducted during the report year.

A brief explanatory letter with tear-off questionnaire (four questions) plus return addressed envelope, was prepared and mailed to each of 183 individuals who had inquired about "equipment" items during the period July 1, 1978 through October 30, 1979.

Respondents were requested to indicate the action that took place after they received the manufacturer's name(s) and address(es) from IPPC. Space was provided on the reverse of the form for comment, suggestions, etc.

Results: 88 completed forms (44%) were received concerning a total of 163 equipment items (many people inquired about more than one item). Of these, 150 inquiries were sent to manufacturers and 132 responses were received. Further action (purchase, use for reference, etc.) was indicated by 58 respondents. A summary of the comments appears in Appendix 8.

Information supplied to Philippine colleagues

Information was supplied from Corvallis by project staff member H. H. Fisher on a variety of topics to collaborating (and other) researchers in the Philippines. A partial listing follows:

- specifics for conducting weed control evaluation in paddy rice;
- information concerning weed control in garlic and onion crops;
- information concerning weed control in ginger;
- material describing weed control by mulching in tomatoes;
- information on various multicropping systems in coconut plantings;



Figure 4. A selection of material published by the International Plant Protection Center and others was provided to each participant at the National Crop Protection Center-IPPC weed science short course.

In addition, numerous articles were photocopied and/or publications provided. A proposal for research to control *Chromolaena odorata* was reviewed and suggestions provided for possible improvement. Also, information concerning possible negative effects of a particular herbicide included in field weed control research was provided to researchers in the Philippines and to the manufacturer of the material.

IPPC Papers series proves popular

The IPPC Papers series of reprints maintained its popularity as an information source during the year. As noted in a summary of distribution (Appendix 4), 1,761 copies were requested and distributed without cost.

Two new titles were added: *So you're going to do a slide show*, By A. E. Deutsch; and, *Small isn't necessarily beautiful in third world agriculture*, by G. Dion.

The series, now containing 29 titles, will continue to be expanded during the coming year.

Requests received

The project, through IPPC, continued to receive a variety of technical and non-technical requests for information.

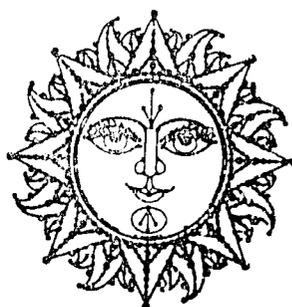
At the request of the AID project monitor in Washington, the project researched and prepared an analysis comparing properties, mode of action, use, and impact of paraquat and glyphosate herbicides.

Appendix 5 lists 41 identifiable requests received, including the source, and the action taken by project staff. Time devoted to a request ranged from very brief—forwarding a prepared document—to more extended when research was involved. The listing excludes the 164 requests for equipment manufacturer names and addresses previously mentioned under INFOLETTER.

Pesticide application equipment file updated

Forty one manufacturers were added to the IPPC master file of pesticide application equipment manufacturers worldwide bringing the total at the end of the report year to 641.

Additionally, new categories of equipment were added to encompass recirculating/recovery sprayers, and wipers (carpet, pad, and wick) both mounted and hand-held.



II. Research

• Central America •

No-till maize shows benefits

Research conducted in the North Atlantic Zone of Costa Rica has developed a consistent trend of higher yields in unfertilized zero tillage¹ plots compared with unfertilized plowed plots. These results suggest that plowing, by burying surface soil, causes its attendant nutrients to be denied to seedling maize plants. Thus, if zero tillage can reduce the need for (increasingly expensive) fertilizer, it may help offset inflationary pressures.

¹ Zero tillage consists of chemically preparing the seedbed to form a mulch. Seeds are planted directly into the mulch. Subsequent weeding, if needed, is by hand or herbicide.

Table 1
Fertilizer and No-till

fertilizer levels	kg/ha shelled maize	
	plowed	no-till
0	2242	2560
1	2804	3047
2	2605	3097
3	3038	3001

The government of Costa Rica is encouraging increased mechanization for land preparation in the North Atlantic Zone. At the same time project research continues to demonstrate several advantages to a zero tillage system. A primary benefit stems from decreasing time and cost to prepare fields for planting. Secondly, in some cases yield increases have occurred in no-till compared with tillage (Table 2).

Table 2
Production and No-till

tillage	kg/ha of maize grain at 12% moisture		
	maize	maize & beans	maize & lima beans
conventional	2777	2679	2429
zero	3907	3182	3882

An experiment conducted on the same plots for three consecutive crop seasons indicates the necessity of considering longer term impacts of no-till. Shifts may occur in weed species from those that are controllable to those that present greater problems. For instance an annual broadleaf (*Hemidiodia ocimifolia*) was not sufficiently controlled (in no-till) by applications of either glyphosate or paraquat. This fact supports the project's contention that most weed control systems should include a handweeding component as needed.

Additional results revealed that use of glyphosate for the first season sufficiently controlled a pervasive perennial grass (*Paspalum fasciculatum*) allowing use of less expensive paraquat the following seasons.



Research was conducted to assess the interaction between insects and no-till. Table 3 suggests that control of insects attacking maize is of far greater importance for conventional tillage systems than no-till. Thus, no-till could provide production increases where insect control measures are not feasible.

Table 3
Insects and No-till

insect control	kg/ha of maize	
	plowed	no-till
no	2776b	3617a
yes	3731a	3812a

Spray shield gains farmer acceptance

Use of fast acting, non-selective herbicides for controlling weeds when crops are present requires some means of restricting spray droplets to weed plants while shielding crop plants. Project staff developed a simple shield to fit over a spray nozzle to accomplish this task.

The shield, which was locally fabricated from readily available materials, is being received enthusiastically by those small farmers in the region who own knapsack style applicators. Non-selective herbicides, formerly limited to certain uses, can now be applied between rows of maize, bean, or other crops without damage to the crops.

Using half as much herbicide

In another approach, project research results show that the use of half rates of soil applied herbicides, supplemented with hand weeding, can be a viable weed control practice for the family with limited capital, but ample family labor. Equal yields were obtained with:

1. normal rate of herbicide
2. hand weeding
3. herbicide at half rate plus hand weeding

Advantages of the third alternative to a small farmer might be:

1. to reduce cost;
2. to reduce potential for herbicide injury to crop
3. to allow hand weeding to be delayed to a more convenient time, i.e., after all planting has been completed;
4. to make hand weeding easier due to fewer weeds present and a more mature, less damage-prone crop.

Control of a tough weed

The weed *Rottboellia exaltata*, a rapidly increasing pest in Asian and African fields, constitutes a serious problem in Central America as well. Panama, in particular, suffers hundreds of hectares of sorghum infested with *R. exaltata*.

Research results indicate that application of the herbicide pendimethalin, plus paraquat, between rows, using a spray shield, at 14-21 days after planting, generated positive control—and in an area where sorghum fields are often abandoned due to *R. exaltata*.

Weed control benefits forestry

In a non-replicated demonstration conducted by the project (in Costa Rica), a comparison was made between chemical weed control and hand cutting in 7-year old pine trees. After 18 months trees growing in an area treated with the herbicide glyphosate had an average increase in diameter 24% greater than trees growing in an area where the weeds had been cut by hand a total of six times.

Forestry Vegetation Management In Costa Rica

7-year old pines treated by	ΔDiam. (18 months)
Weeds hand cut 6 times	X
One application of glyphosate	24% X

• Socio-economic Component •

The report year witnessed significant progress in the economic screening of alternative weed control technologies being developed in the Philippines and Costa Rica by project agronomists. Activities included: (1) evaluation of existing weed control technology at the farm level; (2) evaluation of new or introduced technology at the farm level; (3) evaluation of expected farm level adoption.

Costa Rican study completed

An M.S. thesis completed by T.V. McCarty considered, "The Agronomic, Economic, and Social Effects of the Availability of New Weed Control Treatments to Small Corn Farmers in the North



Atlantic Zone of Costa Rica." It provides an economic benchmark of existing weed control technology plus a preliminary means for evaluating—on paper—the expected economic impact of new weed control technology which had emerged from agronomic trials.

Traditional weed control via mulching was identified as an important practice for crop production and erosion control in the North Atlantic Zone. Weed cutting (and mulching) occurs at least three times per crop season: during land preparation, as a post-planting operation, and again just before crop harvest. Approximately half the family labor for field work and half the cash costs are associated with weed control under traditional systems, though the figure can inflate to 80% under conditions of heavy grass weed growth.



To provide a preliminary evaluation of introduced weed technology, technical inputs used in the field experiments were converted into monetary terms. These results then were compared against those incurred under traditional technology for each of 20 sample farms selected in McCarty's study to assess the potential for adoption. Such preliminary evaluation suggests that limited adoption of glyphosate and paraquat herbicides might be forthcoming as a substitute for machete handcutting during land preparation under specific conditions where an excessive stand of rank perennial grasses exists, and by farmers who rely upon hired rather than family labor. Duration of weed control and possible yield effects from mulch carryover into subsequent crop seasons deserve further scrutiny. Wide variation in the composition and severity of weed problems on sampled farms suggests that a cross section of different farm types be used in the farmer demonstration trials slated for the project's next phase.

Economist destined for Costa Rica

G. Escobar, a Ph.D. candidate in the final phases of a research project supported by the International Research Institute and the Ford Foundation in Colombia, has joined the AID-OSU weed project staff with assignment to the Central American regional program headquartered at Centro Agronómico Tropical de Investigación y Enseñanza, Turrialba.

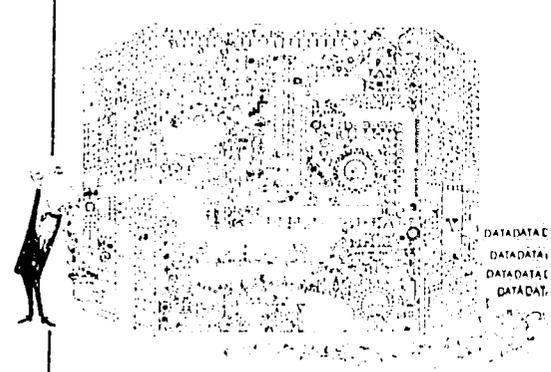
The technology adoption model he developed will be adjusted to reflect Costa Rican conditions and then utilized to evaluate household, risk, and capital constraint effects upon possible technology adoption at the farm level, and distributional effects at the country level. *Ex post* monitoring of actual adoption, to the extent that it occurs, also will take place to measure threshold level requirements, characteristics of

adopters versus nonadopters, and factors influencing adoption rates and levels.

Asian project adds economists

The AID-OSU effort in SE Asia will add a resident economist with the assignment of D. T. O'Brien to the regional field staff at Los Baños, Philippines. He has completed a Ph.D. research thesis, "Risk and Selection of Alternative Weed Management Technologies in Philippine Upland Rice Production."

