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FARMER-TO-FARMER PROGRAMMATIC PERSUAP PESTICIDE EVALUATION REPORT AND SAFER USE ACTION PLAN

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FARMER-TO-FARMER PROGRAMMATIC PERSUAP

PESTICIDE EVALUATION REPORT AND SAFER USE ACTION PLAN

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Rural & Agricultural Incomes with a Sustainable Environment Plus IQC, Farmer-to-Farmer Special Program
Support Project Task Order

DISCLAIMER

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EXECUTIVE SUMMARY

Summary of Findings

This Programmatic Pesticide Evaluation Report-Safe Use Action Plan (PERSUAP) provides F2F volunteers with a list of active ingredients (Attachment A, Table 2) that they may use and recommend (including recommending the active ingredient, providing advice on procurement, storage, mixing, application, and disposal, and conducting training using these active ingredients as examples). Where USAID Missions have produced sector or mission-wide PERSUAPs, Missions will consult with both PERSUAPS and use the PERSUAP that is most up to date with regard to EPA's registry. This means that the approved list of pesticides in Attachment A, Table 2 in this PERSUAP may supersede the approved list of pesticides in Mission PERSUAPS. Once the mission or sector-wide PERSUAP expires, this F2F PERSUAP governs. In cases where the mission PERSUAP proves more up to date, the BFS BEO may be notified and the umbrella PERSUAP may be amended. The Mission is ultimately responsible for checking on the most up to date information and the BEO has the authority to provide clarification to Missions if there is an issue.

Based on the guidance in this PERSUAP, volunteers may provide recommendations and training, and use these active ingredients (AI) and any products comprised of these AIs only if:

1. The AIs and products or similar or same formulations for similar/same use are registered in the host country;
2. The AIs and products are U.S. Environmental Protection Agency (USEPA) toxicity class II or higher (or the equivalent for products not registered by the USEPA); and that
3. The products are General Use Pesticides (GUPs) or the equivalent for products not registered by the USEPA.

This PERSUAP requires that this assistance be given within the context of an Integrated Pest Management (IPM) approach and that safe use measures are also required (see Section 4, the SUAP).

According to USAID's Pesticide Procedures: "when a project includes assistance for procurement or use, or both of pesticides registered for the same or similar uses by USEPA *without restriction* [a GUP], the Initial Environmental Examination for the project shall include a separate section evaluating the economic, social, and environmental risks and benefits of the planned pesticide use..." Therefore, since this PERSUAP analyzes pesticides at the AI level and not down to the product level, it places the responsibility on the F2F volunteers to ensure that the products they recommend are GUPs or similar (if the product is not USEPA registered). F2F volunteers should never recommend RUPs or similar products. Also, F2F volunteers must ensure that, as required by USAID's Pesticide Procedures, the pesticide product is registered for the same or similar use (crops and insects/diseases) as what the F2F volunteer recommends the product for.

Given the programmatic nature of this PERSUAP, it is intended to cover value chains (VCs) that are not yet part of a F2F country program, but may be added over the life of the project. Because of the broad range of VCs, and because at this time it is impossible to predict the full range of VCs that a F2F volunteer may be requested to assist with, the PERSUAP provides guidance for volunteers to ensure that their recommendations/advice on pesticide use are VC-specific.

In addition, given the range of F2F countries, and that additional countries may be added to the F2F Program over the life of project, the F2F PERSUAP is intended to give flexibility to be able to add additional countries over the LOP. The PERSUAP also applies to flexible (or flex) assignments, which

involve placement of volunteers in countries other than F2F core countries. For flex assignments, there is no Country F2F Office; therefore, in these cases, the home office has direct responsibility for oversight of the program, which includes implementation of the PERSUAP conditions. The PERSUAP is not country-specific, but specific to the F2F Program. The steps included in the SUAP (review host country registered pesticides; apply safe use and IPM practices) would apply no matter to which country F2F sends a volunteer. An amendment to the IEE/PERSUAP is not needed if the F2F Program adds additional countries or VCs; however, the conditions in the SUAP must be complied with and reported on.

Attachment J, Table 2 includes all pesticide AIs that were submitted by F2F country programs, including those *rejected for use* by this analysis, and reason(s) for rejection. Attachment A, Table 2 includes only the AIs approved for use by the F2F Program. The F2F Program is requesting approval to assist in the use or procurement of the pesticides shown in Attachment A, Table 2. F2F volunteers who are involved in providing assistance for the use or procurement of pesticides shall comply with the conditions of this PERSUAP. “Assistance for the use or procurement of pesticides” is defined in Section 1.

The selection of pesticide AIs in this PERSUAP is the safest regarding human health and the environment, and is expected to provide the necessary protection against crop pests and diseases, when used in conjunction with an IPM program, and takes into account the need to vary pesticide families to insure against pest resistance. While this Programmatic PERSUAP approves for use the least toxic pesticides, all pesticides are hazardous to the environment and to human health to some degree, and the SUAP (Section 4) recommends measures for mitigating adverse effects of pesticide use on the environment and human health.

With the mitigation measures described in the SUAP, F2F Program assistance for the use or procurement of pesticides is expected to have minimal or no significant irreversible adverse effects on the environment and human health.

Summary of Requirements

See Section 4.2 for the full description of recommendations; below is a summary.

The conditions from the 2013 F2F IEE that refer to pesticide use remain in force in this PERSUAP, as follows:

- The syllabus for each training event that includes pesticide use will be submitted to the Mission Environmental Officer and the USAID F2F AOR/COR for review and comment. The AOR/COR shall consult with the BEO or relevant REA, as needed, in situations where there is no Mission Environmental Officer.
- A representative from USAID (preferably the Mission) should attend the training sessions to the extent possible.
- All Implementing Partners (IPs) will be provided with and will familiarize themselves with the environmental brochures developed for the Farmer-to-Farmer Program. The “John Ogonowski Farmer-To-Farmer Program Environmental and Natural Resource Management Issues” provides program managers with needed information on environmental policies, issues, and regulations relevant to the F2F Program. The “Environmental Guidelines for Farmer-to-Farmer Volunteers” summarizes key environmental issues and regulations as guidance to volunteers to consider all potential environmental implications of their work (attached to the F2F IEE).

Recommendations for F2F Implementing Partners

The following recommendations shall be implemented by F2F implementing partners:

1. F2F IP shall retain a copy of this PERSUAP in their headquarters and at all country offices. The SUAP has been prepared so that it and the attachments can be removed and used as a stand-alone document.
2. IPs shall send PERSUAP sections to F2F volunteers, based on the type of assignment, as described in the SUAP.
3. Individual country lists of approved/registered pesticides shall be kept on file at the F2F country and regional offices, and shall be provided to F2F volunteers who may be recommending and advising on specific pesticide AIs and products as part of their assignment (Type 1 assignments). The approved list should be kept in the local language in addition to English where necessary for effective distribution.
4. IPM practices, submitted in the PERSUAP questionnaire, shall be retained in F2F country and regional office files; and they should be built on and strengthened by knowledgeable F2F volunteers.
5. IPs shall keep on file in-country offices Material Safety Data Sheets (MSDS) for review and use of in-country staff and F2F volunteers.
6. F2F IPs shall retain in country offices all tools, forms, protocols, and plans that volunteers develop such as: scouting protocols, IPM monitoring forms, and measures to monitor the efficacy of pesticides.
7. Given the low level of understanding of pesticide impacts on human health and the environment, the lack of knowledge on IPM and safe pesticide use, as well as other pesticide issues cited by F2F Country Offices (see PER), F2F IPs shall consider recruiting volunteers (through F2F in-country hosts) for assignments in pesticide safe use and IPM.
8. In F2F IP country offices, any USAID mission-wide or sector-wide PERSUAPs for that country shall be kept on file. Missions will consult with both PERSUAPS and use the PERSUAP that is most up to date with regard to EPAs registry. This means that the approved list of pesticides in Attachment A, Table 2 in this PERSUAP may supercede the approved list of pesticides in Mission PERSUAPS. Once expired, the F2F PERSUAP approved pesticide list governs.
9. F2F Country Offices shall provide oversight to ensure that F2F volunteers understand and implement the mitigation measures (1 to 11) in the SUAP (as described in Section 4.2.3).
10. If any F2F program intends to provide assistance for the use or procurement of pesticide AIs other than those approved in Attachment A, Table 2 (or in the governing mission or sector-wide PERSUAP), an amendment to this Programmatic PERSUAP must be prepared and approved by the BFS Bureau Environmental Officer (BEO) prior to providing such assistance.

Recommendations for VEGA

The following recommendations shall be implemented by VEGA:

1. In VEGA's role as focal point to gather and disseminate success stories, best practices, and lessons learned from F2F LWA implementers and SPSP sub-grant implementers, VEGA shall gather and disseminate success stories and lessons learned on pesticide use, training, and recommendations to help ensure wider implementation by F2F IPs of pesticide best practices.
2. In coordination with F2F IPs, VEGA shall identify knowledge gaps in pesticide safe use, IPM, and other pesticide-related issues (including in implementation of the SUAP), and recommend needed capacity strengthening targeted at specific countries and stakeholders, as determined by the gap analysis. F2F beneficiaries to be trained may include farmers, extension officers, input dealers, etc. In addition, VEGA should recommend training of F2F in-country staff (in SUAP implementation, pesticide safe use, IPM and recordkeeping, etc.), if determined necessary by the gap analysis

Recommendations should also include types of training and recommended measures to provide the training.

Recommendations for F2F Volunteers

The following recommendations, as found in the SUAP, (1 to 9) shall be implemented by F2F volunteers to minimize potential impacts on human health and the environment, as identified in the Programmatic Pesticide Evaluation Report (factors (a) to (l)). All recommendations must be provided in conjunction with an IPM program.

1. F2F volunteers shall recommend and encourage the use of IPM and if needed only products made up of least toxic AIs. F2F volunteers shall recommend and encourage the use of USEPA registered, least toxic pesticide AIs (WHO Toxicity Class II and above). F2F volunteers shall only provide recommendations for the use or procurement of pesticide AIs listed in Attachment A, Table 2 all of which are USEPA registered and WHO toxicity class II and above. Missions will consult with both PERSUAPS and use the PERSUAP that is most up to date with regard to EPAs registry. This means that the approved list of pesticides in Attachment A, Table 2 in this PERSUAP may supercede the approved list of pesticides in Mission PERSUAPS.
2. F2F volunteers shall recommend and encourage the use only of pesticide products that are GUPs or the equivalent and that are USEPA toxicity level II and above or the equivalent.
3. F2F volunteers shall provide advice and recommendations for specific pesticides only in conjunction with recommendations for appropriate protective gear, and other safety precautions to mitigate pesticide impacts to human health (Attachment B). Volunteers should be aware of the limited accessibility to protective gear in many cases, and should be prepared to identify measures to access the gear if unavailable.
4. F2F volunteers shall provide advice and recommendations for specific pesticides only in conjunction with recommendations to mitigate impacts on the environment (Attachment C).
5. F2F volunteers shall recommend the use only of pesticides that are approved by the host country government. Most host country government-approved lists cover AIs and products.
6. F2F volunteers whose assignments will involve providing recommendations and advice on specific pesticide AIs and products shall review the www.epa.gov site for recent actions/decisions taken by USEPA.
7. F2F volunteers shall not recommend and shall strongly discourage the use of chemicals listed in Attachment E of the SUAP. When F2F volunteers encounter availability and use of chemicals listed in Attachment E of the SUAP, they must notify the country MEO, with a copy to the F2F AOR/COR.
8. F2F volunteers shall provide training in and shall leave host country partners with the applicable tools (see Attachment G) they will need once the volunteer departs the country. The F2F volunteer may wish to consider amending the training program and documents to provide cautionary information about the environmental and health risks of using these restricted chemicals and undertaking an awareness building activity with Government agriculture and environment authorities.
9. Prior to or upon arrival in-country, F2F volunteers (Type I) shall collect Material Safety Data Sheets (MSDSs) (Annex K for an example) for pesticides they expect to recommend and shall submit to F2F country offices so they may keep these on file.

Monitoring and Reporting

Implementing Partner Reporting: In a separate section (Environmental Compliance) of the IP's semi-annual reports, F2F partners shall report on:

1. The types of assignments that have involved pesticides (i.e., the number of Types 1, 2, and 4 assignments, and a general description of activities that involved pesticides).
2. Key findings and recommendations from F2F volunteer reports regarding limitations and

successes of the PERSUAP, and recommendations for additional technical assistance and training needed to improve pest and pesticide management practices.

In a separate section (Environmental Compliance) of VEGA's semi-annual reports the following should be reported on:

1. VEGA shall report on actions they have taken to assess and disseminate lessons learned and best practices in F2F pesticide use and management.
2. Based on this, VEGA shall report on the need/utility of an F2F volunteer to address priority pesticide management needs.

Volunteer Reporting

Volunteer end of trip reports, as described below, shall be submitted to the F2F Country Office; requirements depend on the type of assignment, and are delineated in Section 4.

The Safe Use Action Plan includes two Environmental Mitigation and Monitoring Plans that each IP and VEGA can use to guide monitoring and reporting on SUAP requirements.

I. INTRODUCTION AND BACKGROUND

All USAID activities are subject to evaluation via, at a minimum, an Initial Environmental Examination (IEE) and if significant environmental effects are expected, an Environmental Assessment (EA). USAID's Pesticide Procedures (a sub-section of USAID's Environmental Procedures, found at 22 CFR Part 216, also known as "Reg. 216") state that all projects involving assistance for the procurement or use, or both, of pesticides shall be subject to the procedures prescribed in 22 CFR 216.3 (b)(1)(i)(a through l).

Because of the high risks of pesticide use, USAID's Environmental Procedures require that 12 factors (a through l) be addressed prior to providing assistance for the procurement or use of pesticides. The 12 factors are required to be addressed in a separate section of an IEE in which economic, social, and environmental risks and benefits of the planned pesticide use are evaluated to determine if a significant environmental impact will result. This analysis has been referred to as a PERSUAP—a Pesticide Evaluation Report-Safer Use Action Plan. The PERSUAP focuses on the particular circumstances of the program being evaluated and the activities involving pesticide use and/or procurement, the pesticide management choices available, and the implementation of a safe use action plan (the SUAP), designed specifically for the subject program.

As described below, it is unlikely that F2F country programs and F2F volunteers will be involved in the procurement of pesticides. However, "assistance for the use" is interpreted broadly to include handling, transport, storage, mixing, loading, application, clean up of spray equipment, and disposal of pesticides, as well as providing fuel for transport of pesticides, and providing technical assistance and training in pesticide use and management. "Assistance for the use of pesticides" is said to occur if recommendations are provided for specific pesticides, including a recommendation to procure certain pesticides. This includes training courses in pesticide use, including information on safe pesticide use even if training does not involve actual application of pesticides. This broad interpretation of "assistance for the use of pesticides" applies throughout this Programmatic PERSUAP.

While the F2F program presents some challenges for preparing a programmatic PERSUAP, it also provides opportunities, especially for acquiring targeted expertise in pesticide use and integrated pest management (IPM). Among the opportunities are the possibility of providing sound advice on pesticide use directly to farmers and pesticide applicators, extension officers, agro-input dealers, and others directly involved with pesticides.

I.1 F2F Program Goal, Purpose, and Objectives

The purpose of the current F2F Program is to improve institutional and human capacity, profitability and competitiveness of agricultural value chains, natural resource management, health and safety conditions and environmental services, and/or increase beneficiaries' net annual income. The objective is to improve farmer livelihoods through increased farm production and increased farmer incomes.

Over the years, the F2F Program has evolved, placing increased emphasis on economic impact and measurable results by concentrating volunteer assignments in specific geographical areas, commodities programs, and service sectors. Now, programs go beyond simply placing volunteers on an individual basis, and instead focus on development of specific market chains for which overall impact can be evaluated. Programs build institutions and transfer technology and management expertise to link small farmers with markets that exploit comparative advantages in production, processing, and marketing. To date, over 1.2 million farmer families (representing about six million people) have been direct beneficiaries of the F2F Program.

