

## 3.3 NATIONAL AGRICULTURE EXTENSION PROGRAM



The establishment of an effective national agriculture extension service is vital to the development of agricultural capacity in Iraq, where farmers have little access to information on improved agricultural practices.

Extension services in Iraq have traditionally relied on mass media (television, radio, leaflets), formal farmer training in classrooms, and demonstration plots. Mass media efforts are often centrally generated, with little consideration for individual farmers' situations or needs, or even for regional variations. Formal training and demonstrations reach only a small fraction of farmers and are inefficient because farmers must be transported to the training sites, which is expensive and time-consuming for the farmer.

Participatory extension services delivered at the farm level are a viable alternative to help farmers adopt new agricultural methods. Rather than present instructions and recommendations at a central agency to farmers, extension

**Farmers attending a field day to observe trials of different wheat varieties and differing technology packages.**

agents provide a “real world” environment in which small groups of farmers can put what they are learning into practice and test it with their peers. The extension agent facilitates these group meetings, which are held on the fields of one of the participating farmers, and supports farmers in solving their production problems. Farmers are able to provide practical feedback to one another, and direct specific questions to the extension agent.

The first step in building such an extension service is to convince government policy makers, extension agents, farmers, and academics of the need to adopt participatory extension practices, and gain consensus on how to proceed. ARDI for this reason, embarked on a series of workshops and meetings that set priorities for establishing those services and took the initial steps to put them into practice.

For extension agents to change their role from that of instructor to one of facilitator requires that agents learn a new set of skills in participatory extension. ARDI helped the Ministry of Agriculture (MOA) to educate a select core of its staff in new ways of providing farmers with responsive participatory extension services at the field and community levels. This core group of “participatory trainers” then trained more field staff as the foundation for a nationwide network of effective participatory extension agents.

In the absence of private sector extension services (which farmers cannot yet afford), the MOA has established extension centers in each of the country’s 18 governorates, as well as 32 model farms. These extension centers needed the basic necessities – from desks to computer equipment – to allow their agents to function efficiently in their jobs. ARDI renovated one public and one non-governmental organization’s extension center and provided equipment to eleven others (including training and media centers within those facilities). The improved extension centers and new technologies benefit not only their employees, but also the tens of thousands of farmers they serve each year.

**TABLE 9I EXTENSION PROJECTS IN IRAQ**

<b>Activity</b>	<b>Number of Projects</b>	<b>ACTIVITIES Primary Beneficiaries</b>
<b>Developing a Strategy for Participatory Extension</b>	5	3 strategy meeting workshops (MOA) 6 farmer workshops
<b>Training Extension Agents</b>	7	1 training for trainers course (MOA) 12 field agent courses (MOA)
<b>Renovating and Equipping Extension Centers</b>	13	2 to renovate extension and training centers (1 NGO, 1 MOA) 10 to equip training and extension centers (3 NGO, 7 MOA) 1 to provide IT equipment to the State Board of Agricultural Extension (MOA)

## DEVELOPING A PARTICIPATORY EXTENSION STRATEGY



### BACKGROUND

ARDI helped set the stage for developing a nationwide extension service by bringing together over 300 government decision makers, extension agents, academics, and farmers in a series of workshops and meetings. Over an 18-month period, participants gradually came to understand and advocate nationwide participatory extension services.

### ACTIVITIES

Participatory extension was introduced to the MOA in a stepwise fashion. During February 2005, ARDI staff reviewed the current extension situation in Iraq and later in the month began holding discussions with various heads of MOA extension and technical departments, as well as university specialists. At the IPM Workshop (see Section 3.5) held in February 2005, participants noted that there was a strong need to promote good crop husbandry through working with farmers in the field.

Farmers practicing pruning at a farmer meeting in a pomegranate orchard, Sulaymaniyah

**National Vision Workshop.** The Director General of the State Board of Extension was extremely supportive of the idea that the MOA needed to revitalize its extension services and change its extension methodology. However, to convince extension service staff that these changes were needed, a national extension vision workshop was held in July 2005 to:

- Formulate a national extension vision that the MOA can sustain using its own resources.
- Agree on a basic methodology that can be used in all extension activities.
- Agree on the structure of the extension service, the extent of its coverage, and the roles of extension staff.
- Identify the steps needed to implement the vision.

Sixty-two participants from the MOAs in Baghdad, Erbil, and Sulaymaniyah, state boards, governorate directorates of agriculture, and state-run enterprises attended the two-day workshop. Participants agreed that a program to train extension staff in adult learning and communications methods, and participatory techniques should be developed and implemented. The Director General had a clear vision of what was needed to revitalize the extension service, and agreed to ARDI's proposed methodology of locating extension agents at the village/community level to work with farmers in groups of 12-15 people each. This was a fundamental change to the extension system – taking extension to farmers rather than bringing farmers to extension.

**Farmer Extension Workshops.** In November and December 2005, after consensus was reached with the State Board for Extension in Baghdad and the MOAs in Erbil and Sulaymaniyah to implement a participatory extension program, ARDI invited farmers to attend a series of workshops in Dahuk, Erbil, and Sulaymaniyah to determine farmers' needs for information and support. The workshops identified major production constraints, compared farmer crop production practices to recommended practices, and obtained farmers' perceptions on extension services and ways to improve them.

Farmers were asked which crops they wished to include in their workshop activities, and chose wheat, apples, grapes, and tomatoes. Many of the major problems they experienced (especially for wheat) could be attributed to past MOA policies of providing equipment, fertilizers, and pesticides at subsidized prices; and both farmers and extension agents looked forward to the return of this system. There was also a general feeling among farmers and extension staff that the government should solve all their problems, especially those concerned with inputs. Surprisingly, lack of production knowledge was not perceived to be a problem.

Poor quality pesticides, from both public and private sources, and lack of certified seed were noted by farmers as major constraints. ARDI was already addressing these concerns through other activities (see, for example, Section 3.5 on the pesticide dealers association and Section 2.3 on high-value agricultural products).

The suggestions made for improving extension services centered on providing more training courses, increasing the number of extension centers and

demonstration plots, and distributing more materials. This was understandable, given that farmers and extension agents had no experience with alternative approaches.

**Strategy Meetings with Director General of Extension.** Following the assassination of the Director General of Extension in September 2005, ARDI staff met twice with the new Director General and his staff to explain and discuss the training conducted to date (see below) and ARDI's collaboration with state board programs. In October, ARDI obtained his views on the new extension activities. After much discussion during this meeting, those present largely agreed that training in participatory methodology should be provided by qualified participatory trainers with practical experience, rather than by university professors.

The December meeting was held to build a common understanding on how to develop and expand the extension program, identify criteria for selecting field staff for the facilitator participatory training courses, and agree on facilitator field activities following the courses. It was agreed that field staff would be based at the model farms and would work closely with groups of farmers in the immediate vicinity. As more staff were trained, they would be located in villages and establish farmer groups closer to the villages. ARDI estimated that a minimum of 5,000 facilitators would eventually be needed to provide regular services, across the country, to farmers at the village level.

