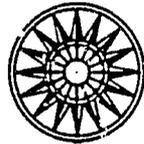
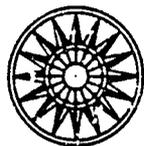




# Concluding Report



## Weed Control Systems Utilization for Representative Farms in Developing Countries



Oregon State University



PN-AAT-748



CONCLUDING REPORT

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WEED CONTROL SYSTEMS UTILIZATION FOR  
REPRESENTATIVE FARMS IN DEVELOPING COUNTRIES

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OREGON STATE UNIVERSITY AND THE  
U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT

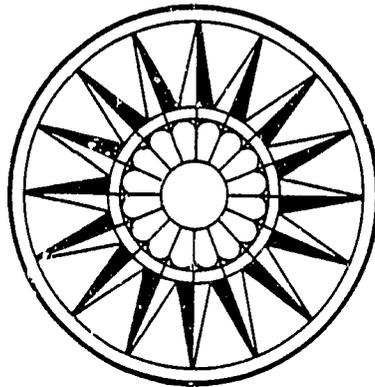
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IPPC DOCUMENT #62-C-85

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DECEMBER 1985

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INTERNATIONAL PLANT PROTECTION CENTER  
OREGON STATE UNIVERSITY  
CORVALLIS, OREGON 97331 / USA





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PROJECT PROFILE

Project Title Weed Control Systems Utilization for Representative Farms in Developing Countries

Contract AID/ta-C-1303

Principal investigator (project director) S. F. Miller, Director International Plant Protection Center Oregon State University Corvallis, OR 97331 / USA

Principal investigator (subproject director) W. T. Haller, Director IPPC/University of Florida Center for Aquatic Weeds University of Florida Gainesville, FL 32606 / USA

Contract period (with extensions) April 1, 1976 through August 31, 1985

Period covered by this report April 1, 1976 through August 31, 1985 (with emphasis on the last 3 years)

Accumulated expenditures for the contract period \$3,745,475

AID Project Manager(s) R. J. Niece, M. A. Smith, B. L. Pollack, H. Hortick, and C. W. Collier S&T/AGR/AP AID, Rm. 413, SA-18 (RPC) Department of State Washington, DC 20523 / USA





EXECUTIVE SUMMARY

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The AID-Oregon State University weed control systems technical assistance effort conducted through OSU's International Plant Protection Center was a major element in a series of successful TA and research contracts extending from 1965 through termination on August 31, 1985.

An estimated 8,450 person-days of OSU professional academic staff time were dedicated to meeting project objectives. Total project expenditures were \$4.16 million of which over \$400,000 were contributed.

Project personnel conducted, or participated in, more than 40 weed management training courses, workshops, and symposia covering both terrestrial and aquatic vegetation topics. Increased emphasis was placed on safe handling and application of pesticides.

Innovative weed management technologies were devised and disseminated. In Costa Rica, an intensive monitoring effort revealed conclusive small farmer acceptance of lower-cost, lower-risk technologies proposed by project personnel.

Staff worked closely with a wide range of national and international colleagues including ministries of agriculture, IARCs, research organization, FAO, and others. In Pakistan, the project collaborated on a series of highly successful courses that inaugurated the new (and AID-funded) National Agricultural Center.

Aquatic weed technical assistance was subcontracted through the Center for Aquatic Weeds at the University of Florida. CAW contributed the services of a project leader. The project leader and an Australian counterpart had an audience with the King of Thailand regarding the project's productive work with assessing the economic impact of aquatic vegetation in that country.

The aquatic subproject participated in creating a massive technical literature data system and also originated a periodic newsletter, Aquaphyte, that was sent to over 4,000 recipients in 64 countries at the time of project termination.

IPPC-Oregon published over 40 issues of the IPPC INFOLETTER during the contract and disseminated copies to more than 6,200 recipients in over 130 countries. Additionally, the project published and widely distributed a number of major weed management titles as well as conducted a popular free reprint service for selected items.



PROJECT BACKGROUND

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Agriculture, Weeds, and LDCs

Agricultural technology introduced to developing nations has had mixed blessings. For small and medium-sized farming enterprises, increased emphasis on required inputs (fertilizer, improved seed, and irrigation) and their associated costs moved dramatic production increases beyond reach. Only more affluent operators could absorb the costs, not to mention the often increased risk.

Advanced technology also contributed to intensification of weed problems. Some of the new, high-yielding cultivars do not compete as vigorously with weeds as many native varieties can. Additional soil fertility, higher moisture levels, and improved seedbeds for both new and old crop varieties provide improved growing conditions for weeds as well. The combination often results in failure to realize potential gains from costly agricultural development projects.

Weed flora shifts occur as weed control technologies change, often causing shifts from relatively controllable broadleaf varieties to more pernicious grassy species which, once established, are more difficult to control.

Weeds become a major constraint to LDC food crop production.

## Project Origin

The international development community grew increasingly concerned about weed control in developing countries. These concerns resulted in the AID-Oregon State University weed control project (a contractual relationship originated in 1966) being encouraged to assess 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 designing 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 successfully concluded 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.

## Formalized Technical Assistance

In 1976, a technical assistance contract was instituted to operate in tandem with the weed control research project. A series of intensive in-country weed control training programs was launched, plus stepped up consulting and information dissemination efforts. Additional technical assistance activities and cooperative linkages were developed to backstop

missions and LDC institutions. In-country personnel had joint responsibility for the technical assistance and weed control research contracts.

### Aquatic Component

Project staff became increasingly aware that aquatic weeds cause serious problems throughout the world's tropics and subtropics, especially in developing countries. Since 1960, explosive growth of aquatic weeds in major hydrological systems of several developing countries reduced or restricted water availability. Where water systems serve multiple purposes, e.g., irrigation, transportation, cooking, fishing, sewage disposal, and hygiene--in Southeast Asia, for example--loss of ready access to water would cause serious sociological problems.

In agriculture, aquatic plants occupy space needed for water storage. Moreover, through transpiration, the aquatic biomass can accelerate water loss from a free water system up to 3 to 8 times that of a clear surface. This threat becomes especially pertinent for critically water-short regions.

To address aquatic weed problems, the AID-OSU weed project enlisted the University of Florida to conduct an aquatic weed program under a subcontract. An agreement was signed and work begun in April 1976. Under the agreement, the U. of F. aquatic weed experts provided technical assistance through short-term consultations with governments of developing countries as well as reference and information center to the same group of nations.

## Research and Technical Assistance

The research component of the AID-OSU weed project was concluded in 1983. Results of the project are available through IPPC Document 51-C-84 "Concluding Report - Weed Control Systems for Representative Farms in Developing Countries". The contract supporting technical assistance, after an extension, formally concluded as of August 31, 1985.



ROLE AND OBJECTIVES

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Project Role

The AID-OSU weed control program constituted but one of many elements in the overall effort to raise food crop production levels in less developed nations. It specifically aimed to help institutions in developing countries design, organize, strengthen, and implement weed control programs to reduce food losses due to weed competition and thereby increase rural and urban living standards.

The program endeavored to work in close collaboration with local, regional, national, and international entities; it was attuned to stated needs and integration of activities. The goal involved collaboration with nonproject colleagues and counterparts to ultimately increase effectiveness of weed science and control.

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

Objectives

Specific objectives included:

1. Train host country counterparts in appropriate weed control research methods;

2. Promote practical and safe usage of herbicides (and other pesticides) through educational programs;
3. Encourage evaluation of ecological and environmental aspects of weed control systems;
4. Foster continued development and maintenance of a worldwide communication-information network for weed control linking the institutions and individuals concerned;
5. Identify biological and socioeconomic problems of aquatic weeds in agricultural production and related nonagricultural situations;
6. Provide short-term consultation for integrated weed control methods in developing countries;
7. Establish general criteria for the assessment of aquatic weed problems;
8. Operate an extensive aquatic weed information and reference center and expand delivery of data therefrom; and,
9. Develop integrated control systems for important aquatic weeds.



ACTIVITIES REVIEW

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I. TRAINING

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A. International

WEED CONTROL SHORT COURSES

The AID/OSU weed project personnel were major players in a series of intensive weed science short courses (Table A). Project personnel were directly involved with organization, arrangements, and course presentation to varying degrees. The project collaborated directly with several international and national agencies and institutions to make the courses happen: FAO, CIMMYT, UNDP, Pakistan Agricultural Research Council, Department of Agriculture (Zambia), Swedish International Development Authority, Pan American Agricultural School, and the Barani Agricultural Research Development Project.

Characteristics and features of each course included:

- close collaboration between the AID/OSU project, as represented by the International Plant Protection Center, cooperating organizations, and host institution;
- a cadre of expatriate weed scientists, supplemented by local expertise, that maintained close and continuous contact with trainee/participants throughout the duration of the course;
- a pre-course and post-course examination that permitted objective evaluation of participant progress;

- a mixture of hands-on field exercises, classroom lectures--with instructor--participant interchange encouraged--laboratory sessions, and field trips;
- provision of an extensive literature packet (reprints, books, technical data sheets) to each participant;
- provision of a light-powered, hand-held calculator for each participant (in 3 of the 4 courses);
- presentation to each participant of an official, multiple signature certificate of successful course completion.

A brief chronological synopsis of recent courses follows, listing: course title, date, location, organizing and cooperating organizations, plus other information. Full details for most of the courses were published in a series of IPPC documents (nos. 47-C-83, 52-A-83, 54-C-84, 55-C-84, 59-C-84, and 60-C-84).

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TRAINING COURSE ON WEED SCIENCE RESEARCH

November 20-December 8, 1982

National Agricultural Research Center; Islamabad, Pakistan

Organized by:

Pakistan Agricultural Research Council (PARC)

Centro Internacional de Mejoramiento de Maiz y Trigo (CIMMYT)

International Plant Protection Center

Supported in part by U.S. Agency for International Development

26 participants from a variety of Pakistani programs

3 primary instructors (IPPC, CIMMYT, and consultant)

average pre-course test score, 41%; post course, 78%

WEED MANAGEMENT TRAINING COURSE

August 29-September 10, 1983

Milimani Hotel; Nairobi, Kenya

Organized by:

FAO (Plant Protection Service)

UNDP (through FAO/UNDP Program for Improved Plant Protection)

U.S. Agency for International Development

International Plant Protection Center

26 participants from various commodity and civil programs

4 primary instructors (IPPC (2), Univ. of Nairobi, and U.S.

agronomist residing in Kenya)

Participants formulated a series of resolutions calling for:

- immediate formation of Kenyan Weed Science Society;
- creation of weed scientist posts in Ministry of Agriculture and at experiment stations;
- increased emphasis on weed management at University; and,
- more frequent weed management workshops or seminars.

ZAMBIA WEED MANAGEMENT COURSE

December 12-23, 1983

Mt. Mukulu Research Station; Chilanga, Zambia

Organized by:

Department of Agriculture, Republic of Zambia

Swedish International Development Authority

FAO

UNDP (Action Program for Improved Plant Protection)

U.S. Agency for International Development

International Plant Protection Center

22 participants, extension oriented, representing all  
agriculturally important regions

5 primary instructors (U.K. (2), IPPC, U.S. agronomist residing  
in Kenya, and development agronomist residing in Mozambique)

Course resulted in part from efforts of U.K. weed scientist  
posted in Zambia.

WEED SCIENCE RESEARCH TRAINING COURSE - PAKISTAN II

January 14 to February 2, 1984

National Agricultural Research Centre; Islamabad, Pakistan

Organized and supported by:

Coordinated Wheat, Barley, and Triticale Program (NARC)

Centro Internacional de Mejoramiento de Maiz y Trigo (CIMMYT)

Barani Agricultural Research Development Project (Canadian aid)

Pakistan Agricultural Research Council (PARC)

U.S. Agency for International Development

International Plant Protection Center

30 participants from a variety of Pakistani programs

3 primary instructors (IPPC (2), and CIMMYT)

average pre-course test score, 42%; post course, 70%.

LESOTHO PESTICIDE HANDLING AND APPLICATION WORKSHOP 1984

August 13-15, 1984

Anglican Training Centre, Maseru, Lesotho

Organized and supported by:

Consortium for International Crop Protection

U.S. Agency for International Development  
International Plant Protection Center  
36 participants from government organizations  
2 primary instructors (IPPC, USAID)  
course resulted from action by USAID Regional Pesticide Advisor  
requesting help from CICP.

ZAMBIA PESTICIDE HANDLING AND APPLICATION WORKSHOP 1984

August 22-24, 1984

Natural Resources Development College, Lusaka, Zambia

Organized and supported by:

Consortium for International Crop Protection

U.S. Agency for International Development

International Plant Protection Center

31 participants from a variety of organizations

3 instructors (IPPC, USAID, and local)

course resulted from action by USAID Regional Pesticide Advisor  
requesting help from CICP

PEST AND PESTICIDE MANAGEMENT TRAINING COURSES, BOLIVIA

September 17-October 10, 1984

3-day courses presented in each of 7 cities

Organized and supported by:

Consortium for International Crop Protection

U.S. Agency for International Development

International Plant Protection Center

242 participants

2 instructors

courses successfully created the participants' awareness of need for improved pest and pesticide management; the effort grew out of the Bolivia Disaster Recovery Project.

