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AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT PAPER FACESHEET

1. TRANSACTION CODE: [A] A = ADD, C = CHANGE, D = DELETE — PP

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3. COUNTRY ENTITY: DS/AGR — RDA-28
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5. PROJECT NUMBER (7 digits): [931-0206.11]

6. BUREAU OFFICE: A. SYMBOL: DSB; B. CODE: [10]

7. PROJECT TITLE (Maximum 40 characters): [Weed Control Utilization]

8. ESTIMATED FY OF PROJECT COMPLETION: FY [8|2]

9. ESTIMATED DATE OF OBLIGATION: For 3 year Extens
A. INITIAL FY [7|9] B. QUARTER [2] (Enter 1, 2, 3, or 4)
C. FINAL FY [8|1]

10. ESTIMATED COSTS ($000 OR EQUIVALENT $1 =) (For 3 year Extension)

A. FUNDING SOURCE	FIRST FY 79			LIFE OF PROJECT		
	B. FX	C. L/C	D. TOTAL	E. FX	F. L/C	G. TOTAL
AID APPROPRIATED TOTAL	383	--	383	1,343	--	1,343
(GRANT)	(383)	--	(383)	1,343	--	1,343
(LOAN)	( )		( )	( )		( )
OTHER U.S. 1.						
OTHER U.S. 2.						
HOST COUNTRY						
OTHER DONORS						
TOTALS	383	--	383	1,343	--	1,343

11. PROPOSED BUDGET APPROPRIATED FUNDS ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E. thru 9/30/78		H. 1st FY 79		K. 2nd FY 80	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN
(1) FN	112 T	[illegible]	--	1,055	--	383	--	467	--
(2)									
(3)									
(4)									
TOTALS				1,055	--	383	--	467	--

A. APPROPRIATION	N. 3rd FY 81		O. 4th FY 82		LIFE OF PROJECT	
	O. GRANT	P. LOAN	R. GRANT	S. LOAN	T. GRANT	U. LOAN
(1) FN	495	--	0	--	2,398	--
(2)						
(3)						
(4)						
TOTALS	495	--	0	--	2,398	--

12. IN-DEPTH EVALUATION SCHEDULE: MM [0|3] YY [8|1]

13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN THE PID FACESHEET DATA, BLOCKS 12, 13, 14, OR 15 OR IN PRP FACESHEET DATA, BLOCK 12? IF YES, ATTACH CHANGED PID FACESHEET.

[1] 1 = NO, 2 = YES

14. ORIGINATING OFFICE CLEARANCE

SIGNATURE

TITLE: Dr. Dean F. Peterson
Director, DS/AGR

DATE SIGNED: MM [1|3] DD [2|2] YY [7|9]

15. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION: MM [ ] DD [ ] YY [ ]

AID 1330-4 (3-78)

PROJECT STATEMENT

February 28, 1979

1. Project Summary.

A. Statistical

Project Title:	Weed Control Utilization - 931-0206.11
New or Extension:	Extension - 3 years
Current Contractor:	International Plant Protection Center (IPPC), Oregon State University, Corvallis, Oregon 97331
Principal Investigator:	Stanley F. Miller, IPPC Director
Duration:	Current Contract - April 1, 1976 to March 31, 1979 Proposed Contract - April 1, 1979 to March 31, 1982
Funding to 9/30/78:	$1,055,000
Estimated Funding for 3 Year Extension:	$1,342,692 to March 31, 1982

Funding Required:		
April 1, 1979 to March 31, 1980	$414,005
April 1, 1980 to March 31, 1981	433,718
April 1, 1981 to March 31, 1982	494,969
TOTAL	$1,342,692

Project Manager:	Dr. G. F. Warren

PROJECT DESCRIPTION SUMMARY

Since 1968, the Agency for International Development (AID) and Oregon State University, working through the International Plant Protection Center (IPPC), have jointly conducted an important and highly regarded weed control program. A single research contract for this effort existed until 1978 when technical assistance was placed under a separate contract. Research focused on developing and evaluating weed control systems for representative farms in developing countries while technical assistance, the companion contract, provided assistance and support to the international weed science community including workers concerned with aquatic weeds. Both contracts terminate March 31, 1979.

Adequate food production continues as a major world problem. A recent world food production resurgence generated complacent attitudes. However, increasing demand for food, uncertain weather, and poorly planned governmental food policies still exist and virtually assure periodic crises in the future.

Weeds constitute a worldwide problem. Crop losses due to weeds often exceed 25 percent; uncontrolled weeds can cause complete crop failure. New or more intense use of agricultural inputs often increases weed problems. Certain mechanization of weed control technologies, however, may cause severe social dislocation through loss of jobs, and subsequent reduced income. Selecting appropriate weed control technology which minimizes adverse effects and is consistent with small farms resource endowments requires care and sensitivity.

Assistance to the world weed control scientific community must be provided if the war on hunger is to be won. The project proposes a continuation of the 12-year joint effort of AID and IPPC to provide this service. The weed control program will be strengthened through continued training in the methods and procedures of weed research, and developing research capabilities of institutions responsible for weed research and policy. Consulting services will be provided in terrestrial and aquatic weed control. And the worldwide system of communication and

linkage will be continued and strengthened.

This proposal covers the period April 1, 1979 to March 31, 1982. complimentary research proposal is being submitted to AID concurrently. Both are essential to meet the need for improved weed control procedures and economic welfare of small farmers in developing countries.

I. Project Description

A. BACKGROUND

During the next decade, the world will doubtlessly experience globally significant food production pressure. A recent resurgence of world food production, stemming from a beneficial weather cycle, generated a complacent attitude. However, relentlessly increasing demand for food, uncertain weather, and poorly planned governmental food policies--basic ingredients of the problem--still exist. Continuing food shortfalls are thus assured.

Food problems, magnified in the developing world, fall most heavily on the urban and rural poor. Conception and implementation of more effective agricultural development strategies and production technologies oriented toward developing countries become imperative.