Over the last 50 years agricultural productivity has risen dramatically, mainly as a result of improved technologies – particularly inputs such as fertilizers, quality seed, crop protection products, machinery and equipment combined with improved management strategies, such as irrigation management, integrated fertilization strategies, and IPM. The F2F Program will support these advances and the continuing productivity improvements and local capacity development. The FY 13-17 Program also encourages attention to issues of global climate change and sustainable natural resources managements, opportunities for rural youth, and nutritional impacts of agricultural development.

Relatively few F2F country projects have focused on environmental activities. Only about two percent of F2F’s assignments are specifically designed for environmental conservation. As the F2F IEE states, such assignments, for example, might include: reducing run-off from dairy operations, more efficient use of fertilizer, switching from pesticides to IPM, etc. (Specific to pesticides, of these illustrative activities, only switching from pesticides to IPM would require compliance with this PERSUAP.) F2F’s experience shows that in such activities increased attention to environmental issues such as environmental and natural resource conservation is critical to long-term sustainability. Thus, F2F’s projects and assignments naturally address these issues as secondary objectives. This new FY 13-17 phase of the program will encourage attention to environmental and natural resource issues and targeting global climate change adaptation and mitigation measures.

The F2F Program for FY 2013-2017 covers 26 core countries (listed below in Table 1). In their proposals, IPs defined their major areas of program focus. These vary by country, as shown in Table 1. In addition to the 26 countries below, over the F2F life of project (LOP), additional countries may be added. The F2F FY 2013-2017 program currently encompasses the countries and programs listed in Table 1 (For comparison purposes, F2F’s FY 2007-2012 core countries are listed in Attachment J, Table 1).

TABLE I: ACTIVE FARMER-TO-FARMER COUNTRY PROJECTS FOR FY 2013-2017

F2F Implementing Partner	F2F Country	F2F Program
Citizens Network for Foreign Affairs (CNFA) – Southern Africa	Angola	Horticulture, with secondary importance legumes (soybeans, common beans, cowpea), both in Zaire province
	Malawi	Legumes (soybeans, groundnuts), horticulture, and dairy
	Mozambique	Legumes (soybeans, common beans, groundnuts), and horticulture
ACDI/VOCA – Europe, Caucasus, and Central Asia (ECCA)	Armenia	Greenhouse production, dried fruits and vegetables
	Georgia	Producer organization development, rural enterprises, agricultural education
	Kyrgyzstan	Rural financial services, agribusiness development services, agricultural education
	Tajikistan	Producer organization development, rural financial services, rural enterprises
ACDI/VOCA-West Africa	Ghana	Producer organization development, rural financial services, rural enterprises
	Liberia	Livestock/poultry/fish, horticulture, youth in agriculture
	Senegal	Millet, horticulture, environmental conservation
	DRC	Cassava, poultry
Partners of the Americas	Haiti	Rural Enterprise Development, environmental restoration
	Guatemala	Rural Enterprise Development, horticulture value chain

F2F Implementing Partner	F2F Country	F2F Program
	Dominican Republic	Horticulture value chain, sustainable use of natural resources
	Nicaragua	Livestock Commercialization, value-added horticulture
Land o' Lakes	Egypt	Food Safety and Quality Assurance Rural Finance
	Lebanon	Food Safety and Quality Assurance Rural Finance
Winrock-West Africa For AET countries, no defined subsectors; much of the work will be on institutional capacity building, but support may also be provided in staple crops, horticulture, livestock, and aquaculture/fisheries, related to AET as well.	Guinea	Formal Institution Agriculture Education and Training (AET) Delivery; Private Sector AET delivery
	Nigeria	AET
	Senegal	AET
Winrock-Asia	Bangladesh	Youth entrepreneurship and AET
	Burma	TBD based on Mission priorities
	Nepal	Youth entrepreneurship and AET
Catholic Relief Services –East Africa	Ethiopia	Productivity of Grain Crops, Market Development for Grains
	Kenya	Small Holder Farmers Income; Expanded Marketing and Trade; Risk Management
	Tanzania	Low-Cost Agriculture Techniques
	Uganda	Quality Inputs, Handling and Marketing

I.2 F2F Program Activities and Methodology

The core F2F Program is implemented under cooperative agreements with US institutions for the the purpose of providing volunteer services for international agricultural development. F2F IPs work closely with overseas USAID Missions and local partner organizations, supporting a variety of development programs aimed at reducing poverty and stimulating sustainable and broad-based economic growth.

This new phase of the F2F Program (FY 2013-2017) over the next five years will continue the basic program approach and activities. USAID has procured implementation services through Leader with Associate (LWA) Cooperative Agreements and a contract or cooperative agreement to manage smaller specialty volunteer programs.

The F2F program relies on the expertise of volunteers from U.S. farms, land-grant universities, cooperatives, private agribusinesses, and non-profit farm organizations to respond to local needs of host country farmers and organizations. Since the F2F Program began, volunteers have been recruited from all 50 U.S. states and the District of Columbia. In general, these volunteers are not overseas development professionals, but individuals who have domestic careers, farms, and agribusinesses, or are retired and want to participate in development efforts. Typically volunteers spend about 20 to 30 days in the host country. Volunteers usually work with medium and small agro-enterprises, cooperatives, individual

producers, agricultural extension and research agencies, and financial institutions. The specific assignments for volunteers are defined on a rolling basis in conjunction with local partners and in response to requests from local farms, agribusiness firms, and agricultural support institutions.

Volunteer assignments involve working with established farms and businesses, improving technology, or management and marketing systems. Volunteers are expected to provide training, through both formal and informal mechanisms, and technical advisory services.

As described in the 2009 PERSUAP, the F2F IPs recruit and manage volunteer placements using similar methodologies:

- Develop Scope of Work (SOW)
- Brief volunteers on their assignment
- Oversee volunteer activities while in-country
- Review Volunteer's final report

Below is a general description of the F2F program methodology.

A request for an F2F volunteer usually originates with a host country organization (the client). Less frequently, a request may come from a USAID project. A request from a USAID project is more common in "flex assignments," described below. In many cases, the F2F country program already has institutional relationships with the client -- local universities, corporate entities, and other organizations, but F2F country programs may also market their services with potential host country partners.

F2F field staff are responsible for identifying potential host country organizations. Field staff develop a list of potential host organizations at the beginning of every year, along with a strategy for each host organization. Each IP has a target number of volunteers they aim to recruit each year, and a target for flexible assignments, as well.

As part of each F2F contract, a number of flexible assignments are "set aside." These flex assignments may be in a core country and outside a target program area or they may be outside of a core country.

Once the need for an F2F volunteer is identified, the host country partner, in collaboration with the F2F country program, will develop an SOW. Volunteers are then recruited for the assignment. All F2F IPs have volunteer databases—US national databases-- from which they can identify appropriate volunteers. IPs may also recruit a volunteer who has the necessary skills without going through the database. One or more CVs may be sent to the field office for review by F2F country staff and the host organization.

Once a volunteer is identified for the assignment, the IP sends a briefing packet to the volunteer. The USAID environmental brochure (2007, 2009, and 2012) described in the conditions to the IEE, is among the items in the briefing packet. From the point a volunteer agrees to undertake an assignment until the volunteer departs for the host country, there is regular correspondence with a volunteer and the F2F office.

Typically, the F2F volunteer will work with an association or organization, and sometimes within a ministry. USAID/Bureau of Food Security (BFS) support to F2F IPs covers the cost of the volunteer. The volunteer is "free" to the host organization, F2F IPs may request an in-kind contribution, such as meals, transport, etc.

Once the volunteer arrives in-country, s/he will meet with F2F country staff for a briefing, and at the end of their stay, for a de-briefing. When a volunteer is in the field, F2F IPs provide different levels of support. The volunteer works directly with the host organization, and in many cases may only return to the F2F country office for an end-of-trip debriefing. In-country staff may assist with translation services.

In some cases, a technical staff member from the F2F country program office will travel with the volunteer at the start of an assignment, and then go back to the field to meet the volunteer at the end of an assignment. Some country programs keep in regular contact with a volunteer, communicating with them every two to three days.

I.3 The F2F Program and Roles of Volunteers as they relate to Pesticide Use and Procurement

In accordance with 22 CFR 216, this PERSUAP covers assistance for the procurement or use of pesticides. Pesticide “use” is interpreted broadly to include the handling, transport, storage, mixing, loading, application, clean up of spray equipment, and disposal of pesticides, as well as the provision of fuel for transport of pesticides, and providing technical assistance in pesticide management. “Use” is said to occur if training curricula include information on safer pesticide use even if it does not involve actual application of pesticide. It also applies if pesticide procurement is facilitated by credit or loans. USAID also strongly encourages including instruction in IPM and alternatives to pesticides in any training on pesticide use as defined above. Under this approach, pesticides are considered a tool of ‘last resort’ and pesticide choice should as far as feasible be the ‘least toxic’ choices. *This definition of “use” applies throughout this PERSUAP.*

F2F volunteer SOWs focus on a variety of tasks; some volunteers will work directly with pesticides, some indirectly, and others not at all. For example, for volunteers who work in agricultural/livestock production or crop protection, pesticides and IPM are integral to the volunteers’ tasks and they will likely be required to recommend specific pesticides. In some cases, volunteers may be requested to provide training in pesticides, safe use, and IPM. These volunteers are expected to have an in-depth knowledge of pesticides and IPM, and would be expected to provide specific recommendations on pesticides to use, methods of application, etc. For purposes of this PERSUAP, these are considered **Type I Assignments**: these volunteers will likely be required to provide recommendations for specific pesticides (AIs and/or products).

In other cases, such as vegetable and fruit marketing, product branding, and business plan development, pesticide issues and IPM may arise, but may not be an integral part of the assignment, unless assistance involves addressing pesticide residues, particularly for export crops to the U.S. , Europe, and other developed countries with strict pesticide residue requirements. For purposes of the PERSUAP, these are considered **Type II Assignments**: these volunteers may encounter issues involving pesticide storage, disposal, application, safe use, etc. and may have opportunities to provide information and advice on safe use of pesticides. But they would not be expected to provide recommendations for specific pesticides.

Type III Assignments cover volunteers whose tasks typically would not involve pesticides, such as those volunteers involved with institutional strengthening, business plan development, training in financial management, etc.

Type IV Assignments are volunteers who will be working directly on another USAID project. These volunteers will be covered by that project’s PERSUAP or IEE and depending on the assignment, may be expected to provide recommendations for specific pesticides.

This Programmatic PERSUAP considers and covers all four types of assignments:

- F2F volunteers who will recommend specific pesticides (Type I);
- F2F volunteers who, because of the nature of their assignments, may have opportunities to provide advice on safe use of pesticides (Type II);
- Volunteers whose assignment will not include pesticides (these volunteers only need to be

familiar with this PER, and understand that in accordance with USAID’s Pesticide Procedures, they may not provide advice or recommendations on pesticide use or procurement) (Type III); and

- F2F volunteers working directly on USAID projects (these volunteers should comply with any existing project-level PERSUAPs or this PERSUAP, as appropriate) (Type IV).

In addition, “flexible assignments” are included in this PERSUAP. These are any F2F volunteer assignments programmed outside of a Country F2F Project. Flexible assignments are used to: respond to targets of opportunity for substantial developmental impact, carry out exploratory activities in new areas or sectors, and respond to unforeseen needs and opportunities of USAID Mission programs and partners. Flexible assignments may be in any country, within or outside of the geographic region for the core country F2F programs.

Winrock’s Agricultural Education and Training (AET) is a new component of the FY 2013-2017 F2F Program. For AET projects, over the life-of-project, Winrock will engage 300 US volunteers in a two-track approach of formal and informal AET to equip a new generation of mid-level agriculture technicians to address evolving agricultural production and marketing challenges. Winrock’s F2F for AET program approach matches volunteers with institutional hosts that have demonstrated the political will to initiate institutional reforms for improved AET. Examples of illustrative tasks under this new F2F for AET program are:

- Conducting labor market assessments to help shape new curricula and programs to reflect market needs and future employment opportunities for graduates.
- Developing or revising curricula, particularly to incorporate business management, leadership, and entrepreneurship.
- Training faculty and students on improved teaching methods and “soft-skills”

It is unlikely that AET tasks will involve assistance for the use or procurement of pesticides, and as such, are expected to fall under Type III assignments.

New to this F2F Program is the VEGA cooperative agreement to implement the F2F SPSP. Key SPSP objectives are:

- Knowledge management
- Capacity development of new organizations and outreach to minority serving institutions MSIs and small NGOs
- Sub-grant management

Among other aspects, VEGA’s role includes acting as a focal point to gather and disseminate success stories, best practices, and lessons learned from F2F LWA implementers and SPSP sub-grant implementers. In this role, VEGA has the opportunity to gather and disseminate success stories and lessons learned on pesticide use, training, and recommendations to help ensure wider implementation by F2F IPs of pesticide best practices.

In general, the F2F Program will be essentially training and advisory activities; the subject of the training or advice may involve use of pesticides. As the IEE states, while there will be no procurement of pesticides, training on how to decide when to use them and how to use them (this includes storing, mixing, applying, and disposing of) safely constitutes a “use.”

Based on the F2F Program (FY 2013-2017) and the illustrative tasks that may involve pesticide use, this PERSUAP provides an approved list of AIs that volunteers can choose from for specific pesticide recommendations. It also includes requirements and guidance (SUAP, Section 4) for volunteers (Types I,

II, and IV and flex assignments) to assist in their efforts to encourage and reinforce best practices for pesticide use, management, and IPM. The SUAP takes into account the various ways that volunteers may be requested to provide pesticide advice and recommendations, and the range of pesticide knowledge the volunteers are expected to have.

I.4 Scope of the Programmatic Pesticide Evaluation Report

This F2F Programmatic PERSUAP was prepared in accordance with the Scope of Work (SOW). As required by USAID's Pesticide Procedures, it evaluates and guides F2F activities that involve "assistance for the procurement or use, or both, of any pesticide...." The PERSUAP amends the F2F Initial Environmental Examination dated December 10, 2012, which recommends a **Negative Determination with the condition** that: *No pesticides may be procured or used, or recommended for procurement or use without first completing an amendment to this Initial Environmental Examination that addresses the requirements of 22 CFR 216.3(b) including a Pesticide Evaluation Report/Safe Use Action Plan which must be approved in writing by the BFS Bureau Environmental Officer. This includes pesticides used in research for eventual dissemination.*

The IEE further states that, *a Negative Determination with Conditions is recommended for the case of training on the use of pesticides, as per 22 CFR 216.2 (e) Pesticides. Although there will be no procurement or physical use of pesticides, the training in how to decide when to use them and how to use them safely can be seen as constituting a "use." Therefore the following conditions are recommended.*

- *The syllabus for each training event will be submitted for review and comment by the Mission Environmental Officer (MEO) and by the USAID F2F AOR/COR.*
- *A representative from USAID (preferably the Mission [Environmental Officer]) should attend the training sessions to the extent possible.*
- *If any specific pesticides are to be used, procured or recommended for use, the USAID Pesticide Procedures (§216.3(b) must be followed. An amended IEE will need to be prepared prior to the training and must include a separate section evaluating the risks and benefits of the proposed use. The 12 factors outlined in Section 216.3(b) are analyzed in that evaluation. This evaluation is known as a Pesticide Evaluation Report and Safe Use Action Plan (PERSUAP).*

The F2F Programmatic PERSUAP will enable the F2F program to respond to and comply with the requirements of USAID Regulation 22 CFR 216.3(b), USAID's Pesticide Procedures, and as the IEE states, will make it possible for the program to comprehensively contribute to environmental and human health safety, while achieving project goals. The PERSUAP addresses all possible uses of pesticides by F2F volunteers, and in particular, addresses bullet 3 above, use/recommendation of specific pesticides.

The PERSUAP updates the original F2F PERSUAP prepared in 2009. Therefore, this PERSUAP highlights changes since the 2009 PERSUAP, such as new types of activities covered by the current F2F Program (AET); pesticide regulations and registrations in F2F countries and U.S. Environmental Protection Agency registration status; and capacity issues in F2F countries. The use of mission-wide or sector-wide PERSUAPs, which are much more common than when the original PERSUAP was prepared, are also considered. Mitigation is largely based on a review of F2F IP implementation of mitigation measures from the original PERSUAP, successes, limitations, and IP recommendations.