**Farmers at an orchard pest management meeting in Dahuk**



**National Extension Workshop.** To help introduce the new methodology in Iraq's governorates, ARDI organized a national workshop in May 2006. Led by 15 ARDI-trained participatory trainers, the workshop described the program to senior governorate extension staff. This two-day workshop was also an opportunity for state board trainers to demonstrate their new skills to governorate staff.

**RESULTS**

Most of the participants at the national vision workshop left with a better awareness of the need for change in Iraq's extension service and a greater understanding of the participatory methodology. By the end of the workshop, they had agreed to use participatory methods and to provide extension agents with the support they need.

From the farmer extension workshops, it became apparent that new extension activities needed to be planned carefully. Based on farmer responses, participants decided that pesticides application and pest management techniques, alternate crops to wheat, beekeeping, and tree pruning were good starting points for extension activities.

The meetings with the new Director General and other MOA staff proved extremely productive in that agreement was reached to develop and implement an extension system based on active farmer participation;

activities would be undertaken on the farmers' own fields. This was a complete reversal of the previous system where farmers were brought to formal training at demonstration plots and extension centers.

**TABLE 92 EXTENSION WORKSHOPS AND STRATEGY MEETINGS**

Activity	Participants
National Extension Vision Workshop	62
Farmer Extension Workshops	222
Strategy Meetings	13
National Extension Workshop	38
<b>Total</b>	<b>335</b>

## TRAINING EXTENSION STAFF



### ACTIVITIES

After the Director General of the State Board had agreed to introduce participatory extension methodology, the Centre for Development Services/Near East Foundation from Cairo, Egypt, gave a nine-week training-of-trainers course in Erbil. Fifteen MOA staff from across the country were trained. These staff, who then became “participatory trainers,” will form the core group of the new extension service and train other extension agents in agriculture extension approaches, communication skills, adult learning theory, and facilitation.

Between January and July 2005, 12 courses were held in Erbil. There, the participatory trainers instructed additional MOA field staff from all of Iraq’s governorates. For this first round of courses, the trainers were monitored and coached by the Near East Foundation. ARDI requested that the criteria for field staff selection for training emphasize that candidates be young, open-minded,

A farmer who participated in a sheep mating farmer group meeting for 15 female breeders in Dahuk.

*“We need her to teach us again and really appreciate her working with us. If all Agricultural engineers sit with us as you did, then you can expect more and more improvement from us.”*



**ARDI provided nationwide extension services in all governorates.**

willing to learn and adopt new methods, deal with farmers on a daily basis, and be “people oriented.” The MOA and participatory trainers observed the training sessions to identify future trainers and master trainers.

**RESULTS**

Following the first round of training, farmer groups were established by MOA staff in Dahuk, Erbil, Muthanna, Ninewa, Salah al-Din, Sulaymaniyah, and Wasit, while after the second round additional groups were established in Kerbala. In total, 27 farmer groups were established, involving 416 farmers.

The facilitators provided information on improved cultivation techniques and other technical information. The farmer groups shared their knowledge with each other, allowing the extension agents to adapt crop production recommendations suited to local knowledge, farmers’ resources, and local conditions. The improved extension services will provide more effective assistance to farmers to raise agricultural production and increase farmers’ income.

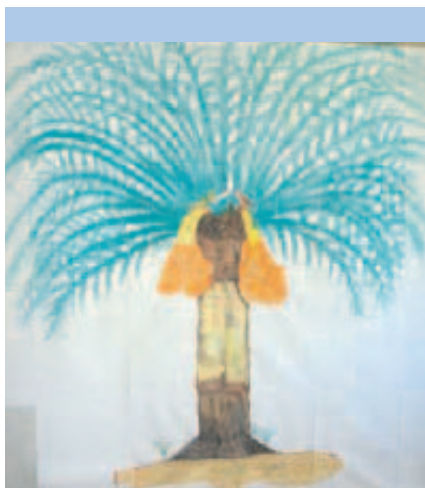
Field implementation was slower than anticipated because the State Board/MOA Baghdad was slow to issue official approvals to the governorates to implement the participatory program with farmer groups. The groups that were established were the result of individual trainers and facilitators who became convinced of the benefits of the methodology and were willing to proceed without official approval.

Two NGO staff members were included in the second round of training because they were horticultural technicians who were working with farmer groups on other ARDI activities. These two technicians established 4 farmer groups in Dahuk and 7 in Sulaymaniyah, involving 115 farmers.

On September 12, 2006, the Deputy Director General (Rural Development) of the State Board for Extension informed ARDI that the Minister had approved the participatory methodology and that the State Board had issued instructions to the governorates to proceed with implementation. This instruction also applied to the Extension Divisions of the governorates’ Departments of Agriculture.

**TABLE 93 EXTENSION TRAINING**

Activity	Participants
Training of Trainers	15
Field Agent Training	174 (including two NGO staff)
<b>Total</b>	<b>191</b>



The participatory trainers drew this “extension tree,” which illustrates the extension methodology they learned during the training course. The soil represents research-extension-farmer linkages, supporting the trunk of participatory extension, while the leaves correspond to the structure and contents. The date palm’s fruits symbolize trainers and trainees.



## 3.4 PARTICIPATORY ASSESSMENT AND PROJECT IDEA DEVELOPMENT (PAPID)



When ARDI began working in Iraq in late 2003, one of the urgent priorities was information gathering through extended discussions with major stakeholders in agricultural development in Iraq. Through its offices in Baghdad, ARDI staff had close and regular contact with the Ministry of Agriculture and the University of Baghdad Schools of Agriculture and Veterinary Sciences. ARDI also conducted formal meetings with prominent figures in agri-business, and major producers in the agricultural and animal production sectors. These sources of information and deep experience, together with a concentrated search of available literature, enabled ARDI to begin planning a comprehensive and coherent strategy for reconstruction and development of the agricultural sector in Iraq.

However, ARDI staff also recognized the need for knowledge and information at the grass-roots level, in order to gain a deeper understanding of the state of agricultural development from the perspective of small farmers, their priorities

**Village leaders worked closely with ARDI facilitators to identify priority needs for each village.**

and needs, and how planning and policy making at the national level was likely to impact individual farmers far removed from the centers of decision making. This information was especially important to design community-based project activities, especially direct grants, which were most often implemented at the level of the individual community, or small group of communities. This rich body of knowledge could only be tapped through direct contact with small farmers at the village level, utilizing a series of activities designed to elicit reliable information from people who might otherwise be reticent to speak frankly with outsiders.