The study focused on understanding and evaluating the importance of weed control in a complex multi-crop environment existing on upland rice farms. A stochastic MOTAD programming



model was developed which includes several unique characteristics to permit labor availability and yield response to vary due to changing weather conditions, sequential rice production decisions, and curvilinear production relations. It is anticipated that the model will be modified and refined on site so that it can help to function as an economic screening mechanism for various weed control systems developed by the project. Those systems displaying both agronomic and economic viability are expected to advance to farmer demonstration trials.

Problems associated with spread of the weed *Mimosa pigra* in northern Thailand will come under scrutiny via a benefit/cost analysis to be conducted by Ph.D. candidate G. L. Robert from the University of Maryland, starting in July 1980.

Evaluation of the *M. pigra* problem extent, and associated economics, is aimed at ultimately determining the feasibility of launching an agronomic research program to identify various control technologies. The Thai National Research Council, the Ford Foundation, and the AID-OSU project are cooperating to conduct the one year study.

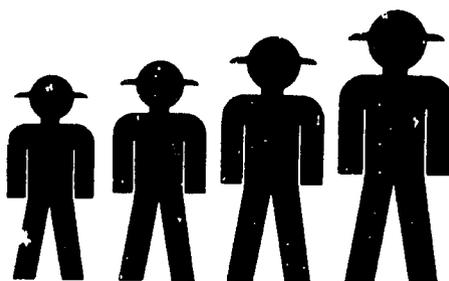
• S.E. Asia •

New data confirm rice weed control

Testing of previously devised weed control systems for upland rice in the Philippines continued during the report year resulting in confirmation of earlier results. Moreover, 1979 conditions included significantly greater moisture depletion, denser weed populations, and the effects of rapid inflation.

The package of agronomic practices tested in two trials was based on a recently developed rice variety, C-22. Despite more weeds, more inflation, and less water, the weed control system was still judged effective in terms of yield, net return to the small farmer, and the amount of time required for weeding.

Research conducted by the AID-OSU program suggests some directions for the small, upland rice farmer in at least one area (Cavite) of the Philippines. The fundamental factor, C-22 rice variety, is now readily available to small farmers. It yields well and competes vigorously with weeds. Its taste is accepted. It does, however, lack drought tolerance.



Besides C-22 planted in 30 cm-wide rows (traditional spacing is 20 cm), the package of agronomic procedures rests on cultivation (now practiced) and handweeding (also now practiced), but adds a third dimension, that of limited herbicide application under certain conditions. The latter helps control weeds early in the growing season when handweeding and cultivation are not practical or feasible.

Use of the herbicide butachlor in rice does not present major obstacles. Some farmers are already familiar with the material, among the least toxic herbicides. Both the chemical and knapsack style sprayers for application are available locally.

Farmers can benefit from a wider range of options—combinations of cultivation, handweeding, and herbicides—and less reliance on hired labor. The increased flexibility of systems helps farmers cope with labor scarcities that peak during the period when upland rice requires its first hand-weeding.

Project studies indicate that a preemergence application of butachlor can provide enough early season weed control to allow rice plant establishment, reduce subsequent handweeding by over 60%, and increase per hectare net returns (from rice alone) by 10-15%. A further benefit may derive from the farmer experiencing lessened demands on his time and thus the possibility for exploring off-farm income opportunities.

Zero tillage for maize after rice

Will it work? That's the question project agronomists were trying to answer as they tested the feasibility of zero tillage maize production following upland (non-irrigated) rice on small farms in the Philippines.

The results achieved were extremely encouraging: zero tillage systems, at least under conditions of the experiment, produced yields equal to, or better, than farmers' practice (Table 4).

That practice, in the Cavite and Batangas regions involves plowing under rice stubble using carabao and locally manufactured plows. Upland rice takes 120 days to mature. By harvest the dry season arrives and the soil dries rapidly becoming difficult to work with a

Table 4
Maize: conventional and zero tillage

Treatment	kg/ha dried maize grain	
	Exp. I	Exp. II
1. Farmers' practice: harrow to remove rice stubble, plow, plant in furrow, hill-up once.	3984b	4373b
2. Chemical weed control: (atrazine + pendimethalin + paraquat), open furrow with plow and plant into furrow, then spray.	4320ab	5040a
3. Chemical weed control: (same as #2), but plant using sharp stick.	4949a	5040a
4. Chemical weed control (broadcast paraquat after planting; 2nd application one month later using weed wiper between rows), plant using sharp stick.	4721a	4727ab
5. Same as #4, substitute glyphosate for first herbicide application.	4595ab	5107a

carabao. When plowed and harrowed the soil loses valuable moisture that the following crop (maize) needs.

Zero tillage would allow faster turn-around, i.e., plant maize sooner, and also eliminate the time and cost of plowing, conserve moisture, and avoid bringing more weed seeds to the soil surface for germination. It would, however, require more effective control (to replace control by plowing) based on herbicides, and a change in seeding/planting techniques.

• Corvallis •

The annual new herbicide screening trial conducted for the project at Corvallis contained 19 new herbicides and 18 standard compounds. Twenty crop species and seven weed species were used to determine overall activity and crop selectivity patterns of the new herbicides.

Two experimental herbicides appeared to be particularly promising for use in developing countries. The nearly identical chemicals from BASF and Maag resulted in excellent control of all the grass species in the trial and had no effect on any of the broadleaf species. It is reported that the herbicides are equally as effective on most perennial grasses as on the annual grasses.

This type of activity and safety will be very useful for grass weed control in beans and other broadleaf crops in developing countries. Project agronomist L. C. Burrill will maintain liaison with the two firms in order to monitor progress of these potentially useful materials.

Detailed weed study launched

Staff weed specialist H. H. Fisher, formerly assigned to the regional project in the Philippines,

began studies leading toward the Ph.D. degree at Oregon State University during the report year. He will concentrate on methods of controlling *Rottboellia exaltata* L.f., a noxious weed that is becoming more prevalent in the world's warm regions.

In addition to his direct experience with field research on control of *R. exaltata*, Fisher has contacted a number of sources worldwide with experience in the same species to gain supplementary data. Additionally, he has collected a series of statements from published material. The combined result is an impressive list saluting the potential hazard and increasing problem of this weed.



Figure 5.
IPPC's Maureen Kressek attends to a typically heavy Monday afternoon arriving mail delivery.

Work Plans

Technical assistance and research contracts in weed control systems between AID and OSU-IPPC are in force from June 1979 to May 31, 1982. Comprehensive work plans have been developed for the entire three years. These plans may be obtained from IPPC upon request. This section contains only those activities scheduled and anticipated for the 1980-81 project year.

Central American Regional Program

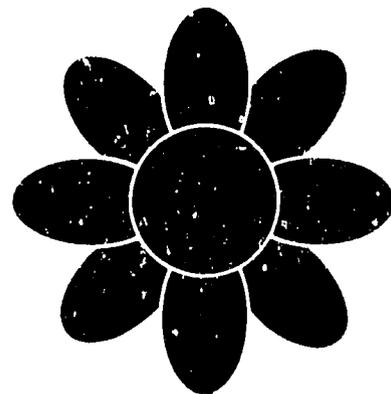
1. Station an economist in the field to monitor the adoption of the chemical seedbed (mulch) system.
2. Continue evaluation and modification of chemical seedbed preparation techniques as a method of weed and erosion control in Costa Rica.
 - a. Experiments in North Atlantic Zone (NAZ) will focus on interactions between the mulch weed control system and other inputs.
 - b. Farmer field trials will be established on 20 cooperating farms in the NAZ.
 - c. The mulch system will be tested in a drier, less tropical zone in Costa Rica.
3. An economist will be sent to Nicaragua to evaluate the economic feasibility of the chemical seedbed system in a different economic and institutional setting.
4. Study the interaction between vegetation management system and other pests.
5. Establish and monitor farm field trials of chemical seedbed preparation techniques.
6. Identify the economic, agronomic, and social factors which influence adoption of the chemical seedbed techniques. Previously conducted farm interviews of ex-ante adoption conditions will be supplemented by ex-post adoption interviews and economic evaluations.
7. Study the control of Rottboellia exaltata in soybeans.
8. Continue collaboration with CATIE-ROCAP Small Farm Cropping Systems Project.
9. Provide consultation, advisory service, and training to Central American countries. Short courses will be presented in Honduras, Costa Rica, and Nicaragua.

Asian Regional Program (Philippines)

1. Station an agricultural economist in the field.
2. Continue field experiments and economic evaluations to develop weed control technologies for small farmers.
3. Define agronomic and economic role of zero tillage and mulching as a weed control technique on upland crops.
4. Conduct tests to determine the most efficient method of controlling extremely noxious weeds such as Rottboellia exaltata.
5. Conduct intensive farm interviews to serve as a basis for economic monitoring of improved weed control systems.
6. Encourage the installation of a "core" experiment for RCPC weed control personnel in all zones of the Philippines. It will serve as a teaching tool and a standard experiment for eventual weed control recommendation.
7. Provide training experiences, both formal and on-the-job, for RCPC weed control staff.
8. Encourage the formation of an NCPC Advisory Committee for Weed Control to be composed of representatives from UPLB, ICARR, BPI, and NCPC.
9. Foster strong linkages with the Weed Science Society of the Philippines.

Corvallis Program

1. Agronomic:
 - a. Continue to improve jab planters for mulch planting;
 - b. Continue investigation of new herbicide application equipment for use by small farmers in developing countries.
 - c. Evaluate promising herbicides.
 - d. Provide support for IPPC foreign-based agronomists.
 - e. Maintain consulting and advisory service on weed control procedures.
 - f. Participate in the Title XII integrated crop protection effort, CRSP.
 - g. Continue as secretariate for IWSS.



2. Economic:

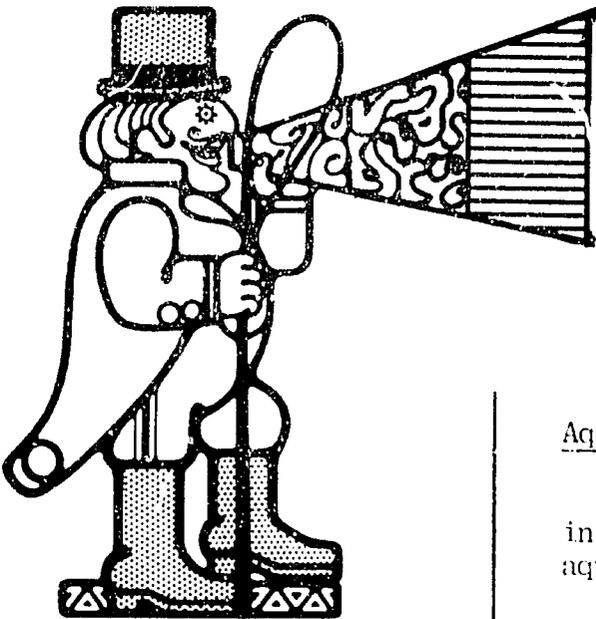
- a. Complete and publish evaluations of weed control methods of small farmers in the NAZ of Costa Rica.
- b. Evaluate the socio-economic impact of mulch preplant weed control systems in NAZ of Costa Rica.
- c. Estimate weed control protection function for upland rice and corn in the Cavite area of the Philippines.
- d. Determine crop yield and net revenue for alternative production techniques affecting resource mix and weeding methods using simulation.
- e. Estimate and publish risk-profit frontiers for a representative upland small farm from new weed control technologies.
- f. Publish economic studies, as feasible.