Additional countries and program areas may be added during the life of the program. As such, F2F may be requested to provide assistance in a VC not among the current target VCs. As with the 2009 PERSUAP, given its "programmatic" nature, this PERSUAP is intended to cover VCs that are not yet included as part of an F2F country program.

Also as with the 2009 PERSUAP, this PERSUAP is meant to cover yet-to-be-programmed F2F support through Associate Awards (USAID Mission funded), the Special Program Support Project through Volunteers for Economic Growth Alliance (VEGA), and “flex assignments” (part of existing F2F contracts). These types of F2F activities may take place in one of the existing F2F countries or in countries that currently have no F2F program; and they may work with F2F target VCs, or with new VCs. For flex assignments, there is no Country F2F Office; therefore, in these cases, the home office has direct responsibility for oversight of the program, which includes implementation of the PERSUAP conditions.

In sum, this Programmatic PERSUAP covers F2F volunteer technical assistance and associated administrative, consultant, training, and technical assistance under the F2F Program. This includes the core country F2F projects, flexible assignments, and volunteer services under Associate Awards and other mechanisms whereby Missions or other offices fund F2F volunteers. The PERSUAP is not country-specific, but specific to the F2F Program. An amendment to the IEE/PERSUAP is not needed if the F2F Program adds additional countries or VCs; however, the conditions in the SUAP must be complied with and reported on.

This PERSUAP covers all regions in F2F program countries. Because of its programmatic nature, it is impossible to identify the ecosystem types where F2F volunteers will be working; the ecosystem types are so wide ranging. Therefore, the SUAP provides recommendations and safeguards for volunteers to use to protect important/sensitive/critical ecosystems (wetlands and waterways, important watersheds, near drinking and washing water sources, protected areas, including national parks and forests, etc.).

This PERSUAP covers all types of pesticides, including herbicides, insecticides, fungicides, nematicides, rodenticides, miticides, and other pesticides and related chemicals. It requests approval from the USAID/BFS Bureau Environmental Officer for pesticide AIs that at a minimum are: registered by the USEPA and that are World Health Organization (WHO) toxicity class II and above (Attachment A, Table 2 contains the list of pesticide AIs for which this PERSUAP requests approval.)

Given the types of support F2F provides (described above), this Programmatic PERSUAP is able to recommend safeguards to ensure—no matter the country or the VC—that F2F “assistance for the procurement or use, or both, of pesticides” will have no unreasonable and foreseeable adverse effects on human health or the environment. This F2F Programmatic PERSUAP provides guidance for F2F IPs to ensure that their actions involving the use of pesticides (actions constituting “use” are described above) will have minimal or no significant irreversible adverse impacts and that the potential for positive effects are maximized.

Safeguards and guidance are provided as part of the Safe Use Action Plan (SUAP, Section 4). This PERSUAP gives volunteers the flexibility to provide advice on pesticide use, and to recommend pesticides, in an IPM context, and within the framework of a safe use program.

I.5 Methodology of the Analysis and Scope of the Pesticides Analyzed in the PERSUAP

Each F2F IP (except AET countries, as described above) compiled a list of pesticides based on best knowledge of the pesticides recommended for current program areas and VCs, and for the pests and diseases encountered in their country. The lists include pesticide AIs and products that the country program intends to “use or recommend” over the five-year F2F implementation period. Since the F2F Program for FY 2013-2017 is at an early stage in development, this required IPs to make assumptions based on past experience and the country situation. The intention was to compile as complete a list as possible to minimize the need for future amendments to the PERSUAP.

The PERSUAP preparer then analyzed the active ingredients to determine if they were registered by the USEPA and to determine their WHO toxicity class (see Attachment J, Table 2 for a list of all active ingredients that IPs submitted for approval). Active ingredients/chemicals that are not registered by USEPA or were cancelled by USEPA are shown in Attachment J, Tables 2 and 3). These shall not be recommended for use or procurement or used in F2F programs. Active ingredients that are WHO 1a and 1b (high acute toxicity; toxicity classes are described in Attachment A), as well shall not be recommended for use or procurement or used in F2F programs (these are rejected pesticides, which are listed in Attachment J, Tables 2 and 3).

The PERSUAP preparer then analyzed AIs for toxicity based on “PAN Bad Actor” classification (Pesticide Action Network’s term for more highly toxic pesticides; a description of this classification is in Attachment A). “PAN Bad Actor” classification is one ranking that can be used to identify toxicity issues, and therefore, help formulate mitigation measures (see Safe Use Action Plan) to minimize risks to human health and the environment.

This PERSUAP requests approval from the USAID/BFS BEO to use or provide advice on pesticide active ingredients proposed for F2F country programs that at a minimum are: registered by the USEPA and that are WHO toxicity class II and above (Attachment A, Table 2 contains the list of pesticide active ingredients that F2F volunteers may use/recommend based on USEPA registration and WHO toxicity class).

A range of products made up of these active ingredients are available to farmers in F2F host countries. The number of possible products is in the thousands, and for the purposes of this Programmatic PERSUAP, it is impossible to evaluate all possible products.

Specific products (brand and trade names) that are comprised of these USEPA-registered AIs may or may not be registered by the USEPA—USEPA registers AIs and products. For the USEPA to register a product, a company must submit the product to the EPA for registration. This can be a timely and costly process, which in part explains why many of the products requested for use by F2F programs are not registered by the USEPA. In many cases, a product may not be registered by the USEPA but may be registered in and commonly used in F2F countries.

In addition, if a product is registered by USEPA, it may be a Restricted Use Pesticide (RUP) or a General Use Pesticide (GUP). The USEPA makes the distinction between an RUP and GUP at the product level, not at the AI level. An RUP classification places more serious restrictions on a product than is placed on a GUP. An RUP classification may be given to a product for a variety of reasons: accident history, potential for groundwater contamination, acute toxicity to humans, application scenario is likely to be hazardous (e.g., fumigants), toxicity to non-target plants or animals, or carcinogenic or mutagenic properties. A GUP is a pesticide product that is not classified by the EPA for restricted use as specified in 40 CFR 152.175 (United States’ Code of Federal Regulations).

Typically, an unregistered product similar to a USEPA registered product (percent active ingredients, type of product: wettable powder, granules, etc.) may be approved in a PERSUAP if the active ingredients are USEPA registered. However, approval to use or procure an RUP is never made in a PERSUAP. According to USAID’s Pesticide Procedures, in the case of an RUP, prior to providing assistance for the use or procurement, an Environmental Assessment must be conducted (or if restricted based on user hazard, an evaluation must be conducted of the user hazards).

According to USAID’s Pesticide Procedures: “when a project includes assistance for procurement or use, or both of pesticides registered for the same or similar uses by USEPA **without restriction** [a GUP], the Initial Environmental Examination for the project shall include a separate section evaluating the economic, social, and environmental risks and benefits of the planned pesticide use...” Therefore, since

this PERSUAP analyzes pesticides at the AI level and not down to the product level, it places the responsibility on the F2F volunteers to ensure that the products they recommend are GUPs or similar (if the product is not USEPA registered). F2F volunteers should never recommend RUPs or similar products. Also, F2F volunteers must ensure that, as required by USAID's Pesticide Procedures, the pesticide product is registered for the same or similar use (crops and insects/diseases) as what the F2F volunteer recommends the product for.

Since only F2F Type 1 and some Type 2 assignments are expected to involve specific pesticide recommendations, the volunteer is a professional who is knowledgeable about pesticides, and placing this responsibility on the volunteer is reasonable from an F2F Program sense. In addition, according to F2F IPs, this method, as required in the 2009 PERSUAP, worked well over the 2009 F2F LOP.

In addition, the USEPA assigns toxicity levels based on concentrations and combinations of active ingredients. Since this programmatic PERSUAP only evaluates pesticides at the active ingredient level, it makes it incumbent on F2F volunteers to ensure that products they use/recommend (for use or procurement) are USEPA toxicity level II products and above (or in the case a product is not registered by USEPA, the product should be similar to one that is toxicity II or above). USEPA toxicity level I products (or similar) shall not be used or recommended (for use or procurement) by F2F program volunteers. Descriptions of EPA classifications for toxicity level, RUP, and GUP are in Attachment A.

In addition, this PERSUAP allows for a range of chemical families to be used so that pesticide resistance is less likely to occur; it requires that F2F volunteers recommend/use least toxic alternatives; it requires that AIs and products must be registered by the host country government; and that all assistance for the use or procurement of a pesticide is provided within an IPM framework.

Several F2F IPs requested approval to provide assistance for the use of oral or injectable veterinary treatments, such as de-wormers and other anti-parasitics, and antibiotics. While the definition of pesticides used by USAID is quite broad, it excludes drugs used to control diseases of humans or animals. These are not considered pesticides; in the U.S., such drugs are regulated by the Food and Drug Administration. In addition, fertilizers, nutrients, and other substances used to promote plant survival and health are not considered pesticides. Therefore, approval in a PERSUAP is not needed for F2F programs to provide support for the use or procurement of these. However, the IEE for the F2F program does place restriction and require environmentally sound approaches to fertilizer use.

This Programmatic PERSUAP provides F2F volunteers with a list of AIs that they may use and recommend (including recommending the AI, providing advice on procurement, storage, mixing, application, and disposal). Based on the guidance in this PERSUAP, volunteers may provide this advice only if the AIs and any products comprised of these AIs are registered in the host country; and any specific products used/recommended are USEPA toxicity class II or higher (or the equivalent for products not registered by the USEPA); and that specific products are GUPs or the equivalent for products not registered by the USEPA. It requires that this assistance be given within the context of an IPM approach and that safe use measures are also strongly recommended (see Section 4, the SUAP).

Given the programmatic nature of this PERSUAP, it is intended to cover VCs that are not yet included as part of an F2F country program. Because of the broad range of VCs, and because at this time it is impossible to predict the full range of VCs that an F2F volunteer may be requested to assist with, the PERSUAP provides guidance for volunteers to ensure that their recommendations/advice on pesticide use are VC-specific.

1.6 PERSUAP Methodology

Each IP submitted a list of pesticides that they would like their F2F country programs to be able to recommend to protect against major pests and diseases in their target VCs. The list included pesticides that may be needed over the five-year life of project. Each IP also provided information on IPM use for the different crop diseases and pests, method of application of pesticides, information on the most critical pesticide issues, and availability of safety equipment in the country.

Because the F2F overall program methodology is largely unchanged from the FY 2007-2012 program, the PERSUAP preparer used the 2009 PERSUAP as the foundation for this PERSUAP. The PERSUAP preparer and each IP discussed by phone their new programs, changes since the FY 2007-2012 program, lessons learned from implementation of the 2009 SUAP conditions, and suggestions for the new SUAP. Country and program area information was revised, as necessary for the F2F Program FY 2013-2017.

The IPs were asked about the 2009 PERSUAP's successes, gaps, applicability and practicality of the conditions and mitigation measures. The SUAP was prepared using this information, and also information from findings in the PER section.

2. PESTICIDE MANAGEMENT AND CHALLENGES FOR THE SAFE USE OF PESTICIDES IN F2F COUNTRIES

2.1 Challenges for the Safe Use of Pesticides in F2F Countries

The PERSUAP preparer compiled the following from information submitted by F2F IPs. It is intended to give a broadbrush view of the pesticide safe use challenges in F2F countries.

The main challenges in Senegal are similar to many of the other F2F countries. One of the main challenges to safe pesticide use in Senegal is that the majority of farmers are illiterate and are unable to read instructions about how to use, store, and dispose of pesticides. In general, farmers buy pesticides from market retailers who are also illiterate. The retailers buy pesticides from shops and repackage them into smaller containers. The majority of retailers and farmers do not know how to apply, store, or dispose of pesticides correctly. For example, farmers are unaware of general safety concerns with application, such as taking wind direction into account; with safe disposal of containers; not to reuse containers; and safeguards for disposal of unused pesticide, such as not to dispose in water, down sinks, or on land. Access to safety equipment is also very limited and when available, often too expensive for farmers to purchase and thus, rarely is safety equipment is used.

Uganda's challenges are largely the same as noted in the 2009 PERSUAP. The major issues are related to counterfeit pesticides, disposal methods, and general lack of knowledge in preparation and application of pesticides, with the most serious problem, improper disposal methods. The larger users of pesticides, mainly the flower farms, have improperly used and disposed of pesticides, and have contaminated waters and affected aquatic ecosystems. Limited knowledge about application of pesticides has resulted in pest and disease resistance, crop loss, and accidents that affect human health and the environment.

In Armenia, the most serious pesticide-related issues are: incorrect application of pesticide (mainly overusing); not allowing an adequate interval between application and harvest; use of cheap and low quality generic pesticides produced in China, India, Turkey, or other countries, where formulations of

pesticides are poorly regulated; using low quality safety equipment, which provides poor protection; and improper pesticide application and disposal methods.

In Egypt and Lebanon lack of knowledge about good practices in pesticide application, storage, handling, and disposal, and lack of availability and use of safety equipment are the main problems.

Mozambique's challenges remained unchanged since the last F2F PERSUAP. In general, information is widely lacking on proper handling and disposal methods, including disposal of empty containers, as well as unused pesticides. Farmers and input suppliers are also largely unaware of safeguards to take against poisoning of applicators and the environment, including pollinators; proper dosage of pesticide; first-aid treatment, including treatment when the first mild symptoms appear and when later severe symptoms occur; and proper transport and storage of pesticides.

In Burma, many illegal insecticides, fungicides, and herbicides can be found, imported from China and Thailand through the border trade. Almost all of the chemicals are in containers with labels that farmers are unable to understand, including information on dosage and use. Moreover, some chemicals are sold beyond the expiration date. These illegal pesticides are attractive to farmers because they are relatively inexpensive due to the lack of tax and registered distributing license. Poor farmers commonly use these pesticides but often they are ineffective and crops fail. Burma's Pesticide Law was enacted on 11 May 1990, yet enforcement is weak, and among other issues, it fails to protect farmers against counterfeit pesticides. In addition, most farmers have limited knowledge of agro-chemicals and application and safety equipment. Farmers commonly use more than the recommended dose. Farmers are also unaware of proper disposal of pesticides and containers, and they are frequently disposed on open land, in ponds and rivers, and near farmers' houses.

The situation in Tajikistan, as well, is largely unchanged in the 2009 F2F PERSUAP. The unavailability of good quality pesticides and the undeveloped coop/associations in the agriculture sector mean that good quality pesticides are very expensive, and therefore, inaccessible to most Tajik farmers. Also, safety equipment is unavailable to most farmers in Tajikistan.

In Kenya, the major challenge to safe use of pesticides is that the majority of small-scale farmers lack knowledge of disposal of chemicals and chemical equipment. However, recently, both the ministry and some national and international organizations have been educating farmers on safety.

In Tanzania, small farmers' knowledge and awareness of correct pesticide application and pesticide container disposal is very low. Many small farmers are illiterate. They may rely on peer farmers for most of their information, yet peer farmers' knowledge is also at a low level. User guides are usually in English or other languages, which even literate farmers are unable to understand. The availability of counterfeit products in the market is also a problem. Use of pesticides that are not certified by the Tanzania Pesticide Research Institute have resulted in crop losses and have affected the health of farmers. Because of limited pesticide choices available to most farmers in Tanzania, people are sometimes forced to use the fake products available in the market.

Angola cited the following as the main pesticide issues:

- Inability to purchase safety equipment because of lack of money
- Lack of proper disposal
- Poor timing of applications
- Improper mixing
- Instructions not printed in a local language or farmer is illiterate
- Pesticides enter country through uncertified agrodealers

As in the 2009 PERSUAP, Malawi cited the discontinuation of training for applicators and also supervision of applicators as challenges to safe use. Malawi also noted that any available pesticide is used even if not prescribed for the specific problem. Lack of enforcement of the pesticide law and lack of effective sanctions mean that counterfeit, sub-standard, and outdated pesticides are commonly found on the market. The pesticide industry is often unwilling to assume wide-scale responsibility for pesticide stewardship at the farm level. Also as in the 2009 PERSUAP, Malawi stated that the long-term health implications of using pesticides are not appreciated by most smallholder farmers.

