

## SP-IPM

### Questionnaire for Inventory and Analysis of System wide & Ecoregional Programs 2005

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1. **Responsible center:** International Institute of Tropical Agriculture (IITA)
  2. **Name of program.** The CGIAR Systemwide Program on Integrated Pest Management (SP-IPM)
  3. **Type of program or inter-center activity:**  
     Ecoregional  
     Systemwide: **YES**  
     Other (eg, ICWG)
  4. **Year initiated:** 1996
  5. **Participating institutions (indicate by country and if public or private)**
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Stakeholder group	The partners and what they bring on board
<b>Research centers</b>	<p><b>International agricultural research institutes:</b> Collectively, international agricultural research institutes have a shared mission to alleviate hunger and poverty in tropical developing countries by generating and promoting appropriate technologies that benefit the poor and enhance productivity while preserving the natural resource base.</p> <p><b>CGIAR centers</b></p> <ul style="list-style-type: none"> <li>• Centro Internacional de Agricultura Tropical (CIAT)</li> <li>• Centro Internacional de Mejoramiento de Maiz y Trigo (CIMMYT)</li> <li>• Centro Internacional de la Papa (CIP)</li> <li>• International Center for Agricultural Research in the Dry Areas (ICARDA)</li> <li>• International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)</li> <li>• International Institute of Tropical Agriculture (IITA)</li> <li>• International Plant Genetic Resources Institute, International Network for the Improvement of Banana &amp; Plantain (IPGRI-INIBAP)</li> <li>• International Rice Research Institute (IRRI)</li> <li>• International Service for National Agricultural Research (ISNAR)</li> <li>• West Africa Rice Development Association (WARDA)</li> </ul> <p><b>Other IARCs</b></p> <ul style="list-style-type: none"> <li>• Asian Vegetable Research and Development Center (AVRDC)</li> <li>• CABI Bioscience (the applied research division of CABI International)</li> <li>• International Center of Insect Physiology and Ecology (ICIPE)</li> </ul>
<b>Specialized IPM promoting agencies networks</b>	<p><b>BioNET INTERNATIONAL</b> is a global taxonomic network dedicated to enable developing countries to overcome the taxonomic impediment, mostly within the work program of the Global Taxonomic Initiative of the CBD.</p> <p><b>FAO Global IPM Facility (GIF)</b> assists Governments and NGOs to initiate, develop and expand IPM programs that aim to reduce pesticide use and associated negative impact on health and environment, while increasing production and profits through improved crop and pest management.</p> <p><b>International Association for the Plant Protection Sciences (IAPPS)</b> encourages information exchange amongst plant protection practitioners to promote an integrated and systems approach to agroecosystem management in pest, disease and weed control.</p> <p><b>The World Bank, Agriculture and Rural Development, Environmentally and Socially Sustainable Development Network</b> is primarily concerned with policy information development and exchange to increase public awareness and recognition of benefits of sustainable agriculture, such as promoted by IPM.</p>

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## 5. Participating institutions (contd.)

Stakeholder group	The partners and what they bring on board
<b>NGO networks</b>	<b>Pesticide Action Network (PAN)</b> is a network of over 600 participating nongovernmental organizations, institutions and individuals in over 60 countries working to replace the use of hazardous pesticides with ecologically sound alternatives around the world. PAN-Africa represented the NGO Committee of the CGIAR (NGOC) on the SP-IPM until 2003. PAN seeks to promote alliances, information sharing and networking around issues and examples of farmer-led, pro-poor and ecologically oriented agricultural research development.
<b>Private sector</b>	<b>CropLife International:</b> CropLife International represents the crop protection industry on the SP-IPM. CropLife is the worldwide representative of the crop protection industry dedicated to promoting the environmentally sound use of crop protection products for economical production of safe, high quality, abundant food, fibers and other crops.

## 5. Other organisations

**In the developing countries:** Participating NARES, including NGOs, in Africa, Asia, Caribbean and Latin America

Country	SP-IPM partner organisations		
	National agricultural research and/or plant protection services/organisations	Universities and technical training institutes	National extension services, NGOs, farmers' corporations
Bangladesh			Co-operative Assistance and Relief Everywhere (CARE)
Belize	National Plant Protection Service (NPPS)		
Bénin	Institut National des Recherches Agricoles du Bénin (INRAB)		CARDER
Bolivia			Foundation for the Promotion and Investigation of Andean Products (PROINPA)
Burkina Faso	Institut de l'Environnement et de Recherches Agricoles (INERA)		
Brazil	Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA)		
Cameroon	Institut de Recherches Agronomique et du Développement (IRAD)		
Colombia			Corporación Colombiana de Investigación Agropecuaria (CORPOICA)
Cuba	Instituto de Investigaciones de Sanidad Vegetal (IISV)		
Dominican Republic	Instituto Superior de Agricultura (ISA)		
Ecuador	Instituto Nacional Autónomo de Investigaciones Agropecuarias (INIAP)		
Egypt	Agricultural Research Center (ARC)		
El Salvador	Centro Nacional de Tecnología Agropecuaria y Forestal (CENTA)	Universidad de El Salvador	

## 5. Other organisations (contd.)

**In the developing countries:** Participating NARES, including NGOs, in Africa, Asia, Caribbean and Latin America

Country	SP-IPM partner organisations		
	National agricultural research and/or plant protection services/organisations	Universities and technical training institutes	National extension services, NGOs, farmers' corporations
Egypt	Agricultural Research Center (ARC)		
El Salvador	Centro Nacional de Tecnología Agropecuaria y Forestal (CENTA)	Universidad de El Salvador	
Ghana	Plant Protection and Regulatory Services Division (PPRSD)		Department of Agricultural Extension services
Guatemala	Instituto de Ciencia y Tecnología Agrícola (ICTA) Programa de Frijol centro Americano (PROFRIJOL)		
Haiti	Programa de Frijol de Haiti (PRONATHAR)		
Honduras		Escuela Panamericana (EAP), El Zamorano	Investigación Participativa en Centro América (IPCA)
India		University of Agricultural Sciences	
Indonesia			Participatory Development of Potato and Sweet Potato ICM by CIP-ICM
Israel		Tel-Aviv University	
Kenya	Kenya Agricultural research Institute (KARI)		Kenya Ministry of Agriculture CARE Catholic Diocese of Homa Bay
Lebanon		Al-Manar University of Tripoli, Al-Manar Boulevard - Abou Samra, Tripoli-Lebanon	
Madagascar	Centre National de la Recherche Appliquée au Développement Rural (FOFIFA)		
Malawi	Bvumbwe Agricultural Research Station (BARS) Lunyangwa Agricultural Research Station (LARS)		
Mali	Institut d'Economie Rurale (IER)		
Mexico	Centro de Investigaciones y de Estudios Avanzados (CINVESTAV) Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias (INIFAP)		
Morocco	Institut National de la Recherche Agronomique (INRA-CRRA Settat)		National extension service of Morocco