ARDI staff designed the Participatory Assessment and Project Idea Development (PAPID) project specifically to obtain detailed information from individual producers at the village level, and to understand the constraints that villagers confronted in meeting their goals. Launched in May, 2004, ARDI worked closely with a local NGO in the northern governorate of Sulaymaniyah to select and train local facilitators who could implement the project. The facilitators were selected for their background in agriculture, sense of commitment to community action, and awareness of the importance of gender and ethnic background. Eight facilitators were chosen, 3 women and 5 men, and they received extensive training in PAPID techniques by an ARDI specialist working through the local NGO. ARDI and the NGO also collaborated in determining criteria for village selection, which included (apart from security concerns) agriculture as the principal source of employment and income, and capacity for a strong working relationship through committed community leaders.

The first phase of the project was designed as a pilot, and included two villages in Sulaymaniyah. All interested adults (men and women), together with community leaders, were invited to participate in a three-day series of workshops and activities designed to elicit issues of greatest concern, unique needs of the village, possible solutions to existing problems, and constraints to development. The focus was on consensus building, and the trained facilitators used a variety of techniques, including brainstorming sessions, prioritization methods, and village map construction to visualize problem areas and sources of community strength.

Using the experience gained through implementation of the first phase of the project, ARDI launched PAPID Phase II, which covered 5 additional villages in the governorate. The final results of the activities in the 7 communities were

analyzed, and proved to be extremely useful for ARDI programming and project implementation.

First, the results confirmed that ARDI was on the right track in terms of “macro” level project design. The villagers repeatedly mentioned the lack of high-quality seed, the poor repair of farm machinery, and the shortage of water for irrigation and animals as major concerns, and these were all areas of ARDI program concentration. This information also proved valuable to ARDI staff in

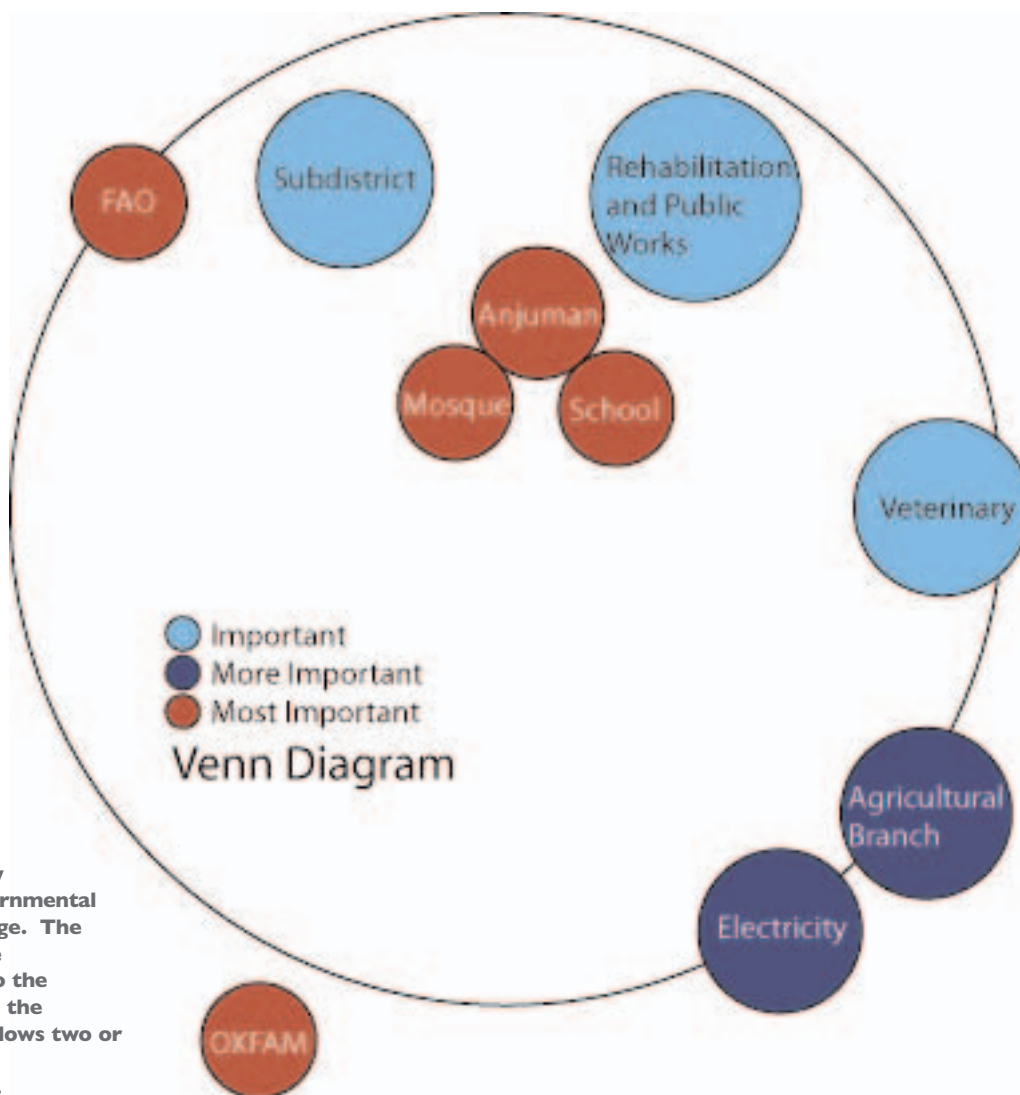


understanding how best to implement the various projects (such as wheat seed multiplication, or tractor repairs) to the greatest benefit of individual farmers.

The information gleaned through PAPID I and II was also critical to grants programming and implementation. A majority of the village irrigation projects were based on information obtained through these community studies, as well as other projects such as orchard improvements and training of village tractor mechanics. One major grant activity area that was a direct result of PAPID was the selection of honey production as a viable community-level alternative for agricultural development. From initial results obtained through PAPID I the first beekeeping project was designed, and 82 participating farmers from the first two villages began working with bees, and eventually became members of the Sulaymaniyah Beekeepers Association. The beekeeping project expanded even more after the conclusion of PAPID II, and eventually reached 8 communities in the governorates of Sulaymaniyah, Tameem, Ninewa, and Diyala (see Section 2.3.).

The farmers in these villages claimed that the high degree of success of the projects was due, in large part, to the fact that they, themselves were instrumental in developing the project.

Women played a key role in PAPID implementation and were included in all decisions reached during the exercise. The women and men who helped develop the beekeeping project also actively reached out to specifically include women heads-of-household, widows, and other disadvantaged members of the community. As a direct result of these concerns, 44% of the original 82 participants in the beekeeping project were women.



This diagram illustrates how governmental and non-governmental institutions impact this village. The colors represent the relative importance of each entity to the villagers who participated in the workshop. This technique allows two or more items to be linked by characteristics or attributes.