3. Information:

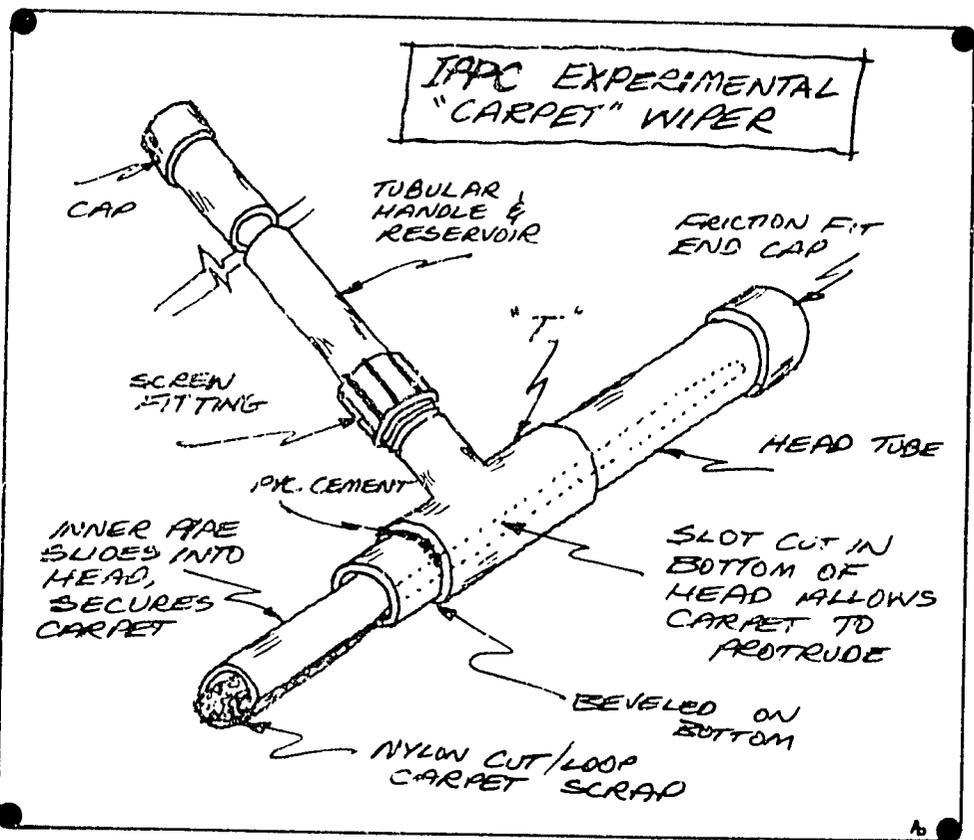
- a. Publish review of world literature on weed competition in cooperation with IWSS.
- b. Publish and disseminate no less than four issues of IPPC INFOLETTER.
- c. Distribute publications and reprints in response to requests.
- d. Service requests for technical and general weed control information.
- e. Maintain and expand technical literature collection.

Aquatic Program

1. Establish an economist in Thailand to assist in development of benefit cost criteria for evaluating aquatic weed infestation.
2. In collaboration with Thai officials, select a watershed for intensive study of aquatic weed monitoring, control, and evaluation.
3. Assist Thai agencies to generate, gather, and evaluate necessary physical and economic data for benefit-cost assessment.
4. Conduct intense aquatic weed control training program in Florida.



5. Expand and maintain aquatic weed information system.
6. Provide short term consultation with government agencies of developing countries.



Financial Review

The following four tables list expenditures and obligations related to the AID-OSU weed projects' broad work areas.

Table A and B cover the report period, June 1, 1979 through May 31, 1980.

Table C and D present data for the contractual period April 1, 1976 through May 31, 1980.



TABLE A

Technical Assistance (AID/ta-C-1303)
June 1, 1979 through May 31, 1980

	Corvallis headquarters	Corvallis publications	Central America (Costa Rica)	Southeast Asia (Philippines)	Category totals
Salaries and wages	62,870	21,370	.....	28,233	112,473
Fringe benefits	14,244	5,118	.....	7,576	26,938
Indirect costs					
on campus	37,200	11,709	.....	.....	48,909
off campus	.....	.....	666	12,110	12,776
sub-total	37,200	11,709	666	12,110	61,685
Differentials and allowances	.....	.....	.....	4,884	4,884
Travel and transportation	10,927	4	1,334	4,802	17,067
Other direct costs	13,111	201	1,549	5,931	20,792
Equipment, vehicles, materials and supplies	7,930	6,351	92	2,361	16,734
Aquatic weed sub-contract	51,511	.....	.....	.....	51,511
TOTALS	197,793	44,753	3,641	65,897	312,084

TABLE B

Research (AID/ta-C-1295)
June 1, 1979 through May 31, 1980

	Corvallis headquarters	Corvallis publications	Central America (Costa Rica)	Southeast Asia (Philippines)	Category totals
Salaries and wages	66,221	5,229	25,926	11,440	108,816
Fringe benefits	12,905	1,259	7,059	2,866	24,089
Indirect costs on campus	39,344	2,486	.....	.....	41,830
off campus	.....	.....	11,290	3,643	14,933
sub-total	39,344	2,486	11,290	3,643	56,763
Differentials and allowances	.....	.....	7,447	4,269	11,716
Travel and transportation	14,446	.....	6,272	5,050	25,768
Other direct costs	14,633	66	3,130	1,240	19,069
Equipment, vehicles, materials and supplies	3,544	485	8,360	842	13,231
TOTALS	151,093	9,525	69,484	29,350	259,452

TABLE C

Technical Assistance (AID/ta-C-1303)
Accumulated Expenditures for the Contract Period
April 1, 1976 through May 31, 1980

	Corvallis headquarters	Corvallis publications	Central America (Costa Rica)	Southeast Asia (Philippines)	Category totals
Salaries and wages	242,912	95,180	50,037	77,295	465,424
Fringe benefits	43,088	16,918	8,151	16,722	84,879
Indirect costs on campus	130,942	53,585	.....	.....	184,527
off campus	.....	.....	20,508	36,502	57,010
sub-total	130,942	53,585	20,508	36,502	241,537
Differentials and allowances	.....	.....	8,335	27,077	35,412
Travel and transportation	38,001	1,764	24,201	32,828	96,794
Other direct costs	25,006	6,307	8,115	9,756	49,184
Equipment, vehicles, materials and supplies	21,193	29,415	6,308	10,222	67,138
Aquatic weed sub-contract	229,041	.....	.....	.....	229,041
TOTALS	730,183	203,169	125,655	210,402	1,269,409

TABLE D

Research (AID/ta-C-1295)

Accumulated Expenditures for the Contract Period
April 1, 1976 through May 31, 1980

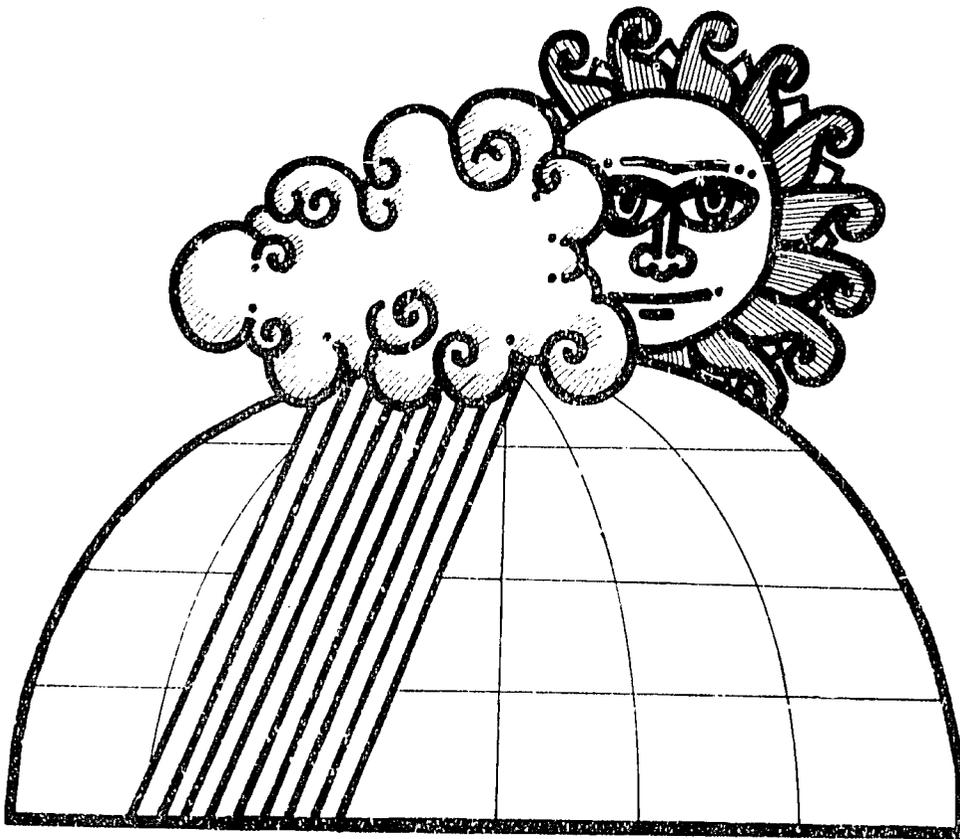
	Corvallis headquarters	Corvallis publications	Central America (Costa Rica)	Southeast Asia (Philippines)	Category totals
Salaries and wages	256,851	20,169	86,819	52,300	416,139
Fringe benefits	42,657	3,650	18,101	10,178	74,586
Indirect costs on campus	135,159	9,108	.....	.....	144,267
off campus	.....	.....	35,411	28,898	64,309
sub-total	135,159	9,108	35,411	28,898	208,576
Differentials and allowances	.....	.....	20,377	25,964	46,341
Travel and transportation	37,745	.....	35,615	47,527	120,887
Other direct costs	22,762	199	8,969	6,236	38,166
Equipment, vehicles, materials and supplies	11,614	845	18,569	10,548	41,576
TOTALS	506,788	33,971	223,861	181,651	946,271



Figure 6. IPPC weed scientist M. D. Shenk (second from left) listens to an official explain experimental field designs in conjunction with a weeds short course on Grenada.