Agricultural development occurs as relatively abundant--hence cheap--factors are substituted for relatively scarce--therefore expensive--production factors. Factor endowments differ in various world regions. A relatively inelastic labor supply in the United States contrasts with abundant land. The developing world usually sustains abundant labor while capital and, at times, land are limited. To be effective and realistic, technologies developed must reflect these endowment differences and provide opportunity for use intensification and substitution of relatively cheap production factors.

1. Weed Control

Weed control characterizes the new agricultural technologies dilemma in developing countries. On one hand, improved weed control appears to be necessary, in many situations, to achieve production increase goals. Left uncontrolled, weeds have the potential to cause complete crop failure. On small farms, in spite of control efforts, weed control losses often exceed 25 percent. The introduction of irrigation or other new agricultural practices often intensifies the problem because weeds, as well as crops, respond favorably to improved growing conditions.

On the other hand, traditional weed control methods--hoeing, chopping, cultivating--impart high labor demands with potential to limit production expansion. Several studies have shown that manual weed control commonly absorbs 20-80 percent of total crop production labor within traditional agriculture. Furthermore, the labor supply is commonly insufficient to remove weeds at critical times and thus prevent serious yield losses. Modern weed control practices generate the opposite effect; as labor-saving innovations in developed agriculture, they can cause severe social dislocations. Weed control thus stands apart from other innovations--new varieties, irrigation, chemical fertilizers, and insecticides--which are labor-using, or neutral. The transition from hoe to herbicides (generally applied by backpack sprayer in developing countries) can reduce labor requirements 20-fold in short cycle crops, and up to 35-fold in long cycle crops.

From this apparent contradiction emerges the conclusion that selection of an agronomically sound, economically efficient, and socially acceptable weed control system requires a thorough understanding of the physical, economic, and social realities of the particular geographical region being considered.

Modern weed control techniques are labor-reducing, ceteris paribus. But if absolute labor constraints exist during peak weed control periods

and land is not limiting, their introduction will permit acreage expansion, or cropping intensification, resulting in expanded labor utilization during other seasons on an entire farm basis. Similar rationale frequently has been used to justify introduction of herbicides into developing countries. This conclusion depends on the presence of a specific economic and ecological relationship characterized by relative scarcity of labor rather than land.

Furthermore, to be economically valid, such conclusions must be based on the social opportunity costs of labor and capital, rather than usually distorted market prices. While the acreage expansion/cropping intensification argument often is valid for high-wage, labor-scarce developed agricultural economies, and for special settings in developing countries, its broad extension to the dominant labor-abundant agriculture pattern in the poor nations remains doubtful. In developing countries, where labor surpluses present serious problems, economic analyses have concluded that the optimal solution rests with intermediate technology, or an improvement of traditional methods.

This, in fact, coincides with a major research thrust of IPPC. A dominant problem in developing countries involves preparing land for the crop. Crop residues, weed regrowth, and heavy labor demands constitute a frustrating bottleneck to adequate seedbed preparation, with consequent weed problems and poor yields. Research results in Costa Rica suggest that chemical seedbed preparation, which provides a residue mulch, may be the most efficient method of preparing land, as well as a technique to reduce weed control costs between 28 and 67 percent compared to traditional systems.

Aquatic weeds constitute an increasingly serious problem for developing countries by affecting irrigation, navigation, drainage, generation of electrical power, fisheries, public health, and agriculture. Not only do aquatic weeds reduce the water storage potential of ponds and lakes by occupying space, they also cause water loss through transpiration at a rate up to eight times greater than that from a free water surface. This fact is particularly important in areas such as Lake Chad

in the African Sahel and the Okavango Swamps in Botswana where water is a diminishing and precious natural resource.

Aquatic weeds such as Salvinia molesta and Pistia stratiotes are serious pests in rice paddies in Southeast Asia.

Some of the most acute problems resulting from aquatic weed infestations are related to several diseases associated with vectors residing in aquatic habitats, i.e., Schistosomiasis and malaria (East and West Africa, Southeast Asia). Aquatic weeds have been responsible for blocking canal, river, and lake navigation. Several instances have been recorded whereby excessive weed populations caused the collapse of small dams in Africa causing serious water losses from metropolitan areas (Aboim, 1966).

B. CURRENT PROJECT BACKGROUND

In 1966 the Agency for International Development contracted with Oregon State University to improve weed control research in selected developing countries, primarily focusing on Latin America. That contract, with extensions, terminated March 31, 1973. The International Plant Protection Center (IPPC) at OSU developed from this contract.

Project objectives were oriented toward developing institutional and staff weed control capabilities within developing countries, that would contribute to increased agricultural production. The project was particularly successful in raising the level of weed control research, and subsequent production, in Colombia and Ecuador, countries in which the project maintained resident staff. On a worldwide basis, IPPC became recognized as a major center for international weed control information and technical support.

Increased food production obviously remained a major goal for developing countries, but, as the first wave of results from the introduction of modern agricultural technology--the "green revolution"--were analyzed, development scholars noted that not all segments of developing country citizenry enjoyed equal benefits from the change. Progressive, relatively affluent farmers tended to capture the bulk of the gains while the social and economic positions of small farmers and rural

laborers deteriorated. Recognition that new technology was not neutral in its social and economic effects precipitated a redefinition of project goals.

A second contract incorporated new dimensions within two basic thrusts:

- to develop weed control systems for small- and medium-size farms in developing countries, encompassing traditional and modern techniques, or combinations;

- to evaluate the resulting systems in terms of effects on both economic and social conditions and goals, such as economic efficiency, unemployment, and income distribution, among others.

Activity under the contract (started April 1, 1978) suggested that a trade-off does exist between societal goals: maximization of a specific objective, such as economic efficiency of production, may not lead to concurrent maximization of other community goals.

Project generated information suggests that small farmers in Northeastern Brazil and El Salvador are likely to continue to rely on manual (traditional) weed control methods for traditional food crops, not only because these methods are economically efficient, but because both on- and off-farm alternative opportunities are extremely limited. But small farmers in both regions also work as farm laborers for larger farms. Under present subsidized prices, weed control for cash crops grown primarily on plantations--sugar cane in Brazil and rice in El Salvador--is moving toward chemical methods. In Brazil, the switch will cause a 45-81 percent decline in labor employment. The distribution impact will be severe: up to 18 cruzeiros will be lost to agriculture workers for every cruzeiro gained by the plantation. Similar conditions were found in El Salvador, though not as extreme.