## 5. Other organisations (contd.)

**In the developing countries:** Participating NARES, including NGOs, in Africa, Asia, Caribbean and Latin America

Country	SP-IPM partner organisations		
	National agricultural research and/or plant protection services/organisations	Universities and technical training institutes	National extension services, NGOs, farmers' corporations
Nicaragua			MIP-CATIE
Nigeria	Institute of Agricultural Research (IAR), Zaria National Root Crops Research Institute (NRCRI)	Amadu Bello University (ABU)	State Agricultural Development Programs (ADPs)
Philippines	Philippine Rice Research Institute (PhilRice) Department of Agriculture (DA) Maligaya, Munoz Science City Nueva Ecija		Users Perspectives with Agricultural Research and Development (UPWARD)
Sudan	Agricultural research Corporation (ARC)	University of Gezira	
Tanzania	Lake Zone Agricultural Research and Development Institute Selian Agricultural Research Institute (SARI) Tanzania Agricultural Research organization (TARO)	National Horticultural Research and Training Institute at Tengeru (HORTI)	
Thailand	Institute of Biological Agriculture and Farmer Field Schools, Department of Agriculture Extension (IBAFFS-DOAE)		
Uganda	Namulonge Agricultural and Animal Production Research Institute (NAARI) National Agricultural Research Station (NARO)	Makere University	
Vietnam			FAO Community IPM Program by FAO-CIPM

## 5. Other organisations (contd.)

**In the developed countries:** List of agricultural research and development organizations

Country	SP-IPM partner organisations		
	Universities	Advanced/specialized research organisations	Donor partners/Private sector
Australia		Commonwealth Scientific and Industrial Research Organisation	Australian Center for International Agricultural Research (ACIAR)
Denmark:	Royal Veterinary and Agricultural University University of Copenhagen	Danish Institute of Agricultural Sciences	Danish International Development Assistance (DANIDA)
Germany		Biologische Bundesanstalt für Land und Forstwirtschaft (BBA)	
Italy			Ministero degli Affari Esteri
New Zealand		New Zealand Institute for Crop and Food Research Ltd	Ministry of Foreign Affairs and Trade (MFAT)
Norway			NORAD
Switzerland		Swiss Centre for Agricultural Extension and Rural Development	Swiss Development Cooperation (SDC)
UK		John Innes Centre (JIC) Natural Resources Institute	United Kingdom's Department for International Development (DFID)
USA	Montana State University University of Florida University of Arizona-Tucson University of Wisconsin-Madison	Donald Danforth Plant Science Center, Missouri Museum of Entomology of Florida State Collection of Arthropods	Center for Economic Growth and Agricultural Development of the United States Agency for International Development (USAID) Agricultural Research Service (ARS) of the United States Department of Agriculture (USDA)

## 6. Objectives (indicating type of research and related activities)

Objective	Activities
1. Promote inter-institutional partnerships (break isolation barriers) for increased effectiveness of IPM research in agriculture	<p><b>Coordination</b></p> <p>Develop/strengthen partnership strategies embodying synergy of efforts by stakeholder groups to develop early-warning and response opportunities for timely identification of and response to ecological imbalances that cause pest constraints to national and regional food balance sheets, and pose hazards to personal and environmental health</p> <p>Encourage stakeholder groups to develop, review, promote comply with governance mechanisms for a shared sense of purpose on IPM development, and promotion of inter-connectivity between partners; guiding principles on IPM research and implementation strategies; inclusive partnerships; position statements on topical IPM issues, such as use of synthetic pesticides; and partnership workshops on topical IPM issues requiring inter-institutional initiatives.</p>
2. Develop and promote holistic and ecological approaches and methodologies for IPM technology development and harmonize these across localities	<p><b>Strategic research</b></p> <p>Diagnose targeted agroecosystems to identify and analyze IPM constraints, and unravel trophic level and other interrelationships within agroecosystems with emphasis on related opportunities for IPM.</p> <p>Develop, test and evaluate client-oriented IPM concepts, methods and options, approaches and tools enabling the proper understanding of topical IPM issues and problems of concern across geographic boundaries, production ecologies, and cropping systems.</p>
3. Develop and promote effective communication and learning models for informed IPM decision making leading to higher, sustainable and healthier harvests.	<p><b>Applied research</b></p> <p>Establish collaborative field trials to test and evaluate ecologically IPM options for tackling targeted pest problems, and to diminish harmful pesticide regimes</p> <p><b>Applied research</b></p> <p>Promote mentored exchange study visits to clarify farmer participatory research (FPR) and participatory learning (PL) approaches for IPM based on synthesized case study information from the exchange visits.</p> <p>Develop guidelines for learning, promoting, and incorporating FPR and PL approaches into mainstream agriculture based on synthesized case study experiences and reports across localities and cultures.</p> <p><b>Outreach/implementation</b></p> <p>Train/orient researchers, technicians, extension/field agents and project managers towards available opportunities for integrating FPR and PL approaches in IPM.</p> <p>Establish pilot sites to promote closer collaboration among partner organizations, farmers' capacity to investigate production constraints more effectively on their own, ecologically sound IPM options</p> <p>Develop mechanisms for large scale uptake of proven technologies against system-wide problems for which farmers' coping strategies are ineffective, and for which no single institution has the individual advantage to address the problems effectively.</p>

## 6. Objectives (contd.)

Objective	Activities
4. Promote policy environment more favourable to the development and application of IPM strategies for sustainable agriculture	<p><b>Thematic reviews</b></p> <p>Synthesise and promote activities and outputs of partner organizations on the development and introduction of botanical and biological pest management agents and constraints encountered.</p> <p>Synthesise extent and promote research links of partner organizations to the implementation of international conventions and other instruments relevant to pest management.</p> <p>Synthesise and guide crop protection research projects at partner organizations for consistency with the SP-IPM position on the use of synthetic pesticides and guiding principles for IPM as laid out in the Programs Partnership strategies.</p>
5. Increase broader awareness of the impact and benefits of IPM leading to the wider adoption of more sustainable crop protection strategies	<p><b>Strategic research</b></p> <p>Synthesize case study information and inventories to fully define and quantify losses in targeted cropping systems</p> <p>Develop indicators and guidelines, based on case study reports, to fully define and quantify the expected benefits on investment in IPM including its positive impact on food security, poverty alleviation, personal and environmental health.</p> <p>Synthesize information on procedures and policies affecting the use biopesticides, botanicals, GMOs and other alternatives to synthetic pesticides as a basis for guidelines on international framework to promote the use of such alternatives.</p> <p>Analyse and quantify the potential of FPR and PL to increase the quality, usefulness and impact of IPM research and outreach activities, especially at IPM pilot sites.</p> <p><b>Outreach/advocacy</b></p> <p>Encourage information exchange in print among stakeholder groups and disseminate information to increase awareness of the benefits of IPM and thereby raise the profile of IPM within public, donor and farming communities:</p>