## 3.5 NATIONAL PROGRAM INTEGRATED PEST MANAGEMENT (IPM)

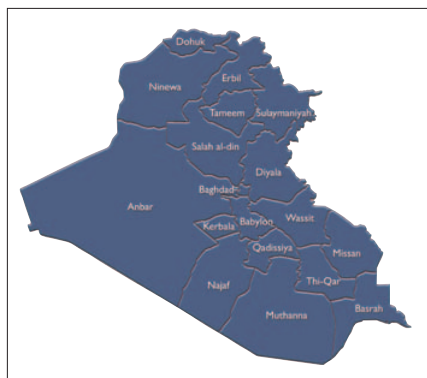


**Fruit pests, as shown in this photograph, are common in fruit orchards in the North.**

The prevalence of destructive pests has severely reduced production in many parts of Iraq. The Sunn pest, for example, destroys about 17% of the wheat crop in the northern governorates, and renders much of harvested wheat unfit for human consumption (see Section 2.1 for discussion of Sunn pest). Several exotic species (e.g., screw worm, jasmine white fly, citrus leaf miner, Colorado potato beetle) have invaded Iraq in the past ten years, affecting livestock, citrus and potato.

Integrated Pest Management (IPM) is the use of all available techniques – cultural, mechanical, chemical, and biological – to manage pest populations. Cultural and mechanical methods involve crop agronomy practices, so good crop management is essential to successful IPM. (ARDI's work to improve cereal grain and high-value agricultural crops is summarized in Section 2 of this report.)

IPM uses pesticides only when they are absolutely necessary. Pesticide use is



**ARDI provided nationwide IPM services in all governorates.**

normally reduced when farmers practice IPM, decreasing their input costs and increasing their profits. In addition, IPM uses pesticides of lower toxicity and persistence wherever possible. This, together with rational and reduced use, has benefits for food quality, human health, and the environment.

While Iraq had made modest attempts to introduce bio-control agents, much of the infrastructure required to support biological control programs was destroyed or looted in 2003. The MOA was able to rebuild some of these units, but still needs additional infrastructure to further develop the government's program for mass-rearing beneficial insects.<sup>1</sup>

The Iraqi government recognizes the potential for IPM in Iraq, and the MOA has stated that IPM is "a vital issue to Iraq rather than an option." Yet many obstacles remain to be overcome on the part of the government, private sector, and farmers. For example:

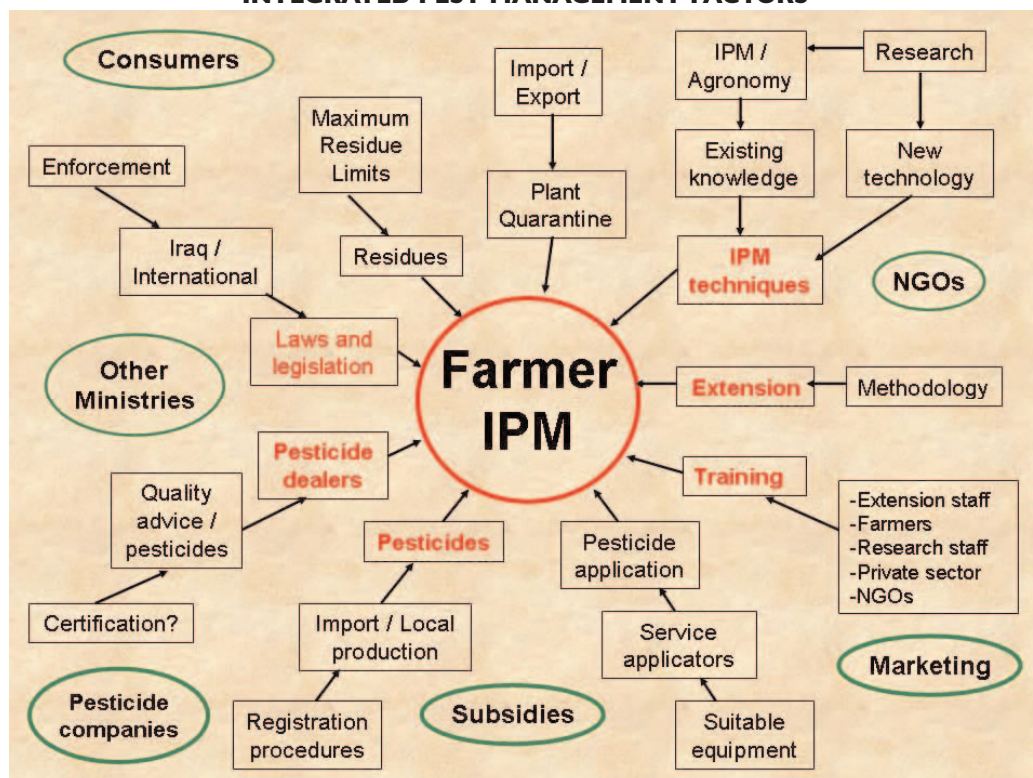
- Crop agronomy and pest/pesticide recommendations exist for all major crops in Iraq, as do many nonchemical pest management strategies. However, this information is fragmented and has not been incorporated into overall crop production recommendation packages. There is thus a need to develop overall crop production recommendations for extension programs, as well as to establish priorities and coordination for crop and IPM research packages.
- The MOA's pesticide registration and control programs need to be improved to ensure that farmers can confidently access quality and safe pesticides for IPM.
- Pesticide dealers provide both pesticides and advice to farmers on their use. At present, the quality of both products and advice is poor in Iraq.
- Iraqi farmers are used to relying on chemical pest control, so they need to change their perceptions and attitudes to adopt IPM. This change requires education through extension, using messages and techniques that educate and persuade farmers rather than send direct instructions. (see Section 3.5).

When developing the IPM program, ARDI was conscious that sustainable farmer IPM is not simply a case of having a) suitable strategies for farmers to implement, b) an effective extension service to educate farmers and c) available inputs. External factors can support or hinder the implementation of IPM, and these need to be considered when promoting IPM. The diagram illustrates all of the factors affecting sustainable farmer IPM. Those marked in red are factors on which ARDI concentrated its activities.

ARDI undertook two major activities to lay the foundations for a national IPM effort in Iraq. First, we worked with stakeholders from all sectors to develop a vision for a national IPM program. Second, we helped private sector pesticide dealers to improve their services and businesses. Additional activities included training farmers to use pesticides safely and preparing the USAID-required

<sup>1</sup> ARDI had planned a project to supply greenhouses, growth chambers, and laboratory equipment to the MOA for the mass-rearing of beneficial insects in seven governorates. However, this project was canceled because of the prolonged illness of the MOA staff counterpart responsible for this activity.

**INTEGRATED PEST MANAGEMENT FACTORS**



Pesticide Evaluation Report and Safer Use Action Plan (PERSUAP).

Together, these activities should contribute to increased crop production from farmers using improved-quality pesticides, and over time, increased revenues for pesticide dealers once farmers begin to trust the products they sell.