IPPC presently holds two contracts. Both began in April 1976. One, a technical assistance effort, aims to strengthen the science of terrestrial and aquatic (subcontract with the University of Florida)

weed control through training, institutional building, and improvement of the flow, scope, and interchange of information among members of the world weed research community.

To date a total of fifteen different workshops, seminars, and short courses have been offered by IPPC personnel throughout Central America and the Philippines on terrestrial weed control techniques. Thirty-eight editions of INFOLETTER have been published and sent to a mailing list that is now over 4,000 recipients worldwide. In excess of 9,000 publications have been sent to weed scientists. And an active information and consulting service is in existence.

The IPPC Aquatic Weed Program conducted two 6-week short courses in Florida and a 3-week short course in Thailand during the past three years. The Thailand short course was conducted via an AID mini-grant while the U.S. short courses were sponsored by the University of Florida and USDA/AID. In addition, six LDC scientists were provided three to 12 months practical training in Florida.

The second contract (research) continues the effort to develop more effective weed control technologies and to evaluate their economic impacts. Since Brazil and El Salvador both had an abundance of cheap labor, countries with different factor endowments were selected for continued research. The Centro Agronomico Tropical de Investigación y Enseñanza (CATIE) headquartered at Turrialba, Costa Rica, plus AID's Regional Office for Central American Programs (ROCAP), and IPPC entered into an agreement to work cooperatively on small farm production problems in Central America. The coastal regions of Costa Rica provided abundant land; also, labor was becoming increasingly scarce, hence, more expensive.

In Asia, a second project site was established jointly with the Philippine National Crop Protection Center. This effort emphasized multiple cropping in upland production zones.

Results from both locations have been encouraging. Work in Costa Rica has been particularly satisfying. Project initiated efforts on chemical seedbed preparation could launch a major production breakthrough for small farmers. Some adoption by farmers has already started. The results of the work are reported in the annual project report and will be part of the final report of the contract.

C. PROJECT ACCOMPLISHMENTS

The U.S. Agency for International Development and Oregon State University have jointly conducted a concerted, 12-year effort to improve the level of weed control in less developed countries.

The program, coordinated through OSU's International Plant Protection Center (IPPC) since 1969, has matured from a pure, production oriented research project, to a multiple objective, multi-disciplinary activity. The program's immediate past encompassed a broader scope and sensitivity to critical socio-economic dimensions. The important facet of aquatic weeds and the threat they pose was integrated into the project in 1973 through a sub-contract with the University of Florida.

The program has generated both tangible and intangible benefits for developing countries. There is no gauge that can effectively measure how many more small farmers altered their weed control practices to incorporate improved techniques. But a groundswell of interest in, and awareness of, weed control has occurred, among farmers, agriculturists, and government policy makers and in this the AID/IPPC project has played a significant hand.

Presently IPPC receives a continuous stream of requests for information and project publications. In calendar 1977 the project distributed 4,499 copies of seven titles--mostly in response to requests--to 99 countries ranging from Argentina to Zambia. An additional 1,139 copies of reprints were distributed by the program in 1977, a 62 percent increase over the previous year. The aquatic group responded to over

300 requests for information by supplying publications and individually assembled bibliographies. A computerized information system was developed with more than 10,000 references on aquatic weeds. It may be the most complete collection of information on water weeds in the world.

The periodic newsletter, INFOLETTER, published by IPPC with project support, contains a news mix of strong interest to most of its nearly 4,000 recipients, judging by the increasing volume of requests for it. Recipients rarely ask to be removed from the mailing list. INFOLETTER has won several awards and is regarded as an important tool for developing country agriculture.

D. PROJECT LINKAGES

IPPC works closely with several major international agricultural centers. A large number of project publications have been supplied to CIMMYT to support its wheat and maize training programs. There is an established interchange between IPPC weed specialists and the weed scientists at IRRI and IITA. IPPC and CIAT, with AID support, organized and conducted an intensive, month-long weed control short course at Cali in 1975 that has been cited as an exemplary training program. Numerous attendees from the course have maintained contact with IPPC.

Personnel from the IPPC Aquatic Weed Program, in conjunction with host government agencies, have observed major aquatic problems in Southeast Asia (Thailand, Indonesia); Central America (Nicaragua, Mexico and Costa Rica); West Africa (Ghana, Nigeria, Ivory Cost, Chad); East Africa (Mozambique, Sudan, Egypt); and South Africa (Botswana). The major pests continue to be the "top four"--water hyacinth (Eichhornia crassipes), water lettuce (Pistia stratiotes), hydrilla (Hydrilla verticillata) and the water fern (Salvinia molesta). In addition, project specialists were alerted to major problems developing in the Okavango Swamps in Botswana, new reservoirs in Nigeria, Lake Chad in Chad and Nigeria, and the San Carlos River in Costa Rica.

The weed control data collection accumulated at IPPC has established the Center, and its project relationship, as an internationally recognized information clearinghouse. Toc. IPPC possesses one of the most exhaustive listings of weed control workers worldwide. This resource materially assists the international community to maintain and establish contacts.

In 1975 Oregon State University established the Office of International Agriculture (OIA) as evidence of the institution's serious long range commitment to world agricultural development. IPPC became an integral segment of OIA and thus benefits through several channels of institutional support and backup. IPPC serves as the secretariat for the International Weed Science Society (IWSS). The Center actively supports other groups; personnel hold offices in four regional societies.

IPPC has established both credibility and continuity over a decade, has honed its administrative functions to a fine working edge, and has successfully knit research and technical assistance into a synergistic relationship. The Center--with clearly stated University support--is dedicated to unceasing efforts to improve LDC weed control and, ultimately, contribute to overall social development. Hence, IPPC offers the following proposal for technical assistance, as a companion to another instrument covering research, with the intent of continuing a successful and productive association with AID and its missions.