Ethiopia noted many of the same issues as those above with the notable addition of a lack of recording of pesticide use and distribution (no reliable records of used/distributed pesticides at village, district, zonal, regional, or federal/national levels). The Ethiopia IP also noted that many “experts” (regional/zonal/district level experts or kebele (village) level development agents) have a low level of awareness about pesticide issues, yet these are the people to whom farmers turn for advice.

Ghana, Liberia, Kyrgyzstan, and the DRC stated that the main issues are lack of safety equipment, improper disposal methods, limited knowledge about application, and loose enforcement of safety laws and regulations across the country.

Nicaragua stated that improper management of waste and inavailability of safety equipment are the main challenges for safe use.

In Haiti, the F2F IP stated that the main challenges to safe use of pesticides are that DDT (or a product called DDT) is still being sold; and that most of the pesticide markets are far from farms. This means they must buy the product and bring it home in the same bag as they bring other goods home. Also, farmers often do not know what they are using, they just go to the store ask for a treatment for aphids and the store owner or vendor gives them what ever is available. Another issue is that pesticides are often stored near food for humans or animals or near water sources.

In Guinea, farmers have little training on mixing and other good practices when handling pesticides. Guinea has no infrastructure for the disposal of chemicals, and packages are left in the fields or used for other purposes (containers for water or vegetable oil). The country does not have a poison control center.

The Nepal IP stated that the main challenge for safe pesticide use is poor access to good quality chemicals and equipment, including safety equipment. Apart from farmers supported by District Agriculture Development Offices, the Regional Plant Protection Laboratory, and some NGOs, the majority of Nepalese farmers have no knowledge of agricultural chemicals and application and safety equipment. The high cost of good quality pesticides and equipment pushes most farmers to use inappropriate chemicals, resulting in adverse impacts to the environment and human health. The Nepal IP provided this additional information:

Nepalese traders commonly go to India, purchase pesticides, and then smuggle them back into Nepal, and also Indian traders smuggle pesticides into Nepal. Rarely will a trader, who puts pesticides in his backpack and crosses the border by motorcycle, get stopped and searched. Counterfeit and re-packaged pesticides are common; often they lack instructions or instructions are in languages not understood by most farmers. The burgeoning cases of poisoning in the country are largely attributed to counterfeit and re-packaged pesticides. Lohani et al. (2013) reviewed reports from five hospitals between 2007 and 2011, and found a total of more than 3,000 cases of pesticide poisoning per year. Most (70%) are suicides committed mostly by women (61% of suicides). Seventy-six deaths from pesticides were classified as occupational (occupational can mean farmers applying them to their fields); while 740 were accidental poisonings. Thirty-one percent of the victims were aged 20-29; followed by 21% aged 30-39; and 19%

under nine years old. The youngest were most likely accidentally poisoned due to parental neglect in not securely storing pesticides.

In the DR, challenges related to pesticide safe use are mainly:

- A majority of the labor force involved in vegetable and fruit production is Haitian and does not speak Spanish. Yet most training is carried out by local government extension workers who do not speak Haitian, Creole, or French, but Spanish.
- Many pesticide applicators have no training in agricultural practices and often do not follow proper application procedures.
- Improper disposal of pesticide containers: Often, containers are simply thrown into the fields.

The Bangladesh F2F program stated that the most serious pesticide issue is overuse of pesticides. Use of pesticides in Bangladesh is increasing very rapidly. A total of 37,712 tons of pesticides were sold in Bangladesh in 2007, an increase of 145.3 percent since 2001 (Rory, 2010). Another estimation by the Bangladesh Crop Protection Association shows in 2009 that 45,172 tons of chemical pesticides were sold in the country compared to 15,632 in 2000, an increase of almost 300 percent (IRIN, 2012). More than 47% of farmers in Bangladesh use more pesticides than needed to protect their crops (The World Bank, 2007). Excessive and indiscriminate use of pesticides has resulted in many health problems, such as vomiting, headache, dizziness, blurred vision, stomach pain, allergy, and breathing problems. In 2012, 14 children died after eating or coming into contact with litchi fruit that had been grown with chemical pesticides in the northern district of Dinajpur (IRIN, 2012). The 2009 Health Bulletin, which compiles health statistics from 2008, recorded 7,438 pesticide-related poisoning deaths at more than 400 hospitals nationwide among men and women aged 15-49.

Whereas in the 2009 PERSUAP, most IPs specifically mentioned over-use of pesticides, ignorance of withholding periods, and limited if any knowledge of IPM, these were less often mentioned as the main issues five years later. Notably, the main issue from the 2009 PERSUAP is poorly educated/informed farmers. SUAP recommendations in Section 4 address many of the related challenges.

2.2 Pesticide Management and Safeguards

The following is from the 2009 PERSUAP; there have been no changes since preparation of that PERSUAP in 2009.

Pesticide Registration in the US

The USEPA is responsible for registering pesticide products for use in the United States. The EPA is granted this authority under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), but other laws also play a role in pesticide regulation, including the Federal Food, Drug, and Cosmetic Act (FFDCA), the Federal Food Quality Protection Act of 1996 (FQPA), and the Safe Drinking Water Act. FIFRA requires EPA to assess the potential effects of a pesticide product on human health and the environment when used according to label directions developed for the product. Once the EPA approves a set of label directions for a pesticide product, any use of the pesticide which does not follow the label directions is a violation and may be subject to civil and/or criminal penalties. FIFRA also requires that EPA reevaluate older pesticides to ensure that they meet more recent safety standards.

Before a pesticide is registered for use on a particular commodity or site, it must be approved for that use by the EPA. Tests are performed by the manufacturers to determine whether the product or its residues on foods presents unreasonable risks to people, wildlife, fish, and plants. The EPA reviews the data submitted by the manufacturers and either approves or disapproves the studies. A summary of rejection rates for these studies shows that historically 20-50% of the manufacturers' studies submitted for

evaluation of pesticides are rejected as inadequate. During the delay while the studies are being re-done, the pesticide—if it had been previously registered—can be sold as it had before, even though the health effects of exposure may be unknown.

For pesticides that are known to have the potential for causing health or environmental problems, EPA has the authority to limit the amount of pesticide applied, restrict the frequency or location of application, or require the use of specially trained, certified applicators (RUPs). For problematic pesticides, EPA may also undertake an extensive Special Review of a pesticide or work with manufacturers and users to implement changes in a pesticide's use to reduce exposures, such as eliminating use on certain crops, reducing application rates, restricting the methods of application, or canceling a pesticide's uses.

Most US states also have laws governing pesticide regulation and use. California's regulatory system is the most comprehensive; this is because nearly 25% of all pesticides used in the U.S. are used in California.

Overview of Maximum Pesticide Residue Level in the United States

There are several agricultural production issues small farmers are facing in FTF countries, particularly in Central America. This includes dealing with seeds with diseases, using inappropriate pesticides, not using recommended amounts, not applying at the correct intervals pre-harvest, and exceeding national and U.S. maximum residue levels (MRL).

For exports to the United States, volunteers need to provide guidance and training to clients about the MRL that are established by the US Food and Drug Administration for specific crops. Volunteers need to be familiar with the MRLs, when they are advising farmers on pesticide use to ensure that crops do not exceed MRLs for export to regional countries and the United States.

In addition, F2F volunteers should be aware of and take into consideration the new U.S. Food Safety Modernization Act (FSMA) and its requirements for exports to the US. FDA is still in the process of preparing rules and regulations for FSMA, which will be important for volunteers to understand, especially when the rules are promulgated. The issues include traceability of crops to exact fields, preparing a hazard analysis plan, identifying critical points in the trade process, and offering solutions for critical export requirements, with a special focus on MRLs.

Host Country Pesticide Registration Processes

USAID-supported programs are required to comply with host country laws and regulations. Therefore, as discussed above, in addition to the USEPA registration requirement and WHO toxicity levels (only WHO II and above are allowed), host country registration must be ensured before an F2F volunteer may provide assistance for the use or procurement of a specific pesticide.

Most F2F country programs submitted lists of pesticides registered in their host countries. Some of these lists are thorough, include guidance, and are well documented. The Georgian law No 1696 on Pesticides and Agrochemicals of 1998-11-26 regulates the whole chain from import, manufacture, sales, use, and disposal of pesticides and other chemicals and provides a registration system for 925 pesticides and 202 other agrochemicals registered and permitted for use in Georgia. Other country lists are simply lists of AIs and products that have been registered in the country, with no additional information—some of these lists are relatively short, and may severely limit a volunteer's recommendations. French-speaking West African Sahelian countries use the *Comite Sahelien des Pesticides* list of regulated pesticides.

Prior to providing assistance for the use of pesticides, this PERSUAP (in the SUAP) requires that F2F volunteers obtain the country pesticide registration list (required by this PERSUAP to be kept at each IP's headquarter office and field office), review it, and have it available when providing recommendations

for specific pesticides. All F2F country programs provided a list of registered pesticides except Angola, which has no such list. In 2009, Angola was also the only F2F country that had no government approved pesticide registration list.

For Angola (and also for any new F2F countries added over the LOP, and for flex assignments non-core F2F countries), Attachment D provides suggestions to volunteers to help them locate a list (flex assignments and non-core countries) or a proxy (Angola). F2F volunteers in Angola who may be directly or indirectly involved with pesticides (Types I and II assignments) should plan to meet with the appropriate ministry to determine applicable regulations/requirements. Even for F2F countries that submitted a list, Types I and II volunteers should ensure that it contains the most recent information (check online or check with the appropriate ministry once in-country). And for F2F volunteer assignments in non-core countries, the volunteer should check online prior to travelling to the country. These measures are included in the SUAP.

WHO Toxicity Classes

The “WHO Recommended Classification of Pesticides by Hazard” was approved by the 28th World Health Assembly in 1975 and the classification has gained wide acceptance. Guidelines were first issued in 1978, and have been revised and reissued at two to three year intervals. In December 2002, the United Nations Committee on Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labeling of Chemicals (UNCETDG/GHS) approved a document called “The Globally Harmonized System of Classification and Labeling of Chemicals” with the intent to provide a globally-harmonized system to address classification of chemicals, labels, and safety data sheets. Classification and labeling based on acute toxicity form a part of the GHS, but there are some differences between the GHS and the WHO traditional classification of pesticides by hazard. The benefits of the GHS (according to <http://www.epa.gov/oppfead1/international/globalharmon.htm>) are:

- Enhance the protection of human health and the environment: Consistent and widespread use of GHS will enhance protection of human health and the environment by providing an internationally comprehensible system for hazard communication. GHS will help ensure more consistency in the classification and labeling of all chemicals, thereby improving and simplifying hazard communication. This improved communication system will alert the user to the presence of a hazard and the need to minimize exposure and risk, resulting in safer transportation, handling and use of chemicals.
- Promote sound management of chemicals worldwide: GHS will provide a harmonized basis for the first step in the sound management of chemicals, identifying hazards, and communicating them. This will be particularly useful for countries without well-developed regulatory systems.
- Facilitate Trade: GHS will reduce costly and time-consuming activities needed to comply with multiple classification and labeling systems, promoting more consistency in regulation and reducing non-tariff barriers to trade.

As the 2009 PERSUAP stated, the WHO is in the process of adjusting the Pesticide Classification to conform to the GHS. This still remains the case today.

WHO bases its classification on the “acute risk to health”—the risk of single or multiple exposures over a relatively short period of time—that might be encountered accidentally by any person handling the product in accordance with the directions for handling by the manufacturer or in accordance with the rules laid down for storage and transportation by competent international bodies. WHO Acute Toxicity Classes are described in SUAP Attachment A.

Prior Informed Consent (PIC) Procedure

The text of the Rotterdam Convention was adopted on 10 September 1998 by a Conference of Plenipotentiaries in Rotterdam, the Netherlands. The Convention entered into force on 24 February 2004. The United Nations Environment Programme (UNEP) and the UN's Food and Agriculture Organization (FAO) had jointly implemented the original PIC procedure, which operated until the adoption of the Rotterdam Convention (officially known as the Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade). For more information on PIC, visit the Rotterdam Convention website on Chemicals, Annex III Chemicals¹, including a list of countries that are party to the Convention.

The objectives of the Convention are:

- to promote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm; and
- to contribute to the environmentally sound use of those hazardous chemicals, by facilitating information exchange about their characteristics, by providing for a national decision-making process on their import and export, and by disseminating these decisions to Parties.

The Convention creates legally binding obligations for the implementation of the PIC procedure. It covers pesticides and industrial chemicals that have been banned or severely restricted for health or environmental reasons. One notification from each of two specified regions triggers consideration of the addition of a chemical to Annex III of the Convention. Severely hazardous pesticide formulations that present a hazard under conditions of use in developing countries or countries with economies in transition may also be nominated for inclusion in Annex III (see Attachment E for chemicals included in Annex III). As discussed in the SUAP, these AIs/chemicals and formulations may not be recommended (for use or procurement) by F2F volunteers in countries party to the Rotterdam Convention, as well as in countries that are not yet a party; and in addition, if a volunteer encounters any of these chemicals being used, the volunteer shall strongly discourage its use, and should inform the producer/producer organization/applicator about its status, hazards, and available alternatives. This should also be included in the volunteer's final report to the IP. These requirements are included in the SUAP.

There are 40 chemicals listed in Annex III of the Convention and subject to the PIC procedure, including 25 pesticides, four severely hazardous pesticide formulations and 11 industrial chemicals. Many more chemicals are expected to be added in the future.

The Convention promotes the exchange of information on a very broad range of chemicals. It does so through:

- The requirement for a Party to inform other Parties of each national ban or severe restriction of a chemical;
- The possibility for a Party which is a developing country or a country in transition to inform other Parties that it is experiencing problems caused by a severely hazardous pesticide formulation under conditions of use in its territory;
- The requirement for a Party that plans to export a chemical that is banned or severely restricted for use within its territory, to inform the importing Party that such export will take place, before the first shipment and annually thereafter;
- The requirement for an exporting Party, when exporting chemicals that are to be used for

¹ Rotterdam Convention, Chemicals, Annex III Chemicals can be found here:
<http://www.pic.int/Default.aspx?tabid=1132>

- occupational purposes, to ensure that an up-to-date safety data sheet is sent to the importer; and
- Labeling requirements for exports of chemicals included in the PIC procedure, as well as for other chemicals that are banned or severely restricted in the exporting country.

The PIC Procedure can be a powerful tool to regulate pesticides, and F2F volunteers should be aware of its requirements.

Persistent Organic Pollutants

The Stockholm Convention on Persistent Organic Pollutants (POPs) is a global treaty to protect human health and the environment from chemicals that remain intact in the environment for long periods, become widely distributed geographically and accumulate in the fatty tissue of humans and wildlife. Exposure to POPs can lead to serious health effects including certain cancers, birth defects, immune and reproductive dysfunctions, increased susceptibility to disease and even diminished intelligence. Given their long range transport, no one government acting alone can protect its citizens or its environment from POPs. In response, the Stockholm Convention, which was adopted in 2001 and entered into force in 2004, requires Parties to take measures to eliminate or reduce the release of POPs into the environment. The Convention is administered by UNEP.

Under the Stockholm Convention, also known as the “POPs treaty,” countries agree to reduce or eliminate the production, use, and/or release of the following 12 POPs: aldrin, chlordane, DDT, dieldrin, endrin, heptachlor, hexachlorobenzene, mirex, toxaphene, polychlorinated biphenyls (PCBs), polychlorinated dibenzo-p-dioxins, and dibenzofurans. The Convention specifies a scientific and procedural review process that could lead to the addition of other POPs chemicals of global concern. Visit, the EPA website on International programs, *Persistent Organic Pollutants, a Global Issue, a Global Response*;² *The Foundation for Global Action on Persistent Organic Pollutants: The United States Perspective*³ (164 pp, 15.0MB, about PDF⁴); and the Stockholm Convention home page⁵; as well as the POPRC Recommendations for listing Chemicals⁶ for chemicals currently under review. The “dirty dozen” POPs are listed in Attachment E.