- Laying the foundation for a national IPM program
- Improving pesticide dealer services
- Training farmers to use pesticides safely
- Preparing the Pesticide Evaluation Report and Safer Use Action Plan (PERSUAP)

**TABLE 94 NATIONWIDE IPM PROJECTS**

Activity	Number of Projects	Projects Primary Beneficiaries
Laying the Foundation for a National IPM Program	5	1 IPM workshop (MOA) 1 national IPM vision workshop (MOA, universities) 1 wheat IPM workshop (MOA, farmers, universities) 1 pesticide registration procedures meeting (MOA) 1 date palm conference (MOA)
Improving Pesticide Dealer Services	2	1 to form a pesticide dealers association (private sector) 1 to train pesticide dealers (private sector)
Training Farmers to Use Pesticides Safely	2	1 to train trainers 1 to train farmers in 480 villages (farmers)
PERSUAP Evaluation	1	1 Pesticide Evaluation Report and Safer Use Action Plan (Internal ARDI – USAID activity)



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**AGRICULTURE RECONSTRUCTION AND  
DEVELOPMENT PLAN FOR IRAQ**

**PESTICIDE EVALUATION AND SAFER USE ACTION  
PLAN (PERSUAP)**

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**LAYING THE FOUNDATION FOR A NATIONAL IPM PROGRAM**



Although Iraq's government has recognized the need for IPM, little was done previously to put it into practice. Thus, ARDI arranged for a series of workshops to gain consensus on the most pressing pesticide management needs in Iraq, to begin setting priorities for more comprehensive programs, and to give Iraqi pest management specialists wider exposure to pest control efforts in neighboring countries.

**A series of workshops were held to prepare for a National Integrated Pest Management Program.**

<b>Activity</b>	<b>Participants</b>
Initial IPM Workshop	88
National IPM Vision Workshop	74
Wheat IPM Workshop	71
Pesticide Registration Procedures	2
Date Palm Conference	3
<b>Total</b>	<b>238</b>

**INITIAL IPM WORKSHOP****BACKGROUND**

ARDI staff had little information on the status of IPM in Iraq when the project began. To correct this situation, it held an IPM workshop early in 2005.

**ACTIVITIES**

The workshop was held in Erbil on February 23, 2005, and a total of 88 participants from the Ministries of Agriculture in Dahuk, Erbil, Sulaymaniyah, and Baghdad attended. During the workshop, the participants:

- Discussed the core concepts of IPM.
- Explored nonchemical strategies to minimize pest and disease levels.
- Identified perceived needs in pest management knowledge and skills.
- Began developing national strategies for extension and pest management services to farmers.

**RESULTS**

The workshop evaluated participants' understanding and knowledge of core IPM concepts, identified major crop/pest/disease problems, identified non-pesticide control methods, and discussed the needs for skills training, IPM practices, and extension practices.

**NATIONAL IPM VISION WORKSHOP****BACKGROUND**

Following discussions with MOA staff in Erbil, Sulaymaniyah, and Baghdad, agreement was reached on the need for an expanded workshop to discuss IPM implementation in Iraq, the factors affecting farmer IPM, and to establish priorities. More specifically, the purposes of the workshop were to:

- Formulate a national IPM vision and establish objectives for its implementation;
- Set priorities to address crops and associated pest/disease/weed complexes;
- Identify activities to address problems and provide support to sustainable farmer IPM;
- Determine the role of the private sector in the provision of IPM services and how to promote this role;
- Identify ways to coordinate among relevant authorities in different sections of the government.

**ACTIVITIES**

The workshop was held in Sulaymaniyah on July 17-18, 2005. The 74 participants included staff from the Ministries of Agriculture in Erbil, Sulaymaniyah, and Baghdad; State Boards for Plant Protection and Agricultural



**Participants at the National IPM Vision Workshop**

Research; governorate directors of Plant Protection; College of Agriculture at Baghdad University; Ministry of Science and Technology; and Ministry of Environment. The participants were divided into working groups and asked to formulate a vision of the state of IPM in Iraq in 2010.

## **RESULTS**

The working groups developed a vision for IPM in 2010 that included farmers, research and extension institutions and the private sector, and considered laws, regulations, and codes for pesticides. They also established priorities for crops and their associated pests/weeds/diseases by Iraq's three principle geo-ecological zones. Last, the participants identified several areas where improvement was needed (IPM techniques, extension, dealers, etc.) and possible activities to overcome them.

## **WHEAT IPM WORKSHOP**

### **BACKGROUND**

The National IPM Vision Workshop identified wheat, date palms, vegetable crops, and orchards as priority areas for IPM development. Following its recommended priorities, a more focused workshop was held for wheat.



The identification of constraints to an effective IPM program occupied much of the discussion during the workshops.

### ACTIVITIES

The two-day workshop was attended by 71 people (farmers, and representatives from the MOA, State Boards of Research and Extension, and universities) from Baghdad and 10 governorates. The participants divided into six working groups to discuss their current activities, identify constraints and the techniques available to overcome them, and the research and extension activities Iraq needs for IPM in the wheat subsector.

### RESULTS

In plenary sessions, the participants agreed that Iraq needs more IPM techniques, particularly in determining treatment thresholds for Sunn pest and smut, and also needs to establish beneficial insect laboratories. They also recommended that the National Center for IPM should prepare a strategic plan for research programs, provide for coordination between different institutions and disciplines, and develop capacity improvement training programs. A number of weaknesses were also identified at this time, requiring more work on overall program implementation.

### PESTICIDE REGISTRATION PROCEDURES MEETING

#### BACKGROUND

The enforcement of pesticide registration procedures is weak in Iraq, as are the monitoring and control of pesticides on the market. As a result, many of the pesticides sold are of poor quality, black-market, fraudulent, decanted into smaller containers such as soft drink bottles, expired, or relabeled. The use of such products is inefficient and incurs additional input costs and crop losses for farmers, as well as increased health and environmental risks to pesticide users and consumers of agricultural produce. This situation is exacerbated by a lack of information from the government and the often poor advice pesticide dealers provide to farmers.

There is a need to review the framework of legislation and regulations, regulatory bodies, implementation of the regulations, distribution, retail sales, and use by farmers. Further, certain active ingredients registered are extremely toxic, and should not be available to farmers, while there is a need to register more pesticides that are IPM- and environmentally-friendly.

**ACTIVITIES**

CropLife Middle East North Africa and the Arab Organization for Agricultural Development are sponsoring a regional program for the harmonization of pesticide registration procedures, as well as pesticide labeling and registration trial data acceptance. The MOA nominated two members of its Pesticide Registration Committee to attend the CropLife-AOAD annual meeting, held in Casablanca, Morocco in September 2005.

The meeting's participants discussed how countries should prioritize implementing the FAO's International Code of Conduct for the Distribution and Use of Pesticides, the introduction of a harmonized pesticide container label, and registration procedures for biological pesticides, among other topics.