E. PROSPECTS FOR THE FUTURE

Feedback received from project operational sites, plus response worldwide, persuasively argues that the AID-IPPC program is more than meeting its objectives. The effort has been instrumental in raising the weed control consciousness level in many, many countries. IPPC has became recognized worldwide as a clearinghouse for current information, professional contacts, and stimulation in a number of weed control related areas. Project professional staff are sought after for consultation and assistance and considered an unbiased source of useful information. IPPC helped organize the International Weed Science Society (IWSS) and now serves as the IWSS secretariat.

Work nearing completion under current contracts indicates considerable progress in developing appropriate weed control technologies for small farmers in developing countries and in assessing the social and economic benefits and costs associated with the new technologies. Additionally, a continuing program of technical assistance has been effectively conducted to improve research and program development and implementation. Capabilities of both aquatic and terrestrial weed scientists in developing countries, as well as the development of associated institutions, have been increased and sharpened.

II. PROJECT PROPOSAL, GOAL AND PURPOSE

A. PROPOSAL

On the basis of experience, progress, and continuity it is proposed that the Agency for International Development and the International Plant Protection Center enter into two new contracts--research, and technical assistance--to capitalize on past activities and to continue to improve the capabilities of developing countries to effectively and efficiently cope with weed problems.

This proposal concerns only technical assistance; a companion proposal discusses research. Both are essential to adequately meet the needs of the weed control community and to provide basic data for weed control policy formulation and evaluation. Complementaries exist through joint management of the contracts. IPPC staff time and interests are divided between the two proposals allowing for simultaneous and interchangeable use. Rejection of one proposal would create major obstacles for realizing objectives of the other.

B. Goal

To increase the quantity of food crop production and the welfare of the small and medium size farmers of the cooperating LDCs by assistance in integrated weed control.

C. Purpose

1. Develop integrated weed control systems for small and medium size farms in developing countries to increase crop yields.

2. Demonstrate improved weed control systems on farmers' fields.

3. Train weed scientists in LDCs for research extension and teaching.

4. Improve interchange of weed control information with LDCs.

5. Assist in the organization of groups interested in weeds and their control.

6. Identify important aquatic weed problems and recommend control systems

III. PROJECT OBJECTIVES AND BENEFITS

A. Objectives

1. Training

a. Train weed control research and extension personnel in matters related to weed control research.

b. Train agricultural administrators and decision-makers as to the role of weeds in agricultural development, the economic and human costs associated with weeds, the effect agricultural policies can exert on weed control and ultimately agricultural production.

2. Consulting

a. Respond to requests from USAID missions and other international organizations for on-site assistance and advising related to both terrestrial and aquatic weed control.

b. Develop a protocol for assessing aquatic weed problems in developing countries including the socio-economic impact on

local communities.

3. Linkages

a. Foster, promote, and maintain active contact and association with a broad array of organizations concerned with various aspects of weed science and weed control.

b. Maintain and develop the relationship between the Consortium for International Crop Protection (CICP) and IPPC.

4. Communication

a. Maintain, and continue to develop, an international clearinghouse of weed science information.

b. Conduct an international weed science information dissemination program.

c. Provide an information-retrieval system for aquatic weed research and control.

B. BENEFITS

1. POTENTIAL BENEFITS TO DEVELOPING COUNTRIES

A presidential panel on world food supply noted in 1967 that, "the U.S. government considers aid for agricultural development an important arm of foreign policy." Agrarian cultures can benefit from increased agricultural production through lowered dependence on external food sources, less depletion of monetary reserves, and avoidance of food shortages and associated civil unrest.

However, increased agricultural production is not sufficient in itself to stimulate broad improvement of social welfare in developing countries. The benefits and costs of advanced technology tend to be distributed unevenly within the community. As new productive methods are adopted, certain population groups gain while others lose. Income levels, income distribution, and employment are all affected.

Uninformed governmental decision makers, when faced with the need to promulgate edicts, may base their policies on supposition, rather than fact. The proposed program of technical assistance has the potential to provide information to assist governmental representatives in developing programs and in formulating policies bearing on weed control in a more rational, informed manner.

2. POTENTIAL VALUE TO AID

Previous pairing of research and technical assistance activities by the AID-supported program produced a synergistic result with both elements thriving and complementing one and other. The same opportunities exist in the new proposal.

Benefits also derive from the fact that an experienced, knowledgable staff utilizing an established infrastructure is in place and ready to commence project operations virtually without start-up delays and costs.

a. Anticipated Benefits

Benefits would be expected to flow from the following facts:

I. a functioning, experienced core staff;
II. an established and equipped project headquarters (eliminating the possibility of lost time due to start up);
III. a project staff with extensive worldwide contacts in weed science and agricultural economics;
IV. relatively minimal recruitment needs (from the existing pool of weed science expertise) to launch new regional projects;

V. continuing strong institutional support and extensive facilities;

VI. interest and ability in foreign languages;

VII. familiarity with AID administrative and managerial operating policies and procedures;

VIII. a backup staff geared to multiple functions and meeting changing needs.

IV. Project Analysis

A. Economic Feasibility

Information in the project description indicates the economic feasibility of technical assistance on weed control. Losses due to weeds in LDCs average 25% of the crop and often are much greater. In addition, 25 to 30% of the labor required for crop production is used for weed control. Furthermore, the labor supply is commonly insufficient to remove weeds at critical times and thus prevent serious yield losses. In many LDCs labor for weed removal is the limiting factor in the amount of land that can be planted by a family. Thus, improved weed control systems can increase yield per acre and area planted per family resulting in much more production per individual farm worker. A great shortage of trained weed scientists exists in LDCs to do the applied research, extension, and teaching to introduce appropriate new methods of control. This project proposes to improve the situation and facilitate the adaption of improved weed control methods by small and medium size LDC farmers.

B. Social Soundness Analysis

Applying appropriate technology to the weed problem at hand is the key to preventing socially unacceptable labor displacement. Data from the research project indicates that on small farms, i.e., our target population, family labor provides most of the weeding labor force. Family labor would be better employed in other activities such as farming more land, more intensive crop production, part-time employment off the farm, or education. Only in plantation operations hiring a large labor force does extensive

use of herbicides for weed control cause major labor displacement.