### 7. Principal operational sites by country and ecology

The major operational sites are:

- Tropical highlands of Latin America: Colombia, Ecuador, Dominican Republic, Brazil, Ecuador, Peru
- Tropical mid-altitude zones in Africa: Parts of Kenya, Cameroon, Nigeria, Tanzania, Malawi Uganda
- Tropical lowlands of Central America: Mexico and the Caribbean: Cuba, Haiti, Mexico, Guatemala, Belize, Honduras, El Salvador, Nicaragua, Cuba
- Dry and semi-dry areas: Syria, Turkey, Iran, Afghanistan, Kyrgistan, Morocco, Pakistan, India, Ethiopia, Egypt, Algeria,,Nigeria, Kenya, Uganda, Rwanda, Sudan, Jordan
- Sahel zones in Africa: Burkina Faso, Mali, Sudan
- Humid and sub-humid tropics: Nigeria, Cameroon, Benin, Ghana, Uganda, Tanzania, Kenya, Malawi, Philippine, Thailand, India, Pakistan, Bangladesh, Nepal, Pakistan, Vietnam Cambodia Laos India

### 8. Principal recommendation domains by production system, agroecology, and/or ecoregion

**Humid and sub-humid forested tropics:** These zones are characterized by a pattern of bimodal rainfall or permanent rainfall or monomodal with a short or absent dry season; they are continually humid with swamp inland valleys and growing periods from 270 days to all year round; the soils are mostly acidic ultisols and oxisols; there is limited insulation by cloud cover. The mean daily temperatures average 25-28C throughout the year, with the greatest daily temperature fluctuations (ca.10C) found during the early part of dry seasons. The relative humidity (RH) fluctuates seasonally between a mean minimum of 60 % during the dry season to about 80% during the rainy season. The moist mid-altitude agro-ecologies account mostly for growing grain cereals and legumes, root and tuber crops and other starchy staples, vegetables and a diverse range of tree crops. The farmers traditionally grow these crops sole,

mixed/intercropped. Damage caused by the pests is exacerbated by declining soil fertility faced by farmers in the agroecology.

**The savannas:** Rainfall pattern in the savannas is commonly unimodal with an average precipitation of ca. 500-1300 mm/year and minimum growing periods of about 90-140 days. In the wet savannas, mean daily temperatures and RH are similar to those in the humid and sub-humid forests zones. Insulation levels are high, with hot days and lower night temperatures producing high potential photosynthesis. Soils are with moderate nutrient and organic matter content and are acidic in some areas. In the agroecology, farmers encounter increasing problems with declining soil fertility, parasitic weeds, stem borers and a variety of flower and pod feeders which keep yields well below their potential. With increasing agricultural intensification, mainly in response to increasing population growth, many farmers in the savannas depend on long fallows to restore soil fertility.

**Dry and semi-dry areas:** The majority of farmers in arid, semi-arid and sub-humid regions in Asia and Africa grow cereals and legumes. The region is characterized by limited arable land, low/limited rainfall, terminal drought stress; cereal monoculture is a common practice in the zones. The regions are mostly intermediate and low input agricultural systems, and rely on the continuing function of the soil microbial community and its relationship with organic matter to maintain the integrity of the agro-ecosystem. The challenge is to develop more sustainable productive cropping systems and water management practices without disrupting the balance intrinsic in the traditional practices.

## 9. Operational modalities, such as information exchange, multi-institutional taskforces, competitive grants, etc

**Steering Committee (SC)** is the decision making body comprising institutionally nominated representatives of partner institutions who elect a Chair from/at any of the participating institutions. The SC ensures that proposed work plans and budgets guarantee inter-institutional collaboration, multidisciplinary approaches, use of appropriate scientific methodologies, and that the activities complement existing efforts, and respond to clearly identified felt needs. The SC endorses amendments to the SP-IPM mission and policy statements and approves financial plans and statements. The Chair serves for a renewable 3-year period and provides overall leadership, promotes collaborative linkages, advocacy/public relations, and fund raising.

**Coordinating Secretariat** is located at IITA the Program's convening center<sup>1</sup>. The Secretariat is managed by a Coordinator who serves as the global contact point to catalyze and facilitate approved activities, mobilize and disseminate resources, and facilitate communication between stakeholder groups and with donors. The coordinator serves as *ex officio* member of the Steering committee, assists in fund-raising, participates in planning and review meetings of the thematic working groups, manages the program's budget as approved by the Steering Committee, prepares financial reports, and organizes external evaluation of the program in consultation with the Steering Committee.

**Inter-Institutional Working Group (IIWG)** comprises institutionally designated representatives of partner institutions and coordinators of SP-IPM projects and thematic working groups. The IIWG meets annually for partners to discuss and agree on policy and vision, identify problems for which an inter-institutional effort could make a difference, set priorities, agree on contractual obligations, program, process and budgetary issues to strengthen collaboration, promote networking, and review progress. Occasionally, special interest groups are invited to IIWG workshops where the meeting agenda require additional expert advice.

**Thematic Working Groups (TWGs)** have primary responsibility for scientific quality of SP-IPM projects and special initiatives. TWGs are multi-institutional in membership and include representatives of key stakeholders in national and international research and development organizations. TWGs examine and analyze priority problems, develop coherent responses, and provide advisory services. Peer review by TWGs ensures that recommended responses complement existing efforts, promote synergy of efforts and respond to farmers' felt needs. Thematic groups submit proposals for approval by the Steering Committee. The TWGs also assist to link up national institutions to crop germplasm, biological control agents, specialized information, expertise and other relevant resources available from other institutions. The TWGs are

**a) Alien invasive and beneficial species (IITA-led)** to compile/update a global database of potential invaders and their related natural enemies; provide inputs to web-based early warning systems for potential invaders; revise pest status of 'circumtropical' pests of agricultural importance, search their true area of origin and scout for natural enemies; screen for best natural enemies of target pests and redistribute the natural enemies where absent; and develop national taxonomic capacity to strengthen early-warning opportunities for timely identification of ecological imbalances that cause pest problems.

**b) Crop loss and IPM impact assessment (CIP-led)** to generate/exchange information about methods and results of loss assessment and impact studies related to IPM; make inventories of studies on crop loss and impact evaluation of IPM, particularly focusing on the methods used; extract lessons from published studies to elaborate basic guidelines for impact evaluation; and encourage the incorporation of impact evaluation in existing IPM projects and in the design of new ones.

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<sup>1</sup> The SP-IPM Steering Committee decided in March 2003 and February 2004 to rotate the convening center with the Secretariat every 3 years (renewable for two terms) to new locations of successive SC Chairs.