**RESULTS**

This important initiative exposed Iraqi regulators to pesticide registration developments within the region. Their participation in this initiative will help to support the introduction of improved pesticide registration, basic controls, and monitoring procedures in Iraq. Importantly, the meetings enabled Iraqi pesticide registrars to establish contact with their counterparts in other Middle East countries and allowed them to compare Iraq's pesticide registration procedures with regional and international standards.

Subsequent to Iraq's participation in the meeting, the Director General of the Arab Organization for Agricultural Development invited Iraq to join its regional initiative to harmonize pesticide registration procedures. Ten of the region's 18 countries are now fully implementing harmonized protocols.

**DATE PALM CONFERENCE****BACKGROUND**

In the early 1960s, Iraq was planted with between 30 and 40 million date palm trees; today, the number is about half that, at 16 to 19 million trees. Once a major exporter of high-end date varieties, Iraq was not permitted to export during the period of economic sanctions, and lost its overseas markets to regional competitors. To regain its position in the international date market, Iraq needs a concerted and coordinated effort among growers, processors, exporters, and the MOA to improve its competitive position.

Major pests of date palm in Iraq include Dubas bug, dust mite, and various scales and borers. Date palm and citrus are commonly grown together in the same orchard, which presents a complex situation in which to develop IPM strategies.

**ACTIVITIES**

ARDI sent three date palm specialists in plant protection (IPM and pesticides) and biotechnology (tissue culture) from the State Board for Agricultural Research to the Third International Conference on Date Palms in Abu Dhabi on February 19-21, 2006. Two of these specialists presented papers at the conference. Other Iraqi participants from universities and the private sector (producers) also attended.

**Invasive insects are found in most crops currently grown in Iraq. Many have become resistant to pesticides due to overuse.**





**Apricot borer damage.**

### **RESULTS**

Since Iraqi scientists had been virtually cut off from direct interaction with their counterparts in other parts of the world, the conference was particularly helpful in building the capacity of the MOA by exposing date specialists to the latest developments in date production. It also gave them the opportunity to interact with IPM and date palm specialists from other countries and discuss their experiences.

- Laying the foundation for a national IPM program.
- Improving pesticide dealer services.
- Training farmers to use pesticides safely.
- Preparing the Pesticide Evaluation Report and Safer Use Action Plan (PERSUAP).

## IMPROVING PESTICIDE DEALER SERVICES



**A typical pesticide dealership in Iraq.**

Iraq's pesticide dealers do more than supply pesticides to farmers; they also act as private sector extension agents by providing advice on pesticide use. Government staff, farmers, and pesticide dealers alike have identified problems in the private sector's provision of pesticides, including the large amount of substandard pesticides on the market, the poor quality of advice dealers offer, and the absence of information on IPM. ARDI implemented two sets of activities to help raise the standards of pesticide dealers: the establishment of a pesticide dealers association and training for dealers.

### **FORMING A PESTICIDE DEALERS ASSOCIATION**

#### **BACKGROUND**

During the February and July 2005 IPM workshops, the MOA identified the need to improve the pesticide dealer subsector. Establishing a pesticide dealers

association in Iraq was viewed as a way to alleviate some of the problems dealers face in providing good pesticides and advice to farmers, as well as to establish an element of self-regulation in the subsector. In addition, an association would provide a single point of contact for developing wide support to a large number of individual dealers.

ARDI arranged for a series of workshops in preface to forming an association of pesticide dealers. A total of 217 dealers and MOA staff participated in these events.

**ACTIVITIES**

An agrochemical association consultant from Egypt assisted with dealer association and training activities. Work with pesticide dealers had begun by the time of the National IPM Vision Workshop in July 2005. In order to evaluate the opinions of dealers regarding the formation of an association, ARDI held seven workshops nationwide, followed by two workshops to establish the association.

The initial workshops, which were held from 18 May to 14 September, familiarized dealers and government staff with the structure and activities of agrochemical associations in Egypt and their relationship with the Ministry of

**TABLE 95 WORKSHOPS ON THE FORMATION OF A PESTICIDE DEALERS ASSOCIATION**

<b>Date</b>	<b>Location</b>	<b>Attendees</b>	<b>Number</b>
18-May-05	Dahuk	MOA staff	5
19-May-05	Dahuk	Dealers	21
24-May-05	Sulaymaniyah, Tameen	MOA staff	16
25-May-05	Sulaymaniyah, Tameen	Dealers	33
29-May-05	Erbil, Mosul	Dealers	24
30-May-05	Erbil, Mosul	MOA staff	8
14-Sep-05	Babylon, Baghdad, Basrah, Kerbala, Missan, Muthanna, Najaf, Qadissiya, Thi-Qar, Wassit	Dealers	19
15-Sep-05	Babylon, Baghdad, Basrah, Dohuk, Erbil, Kerbala, Missan, Muthanna, Najaf, Ninewa, Qadissiya, Sulaymaniyah, Tameen, Thi Qar, Wassit	Dealers	38
January 26-27, 2006	Babylon, Baghdad, Basrah, Dahuk, Erbil, Kerbala, Missan, Muthanna, Najaf, Ninewa, Qadissiya, Sulaymaniyah, Thi Qar, Wassit	Dealers	53
<b>Total</b>			<b>217</b>

Agriculture, and to obtain responses regarding dealers' problems and perceived training needs.

The participants agreed that the biggest problems facing pesticide dealers are expired pesticides, poor dealer knowledge, and poor quality. They agreed that the formation of a pesticide dealer association would help to overcome some of these problems, and that the association should have a code of conduct for its members. They also concluded that dealer training is essential and a certification and licensing system for pesticide dealers should be implemented gradually.

The first workshop for dealers from all of Iraq was held in Dahuk on September 15, 2005. The participants, 38 dealers from 15 governorates, met to agree on whether or not to establish an association. Here, dealers were almost unanimous in their support for forming an association, and defined its aims.

Following this workshop, dealers who had been nominated as contacts met with



other dealers in their governorates to explain the contents and outcomes of the workshop, and to elicit their opinions and ideas.

ARDI then surveyed pesticide dealers nationwide, 153 dealers responded with data on the major crops, pests, diseases, and weeds in their areas; the pesticides they sold; the types of training needed; and the value of forming a pesticide dealers association. Their responses helped to shape the development of training courses for dealers.

On January 26-27, 2006, 53 dealers from 15 governorates came together for a workshop in Erbil. The participants agreed on the basic structure for the association and elected three committees to handle its registration, management, and finance. One pesticide dealer from each governorate was designated as the point of contact for his or her governorate.

The interim committees met again on May 22-23 in Erbil to assess the progress made toward registering the association. They also identified and discussed next steps, proposed activities for members, and discussed the association's fee structure and management. The new association was named The Iraqi Association for Agriculture Development and Promotion.

The Association's first general meeting was scheduled for August 20, 2005 to elect a board of directors. The majority of members were unable to attend because of a three-day curfew in Baghdad, and the general meeting was postponed to a later date.