INTENSIVE WEED MANAGEMENT TRAINING COURSE / CURSO CONTROL DE MALEZAS (COSTA RICA)

October 31-November 24, 1984

Centro Agronomico Tropical de Investigacion y Ensenanza, (CATIE)  
Turrialba, Costa Rica

Organized and sponsored by:

Food and Agricultural Organization

International Plant Protection Center

U.S. Agency for International Development

CATIE

21 participants from 9 Central American and Caribbean countries  
15 professionals representing 9 institutions took part  
average test scores improved from 65% to 83%.

PAKISTAN WEED SCIENCE WORKSHOP

January 17-24, 1985

National Agricultural Research Centre, Islamabad

Organized and supported by:

Pakistan Agricultural Research Council

U.S. Agency for International Development

International Plant Protection Center

29 participants, mostly previous participants at project  
shortcourses given in 1982 and 1984

2 instructors

served as both a refresher and vehicle for maintaining contact  
and interest.

FIRST REGIONAL PEST AND PEST MANAGEMENT COURSE, PERU

July 1985

Yurimaguas Experiment Station

Organized and supported by:

North Carolina State University program

U.S. Agency for International Development

International Plant Protection Center

22 participants

3 instructors

course grew out of concern (by NCSU graduate student working at  
Yurimaguas) over improper use of pesticides.

AQUATIC WEED TRAINING COURSES

A six-week aquatic weed training course was held at the  
University of Florida June 10 - July 25, 1984. The course was  
specifically concerned with the utilization and management of  
aquatic vegetation. Over fifty LDC scientists requested  
financial assistance to attend the course; however, due to  
limited funding, only scientists from India, Mexico, and Nigeria  
attended. Another course is planned for the summer of 1986.

Table A

## IPPC/AID PROJECT PARTICIPATION IN INTERNATIONAL SHORTCOURSES AND WORKSHOPS, APRIL 1976 TO AUGUST 1985

date	duration	event	number of participants	held at
5/76	4 days	Weed Control of Cassava	30	Cruz das Almas, Brazil
3/77	2 weeks	Weed Control Short Course	30	Leon, Nicaragua
3/77	1 month	Economic Significance of the Control of Aquatic Weeds and an Assessment of their Economic Significance in Thailand	25	Bangkok, Thailand
6/77	2 days	Weed Control in Rice	10	Nueva Ecija, Philippines
8/77	1 day	Weed Control in Rice	30	Los Banos, Philippines
8/77	2 months	Identification, Control and Utilization of Aquatic Plants	10	Gainesville, Florida
10/77	1 day	Pest Management and General Weed Control	15	Central Mindanao, Philippines
10/77	2 days	Research Methods on Weed Control	15	Maligaya, Philippines
10/77	1 day	Weed Control Research Progress	22	Central Mindanao, Philippines
2/78	1 week	Weed Control Short Course	20	Leon, Nicaragua
3/78	1 week	Research Methods in Weed Control	21	Panama
4/78	1 week	First Mindanao Weed Science Workshop	26	Central Mindanao Univ., Philippines
4/78	4 days	Herbicide Application Minicourse	17	Los Banos, Philippines

Table A - continued

date	duration	event	number of participants	held at
5/78	4 days	Second Mindanao Weed Science Workshop	20	Xavier Univ. Cagayan de Oro City, Philippines
7/78	3 days	Weed Control for Extentionists	34	San Pedro Sula, Honduras
8/78	1 day	Weed Control in Cacao	30	La Lola, Costa Rica
8/78	4 days	Herbicide Properties and Behavior Minicourse	15	Los Banos, Philippines
9/78	4 days	Third Mindanao Weed Science Workshop	30	Central Mindanao Univ., Philippines
10/78	4 days	Weed Ecology and Identification Minicourse	15	Silang, Philippines
10/78	1 day	Weed Control in Pastures	50	Turrialba, Costa Rica
10/78	2 weeks	Research Methods in Weed Control	20	Managua, Nicaragua
12/78	1 week	Weed Management	36	San Salvador, El Salvador
1/79	1 day	Weed Control in Cacao	11	La Lola, Costa Rica
3/79	4 days	People's School Weed Control Workshop	15	Silang, Philippines
3/79	4 days	Fourth Mindanao Weed Science Workshop	42	BPI, Davao City, Philippines
4/79	1 week	Weed Control in Forests	20	Comayagua, Honduras
5/79	2 days	Equipment Calibration	31	La Lola, Costa Rica
10/79	4 weeks	Weed Control Short Course	28	San Fedro, Argentina

Table A - continued

date	duration	event	number of participants	held at
1/80	3 weeks	Weed Management	34	Los Banos, Philippines
4/80	1 week	Weed Management	26	Grenada
4/80	1 week	Weed Management	22	Antigua
6/80	1 day	Weed Control Developments	20	Guayaquil, Ecuador
6/80	4 days	Intensive Course on Weed Control	14	Honduras
3/80	1 day	Weed Control of Cacao	5	Turrialba, Costa Rica
10/80	1 week	Systems Design Seminar	30	Panama
10/80	1 day	Pastures as a Means of Weed Control	40	Guatamala City, Guatamala
2/81	1 day	Use of Glyphosate to Control <u>Paspalum fasciculatum</u>	75	Univ. of Costa Rica, Costa Rica
3/81	3 days	Agronomic Systems for Basic Grains	40	Nicaragua
5/81	2 days	Soybean Weed Control	30	Turrialba, Costa Rica
5/81	1 day	Weed Control in Pastures	37	Turrialba, Costa Rica
8/81	3 days	Weed Control Principles	20	Nicaragua
10/81	6 days	Weed Control Short Courses	22	Nicaragua
12/81	4 days	Integrated Pest Control in Small Farm Production Systems	19	Panama
2/82	4 days	Weed Control for Small Farms	20	Costa Rica
2/82	3 days	Weed Control Short Courses	14	Honduras

Table A - continued

date	duration	event	number of participants	held at
4/82	2 days	Weed Control in Cacao	40	Guatemala
11/82	20 days	Weed Control Research	20	Pakistan
2/83	25 days	Weed Control Equipment	150	Indonesia
4/83	3 days	Teaching Weed Science	20	Thailand
7/83	12 days	Weed Control	26	Kenya
11/83	4 days	Weed Control	32	Chile
12/83	12 days	Weed Control	32	Zambia
1/84	21 days	Weed Control	30	Pakistan
8/84	2 days	Pest Management	36	Lesotho
8/84	2 days	Pest Management	31	Zambia
9/84	23 days	Pest Management	242	Bolivia
11/84	25 days	Weed Control	22	Costa Rica
11/84	18 days	Weed Control	30	Tanzania
11/84	14 days	Weed Control	125	Honduras
1/85	7 days	Weed Control Workshop	32	Pakistan
6/85	12 days	Pest Management	21	Peru

All the courses were well received. In particular, the combination of two courses in Pakistan with a follow-up session, plus the continuity of a CIMMYT agronomist being present, provided a more definitive measure of direct benefits, including:

- \* The courses effectively utilized the new National Agricultural Research Centre at Islamabad.

- \* The second course was arranged and funded through the resources of 6 national and international organizations.
- \* The teaching techniques utilized, which generated extensive trainee participation, drew as many positive reactions as the subject matter.
- \* Follow-up directly attributable to the 2 courses:
  - a national weed coordinator position was created and a person selected to fill it;
  - a strong impetus exists to form a professional weed science society in Pakistan;
  - a future meeting is planned for participants from both courses; and,
  - 15 of the 30 participants (2nd course) joined the International Weed Science Society.

#### TRAINING MANUAL

The Plant Protection Service of FAO, through the FAO/UNDP Action Program for Plant Protection, contacted IPPC with a request to prepare an instructor's manual for weed control research training. IPPC accepted and entered into a contract to prepare the material. A draft copy was submitted in April 1984 and accepted by FAO. The text is designed to provide a material outline for instructors, supplemented with practical teaching aids developed from actual conduct of training courses. FAO plans to publish the material in six languages.

## INTERNATIONAL STUDENT SUPPORT

The AID/OSU weed project provides some support for several international students. During the report period, five graduate students--Ahmad Akbari (Iran), Raouf Cherif (Tunisia), Albert Fischer (Uruguay), Manhaz Saremi (Iran), and Karin Tanphiphat (Thailand)--were involved with the IPPC-coordinated weed project. In each case, individual research projects were specifically designed to provide the student with experience and applicable information and techniques, as well as add to the project's technical information pool. Their research is reported later in this document.

## SAFETY REFRESHER COURSES

In January-February 1983, a project weed scientist conducted training/refresher short courses on herbicide safety and application at five Indonesian food and estate crops research institutes and at the SEAMEO Regional Center for Tropical Biology (Bogor). Varying size groups of technicians participated in the information sessions. Hand-pumped, person-carried, lever-operated knapsack sprayers were used to demonstrate appropriate techniques for maintaining safety and effective application.

### SPRAYING SHORT COURSE

At the request of the AID/OSU Tunisia project, IPPC arranged and conducted a spraying short course for 11 Tunisian participants at Corvallis. The course, presented in French for IPPC by Albert Fischer and Herb Fisher, covered safety, sprayer calibration, pesticide handling, and environmental concerns. Participants took part in calibrating equipment provided by IPPC.

### B. Domestic

### UNIVERSITY TEACHING

Two project staff members carried university teaching responsibilities. Project director S. F. Miller taught International Agricultural Development (AREC 462) each year during the winter quarter and also advised graduate students in agricultural and resource economics. International students comprised 25% of the course's average 36 person enrollment. The course's objectives are to introduce students to economic issues which focus on agriculture in the development process and to examine the ability of agriculture to contribute to economic growth.

Senior weed scientist L. C. Burrill instructed two laboratory sections weekly of Crop Science 418, Weed Control, and guided four or five discussion sections. The activity is

particularly useful for developing practical teaching techniques and projects that are applicable to international short courses. He also advised graduate students in crop science. The 1983 weed control class included students from Trinidad, Pakistan (2), Thailand, China, Costa Rica, Paraguay, Indonesia, Tunisia, Philippines, Libya, Morocco, and Mexico. Ten international students were in the 1982 class and 13 in 1984.

### DOMESTIC GRADUATE STUDENTS

Four U.S. graduate students received support from, and were involved with, the AID/OSU weed project; H. H. Fisher (PhD), G. L. Robert (PhD), A. S. Cooper (MS), and M. Peterman (MS). Descriptions of their research projects follow. Fisher and Cooper served half-time as research assistants for the project and were involved not only with field work associated with research, but international activities, technical literature collection development, equipment evaluation, and other aspects of the project as well. Robert conducted his work in Thailand.

## II. Research

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### A. Degree Programs

Descriptions of research projects conducted by full and part time students receiving some measure of support through the AID/OSU project follow:

\* Herb Fisher (US), PhD: Adaptability and competitiveness of two Rottboellia exaltata Lf. biotypes and some of their F2 progeny - a noxious grass weed of the tropics, Rottboellia is spreading and therefore challenges agronomists to develop effective controls. This weed biology study seeks to predict which biotypes and progeny are most likely to invade new habitats and should receive priority in prevention and control efforts.

\* Ahmad Akbari (Iran), PhD: The economic effects of minimum and no-till tillage systems for weed and erosion control in Oregon - Herbicides play an important role in minimum and no-till cultivation systems. Private and social costs and benefits occur as technology switches away from traditional tillage. This study attempts to evaluate these benefits and costs with the intent that the same approaches will be applicable to non-U.S. conditions.

\* Manhaz Saremi (Iran), PhD: An econometric analysis of the Mexican import demand for U.S. pesticides - This study sought improved understanding of factors affecting Mexican import demand for three groups of pesticides: insecticides, herbicides, and fungicides. Study objectives included: description of market characteristics for pesticides in the U.S. and Mexico, identification of major consumers of pesticides in Mexico, review of Mexican agricultural policy effecting pesticide use, and construction and estimation of an econometric model for the three pesticide groups.

\* A. S. Cooper (U.S.) MS, A. Fischer (Uruguay), PhD, and M. Peterman (U.S.), MS: Maize-white clover cropping system -

Studies were begun in 1982 at 3 sites in Oregon's Willamette Valley to test the feasibility of growing Zea mays L. var. 'Golden Jubilee' in a living Trifolium repens L. var. 'New Zealand' (white clover) sod. Objectives were to develop a system that optimizes the beneficial effects of a legume cover crop while simultaneously producing a sweet corn crop. Potential benefits are weed suppression, reduced soil erosion, added organic matter, added nitrogen, reduced tillage, and enhanced water use efficiency through improved hydraulic conductivity combined with improved root penetration.