**c) Farmer participatory research and participatory learning for IPM (CABI-led)** to facilitate constructive dialogue between stakeholder groups for a common understanding of FPR and PL approaches; provide research planners, managers and policy makers with guidelines and learning resources on FPR and PL principles and practices underpinning successful IPM; and encourage the incorporation of FPR and PL approaches in existing IPM projects and in the design of new ones.

**d) IPM policy research (FAO/Global IPM Facility-led)** to review and promote activities and outputs of SP-IPM partner organizations on the development and introduction of botanical and biological pest management agents and review constraints encountered; review extent of and promote research links of SP-IPM partner organizations to the implementation of international conventions and other instruments relevant to pest management; review and guide crop protection research projects by SP-IPM partner organizations for consistency with the SP-IPM position on the use of synthetic pesticides and guiding principles for IPM; and determine how policy-related issues could be incorporated into IPM programs.

**e) Leaf miners (ICIPE-led)** to compile/update a global database of leaf miners and their related natural enemies; revise pest status of leaf miners of agricultural importance in targeted recommendation domains; develop capacity for timely identification of leaf miners and ecological imbalances that cause leaf miners problems; and develop, test and implement IPM technologies in targeted recommendation domains.

**f) Soil biota (CIAT/ICARDA- led)** to compile/update a global database of soil biota (including arthropod pest, plant pathogens and nematodes) and their related natural enemies of agricultural importance in targeted recommendation domains; develop capacity for timely identification of noxious and beneficial soil biota and ecological imbalances that cause soil biota pest problems; develop, test and implement IPM technologies in targeted recommendation domains.

**g) Tropical whiteflies and viruses (CIAT-led)** this TWG comprises the Steering Committee of the global Tropical Whitefly IPM project to compile/update a global database of pest and vector whiteflies with associated viruses and natural enemies in diverse cropping systems; develop capacity for timely identification of pest and vector whiteflies with associated pathogens and ecological imbalances that cause leaf miners problems; and advise the SP-IPM on the status of IPM technologies in targeted recommendation domains.

## **10. Principal achievements and impacts realised to-date**

### **10.1 INCLUSIVE PARTNERSHIPS**

Towards inclusive partnership for more effective program delivery, the Steering Committee:

- Strengthened collective ownership of the Program, promoted transparency in decision-making through inter-institutional consultation on program governance, diversification of scientific leadership of seven thematic working groups (TWG) and by encouraging the integration of TWG action plans on concepts and methods with those on specific pests; the SC also encouraged the TWGs on concepts and methods to service field projects/special initiatives of the SP-IPM partner organizations.
- Reviewed the program's positioning on the concept of IPM and qualified its mission to focus on livelihood improvement in consonance with other inter-disciplinary concepts such as integrated crop management (ICM) and integrated natural resource management (INRM).
- Welcomed three new organizations to the program: BioNET INTERNATIONAL for global taxonomic linkages, IPGRI/INIBAP for strengthening of plant genetic inputs in IPM, and the World Bank for providing a policy front requiring technical IPM inputs.

### **10.2 INFORMATION GENERATION**

Scientific quality of IPM information is pursued through TWGs:

**a) Soil Biota:** The SP-IPM has recently (2004) formulated a global project "Better Lives from Healthy Soils: Integrated Pest Management in Soil Agroecosystems" aimed at enhancing food security and livelihoods of poor farmers through soil ecosystem management for soil and plant health. The project involves 11 IARCs, collaborating NARES and smallholder farmers in 40 to 50 countries of Asia, Africa, and tropical America. The inter-institutional network will breakdown isolation barriers between a large pool of soil biota scientists. A previous project concept note on sedentary nematodes and CIMMYT, ICARDA, and IITA and ARIs and Universities in Germany is incorporated in the global project proposal. The SP-IPM has also produced in 2004 its Research Brief #2 "Soil Biota and Sustainable Agriculture: Challenges and Opportunities" targeted at agricultural research managers, policy makers, and the development partners with whom governments plan IPM inputs into agricultural and rural development activities. SP-IPM Research Brief #2 addresses the challenges and opportunities presented by the great diversity of soil biota species and helps to increase public awareness of the principal groups of soil-dwelling organisms, their roles in agroecosystems, and how they can best be managed by farmers in the developing world. In addition to summarizing the current state of knowledge, the brief also outlines research needs and policy objectives that will help reinforce and support the advances already made.

In a supporting activity, IITA and CIMMYT drafted a technical field guide to assist nematology research, this will be released in 2005.

**b) Invasive Alien Species (IAS):** The SP-IPM linked with the International Plant Protection Convention/IPPC<sup>2</sup> (based at FAO-Rome) and CABI in 2003 and 2004 to build strategic alliances with broader groups such the Global Invasive Species Program/GISP<sup>3</sup> and NARS focal points that are key players in the field of IAS. The evolving broader partnership lays a foundation for the SP-IPM to revise pest status of ‘circumtropical’ pests of agricultural importance, search their true area of origin and scout for natural enemies, and convert available inventories of potential invaders and their related natural enemies into an indexed/searchable database. In this regard, a full proposal on biological control of legume pod borer *Maruca vitrata* has been developed based on a winning BMZ concept note by IITA. The project indicates specific roles by IITA, ICRISAT, CABI, AVRDC, EMBRAPA/Brazil, MARDI/Malaysia (through BioNET INTERNATIONAL), INRAB/Benin, PPRSD/Ghana, KNARDA/Nigeria. An IITA/AVRDC feasibility study<sup>4</sup> on *Apanteles taragamae* in biocontrol of *M. vitrata* is incorporated into the project proposal to support screening for best natural enemies of target pests and redistribute the natural enemies wherever absent.

**c) Leaf miner flies:** The SP-IPM developed in 2003 two interrelated databases “On line literature search on leafmining flies *Liriomyza* spp and its parasitoids” and “Global literature on leafmining flies and its natural enemies” in a wide range of cropping systems; and promoted inclusive partnership for project proposal development. Leaf miners TWG members from ICARDA, ICRISAT, INRA-CRRA Settat in Morocco, PhilRice in Philippines, and ICIPE participated in the XXII International Congress of Entomology in Brisbane, Queensland, Australia, in 2004 and used that occasion develop a project frame based on exiting activities at different participating organisations, the project frame is being developed into a project concept note.

**d) Tropical whitefly IPM project:** Phase I results of the project had provided the scientific basis for follow-up phases to focus on applied research, IPM implementation and NARS capacity building to improve understanding of whitefly and disease dynamics in critical target areas/pilot sites representing whitefly/virus “hot-spots” and where the most promising IPM practices are being evaluated. In succeeding phases of the project, three SP-IPM thematic working groups (one on whiteflies and whitefly transmitted viruses, the second on farmer participatory research/FPR and farmer participatory learning/FPL for IPM, and the third on crop loss and impact assessment) continued to provide technical assistance to the Tropical whitefly IPM project in efforts to integrate FPR, FPL and impact assessment (IA) skills. In previous years, the Tropical Whitefly IPM Project established an international network for researchers on whiteflies and whitefly-transmitted viruses in the tropics. The required FPR, FPL and IA skills will be developed by focusing on members of this network as part of the project addresses IPM needs emerging from its extensive baseline information on the diversity, distribution, economic importance of whiteflies and associated natural enemies, pathogenic viruses, and ecological imbalances causing production problems in cassava, legumes and sweet potato in target countries. Technical resources/guidelines developed by the now terminated SP-IPM project on FPR & PL for IPM will provide additional guidelines for the Tropical whitefly IPM project to encourage the incorporation of key FPR & FPL elements and approaches into on-going and planned activities.