Organophosphate pesticides (OPs) are among the most acutely toxic pesticides, with most of these chemicals classified by the USEPA as toxicity class I (highly toxic) or toxicity class II (moderately toxic). In addition, some OPs cause developmental or reproductive harm, some are carcinogenic, and some are known or suspected endocrine disruptors. OPs of primary concern include: azinphos-methyl, chlorpyrifos, diazinon, dichlorvos (DDVP), dimethoate, ethephon, malathion, methamidophos, naled, and oxydemeton-methyl. Residential uses of chlorpyrifos and diazinon were recently banned by the USEPA. OPs of primary concern are included in Attachment E.

Overview of Pesticide Registration in the European Union

The European Community (EC) has established a harmonized legal framework for the regulation of pesticides in all member countries of the EC. The Commission of the European Communities, in

² “EPA, International Programs, Persistent Organic Pollutants: A Global Issue, A Global Response” can be found here: <http://www.epa.gov/oia/toxics/pop.html>

³ <http://www.epa.gov/ncea>

⁴ “EPA, PDF Files, About Portable Document Format (PDF) Files” can be found here: <http://www2.epa.gov/home/pdf-files>

⁵ Stockholm Convention website can be found here: <http://chm.pops.int/Home/tabid/2121/mctl/ViewDetails/EventModID/1126/EventID/468/xmid/6921/Default.aspx>

⁶ “Stockholm Convention, POPRC Recommendations for listing Chemicals” can be found here: <http://chm.pops.int/Convention/POPsReviewCommittee/Chemicals/tabid/243/language/en-US/Default.aspx>

collaboration with member countries of the EC, is responsible for the registration of pesticide *active ingredients* (also referred to as *active substances*) for use in all EC member countries. Individual member countries, called Member States, are responsible for the registration in their country of specific pesticide *products* containing AIs authorized for use by the Commission.

The EC pesticide registration procedure establishes uniform standards for both the re-evaluation of AIs on the market in the EC on or before July 25, 1993 (called *existing active ingredients*), and the registration of new AIs introduced after this date. The evaluation of a new active ingredient begins when a pesticide manufacturer submits an application, called a dossier, to the Member State of their choice. Once the Commission determines that all required information is included in the dossier, any Member State can grant a renewable three-year *provisional authorization* to an AI for use in their country. Provisional authorizations are granted before an AI has been fully evaluated and approved by the EC.

The master list of pesticide AIs approved for use in the EC is included in an Indicative List in Annex I of the Directive 91/414/EEC. Individual Member States maintain records of AIs that have been granted provisional authorizations pending a Commission decision on their full authorization throughout the EC. For an accurate list of pesticide AIs registered for use in an EC country, one must consult both Annex I and the specific country's responsible authority.

For F2F volunteers' SOWs that involve agricultural trade with EU countries, they should review and be aware of EU pesticide registration requirements and maximum residue levels (MRL), discussed below.

The European Commission's Maximum Residue Levels

According to an EC factsheet, *New Rules for Pesticide Residues on Food* (September, 2008), an MRL is the highest level of a pesticide residue that is legally tolerated in or on food or feed. The EC fixes MRLs for food and animal feed. MRLs for all crops and all pesticides can be found in the MRL database on the Commission website⁷. Chemicals and products can be searched on this database. For F2F SOWs that involve agricultural trade with EU countries, volunteers should review this database.

To avoid the confusion that previous EC MRLs were causing, as of 1 September 2008, there is a newer regulation covering all agricultural products intended for food or animal feed. This updated regulation establishes MRLs for fresh products, and these MRLs also apply to the same products after processing, adjusted to take account of dilution or concentration during the process. The regulation covers pesticides currently or formerly used in agriculture in or outside the EU (over 1,100 pesticides). Where a pesticide is not specifically mentioned, a general default MRL of 0.01 mg/kg applies. The regulation covers the safety of all consumer groups, including, for example, babies, children and vegetarians.

EurepGAP - GlobalGAP

The following information is summarized from the EurepGAP website⁸. EurepGAP is a private sector body that sets voluntary standards for the certification of agricultural products around the globe. It is a partnership with agricultural producers and retailers who want to establish certification standards and procedures for Good Agricultural Practices (GAP). The standard is "pre-farm-gate" and includes the process of a certified product from before the seed is planted until it leaves the farm.

EurepGAP started in 1997 as an initiative by retailers belonging to the Euro-Retailer Produce Working Group (EUREP). It was a reaction to growing concerns by consumers about product safety, and environmental and labor standards. To address these concerns, EUREP started to work on harmonized

⁷ "EU Pesticide Database" can be found here: http://ec.europa.eu/sanco_pesticides/public/?event=homepage

⁸ GlobalG.A.P. homepage: www.eurepgap.org

standards and procedures for the development of GAP in conventional agriculture. In September 2007, EurepGAP changed its name to GLOBALGAP. The decision was taken to reflect its expanding international role in establishing Good Agricultural Practices between multiple retailers and their suppliers. More information about GLOBALGAP and the series of standards can be accessed on their website.⁹

For F2F volunteers working on agricultural trade with EU countries, the GlobalGAP website should be checked on a regular basis to identify countries with certified GAP schemes and for other updates.

FAO/WHO Codex Alimentarius

The *Codex Alimentarius* is a collection of international food safety standards that have been adopted by the *Codex Alimentarius* Commission (the “Codex”). The Codex is funded jointly by the FAO and WHO, which in the early 1960s, recognized the importance of developing international standards to protect public health and minimize disruption of international food trade. The Joint FAO/WHO Food Standards Program was established, and the Codex Alimentarius Commission was designated to administer the program.

Over the years, the Codex has developed over 200 standards covering processed, semi-processed or unprocessed foods intended for sale for the consumer or for intermediate processing; over 40 hygienic and technological codes of practice; evaluated over 1000 food additives and 54 veterinary drugs; set more than 3000 maximum levels for pesticide residues; and specified over 30 guidelines for contaminants.¹⁰

The Agreement on the Application of Sanitary and Phyto-sanitary Measures, also known as the SPS Agreement, is an international treaty of the World Trade Organization (WTO). It was negotiated during the Uruguay Round of the General Agreement on Tariffs and Trade, and entered into force with the establishment of the WTO at the beginning of 1995. Under the SPS agreement, the WTO sets constraints on member states’ policies relating to food and safety (bacterial contaminants, pesticides, inspection, and labeling) as well as animal and plant health and imported pests and diseases. Notably, the SPS Agreement cites Codex's food safety standards, guidelines, and recommendations for facilitating international trade and protecting public health.

3. PESTICIDE EVALUATION REPORT (PER): USAID’S PESTICIDE PROCEDURES

3.1 Factor a. USEPA registration status of the proposed pesticides

Table 2 in Attachment J lists all pesticides (active ingredients) requested by F2F country programs, and shows USEPA registration status of each active ingredient. Active ingredients that are not registered by USEPA may not be used or recommended (for use or procurement) by F2F volunteers. The F2F Program requests approval to provide assistance for the use or procurement of pesticide active ingredients that are listed in Attachment A, Table 2; all pesticide active ingredients in Attachment A are USEPA registered.

⁹ Global G.A.P homepage: http://www.globalgap.org/uk_en/

¹⁰ <http://www.codexalimentarius.org/>

In addition to USEPA registration status, the table in Attachment J shows WHO toxicity class of the pesticides requested. Any active ingredient that is WHO toxicity class 1 (1a and 1b) is rejected due to its high toxicity (Attachment J, Tables 2 and 3). Attachment A, Table 2 lists pesticides that are WHO toxicity class 2 and above, and that this PERSUAP requests approval for.

Some F2F country programs submitted soil and post-harvest fumigants; these are considered highly toxic (although WHO does not assign toxicity levels to fumigants), and the USEPA has stringent standards for their use. The USEPA requires protections for workers, bystanders, and people who live and work nearby to areas that are fumigated. Applicators must be certified, and USEPA requires the use of certain fumigation equipment that must be regularly maintained. These standards should also be upheld by any USAID supported activities where fumigants will be recommended or used, however, in most F2F country programs, it is very difficult to ensure these high standards. Therefore, the fumigants submitted by F2F country programs have been rejected in this PERSUAP.

However, USAID's Programmatic Environmental Assessment (PEA) for Fumigation of Title II Food Aid Commodities may be applicable to some F2F volunteer assignments. If a volunteer is involved in a Title II food aid project (Type IV assignment), assistance for the use or procurement of pesticides would fall under that PEA, which allows assistance for the use of fumigants within a very strict framework. In this case, the F2F volunteer should obtain the PEA, and should comply with its requirements.

The 2009 PERSUAP reported that endosulfan was expected to be added to the Stockholm Convention on POPs, and a global ban on the chemical may be imminent. Although the global ban is not yet in place, endosulfan use is rejected under this PERSUAP due to its high toxicity to humans and the environment, and its persistence in the environment. Endosulfan was first proposed for addition to the Stockholm Convention on POPs in 2007. At that time about 50 countries had already banned it; today, more than 80 countries have banned it or announced phase-outs. In June 2010, the USEPA took action to end all uses of endosulfan in the United States, after concluding that "endosulfan poses unacceptable risks to agricultural workers and wildlife, and can persist in the environment." USEPA is phasing out all uses by 2016.

The 2009 PERSUAP also rejected atrazine. Atrazine is a groundwater contaminant, considered highly toxic to humans and amphibians, and the EU has withdrawn regulatory approval for it. Although atrazine is registered by the USEPA, it is highly toxic to humans and the environment, and its use rejected under this PERSUAP.

As discussed in the SUAP, F2F volunteers will be required to verify that active ingredients and any products recommended are approved/registered by the host country or are similar or same formulations for similar/same use as are registered in the host country before an F2F volunteer recommends a specific pesticide (active ingredient or product). This PERSUAP requests approval to provide assistance for the procurement or use of active ingredients (with the caveat that they must be registered in the host country). For product level approvals, the F2F volunteer needs to do the due diligence to ensure that prior to recommending a specific pesticide product, it is considered a GUP or the equivalent, and that it is USEPA toxicity level II or above or the equivalent (if the product is not US EPA registered). The volunteer also must ensure that the product is registered by EPA for the same or similar use (crop and insects/diseases) as that which the volunteer is recommending it.

The above requirements are the same as the 2009 PERSUAP. As stated in the 2009 PERSUAP, F2F volunteers should be aware of the often low level of understanding of the toxic effects of pesticides in many of the F2F countries. This situation is unchanged since the 2009 PERSUAP, as indicated in the questionnaires submitted by F2F IPs (see Section 2.2—challenges to safe use).

Attachment A, Table 2 lists a range of active ingredients that can be recommended by F2F volunteers. Volunteers who provide recommendations for specific pesticides should also be prepared to discuss toxic

effects and recommend mitigation measures (this is discussed in detail in the SUAP). For example, copper products are commonly used as fungicides, and there is a common misunderstanding by many in F2F countries that they are not highly toxic. According to the *Pesticide Toxicity Profile: Copper-based Pesticides*,¹¹ the dust and powder formulations of copper compounds are irritating to the skin, respiratory tract, and particularly the eyes; and livestock seem uniquely vulnerable to copper's effects. Chronic effects have been reported by vineyard workers who experienced liver disease after 3 to 15 years of exposure to Bordeaux mixture. Yet Bordeaux mixture is very common, available, and accessible in many F2F countries, and some even perceive it to be a “natural” product.

As mentioned above, some F2F IPs requested approval to provide assistance for the use of oral or injectable veterinary treatments, such as de-wormers and other anti-parasitics, and antibiotics. As mentioned above, these do not require USAID approval in a PERSUAP (their use should be evaluated in an IEE of the F2F Program).

Missions will consult with both PERSUAPS and use the PERSUAP that is most up to date with regard to EPAs registry. This means that the approved list of pesticides in Attachment A, Table 2 in this PERSUAP may supercede the approved list of pesticides in Mission PERSUAPS. Once the mission or sector-wide PERSUAP expires, this F2F PERSUAP governs. In cases where the mission PERSUAP proves more up to date, should BFS BEO be notified and the umbrella PERSUAP may be amended. The Mission is ultimately responsible for checking on the most up to date information and the BEO has the authority to provide clarification to Missions if there is an issue This will help ensure consistent messages are given to USAID beneficiaries, and should also help ensure F2F volunteers are not hampered in their recommendations.

3.2 Factor b. Basis for selection of requested pesticides

F2F country programs were asked to provide the reasons they selected each of the requested pesticides. For most countries, the reasons for selecting pesticides included one or more of the following: availability, economical, very economical, inexpensive, effective, traditional use, good results, very good results, affordable, efficient, registered/approved by government, long-lasting effect, reliable, farmer-friendly, highly selective, broad-spectrum, and time-saving.

Comments from Country F2F Program Implementers

Armenia gave the basis as effective, available, and affordable. For the *DRC*, the focus was on availability. *Ethiopia*'s basis is: tested and registered by government and available. The three most common bases for traditional farmer pesticide selection for crops in *Georgia* are price, availability, and efficacy. *Ghana* solely focused on registration status of the selected pesticides, and chose only those pesticides that are USEPA and Ghana EPA registered. *Tajikistan* focused solely on availability. *Uganda*'s selections are mainly because they are broad spectrum, approved for use, and available. *Nepal*'s selection is based on availability and effectiveness. *Senegal*'s selection is based on availability and also that azadirachtin is available at no cost. *Liberia* made their selections because they are available and inexpensive. *Angola* selected solely based on cost and availability. For the *DR*, selections were mainly based on availability and cost, but also several were selected because they are highly effective.

Haiti noted that they chose malathion, for among other reasons, because it is less dangerous than the alternatives. *Kyrgyzstan* selected the pesticides based on their effectiveness on the target crops and

¹¹ “University of Florida IFAS Extension, Pesticide Toxicity Profile: Copper-based Pesticides” can be found here: <http://edis.ifas.ufl.edu/pi103>

because they are registered for use on these crops. Malawi made their selections solely on availability (although the presumption is that they are also registered and effective).

Nicaragua provided detailed information on the basis for selecting the pesticides they chose, such as: readily available, does not remain in soil, and does not damage the soil structure (picloram); insecticide that is absorbed by the leaves and affects the insect's nervous system, causing paralysis and death; available in markets (abamectin); a broad-spectrum, systemic fungicide with preventative and curative properties (carbendazim).

Tanzania made all their selections based on availability only. As mentioned above, availability of pesticides is a severe constraint in Tanzania, and because of the limited availability, farmers are often forced to use counterfeit pesticides.

Mozambique selected pesticides mainly because of availability, low cost, and because of low toxicity; Mozambique chose many pesticides based on low toxicity (or perceived low toxicity, i.e., cypermethrin, lambda cyhalothrin).

Burma chose the requested pesticides because they are available in the market and commonly used. Selection was also based on ease of use and because they provide relatively inexpensive yet effective pest control without the need for a great deal of technological skill on the part of farmers.

Bangladesh F2F staff conducted a survey of pesticides most often used in Bangladesh. They visited pesticide shops, interviewed retailers and dealers, pesticide company representatives, and lead farmers, and discussed the situation with experts in the field. The survey was conducted in Dhaka, Khulna, and Jessore district. They found that:

- Dealers and retailers strongly influence the supply chain of pesticides due to their involvement with selling fertilizers, seeds, feeds, and other agricultural inputs.
- Farmers largely depend on the recommendations of those dealers and retailers for selecting pesticide brands and doses of pesticides.
- The selection of pesticides also depends on the quality, availability, competitive price, effectiveness, good will of the company, and the cropping pattern of the specific agro-ecological zone.
- The leading pesticide companies are: Syngenta, Auto Crop Care, Bayer Crop Science, Padma Oil Company Ltd., Setu Corporation Ltd., and McDonald BD Ltd.
- The survey results suggest that pesticides of these leading companies are very popular among farmers.

Notably, very few F2F programs gave a basis for selection related to environmental or health reasons. While the most common reasons for choosing the pesticides requested are valid—available, effective, and inexpensive, as in the 2009 PERSUAP, the replies from the country programs indicate that there is still major work that needs to be done before farmers, applicators, and extension officers consider human health and environment issues along with other reasons for selecting a specific pesticide.