\* G. L. Robert (US), PhD: Economic Returns to Investment in Control of Mimosa Pigra in Thailand - Mimosa Pigra, a semi-aquatic herbaceous plant originally introduced into Thailand to reduce soil erosion on steep slopes, has become a serious pest threatening waterways and agriculture in the entire Mekong River System. At the request of the Thai Deputy Undersecretary of Agriculture, a study was undertaken to assess the economic impact of Mimosa Pigra. The published results of the study indicated that economic returns to investment in control of M. pigra in irrigation system and reservoirs are very high. However, in agricultural land, normal farming activities effectively control the weed. As a result of the study, a proposed multi-million dollar project to control M. pigra in agricultural land was suspended. The investment was redirected from the agricultural level where the B/C ratio was less than one to investment in control measures within the irrigation system, rivers, and reservoirs where the B/C exceeded 35 to one.

\* Raouf Cherif (Tunisia), MS: Weed control in cuphea (a new oil seed crop) - This research program was selected because the steps taken to search for a weed control program are similar for most crops. This student will be expected to conduct research to find weed control solutions for several crops upon his return to Tunisia. In the first year, 22 herbicides were tested to determine their effect on cuphea. A similar trial with different herbicides was conducted in 1984. In addition, the most promising herbicides from the 1983 test will be included in a yield trial in 1984.

\* Karin Tanhiphat (Thailand), MS: Soil persistence of clopyralid - Clopyralid is a new herbicide that is safe in wheat and also controls some hard-to-kill perennial weeds commonly found in wheat. There is concern that crops following wheat will be injured by traces of clopyralid remaining in the soil. Several rates of clopyralid will be applied to the soil over a 2-year period. Sensitive crop will be planted in treated plots in the field and in soil samples in the greenhouse to determine levels of active clopyralid remaining in the soil.

#### B. New Herbicide Screening

In 1983, evaluations were made of general phytotoxicity and crop selectivity on 9 experimental herbicides. In 1984, 10 new herbicides were tested; in 1985, four. Approximately 20 crops and 10 weed species were used to test these herbicides. In earlier years evaluations were made for: 1979 - 14 experimental and 9 standard herbicides; 1980 - 19 experimental and 18

standard; 1981 - 33 experimental and 20 standard; 1982 - 21 experimental and 12 standard.

### C. Equipment Studies

In response to increasing international interest, IPPC conducted a familiarization and evaluation study of lever-operated knapsack sprayer components based on a randomly acquired cross-section of 37 machines representing 26 manufacturers in 15 countries. The objectives included gaining staff familiarity with the genre so as to better advise AID and other agencies, and secondly, to determine those features that are desirable to incorporate in a knapsack sprayer.

The evaluation itself was performed with practicality in mind and from the viewpoint of a potential purchaser-user. Torture-style tests were not included, but in-field performance and convenience aspects were. The results were published as an illustrated, 32-page guide.

Several U.S. manufacturers expressed direct interest; two firms sent representatives to visit IPPC. Several new, improved machines are now under development.

### III. Collaboration / Linkage

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The project has historically worked closely with national, regional, and international institutions and organizations, both directly and indirectly. The small scope of the project and its

specialized nature demanded collaboration and cooperation in order to achieve impact and gain dissemination of information.

This section notes the organizations and institutions involved, examples of collaborative efforts, and the reach of the project when coupled with other, large organizations.

#### A. Direct Involvement with Institutions

##### FAO

The project maintained contact with the Plant Protection Service of FAO for many years, and increased that collaboration noticeably when FAO created and staffed a weed scientist position. IPPC worked closely with the FAO weed scientist and, more recently, the manager of the FAO/UNDP Action Program for Plant Protection, in organizing and conducting short courses, preparing printed training materials, and serving on the FAO Panel of Experts on Improved Weed Management.

In September 1982, project senior agronomist L. C. Burrill, as one of 35 weed scientists representing 20 nations, participated in the "FAO/IWSS Expert Consultation on Weed Management Strategies for the 1980s for the LDCs." Ten recommendations were developed and accepted. Special emphasis was placed on instituting improved weed control programs in Africa.

Project staff members made 8 person-trips to FAO/Rome during the report period in conjunction with various activities.

One result was that in November 1983, a 4-day workshop on Biology and Control of Selected Perennial Weeds was held in Santiago, Chile, with major funding from FAO. The AID/OSU weed project supported the travel costs of international weed scientist Dr. J. D. Doll (Univ. of Wisconsin). The workshop proceedings were published in Spanish.

#### CIMMYT

Linkage between CIMMYT and the project, extending back to the early 70s, continued to be highly cooperative, particularly in the joint organization and conduct of two successful weed science short courses in Pakistan (December 1982 and January 1984 as described in the training narrative section of this report). The positive outcome of these courses was directly due to the professionalism of CIMMYT wheat agronomist in Pakistan Dr. P. Hobbs, and the collaboration between the two organizations and the host country institutions. A one-week follow-up workshop with 35 selected trainees was conducted in January 1985.

Dr. Hobbs coordinated all the on-site preparations, participant selection, field arrangements, and organizational input; the project supplied teaching materials and financial support for participants; CIMMYT and project staff members shared instructional duties; the project published and distributed reports of the courses.

PARC, NARC

The project forged a close link with the Pakistan Agricultural Research Council (PARC) and the National Agricultural Research Centre (NARC) at Islamabad. The primary areas of collaboration involved the weed science short courses, advanced degree training of Pakistani scientists in Oregon, participation as coordinating scientist for a series of USDA-PL 480 programs (see below), and provision of printed materials to Pakistanis.

CATIE, ROCAP

The project established close ties with both the Centro Agronomico Tropical para Investigacion y Ensenaza (CATIE) and AID's Regional Office for Central American Programs (ROCAP) during the 5 years that project specialists resided at Turrialba. The linkage remained intact as project weed scientist M. D. Shenk traveled to Central America three times at the request of ROCAP to provide technical expertise on weed control and small farming programs. Shenk helped instruct short courses, advised regarding weed control and IPM, and served on a regional IPM design team.

## SOCIETY SUPPORT

Project weed scientist C. E. Munroe (until 1982) co-authored Major Weeds of the Philippines, a 328-page, fully illustrated handbook published by the Weed Science Society of the Philippines in 1984. Drs. K. Moody (IRRI weed scientist and newly named president of the International Weed Science Society), E. C. Paller, Jr., and R. T. Lubigan (University of the Philippines weed scientists) collaborated on the publication.

The volume offers full-page, full-color plates of 134 species, along with descriptions, nomenclature, and a glossary. It is the first all-color collection of weed taxonomy to be published for the Philippines.

### B. Networking

During 16 years of project activity, an extensive list of organizations evolved into an international network. A listing of the 66 organizations (in Latin America, Africa, Asia, and international) is attached as Appendix 1.

In a less formal sense, IPPC's 6,300 name mailing list constituted an information channel and network as information flows bidirectionally. This linkage resulted in exchange and sharing of information.

### C. Support

## USDA-PAKISTAN

The project, through IPPC, is cooperating with the USDA in Pakistan. IPPC weed scientist M. D. Shenk was designated in April 1984 as the Cooperating Scientist for five Pakistani Special Foreign Currency (SFC) research projects on weeds of cereals (P/C-ARS-199(FG-Pa-377)) through (P/C-ARS-203 (FG-Pa-381)). Primary responsibilities involved interacting with Pakistani Principal Investigators to develop, implement, and review a weed control research program for cereal crops in Pakistan. It is anticipated that the cooperative effort will cover a 3 to 5 year span and require periodic on-site visits.

## HONDURAS

On May 15, 1984, IPPC entered into an agreement with the distinguished Escuela Agricola Panamericana (EAP), Tegucigalpa, Honduras, under contract to USAID/Honduras, to prepare a syllabus (in Spanish) for a weed control course that will be offered at EAP, to prepare a Spanish language weed control field/laboratory guide book, to conduct a weed science course (in Spanish) at EAP from June 25 through July 27, 1984, and to provide periodic consultation to EAP in its pursuit to enhance weed control in Honduras.

Initial work on the syllabus began. Also, Albert Fischer, PhD weed science candidate from Uruguay, agreed to instruct the

course and successfully did so. Syllabus materials were tested in the course with necessary modifications made subsequently.

The field/laboratory guide book will contain appropriate laboratory and field exercises for demonstrating weed control principles such as: leaching of herbicides in soil, herbicide volatility, movement of selected herbicides within plants, multiple crop herbicide screening trials, and problems of herbicide residues in spray application equipment.

A second course is scheduled to be given in January 1986.

#### SUPPORT NETWORK

The AID/OSU project extended a network of support encompassing several professional societies and activities:

- \* Responding to a request from the International Parasitic Seed Plant Research Group, the project redesigned and published and distributed five issues of the Group's newsletter, Haustorium.

- \* The weed project supplied backup to USAID projects in Yemen, Tunisia, and Tanzania through orientation of personnel and supply of technical information.

- \* For the International Weed Science Society, support included publication assistance with the IWSS Newsletter, clerical services, and editorial-production, plus distribution, for the proceedings of the joint IWSS-Weed Science Society of America symposium, "Communication of Weed Science Technologies in Developing Countries (see appendix 3).

\* Through interest in mulching as a weed control technique, the project agreed to produce and publish a mulch workshop proceedings as, "Crop Production using Cover Crops and Sods as Living Mulches."

\* IITA weed scientist Dr. I. O. Akobundu elected to spend a one-year sabbatic at IPPC during 1984-85. He actively participated in a wide range of activities while also working on the manuscript for a weed management text.

#### IV. Consulting

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##### A. Aquatic Weeds

#### ECUADOR

Two aquatic weed scientists from U.F., under joint sponsorship of the AID mission and two Ecuadorean agencies, spent a week surveying the Rio Guayas basin in Ecuador during April 1984 to assess and advise on the problem of waterhyacinth and its impact on a major hydroelectric project under construction.

Drs. W. T. Haller and J. C. Joyce, at the invitation of the Instituto Nacional de Investigaciones Agropecuaria (INIAP) and the Comision de Estudios para el Desarrollo de la Cuenca del Rio Guayas (CEDEGE) noted dense infestations of waterhyacinth (a floating aquatic weed that is not native to Ecuador) that officials feared would drastically impact the planned 24,000 ha reservoir. Current control procedures were observed and

suggestions offered for Ecuadorean research and control initiatives under way at the INIAP research stations at Guayaquil and Boliche. The U.F. scientists also presented a seminar about waterhyacinth that was attended by more than 120 Ecuadorean technicians.

It is expected that the trip will lead to further contacts among researchers concerning biological, chemical, and mechanical control programs for waterhyacinth. Though one biological control agent, Neochetina, has been reported in Ecuador, the U.F. team found no evidence of feeding or other insect damage on waterhyacinth in the Rio Guayas Basin.

#### INDIA

U.F. aquatic plant pathologist Dr. R. Charudattan, with partial support from the IPPC aquatic weed program, presented an invited paper and chaired one section of the International Conference on Waterhyacinth held in Hyderabad, India, during February 1983. Seventy papers and 6 plenary lectures were presented. Dr. Charudattan was the lone representative of the U.S., despite participation of several Asian nations, Australia, and U.K.

Strong sentiment for utilization, rather than control, became evident, Dr. Charudattan reported. However, he felt that, "the experience of our scientists in Florida would have been very beneficial to the conference ... in a way, the conference was rediscovering the wheel with respect to utilization ... I don't

think utilization is the approach (for India) to take in view of the energy inputs required."

He further reported that India had just issued clearance for the introduction of Neochetina and that this biocontrol agent, along with some native pathogens, could provide successful control of waterhyacinth. He also noted that biocontrol appears to be the most appropriate solution to the waterhyacinth problem in developing countries.

#### KENYA

In September 1982, Dr. W. T. Haller (U.F.) and W. L. Maier, assistant chief, Bureau of Aquatic Research and Control (State of Florida), traveled to Yugoslavia to attend the Sixth International Symposium on Aquatic Weeds and the Second International Symposium on Herbivorous Fish, and then continued to Nairobi where USAID/Kenya's Dr. J. Gaudet had arranged for a visit.

Two days were devoted to meeting with scientists of several universities and institutions covering various aspects of aquatic plant problems and research currently being conducted. Field trips were made to Lake Navisha to view Salvinia molesta infestations and to view irrigation schemes in the Mwea rice fields, a relatively new development, where emergent aquatic weeds have become a serious problem. Plans were formulated for aquatic weed control short courses to be held in East Africa.

## THAILAND

During September and October 1983, Dr. Haller and Australian aquatic weed scientist Dr. D. Mitchell travelled in Thailand visiting the National Biological Control Research Center at Kasetsart University and other institutions in the Bangkok area. They reviewed the aquatic weed bio-control projects in Thailand, met with the Thai Minister of Science, Education and Technology, and had an audience with the King of Thailand regarding aquatic weed control projects in Thailand. As a result of these meetings, the Thai Minister of Science, Education, and Technology requested the opportunity to visit Florida. The request was honored in April of 1984 when the Minister and his delegation arrived in Florida and were shown an operational sewage treatment-water hyacinth project, mechanical harvesting of aquatic plants, and biological control programs and chemical control of water hyacinth on the St. Johns River.