In the training programs the social aspects of changes in weed control methods will be discussed and the most appropriate systems suggested for each situation.

C. Technical Feasibility

A great deal of basic technology is available in developed countries and the companion research project is generating technology for weed control in LDCs. The technical assistance project will train LDC research and extension personnel in the basic principles of weed control and in the approaches to take in adapting technology to local conditions. The project also serves as a worldwide information source for assistance in solving weed problems in LDCs. Research has shown that a minimum of capital inputs in the form of well-timed herbicide applications when integrated with traditional weed control methods can improve yields, reduce erosion, and allow for more timely weed control operations. The future of minimum tillage and mulch systems look highly promising for many situations in the LDCs.

D. Administrative Feasibility

The project has been administered in the past by a land grant university which overtime has developed both a domestic and international staff to implement the project. They also have provided a reference library and newsletter of international reputation to disseminate weed control information. The companion research project managed by the same institution is closely coordinated with the technical service activity and form a complete service for LDCs.

To cover aquatic weed problems this institution has subcontracted with another university which specializes in this area. As can be seen the technical management of the project is very diverse and complicated. Much time, effort and investment has gone into the development of this capability and facility and it could not be readily or quickly duplicated. Unique skills and specialties are required that are not readily available. Rather they must be trained and developed over time through formal education and field experience. To accomplish this administration task CSU has organized the IPPC which also supports and cooperates closely with the International Weed Science Society (IWSS).

Host country administration is provided by CATIE in Costa Rica and the National Crop Protection Center in the Philippines. Both entities have proven most cooperative and supportive as concerns the project. In Asia particularly, this was a long involved process to discover and involve interested and competent host country administrators. In Central America due to their past experience with the project activities and staff the transition from Brazil to Costa Rica was not such a difficult process.

In summary the administrative functions of the project are extensive and complicated. It requires not only the intent and resources but experience expertise, reputation and international contacts to be able to provide the services on which AID and LDCs have come to depend.

E. Environmental Impact

Initial Environmental Examination - the activities of this project fall into the area described in environmental procedure regulations, Para. 216.2(c) "Analyses, Studies, Academic or Investigative Research, Workshops and Meetings". These classes of activities will not normally require the filing of an Environmental Impact Statement or preparation of an Environmental Assessment. In all training sessions methods for the safe use of herbicides and equipment will be emphasized. Considerable activity will be devoted to adaption of various mulch and minimum tillage crop production systems which greatly reduce soil erosion and compaction. Under the guidelines, the project activities clearly qualify for a negative determination at the time when a threshold decision is determined.

V. Financial Plan

This proposal requests AID funding to extend the project an additional three years to:

1. Train weed control and extension personnel.

2. Train agricultural administrators as to the role of weeds in agricultural development.

3. Respond to requests for assistance on both terrestrial and aquatic weed control.

4. Maintain active contact and association with organizations concerned with weed control.

5. Serve as an international information source for both teresstrial and aquatic weed problems.

Host country contributions of staff, land, facilities, supplies and equipment exceed 25% of the cost of the project activity in their respective countries.

Following is a statement of annual costs and FY obligations:

Year	Required Amounts	Obligations FY (000)
April 1, 1979-Mar. 31, 1980	$414,005	FY 79-383
April 1, 1980-Mar. 31, 1980	433,718	FY 80-100
April 1, 1981-Mar. 31, 1982	494,969	FY 81-490
		FY 82-380
Three Year Total	$1,342,692	1,353

A detailed budget is provided in Annex A.

VI. Implementation Plan

A. Geographic Areas

Two geographic areas have been identified as productive sites for in-field staff: Costa Rica and the Philippines, with outreach to neighboring nations.

1. Costa Rica - Results from the proposed weed research project, coupled with the established CATIE extension infrastructure, define Turrialba as a high potential site for the proposed technical assistance effort. CATIE, through an AID contract, is attempting to develop appropriate farm systems for small farmers in Central America. IPPC has formed an integral and important part of this effort, so much so that presently an IPPC staff member is serving as Associate Director for Training and International Relations for CATIE. Relations with CATIE are excellent and continue to be jointly successful.

2. Philippines The project input is anticipated to complement ongoing programs at the Los Baños based National Crop Protection Center (NCPC). NCPC, through its regional bureaus, is embarking on a nationwide effort to meet the research, training, and extension pest control needs of small farmers in the Philippines. Weeds consti-

tute one of the major problems. It is envisioned that NCPC will expand its activities to include parts of Southeast Asia as its capabilities increase.

B. Personnel

Proposed staffing for the project envisions:

Two professionals in the field;
Four professionals (part-time at Corvallis)
Four support staff (part-time at Corvallis)

3.3.2.1 In-field

Weed Control Specialist (1.0 FTE) - stationed at CATIE, Turrialba, working with CATIE, ROCAP (Regional Office of Central American Programs), the Costa Rican Ministry of Agriculture, as well as MOA personnel in El Salvador, Guatemala, Nicaragua, Honduras, and Panama. Would also collaborate with various university staffs.

Weed Control Specialist (1.0 FTE) - stationed at Los Baños, the Philippines, working through NCPC, regional crop protection centers, the Bureau of Plant Industry, and other entities.

3.3.2.2 At Corvallis

Project Leader (.3 FTE) - primarily administers program and coordinates both human and material inputs through the OSU Departments of Crop Science, and Agricultural and Resource Economics; also provides general staff and budget management and carries responsibility for contact with AID, plus national and international research organizations. The

project leader will be expected to visit project staff in the field at least once, and probably twice, a year.

Weed Control Specialist (.8 FTE) - helps the project leader provide direct in-field project management and maintain liaison with other agencies. The specialist directs the program of handling and responding to inquiries for technical information, provides literature and material back-up support for the field staff, and serves as a consultant and short course principal.