The SUAP includes specific recommendations for F2F volunteers to help raise awareness of the human health and environmental consequences of pesticide use with the aim of encouraging farmers and applicators to consider human health and the environment when making pesticide choices. These recommendations will help ensure that F2F volunteers' recommendations and advice on pesticide use have positive effects on human health and the environment.

3.3 Factor c. Extent to which the proposed pesticide use is, or could be, part of an ipm program

USAID strongly encourages an IPM approach in agricultural production activities (crops and livestock). Under this approach, pesticides are considered a tool of ‘last resort’ and the choice of pesticide should as far as feasible be the ‘least toxic.’ Pesticide use should be judicious, and in accordance with best, safe use practices.

However, as described in 3.2 above, most F2F country programs do not currently make their pesticide choices based on least toxic alternatives—this has remained unchanged since the last PERSUAP. Also, as noted in Section 2.2 (main challenges to safe use), over-use (as opposed to judicious use) is still common. That more highly toxic pesticides are often selected over less toxic may be due to limited availability of less toxic products, high cost of less toxic products, or lack of awareness of these products. Also, it is likely that farmers and extension officers are more accustomed to using the older, more highly toxic products. In addition, as stated in the Georgia Economic Prosperity Initiative (EPI) PERSUAP, farmers prefer to see insects killed quickly, so they are more likely to choose a highly toxic product. The EPI PERSUAP includes an annex of IPM tactics to implement as part of an insect/disease control program. For F2F volunteers in Georgia (and the region), this can serve as a useful tool and is available from the USAID/Georgia mission.

The USAID/Guatemala Economic Growth Project PERSUAP also outlines extensive IPM tactics that will be useful for F2F volunteers to that country, and possibly in the Central America region.

F2F volunteers, whose assignments directly or indirectly involve pesticides, have an opportunity to raise awareness about IPM, to encourage IPM, and to discourage poor practices.

As part of this Programmatic PERSUAP, each F2F country program was requested to provide IPM measures recommended as part of disease and insect control strategies. The situation has changed little since 2009; among F2F host countries there is a wide range of understanding and implementation of IPM. Clearly, there is room for capacity building in IPM in all F2F core countries.

Comments from Country Programs

Angola stated that the IPM method typically used is that farmers burn stalks of maize, groundnuts, and beans then mix it up with soil.

Armenia mentioned using pheromone traps, color traps, and also using chemicals that can be mixed in containers and hand sprayed.

Among other IPM measures they use, the DR mentioned correct timing of application, monitoring, application of pesticide with irrigation system, apply the lowest dose, and apply only when necessary.

Senegal only requested two pesticides, and provided adequate IPM information for those. Tajikistan’s main IPM measure is to spray during “vegetation period.” Uganda’s main IPM measure is to apply once every two weeks during pest infestations; apply as a preventive and protectant spray regime, once every month or when there are signs of pest presence. Malawi described a range of IPM practices typically used.

Tanzania’s main IPM strategies are: removal of crop residue before planting; crop rotation where possible; good land preparation; timing of planting; and physical weed control. Kyrgyzstan listed very few IPM measures: agroforestry, crop rotation, and learn to identify beneficial v. parasitic nematodes. Liberia only mentioned crop rotation and agroforestry.

Bangladesh provided detailed information on IPM practices, such as manual weeding, judicious use, crop rotation, good field sanitation, and use of disease resistant varieties. A variety of measures were presented for each pesticide requested. For example, for glyphosate, the Bangladesh F2F program described the IPM measures as: deep ploughing and exposing the nursery bed soil in scorching sun in April-May; early planting and use of fast growing varieties; application of proper amounts of water and nutrients to the crop; and application of herbicide.

Haiti also provided detailed information on IPM measures. The measures mainly have to do with timing, judicious use, crop rotation, good soil and water management, good sanitation practices, and others.

Nicaragua provided an extensive and useful description of IPM practices. For example, for carbendazim, used against damping off, blight or leaf scorch, root bifurcation, pododumbre gris (*Botrytis cinérea*), pododumbre of the stem base, late blight, and mildew, the IPM measures are: destroy crop remains; crop rotation; drip irrigation; remove diseased plants; use healthy, certified seeds and seedlings; resistant varieties; clean growing structures and tools; use sterile substrate; remove weeds; use plastic mulch. For thiamethoxam + lambda cyhalothrin used to control aphids, picudo, white fly, and leaf miners, the IPM measures are: plant far from land bearing old crops; crop rotation; use pheromones to control adults; avoid tiered planting; use protected nurseries; remove crop remains; place yellow traps in planting area upon planting crops; use plastic mulch in raised beds; remove lower, damaged leaves; and use live barriers.

Nepal's list of IPM practices is also detailed and instructive. For each pesticide, they provide a range of measures. For example, for deltamethrin used to control field and storage pests: under field condition proper pruning of infected plant parts including hand picking and destroying the insect larvae; judicious use of insecticides with rotation; storage pests managed through properly drying the grains before storage; proper cleaning (old grains, pests inoculums) of storage bins before storing the commodity; use of proper dose of insecticide. For chlorpyrifos used to control insects on wheat, rice, chickpea, mung bean, groundnut, mustard, eggplant, cabbage, cauliflower, onion, potato: use of pest resistant variety, crop rotation, burning of ratoons plant debris after harvest, timely planting seeds, and judicious application of chlorpyrifos.

Burma mentioned that their IPM approach includes regular and careful sampling of pests and natural enemies and an assessment of crop performance. Insecticides are used only if infestation is above the economic threshold level. Insecticides are used along with IPM practices such as using pest resistant varieties, crop rotation, and mixed cropping with trap crops. For IPM with fungicide application, crop rotation, resistant varieties, burning plant debris, cutting diseased plants, and sanitation to control diseases are used. With herbicide application, the IPM approach is early planting, using improved varieties, manually selective weeding, and effective water treatment. The greatest obstacle to implementing an IPM approach in Burma is the attitude and knowledge of people who train in and use IPM, such as growers, research entomologists, and extension workers. IPM is often not effectively communicated and implementing it requires collaboration, which often fails to take place.

Mozambique provided separate lists for insect management, disease management, and weed management tactics, and under each category, a list of preventive measures and remedial measures.

Ethiopia stated that pesticides are used only for a limited number of agricultural crops such as cereals, cotton, tomato, and few other vegetables. During the last two decades, Ethiopia has taken important steps to strengthen national pesticide legislation, and to reduce risks associated with the use of pesticides. Ethiopia's legislation recommends the following: awareness and training on pesticide technologies, filling research gaps on pesticides, re-initiating IPM, focusing on natural/biological pest control methods and promoting the guiding principle of no/low external inputs (LEI), further development and use of improved varieties, etc. The main IPM measures used are biological methods and promotion of LEI.

The DRC provided no information on IPM measures, and there is presumably a low level of knowledge and use of IPM. F2F could play a key role in increasing IPM knowledge and practices in the DRC.

As is clear from the above discussion, F2F country programs mentioned a wide range of practices as part of IPM, and there is a wide range of understanding and use of IPM measures. Given this range, volunteers who may recommend pesticides and provide pesticide training and advice, should be prepared to advise on IPM tactics/best practices as part of all recommendations involving pesticides. This will ensure that F2F assistance for the use or procurement of pesticides will not have adverse impacts and may have positive environmental and health effects.

Training and recommendations for use shall include an IPM approach, and pesticides should be the last resort. The focus of any recommendations and training should be on IPM and the environmentally responsible and safe use of pesticides when they are needed. Each IP will ensure this condition is included as a standard element in the briefing materials it provides every volunteer prior to their travel. This is included as a mitigation measure in the SUAP.

As mentioned above, many of the F2F IP responses about IPM were detailed and instructive. This IPM information, submitted as part of the questionnaires, should be retained in F2F program files for reference by volunteers; and they should be built on and strengthened by knowledgeable F2F program volunteers. This requirement is included in the SUAP. In addition, Attachment F includes example IPM measures from questionnaires received.

3.4 Factor d. Proposed method or methods of application, including the availability of application and safety equipment

Each F2F country program was asked to provide the methods of application of the requested pesticides, information on the availability of safety equipment, and measures for maintaining application and safety equipment. Replies that best illustrate the situations in F2F countries are shown below.

Application Methods

As in the 2009 PERSUAP, IPs indicated that handheld sprayers and backpack sprayers are the most commonly used application method—backpack sprayers are more common than handheld. Motor sprayers, high volume, low volume, and ultra low volume sprayers are used in some countries, most commonly in Uganda and Malawi. Seed treatments are also widely used, and some pesticides are applied as baits. Some F2F IPs requested approval for fumigants (see Factor a).

Most countries commonly use more than one application method. The EPI PERSUAP Update (Georgia, 2013) states that according to field visits, farmers use any of the following types of pesticide applicators: hand-pump backpack sprayer with wand; motorized backpack sprayer for orchards; tractor-pulled spray tank and boom unit for field crops; and tractor-pulled air-blast fan sprayers for orchards.

Availability of Application and Safety Equipment

Many F2F IPs stated that safety equipment is available in their countries. Most, if not all, agro input distributors, wholesalers, and retailers in Mozambique sell safety equipment such as rubber gloves, face masks, overalls, and rubber boots. Uganda stated that safety equipment is available but accessibility and quality are issues; the equipment is expensive for small farmers to purchase. This was a common problem mentioned by almost all F2F IPs. In Kyrgyzstan, for example, safety equipment is available, however use is limited due to the high price.

Since the 2009 PERSUAP, based on the questionnaires, availability of safety equipment has increased, however accessibility (due to high cost and location of shops that sell the equipment) has not. For the 2009 F2F PERSUAP, most IPs stated that the expense of protective equipment is an issue and a reason that farmers and applicators fail to use protective gear. This remains unchanged. The exception may be where USAID or another donor has provided vouchers or has subsidized the cost of the equipment.

In Ghana and Liberia, safety equipment is available, however its use is constrained by the high price, and smallholders and illiterate farmers rarely use it. This is mainly due to expense and ignorance of the dangers involved. For these reasons, F2F in Liberia has focused on organic pest management practices. In Nigeria, safety equipment is available, both locally manufactured and imported. But the main challenge in getting more farmers to use it is their inability to afford safety equipment.

In Malawi, the availability of safety equipment depends on the agro-dealer shops and their willingness and ability to carry the equipment. The farmers, who are mostly smallholders, buy the equipment as a group and they share the maintenance cost. Even so, the use of safety equipment is hampered by lack of knowledgeable staff who sell the equipment.

In Burma, safety equipment is only available at major agrochemical dealers in the major cities. The main constraint to wider availability is that farmers are not educated about health and environmental effects of pesticide use.

In Tanzania, most small- and medium-scale farmers rarely use personal protective equipment (PPE) other than gum boots, long pants, a shirt and a hat, and therefore many farm stores do not stock gloves, respirators, and goggles—the demand for these items does not exist. Respirator masks found in farm stores have only sponge or paper filters, which filter dust and some mists, but not volatile organic vapors. The best masks for protection from pesticide vapors contain carbon filters, but these are usually unavailable.

Safety equipment is available in Armenia, particularly in areas near the capital city. Farther outside the capital, and in remote areas, safety equipment is not readily available; often only a small supply is kept on hand. This is probably because retailers are not interested in carrying it due to the low demand among farmers (which is due to its high cost).

In Senegal, most farmers do not use safety equipment for pesticide application. Sometimes farmers can find gloves to purchase; however, they are usually not the appropriate type. In Nicaragua, most producers practice “traditional pesticide application and management.” This traditional method involves no use of safety equipment. Most farmers in Georgia do not use PPE. In Ethiopia, safety equipment is not readily available. Smallholder grain farmers rarely use it; it is mainly for use at mechanized vegetable and fruit producing farming companies.

Safety equipment is sold in major markets in Guinea. But typically, farmers do not use the equipment because of the high cost, but some just because of carelessness and ignorance. The main way to increase the use of safety equipment, is to raise awareness among farmers of the importance of protecting themselves when using pesticides.

In Haiti, safety equipment is not readily available in most agriculture supply stores. Additionally, the restrictive cost of protective equipment means that many farmers cannot afford it. Backpack sprayers for example, are generally available but are often too expensive. Even where the safety equipment is available, a majority of farmers lack knowledge about the chemicals. Chemical-resistant gloves are not widely available in Haiti so medical gloves are often used instead.

Tajik farmers use only backpack sprayers and hand sprayers and there is only one commercial farm “Favz” which has industrial size fogging and spraying equipment capable of treating large plots. During

the last four years, a USAID project, ProAPT, cooperated with a company called SughdAgroserv, which brings chemicals, pesticides, and related equipment to Tajikistan. Now, through a voucher program, the project created several agrosshops in Khatlon region where some good quality chemicals and equipment are available.

In Nepal, pesticides are applied using 9-16 liter capacity knapsack sprayers. The cheapest models are made of plastic imported from India and China. The more sturdy models are made of stainless steel but cost more. The plastic types are prone to leaks as the screw top is not very water tight. This places the farmer who uses this sprayer in danger of being poisoned. Farmers are not likely to wear sufficient PPE and may walk through the spray path with bare legs and no shoes.

In Bangladesh, generally safety information is labeled on the bottle, container, or packets and the cautionary instructions clearly stated on each label. There are three colors (green, yellow, and red) for informing farmers on the restricted entry interval. (REI) In most of the cases, farmers apply pesticides with no PPE, although some trained professional pesticide sprayers use safety equipment, such as mask, cap, etc., but those professionals are very few. Usually, farmers use a plastic backpack and hand held sprayer and traditional piece of cloth as masks; no other standard practices are followed. This is mainly due to the farmers' ignorance about pesticide risks and also lack of money to purchase PPE. A World Bank report states that:

- Only 4% of Bangladeshi farmers are formally trained in pesticide use or handling.
- More than 87% freely admit to using little or no protective measures while applying pesticides.
- 54% of the traders report frequent health symptoms commonly associated with acute pesticide poisoning.
- 92% freely admit that they do not take any protective measures while handling pesticides (The World Bank, 2007).

In the Dominican Republic, many safety equipment representatives and distributors are located primarily in the larger cities, such as Santo Domingo and Santiago. In addition to the larger distributors, small distributors and technicians promote products and directly assist farmers to use them.

The Angola IP is the only F2F IP that stated that safety equipment is commonly used: "Safety equipment is commonly used by farmers in Angola, particularly in Benguela, Kuanza Sul, Bie, and Huambo."

Maintenance of Safety Equipment

Maintenance of safety equipment (including application equipment) remains a problem, as it was when the 2009 PERSUAP was prepared. Questionnaire responses from the IPs are provided below to illustrate the range of conditions in F2F countries.

In Uganda, most farmers and agro-chemical dealers have no training in maintenance of safety and application equipment. In Nepal, however at the time pesticides are purchased, most pesticide dealers provide information about pesticide safety and safety equipment maintenance; as license holders to sell pesticides, pesticide dealers are trained in safety precautions. They will also discuss safe storage of pesticides, keeping them out of the reach of children and other adults.

The Kenya F2F IP stated that chemical companies provide training to farmers on use and maintenance of application and safety equipment. Also, all manufacturing companies are mandated to educate agro-dealers on safety issues especially long-term effects of chemicals. The agricultural input supply companies also provide Material Safety Data Sheets (MSDS) as reference for the pesticides they promote.

In the Dominican Republic, upon purchasing pesticide safety equipment, specialists and equipment manufacturers train the farmer or applicator to maintain and properly use the equipment. Additionally, extension workers provide pesticide applicators with training on chemical use, storage, and disposal.

A few personnel in Nigeria are trained in maintenance of equipment. Since farmers are often unaware of the need for safety equipment, the Nigeria F2F IP stated that farmers need to be sensitized to use safety equipment; this was a common comment of many IPs. In addition, because there are few users of safety equipment, there is little demand for maintenance of safety equipment.

In Mozambique, the most commonly used equipment is backpack sprayers, masks, gloves, and overalls. Most farmers understand that this PPE requires maintenance and they take care of these by washing them and changing mask filters.

In Armenia, the vendors are specialists in maintenance and care of equipment, and provide advice. However, there is no way to monitor whether equipment is actually maintained; this is up to the individual farmer.

While maintenance continues to be a challenge in rural areas of Haiti, most farmers have received training in proper cleaning and maintenance of pesticide equipment, including PPE.