While in Thailand, Haller and Mitchell reviewed the Mimosa pigra infestations in Chiang Mai; at the research station affiliated with Prince of Songhla University, the scientists evaluated the efficiency of waterhyacinth weevils.

## OTHER

Arrangements were made for Dr. K. Opuszynski, a noted Polish fisheries scientist, to spend his sabbatical with the Center for

Aquatic Weeds to develop simple, economical techniques for raising grass carp to stocking size for biocontrol of aquatic weeds.

In cooperation with Drs. D. Mitchell and B. Napompeth, CAW staff developed plans for a series of booklets on aquatic weeds of the world. Three are presently in process: Hyacinth, Salvinia molesta, and Mimosa pigra.

The project sponsored a tour of aquatic weed problem areas in Florida following the National Aquatic Plant Management Society 1983 annual meeting held at Lake Buena Vista, Florida. Over 25 foreign scientists participated in this tour which covered many aspects of aquatic weed management and control.

University of Florida/IPPC personnel responded to specific requests for assistance to scientists working in Zambia, Thailand, Sri Lanka, Ecuador, Peru, India, and Nigeria. Assistance ranged from providing peer review of their programs to providing materials and supplies for conducting research on aquatic weeds.

#### B. Terrestrial Weeds

#### INTERACTION WITH FAO

During the report period, AID weed project staff members provided consultation for FAO through:

- participating in three separate meetings related to the FAO Panel of Experts on Weed Management;

- assisting the FAO/UNDP Action Programme for Improved Plant Protection through developing and organizing information.

### ROCAP

Consultation was provided to ROCAP on several occasions during the report period. In October 1982, project weed scientist M. D. Shenk, at the request of ROCAP and CATIE, visited Panama, Costa Rica, Nicaragua, El Salvador, Honduras, and Guatemala to evaluate the state of weed control research in ROCAP/CATIE projects, including the small farm systems program. A report of findings was provided to both ROCAP and CATIE.

A similar consulting trip was carried out by M. D. Shenk in March 1983 specifically for the Small Farmer Systems Research project.

Shenk was also a member of the IPM/Central America initial design team that visited the region in July 1983.

In July, 1984, Shenk met with personnel from the ROCAP/CATIE Small Farms Cropping Systems Research Project for final review of weed control recommendations in the "tec packs" for several cropping systems.

## OTHER

In April 1983, Dr. A. P. Appleby (Oregon State University) agreed to consult for the AID project and traveled with project senior agronomist L. C. Burrill to Bangkok. There, on the invitation of the agronomy department of Kasetsart University, Appleby and Burrill conducted a 2-day workshop for 20 people on "Teaching Weed Science." The project members also traveled to Chiang Mai to attend, and present papers, at the first conference of the Weed Science Society of Thailand.

Earlier, Burrill was invited to participate in a Symposium on Tropical Agriculture organized by the Sri Lanka Pugwash Group. As a continuation of the same trip, he visited Bangladesh at the invitation of the Bangladesh Rice Research Institute. Consultation on weed problems and promising methods of weed control was provided at several sites.

## V. INFORMATION

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Collection, publication, and provision/dissemination of technical weed control information has been a hallmark of the AID/OSU project for more than a decade. Activities conducted during the report period reflect that orientation.

### A. Publications

## MAJOR PUBLICATIONS

In addition to the 94 technical papers, chapters, articles, and presentations prepared by project staff (listed in Appendix 3), IPPC--utilizing project support--published several major works.

In 1982, the project helped organize a workshop at Oregon State University focusing on the role of cover crops as mulches. IPPC was approached in regard to publishing the workshop proceedings. The result was Crop Production Using Cover Crops and Sods as Living Mulches containing useful information regarding weed control and directly related to research conducted by the project in Costa Rica and underway at Corvallis.

Another proceedings, that of an international symposium held in Chiang Mai, Thailand, jointly organized by the project and Thai governmental agencies, resulted in Mimosa Pigra Management. The work represents one of a very few published information sources concerning an extremely noxious semi-aquatic weed. The symposium itself has been hailed as landmark event in furthering study and communication about M. pigra.

In collaboration with both the West African and the International Weed Science Societies (IWSS), IPPC published No-tillage Crop Production in the Tropics, the proceedings of a 1981 international symposium held in Monrovia, Liberia. Indications were that the material presented at the symposium would either not be published at all, or only with difficulty and delay, had the project not become involved.

Somewhat the same conditions prevailed when the project assumed responsibility for publishing the proceedings of the 1983 IWSS-Weed Science Society of America symposium, Communication of Weed Science Technologies in Developing Countries.

In conjunction with the Intermediate Technology Development Group in the U.K., the project published Small Farm Weed Control, An Annotated Bibliography, a comprehensive overview of print materials concerned with weed control methods, equipment, and strategies for small farms in less developed countries. This was a "first" and became a baseline collection of information.

Copies of all these titles have been made available widely, both to USAID missions, as well as individual requesters in LDCs.

#### INFOLETTER

For the period reported, IPPC (with project support) published and distributed 23 issues of the IPPC INFOLETTER. Copies of each issue were mailed to 6,000 recipients in more than 130 countries (see Appendix 2). INFOLETTER marked its 15th consecutive year of publication.

Feedback received indicated that the "In Print" section listing brief notes on a wide variety of weed science/small farm/developing agriculture materials and the policy of always including a contact address, continued to be extremely useful to recipients.

Articles published in INFOLETTER during the period included: a feature on the Commonwealth Institute of Biological Control;

FAO pesticide research guidelines; use of aquatic weeds for paper-making; women and weed control; weed-caused crop losses; weeds reduce winter hardiness of some orchard crops; herbicide use trends; pigeonpea weed control; impact of weeds on African small farms; lever-operated knapsack sprayers; features on smaller, often hand-operated equipment; integrated crop protection; "weeds" that improve tropical pastures; weeds' impact on jojoba; dryland weed control in India; a profile on CICP; tribute/obituary for Dr. F. W. Whittmore; the cost of weed-caused crop losses in the U.S.; use of motorbikes for herbicide application (with a roundup of models and manufacturer names); profile of Dr. B. L. Pollack, AID/OSU project manager; pesticide packaging and communication issues; pesticide poisoning symptoms and first aid measures; aquatic plant survey for Florida; the need for weed research training; impact of Striga on African cereal crops; plus, a number of smaller articles and sidelights.

#### AQUAPHYTE

The IPPC Aquatic Weed Program, a part of the Center for Aquatic Weeds at the University of Florida, publishes AQUAPHYTE twice a year and now mails it to more than 4,300 recipients in 64 countries. First issued in fall 1981, the newsletter reports on international dimensions of various developments concerning aquatic macrophytes.

A sampling of articles that appeared in AQUAPHYTE during the report period includes: mechanical control of aquatic plants; Salvinia--possible biological effects on fish in Papua New Guinea?; new pathway for Hydrilla?; a profile of the University of Florida's newly formed Center for Aquatic Weeds; aquatic herbicides evaluated; a description of the CAW aquatic plant information and retrieval system; apple-snails eating chara; U.F. grass carp research; a profile of new CAW director, Dr. J. C. Joyce; and, IPPC aquatic weed survey in Ecuador.

B. Other Information Activities

AQUATIC WEED INFORMATION SYSTEM

The Center for Aquatic Weeds' information storage and retrieval system, partially supported by the AID weed project, currently stands as one of the most extensive aquatic macrophyte information collections in the world. Starting in July 1983, it received a \$20,000 annual contribution from the Florida Department of Natural Resources for domestic use of the system.

During the report period, the system prepared full bibliographies and distributed them in response to requests received from parties in the U.S. and other countries. The staff continued to receive approximately 200 publications monthly that were cataloged into a rapidly expanding database of more than 21,000 titles.

Since its inception, more than 3,000 authors from around the world have made contributions to the system. The system also provides extra copies of the literature to its users, and acts as a clearing house for names and addresses of researchers, institutions, and government agencies. During the single year July 1984 to June 1985, University of Florida/IPPC personnel prepared and distributed 511 retrospective retrievals and 2,204 current awareness retrievals. Also, 1,626 research articles and reports were provided for requestors.

#### INFORMATION BINDERS

The project devised and produced Weed Control Information binders (3-ring) and provided a copy for every USAID mission. Binders were divided into general, training, equipment, control methods, herbicides, and weed species sections, with additional unspecified dividers to allow for individual mission customizing.

The binders were distributed with an initial selection of material and a cover letter explaining their intent and purpose. A series of technical bulletins was launched for the binders (as well as other uses). Bulletin #1 accompanied the binders; bulletin #2 was distributed several months later. Additional topics were under consideration for future bulletins.

### TECHNICAL LITERATURE RECYCLING

IPPC, in collaboration with the Weed Science Society of America and the International Weed Science Society, began a modest program to collect publications no longer needed by U.S. (or other) scientists and redistribute them to libraries and institutions in developing countries.

Collections, such as one containing several complete years of the WSSA journal Weed Science, were received. Two shipments totalling over 1,500 lbs. were sent to the National Agricultural Research Centre, Islamabad, Pakistan. The USAID mission in Pakistan agreed to help expedite the shipments. Other shipments were made to Costa Rica and Trinidad.

### INFORMATION AUTOMATION

IPPC and the AID/OSU weed project were fortunate to have direct access to dedicated word processing for several years. More recently, the project received authorization to acquire personal computing equipment to:

- \* help train students (at Corvallis) and participants at short courses in data handling and manipulation;
- \* increase project staff efficiency through linkage of computers with word processors;

- \* decrease time and cost for publication by being able to directly transmit material to the University printing department;
- \* store, send, and retrieve information in-house and on-line.

## VI. LIVING MULCH

As mentioned under the Research Section, members of the AID weed program staff are conducting work at Corvallis that is closely linked with various project objectives, including developing small farmer-appropriate weed management systems. Integrated approaches combining various methods and minimizing "external" inputs is emphasized.



FINANCIAL SUMMARY

Two tables (F1, F2) list expenditures by the AID-IPPC technical assistance project during the period April 1, 1976 to the termination of the contract August 31, 1985. S&T/AGR provided \$3,745,475 to IPPC during the period. In addition, \$213,000 was contributed by OSU and \$202,500 by the Uoff, bringing total expenditures to \$4,161,275. OSU's contribution came primarily in support of "Other Direct Costs," i.e., supplies, equipment, and land while the Uoff contributed the services of a project coordinator.

Indirect support also was received from FAO, with which many joint training programs were conducted, as well as U.S. and international private firms. Their combined contribution exceeds \$300,000.

FINANCIAL REVIEW

Table F1

project: WEED CONTROL RESEARCH

project no.: AID/ta-C-1295

termination: May 31, 1983

item: BUDGET PLUS ANNUAL EXPENDITURES AND OBLIGATIONS

category	budget including adjustment	April 1, 1976 thru June 30, 1978	July 1, 1978 thru June 30, 1980	July 1, 1980 thru June 30, 1982	July 1, 1982 thru June 30, 1984	July 1, 1984 thru Aug. 31, 1985	Total April 1, 1976 thru Aug. 31, 1985
Salaries and Wages	\$1,365,111	\$ 237,294	\$ 237,630	\$ 267,360	\$ 357,092	\$ 213,666	\$1,313,042
Fringe Benefits	330,637	37,749	49,637	71,823	103,568	58,381	321,158
Indirect Costs	657,708	118,152	129,822	147,720	185,498	114,972	696,164
Travel and Transportation	302,200	46,509	54,231	95,409	73,124	31,841	301,114
Other Direct Costs	64,341	41,696	60,993	113,812	68,422	57,068	341,991
Equipment, Vehicles, Materials and Supplies	527,928	66,113	73,038	58,565	58,996	17,820	274,532
Subcontract	497,474	75,845	83,297	183,480	91,638	63,214	497,474
<b>TOTALS</b>	<b>\$3,745,475</b>	<b>\$ 623,358</b>	<b>\$ 688,648</b>	<b>\$ 938,169</b>	<b>\$ 938,338</b>	<b>\$ 556,962</b>	<b>\$3,745,475</b>

FINANCIAL REVIEW

Table F2

project: WEED CONTROL RESEARCH

project no.: AID/ta-C-1295

termination: May 31, 1983

item: CONTRIBUTIONS

<u>category</u>	<u>total AID support</u>	<u>OSU contribution</u>	<u>U of Florida contribution*</u>	<u>total expenditure</u>
Salaries and Wages	\$ 1,313,042	\$ 30,418		\$ 1,343,460
Fringe Benefits	321,158	16,283		337,441
Indirect Costs	696,164	--		696,164
Travel and Transportation	301,114	--		301,114
Other Direct Costs	341,991	125,283		467,274
Equipment, Vehicles, Materials	274,532	41,316		315,848
Subcontract	497,474	--	\$ 202,500	699,974
<b>TOTALS</b>	<b>\$ 3,745,475</b>	<b>\$ 213,300</b>	<b>\$ 202,500</b>	<b>\$ 4,161,275</b>

\* U of Florida contributed services of project coordinator.



APPENDIXES

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1. IPPC Networking Organizations.