Appendixes

1. Bibliographic List
2. Worldwide Distribution of INFOLETTER
3. Distribution of Publications
4. IPPC Papers Requested and Distributed
5. Requests for Information
6. Project Staff Travel Log
7. Participation/Attendance at Events
8. INFOLETTER Equipment Survey
9. Project Personnel



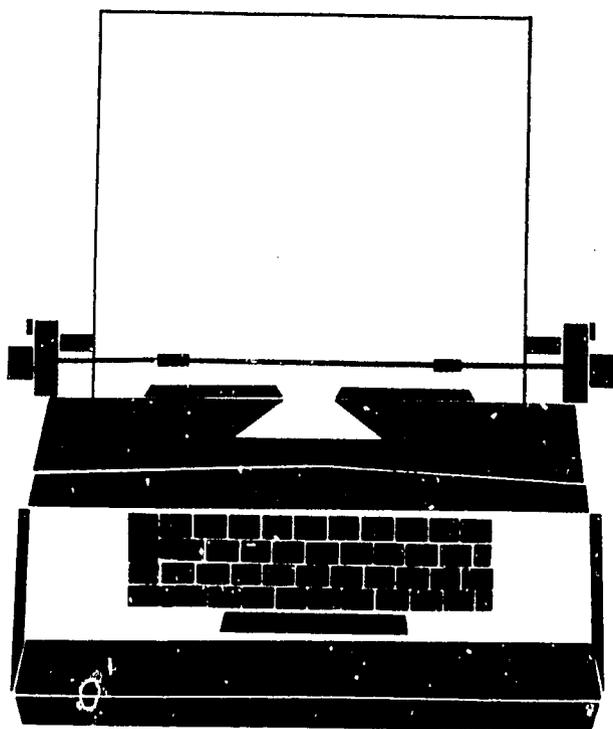
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- | | | |
|--------------------|--------------|--------|
| Working Paper I | 31-A-79-I | 153 p. |
| Working Paper II | 31-A-79-II | 98 p. |
| Working Paper III | 31-A-79-III | 43 p. |
| Working Paper IV | 31-A-79-IV | 27 p. |
| Working Paper V | 31-A-79-V | 101 p. |
| Working Paper VI | 31-A-79-VI | 27 p. |
| Working Paper VII | 31-A-79-VII | 65 p. |
| Working Paper VIII | 31-A-79-VIII | 31 p. |
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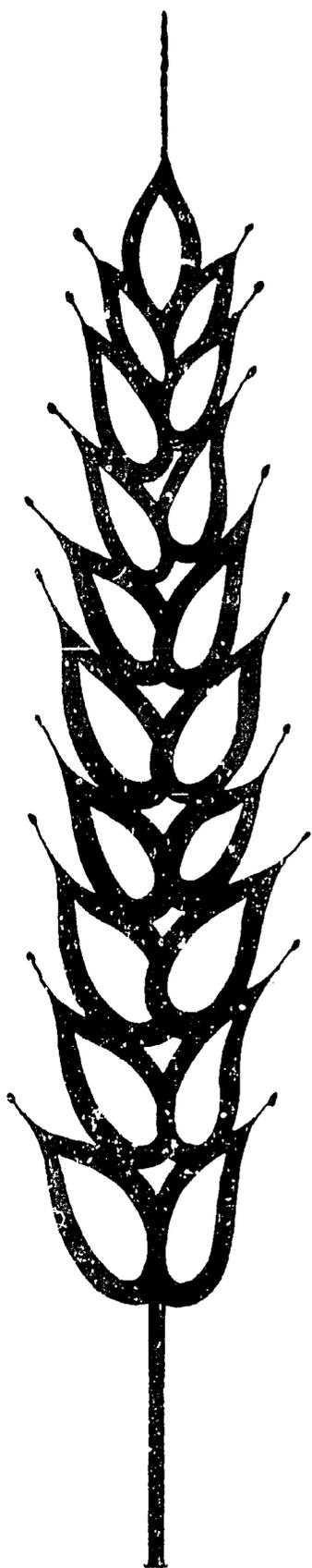
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2.
 WORLDWIDE
 DISTRIBUTION
 OF
INFOLETTER

country	recipients as of			
	Dec. 1975	Apr. 1978	May 1979	May 1980
Abu Dhabi	1	1	1	1
Aden	1	1	1	1
Afghanistan	15	13	13	12
Algeria	2	3	4	4
Angola	2	2	-	1
Antigua	2	2	2	2
Arab Rep. of Egypt	9	11	14	15
Arabian Gulf	-	-	-	1
Argentina	213	131	141	151
Australia	59	63	68	72
Austria	5	5	6	6
Bahamas	1	1	1	1
Bangladesh	4	4	4	6
Barbados	2	2	3	3
Basseterre	-	-	-	1
Belgium	11	12	28	28
Belize	8	8	7	7
Benin	1	1	2	2
Bermuda	1	1	1	1
Bolivia	21	29	27	28
Botswana	3	3	3	4
Brasil	183	186	179	188
Brunei	3	3	3	3
Bulgaria	2	2	2	2
Burma	3	3	3	4
Cameroon	4	5	6	6
Canada	101	108	100	116
Canary Is.	1	1	1	1
Cape Verde Is.	-	1	1	1
Caroline Is.	1	-	-	-
Cayman Is.	-	1	1	1
Cent. African Rep.	1	1	1	1
Chad	3	5	5	4
Chile	37	37	41	41
People's Rep. of China	-	1	2	2
Colombia	166	92	93	96
Comores	2	2	2	2
Costa Rica	54	68	71	78
Cuba	1	1	2	1
Cyperus	3	2	3	4
Czechoslovakia	8	10	10	12
Denmark	9	10	19	19

<u>country</u>	<u>Dec.</u> <u>1975</u>	<u>Apr.</u> <u>1978</u>	<u>May</u> <u>1979</u>	<u>May</u> <u>1980</u>
Djbouti	-	1	1	1
Dominican Rep.	10	11	12	13
Ecuador	45	45	47	49
El Salvador	18	10	12	12
England	113	120	148	158
Ethiopia	20	25	25	25
Fiji	4	3	3	4
Finland	8	9	17	16
France	22	27	69	74
French W. Indies	-	-	1	1
Gabon	1	8	1	1
Gambia	2	5	4	5
Germany (East)	2	5	4	5
Germany (West)	38	41	59	56
Ghana	22	24	24	26
Greece	16	24	28	28
Guatemala	29	3	13	16
Guinea	1	1	1	1
Guyana	2	3	2	3
Haiti	3	3	3	3
Honduras	34	18	18	19
Hong Kong	4	4	4	4
Hungary	4	4	7	8
India	161	183	203	219
Indonesia	88	86	90	95
Iran	10	12	12	13
Iraq	2	3	3	3
Ireland	7	7	7	7
Israel	18	18	20	21
Italy	19	27	31	31
Ivory Coast	4	5	6	8
Jamaica	11	11	11	11
Japan	52	53	53	55
Jordan	7	8	8	8
Kenya	28	28	26	29
Korea	12	15	14	14
Laos	7	7	7	7
Lebanon	8	7	7	7
Lesotho	2	2	2	3
Liberia	7	8	7	7
Libya	1	2	5	5
Malagasay Rep.	1	1	1	1



<u>country</u>	<u>Dec.</u> <u>1975</u>	<u>Apr.</u> <u>1978</u>	<u>May</u> <u>1979</u>	<u>May</u> <u>1980</u>
Malawi	5	6	7	7
Malaysia	56	59	58	58
Mali	1	2	3	3
Malta	3	3	4	4
Mariana Is.	1	-	-	-
Mauritania	-	2	2	2
Mauritius	2	2	3	3
Mexico	126	56	63	67
Morocco	3	3	3	3
Mozambique	2	2	2	2
Nepal	-	2	2	3
Netherlands	15	17	29	33
New Caledonia	4	4	4	4
New Guinea	15	17	16	15
New Hebrides	2	2	2	2
New Zealand	21	30	26	27
Nicaragua	29	16	19	19
Niger	-	1	1	2
Nigeria	28	38	52	53
Norway	10	10	14	13
Pacific Is.	2	3	1	2
Pakistan	14	21	19	22
Panama	26	15	16	16
Paraguay	9	10	10	10
Peru	74	73	75	76
Philippines	67	139	182	191
Poland	9	9	10	9
Portugal	5	7	10	11
Romania	2	2	4	4
St. Kitts	-	1	3	3
St. Lucia	1	-	-	-
St. Vincent	-	-	-	2
Samoa	1	-	-	-
Saudi Arabia	6	6	5	5
Scotland	4	4	7	4
Senegal	11	18	20	22
Seychelle Is.	1	2	1	1
Sierra Leone	4	4	7	6
Singapore	14	13	12	11
Solomon Is.	2	2	2	3
Somalia	-	1	1	1
South Africa	-	2	3	4