Information Specialist (.8 FTE) - has dual responsibility for all aspects of the publications/information program plus administrative duties including acting as project director during the director's absence. Carries out and supervises all functions associated with preparing, publishing, and distributing INFO-LETTER. Conducts the IPPC publishing and distribution program.

Fiscal Affairs/Translator (.8 FTE) - responsible for fiscal affairs including maintenance of accounts, records, ordering, billing, travel, and budget preparation under guidance of the director.

Secretary (.8 FTE) - normal range of clerical activities including typing staff correspondence, reports, and other documents, as well as filing, reception, and other support.

Graduate Student (0.5 FTE) - assists in locating information for use in preparing responses to inquiries, and helps catalog incoming printed material.

Clerical Specialist (0.6 FTE) - supervise library and assist Information Specialist in publishing and editing appropriate IPPC weed publications.

Technician (0.6 FTE) - assist Weed Control Specialist to provide back-up support for field staff. Conduct studies and evaluations of equipment.

C. PROJECT METHODS

1. Training

IPPC proposes to organize and conduct the following activities toward meeting training objectives.

a. Present a series of in-country mini courses of two to three day duration aimed at two levels of weed science personnel: experienced, such as degreed weed researchers, and relatively inexperienced, such as extension workers, or agricultural generalists.

b. Present one day seminars to agricultural administrators and decision-makers to inform them of:

- the effect weeds have on crops;
- the result in terms of economic and human costs of controlling versus not controlling weeds;
- the variety of control methods and combinations available;
- the special concerns that relate to use of agrichemicals;
- the effect of agricultural policies on the use of inputs for weed control.

c. Conduct on-the-job (OJT) training of counterparts in conjunction with the weed research project.

d. Interact with international agricultural research centers to: provide advice on weed control training, participate in on-site training events, or include center trainees in programs conducted at Corvallis.

e. Collaborate with the FAO weed scientist to provide training input as international programs take shape.

2. Consulting

The rapid spread of, and continued losses due to, terrestrial and aquatic weeds in developing countries has placed a major strain on IPPC to provide adequate consulting services. Increased service will be

required to meet the need. IPPC proposes to respond to requests for on-site short-term technical expertise by providing consultants versed in both terrestrial and aquatic weed control. Assistance will be continued in developing aquatic weed maintenance programs in Thailand, Ghana, and Nicaragua.

Many LDCs have an array of weed-related problems that need attention. Some problems can be handled by resident technicians, others require more comprehensive assistance. IPPC will continue to respond to requests for consultants in terrestrial and aquatic weeds. Also, it is anticipated that the available talent pool will include expertise in pasture and rangeland weeds, poisonous weeds, equipment, and other specialized weed problems.

Aquatic weeds have reached economically important levels throughout the tropics and sub-tropics of the world during the last five years. A major reason relates to development schemes such as irrigation networks and hydroelectric power plants which cause drastic alteration in the ecology of established water systems. In order to properly identify the problems and assess benefits from control, a procedure for conducting reliable benefit-cost analyses will be developed. Environmental, ecological, and social as well as economic factors will be considered in developing the protocol.

C. Linkages

Cooperation to strengthen existing weed control based connections with worldwide entities, proposes to:

a. Promote and participate in the formation, growth, and activities of international, regional, and national weed science societies.

b. Encourage weed control activities at international agricultural research centers through collaboration, scientist exchanges, and other forms of support.

c. Foster linkages with LDC governmental research, extension, and commodity organizations.

d. Maintain ties with counterpart weed research groups worldwide based on sharing state-of-the-arts knowledge, visits, and field tours.

e. Become an active member in the Consortium for International Crop Protection (CICP). The Consortium has been formed as a response to the Title XII program of the International Development Food Assistance Act of 1975 with the purpose of focusing U.S. agricultural institutions on the general problem of integrated pest management including weeds.

4. Communication

To preserve its unique role of weed control information resource and disseminator, IPPC has planned the following activities.

a. Provide prompt, individualized response to all requests for information or publications it receives.

b. Periodically inform the world weed science community about matters of general interest by publishing no less than four issues of INTERCHANGE each 12-month year and distributing copies to approximately 4,000 recipients in over 120 countries.

c. Maintain and expand a weed-related technical information base to provide data to project personnel, AID, and USAID staff members, and requestors.

d. Expand and improve the computerized aquatic weed information system. A new computer program will be developed for this purpose.

e. Research, write, edit, publish, and distribute technical publications oriented toward improving the knowledge of LDC weed specialists.

f. Enlarge the IPPC Papers series of reprints and provide copies to requestors worldwide.

A. Related to Objectives

Evaluation could be based on the following quantifiable points.

1. The number of people trained through in-country short courses.
2. The number of administrators (and others) exposed to seminars.
3. The number of international students participating in training at contract headquarters.
4. The number of consulting requests received and their disposition.
5. The extent of involvement with weed science organizations.
6. The volume of information and publications prepared and distributed.
7. The number of papers prepared for professional meetings.

B. Intangible Evaluation

Overall quantification of project effect in developing countries—greater practice of more effective or efficient weed control resulting in higher production, with attendant socio-economic conditions acceptable to the government—borders on the impossible in the short range. No single measurement device seems appropriate for systematically assessing improvement.

Broad evaluation, therefore, necessarily reverts to: periodic reviews; the attitude or actions of those developing countries' citizens who have had contact with project activities; and other forms of feed-back. Experience indicates that host government interest provides a clue to project worth.

Periodic reviews by AID personnel and others provide useful and welcome opinions of project activity, as well as highlighting and defining areas in which project operations can be modified and strengthened.

C. Evaluation Schedule

1. Annual review by project manager.
2. Team review following 18 months of activity.
3. Terminal team review to assess progress and determine future activity in the weed control field.