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  2. Worldwide Distribution of INFOLETTER.

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  3. Project Bibliography.

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  4. Worldwide Distribution of Publications.

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  5. Worldwide Distribution of IPPC Papers.

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  6. Travel Log.

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  7. Staff / Student Roster.

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Appendix 1

IPPC NETWORKING ORGANIZATIONS

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\* - Indicates a primary networking contact

LATIN AMERICA

- \* CIMMYT, Apartado Postal 6-641, Mexico 6, D.F., Mexico
- \* CATIE, Turrialba 7170, Costa Rica
- \* Escuela Panamericana, Apartado 93, Tegucigalpa, Honduras
- CIP, Apartado 5969, Lima, Peru
- \* CIAT, Apartado 67-13, Cali, Colombia
- \* COMALFI (Colombian Weeds/Pests Society), AA 29688, Bogota, D.F.,  
Colombia
- ICA, Inst. Colombiano Agropecuario, AA 151123, Bogota, Colombia
- EMBRAPA, C.P. 1316, 70.000 Brasilia, DF, Brazil
- IAPAR, C.P. 1331, 86.100 Londrina, PR, Brazil
- \* ESALQ, C.P. 9, 13.400 Piracicaba, SP, Brazil
- CSIRO, C.P. 322, 80.000 Curitiba, PR, Brazil
- \* Fitotecnia, Fac. de Agro., Univ. Catolica de Chile, Casilla 114-D,  
Santiago, Chile
- \* INIAP, Apartado 2600, Quito, Ecuador
- CENTIA, Apartado Postal 885, Santa Tecla, El Salvador
- Min. of Agric., Weed Control Section, Port-au-Prince, Haiti
- \* Dept. of Agric., P.O. Box 149, Belize City, Belize
- \* Min. de Desa. Agro., Apartado 5390, Panama, Panama
- \* CARDI, F.O. Box 971, Castries, St. Lucia, WI

Dept. of Crop Science, Univ. of the West Indies, St. Augustine,  
Trinidad \* Tobago, WI

ASIA

- \* AVRDC, P.O. Box 42, Shanhua, Tairan 741, Taiwan, ROC
- \* IRRI, P.O. Box 933, Manila, Philippines
- \* National Crop Protection Center, College, Laguna, Philippines
- \* University of the Philippines, Weed Sci. Group, College, Laguna,  
Philippines
- \* ICRISAT, Patancheru P.O., Andhra Pradesh 502 324, India  
Dept. of Agriculture, Bandar Seri Begawan, Brunei  
Directorate of Agric., 72 Shwedagon Pagoda Rd., Rangoon, Burma  
Canada-IRRI-Burma Project, P.O. Box 1369, Rangoon, Burma  
Nanjing Agric. College, Dept. of Agron., Nanjing, People's Rep. of  
China  
Dept. of Agric., P.O. Box 358, Suva, Fiji Islands  
Dept. of Agron., Haryana Agric. Univ., Hissar, Haryana, India  
India Council of Ag. Research, New Delhi 1, India  
Indian Agr. Res. Institute, New Delhi 110012, India
- \* Central Plant Prot. Training Institute, Hyderabad 500030, A.P.,  
India
- \* BIOTROP, P.O. Box 17, Bogor, Indonesia
- \* MARDI, P.O. Box 2301, Kuala Lumpur 01-02, Malaysia  
FAO South Pacific Commission, P.O. Box 9, Noumea, New Caledonia  
Min. of Ag., Private Bag, Palmerston North, New Zealand
- \* Agron. Dept., University of Agriculture, Faisalabad, Pakistan
- \* NARC, Islamabad, Pakistan

- \* National Weed Research Center, Dept. of Agronomy, Bangkok 9,  
Thailand
- \* National Bio. Cont. Res. Center, P.O. Box 9-52, Bangkok 9, Thailand
- \* Dept. of Agron., Kasetsart University, Bangkok, Thailand

NEAR, MIDDLE EAST, N. AFRICA

- Inst. National Agron., El Harrach, Alger, Algeria
- Volcani Institute, P.O. Box 6, Bet Daga 50200, Israel
- Plant Prot. Dept., P.O. Box 7054, Hakirya, Tel-Aviv, Israel
- Dir. de la Rech. Agron. Phyt., B.P. 415, Rabat, Morocco
- Inst. Nat. de Rech. Agron., Ave de l'Independence Ariana, Tunisia
- \* Fac. of Agri., Weed Control, Amer. Univ. of Beirut, Beirut, Lebanon

AFRICA

- \* IITA, PMB 5320, Ibadan, Nigeria
- \* WARDA, Box 1019, Monrovia, Liberia
- ISABU, B.P. 795, Bujumbura, Burundi
- Directorate of Agric., Min. of Agric., Yaounde, Cameroon
- Dept. of Agric., Cape St. Mary, Gambia
- Inst. for Ag. Resch., Ahmadu Bello Univ., Zaria, Nigeria
- Weed Sci. Society for E. Africa, P.O. Box 43340, Nairobi, Kenya
- \* University of Nairobi, Crop Science Dept., P.O. Box 30197, Nairobi,  
Kenya
- \* Mount Makulu Research Station, P/B 7, Chilanga, Zambia

INTERNATIONAL & OTHER

- \* FAO, Plant Prot. Div., Via delle Terme di Caracalla, 00100, Rome,  
Italy

\* CID (Consortium for Intl. Dev.), 5151 E. Broadway, Tucson, AZ 85711

USA

ISNAR, P.O. Box 93375, 2509AJ The Hague, The Netherlands

\* Weed Research Org., Begbroke Hill, Yarnton, Oxford OX5 1PF, U.K.

\* GTZ, Postfach 5180, D-6236 Eschborn 1, F. R. Germany

Winrock, Petit Jean Mountain, Morrilton, AK 72110

IDRC, P.O. Box 8500, Ottawa, Ont. K1G 3H9, Canada

\* World Bank, 1818 H Street NW, Washington, DC 20433 USA

\* IBS Weed Control, P.O. Box 14, Wageningen, The Netherlands

## Appendix 2

## WORLDWIDE DISTRIBUTION OF INFOLETTER

Country	Recipients as of			
	May 1979	May 1981	May 1984	Aug 1985
Abu Dhabi	1	1	1	1
Aden	1	1	-	-
Afghanistan	13	12	11	11
Africa	-	-	1	-
Algeria	4	3	7	6
Angola	-	1	1	1
Antigua, W.I.	2	2	2	2
Arab Republic of Egypt	14	16	23	23
Arabian Gulf	-	1	-	-
Argentina	141	158	179	183
Australia	68	87	110	111
Austria	6	5	6	6
Bahamas	1	1	2	2
Bangladesh	4	8	16	17
Barbados	3	3	2	3
Basseterre, W. I.	-	1	2	1
Belgium	28	29	31	31
Belize	7	6	10	10
Benin	2	2	1	4
Bermuda, W. I.	1	1	1	1
Bhutan	-	-	-	1
Bolivia	27	28	26	37
Botswana	3	4	11	11
Bourkina Faso	5	6	10	13
Brasil	179	192	206	205
Brunei	3	3	3	2
Bulgaria	2	2	2	2
Burma	3	4	7	7
Burundi	-	2	2	3
Cameroon	6	7	10	11
Canada	100	138	153	152
Canal Zone	-	-	3	3
Canary Islands	1	1	1	1

Country	Recipients as of			
	May 1979	May 1981	May 1984	Aug 1985
Cape Verde Island	1	1	3	3
Cayman Island, W. I. .	1	1	1	1
Cent. African Republic	1	1	1	2
Chad	5	4	2	-
Chile	41	45	46	47
China, People's Rep. of	2	4	7	7
Colombia	93	97	94	95
Comores	2	2	2	2
Congo	-	-	1	1
Cook Islands	-	-	3	3
Costa Rica	71	76	82	86
Cuba	2	1	3	3
Cyprus	3	4	6	6
Czechoslovakia	10	12	12	13
Denmark	19	20	21	21
Djibouti	1	1	1	1
Dominican Republic	12	15	16	18
East Germany	4	1	1	2
Ecuador	47	49	52	53
El Salvador	12	11	12	12
Ethiopia	25	27	32	41
Federal Rep. of Germany	59	59	60	60
Fiji Islands	3	5	14	15
Finland	17	18	16	16
France	69	74	84	102
French W. Indies	1	1	-	-
Gabon	1	1	1	2
Gambia	4	4	6	8
Ghana	24	31	41	46
Greece	28	27	28	29
Grenada	-	-	1	1
Guadeloupe, W. I.	-	-	1	1
Guatemala	13	15	18	20
Guinea	1	1	8	3
Guyana	2	4	5	6
Haiti	3	3	5	5

Country	Recipients as of			
	May 1979	May 1981	May 1984	Aug 1985
Honduras	18	21	31	31
Hong Kong	4	5	4	4
Hungary	7	8	7	7
India	203	232	300	315
Indonesia	90	97	123	123
Iran	12	12	2	8
Iraq	3	3	3	3
Ireland	7	7	8	9
Israel	20	21	29	31
Italy	31	32	35	37
Ivory Coast	6	9	8	9
Jamaica	11	10	10	10
Japan	53	58	60	61
Jordan	8	8	8	8
Kenya	26	35	57	62
Korea	14	13	12	12
Kuwait	-	2	2	2
Laos	7	7	7	7
Lebanon	7	6	-	-
Lesotho	2	3	3	8
Liberia	7	7	12	12
Libya	5	5	5	5
Madagascar	-	-	1	1
Malagasay Republic	1	1	1	1
Malawi	7	7	13	15
Malaysia	58	65	76	81
Mali	3	3	6	9
Malta	4	4	4	4
Mauritania	2	2	5	5
Mauritius	3	3	4	4
Mexico	63	69	88	93
Montserrat	-	1	1	1
Morocco	3	3	5	7
Mozambique	2	2	3	3
Nepal	2	2	7	6
Netherlands	29	36	44	50

Country	Recipients as of			
	May 1979	May 1981	May 1984	Aug 1985
New Caledonia	4	4	4	4
New Guinea	16	14	18	25
New Herbrides	2	2	2	1
New Zealand	26	26	31	28
Nicaragua	19	19	20	19
Niger	1	3	4	5
Nigeria	52	55	69	67
Niue	-	-	1	1
Norway	14	12	12	12
Oman	-	-	1	1
Pacific Islands	1	2	2	2
Pakistan	19	20	66	73
Panama	16	17	21	23
Paraguay	10	11	12	12
Peru	75	77	83	84
Philippines	182	198	207	212
Poland	10	9	10	10
Portugal	10	11	14	14
Qatar	-	-	2	3
Romania	4	4	4	9
St. Kitts	3	3	3	3
St. Lucia	-	-	2	2
St. Vincent	-	2	3	3
Saudi Arabia	5	6	11	11
Scotland	7	4	-	-
Senegal	20	22	24	29
Seychelle Is.	1	1	1	1
Sierra Leone	7	6	7	11
Singapore	12	10	12	13
Solomon Islands	2	3	5	6
Somalia	1	1	1	2
South Africa	3	5	7	9
South Atlantic	-	-	1	1
South Pacific	-	-	2	2
South Vietnam	11	7	-	-
Spain	22	25	26	28

Country	Recipients as of			
	May 1979	May 1981	May 1984	Aug 1985
Sri Lanka	18	18	26	28
Sudan	12	17	24	26
Surinam	4	6	7	6
Swaziland	2	2	4	4
Sweden	27	28	27	27
Switzerland	29	28	28	29
Syria	8	9	8	10
Tahiti	3	3	2	2
Taiwan R.O.C.	17	17	19	19
Tanzania	15	17	20	19
Thailand	48	60	96	98
Togo	2	2	4	4
Tonga	-	-	1	1
Trinidad & Tobago	19	21	27	27
Trucial States	1	1	1	1
Tunisia	5	5	7	7
Tuvalu	-	-	-	1
Uganda	5	5	6	7
United Kingdom	148	169	206	212
United States	1,482	1,661	1,854	1,940
Uruguay	20	23	27	27
U.S.S.R.	4	4	6	6
Vanuatu	-	-	-	1
Venezuela	53	59	63	66
Western Samoa	6	9	15	17
Yemen Arab Republic	1	3	2	2
Yugoslavia	8	8	12	14
Zaire	3	4	4	5
Zambia	8	10	10	16
Zimbabwe	-	1	6	8
<b>TOTAL</b>	<b>4,511</b>	<b>4,931</b>	<b>5,735</b>	<b>6,018</b>

Appendix 3

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A. Technical Papers, Chapters, Articles, Presentations

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## B. Major Publications

KNAPSACK SPRAYERS: USE, MAINTENANCE, ACCESSORIES - Fraser, F., L. C. Burrill. The authors employed over 75 photographs and illustrations to describe various functions and, in particular, present details for constructing a variety of multi-nozzle booms to be used in conjunction with manually operated sprayers. Care, maintenance and calibration of sprayers is also included. 31 pages, paperback. 1979.

WEED-CROP COMPETITION, A REVIEW - Zimdahl, R. L.