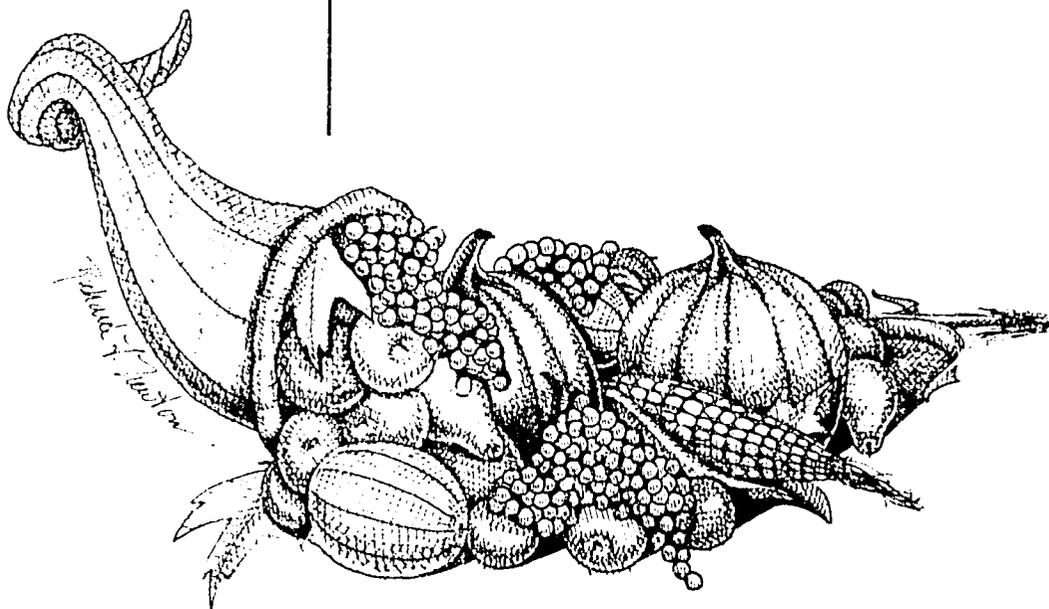
<u>country</u>	<u>Dec.</u> <u>1975</u>	<u>Apr.</u> <u>1978</u>	<u>May</u> <u>1979</u>	<u>May</u> <u>1980</u>
South Vietnam	11	11	11	-
Spain	9	14	22	23
Sri Lanka	11	15	18	19
Sudan	9	13	12	14
Surinam	4	4	4	5
Swaziland	2	2	2	2
Sweden	13	16	27	27
Switzerland	27	26	29	28
Syria	2	6	8	8
Tahiti	3	3	3	3
Taiwan R.O.C.	18	8	17	16
Tanzania	12	13	15	16
Thailand	40	45	48	52
Togo	1	1	2	2
Trinidad	15	17	19	21
Trucial States	1	1	1	1
Tunisia	4	4	5	4
Turkey	16	15	19	21
Uganda	5	5	5	5
Upper Volta	2	5	5	6
Uruguay	18	22	20	20
United States*	1,213	1,356	1,482	1,569
U.S.S.R.	4	4	4	4
Venezuela	50	53	53	57
Western Samoa	6	7	6	7
Yemen	-	1	1	2
Yugoslavia	5	6	8	2
Zaire	3	3	3	4
Zambia	8	7	8	8
Zimbabwe Rhodesia	-	-	-	1
TOTAL	3,930	4,069	4,511	4,626

*Includes Guam - 2, Canal Zone - 4, and numerous AID and other U.S. government employes overseas who receive their mail through Washington or APOs.

3.
DISTRIBUTION
OF
PUBLICATIONS

Identification Key

<u>symbol</u>	<u>title</u>
Aq. Biblios	AQUATIC PLANT BIBLIOGRAPHIES
Biblio	BIBLIOGRAFIA PARCIAL DE INVESTIGACION SOBRE MALEZAS Y SU CONTROL PARA AMERICA DEL SUR, AMERICA CENTRAL, EL CARIBE Y MEXICO, 1942-1976
Campe	MANUAL DE CAMPO PARA INVESTIGACION EN CONTROL DE MALEZAS
Field Manual	FIELD MANUAL FOR WEED CONTROL RESEARCH
Knapsack	KNAPSACK SPRAYERS; USE, MAINTENANCE, ACCESSORIES
Trucos	ALGUNOS "TRUCOS" UTILES EN ESTADISTICA/ SOME USEFUL TRICKS IN STATISTICS
W-C Comp	WEED-CROP COMPETITION, A REVIEW
Weed Seeds	SEMILLAS DE MALEZAS TROPICALES I Y II/ TROPICAL WEED SEEDS I AND II
WW List	A WORLDWIDE CATEGORIZED PARTIAL LISTING FOR MANUFACTURERS OF PESTICIDE APPLICATION EQUIPMENT/UNA LISTA PARCIAL MUNDIAL Y CLASIFICADA DE FABRICANTES DE EQUIPOS PARA LA APLICACION DE PESTICIDAS



country	Ag. Biblios	Biblio	Campo	Field Manual	Knapsack	Trucos	W-C Comp.	Weed Seeds	WW List
Angola	-	1	-	1	-	1	-	-	-
Argentina	1	3	75	1	4	3	-	41	4
Arabian Gulf	-	1	-	1	1	-	-	-	1
Australia	1	-	-	-	2	-	-	-	-
Austria	-	-	-	-	-	-	-	-	1
Bangladesh	-	-	-	2	1	-	-	2	-
Barbados	-	-	-	50	51	-	-	50	-
Bolivia	-	1	1	-	-	100	-	-	-
Botswana	-	1	-	3	-	-	-	1	-
Brasil	1	7	6	4	1	3	1	31	-
Burma	-	-	-	1	-	-	-	-	-
Burundi	-	-	-	1	-	-	-	-	-
Cameroon	-	-	-	-	-	-	-	-	1
Canada	-	1	1	3	8	1	7	1	1
Cayman Is.	-	-	-	-	1	-	-	-	-
Chile	-	4	3	1	1	3	1	-	3
Colombia	-	5	4	1	1	5	1	2	1
Costa Rica	-	2	1	20	7	-	-	-	-
Denmark	-	-	-	-	2	-	1	-	-
Dominican Rep.	-	-	1	-	-	-	-	-	-
Ecuador	-	-	1	-	2	1	1	1	-
Egypt	-	1	1	1	-	1	-	1	1
El Salvador	-	1	-	-	-	1	-	1	1
England	-	1	-	2	8	2	3	2	4
Fiji	-	-	-	-	-	-	2	-	-
France	-	-	-	-	-	-	1	-	-
Gambia	-	-	-	-	1	-	-	1	1
Greece	-	1	-	1	1	-	-	1	1
Guatemala	2	-	-	-	1	-	-	2	-
Guyana	-	-	-	2	1	-	-	-	-
Honduras	-	2	2	-	1	2	-	3	3
India	6	1	-	8	6	2	22	6	6
Indonesia	-	1	-	2	4	-	1	1	1
Ireland	-	-	-	1	-	-	-	-	-
Israel	-	-	-	1	1	1	-	1	2
Italy	-	-	-	-	1	-	1	-	3
Jamaica	-	1	-	1	-	-	-	4	1
Japan	1	-	-	-	1	-	-	-	-
Jordan	-	-	-	-	1	-	-	-	-

country	Ag. Biblios	Biblio	Campo	Field Manual	Knapsack	Trucos	W-C Comp.	Weed Seeds	WW List
Kenya	-	-	-	2	1	-	1	-	-
Lebanon	-	-	-	1	1	-	1	1	1
Malaysia	1	-	-	-	1	-	2	1	1
Mexico	-	2	16	1	6	2	4	4	2
Nassau	-	-	-	1	1	-	-	1	1
Nepal	-	-	-	1	-	-	-	-	-
Netherlands	-	-	-	2	-	-	2	1	-
New Caledonia	-	-	-	-	1	-	-	-	-
New Zealand	2	-	-	1	-	-	2	-	1
Nicaragua	-	1	3	-	1	3	-	3	1
Nigeria	-	1	-	7	2	-	7	-	2
Pakistan	-	-	-	68	16	-	2	1	1
Paraguay	-	1	-	-	-	-	-	-	-
Peru	-	-	-	-	2	-	-	-	-
Philippines	-	3	1	37	6	3	3	26	3
Portugal	-	-	-	-	-	-	1	-	-
Puerto Rico	-	3	1	2	-	2	-	2	2
St. Lucia	-	-	-	1	-	-	-	-	-
St. Vincent	-	-	-	1	-	-	-	1	1
Scotland	-	-	-	1	-	-	-	-	-
Sierra Leone	-	-	-	1	-	-	-	-	-
Singapore	-	-	-	-	1	-	-	-	-
Solomon Is.	-	-	-	1	-	-	-	-	1
Spain	-	-	-	-	1	-	2	-	-
Sri Lanka	-	-	-	1	-	-	-	-	-
Sudan	-	-	-	2	-	-	-	1	-
Switzerland	-	-	-	1	4	-	-	-	-
Syria	-	-	-	-	2	-	2	-	-
Taiwan, R.O.C.	-	-	-	1	2	-	-	-	1
Tanzania	-	1	-	4	1	-	2	1	-
Thailand	5	-	-	3	3	-	-	1	3
Trinidad	-	-	-	1	3	-	-	1	-
Turkey	-	-	-	1	1	-	-	-	1
Uganda	-	-	-	2	-	-	-	1	-
Uruguay	-	1	-	-	-	-	-	-	-
United States	26	12	11	48	130	6	229	13	37
Venezuela	1	-	1	-	1	1	-	1	-
West Germany	3	-	-	1	-	-	-	-	-
Yugoslavia	1	-	-	-	-	-	-	-	-
Zambia	-	-	-	-	-	-	-	-	1
Zimbabwe	-	-	-	-	-	-	1	-	-

IPPC PAPERS
REQUESTED/
DISTRIBUTED

No. of copies requested during report period	Date written, title, authors, source, date published
23	1971, <u>Weed control in cacao</u> , M.D. Shenk, WORLD FARMING, 1971.
58	1972, <u>New weed control equipment and techniques</u> , A.E. Deutsch, AGRICULTURAL MECHANIZATION IN ASIA, 1972.
66	1972, <u>Spray adjuvants make pesticides do a better job</u> , L.F. Taylor, WORLD FARMING, 1972.
24	1972, <u>El papel de la ciencia de malezas en paises en desarrollo</u> , C. Parker, Weed Science Society of America meeting, 1972.
39	1972, <u>Reviewing the small applicators</u> , A.E. Deutsch, WORLD FARMING, 1972.
57	1973, <u>New techniques in weed control</u> , L.C. Burrill, Asian-Pacific Weed Science Society meeting, 1973.
44	1974, <u>Small pesticide application equipment--its selection, use and maintenance</u> , A.E. Deutsch, WORLD FARMING, 1974.
119	1974, <u>Equipos pequenos para aplicar plaguicidas...</u> , A.E. Deutsch, AGRICULTURA DE LAS AMERICAS, 1974.
11	1974, <u>Con los plaguicidas--evite peligros</u> , A.E. Deutsch, AGRICULTURA DE LAS AMERICAS, 1974.
93	1974, <u>Problems of herbicide use in peasant farming</u> , J.L. Hamerton, Weed Science Society of America meeting, 1974.
70	1974, <u>Crop varieties: can they suppress weeds?</u> , R.D. Sweet, et. al., NEW YORK LIFE SCIENCES QUARTERLY, 1974.
52	1974, <u>Biological suppression of weeds: evidence for allelopathy in successions of cucumber</u> , A.R. Putnam and W. Duke, SCIENCE, 1974.
59	1975, <u>Weed control with plant pathogens</u> , R. Charudatten, AGRICHEMICAL AGE, 1975.
20	1974, <u>Calibrating and adjusting granular row applicators</u> , J. Siemens, WORLD FARMING, 1974.
33	1975, <u>Statement on 2,4,5-T and TCDD</u> , Dost et. al., Oregon State University, 1975.