B. BUDGET

First Year: 4-1-79 through 3-31-80

	FTE*	Man Months	Budget	Est. Cost
Salaries				
U.S. Based Staff				
Project Leader	.30	3.6	$ 9,407	
Weed Control Specialist	.80	9.6	19,968	
Information Specialist	.80	9.6	18,284	
	(1.90)	(22.8)	($47,659)	
Grad. Research Asst. (Crop Sci.)	.50	6.0	5,496	
	(.50)	(6.0)	($ 5,496)	
U.S. Based Support Staff				
Fiscal Affairs/Translator	.80	9.6	12,409	
Secretary	.30	9.6	7,167	
Clerical Specialist	.80	9.6	7,092	
Technician	.30	9.6	11,632	
	(3.20)	(38.4)	($38,320)	
(On-Campus Total)				$ 91,315
Field Staff				
Weed Control Specialist, Costa Rica	1.00	12.0	$23,136	
Weed Control Specialist, Philippines	1.00	12.0	27,300	
	(2.00)	(24.0)	($50,436)	
(Off-Campus Subtotal)				$ 50,436
Total U.S. Salaries				$141,753

*FTE: full time equivalent

	Budget	Est. Cost
Fringe Benefits (payroll costs)		
Factor X salaries + post differential 18% X $141,753 + $5,044		$ 25,423
Overhead (indirect costs)		
On campus: 34% X $139,139	$ 47,307	
Field: 21.3% X $104,608	22,177	
Total Overhead.....		$ 69,484
Travel and Transportation		
International travel (personnel and dependents)		
Send one family to Costa Rica	$ 1,688	
Send one family to Philippines	2,512	
	$ 4,180	
Other personnel travel		
Two trips to Washington by director	$ 1,640	
One trip to Costa Rica by director	1,153	
One trip to Costa Rica by weed specialist	1,153	
One trip to Philippines by director	1,656	
One trip to Philippines by weed specialist	1,656	
One trip to Toronto for WSSA meeting	657	
One trip to Australia by weed control specialist	5,774	
In-country travel by field staff	4,000	
	$ 17,749	
Travel Subtotal.....		$ 21,929
Transportation of household goods, baggage and vehicles		
One family to Costa Rica	$ 8,213	
One family to Philippines	9,321	
Transportation of Goods Subtotal.....		$ 17,534
Storage of household effects and vehicles		
Storage for one family in Costa Rica	$ 600	
Storage for one family in Philippines	600	
Storage Subtotal.....	$ 1,200	
Total Travel and Transportation.....		$ 40,663

	Budget	Est. cost
Allowances		
Post differential		
One staff member in Costa Rica (15%)	2,314	
One staff member in Philippines (10%)	2,730	
Post differential subtotal		$5,044
Quarters		
One family in Costa Rica	2,880	
One family in Philippines	4,600	
Quarters subtotal		$7,480
Temporary lodging		
One family to Costa Rica	630	
One family to Philippines	960	
Temporary lodging subtotal		$1,590
Education		
One family in Costa Rica	450	
Total allowances		$14,564
Other Direct Costs		
Communications	2,000	
Medical examinations	535	
Vehicle insurance	600	
Defense base act insurance	4,855	
Printing and mailing Infoletter	2,925	
Total other direct costs		$10,915
Equipment, Vehicles, Materials and Supplies		
Equipment (title retained in AID)		
One sprayer C-P	100	
One 35 mm camera	450	
One telephoto lens for camera	200	
Equipment subtotal		$750

	Budget	Est. Cost
Materials and Supplies		
Short course materials	$ 1,500	
Books and publications	1,500	
Postage for Infoletter	2,429	
Envelopes for Infoletter	1,000	
Office supplies and postage	2,000	
Materials and supplies subtotal.....	$ 8,429	
Freight		
Ship one vehicle, other freight charges	$ 1,000	
Total equipment, vehicles, materials and supplies.....		$ 10,179

Participant Training

None

Subcontracts

University of Florida for aquatic weed control

Salaries	$ 30,000	
Consultants	3,000	
Fringe benefits	3,439	
Overhead (15% of all direct costs)	13,046	
Travel and transportation	20,306	
Data Processing		
Equipment - computer terminal	4,000	
Software and service	7,000	
Other direct costs	9,380	
Materials and supplies including training	6,854	
Subcontract total.....		$100,024
Total budget for 1979-80		$414,005

Second Year: 4-1-80 through 3-31-81

	FTE*	Man Months	Budget	Est. Cost
Salaries				
U.S. Based Staff				
Project Leader	.30	3.6	$10,348	
Weed Control Specialist	.80	9.6	21,844	
Information Specialist	.80	9.6	20,057	
	(1.90)	(22.8)	($52,249)	
Grad. Research Asst. (Crop Sci.)	.60	6.0	6,046	
	(.60)	(6.0)	($ 6,046)	
U.S. Based Support Staff				
Fiscal Affairs, Translator	.80	9.6	13,672	
Secretary	.60	9.6	7,364	
Clerical Specialist	.80	9.6	7,801	
Technician	.80	9.6	12,795	
	(3.20)	(38.4)	($42,132)	
(On-Campus Total)				$100,447
Field Staff				
Weed Control Specialist, Costa Rica	1.00	12.0	25,456	
Weed Control Specialist, Philippines	1.00	12.0	30,026	
	(2.00)	(24.0)	($55,482)	
(Off-Campus Subtotal)				$ 55,482
Total U.S. Salaries				$155,929

*FTE: full time equivalent

4-1-80 through 3-31-81

	Budget	Est. Cost
Fringe Benefits (payroll costs)		
Factor X salaries + cost differential 18% X $155,909 + $6,821		$29,295
Overhead (indirect costs)		
On campus: 34% X $140,196	$ 47,667	
Field: 21.2% X $105,231.	22,309	
Total Overhead		$69,976
Travel and Transportation		
International travel (personnel and dependents)		
Home Leave for two families	8,360	
Other personnel travel		
Two trips to Washington by director	1,804	
One trip to Costa Rica by director	1,268	
One trip to Costa Rica by weed specialist	1,268	
One trip to Philippines by director	1,745	
One trip to Philippines by weed specialist	1,745	
One trip to Las Vegas for WSSA meeting	394	
One trip to Brigton, England by weed control specialist	1,804	
One trip to Rome by weed control specialist for IWSS meeting	1,993	
In-country travel by field staff	4,400	
	$ 15,067	
Travel Subtotal		$24,421
Storage of household effects and vehicles		
Storage for two families overseas	$ 1,320	
Total Travel and Transportation		$25,741