A comprehensive, up-to-date survey of world literature for weeds' competitive influence on crops includes a historical overview and serves as an in-depth reference for relevant research published through 1978. It contains over 700 citations categorized under the headings of competition and studies of weed biology. 198 pages, paperback. 1980.

ECONOMICS OF INTEGRATED PEST MANAGEMENT \* An Interpretive Review of the Literature - McCarl, B. A. The existing body of literature dealing with the various economic aspects of integrated pest management was reviewed and appraised. An extensive bibliography is included. 142 pages, paperback. 1981.

SMALL FARM WEED CONTROL \* An Annotated Bibliography - Compton, J.A.F. In conjunction with the Intermediate Technology

Development Group in the U.K., the project prepared a comprehensive overview of print materials concerned with weed control methods, equipment, and strategies for small farms in less developed countries. 170 pages, paperback. 1982.

ECONOMIC RETURNS TO INVESTMENT IN CONTROL OF MIMOSA PIGRA IN THAILAND - Robert, G. L. A study was conducted in northwest Thailand (Chiang Mai) to assess the parameters for when, or when not, to invest in controlling the noxious plant, Mimosa pigra. Also, a determination was developed for the most economic control methods to utilize. 247 pages, paperback. 1982.

CROP PRODUCTION USING COVER CROPS AND SODS AS LIVING MULCHES - Edited by Miller, J. C., S. M. Bell. Proceedings of a workshop held in Corvallis, Oregon, were published in cooperation with an on-campus coordinating group. 123 pages, paperback. 1982.

NO-TILLAGE CROP PRODUCTION IN THE TROPICS - Edited by Akobundu, I.O., A. E. Deutsch. The project published the proceedings of an international symposium held in Monrovia, Liberia, in 1981. The publication was a collaborative effort on the project, the International Weed Science Society, and the West African Weed Science Society. 235 pages, paperbound. 1983.

MIMOSA PIGRA MANAGEMENT - Edited by Robert, G. L., D. H. Habeck.

This publication presented the proceedings of an international symposium held in Chiang Mai, Thailand, in 1982. The event was organized by the International Plant Protection Center in cooperation with several Thai governmental agencies. 140 pages, paperback. 1983.

COMMUNICATION OF WEED SCIENCE TECHNOLOGIES IN DEVELOPING

COUNTRIES - Edited by Williams, R. D. Proceedings of a 1983 symposium sponsored by the International Weed Science Society and the Weed Society of America, published on behalf of the Societies by the International Plant Protection Center. 214 pages, softbound. 1983.

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ASSESSMENT OF FEATURES, COMPONENTS, AND

OPERATION--IMPLICATIONS FOR PURCHASERS, USERS, AND

MANUFACTURERS - Fisher, H. H., A. E. Deutsch. A

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C. Special Publications

Weed Research Short Course-Final Report. 1979. 27 pages.

English.

Weed Research Short Course-2, 1980. 19 pages. English.

Miller, S. F., L. C. Burrill. 1980. Weed Control Problems in Tanzania. A review team report. 42 pages. English.

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1984 Tanzania Weed Management Training Course Summary Report.  
1985. 15 pages. English.

D. Project Periodic Reports

Periodic Report, 1978-79. 56 pages.

Annual Report, 1979-80. 52 pages.

Annual Report, 1980-81. 64 pages.

Report, 1982-84. 93 pages.

Concluding Report - Weed Control Systems for Representative Farms  
in Developing Countries. 89 pages.

Appendix 4

WORLDWIDE DISTRIBUTION OF PUBLICATIONS

(For period June 1979 - August 1985)

Identification Key

<u>Symbol</u>	<u>Title</u>
AQ	AQUATIC PLANT BIBLIOGRAPHIES
SF	SMALL FARM WEED CONTROL
WCC	WEED-CROP COMPETITION
KS	KNAPSACK SPRAYERS; USE, MAINTENANCE, ACCESSORIES
T	ALGUNOS "TRUCOS" UTILES EN ESTADISTICA/SOME USEFUL TRICKS IN STATISTICS
TWS	SEMILLAS DE MALEZAS TROPICALES I Y II/TROPICAL WEED SEEDS I & II
FM	FIELD MANUAL FOR WEED CONTROL RESEARCH
MDC	MANUAL DE CAMPO PARA INVESTIGACION EN CONTROL DE MALEZAS
B	BIBLIOGRAPHY
NT	NO TILLAGE CROP PRODUCTION IN THE TROPICS
CPM	CROP PRODUCTION USING COVER CROPS AND SODS AS LIVING MULCHES
MP	MIMOSA PIGRA MANAGEMENT
C	COMMUNICATION OF WEED SCIENCE TECHNOLOGIES IN DEV. COUNTRIES
IPM	ECONOMICS OF INTEGRATED PEST MANAGEMENT
LOK	LEVER-OPERATED KNAPSACK SPRAYERS
WCR	WEED CONTROL IN RICE

COUNTRY	AQ	SF	WCC	KS	T	TWS	FM	MDC	B	NT	CPM	MP	C	IPM	LOK	WCR
Abu Dhabi	--	--	--	--	--	--	--	--	--	--	--	--	1	--	--	--
Afghanistan	--	--	2	--	--	10	1	--	--	--	--	--	--	--	--	--
Africa	1	1	2	2	--	--	1	--	2	2	1	1	1	--	--	--
Algeria	--	--	--	--	--	--	--	--	1	--	--	--	2	--	--	--
Angola	--	--	--	--	1	--	1	--	1	--	--	--	--	--	--	--
Antiqua	--	--	--	1	--	1	1	--	1	--	--	--	--	--	--	--
Arabian Gulf	--	--	--	1	--	--	1	--	1	--	--	--	--	--	--	--
Argentina	40	10	33	20	47	63	21	219	45	1	2	2	4	5	2	--
Australia	40	1	20	29	--	20	50	6	2	3	4	3	2	3	6	--
Austria	10	--	4	--	--	--	1	--	--	--	--	--	--	--	2	--
Bahamas	--	--	--	2	--	2	2	--	--	--	--	--	--	--	--	--
Bangladesh	4	3	7	6	--	4	8	1	1	--	--	--	5	2	1	--
Barbados	--	1	1	1	1	3	5	1	1	--	--	--	--	--	--	--
Belgium	6	--	1	--	1	--	5	--	--	--	--	--	--	--	3	--
Belize	--	1	2	2	2	19	11	17	11	1	--	--	--	1	--	--
Benin	--	--	1	1	--	1	1	--	1	1	--	--	--	--	--	--
Bhutan	--	--	--	2	--	--	--	--	--	--	--	--	--	1	--	--
Bolivia	--	1	2	2	17	41	9	11	31	2	--	--	1	2	1	--
Botswana	4	2	2	3	--	8	7	--	1	--	--	1	1	1	--	--
Bourkina Faso	--	1	--	--	--	1	1	--	--	--	--	--	1	--	1	--
Brazil	17	6	33	12	40	107	2	46	27	9	4	5	3	12	14	1
Brunei	--	1	2	2	--	2	2	--	--	--	--	--	--	1	--	--
Bulgaria	--	--	--	--	--	--	--	--	--	--	--	--	1	--	--	--
Burma	--	--	1	--	1	--	--	2	--	--	--	--	--	--	--	--
Burundi	--	--	--	1	2	--	--	2	--	--	--	--	2	1	--	--
Cameroon	--	--	1	3	--	1	2	--	1	--	--	--	--	--	--	--
Canada	51	3	69	17	3	7	75	4	5	2	3	--	6	14	47	--

COUNTRY	AQ	SF	WCC	KS	T	TWS	FM	MDC	B	NT	CPM	MP	C	IFM	LOK	WCR
Chad	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--	--
Chile	--	6	16	4	13	9	4	15	13	1	--	--	--	--	--	--
China	5	--	48	1	--	--	1	2	--	7	--	--	46	--	--	10
Colombia	9	3	10	5	37	3	18	47	22	3	4	7	2	13	5	--
Comores	--	--	--	--	--	--	--	--	--	--	--	--	1	--	--	--
Costa Rica	--	28	38	16	60	172	85	68	45	19	8	1	6	9	7	--
Cyprus	--	1	3	1	--	--	2	--	1	--	--	--	--	--	1	--
Czechoslovakia	18	--	--	--	--	--	3	--	--	--	--	--	--	--	--	--
Denmark	4	--	6	2	--	--	4	1	--	--	1	--	1	--	15	--
Dominican Republic	--	3	6	1	6	4	5	16	11	--	--	2	--	2	2	--
East Germany	9	--	1	--	--	--	1	--	--	--	--	--	--	--	--	--
Ecuador	1	2	9	6	24	99	6	50	51	--	--	--	3	1	2	--
Egypt, Arab Rep. of	17	2	3	3	1	--	4	1	1	1	--	--	1	2	--	--
El Salvador	2	--	2	2	16	19	7	15	10	--	--	--	--	--	--	--
Ethiopia	3	8	11	8	--	6	20	--	2	4	2	4	4	4	3	3
Fiji	--	4	9	5	--	3	8	--	1	1	1	--	--	2	2	--
Finland	7	--	--	--	--	--	2	--	--	--	--	--	--	--	--	--
France	46	3	19	3	1	1	11	2	2	--	--	1	2	2	6	--
Gambia	--	1	1	1	3	--	4	--	--	--	--	--	--	--	1	--
Ghana	13	6	17	16	1	16	4	10	6	2	--	--	25	7	2	--
Greece	--	--	3	1	--	4	11	--	2	1	--	--	--	1	1	--
Grenada	--	--	--	--	--	--	--	1	--	--	--	--	--	--	1	--
Guadeloupe	--	1	--	--	1	1	1	--	1	--	--	1	--	--	--	--
Guam	--	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--
Guatamala	--	1	5	4	6	17	14	18	9	1	--	--	--	--	2	--
Guyana	7	2	1	1	--	1	6	--	--	--	--	1	--	1	--	--
Haiti	--	--	--	--	--	--	--	--	--	--	--	--	1	--	--	--

COUNTRY	AQ	SF	WCC	KS	T	TWS	FM	MDC	B	NT	CPM	MP	C	IPM	LOK	WCR
Honduras	3	7	6	11	21	58	16	43	18	2	3	1	3	4	2	--
Hong Kong	--	--	--	1	--	--	1	--	--	--	--	--	--	4	2	--
Hungary	10	-	1	--	--	4	1	--	--	--	1	--	1	--	--	--
India	131	32	177	39	13	67	134	2	17	16	11	10	28	24	17	--
Indonesia	1	12	30	13	8	20	43	5	4	9	11	12	5	13	13	--
Iran	--	--	1	--	--	--	5	--	--	--	--	--	--	--	--	--
Iraq	--	--	1	--	--	2	2	--	--	--	--	--	--	--	--	--
Ireland	--	--	2	--	--	--	5	--	--	--	--	--	--	--	--	--
Israel	20	--	9	1	--	3	8	--	--	2	2	--	1	2	2	--
Italy	12	--	4	2	2	1	13	3	4	2	1	--	--	--	4	--
Ivory Coast	--	--	2	--	--	1	3	1	1	1	--	--	1	1	--	--
Jamaica	4	--	1	6	--	4	6	--	2	--	--	1	--	--	1	--
Japan	35	1	3	1	1	1	7	--	--	1	--	1	--	--	12	--
Jordan	--	1	--	1	--	--	2	--	--	--	--	--	2	--	1	--
Kenya	--	3	16	11	--	1	16	1	1	2	--	--	3	2	14	--
Korea	7	-	2	2	--	2	2	--	2	--	--	--	--	--	2	--
Kuwait	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--	--
Lebanon	--	--	3	1	--	3	4	--	--	--	--	--	1	--	--	--
Lesotho		--	2	1	2	1	3	1	1	--	1	--	1	--	--	--
Liberia		1	4	3	--	8	8	--	1	1	--	--	2	1	1	--
Libya		--	--	--	--	--	2	--	--	--	--	--	--	--	--	--
Malawi	--	5	6	5	--	3	8	2	1	4	3	1	5	2	3	1
Malaysia	5	5	28	11	1	14	44	1	5	2	--	9	7	5	18	--
Mali	--	1	--	1	--	--	1	--	--	--	--	--	--	--	--	--
Mauritius	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mexico	20	10	57	54	43	96	180	428	68	4	5	4	6	6	211	1
Morocco	--	1	2	2	--	--	2	--	1	1	--	--	1	1	1	--