**e) IPM policy research:** To actualize SP-IPM position statements that have policy implications, FAO/Global IPM Facility presented an evolving framework under development by the Facility to guide policy reform in support of IPM. The framework will be a tool to help define a full work plan for the SP-IPM thematic working groups on IPM policy research. The World Bank and the FAO/Global IPM Facility have urged the SP-IPM research organisations to effectively contribute to IPM policy reform e.g., identify and analyse mechanisms to feed research outputs into policy-making processes; and use policy processes to support IPM research; analyse policy framework and identify information needs to enhance the uptake of IPM; promote activities by SP-IPM and/or its partner organizations to assist national governments to meet their obligations to international conventions that are pertinent to IPM; and develop methodology for health and environmental, socio-economic (financial incentives/disincentives) impact of use of synthetic pesticides and as well as alternatives to these pesticides.

### 10.3 IPM OUTREACH/ADOPTION

<sup>2</sup> IPPC (International Plant Protection Convention) is an international treaty relating to plant health, providing international phytosanitary standards on how to prevent introduction and spread on plant pests, and to promote appropriate measures for their control. IPPC implementation is through National and Regional Plant Protection Organizations

<sup>3</sup> GISP (Global Invasive Species Program) is an enabling body, focusing on effective information exchange and networking mechanisms. Key partners on the GISP are the Scientific Committee on Problems of the Environment (SCOPE), CAB International (CABI) and the World Conservation Union (IUCN), partly funded by the United Nations Environment Programme (UNEP).

<sup>4</sup> Through a small grant from Gatsby Charitable Foundation

**Parasitic weeds:** The SP-IPM revitalized international consensus and collaboration to promote IPM of parasitic weeds in cereal–legume cropping systems in Africa. The stakeholder groups involved are SP-IPM partner research organizations, the Pan-African *Striga* Control Network (PASCON<sup>5</sup>), the Agriculture Department of FAO’s Regional Office for Africa (FAORAFA), AU’s Semi-Arid Food Grains Research and Development programme (AU/SAFGRAD), and the FAO/Global IPM Facility. These partners recognize the substantial knowledge base already established on parasitic weed management and the progress already made in demonstrating the feasibility of integrated parasitic weed management approaches, (e.g., at SP-IPM pilot sites for IPM of *Orobanche* in Morocco and Egypt, and for *Striga* in Kenya, Nigeria, Burkina Faso and Mali). The partners agree to work with countries in Africa to develop a common field programme and to identify the resources necessary to support this new collaborative effort. To this end the SP-IPM, in 2003 prepared a project concept note “Sustainable integrated parasitic weed management in cereal–legume production systems in Africa (SIPWEMA)” aimed at reducing crop losses caused by parasitic weeds and increase agricultural profitability to improve livelihoods of both men and women farmers at community and national levels. Through the SIPWEMA concept, the SP-IPM pilot sites on parasitic weeds have now graduated (in 2004) into FAO/TCP projects for *Orobanche* in food legumes in North Africa (6 countries with ICARDA providing technical back-up services) and *Striga* in staple cereals in West Africa (5 countries with IITA providing technical back-up services). The IARC partners have also initiated linkages with CropLife International to incorporate gains of prior BASF participation with CIMMYT on IR maize/herbicide seed dressing option to increase the range of IPM options and promote local seed companies for *Striga* management. In support of project activities, the SP-IPM produced and released in 2003 its Research Brief # 1 “Tackling the Scourge of Parasitic Weeds in Africa” targeted at agricultural research managers, policy makers, and the development partners with whom governments plan IPM inputs into agricultural and rural development activities. The brief discusses the challenge posed by parasitic weeds to the productivity and sustainability of cereal–legume production systems in Africa and presents ecologically sound IPM options for controlling these weeds, which have become a major factor contributing to food insecurity in the continent.

#### 10.4. IPM INFORMATION RESOURCES AND ADVOCACY

**a) SP-IPM position on POPs:** Within the framework of its position on pesticides that are persistent organic pollutants (POPs), the SP-IPM in collaboration with UNIDO hosted a consultative workshop in 2004 on the search for and promotion of alternatives to banned/restricted POPs. The workshop explored strategic alliances between researchers, national implementing programmes for POP enabling activities and the industry to develop pilot projects through which the partners will encourage national compliance with Stockholm Convention on POPs, e.g.: identify and scale-up proven biologically based alternatives/products to POPs; create awareness, secure sustainable access to the products, and encourage local production of these products (e.g., biolarvicides as alternatives to DDT in integrated vector management for malaria control); build national capacities in the search for and promotion of alternatives to POPs with a focus on training, infrastructure, and technology transfer for local production; develop and harmonize sub-registration framework for biopesticides as alternatives to POPs; and monitor, evaluate and publicise impact of alternatives to POPs, especially to help minimize the current growing demand for DDT in developing countries. The workshop recommended that pertinent stakeholder groups urgently undertake a plan to effectively address cross-cutting issues it identified as issues that stand in the way of the search and promotion of alternatives to POPs in the intervention areas of agriculture/food production, health/vector control, environment/biodiversity, construction/infrastructures, and industry. Two project concept notes and a full proposal were subsequently developed by the SP-IPM, UNIDO, NRI (UK) and Valent BioSciences (USA-based private industry on biolarvicides).

**b) IPPC, Beijing, China:** The SP-IPM was part of the international organising committee of the 15<sup>th</sup> International Plant Protection Congress (IPPC) May 2004, Beijing, China. The SP-IPM symposium at the congress featured 10 papers on the theme “Increasing the quality and usefulness of IPM research”. During the congress, the two SP-IPM partner research centers participated in Governing Board meetings of the International Association for the Plant Protection Sciences (IAPPS), the parent body of the congress.