80-81

	Budget	Est. Cost
Allowances		
Post differential		
One staff member in Costa Rica (15%)	3,818	
One staff member in Philippines (10%)	3,003	
Post differential subtotal----		$6,821
Quarters		
One family in Costa Rica	3,168	
One family in Philippines	5,060	
Quarters subtotal-----		$8,228
Education		
One family in Costa Rica	495	
Total allowances---------		$15,544
Other Direct Costs		
Communications	2,200	
Medical examinations	333	
Vehicle insurance	660	
Defense base act insurance	3,340	
Printing and mailing Infoletter	3,217	
Total other direct costs----------		$12,006
Equipment, articles, Materials and Supplies		
Replace one 35mm camera	500	
Equipment subtotal----------		$500

80-81

	Budget	Est. Cost
Materials and Supplies		
Short course materials	$ 550	
Books and publications	350	
Postage for Infoletter	2,112	
Envelopes for Infoletter	500	
Office supplies and postage	2,200	
Materials and supplies subtotal...	$ 5,912	
Freight		
Ship one vehicle, other freight charges	$ 1,000	
Total equipment, vehicles, materials and supplies.....		$ 7,412
Subcontracts		
University of Florida for aquatic weed control		
Salaries	34,100	
Consultants	4,400	
Fringe benefits	3,527	
Overhead (15% of all direct costs)	15,367	
Travel and transportation	38,381	
Data Processing	8,300	
Human direct costs	9,240	
Equipment	1,210	
Materials and supplies including training	7,040	
Subcontract total.....		$117,815
Total budget for 1980-81		$433,713

Third Year: 4-1-81 through 3-31-82

	FTE*	Man Months	Budget	Est. Cost
Salaries				
U.S. Based Staff				
Project Leader	.30	3.6	$11,383	
Weed Control Specialist	.80	9.6	24,028	
Information Specialist	.80	9.6	22,063	
	(1.90)	(22.8)	($57,472)	
Grad. Research Asst. (Crop Sci.)	.50	6.0	6,681	
	(.50)	(6.0)	($ 6,681)	
U.S. Based Support Staff				
Fiscal Affairs/Translator	.80	9.6	18,039	
Secretary	.80	9.6	8,672	
Clerical Specialist	.80	9.6	8,681	
Technician	.80	9.6	14,075	
	(3.20)	(38.4)	($49,367)	
(On-Campus Total)				$113,490
Field Staff				
Weed Control Specialist, Costa Rica	1.00	12.0	27,997	
Weed Control Specialist, Philippines	1.00	12.0	33,033	
	(2.00)	(24.0)	($61,030)	
(Off-Campus Subtotal)				$ 61,030
Total U.S. Salaries				$174,522

*FTE: full time equivalent

4-1-81 through 3-31-82

	Budget	Est. Cost
Fringe Benefits (payroll costs)		
Factor X salaries + post differential 10% X $171,522 + 37,503		$ 32,225
Overhead (indirect costs)		
On campus: 34% X $150,339	$ 51,115	
Field: 21.2% X $134,416	28,496	
Total Overhead.....		$79,611
Travel and Transportation		
International travel (personnel and dependents)		
Return of two families	5,000	
Other personnel travel		
Two trips to Washington by director	1,984	
One trip to Costa Rica by director	1,395	
One trip to Costa Rica by weed specialist	1,395	
One trip to Philippines by director	1,919	
One trip to Philippines by weed specialist	1,919	
One trip to New Orleans for WSSA meeting	550	
In-country travel by field staff	4,840	
Travel Subtotal.....	$ 19,108	
Transportation of household goods, baggage and vehicles		
Two families to return to U.S.	21,040	
Storage of household effects and vehicles	1,452	
Total Travel and Transportation	$ 41,600	

81-82

	Budget	Est. Cost
Allowances		
Post differential		
One staff member in Costa Rica (15%)	4,200	
One staff member in Philippines (10%)	3,303	
Post differential subtotal	$7,703	
Quarters		
One family in Costa Rica	3,485	
One family in Philippines	5,866	
Quarters subtotal	$9,351	
Temporary lodging for two families	$1,500	
Education		
One family in Costa Rica	844	
Total allowances		$19,398
Other Direct Costs		
Communications	2,420	
Medical examinations	647	
Vehicle insurance	726	
Defense base act insurance	5,875	
Printing and mailing Infoletter	3,539	
Total other direct costs		$13,207
Equipment, Vehicles, Materials and Supplies		
Replace slide projector	500	
Equipment subtotal	$500	

81-82

	Budget	Est. Cost
Materials and Supplies		
Short course materials	$ 606	
Books and publications	606	
Postage for Infoletter	2,323	
Envelopes for Infoletter	550	
Office supplies and postage	2,420	
Materials and supplies subtotal.....	$ 6,503	
Freight		
Ship one vehicle, other freight charges	$ 1,100	
Total equipment, vehicles, materials and supplies.....		$8,103
Subcontracts		
University of Florida for aquatic weed control		
Salaries	37,510	
Consultants	4,340	
Fringe benefits	4,319	
Overhead (15% of all direct costs)	16,070	
Travel and transportation	8,866	
Data Processing	7,260	
Other direct costs	10,164	
Equipment	1,331	
Materials and supplies including training	7,744	
Subcontract total.....		$130,103
Total budget for 1981-82		$494,969

THREE YEAR BUDGET SUMMARY

	1st Year	2nd Year	3rd Year	Total
Salaries	$ 141,753	155,929	171,522	$469,204
Fringe Benefits	26,429	29,295	32,225	87,949
Overhead	69,484	69,976	79,611	219,071
Travel & Transportation	40,663	25,741	41,600	108,004
Allowances	14,864	15,644	18,698	48,706
Other Direct Costs	10,916	12,006	13,207	36,128
Equipment & Supplies	10,179	7,412	8,103	25,694
Subcontract	100,024	117,815	130,103	347,942
Total	414,006	433,718	494,969	1,342,692