COUNTRY	AQ	SF	WCC	KS	T	TWS	FM	MDC	B	NT	CPM	MP	C	IPM	LOK	WCR
Mozambique	3	1	1	1	2	1	2	2	--	--	--	--	1	1	--	--
Nepal	--	1	1	2	--	3	3	--	--	1	1	--	1	--	--	--
Netherlands	31	1	11	1	2	6	13	1	--	3	1	--	2	1	10	--
New Caledonia	--	--	--	--	--	--	--	--	--	--	--	1	1	--	--	--
New Guinea	--	1	4	2	--	1	3	--	--	--	--	--	1	--	1	--
New Zealand	34	2	5	3	--	--	17	--	--	--	1	--	3	--	6	--
Nicaragua	--	2	7	10	19	38	10	53	23	1	2	--	--	4	--	--
Niger	--	1	1	1	--	--	2	--	--	1	--	--	1	1	1	--
Nigeria	5	14	37	8	2	10	26	2	3	53	6	2	12	7	1	--
Norway	--	1	--	--	--	--	1	--	--	--	--	--	--	--	--	--
Oman	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Pakistan	--	4	18	32	2	3	59	3	2	3	11	1	5	3	4	3
Panama	--	1	3	1	6	30	4	35	26	1	1	--	1	1	2	--
Paraguay	--	--	1	--	1	19	1	25	19	--	--	--	1	1	--	--
Peru	7	4	6	7	17	43	38	62	44	2	1	1	3	4	3	1
Philippines	6	42	68	31	28	61	202	13	29	15	17	9	14	17	28	--
Poland	41	--	2	--	--	--	--	--	--	--	1	--	1	1	2	--
Portugal	--	--	5	2	2	1	--	2	2	--	--	--	--	1	1	--
Puerto Rico	--	1	1	--	--	--	--	--	--	1	--	--	1	--	--	--
Romania	2	--	--	--	--	--	1	--	--	--	--	--	--	--	--	--
St. Helena	--	1	--	1	--	--	--	--	--	--	--	--	--	--	--	--
St. Kitts	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--	--
St. Lucia	3	--	4	2	--	1	3	--	1	--	1	--	--	2	1	--
St. Vincent	--	--	--	--	--	1	1	--	--	--	--	--	--	--	--	--
Saudi Arabia	--	--	1	1	1	2	2	--	--	--	--	--	--	--	--	--
Senegal	--	1	2	4	--	--	9	--	--	1	--	--	1	1	--	--
Sierra Leone	--	1	2	1	--	2	5	--	--	1	--	--	1	--	2	--

COUNTRY	AQ	SF	WCC	KS	T	TWS	FM	MDC	B	NT	CPM	MP	C	IPM	LOK	WCR
Singapore	--	--	--	2	--	3	6	--	1	--	--	--	--	--	2	--
Solomon Islands	--	1	1	1	--	1	1	1	--	1	1	2	--	--	1	--
South Africa	15	1	11	2	--	1	7	1	--	1	--	--	--	2	5	--
South Atlantic Ocean	--	--	--	--	--	--	--	--	--	--	--	--	1	--	--	--
South India	--	1	--	1	--	--	1	--	--	--	--	--	--	--	--	--
South Pacific	--	1	2	3	--	1	8	--	--	--	--	1	--	1	--	--
Spain	9	--	6	4	5	4	3	6	1	--	2	--	--	--	5	--
Sri Lanka	7	3	11	8	--	2	17	--	--	1	1	2	3	6	4	--
Sudan	4	1	4	2	--	5	8	--	--	--	--	--	--	3	--	--
Suriname	--	1	--	--	1	1	--	--	1	--	--	--	--	--	--	--
Swaziland	--	1	--	--	--	--	2	--	--	--	--	--	1	--	1	--
Sweden	10	--	3	1	--	--	3	1	1	--	2	--	4	--	2	--
Switzerland	18	--	20	14	2	3	122	--	1	--	--	--	1	--	8	--
Syria	--	1	3	2	--	10	1	--	--	1	1	--	1	--	1	--
Taiwan, R.O.C.	9	2	10	5	1	3	9	--	1	1	2	1	2	3	5	--
Tanzania	--	1	23	3	--	3	19	--	1	10	--	--	3	--	3	--
Thailand	8	6	21	19	--	16	35	1	5	5	2	7	6	5	7	--
Togo	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--	--
Tonga	--	1	1	1	--	--	1	--	--	1	--	--	--	--	--	--
Trinidad	--	2	8	7	3	21	14	1	5	2	1	--	3	1	2	--
Turkey	--	3	13	7	--	3	13	--	5	--	--	3	--	1	2	--
Uganda	--	2	3	1	--	3	4	--	--	--	--	--	--	--	--	--
United Kingdom	63	234	59	41	2	11	73	4	6	14	12	1	2	9	130	--
United States	766	228	1325	1098	615	229	1328	834	701	70	67	24	357	193	533	3
Uruguay	--	2	9	2	12	9	3	14	9	3	1	1	--	2	8	2
USSR	9	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--
Venezuela	--	2	13	3	14	21	10	24	10	1	--	--	1	8	2	--

COUNTRY	AQ	SF	WCC	KS	T	TWS	FM	MDC	B	NT	CPM	MP	C	IPM	LOK	WCR
Viet Nam	--	--	--	1	--	1	1	--	1	--	--	--	--	--	--	--
West Africa	--	--	1	--	--	1	--	--	--	--	--	--	3	1	1	1
West Germany	20	1	28	--	1	5	34	2	1	1	2	2	2	1	10	--
West Indies	1	--	1	--	--	--	--	--	--	--	--	--	1	--	--	--
Western Samoa	--	1	5	4	--	7	4	--	1	1	1	2	1	2	2	--
Yemen	--	--	1	1	--	--	1	--	--	--	--	--	--	--	--	--
Yugoslavia	11	--	1	1	--	1	2	--	--	--	--	--	--	--	--	--
Zambia	--	3	5	2	--	1	3	--	--	1	1	1	3	2	2	--
Zanzibar	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zimbabwe	4	2	5	3		1	3	--	--	--	--	--	--	2	3	--
<b>TOTALS</b>	<b>1648</b>	<b>764</b>	<b>2523</b>	<b>1802</b>	<b>1113</b>	<b>1523</b>	<b>3086</b>	<b>2129</b>	<b>1335</b>	<b>305</b>	<b>207</b>	<b>129</b>	<b>634</b>	<b>433</b>	<b>1235</b>	<b>27</b>

Appendix 5

WORLDWIDE DISTRIBUTION OF IPPC PAPERS  
(For period of July 1979 - August 1985)

<u>Date written, title, authors, source, date published</u>	<u>Copies Distributed</u>
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1972, <u>El papel de la ciencia de malezas en desarrollo</u> , Chris Parker, <u>Weed Science Society of America meeting, St. Louis, MO, 1972.</u>	94
1974, <u>Problems of herbicide use in peasant farming</u> , John L. Hammerton, <u>Weed Science Society of America meeting, Las Vegas, NV, Feb. 1974.</u>	368
1974, <u>Small pesticide application equipment--its selection, use and maintenance</u> , A. E. Deutsch, <u>WORLD FARMING, 1974.</u>	219
1974, <u>Equipos pequenos para aplicar plaguicidas--su selection, uso y mantenimiento</u> , A. E. Deutsch, <u>AGRICULTURA DE LAS AMERICAS, 1974.</u>	216
1974, <u>Con los plaguicidas--evite peligros</u> , A. E. Deutsch, <u>AGRICULTURAL DE LAS AMERICAS, 1974.</u>	67
1974, <u>Crop varieties: can they suppress weeds?</u> R. D. Sweet, C. P. Yip and J. B. Siczka, <u>NY LIFE SCIENCES QUARTERLY, Vol. 7, No. 3, 1974.</u>	314
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1974, <u>Calibrating and adjusting granular row applicators</u> , J. Siemens, <u>WORLD FARMING, 1974.</u>	166
1975, <u>Weed control with plant pathogens</u> , R. Charudattan, <u>AGRICHEMICAL AGE, 1975.</u>	279
1975, <u>The beautiful blue devil (water hyacinth)</u> , N. D. Vietmeyer, <u>NATURAL HISTORY, 1975.</u>	221

<u>Date written, title, authors, source, date published</u>	<u>Copies Distributed</u>
1975, <u>Statement on 2,4,5-T and TCDD</u> , Dost, et. al., Oregon State University, Corvallis, OR.	157
1976, <u>The relative agronomic and economic viability of alternative weed control systems for small farmers in northeast Brazil</u> , Myron Shenk and Douglas L. Young, International Plant Protection Center, Oregon State University, Corvallis, OR.	134
1976, <u>Herbicides used in and around water for management of aquatic vegetation</u> , JOURNAL OF AQUATIC PLANT MANAGEMENT, Vol 14, 1976.	221
1976, <u>Residuos de herbicidas en el suelo</u> , Eduardo Locatelli, REVISTA COMALFI, Vol. III, No. 1, 1976.	113
1976, <u>Approaches to weed control in cropping systems</u> , D. L. Plucknett, et. al., 1976 Cropping Systems Symposium of the International Rice Research Institute, Los Banos, Laguna, Philippines	373
1976, <u>Weed Control problems causing major reductions in world food supplies</u> , C. Parker and J. D. Fryer, FAO PLANT PROTECTION BULLETIN, Vol. 23, 3/4, 1975.	285
1976, <u>Problemas que presenta el control de las malezas que causan reducciones importantes en los abastecimientos mundiales de alimentos</u> , C. Parker and J. D. Fryer, FAO BOLETIN FITOSANITARIO, Vol. 23, 3/4, 1975.	81
1976, <u>Lutte contre les mauvaises herbes occasionnant d'importantes reductions des ressources alimentaires mundiales</u> , C. Parker and J. D. Fryer, FAO BULLETIN PHYTOSANITAIRE, Vol. 23, 3/4, 1975.	44
1976, <u>Purple nutsedge: tropical scourge</u> , R. D. William, HORTSCIENCE, Vol. 11, No. 4, 1976.	190
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Appendix 6  
TRAVEL LOG

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<u>Staff member</u>	<u>Date, Location, Purpose</u>
Shenk	June 14-16, 1979, El Salvador: To give a short course on application of herbicides with emphasis on knapsack sprayers.
Shenk	June 26-30, 1979, Panama: Establish weed control experiments in pastures in Los Santos y Sona South of Divisa, Azuero Peninsula, and in Gualaca.
Burrill	September 10-20, 1979, Philippines: Assist Dr. Joe Gingrich in reestablishing OSU/AID weed control project.
Burrill	September 21, 1979, Honolulu: Meet with Mr. Cliff Munroe, new IPPC staff member and Dr. Roy Nishimoto, University of Hawaii Weed Science.
Conklin	September 14-25, 1979, Philippines and Thailand: Meet with Bill Ratliff and Percy Sajise in the Philippines to discuss Roger Tagarino's Ford Foundation Fellowship program. Met Sam Johnson, Ford Foundation in Thailand to discuss IPPC program and Ford program.
Shenk	October 2-6, 1979, Panama: To evaluate the three pasture weed control experiments IPPC established June 26-30.
Miller	October 14-18, 1979, Costa Rica: Met with CATIE to discuss a new memorandum of understanding.
Shenk	October 25 - November 10, 1979, San Pedro, Argentina: To participate in INTA/FAO Weed Control Short Course.
Shenk	January 6-9, 1980, Panama: To evaluate three pasture weed control experiments (79-9P, 79-10P, 79-11P), which were established on June 25-27, 1979.
Miller & Conklin	January 20, 1980 - February 1, 1980, Philippines and Thailand: Met with Dr. Lane Holcroft, Chief of Agric., AID/Manila, to discuss project and personnel. Give weed control training course for 34 participants of NCPC/IPPC in Philippines. Met at the

Ford Foundation in Thailand to discuss program thrust for aquatic weed assessment from water hyacinth to Mimosa pigra.

Shenk April 12 - May 3, 1980, Caribbean: Visit project sites of the CARDI/USAID Small Farm Multiple Cropping Program with a one-week weed control workshop being given in both Grenada and Antigua.

Shenk June 9-12, 1980, Panama: To establish two experiments studying insect and weed dynamics in rice and sorghum with Dr. Joe Saunders.

Shenk June 15-20, 1980, Ecuador: To attend V Congress of ALAM in conjunction with the I Congress of SEM (Ecuadorian Weed Society).

Deutsch July 30 - August 16, 1980, Rome, Netherlands, and U.K.: Met with FAO in Rome to discuss AID/OSU weed project and no-till farming; Met with IAMFE in Netherlands for conference and with WRO, United Kingdom to discuss weed management vs. control with John Fryer.

Shenk August 18-20, 1980, Panama: To evaluate weed control insect interaction trial in rice with predominance of Rottboellia exaltata in Baru and plan with IDIAP personnel future experiments in Caizan.

Burrill September 11-12, 1980, St. Louis, MO: Title XII integrated crop protection - planning phase meeting of advisory committee to Purdue University.

Shenk October 12-16, 1980, Panama: Survey pastures, design weed control experiments in pastures and participate in CATIE Systems Design Seminar for 30 technicians from National Research Institutions throughout Central America.

Burrill October 13-18, 1980, Philippines: Discuss and plan weed control project activities with staff, work in the Philippines.

Conklin October 13-26, 1980, Philippines and Thailand: Discuss and plan weed control project activities with staff, and work in the Philippines. In Thailand, discuss personnel issues and economic assessment

plans associated with M. pigra encroachment with Lamar Robert.