**c) IPM of *Orobanche* and viral diseases of faba bean:** The SP-IPM pilot site hosted by Agricultural Research Center, Egypt in collaboration with ICARDA, RNE-FAO, Egypt-German IPM project, Nile Valley Red Sea project (NVRSP) organized a sub-regional workshop in 2003 at El-Fayoum governorate on the control of broomrape and viral diseases in food legumes. The workshop featured 16 papers. The discussions recognized the progress made in developing IPM technologies related to the management of faba bean pest and called for nationwide programs to enhance implementation of faba bean IPM

**d) Information resources:** SP-IPM continues to increase public awareness of the benefits of IPM by developing and disseminating (through diverse channels) various information resources and disseminated the materials. The information dissemination channels include research highlights of partners institutions; scientific publications and book chapter contributions; newsletters of partners organizations, publicity videos, information resources on CD; websites

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<sup>5</sup> PASCON is a 27-member *Striga* control network established in 1988 by FAO and the Organization of African Unity (now known as African Union, AU)

[www.cgiar.org/spipm](http://www.cgiar.org/spipm) [www.tropicalwhiteflyipmproject.cgiar.org](http://www.tropicalwhiteflyipmproject.cgiar.org); web-based newsletter with the EU supported RUNetwork: [http://www.runetwork.de/Journals/journal\\_index.php?language=english&location=SPIPm](http://www.runetwork.de/Journals/journal_index.php?language=english&location=SPIPm) Interactive.

Recent SP-IPM information resources developed are:

**In 2004:**

- Anderson P.K. and R. H. Markham. (eds) 2004. *Whiteflies and whitefly-borne viruses in the tropics: building a knowledge base for global action*. Centro Internacional de Agricultura Tropical, Cali, Colombia. (in press)
- Anderson P., and B. James. 2004. Increasing the quality and usefulness of Integrated Pest Management Research: an Overview. p 52 Abstracts 15<sup>th</sup> International Plant Protection Congress, Beijing, China, 11-16 May 2004.
- Anon 2004. The search for alternatives to banned/restricted POPs. UNIDO/SP-IPM consultative workshop , BCCA, IITA-Benin, 9-13 February 2004. Information resources on CD
- Anon 2004: Soil Biota and Sustainable Agriculture: Challenges and Opportunities. IPM research brief No. 2. SP-IPM
- Bellotti, A. C., A. Bohorquez, B. Arias, J. Vargas, H. L. Vargas, C. Mba, M. C. Duque, and J. Tohme. 2004. Recent advances in whitefly (*Aleurotrachelus socialis* Bondar: Homoptera: aleyrodidae) resistance in cassava (*mahinot esculenta* Crantz). p50 Abstracts 15<sup>th</sup> International Plant Protection Congress, Beijing, China, 11-16 May 2004
- Bergvinson, D. J, J. M. Songa, M. Mulaa, S. Mugo and D. H. de Groote. 2004 Genetic engineering as a component of IPM for maize stemborer control in Africa. p51 Abstracts 15<sup>th</sup> International Plant Protection Congress, Beijing, China, 11-16 May 2004
- Dahan. R., B. James, M. Kharrat, E.H. El Shirbini, O. Mamdouh, M. Meskine, M.E.H. Maatougui and A. Zemrag: Orobanche IPM in cereal-legume systems in North Africa. p50 Abstracts 15<sup>th</sup> International Plant Protection Congress, Beijing, China, 11-16 May 2004
- Emechebe, A. M., B. James, T.K. Atala, I. Kureh, M.A. Hussaini, B.B. Singh, A. Menkir, A.C. Odunze, J.P. Voh, S.G. Ado and S.O. Alabi: Farmer-Participatory On-farm Evaluation of *Striga hermonthica* Management Options in the Nigerian Northern Guinea Savanna Pilot Site of the SP-IPM. p51 Abstracts 15<sup>th</sup> International Plant Protection Congress, Beijing, China, 11-16 May 2004.
- Francisco, J. and G. Morales. 2004. Whiteflies (Homoptera: aleyrodidae) as virus vectors. p51 Abstracts 15<sup>th</sup> International Plant Protection Congress, Beijing, China, 11-16 May 2004
- Legg, J. P., B. Owor, J. Ndunguru, C. Fauquet. 2004. Virus diseases of cassava in Africa. p51 Abstracts 15<sup>th</sup> International Plant Protection Congress, Beijing, China, 11-16 May 2004
- Lum, K. Y 2004. Addressing taxonomic impediments for IPM development: the role of BioNET and its LOOPS. ). p51 Abstracts 15<sup>th</sup> International Plant Protection Congress, Beijing, China, 11-16 May 2004
- Tamo, M., and P. Neuenschwander. 2004. Important invasive alien species in agricultural systems: opportunities for biological control. ). p51 Abstracts 15<sup>th</sup> International Plant Protection Congress, Beijing, China, 11-16 May 2004
- Van de Fliert, E., Ann. R. Braun, Janny G. M. Vos 2004. The FPR-IPM project : exchanging experiences on participatory IPM research and learning programs, p50 Abstracts 15<sup>th</sup> International Plant Protection Congress, Beijing, China, 11-16 May 2004.

**In 2003:**

- Anon 2003. Increasing the quality and usefulness of IPM research. The SP-IPM 2001 and 2002.
- Anon 2003. LMF scientific information resources is available on CD
- Anon 2003: Report of the First External Review of the Systemwide Programme on Integrated Pest Management (SP-IPM). CGIAR Interim Science Council
- Anon 2003: Tackling the scourge of parasitic weeds in Africa. IPM research brief No. 1. The SP-IPM
- Emechebe, A. M, B. James, T.K. Atala, I. Kureh, M.A. Hussaini, B.B. Singh, A. Menkir, A.C. Odunze, J.P. Voh, S.G. Ado and S.O. Alabi. 2003. Farmer-Participatory On-farm Evaluation of *Striga hermonthica* Management Options in the Nigerian Northern Guinea Savanna Pilot Site of the SP-IPM. Sixth Biennial Conference of the African. Crop Science Society, Nairobi, Kenya, 12-17 Oct. 2003
- James, B., Neuenschwander, P., Markham, R.H., Anderson, P., Braun, A., Overholt, W., Khan, K., Makkouk, K., and Emechebe, A. (2003) Bridging the gap with the CGIAR Systemwide Program on Integrated Management. In: Maredia, K, Dakouo, D. and Mota-Sanchez, D. (eds) Integrated Pest Management in the Global Arena. CABI International, Wallingford, U.K. Pp 419-434
- Osama Al-Menoufi, Safaa Kumari and Amor Yahyaoui 2003. Integrated Management of Orobanche and Viral diseases of faba bean. Proceedings of workshop, El-Fayoum Governarate, Egypt, Sept 20 -21, 2001 (16 papers on CD; hard copies available)
- Website [www.spipm.cgiar.org](http://www.spipm.cgiar.org) updated to include partnership news in the interactive news page with RUNet