No. of copies
requested during
report period

Date written, title, authors, source, date published

43	1976, <u>Herbicides used in and around water for management of aquatic vegetation</u> , JOURNAL OF AQUATIC PLANT MANAGEMENT, 1976.
23	1976, <u>Residuos de herbicidas en el suelo</u> , E. Locatelli, REVISTA COMALFI, 1976.
55	1976, <u>Weed control problems causing major reductions in world food supplies</u> , C. Parker and J. Fryer, FAO PLANT PROTECTION BULLETIN, 1975.
19	1976, <u>Problemas que presenta el control de las malezas...</u> , C. Parker and J. Fryer, FAO BOLETIN FITOSANITARIO, 1975.
7	1976, <u>Lutte contre les mauvaises herbes occasionnant...</u> , C. Parker and J. Fryer, FAO BULLETIN PHYTOSANITAIRE, 1975.
57	1976, <u>Purple nutsedge: tropical scourge</u> , R. William, HORT-SCIENCE, 1976.
31	1975, <u>The beautiful blue devil</u> , N. Vietmeyer, NATURAL HISTORY 1975.
77	1976, <u>Approaches to weed control in cropping systems</u> , D.L. Plucknett et. al., Cropping Systems Symposium at the Int'l. Rice Research Institute, 1976.
49	1978, <u>Controlled drop application - what does it all mean?</u> , G. Cussans and W. Taylor, ARABLE FARMING, 1978.
115	1978, <u>Selecting appropriate weed control systems for developing countries</u> , D. Young et al., WEED SCIENCE, 1978.
111	1979, <u>Aquatic plants and their control</u> , R.C. Hiltibran, WEEDS TODAY, 1979.
108	1979, <u>Herbigation: applying herbicides through sprinkler systems</u> , E. Heikes, WEEDS TODAY, 1979.
178	1979, <u>So you're going to do a slide show</u> , A.E. Deutsch, Int'l. Plant Protection Center, 1979.
120	1979, <u>Small isn't necessarily beautiful in third world agriculture</u> , G. Dion, DEVELOPMENT DIRECTIONS, 1979.
Total	1,761

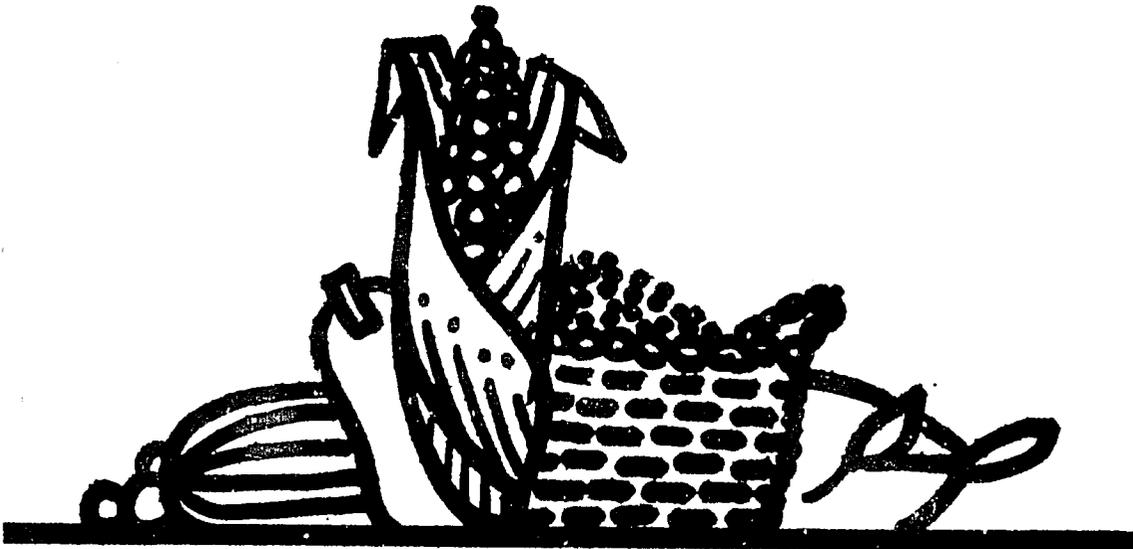
5.
 REQUESTS FOR
 INFORMATION

<u>Requestor</u>	<u>Request</u>	<u>Action by project</u>
Professor, Agr. Econ., El-mania Univ., El-mania, Egypt.	Information concerning alter- native means of boll weevil control, weed control and methodologies.	Referred to USDA, Washington, D.C. and National Agr. Library, MD; sent copy of paper by Young et. al. on weed control methodologies.
Lanken Ceylon Ltd. Colombo, Sri Lanka.	Information on manufacturers of protective gear for use while handling pesticides.	Photocopy of section in master list of worldwide manufacturers of pesticide application and safety equipment.
AID-OSU project monitor, AID/W.	Requested a thorough analysis comparing properties, action, use, and impact of paraquat and glyphosate herbicides.	Project personnel researched data and prepared a detailed response.
WRO, Begbroke Hill, Yarnton Oxford, England.	Information on terra-tires.	Sent letter and photocopies of technical info for U.S.
Assoc. Editor, Farm Chemicals, Willoughby, OH.	List of international confer- ences and plant protection meetings.	Sent current listing.
Weeds agronomist, Guyana Sugar Corp. Limited, Georgetown, Guyana.	Information on weed control in sugarcane and in aquatic situa- tions.	Sent requested information.
Exec. VP, CAST, Ames, IA.	Picture from Infoletter No. 41; tansy/cinnabar moth.	Referred to USDA source for a copy.
Director, Agr. Canada, Regina, Sask.	Reports from Symposium on Wild Oats in Yugoslavia.	Sent photocopy of reports.
Researcher, Nagpur Univ., Nagpur, India.	Address for correspondence of V International Symposium on Biological Control of Weeds in Brisbane.	Sent information.
Asst. Director of Agr., Semongok, Malaysia.	Information on crop protection conferences and symposia for 1980.	Sent listing.
Crops Research Div., Philip- pine Council for Agr.; Re- sources Research, Laguna, Philippines.	Relevant papers in plant path- ology and entomology.	Referred to Dr. Joe Gingrich for information concerning weed science, regrets con- cerning information on plant pathology and entomology.
Senior Editor, Successful Farming, Des Moines, IA.	Photo of cinnabar moth on tansy for biological control article.	Referred to USDA for copy or slide; phoned personally.

<u>Requestor</u>	<u>Request</u>	<u>Action by project</u>
Agronomist, Univ. of Calif. Extension, Riverside, CA	Material on equipment for harvesting of small scale plantings of crops.	Sent requested material.
Zoologist, Pasto, Colombia.	Information about weed control and literature on pastures and forage.	Sent publications list, photocopy of section (herbicides used in pastures) from 1979 WEED CONTROL MANUAL, addresses for two local organizations for specific weed problems.
Agronomist, CIMMYT, Pakistan.	Copies of references cited in an IPCC paper, copies of an out-of-print research manual.	Sent papers requested, referred to Burrill's <u>Field Manual for Weed Control Research</u> .
Individual, San Bernardino, CA.	To be added to INFOLETTER mailing list, information on functions of IPCC, possibility of employment.	Added to list, sent order form, papers list, brief description of IPCC's functions.
Individual, IBS Weed Control Dept., The Netherlands.	Reports on experimental herbicides and their evaluation.	Sent copies of reports of new herbicide evaluation trials, added to list for such, sent copy of Crop Science Dept. reports on field research.
Individual, Plant Path. Dept., Rangoon, Burma.	IPPC literature; IPCC and AID recruitment policies; address of Inter. Agricultural Development Service.	Sent the requested literature, IADS address, AID address; informed of IPCC's employment policies.
Individual, Trinidad, W.I.	Information on bird scarers and/or bird chasers, and on sprayers and herbicide injury.	Sent photocopies of bird-scarers and additional information, copies of "Knapsack Sprayers" and "Diagnosis and Prevention of Herbicide Injury."
Agronomist, CIMMYT, Pakistan.	Prices of major herbicides.	Sent photocopies from 1979 Weed Control text supplement with prices current for April-May '79.
Agronomist, CIMMYT, Pakistan.	Names and addresses of companies marketing small sprayers, suppliers of parts for knapsack sprayers.	Sent the requested information.
Project leader, INISOY, Peru.	Information on "XIII Congresso Brasileiro de Herbicidas e Plantas Daninhas."	Sent requested information.
Associate Editor, "Farm Chemicals," Willoughby, OH.	Information of "XIII Congresso Brasileiro de Herbicidas e Plantas Daninhas."	Sent requested information.

<u>Requestor</u>	<u>Request</u>	<u>Action by project</u>
Director, Plantation Agencies, Malaysia.	Information on Minimizing Herbicide Waste" article.	Sent information plus IPPC Papers list.
Individual, INIA, Spain.	Information on mango rot problems.	Informed of IPPC's concern solely with weed science.
Individual, North Davao, Philippines.	Addresses and subscription rates to several journals.	Referred to IRRI, UPLB, and SEARCA libraries at Los Banos.
Professor, Univ. of Saskatchewan Crop Science Dept.	Names of manufacturers of cabinet sprayers for plot trials.	Sent information about Canadian equipment mfr.
Researchers, Univ. of Puerto Rico, Rio Piedras, PR.	Copy of "Bibliografia Parcial" and other publications on related, medicinal or poisonous plants.	Sent gratis copy and list of books and their publishers dealing with poisonous plants.
Crop Protection Manager, Savannah Sugar Co. Nigeria.	Information on sprayers manuf. in N. America suitable for applying herbicides to sugar cane fields.	Sent <u>Worldwide Categorized Partial Listing</u> , letter mentioning specific categories within the publication that might apply.
Project Manager, ICRAF, Kenya.	List of woody perennial weed species.	Sent listing of woody plants; sent gratis copies of several publications for the ICRAF library.
Plant Quarantine Officer, ICRI SAT, India.	Information on important weeds which should receive maximum quarantine attention.	Sent copy of U.S. Federal Noxious Weed Act of 1974; copy of Australian journal article; referred to two other contacts for info.
Mitsui Chemicals, New York	Information on makes and addresses for fog sprayers (phone).	Returned call with names of two firms.
AID Environmental Impact Officer, Washington.	Information concerning suitability of several herbicides for use in Panama.	Project agronomist discussed (via phone) matter and provided answers to questions.
USAID/Ghana.	Specifies on small powered cultivator and a plot combine.	Letter forwarded to respective manufacturers.
Banco Nacional de Nicaragua.	Technical information on amphibious power tiller.	Forwarded letter to mfr. in Philippines.
Seed Analyst, Rural Development Project, The Gambia.	Information on tropical weed seeds.	Sent <u>Tropical Weed Seeds I & II</u> , list of other references and forwarded his request to USDA, Beltsville.
Student, College of Science and Technology, Nigeria.	Information on weed control systems in developing countries.	Sent copies of relevant IPPC Papers.