- Conklin November 29 - December 6, 1980, Costa Rica: To plan and coordinate the agronomic/economic programs of IPFC in Costa Rica for the remaining 18 months.
- Miller November 30 - December 6, 1980, Costa Rica and Gainesville, FL: To plan and coordinate the agronomic/economic programs of IPPC in Costa Rica; In Florida, met with Victor Ramey and Dr. Dan Shankland, Univ. of Florida to review OSU-UoF subcontract on aquatic weeds.
- Shenk December 10-14, 1980, Nicaragua: Survey several areas near Jinotega, where the GTZ-CATIE-INTA Farming Systems Project will be operating, to help design their weed management experiments.
- Deutsch February 9-12, 1981, Tulare, CA: To attend California Farm Equipment Show and International Exposition.
- Burrill February 15-19, 1981, Las Vegas, NV: Attend annual conference of WSSA and Participate in planning sessions of Executive Committee of IWSS.
- Miller March 28 - April 11, 1981, Thailand and Philippines: Discuss Ford Foundation project and the Mimosa pigra study in Thailand; Attend project review in Los Banos, Philippines.
- Cooper March 30, 1981, Philippines: To assume duties as research agronomist
- Miller June 1-5, 1981, Gainesville, FL: Discuss OSU, IPPC/University of Florida Aquatic Weed contract.
- Deutsch August 2-10, 1981, Monrovia, Liberia: To attend No-tillage Crop Production in the Tropics (a symposium) course.
- Burrill August 19 - September 13, 1981, Philippines and Thailand: Attend conference on Weed Control in Rice sponsored by the IRRI and the IWSS; discuss project activities and future direction with Philippines staff, Dr. Sanchez and Ed Rice. In Thailand, discuss

with AID Bangkok a request from Chiang Mai Univ. for general assistance in agriculture. Visit Chiang Mai to discuss above request with Dean of Agric. and to review IPPC project on economic evaluation of Mimosa pigra.

- Miller September 19-27, 1981, Costa Rica: To review project activities in Costa Rica.
- Deutsch November 15-29, 1981, Thailand: Attend Mimosa symposium; Philippines: Discuss program termination; India: Attend 8th Asian-Pacific Weed Science Society meeting.
- Miller January 30 - February 4, 1982, Costa Rica: Discuss possibilities of additional funding for IPPC activities in Central America.
- Miller February 18 - March 10, 1982, S.E. Asia: Participate in the International Symposium on Mimosa Pigra in Thailand. Review the status of the IPPC program in Thailand with Mr. Bob Queener and later with the Ford Foundation. Met in Bogor, Indonesia to discuss training sessions for spraying equipment. In Philippines, met with AID, Manila to review reasons for withdrawing from the Philippines and types of activities and services we could provide in the new contract.
- Burrill February 18 - March 10, 1982, S.E. Asia: Make arrangement for a weed science training course in Pakistan. Review the status of the IPPC program in Thailand with Mr. Bob Queener and later with the Ford Foundation. Met in Bogor, Indonesia to discuss training sessions for spraying equipment. In Philippines, met with AID, Manila to review reasons for withdrawing from the Philippines and types of activities and services we could provide in the new contract.
- Burrill March 31 - April 10, 1982, Costa Rica and Belize: In Turrialba, Costa Rica to review project activities in Central America. In Belize to respond to AID request for weed control specialist to survey and advise on weed problems in citrus groves.

Burrill July 3-15, 1982; Sri Lanka: To participate in Symposium on Tropical Agriculture; Bangladesh: To become familiar with people working in various Bangladeshi and foreign agriculture organization and alert them to potential for support from IPPC.

Burrill August 30 - September 11, 1982, Rome and Italy: Met in FAO Rome to draft suggestions aimed at promoting weed management in Africa. Participate in the FAO/IWSS Expert Consultation on Weed Management Strategies for the 1980's for the LDC's.

Deutsch September 13-15, 1982, Berkeley, Albany, Davis and Winters, CA: Attend various activities at the CICP, USDA and University of California, Davis, Biological Control of Weeds labs, University of California and Bio. Integral Research Center.

Haller September 18 - October, 1982, Novi Sad, Yugoslavia: Attend 6th annual International Symposium on Aquatic Weeds and the 2nd International Symposium on Herbivorous Fish; In Rome Italy, meet with officials at FAO; in Nairobi, Kenya, establish contacts for a future aquatic weed short course in Kenya to involve several East African countries.

Miller November 20 - December 3, 1982, England: Give paper at BCPC; In Pakistan, conduct a weed short course in Islamabad.

Shenk November 13 - December 10, 1982, Pakistan: Participate in joint IPPC-CIMMYT-PARC weed control training course.

Ramey December 7-9, 1982, Chicago, IL: Attend 1st Annual Conference on Computers in Science.

Burrill December 12-19, 1982, Rome: Plan weed management training activities for Africa as a follow-up to recommendations made by a group of weed scientists meeting in Rome in September.

Fisher January 10 - February 5, 1983, Indonesia: Provide training/refresher shortcourses on herbicide application at five Indonesia food and estate crops research institutes and at the BIOTROP. Bangkok, Thailand: Give technical assistance in weed control as requested, arrange for possible future IPPC

- weed science shortcourses/seminars with Indonesian and Thai weed science society officers, visit with Thai weed group at Kasetsart University and at the National Weed Research Center, visit ASMEC to observe testing of knapsack sprayers, interview recent Thai agronomy graduate wishing to pursue Masters studies in Weed Science at OSU.
- Charudattan (U.F.) February, 1983, Hyderabad, India: Attend Waterhyacinth Conference, collect plants. (IPPC/AWP contributed \$500 toward this trip).
- Shenk March 7-29, 1983, Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica and Panama: Consultant to the ROCAP/CATIE Small Farmer Systems Research Project.
- Burrill & Appleby April 1-3, 1983, Chiang Mai, Thailand: Attend the First Conference of the Weed Science Society of Thailand and present two papers. Rome, Italy: Prepare budgets and plans for collaborative FAO/IPPC weed management training courses.
- Shenk May 15-28, 1983, Guatemala, El Salvador, Costa Rica: Evaluate ROCAP/CATIE Farming System Research program in Guatemala; consult with the USAID/Ministry of Natural Resource Reforestation Program in El Salvador; and participate in ROCAP, CICP Integrated Crop Protection Planning seminar for Central America in CATIE.
- Burrill May 21-30, 1983, Nairobi, Kenya: Attend 9th Biennial Conference of Weed Science Society for Eastern Africa. Discuss arrangements for weed management training course scheduled for September.
- Shenk July 25-29, 1983, Turrialba, Costa Rica: Participate in writing CATIE/ROCAP FSR technical recommendations
- Cooper July 11-12, 1983, Kutztown, PA and University Park, PA: Observe research and exchange ideas and information on living mulch cropping systems.
- Burrill, Shenk and Miller August-September, 1983, Nairobi, Kenya: prepare for a weed management training course; Cairo, Egypt: explore interest in a

weed management training course for Egypt;  
Rome, Italy: report on training course and  
discuss further cooperative training  
efforts.

Haller September 26 - October 6, 1983, Thailand:  
Meet with Dr. Napompeth, Director National  
Biological Control Research Center and Mr.  
John Neave of USAID. Discuss Mimosa work  
and observe other biocontrol programs in  
waterhyacinth. Sri Lanka: Meet with Mr.  
Eric Loken and Dr. I. Balasooriya of the  
University of Kelaniya to discuss aquatic  
weed problems and assistance in Sri Lanka.

Deutsch November 15-27, 1983, Rome, Italy: Hold  
discussions with contacts relative to FAO's  
scope of crop protection activities and  
possible future AID/OSU-IPPC involvement.  
United Kingdom: attend the ICPP.

Miller & Burrill November 25 - December 3, 1983, Philippines:  
Participate in conference of Asian Pacific  
Weed Science Society.

Burrill December 6-18, 1983, Lusaka, Zambia: Help  
prepared for and teach weed management  
training course.

Shenk December 3-15, 1983, Costa Rica and  
Honduras: Work out details for intensive  
weed control short course in CATIE, and  
study request from PAS for IPPC support  
during the next 28 months.

Miller & Burrill March 27 - April 7, 1984, Washington, D.C.:  
Discuss future contract with AID/W, CICP,  
and University of Florida. Nairobi, Kenya:  
Attend meeting of FAO Panel of Experts on  
Weed Management.

Haller & Joyce April 22-29, 1984, Quito, Ecuador: Meet  
with Darell McIntyre, USAID Ecuador, and Dr.  
Fausto Maldonado Agricultural Program  
specialist with USAID Ecuador; investigate  
waterhyacinth problem in agricultural areas  
near Guayaquil and in a 24,000 ha reservoir  
project under construction on the Daule and  
Peripa Rivers in Central Ecuador.

Shenk & Miller May 6-11, 1984, Turrialba, Honduras:  
Elaborate memorandum of understanding at  
PAS; San Jose, Costa Rica: finalize plans  
for an IPPC/FAO/CATIE weed management short

course in November; Gainesville, FL: review the University of Florida/IPPC Aquatic Weed Control program with Director W. T. Haller.

Miller & Freed            June 11, 1984, Berkeley, CA; To discuss future CICP/IPPC activities.

Deutsch                    June 17-29, 1984, Haiti: ACVFA Conference, meet with USAID/Haiti officials; AID/Washington: discuss the AID-OSU weed project. Norfolk VA and Raleigh NC: Discuss the work being done in North Carolina to contain and reduce Striga infestations; Washington: Attend OCIAC meeting.

Miller                      June 21-22, 1984, Washington, DC: Discuss contract with AID/S&T Personnel.

Shenk                      August 6-16, 1984, LaPaz, Boliva: Finalize arrangements for training course on pests and pesticide management, under the AID Disaster Recovery Project; Project No. 511-0581, AID Loan and Grant No. 511-F-069.

Cooper                     August 3-29, 1984, Lusaka, Zambia and Maseru, Lesotho: To provide USAID/CICP/IPPC sponsored training in the safe and effective use of pesticides representing MOA research. A three-day workshop was held at both locations for approximately 30 participants each.

Shenk                      September 12 - October 13, 1984, Bolivia: Conduct 3-day training course on pests and pesticide management in 7 different cities.

Shenk                      October 31 - November 24, 1984, Turrialba, Costa Rica: Participate in FAO/IPPC/CATIE intensive weed management training course.

Burrill                     November 19 - December 21, 1984, Arusha, Tanzania: Prepare for and conduct a 2-week weed management training course for 25 Tanzanian participants; Nairobi, Kenya: Meet with Dr. Ratemo Michieka to discuss work on control of Striga spp. Redso, Kenya: Meet with Mr. Don Fiester to discuss proposal by IPPC and NCSU and future training activities; FAO Rome: Discuss publication on weed identification for Kenya and summer weed management course at Corvallis.

Burrill & Shenk      January 14-26, 1985, Pakistan: Participate in Weed Science Workshop.

Shenk                    January 14 - February 15, 1985, Pakistan: Review PL 480 projects; National Research Program on Weeds of Cereals; PK-ARS-199 through 203:FG-Pa-377 through 381). Attend IPPC/PARC Weed Control Workshop.

Burrill                  February 4-8, 1985, Seattle, WA: Attend meeting of the WSSA International Affairs Committee and to hold sessions on organization and activities of the IWSS.

Miller & Deutsch      February 12-14, 1985, Miami, FL: To determine IPPC/CICP response to proposed IPM RFP.

Burrill                  March 3-9, 1985, London: Discuss strategy to encourage appropriate funding and organization for research and training on control of Striga sp; Jordan: Make preliminary arrangements for a weed management training course.

Shenk                    June 25 - July 10, 1985, Honduras, Costa Rica, Peru: To participate in the pest and pesticide management course in Yurimaguas, Peru at the request of AID. Consult with Drs. Keith Andrews and Joe Saunders in Honduras and Costa Rica.

Appendix 7

STAFF/STUDENT ROSTER

Project staff members served for all or part of the period covered by this report, either full time or as indicated.

Project Staff

Stanley F. Miller	Project Director	50%
W.T. Haller	Aquatic Weed Project Director	
Larry C. Burrill	Senior Weed Research Specialist/ Support agronomist	
Myron D. Shenk	Weed Research Scientist	
Allan E. Deutsch	Communication/Administration	
Alan S. Cooper	Weed Management Agronomist	
Victor Ramey	Aquatic Plant Information Specialist	
Herbert H. Fisher	Weed Research Assistant	50%
Susan G. Larson	Secretary	
Ruth M. Carr	Word Processing Specialist	
Karen Bruder*	Secretary	
Cindy Roy-Brown*	Word Processing Specialist	
Donna Castillo*	Fiscal Affairs Clerk	25%
Mary Welsh*	Word Processing Specialist	
Bobbie Jean Biles	Aquatic Project Support Clerk	

Students

Herbert H. Fisher	PhD, Horticulture
Alan S. Cooper	MS, Crop Science
Albert Fischer	PhD, Crop Science
Raouf Cherif	MS, Crop Science
Mark Peterman	MS, Crop Science

\* Left during the report period