### 11. Principal outputs, milestones, and impacts expected by 2006

Output	Milestones		
	2004	2005	2006
Output 1: Mechanism to promote inter-institutional partnerships on IPM is enhanced	<ul style="list-style-type: none"> <li>• Consensus reached among partners at annual Inter-Institutional Working Group (IIWG) and Steering Committee meetings on program content, partnership, commitments and obligations.</li> <li>• Review of progress by thematic working groups on IPM concepts and methodologies (FPR &amp; PL, crop loss and impact assessment) and on specific pest threats (alien invasive species, leaf miners, soil biota, whiteflies and whitefly transmitted viruses) to assure technical/scientific quality and effective program delivery</li> <li>• Increased global visibility and advocacy of IPM through SP-IPM symposium at international plant protection conferences, congresses and planning workshops to promote inter-institutional collaboration.</li> <li>• Technical briefs, field documents, and advisory services to assist stakeholder awareness and recognition of IPM benefits, and to support the development of national plant protection policies.</li> <li>• Website and interactive newsletter updated with current IPM information from partner organizations</li> <li>• Illustrated brochures on IPM activities by partner organizations</li> </ul>	<ul style="list-style-type: none"> <li>• Consensus reached among partners at Inter-Institutional Working Group (IIWG) and Steering Committee on program content, partnership, commitments and obligations.</li> <li>• Incorporation of TWG activities on concepts and methodologies into field projects/special initiatives of the SP-IPM and/or its partner organizations.</li> <li>• Increased global visibility and advocacy of IPM through SP-IPM symposium at international plant protection conferences, congresses and planning workshops to promote inter-institutional collaboration.</li> <li>• Database of IPM projects and expertise at partner organizations to facilitate partnership building and networking.</li> <li>• Website and interactive newsletter updated with current IPM information from partner organizations.</li> <li>• Revised mission statement to increase IPM contributions to improved livelihood.</li> <li>• Technical briefs, field documents, and advisory services to assist stakeholder awareness and recognition of IPM benefits, and to support the development of national plant protection policies.</li> <li>• Bi-annual highlights of IPM activities of partner organizations</li> <li>• Sub-regional and national IPM information workshop focusing on technical and socio-political issues to facilitate end-user compliance with national and international plant protection policies and protocols.</li> </ul>	<ul style="list-style-type: none"> <li>• Review and update of program work plan and budget by Inter-Institutional Working Group (IIWG) and a Steering Committee to guide inter-institutional collaboration</li> <li>• Increased global visibility and advocacy of IPM through SP-IPM symposium at international plant protection conferences, congresses and planning workshops to promote inter-institutional collaboration.</li> <li>• Video documentaries to enhance public understanding of IPM by non-specialists and encourage donor investment in IPM</li> <li>• Technical briefs, field documents, and advisory services to assist stakeholder awareness and recognition of IPM benefits, and to support the development of national plant protection policies.</li> </ul>

**Principal outputs, milestones, and impacts expected by 2006 (contd.)**

Output	Milestones		
	2004	2005	2006
Output 2: Constraints to and opportunities for IPM in crop/pest systems analyzed	<ul style="list-style-type: none"> <li>• Scientific information database of identity, incidence, distribution, biology, ecology, control options and collections of leaf miners and associated natural enemies in target cropping systems.</li> <li>• A reference collection and geo-referenced maps of distribution of leaf miners in target cropping systems</li> <li>• Recommendations to incorporate alternatives to hazardous pesticides into food production practices.</li> </ul>	<ul style="list-style-type: none"> <li>• Scientific information database of identity, incidence, distribution, biology, ecology, control options and collections of soil biota and associated natural enemies in target cropping systems.</li> <li>• Scientific information database of identity, incidence, distribution, biology, ecology, control options and collections of alien invasive species and associated natural enemies.</li> <li>• Base line information on post-harvest IPM problems and related IPM opportunities.</li> <li>• Review of national procedures and policies affecting the application of bio-pesticides and botanical pesticides.</li> <li>• A reference collection and geo-referenced maps of distribution of soil biota in target cropping systems.</li> <li>• A reference collection and geo-referenced maps of distribution of alien invasive species in target cropping systems.</li> </ul>	<ul style="list-style-type: none"> <li>• Scientific information database of identity, incidence, distribution, biology, ecology, control options and collections of food legume pests and associated natural enemies.</li> <li>• A feasibility studies for local production of biopesticides and botanical pesticides.</li> <li>• Harmonized international regulatory framework on production, end-user access and application of biopesticide alternatives to hazardous pesticides.</li> <li>• A reference collection and geo-referenced maps of distribution of food legume pests in target cropping systems</li> </ul>

## Principal outputs, milestones, and impacts expected by 2006 (contd.)

Output	Milestones		
	2004	2005	2006
Output 3: Ecologically sound IPM options generated, improved, and evaluated	<ul style="list-style-type: none"> <li>• Catalogue of cereals and legume varieties with proven resistance against parasitic weeds in different production ecologies.</li> <li>• Catalogue of root and tuber crops with proven resistance to whiteflies and whitefly transmitted viruses in different production ecologies.</li> <li>• Databases of farmer tested trap crops/plants with proven ability to induce suicidal germination of parasitic weeds in cereal-legume cropping systems in different production ecologies.</li> <li>• Ecologically sound and client-oriented IPM options to control whiteflies and whitefly transmitted viruses in cassava, legumes and sweet potato.</li> <li>• Case studies embodying novel approaches to loss assessment such as quantifying opportunities for gains through IPM implementation</li> </ul>	<ul style="list-style-type: none"> <li>• Field-tested methodologies and client-oriented approaches to quantify crop losses due to pests in selected food cropping systems.</li> <li>• Diagnostic surveys on agronomic, socioeconomic, &amp; epidemiological features of soil biota in diverse cropping systems.</li> <li>• Diagnostic surveys on agronomic, socioeconomic, &amp; epidemiological features of leaf miners in diverse vegetables, horticultural and ornamental crops.</li> <li>• Phytosanitary field protocols against whiteflies and whitefly transmitted viruses in any of cassava, legumes and sweet potato.</li> </ul>	<ul style="list-style-type: none"> <li>• Catalogue of vegetables, horticultural and ornamental crop varieties with proven resistance to key pests in different production ecologies.</li> <li>• Isolates of soil borne pathogens with proven ability in biological control/antagonist of key pests in target cropping systems.</li> <li>• Database of biologically based alternatives to POP pesticides including publicized impact of these alternatives</li> <li>• Availability of early warning methodologies for potential alien invasive pest species.</li> <li>• Field-tested methodologies and client-oriented approaches with practical indicators to fully quantify the impact/benefits of IPM on national economies, food security, and the environment in selected food cropping systems.</li> </ul>