Maintenance of application equipment in Malawi is in the hands of the farmer as the Agricultural Extension Services has no maintenance workshop. Sometimes suppliers of the equipment are hired to give training in maintenance. For repairs, often farmers resort to local artisanal workshops that use their mechanical repair skills to repair application equipment.

In Ethiopia reliable maintenance occurs only at the few mechanized fruit and vegetable producing and marketing companies, where pesticide application is mainly done from a sprayer mounted on a tractor. Application is by trained personnel, and maintenance of safety equipment is also performed by skilled personnel. For smallholders, safety equipment is very rarely used, and if used, is usually not well-maintained.

After applying pesticides, farmers in Bangladesh typically wash their equipment near waterbodies, which contaminates aquatic ecosystems. They also typically throw empty chemical containers and packets on the ground and they reuse clothes without proper cleaning. Good maintenance practices are not widely known.

For the most part, F2F countries concur that dealers of agricultural inputs and agriculture extension workers need to be better trained on PPE and safety equipment maintenance since they are the ones who have the most interaction with farmers, and who farmers view as the experts. Pesticide dealers and agriculture extension workers should be able to disseminate information on mixing, applying, clean-up, storing, and handling of agricultural chemicals, including information on over-applying or applying under conditions contrary to the recommendations, and avoiding use of chemicals, including disposal of them within 50 feet (the typical condition) of any surface water and providing buffer areas around water.

The above is similar to the findings in the 2009 PERSUAP, which stated that agricultural producers and others involved in pesticide application, pesticide sales, and those providing pesticide advice (agro-input dealers/distributors, extension officers, applicators) need more training in use and maintenance of pesticide safety equipment.

Lack of secure storage of equipment is also a problem commonly mentioned by F2F IPs. In Bangladesh, farmers store pesticide bottles and containers, and sprayers at their home. F2F Partners of the Americas' implementer in Haiti, Makouti Agro-Enterprise, produced material in Creole to increase producers' knowledge of safe storage. Most producers have no place to store chemical products; they often leave

them at the home or with their livestock. Partners has been working to change some of this behavior. The Nicaragua F2F program has also tried to improve storage (as well as other) methods by carrying out trainings.

All IPs agreed that the use of safety equipment can be increased by raising awareness among farmers so that they use proper safety equipment, such as waterproof aprons, masks, gloves, boots, hats, glasses, etc., in accordance with labels. Most IPs stated that where by-laws or other legislation exists, government should enforce the regulations so that pesticide sellers are required to provide proper instructions and sell PPE (See Section 3.10 for more information on government capacities). Most IPs agreed that a voucher system is useful to encourage agro dealers to carry PPE.

The Malawi IP suggested that training on repair and maintenance of equipment should target community-based artisanal workshops since they are often the ones a farmer will go to for repairs.

An F2F IP stated that in the past, since safety equipment is not always available and can be expensive, some volunteers have recommended creating a committee and/or a fund, into which participants pay a portion of the cost for appropriate safety equipment which they could then rent out as needed. The committee would also provide training to ensure proper use of the equipment.

These two suggestions are included in the SUAP for volunteers to consider when providing advice on pesticide use.

Notably, no F2F IP mentioned regular calibration of spray equipment; this has remained unchanged since the last PERSUAP. While no IP mentioned attention to drift or water contamination issues in the questionnaire for the 2009 PERSUAP, a few mentioned it this time; in particular, the Bangladesh IP had a good understanding of the need to train farmers and applicators on this. As with the last PERSUAP, for most countries, disposal of pesticide containers was noted as one of the biggest problems.

Unless F2F volunteers are specifically recruited to work on a PPE voucher system (or other type of PPE provision), they are usually unlikely to have a long-term influence over many of the issues regarding safety equipment, such as lack of availability in rural areas and high cost. But F2F volunteers can strongly encourage the use of protective gear, in line with label requirements. In some cases, if protective gear is unavailable or in many tropical countries, where protective clothing is uncomfortable, and therefore applicators refuse to use it, F2F volunteers may be able to identify low-cost and comfortable alternatives.

F2F volunteers should always recommend protective gear, as required by the label, when they recommend use of pesticides (see SUAP, Section 4), and they should be aware of the limited accessibility of protective gear in many cases, and be prepared to identify measures to access it. F2F volunteers should also be aware of the lack of intact labeling in some F2F countries. The label is used to provide directions on protective gear. Where labels are absent or incomplete (such as when pesticides are repackaged and sold in small quantities, as is the case in many F2F countries), F2F volunteers must be prepared to provide advice on appropriate protective gear (see SUAP Section 4 for recommendations). Practical advice for safety clothing, equipment, and precautions go a long way in F2F countries, and with appropriate recommendations, F2F program assistance for the use or procurement of pesticides is not expected to have adverse impacts on human health.

3.5 Factor e. Any acute and long-term toxicological hazards, either human or environmental, associated with the proposed use, and measures available to minimize such hazards

Attachment J, Table 2 gives the acute and chronic human toxicity levels, based on the WHO classification system, of all F2F-requested active ingredients. The table also makes note of active ingredients considered “PAN Bad Actors,” a system denoting particularly toxic pesticides. Both the WHO classifications and PAN Bad Actors system are described in Attachment A.

SUAP Attachment A shows all requested active ingredients *except* those considered too highly toxic for use in F2F countries; the too highly toxic pesticides are WHO toxicity level 1a and 1b, and other active ingredients of concern due to human health or the environment. The table in Attachment A includes only those active ingredients that volunteers may use or recommend. Formulated products used or recommended may be comprised of only the approved active ingredients, and no other active ingredients. Based on the analyses conducted for this Programmatic PERSUAP, the more highly toxic pesticides are not to be used or recommended by F2F volunteers.

As mentioned above, the USEPA rates the toxicity of formulated products for USEPA registered products only. Many of the products available in F2F countries are not registered by the USEPA, and therefore, the label has no USEPA toxicity rating. In addition, some pesticide formulations are more toxic than their AIs alone because of surfactants, adjuvants, or other ingredients in the formulation. The SUAP requires F2F volunteers to ensure that they recommend only *products* that are the equivalent of USEPA toxicity level II and above; or if they use/recommend *active ingredients*, they should ensure that formulated products are actually available in the host country at USEPA toxicity level II and above (or the equivalent for a non-USEPA registered product).

Appropriate safeguards must be taken for pesticide active ingredients noted to have acute and long-term toxicological hazards to humans (Attachment B). There are several ways to mitigate exposure to humans. The SUAP requires mitigation measures for active ingredients of special concern; these measures are outlined in Attachment B. Given the F2F country program responses regarding limited knowledge of the human health hazards of pesticides, and the limited accessibility, use, and maintenance of protective gear, F2F volunteers should be prepared to provide sound, practical information about safeguards. In this regard, F2F volunteers should refer to Attachment B, which contains practical mitigation measures to minimize impacts to human health.

To help identify potential impacts to water resources (wetlands, waterways, drinking water, etc. and fish and wildlife that rely on these resources), Attachment A provides groundwater contamination potential of approved active ingredients. For active ingredients that show high potential to contaminate groundwater, appropriate precautions should be taken as discussed in Attachment C.

However, given the lack of attention to environmental hazards noted by most F2F IPs in their questionnaires, and the potential environmental hazards presented by pesticide use, appropriate precautions to minimize adverse impacts on the environment should be taken for all pesticides. Best practices in mixing, storing, applying, disposing, and transporting of pesticides should be instilled in farmers and applicators when using any pesticide. If an F2F volunteer is training in pesticide use, best practices should be encouraged for all pesticides (including for storage, application, etc). F2F volunteers are usually well-placed to encourage best practices; Attachment C includes best practices to minimize impacts of pesticide use on the environment.

F2F volunteers should be aware of the often low level of understanding of the environmental hazards of pesticides, and the widespread misuse of pesticides. Volunteers should also be aware that many farmers

and applicators may have a low level of education as noted in several F2F country questionnaire submissions, and may either be illiterate or unable to read and understand English. Alternatives to English training materials may be needed.

With well-informed and prepared F2F volunteers, equipped to provide guidance to F2F recipients on mitigating impacts of pesticides to human health and the environment, F2F assistance for the use or procurement of pesticides is unlikely to have adverse effects; and F2F input will likely result in improved practices, with positive human health and environmental effects. The measures in Attachments B and C provide the necessary guidance, and this guidance should be provided in conjunction with all F2F assistance for the use or procurement of pesticides.

3.6 Factor f: Effectiveness of the requested pesticide for the proposed use

For most of the IPs, *effectiveness* was one of the primary reasons for selecting a pesticide. Often, however, a pesticide is effective because it is highly toxic, and therefore, also presents a hazard to human health and the environment. As stated in the Georgia EPI PERSUAP, farmers like to spray and see the insect die right away.

Newer, sometimes more expensive pesticides may be just as effective as some of the more commonly used, but highly toxic options. Also, biological pesticides may be just as effective (although there is a common misconception that biological pesticides are not toxic to humans). F2F volunteers can help farmers and applicators monitor efficacy of a pesticide product, and guidance for this is included in Attachment G. F2F volunteers can also help farmers identify less toxic and efficacious pesticides (See SUAP Attachment H for useful websites).

The problem of product adulteration is a concern for most F2F country programs. Adulterated products minimize the efficacy of a product. Obsolete products are also a concern; obsolete products are also commonly sold in most F2F countries. Governments of many F2F countries are unable to adequately control adulteration or the continued sale and use of obsolete products.

Attachment G provides guidance on monitoring efficacy and adulteration, and includes measures to protect against adulteration and use of obsolete products. In addition, F2F volunteers who recommend specific pesticides should ensure that the pesticide recommended is the most effective, while least toxic, for the proposed use. Armed with the information in Attachment G, F2F volunteers will be able to help protect against the use of adulterated and obsolete products; will be able to help farmers monitor efficacy of pesticides used; and will be able to help farmers select the least toxic pesticide for the proposed use (with the condition that the recommended pesticide active ingredient must be approved by this F2F PERSUAP).

3.7 Factor g: Compatibility of the proposed pesticide use with target and non-target ecosystems

No IPs indicated increased awareness of measures to avoid impacts to non-target organisms. The following remains unchanged since the 2009 PERSUAP was prepared.

All pesticides can be hazardous to non-target ecosystems, fish, wildlife, and beneficial insects, spiders or other pest predators. As indicated on F2F country submissions, there is a low level of knowledge about the effects of pesticides on non-target organisms. Practices that could impact non-target ecosystems are common in F2F countries: over-use and other misuse of pesticides, such as using the wrong pesticide for the pest or disease; mixing and disposing of pesticides without using precautions to protect soil, water,

and natural vegetation, lack of attention to drift, applying pesticides during times that beneficial insects, spiders and other pest predators are active, etc. These poor practices can affect non-target ecosystems and organisms.

In addition, in F2F countries, broad spectrum pesticides are commonly used—pesticides that kill a wide range of organisms, and selective pesticides are less commonly used. Intact pesticide labels should include information on a pesticide product’s effects on non-target organisms. However, as mentioned, in several F2F countries, pesticides are often found re-packaged and without intact labels.

F2F volunteers should be aware of the limited knowledge in many F2F countries about pesticide effects on non-target ecosystems and organisms; and they should also be aware that possible alternative pesticides—those less hazardous to non-targets—may be inaccessible (unavailable, expensive, or not registered by the country).

Attachment C provides guidance for volunteers to help ensure their recommendations for specific pesticides will be the least hazardous to non-target ecosystems, fish, wildlife, and beneficial insects, spiders and other pest predators. Attachment C also includes precautions to take to minimize impacts to fish, birds, and wildlife, and it includes a list of pesticides that are moderately or highly toxic to honey bees. F2F volunteers should be prepared to provide this information to F2F recipients in conjunction with providing recommendations for the use or procurement of pesticides.

As was the case in 2009, some F2F submissions indicate a misunderstanding that botanicals may be less toxic to non-target species than synthetically derived pesticides. Though derived from natural sources, botanicals are not necessarily safer or less toxic than synthetic pesticides. In fact, most botanicals are broad-spectrum insecticides, which kill both good and bad insects indiscriminately. Some botanicals are highly toxic to fish, wildlife, and domestic animals, others cause allergic reactions in people and some may even cause cancer. For example, although relatively harmless to humans, pyrethrins are very highly toxic to fish and bees and moderately toxic to birds. Pyrethrins kill both beneficial and pest insects. Although pyrethrins are naturally-derived, many commercial products contain pyrethrins. All pesticides – including botanicals – should be used only as a last resort and safe practices should be applied.

As indicated in F2F country submissions and as discussed above, farmers and applicators in many F2F countries may be illiterate or unable to read English. Their main concern will be managing the pest or disease that is affecting their crop. They may be unconcerned about non-target organisms and ecosystems or have little or no knowledge of pesticides’ effects on non-targets. They will likely be unaware of mitigation measures to protect non-targets. F2F volunteers may have the opportunity to provide guidance and practical safeguards.

SUAP Attachment C provides a range of best practices that F2F volunteers can use and encourage others to use. To ensure assistance for use of pesticides have minimal or no significant irreversible adverse effects on non-target ecosystems, these best practices should be recommended in conjunction with any pesticide recommendations (including pesticide training).

3.8 Factor h: Conditions under which the pesticide is to be used, including climate, flora, fauna, geography, hydrology, and soils

F2F volunteers will be working in 26 core countries, and within F2F countries, volunteers may work in any region. In addition, over the LOP, additional countries may be added. Flex assignments will take place in non-core countries. Therefore, it is impossible in this Programmatic PERSUAP to provide information on the range of climatic, floral, faunal, geographic, hydrologic, and soil conditions that will be found in areas where F2F volunteers will be working. However, guidance is provided in the SUAP to

help ensure there will be minimal or no significant irreversible adverse impacts to the environment – whatever the conditions under which pesticides will be used or recommended.

Of particular concern are aquatic resources. These act as sinks for eroded soil and effluent, and safeguards must be in place if pesticides are to be used adjacent to, or upslope from aquatic environments. Aquatic resources can be contaminated when farmers or applicators wash pesticide sprayers and other equipment in or near waterways and when farmers or applicators indiscriminately dispose of pesticide residue and pesticide containers. Contamination can also occur directly from applying pesticide on crops and soil. This contamination could be from pesticides that enter the waterway either directly or combined with soil from field runoff after rains or from pesticide spray drift.

Each pesticide has physical characteristics, such as solubility in water and ability to bind to soil particles and be held (adsorbed) by soil so they do not enter the soil water layers and the groundwater table. This data can be found for F2F requested pesticides by checking each pesticide on the PAN website¹². The water solubility, soil adsorption, and natural breakdown rates, if available, are included at the bottom of the webpage for each parent chemical.

In general, pesticides with water solubility greater than 3 mg/liter have the *potential* to contaminate groundwater; and pesticides with an adsorption coefficient of less than 1,900 have the *potential* to contaminate groundwater (this is also indicated in Attachment A, Table 2). And, pesticides with an aerobic soil half-life greater than 690 days or an anaerobic soil half-life greater than nine days have the potential to contaminate groundwater. Pesticides with a hydrolysis half-life greater than 14 days have *potential* to contaminate groundwater. All of these statements are generalizations, but good rough guides to anticipated pesticide behavior in soil and water. However, each pesticide requires individual investigation and research.

As noted in Attachment A, Table 2, some of the proposed pesticides are potential groundwater contaminants. These pesticides in particular, but others in general, should not be mixed, applied, stored, or disposed of adjacent to or upslope from waterways, wetlands or drinking water sources without appropriate safeguards described in the Attachment C.

As discussed above, given the number of countries where F2F volunteers will work, and the variety of ecosystems within each country, it is impossible at this stage to identify the flora and fauna at F2F sites. However, safeguards are available to protect non-target flora and fauna. Attachment C includes measures to protect national parks, forests, and other protected areas. Recommended in conjunction with F2F assistance for the use or procurement of pesticides, these measures will help ensure that the F2F program will have minimal or no significant irreversible effects on a host country's protected areas, flora, and fauna.