<u>Requestor</u>	<u>Request</u>	<u>Action by project</u>
Researcher, Rijksherbarium, The Netherlands.	Copy of <u>Prevalent Weeds of Central America</u> .	Sent requested publication.
Product Development Manager, Monsanto, Brazil.	Information on control of <u>Typha</u> sp.	Sent copies of some research reports on <u>Typha</u> from <u>Weed Abstracts</u> ; provided addresses of other sources of information.
Researcher, Ahmadu Bello U. Zaria, Nigeria.	Information on weed control in onions.	Sent copies of papers from <u>Proceeding of British Weed Control Conference</u> ; suggested some possible systems, provided addresses of further references.
Rice Project Manager, Venezuela.	Information on chemical control of <u>Bactris</u> sp.	Listed some alternatives and referred to Dr. David Rincon, FUSAGRI, Venezuela.



6.
PROJECT STAFF
TRAVEL
LOG*

<u>staff</u>	<u>date, location, purpose</u>
Shenk	June 14-16, 79 - San Salvador/El Salvador - 2 day course on application of pesticides for 12 extension agents and eight CENITA research staff members.
Burrill	June 19-20, 79 - Salt Lake City, UT - chair Western Weed Science Society meeting.
Gingrich	June 18, 79 - Travel to duty post at Los Banos/Philippines.
Allen	July 15-18, 79 - Chattanooga, TN - attend Aquatic Plant Management Society meeting.
Miller	Aug. 1-3, 79 - St. Louis, MO - attend meeting of Crop Protection of BIFAD.
Shenk	Aug. 27-Sept. 5, 79 - Corvallis, OR - conduct project planning meetings with staff.
Shenk	Sept. 2-6, 79 - Panama City, David, and Santiago/Panama - review weed control research and confer with IDIAP staff.
Conklin	Sept. 3-11, 79 - Banff, Alb./Canada - present paper at meeting of International Association of Agric. Economics.
Burrill	Sept. 10-22, 79 - Manila, Los Banos/Philippines, Bangkok/Thailand - confer with AID and Philippine officials regarding continuation of AID/OSU weed control program; confer with Thai officials regarding aquatic weed problems.
Shenk	Sept. 14-15, 79 - Tegucigalpa/Honduras - confer with AID mission and Honduran officials concerning possible involvement of AID/OSU weed control program.
Miller	Sept. 14-18, 79 - Turrialba/Costa Rica - confer with CATIE staff, AID mission, and ROCAP personnel regarding aspects of AID/OSU weed research and technical assistance.
Conklin	Sept. 14-26, 79 - Manila/Philippines, Bangkok, Chiang Mai/Thailand - confer with AID mission and Philippine officials concerning project matters; discuss aquatic weed project research potential with Thai officials.
Shenk	Oct. 8-Nov. 11, 79 - Quito/Ecuador, San Pedro/Argentina - review Ecuadorian weed program and participate in Argentina weed short course.

(*Note: excludes the numerous in-country trips made in connection with visiting research sites, and for other purposes.)

<u>staff</u>	<u>date, location, purpose</u>
Miller	Oct. 14-18, 79 - Costa Rica - confer with AID mission, ROCAP and CATIE regarding project
Miller	Oct. 22-23, 79 - St. Louis, MO - attend meeting on crop protection planning grant (Title XII).
Munroe	Nov. - Travel to duty post at Los Banos/Philippines.
Burrill	Jan. 3-28, 80 - Los Banos/Philippines - instruct and help coordinate 3-week weed science short course.
Shenk	Jan. 6-9, 80 - Panama City, Chitre/Panama - evaluate weed control research.
Fraser	Jan. 20-24, 80 - Sacramento, CA - attend California Weed Conference.
Miller	Jan. 20-Feb. 1, 80 - Los Banos/Philippines, Bangkok/Thailand - participate in weed science short course, develop memorandum of understanding for cooperative effort in Thailand.
Conklin	Jan. 24-Feb. 1, 80 - Bangkok/Thailand - develop administrative framework for conducting an aquatic weed research effort.
Fraser	Feb. 1-9, 80 - Houston, TX - deliver project vehicle to Houston for pick up by staff member driving it to Costa Rica.
Burrill	Feb. 3-7, 80 - Toronto, Ont./Canada - attend Weed Science Society of America annual meeting.
Fisher	Feb. 4-7, 80 - Toronto - attend Weed Science Society of America meeting and present paper.
Shenk	Feb. 4-15, 80 - Toronto - attend Weed Science Society of America meeting and drive project vehicle to Costa Rica.
Escobar	Mar. 3-8, 80 - Turrialba/Costa Rica - explore possibility of accepting project assignment in Costa Rica.
Burrill	Mar. 17-20, 80 - Salt Lake City, UT - preside over Western Society of Weed Science meeting.
Cooper	Mar. 17-20, 80 - Salt Lake City, UT - attend Western Society of Weed Science meeting.
Burrill, Miller	Mar. 27-Apr. 28, 80 - Tanzania, London/U.K. - conduct extensive review of weed research and control problems; confer with staff at Weed Research Organization, Oxford.
Shenk	Apr. 12-May 1, 80 - Barbados, Grenada, Antigua - act as consultant for USAID/CARDI small farm multicrop program and present two short courses.

7.
PARTICIPATION/
ATTENDANCE
AT EVENTS

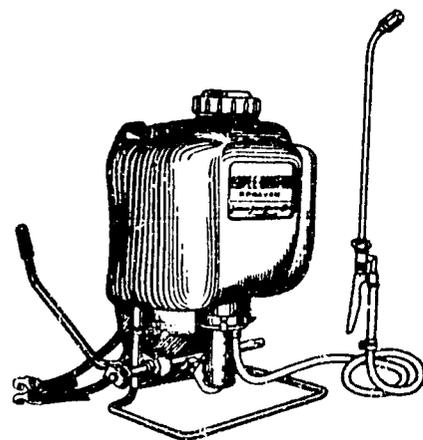
<u>staff</u>	<u>event, activity, date</u>
Burrill	Western Society of Weed Science, chair executive committee meeting, June 19-20, 79.
Miller	BIFAD crop protection meeting, attend, Aug. 1-3, 79.
Conklin	International Association of Agricultural Economics meeting, present paper, Sept. 3-11, 79.
Miller	Title XII crop protection grant meeting, attend, Oct. 22-23, 79.
Fraser	California Weed Conference, attend, Jan. 21-24, 80.
Burrill, Fisher, Shenk	Weed Science Society of America annual meeting, attend and present paper, Feb. 3-7, 80.
Burrill	Western Society of Weed Science, annual meeting, preside as chairman.



INFOLETTER
 Equipment Survey

A survey of respondents to the "equipment" section contained in most issues of the IPPC INFOLETTER in recent years indicated that the feature itself served a useful purpose.

In addition to the response tabulation (mentioned in II. Technical Assistance, Corvallis), the survey generated numerous suggestions and comments, many of which are listed below.



SUMMARY OF QUESTIONNAIRE COMMENTS AND SUGGESTIONS

"Particularly useful are the reports from local research stations, etc., in developing countries, which otherwise tend not to reach international publications." - Ecuador

"I informed a local supplier of the availability of the equipment and the wish of the American firm to have agents abroad. I do not know whether any further action was taken. I find the items in the equipment section very interesting. I send photocopies of some to my colleagues in the Agricultural Engineering Department of this Research Centre. This section and 'In Print' are the most valuable parts of Infoletter for me." - Ireland

"Excellent info for U.S. Scientists, way out ahead of the Establishment." - USA

"The section on equipment is the major source we have for innovative ideas in the industry." - Canada

"Equipment section is very useful. Keep up the good work." - USA

"a) It might not hurt to mention the mfrs' names in the New Products section, as most addresses are known in the trade and this would reduce your work load in having to respond to queries. b) Your format is a little difficult to handle (filing). c) It seems that the New Products section treats experimental prototypes the same as true standard stock items. This can cause time-wasting needless inquiries and disappointment. Again, the mfr's name would be helpful to pre-evaluate the merits of a new product.

We appreciate your continued services and god will very much and hope you will call on us at any time we might be able to reciprocate." - Canada

"Used the information from letter and manufacturer in article for The Furrow." - USA

'Keep up the excellent work. I think your equipment and book section is useful. I have no 'constructive criticism' to add.'

- USA

"Excellent publication - needed to keep up with happenings in pest control, new equipment, pesticides and useful publications available." - USA

"It was a case of not having the money available for purchase of said item. The service was good." - USA

"In both cases the manufacturer no longer made the equipment covered in the Infoletter. Perhaps the equipment section should be more up-to-date. Checking with the manufacturer before listing a piece of equipment would solve this problem." - USA

"Very useful source of equipment/innovations for research purposes. Suggestion: include a price range (approximate) for equipment described." - USA

"As a matter of fact, this is the only published vehicle giving equipment developed for small scale agriculture - if anything enlarge the publication to include a wider range of equipment especially for field operations. Whatever you do don't stop. Expand." - USA

"Decision was made on firmer management procedures to be followed for controlling birds. Although the equipment was not ordered the manufacturer's response helped in our decision-making process. There is a considerable lack of dissemination of information on small machinery especially in the developing world. INFOLETTER helps to fill the gap. Keep it up!" - Mexico

"Excellent information, please keep it coming." - USA

"Visited their plant in the USA and will distribute their equipment in Mexico. Please keep it as good as now! Thank you for sending it." - Mexico

"I have not received Infoletter for at least the last six months." - Western Samoa

"Did purchase a small sprayer. Information has been beneficial." - USA

"Valuable service." - USA

"I requested brochures for file information. It would facilitate the correspondence if the newsletter contained the names and addresses of the companies involved. I would probably contact more if I could jot off a note to the company at the time I read it in your newsletter." - USA

"I passed the information on to our on-farm testing personnel, but it wasn't pursued further. Thanks for sending." - USA

"Regarding INFOLETTER I consider it to be of great help for my work, and I certainly think that every effort must be done to maintain its publication. Sometimes it is amazing to realize the great amount of useful information one can get from a single

issue of INFOLETTER. Correspondingly I think that the "equipment" section is also of practical value." - Mexico

"Although I have not contacted any manufacturers, I have circulated equipment items described in Infoletter to extension colleagues and farmers on occasion." - USA

(After receiving information from IPPC did you contact the manufacturer(s)?)