**Principal outputs, milestones, and impacts expected by 2006 (contd.)**

Output	Milestones		
	2004	2005	2006
Output 4: National capacity to increase agricultural productivity and profitability strengthened	<ul style="list-style-type: none"> <li>• Synthesized information on mentored study tour exchanges and learning workshop on FPR &amp; PL approaches for IPM</li> <li>• Field tested guidelines and client-oriented approaches to assist project managers to incorporate Farmer Participatory Research and Learning processes into IPM projects and programs and promote IPM</li> <li>• Recommendations on novel approaches to promote IPM researcher-farmer-level partnerships</li> <li>• Pilot sites for IPM of whiteflies and whitefly transmitted viruses established in Latin America, Asia and Africa.</li> <li>• Regional FAO/TCP field program (based on prior SP-IPM pilot site results of farmer tested best-bet clusters of IPM options) initiated to control Striga in cereal-food legume cropping systems in sub-Saharan Africa, and Orobanche in food legume systems in North Africa.</li> <li>• Facilitation of national capacities in the search for and promotion of alternatives to POPs with a focus on training, infrastructure, and technology transfer for local production.</li> </ul>	<ul style="list-style-type: none"> <li>• Taxonomic tools and products to identify and collect selected soil biota, leaf miners, alien invasive species and post-harvest storage pests, and their natural enemies.</li> <li>• National biodiversity monitoring schemes to report new pests, alien invaders and associated natural enemies.</li> <li>• Database of type and sources of biopesticides and botanical alternatives to synthetic pesticides in selected cropping systems.</li> <li>• Bench, group, post-graduate and field-based training to strengthen IPM capacities and improve the quality of taxonomic information required to reduce international quarantine risks and increase trade opportunities.</li> <li>• Baseline information on bio-physical and socio-economic features at proposed localities for new pilot sites</li> <li>• Participatory problem analyses and identification of 'best bet' IPM options for technology testing and adaptation at new pilot sites</li> <li>• New pilot sites established for farmer learning, testing, evaluation and adaptation of IPM options against leaf miners; post-harvest pests, soil pests, food legume pests.</li> <li>• Community-based seed multiplication plots established for farmer-preferred varieties tolerant/resistant to key pests.</li> <li>• A research guide for technicians to sample, identify and evaluate key pests in target cropping systems.</li> </ul>	<ul style="list-style-type: none"> <li>• Increased IPM literacy and awareness in farming communities</li> <li>• Greater incorporation of new IPM knowledge and skills in formal and informal education training curricula in target countries</li> <li>• Wider adoption of biological alternatives to hazardous pesticides</li> <li>• Greater numbers of women farmers are reached beyond the stated training targets</li> <li>• Greater numbers of farmers routinely apply IPM options against target pests</li> <li>• Greater numbers of farmers innovative on what they learn</li> <li>• Greater reduction in labor/drudgery in controlling key pests through IPM practices</li> <li>• Greater reduction in temporal and spatial incidence and damage of target pests in farmers' fields</li> <li>• Bench, group post-graduate and field-based training continued.</li> </ul>

**Principal outputs, milestones, and impacts expected by 2006 (contd.)**

Output	Milestones		
	2004	2005	2006
Output 5: Policy options in IPM are analyzed, evaluated and promoted	<ul style="list-style-type: none"> <li>• Facilitation of national activities to enable governments to meet their obligations to international conventions on pesticide safeguards policies.</li> <li>• Inter-institutional agreements to exclude POPs, Class I and (where feasible) Class II compounds in IPM research and recommendations, and to focus IPM research, development and training on non-toxic and/or low toxic methods and materials (e.g. Class U, biological organisms)</li> <li>• Greater end-user awareness with sustainable access to biologically based alternatives to POPs</li> </ul>	<ul style="list-style-type: none"> <li>• Thematic reviews of operational environments (e.g., institutions, human capacities, technical resources, policies, trade impacts) guiding IPM development in selected countries in any of the sub-regions Latin America, West Asia, Near East and North Africa, Central Asia, SE Asia, and sub-Saharan Africa.</li> <li>• Inter-institutional consensus on mechanisms to incorporate biotechnology tools and products (transgenic crops and arthropods) in IPM</li> <li>• Greater level of private sector participation in the program's technology/product development and dissemination activities</li> <li>• Greater level of NGO participation in the program's technology/product development and dissemination activities</li> </ul>	<ul style="list-style-type: none"> <li>• Practical indicators on technical, environmental and socio-economic concerns to guide the incorporation of genetically modified crops in IPM.</li> <li>• Analyzed data on benefits of IPM on national economies, food security, and the environment</li> <li>• Advisory service on international regulatory framework for plant protection products</li> <li>• Guidelines to incorporate genetically modified crops in IPM</li> <li>• Database of type of market opportunities enabling farmers to benefit from new IPM technologies</li> </ul>

**Gains (Impact)**

- Increase quality and usefulness of IPM research promotes CGIAR outputs on germplasm improvement, germplasm collections, sustainable production, policy environment, and enhancing NARES.
- Sustained inter-institutional partnerships between international and national institutes, organizations and programs increases national efforts to produce more food with minimal damage to agric and natural ecosystems to raise living standards.
- Increased end-user access to IPM resources contributes to greater food security and poverty reduction through reduction of yield losses and increase in food quality.
- Greater public-private sector partnerships promotes IPM for better personal and environmental health, improved environmental quality, and increased income opportunities for farmers.
- Improved equity and gender balance through better access to pest management technologies by resource poor farmers, especially women increases on- and off-farm incomes for women (farmers, food processors, traders).
- Improved NARES and NGOs capacity building in IPM through training and skills development and information campaigns at all levels promotes IPM adoption.

## 12. Financial information

### a) History of funding to-date, USD'000

Source	Fungible (Y/N)	Year 1 1995/6	Year 2 1997	Year 3 1998	Year 4 1999	Year 5 2000	Year 6 2001	Year 7 2002	Year 8 2003	Year 9 2004
Switzerland	N	127,076	154,485	136,407	133,156	125,786	115,654	118,800	144,928	158,228
Norway	N	170,121	145,964	-	127,110	116,276	109,743	173,394	-	-
Italy	N	-	-	-	-	-	-	177,702	120,000 <sup>6</sup>	-
World Bank/CGIAR	N	-	-	-	300,000	-	-	150,000	150,000	-
<b>Total for year</b>	<b>N</b>	<b>297,197</b>	<b>300,449</b>	<b>136,407</b>	<b>560,266</b>	<b>242,062</b>	<b>225,397</b>	<b>619,896</b>	<b>414,928</b>	<b>158,228</b>

### b) Funding requirements and expected sources to 2006 to achieve principal outputs, milestones and impacts

Source	Fungible (Y/N)	2004	2005	2006
<b>Total required</b>	<b>N</b>	<b>720.0</b>	<b>740.0</b>	<b>750</b>
Expected from Switzerland	N	170,000	180,000	180,000
Norway	N	100,000	100,000	100,000
Italy	N	120,000	130,000	130,000
World Bank/CGIAR	N	150,000	150,000	150,000
Additional required <sup>7</sup>	N	120,00	100.0	50.0

<sup>6</sup> Payment from Italy is yet to be received by IITA

<sup>7</sup> Additional funds required = funds anticipated to launch and leverage support for sub-regional/global research and outreach special projects on soil biota and leaf miner flies in Africa, Asia and Latin America