## RESULTS

Iraq's first pesticide dealers association – The Iraqi Association for Agriculture Development and Promotion – was formally registered on May 24, 2006. This organization will enable members to work together to ensure that all dealers in Iraq are qualified and follow the necessary laws and regulations, are able to provide advice on rational and safe pesticide use to farmers, and only sell appropriate, high-quality products, so as to protect the environment, consumers, and human health. This, in turn, will help pesticide dealers improve their business, as it will reduce the amount of fraudulent pesticides sold to farmers and increase farmers' trust in the pesticide industry.

The Association is now preparing a code of conduct for its members, which will be the first step toward self-regulation to stem the sale of substandard pesticides. It is also looking forward to establishing a good relationship with the government, and working toward a certification scheme for pesticide dealers.

## PESTICIDE DEALER TRAINING

### BACKGROUND

A project IPM specialist noted, "While not in itself overcoming the problem of poor-quality pesticides on the market, dealer education can assist in decreasing their incidence. Dealers require training in pesticide handling, storage, sales, use, disposal, and safety. They should be encouraged to improve the standards of shops."

*"We are from all over Iraq. We have friendly discussions and come to agreements. Why could the constitution not be like this?"*

A participant at the September 15, 2005 pesticide dealers workshop

### **PUTTING THE GOOD SERVICE = GOOD BUSINESS CONCEPT INTO PRACTICE**

Three months after the dealer training was completed, surveyed dealers reported that their advice to farmers had improved. They counseled customers on the safe use of pesticides and disposal of empty containers, and non-pesticide control methods, even when their customers did not ask for it.

Trainees also reported that their relationships with their customers (farmers) have improved and their sales increased between 15 and 35% as a result.

### **ACTIVITIES**

An agrochemical association consultant from Egypt assisted with dealer association and training activities. Eight five-day training courses were held between February and May 2006 in Erbil and Dahuk; they were attended by 119 dealers from all of Iraq's 18 governorates. Each course used a participatory methodology and covered:

- Working with farmers
- Principles of pest management
- Biological control
- Pesticide classifications and formulations
- Pesticide labeling
- Transport, mixing, applications and disposal
- Toxicity, health, and safety
- Nonchemical pest control techniques
- Environmental aspects
- Pesticide storage, handling and sales
- Local, regional, and international pesticide regulations.

Promoting rational pesticide use and IPM often means selling less pesticide to individual farmers, which goes against dealers' business instincts. The courses thus provided guidance on correct and safer pesticide use, while emphasizing the concept of "good service = good business." For example, maintaining a clean, tidy, and well-lit shop with attractively displayed posters and products; treating the farmer as a friend rather than a source of money; being knowledgeable about farmers' problems and appropriate solutions; providing practical advice that farmers can easily understand and remember; and being honest all help dealers maintain sales and gain repeat customers. To help them retain what they learned at the course, each dealer was given a manual with essential information on pesticides and pest management.

### **RESULTS**

Dealers were given tests of their knowledge both before and after the training. They showed substantial improvements in their knowledge of shop management (e.g., keeping powders on shelves above liquids, improved ventilation, keeping stock records) and the advice they should be giving to farmers (before the course only 27% of participants scored 80% or higher on the test; this number rose to 71% at the completion of the course).

The 119 dealers who completed the training course are now prepared to provide better assistance to farmers. This assistance, which constitutes a private sector extension service, will improve the relationship between farmers and pesticide dealers, improve the dealers' business, contribute to the safer use of appropriate pesticides, and help farmers improve their agricultural production.

### **BACKGROUND**

Iraq's farmers are generally unaware of the risks involved in pesticide transport, storage and use. Some of the problems in this area include purchasing/using

## TRAINING FARMERS TO USE PESTICIDES SAFELY



products that are unsuitable for the pest situation, dangerous transport and storage practices, decanting pesticides into soft drink bottles, and lack of knowledge of pesticide safety, application rates, and preharvest intervals.

### ACTIVITIES

In June 2006, two pesticide specialists from the Sulaymaniyah MOA trained 16 plant protection specialists from a local NGO, all of whom had previously worked for the FAO. These specialists were to serve as trainers on an ARDI project to educate governorate farmers on safe and proper pesticide use. The three-day training course covered the topics that would be addressed at the village meetings:

- Pesticide selection and purchase
- Safe transport, storage, use, and disposal of pesticides and containers

**Farmers received practical training in safe application methods in the proper use of personal protective equipment (PPE).**

*“If we had had this training on safe pesticide use before, these deaths would not have happened.”*

A farmer from a village where five people had died from pesticide poisoning since 1991.

- Precautions to protect bees from pesticides
- Pesticide first aid
- Principles of IPM.

Training meetings for farmers began in July 2006, and consisted of one-day pesticide training workshops for a total of 5,383 farmers in 480 villages throughout Sulaymaniyah governorate. The 16 plant protection specialists instructed farmers on points they should consider when buying and transporting pesticides, calibrating and cleaning pesticide sprayers, applying pesticides and choosing dosages, protecting useful insects when spraying, and discarding remaining solutions after spraying. The specialists also gave farmers essential information on how to respond to accidental poisoning or misuse of pesticides.

**RESULTS**

Four hundred eighty training meetings were held for farmers. The meetings proceeded on schedule, with additional trainers being recruited to complete the program within ARDI’s shortened timeframe. Approximately 15 farmers attended each of the meetings. Some of them had attended earlier FAO awareness programs, but considered this program to be much better because the meetings were held in the farmers’ own villages rather than extension centers, the meeting structure was more comfortable, and farmers felt more free to become involved in discussions.

ARDI trained 16 IPM specialist to handle additional training at the village level. This group of 16 held 480 village meetings and trained 5,383 farmers.