"No, because I knew (after learning the manufacturers name) that the price would be ridiculously high. Please include the name and address of the manufacturer in the INFOLETTER. Both time and postage are wasted by us and by you in having to write to you for this information." - Pakistan

"The purposes of my inquiries were to obtain sources of new and different pesticide application equipment and catalogs describing such equipment. This information has made a valuable addition to our branch library. Infoletter is very useful to me as a world-wide source of information, especially since it covers pesticides broadly and not just within my own specialty, insecticides." - USA

"I read Infoletter religiously, keep up the good work."
- Senegal

"I find Infoletter very useful." - Canada

"We have not contacted the companies yet; however, we are interested in receiving further information relevant to all the equipment items." - Italy

"Find it a useful source of information, especially in regards to weed science literature." - New Zealand

"An excellent service and a lot of information on a small space." - Borneo

"We hope to purchase some of the equipment in 1980-81. Our present budget is restrictive." - Malaysia

"Information was forwarded to others on our staff who could use it in their information programs. Equipment was not purchased." - Canada

"Infoletter provides a useful service particularly to workers in rather isolated situations such as ours." - Zambia

"I find the Infoletter useful because I send information to others, per previous requests or known areas of interest. I sometimes contact manufacturer's for people overseas, but didn't in this case." - USA

"The equipment was purchased. Infoletter information was very useful." - Spain

"I find Infoletter useful because it is short and up-to-date." - Italy



"Information on availability of this item was used in building a file for future reference. Have not had reason to pursue it further. We have in the past independently located two items of equipment which were described in Infoletter (first source of information), both were purchased. We find Infoletter to be a very useful and informative publication. Although it is not aimed at our principal field (Aquaculture), it provides a lot of information in an area of concern (Aquatic Weeds)." - USA

"1) The address and name of the manufacturer's have been filed and could turn out important in the future for myself or any farmer. 2) Infoletter is very important because it gives latest information on weed control. Inprint section is very important for us here in Tanzania because it is very difficult to get foreign exchange for buying other publications which are not free. 3) It would be really kind of you if you could give first preference for limited copies of free publications to those who don't receive foreign exchange to buy the copies." - Tanzania

"More sprayer and accessory information." - Argentina

"We are very pleased to receive Infoletter because of its usefulness. It gives brief information on many subjects and equipment that initiate further action. As for equipment, I would like to suggest a yearly document in which you would compile all new equipment with all the adequate information in full details." - Senegal

"I do not remember if I requested more than two items. I was pleased with the information received from the manufacturers. No further action has been taken because projects for which I might have used the equipment have not been funded. I value the Infoletter and commend your efforts and encourage your continued activity. Could you add the following names to your mailing list:

Jorge L. Hernandez G.	J. Vistoso Partarrien
Apartado de Correo No. 44	El Sombrero
Calabozo	Edo. Guarico
Edo. Guarico, Venezuela	Venezuela." - USA

"a) The machine described in Infoletter was no longer being manufactured at their plant. Literature on machinery which they do manufacture was sent to me. b) Looking further into methods of scaring birds." - New Zealand

"I find the Infoletter quite useful, sometimes a little more detail would be appropriate." - Canada

"I have purchased for use and demonstrated here a few pieces of equipment. Infoletter keeps me up-to-date on several areas. I like it!" - Pakistan

"I do not recall the order, nor the number of manufacturers I have contacted as there have been many. As a rule, response has been good - several cases where no response was made. I believe you have a valuable service and I enjoy your newsletter." - USA



"We bought pressure regulators." - Switzerland

"Two units of hand-pushed seeders and a cultivator were purchased but these were found to be not suitable under our tropical field conditions. We did not take further actions on the other items, as we believe they are not practical or suitable under the conditions which we want to use them.

I find Infoletter useful and informative as it gives in summary a number of topics which are beneficial in my line of work. It also makes available to us the addresses of manufacturers of "equipment" without which we would find difficulty in getting them." - Malaysia

"We bought one." - USA

"Knapsack sprayer CP3 - (Cooper Pegler). Infoletter is a useful service especially for sprayer manufacturers' as we are.

Included are some catalogs of our production program."
- Brasil

"The manufacturers do not answer with information on equipment, prices, delivery, etc." - Mexico

"Information sent to field personnel for their information. It would be nice to show some homemade plans for making your own equipment." - USA

"Purchase of items of equipment." - Australia

"The information was very useful. We are planning to get some of the equipment requested. I found Infoletter very useful." - Argentina

"Manufacturers should somehow be encouraged to respond. Otherwise it tends to reflect badly on your Infoletter service." - England

"We are going to buy machines." - Mexico

"I was interested in a small 5hp combine. Wrote to you for manufacturer - manufacturer sent me "commercial propaganda" on everything he made except small combines. Wrote back, specifying what I wanted, and he answered saying that they didn't make it anymore and somebody else was. He didn't mention who. The whole process took two months! I finally bought one from China." - Canada

"The purchase of equipment lights for field use are proving excellent." - Kenya

"I am still in the process of setting up a test on the equipment with appropriate applied research group in the Philippines. The second manufacturer has not answered the second request for information and is assumed not interested in overseas inquiries. That manufacturer presented a two-wheeled small farm multipurpose vehicle. I continue to be interested in these items, especially as related to intermediate technology and more efficient energy use."

- Philippines

"I inquired about buying a hand pushed sowing machine. Regretfully the manufacturer did not reply." - Chile

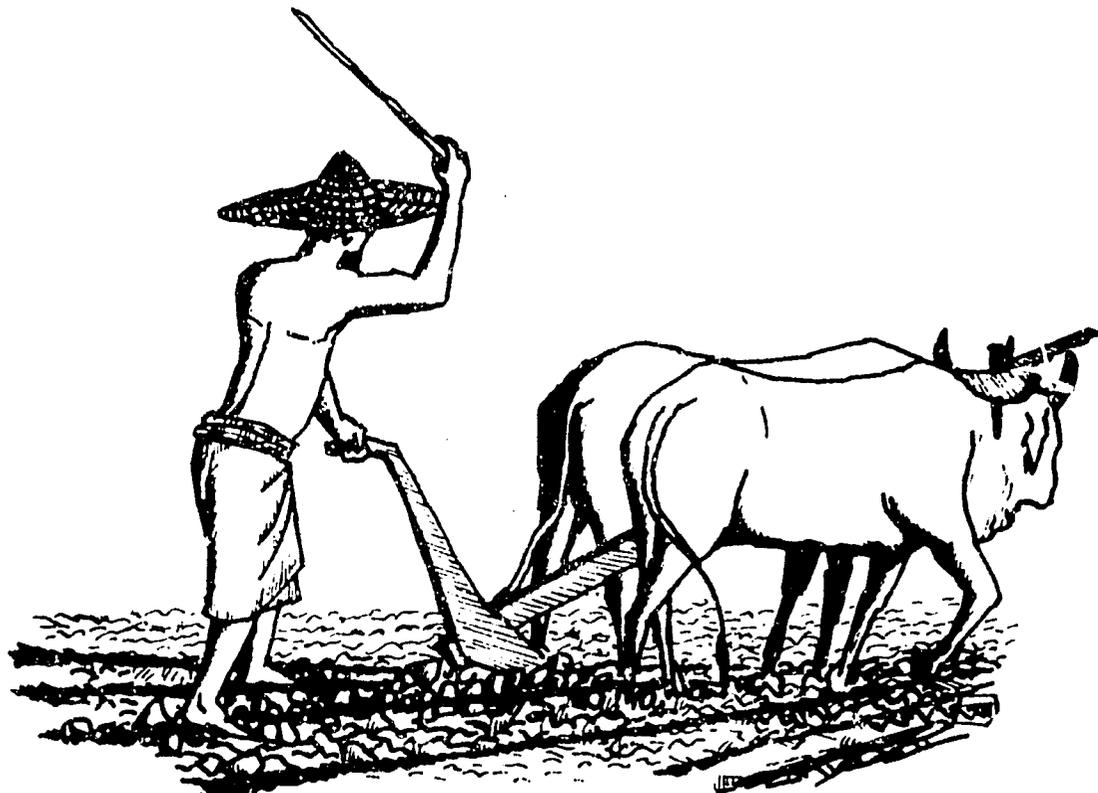
"Equipment ordered and received; one of the O's may still become an X." - Canada

"I would recommend that the manufacturers name and address, and in the case of foreign sources, a U.S. distributor be listed in the Infoletter rather than wasting everyone's postage and handling time in providing the address as currently done."
- USA

"I purchased a sprayer for use in my home orchard." - USA

"Representatives from Australian firms contacted us to tell us more about the equipment. We have not actually purchased any items we have enquired about. More a long-term interest in some of these items, comparing them with those available in Australia. Infoletter is a very useful newsletter which all personnel on our Research Farm read eagerly to see the latest developments and interesting equipment presented which relate to our sphere of work." - Australia

"Information used in lecture preparation for ideas in our R & D programs. More comments from those who use the equipment: is it any good? What would they really like and how much can they afford? It is a useful publication." - England



9.
PROJECT
PERSONNEL

	Project staff members served for the period covered by this report, or as indicated.	TA = technical assistance R = research FTE = full-time equivalent
STANLEY F. MILLER	Oregon, director	50% FTE, TA/R
GEORGE E. ALLEN	Florida, aquatic program coordinator	33% FTE, TA
LARRY C. BURRILL	Oregon, weed res. specialist/ support agronomist	TA/R
FRANK S. CONKLIN	Oregon, agric. economist	50% FTE, R
ALAN S. COOPER	Oregon, weed res. spec.	50% FTE, TA, Sept. 16, 79 to date
VICKI CORLEY	Florida, secretary	TA
ALLAN E. DEUTSCH	Oregon, information/admin.	TA/R
GERMAN ESCOBAR	Oregon, agric. economist	50% FTE, R, Mar. 1, 80 to date
HERBERT H. FISHER	Oregon, weed res. spec.	50% FTE, TA
FRANK FRASER	Oregon, technician	TA/R
JOE R. GINGRICH	Philippines, weed res. spec.	TA
CAROLYN JOHNSON	Oregon, secretary	50% FTE, R
KATHY JONES	Florida, information spec.	TA
GEORGENA S. KNAPP	Oregon, fiscal/translation	TA/R, to Dec. 31, 79
MAUREEN S. KRISSEK	Oregon, secretary/fiscal	TA/R
THOMAS V. McCARTY	Oregon, agric. economist	50% FTE, R, to Oct. 31, 79
ANNE M. MICHALSKI	Oregon, clerical spec.	TA/R, to Nov. 15, 79
PHILIP S. MOTOOKA	Philippines, weed res. spec.	TA, to June 30, 79
CLIFFORD E. MUNROE	Philippines, weed res. spec.	R, Nov. 1, 79 to date
DENNIS T. O'BRIEN	Oregon, agric. economist	50% FTE, R
G. LAMAR ROBERT	Oregon, agric. economist	50% FTE, R, Jan. 1, 80 to date
MYRON D. SHENK	Costa Rica, weed res. spec.	R
ANNE STAINBROOK	Oregon, clerical spec.	TA/R, Oct. 12, 79 to date
SUSAN STEWART	Florida, clerk-typist	TA