**PREPARING THE PESTICIDE EVALUATION REPORT AND SAFER USE ACTION PLAN**

Generic name of Pesticide (or accepted common name)/EPA and Iraq ACB Status	IPM program	Toxicological and Environmental Hazards	Primary concerns
<b>1. Insecticides (including Miticides)</b>			
<p><b>Abamectin 18% EC (Vertimec)</b> Syngenta. <b>Registered-USEPA</b>. Toxicity Class IV CAUTION; Registered in Iraq.</p> <p>Controls spider mites, leaf miners.</p> <p>Uses: Tomato, citrus, avocado, mango, pear, peach, apricot, pistachio, sweet pepper, hot pepper, pineapple, cucumber, eggplant, broccoli, artichoke.</p>	<p>Constant monitoring of crops by trained scouts to detect presence of pests. Use minimum effective dosages. Use resistant plants. Conservation of natural enemies for biological control.</p>	<p>A mix of natural avermectins (derived from a soil bacterium). EC concentrations may cause eye and skin irritation. Pupil dilation, vomiting, convulsions, tremors, coma. Not readily absorbed through skin. Possible teratogenic and reproductive effects.</p> <p>Can kill fish, crustaceans, and aquatic invertebrates. Highly toxic to bees. Harms mollusks, aquatic plants and zooplankton.</p>	<p>Potential impact on fish, aquatic invertebrates, and aquatic plants.</p> <p><b>Special concerns: fish, bees, aquatic invertebrates, plants. Do not spray near water. Spray morning to afternoon.</b></p>
<p><b>Bacillus thuringiensis (Dipel, Condor, Deliver, Foray, etc.)</b> Valent Biosciences, Certis Corp. Registered-USEPA Toxicity Class III-slightly toxic; <b>not yet registered in Iraq.</b></p>	<p>Constant monitoring by trained scouts to detect armyworms, bollworms, and caterpillars. Not likely for pests to develop resistance to Bt, but rotating pesticides is still encouraged.</p>	<p>Very safe by acute oral or dermal contact. An eye irritant. Practically non-toxic to humans and animals by acute exposure. No known mammalian chronic health effects. No reproductive effects; non-mutagenic; non-teratogenic; an unlikely carcinogen; not an endocrine disruptor. No known effects on non-target organisms from normal use. Not toxic to birds, fish, aquatic invertebrates, earthworms, bees, domestic/wild mammals, aquatic plants, and beneficial arthropods, except possibly predatory mites and insects used for biocontrol of weeds.</p>	<p>Potential impact on humans.</p>
<p><b>Carbaryl 10% D (Sevin) Generic, and Carbaryl 85% WP (Sevin) Generic; Registered-USEPA Toxicity Classes I DANGER to Class III CAUTION (depending upon percent of active ingredient present in formulation).</b></p> <p>Only Formulations of Toxicity Class II and III being proposed for use in ARDI project; Registered in Iraq.</p> <p>Used on maize, dry beans, French beans, cocoa, roses, chrysanthemums against defoliating worms, blister beetle, and maize/sorghum stalk borer.</p>	<p>Constant monitoring by trained scouts to detect the presence of insect pests. Minimum effective dosages used. Insecticides</p>	<p>Skin, eye, ingestion hazards. May affect the lungs, kidneys, liver, and nervous system with chronic use. Highest risk to public is from residues in food. No reproductive or fetal effects, although lowered sperm counts and sperm morphological abnormalities have been noted. Possibly evidence of minimal teratogenic effects. Unlikely to be mutagenic. Potential carcinogen. Possible endocrine disruptor. Moderately toxic to fish and aquatic invertebrates. Highly toxic to earthworms.</p>	<p>Potential impact on humans, fish, invertebrates, earthworms, and other domestic target insects and other domestic wild mammals.</p> <p><b>Special concerns: fish, bees, aquatic invertebrates, plants. Do not spray near water. Spray morning to afternoon.</b></p>

USAID’s environmental regulations require that an Initial Environmental Examination (IEE) be prepared for all of the Agency’s activities. Because pesticide use poses a risk to the environment where pesticides are to be used in an activity, the IEE must include specific pesticide factors. A Pesticide Evaluation Report and Safer Use Action Plan (PERSUAP) must be submitted with the IEE to address these factors.

**ACTIVITIES**

An IEE and PERSUAP were prepared for the ARDI program in 2005 to:

- Review the pesticides used in the program’s demonstration plots and activities, against US Environmental Protection Agency registration and use criteria
- Develop a list of approved, conditionally approved, additionally

**PESTICIDE EVALUATION REPORT AND SAFER USE ACTION PLAN = PERSUAP**



The use of recycled containers particularly soft drink bottles is customary practice for many pesticide dealers.

approved, and rejected pesticides for the program



- Develop recommendations to mitigate the potential adverse environmental and health effects of pesticide dealers.

A specialist consultant was retained to undertake the required evaluations. All ARDI component managers provided details on their programs that used pesticides, including the crops, pests, pesticides, application rates, and application methods. The data were compiled into tables by ARDI staff, one for each crop/pesticide combination, and reviewed by the consultant against relevant EPA registration and use criteria for the pesticide.

**RESULTS**

The consultant developed a list of pesticides (13), herbicides (10), fungicides (5) and rodenticides (1) that were approved for program use. Another four pesticides were conditionally accepted and six were additionally accepted. An IEE and PERSUAP were prepared for the project, as well as a set of recommendations. Recommendations implemented by ARDI consisted of the preparation of information sheets for all approved pesticides; preparation of nonchemical pest management guidelines for tomatoes, apples and date palms; distribution of a pesticide application record form to all ARDI components; and completion of a pesticide use checklist by ARDI partner organizations prior to initiating activities using pesticides.



## Date Palm Pest Management Guidelines

Pest management is on isolation, as crop management successful pest management and damage, has a high

Pest management is crop from pest injury or environment. Pesticides

These Guidelines provide palm. Most of the methods yields are to be obtained

**General Crop Management**

Insect pest and disease The first essential for pest correctly fertilized, irrigated forced to rely on chemical height of the crown above

Date palm prefers deep drainage is essential. It growth and lowers fruit

The addition of organic improve soil structure, water



Optimum spacing is 9-11

Intercropping with citrus the incidence of many pests

Fruit thinning of individual circulation and reduces alternate years. About 8

While date palm is drought adequate, but not excessive

All the varieties indicate given as an indicator of

## Tomato Pest Management Guidelines

Pest management is only isolation, as crop management successful pest management and damage, has a high

Pest management is crop from pest injury or environment. Pesticides should

These Guidelines provide tomatoes. Most of the methods yields are to be obtained

**General Crop Management**

Tomatoes prefer deep, water prone to waterlogging

Tomatoes are moderately irrigation water with salinity

A pH between 5.0 and 6.0 Tomato should not be grown zinc)

Do not grow tomatoes on faba bean, alfalfa, berseem peppers, eggplant



Maintain soil organic matter

Provide suitable soil conditions as necessary

Use clean, certified, disease free nursery

Apply balanced amounts testing. Split the total amount growth stages. Excessive diseases

Irrigate after fertilizer application

## Apple Pest Management Guidelines

Pest management is only isolation, as crop management successful pest management and damage, has a high

Pest management is crop from pest injury or environment. Pesticides should

These Guidelines provide apples. Most of the methods yields are to be obtained

**General Crop Management**

Orchards are best located tolerated, soils with neutral waterlogging or with a high


Careful attention to pruning pruning of bearing trees is the incidence of disease, a dormant period, in late winter

Apples are prone to biennial of the fruit produced, and a

Fertiliser application should will provide nutrients, improve

Air ventilation through the and some pests

A cover crop of grass between grass should be kept short of the trunk should be kept



# Pesticide Reference Guide

## ARDI Pesticides Safe Use Action Plan

March 2006



**As a result of the dealer training activities conducted in coordination with the newly formed Pesticide Dealers Association, dealers are able to provide better extension services to farmers. ARDI developed several tools to assist the dealers with information, technical bulletins and diagnostic tools. The dealers and farmers have both commented on the better level of service and knowledge of the pesticide dealers after the training and workshops sponsored by ARDI.**