3.8 Factor i. Availability of other pesticides or non-chemical control methods

As stated in the 2009 PERSUAP, non-chemical methods used by farmers in F2F countries are predominantly cultural and mechanical practices. This is currently the case, as well. For example, weed control by hand may be used instead of or before the application of herbicides. Cultural pest management methods include crop rotation, using clean seed, variable planting times, good water management, and use of manure. In many F2F countries non-chemical methods are the most common pest control methods used because they are the least expensive. The high price of pesticides is a deterrent to their use in many F2F countries, as mentioned in questionnaires.

¹² PAN Pesticide Database can be found here: <http://www.pesticideinfo.org/>

Also, notably, IPM is not well known, especially at the smallholder level, in many F2F countries, and this has remained unchanged since the last PERSUAP. Almost all F2F countries mentioned the need for training in non-chemical methods of control. In addition, less toxic pesticides are not widely known, and often are more expensive in F2F countries than the more highly toxic pesticides. The newer, less toxic pesticides are still not registered in many countries (as was the case in 2009).

This PERSUAP requests that a wide range of active ingredients be approved (Attachment A, Table 2). They cover a range of pesticide families. If a pesticide in Attachment A, Table 2 is registered by the host country, and if it is available in-country, volunteers have a range of active ingredients to choose from. Accordingly, the pesticides of choice should be the least toxic alternatives. And pesticides should be used as a last resort control measure, in accordance with IPM principles. In addition, biological and organic pesticides should be investigated and encouraged. These principles and practices are included in Attachment F.

3.9 Factor j. The host country's ability to regulate or control the distribution, storage, use, and disposal of the requested pesticide

The intent of this factor is to examine the host country's existing infrastructure and human resources for managing the use (from import to disposal) of proposed pesticides. If the host country's ability to regulate pesticides is inadequate, assistance for the use or procurement of pesticides could harm the environment. However, in the absence of adequate government management of the pesticide sector, expert volunteer technical assistance can be expected to provide potential improvement in the safe use of pesticides.

F2F country programs were asked to provide the list of government approved/registered pesticides for their country. All countries provided lists or links except Angola. Liberia submitted the Government list of banned pesticides; the country has no list of approved pesticides. Along with their list of registered pesticides, Bangladesh sent a list of cancelled pesticide products (109 items).

Angola's CNFA F2F Country Director checked with the Ministry of Agriculture and confirmed there is no list of government approved pesticides. This is the same situation as in the last PERSUAP.

The Egyptian Agricultural Pesticide Committee provides information on pesticides, but the GoE does not have an "approved list" of pesticides. Instead, European directives are followed, as farmers are interested in export to Europe and must adhere to EU standards. The Egypt F2F IP submitted EC Regulation No. 1007/2009-- Sustainable Use Directive and Statistics Regulation for approved Pesticide list and Maximum Residue Levels (MRLs)). Lebanon also uses the EU MRLs.

Pesticide registration in Ethiopia began after the first decree of pesticide legislation in 1990 that provides for the "registration and control of pesticides" by the People's Democratic Republic of Ethiopia (NG-PDRE, 1990). Except for a few pesticides supplied by the Adami Tulu Pesticide Processing Share Company, established in 1998, most agricultural and health related chemicals are imported from abroad, mainly from Germany, Switzerland, England, Japan, Belgium, India, and the U.S.

The Georgia EPI PERSUAP (2011) states that the Ministry of Agriculture in Georgia has produced updated pesticide regulations and an up-to-date list of permitted pesticides for agriculture, veterinary, and warehouse pest control. However, it has very limited research, extension, and enforcement services.

The Department of Agricultural Extension (DAE) and Bangladesh Agricultural Development Corporation (BADC) are controlling authorities, who approve pesticides and provide registration to dealers and retailers in urban and rural areas and control pesticide use.

The Kenya IP stated that the National Environmental Management Authority (NEMA), publishes and disseminates manual codes and guidelines relating to environmental management and prevention or abatement of environmental degradation. NEMA in collaboration with agencies such as the Pest Control Products Board (PCPB), Agrochemicals Association of Kenya (AAK), Kenya Pharmacy and Poisons Board and Kenya Plant Health Inspectorate Service (KEPHIS) have published manuals and guidelines which illustrate procedures and guidelines on types and uses of agrochemicals.

As mentioned above (Section 2.2), some country lists are more thorough, and include more chemicals and products than others; some include more information (crops the pesticide may be used on) than others. F2F volunteers should only recommend pesticides included in Attachment A, Table 2 and that are on the host government approved list. This condition is included in the SUAP.

Most F2F IPs acknowledged that unregistered pesticides may be entering F2F countries. In many of these countries, regulations covering pesticide import exist, but enforcement may be weak. Obsolete and illegal pesticides cross into F2F countries through relatively porous borders. Constraints to enforcement include limited human and financial resources and limited technical capacity.

Government regulations covering transportation and labeling/packaging vary among F2F countries, and their ability to enforce these regulations also varies. F2F volunteers should be aware that pesticides are often sold after being repackaged, and may not have labels; may have “forged” labels, and may actually be obsolete products or adulterated. It is unlikely that F2F volunteers will be able to rely on intact labeling, and should be prepared to provide advice in place of label directions. For example, the Bangladesh IP stated that there are around 250 pesticide companies in Bangladesh; most of them import concentrated chemicals mainly from China, India, and Germany, then dilute them in approved mixing ratio. Afterward, they pack and label them for marketing.

F2F country programs were asked to list the most serious pesticide-related issues in their country (See Section 2.2). Some mentioned that government fails to control import and disposal of pesticides. Obsolete pesticides—use of them and lack of disposal measures for them—are a problem in many F2F countries. No F2F host countries mentioned that they have a program to certify applicators. Many have continuing education available for applicators, but this often depends on donor funding. Training of farmers is also available in many F2F countries, but often implemented through an agriculture ministry, and often supported by a donor project.

F2F volunteers should especially be aware that few, if any F2F host countries have a program to certify applicators. And for this reason—and also because of USAID policy—no RUPs should be recommended (see recommendations in the SUAP). Rather than relying on government control and regulations, F2F volunteers can encourage, from bottom-up, good practices in storage, use, and disposal. “Best practices” are included in Attachments to the SUAP.

3.10 Factor k. Provision for training of users and applicators

F2F volunteers may be recruited to provide training for pesticide users, agro-input dealers, pesticide applicators, extension officers, and others involved with pesticides. However, it is up to the F2F country partner to request a volunteer and to specify the tasks. F2F country programs may market the IPM skills of their volunteers and promote the use of volunteers for training in IPM and safe use. Given the need for this type of training, as indicated by the F2F country responses—and that the situation has improved little since the 2009 PERSUAP was prepared, F2F country programs should market their volunteer IPM/safe use experts to their host countries. This would fill a gap noted by all F2F country programs, and a constraint to improved pesticide practices.

Some F2F countries provide for training of users and applicators, but as stated above, funding is most often from donor projects, and once the project ends, the funds for training end. The Malawi IP stated that the GoM discontinued training for applicators and also supervision of applicators. In the DR, extension workers provide training for pesticide users but training is in Spanish, and most of the workers speak Creole. F2F countries all agree that more training of users and applicators is sorely needed.

3.1.1 Factor I. Provisions made for monitoring the use and effectiveness of each pesticide

F2F volunteers are in-country for short periods of time, usually no more than 30 days. The technical assistance provided to producer associations, extension officers, individual farmers, input dealers, and others is based on an SOW with clearcut objectives. Unless explicitly stated in the SOW, volunteers may not have the opportunity themselves to monitor the use and effectiveness of pesticides. Therefore, volunteers who provide advice on pesticide use, should be prepared to also provide information on how to monitor the use and effectiveness of the pesticides recommended.

To help farmers monitor efficacy once the volunteer is gone, the F2F volunteer could draw up simple monitoring plans, and could train recipients to collect data on reduction in efficacy and any other known environmental impacts which should trigger a change to a different pesticide or a different method of control. Simple forms that farmers can easily use are best. Volunteers who prepare such plans should submit them to the F2F country office so that subsequent volunteers can build upon these plans, incorporating lessons learned. In this way, the monitoring plan will be a dynamic and up to date resource and available for other volunteers. See Attachment G for recommendations for monitoring plans.

4. SAFE USE ACTION PLAN (SUAP)

Based on the information in the Pesticide Evaluation Report, this Safe Use Action Plan provides a set of mitigations to ensure that the F2F Program's assistance for the use or procurement of pesticides will have **minimal or no significant irreversible** effects on the environment. Pesticide "use" is interpreted broadly to include the handling, transport, storage, mixing, loading, application, clean up of spray equipment, and disposal of pesticides, as well as the provision of fuel for transport of pesticides, and providing technical assistance in pesticide management. "Use" is said to occur if training curricula include information on safer pesticide use even if it does not involve actual application of pesticide. It also applies if pesticide procurement is facilitated by credit or loans. USAID requires including instruction in IPM and alternatives to pesticides in any training on pesticide use as defined above. Under this approach, pesticides are considered a tool of 'last resort' and pesticide choice should as far as feasible be the 'least toxic' choices. *This definition of "use" applies throughout the PERSUAP.*

Two Environmental Mitigation and Monitoring Plans (EMMP), one for F2F IPs and one for VEGA, list the conditions/mitigation measures from the SUAP, monitoring indicators, and reporting requirements. The EMMPs provide a framework for IPs and VEGA in their monitoring and reporting to USAID.

Given the programmatic nature of the PERSUAP, the SUAP is intended to cover crops and animals in value chains (VCs) that are not yet included as part of an F2F country program. Because of the broad range of VCs, and because at this time it is impossible to predict the full range of VCs that an F2F volunteer may be requested to assist with, the PERSUAP provides guidance for volunteers to ensure that their recommendations/advice on pesticide use are crop and end use-specific.

In addition, given the range of F2F countries, and that additional countries may be added to the F2F Program over the life of project (LOP), the F2F SUAP is intended to give the flexibility to add additional countries over the LOP, without further amendment of the PERSUAP or approval of the BEO. If additional countries or VCs are added, the conditions below must be complied with and reported on. The PERSUAP also applies to flexible (or flex) assignments, which involve placement of volunteers in countries other than F2F core countries. For flex assignments, there is no Country F2F Office; therefore, in these cases, the home office has direct responsibility for oversight of the program, which includes implementation of the PERSUAP conditions. The PERSUAP is not country-specific, but specific to the F2F Program. The steps included in the SUAP (review host country registered pesticides; apply safe use and IPM practices) apply no matter the host country.

As required in the F2F Initial Environmental Examination, to prevent environmental mistakes, to integrate environment into assistance activities, and to promote environmentally positive impacts, USAID/F2F has developed standard guidelines, or two brochures for the IPs. The two brochures explain environmental concerns and provide practical and consistent guidance on compliance. One brochure is designed for the IPs, and the other is for volunteers to use before and during their assignments. These environmental guidelines focus on protecting the health and safety of volunteers and on encouraging volunteers to think about how their recommendations, advice, and efforts might affect the environment. The measures outlined below include the dissemination to all F2F volunteers of the environmental brochure.

4.1 Safe Use Action Plan: Mitigation measures from the F2F IEE carried over to the PERSUAP

The conditions from the 2013 Farmer to Farmer (F2F) IEE that refer to pesticide use remain in force in this PERSUAP, as follows:

A Negative Determination with Conditions is recommended for the case of training on the use of pesticides, as per 22 CFR 216.2 (e) Pesticides. The following conditions are required:

- A syllabus for each training event will be submitted for review and comment by the Mission Environmental Officer (MEO) and the USAID F2F AOR/COR. Input is encouraged from the Regional Environmental Advisors, as and where appropriate.
- A representative from USAID (preferably the Mission) should attend the training sessions to the extent possible.
- All IP will be provided with and will familiarize themselves with the environmental brochures (attached to the F2F IEE).

4.2 Safe Use Action Plan: Mitigation measures to be incorporated into the F2F Program

Based on the above Pesticide Evaluation Report, and in accordance with 22 CFR 216.3(a) to (l), the following measures shall be implemented to ensure there will be minimal or no significant irreversible long-term adverse effects on the environment or human health. With implementation of these recommendations, F2F assistance should result in positive effects: raised awareness of pesticide effects on human health and the environment; increased understanding of the need to use pesticide protective equipment (PPE); knowledge of how to avoid harm to the environment and people; and increased understanding of safe use practices from purchase to disposal.

4.2.1 The following recommendations shall be implemented by F2F IP

1. F2F IPs shall retain a copy of this PERSUAP in their headquarters and at all country offices. It would be preferable to have PERSUAPS in the local country language, at least for attachments A-1 of the SUAP. The SUAP has been prepared so that it and the following attachments can be removed and used as a stand-alone document:
 - Attachment A: Compiled list of active ingredients allowed in F2F programs
 - Attachment B: Guide to minimizing the impacts of pesticides to human health
 - Attachment C: Guide to minimizing impacts of pesticides on the environment
 - Attachment D: Guide to Host Country Registered Pesticides
 - Attachment E: Pesticides of Global Concern
 - Attachment F: Guide to IPM Practices
 - Attachment G: Monitoring Pests and Pesticide Effects
 - Attachment H: Key Websites for Pesticide and IPM Research
 - Attachment I: Bullet Points for SOWs
2. IPs shall send pertinent sections to F2F volunteers, based on the type of assignment, as described below:

Type 1 Assignments: These volunteers are expected to provide direct assistance for the use or procurement of pesticides. They will likely recommend and/or provide advice on specific pesticide active ingredients or products, and they may provide training in pesticide use, safe use, and IPM.

Send to volunteers: the PER, SUAP, Attachments A, B, C, D, E, F, G, H, the Environmental Brochure, and the PERSUAP questionnaire

Type 2 Assignments: These volunteers may provide indirect assistance for the use or procurement of pesticides; these assignments do not involve recommending or providing advice on specific pesticide active ingredients or products. These volunteers will likely be in the field and when the opportunity arises, the volunteer shall encourage good practices in pesticide use and IPM and discourage poor practices.

Send to volunteers: the SUAP and Attachments B, C, F, H, the Environmental Brochure, and the PERSUAP questionnaire

Type 3 Assignments: These volunteers are not expected to be involved in pesticide issues.

Send to volunteers: the Environmental Brochure

Type 4 Assignments: Although these volunteers will be F2F volunteers, they will be working on USAID mission projects.

Send to volunteers: the Environmental Brochure

Also, see the PERSUAP for the USAID project (or USAID mission-wide or sector-wide PERSUAP), and if there is no existing PERSUAP, use the F2F Programmatic PERSUAP (and follow instructions for the relevant Type 1, 2, or 3 assignment).

3. (a) Individual country lists of approved/registered pesticides shall be kept on file at the F2F country office, and shall be provided to F2F volunteers who may be recommending and advising on specific pesticide active ingredients and products as part of their assignment (Type 1 assignments). These should be on file at USAID Missions and in regional offices for non-

presence countries.

(b) For all F2F countries, where there is an approved list of pesticides (as of December 2013, this includes all F2F countries except Angola¹³), this list must be provided to the F2F Volunteer (Type 1 assignments only) prior to or upon arrival of the volunteer in-country.

(c) For F2F assignments in countries with no nationally approved list of pesticides (besides Angola, this might include flex assignment countries and other countries added over the LOP), the F2F IP shall obtain a letter from the government stating that there is no list of government approved pesticides, and noting any specific measures that should be taken when F2F volunteers recommend pesticides.

(d) The F2F office in Angola should consider encouraging their partners to develop an F2F SOW to help establish a database of government authorized pesticides. For additional guidance on obtaining government approved lists, see Attachment D.

4. IPM practices, described in the questionnaire submitted for this PERSUAP, shall be retained in F2F country office files; and they should be built on and strengthened by knowledgeable F2F volunteers. F2F volunteers whose assignments involve direct or indirect assistance for the use or procurement of pesticides shall be given a copy of these practices for the specific country (Types 1 and 2 assignments).
5. IPs shall keep on file in country offices Material Safety Data Sheets (MSDS) for review and use of in-country staff and F2F volunteers (See Section 4.2.3 #11). These should be translated into local languages, where necessary for effective distribution.
6. F2F IPs shall retain in country offices all tools, forms, protocols, and plans that volunteers develop such as: scouting protocols, IPM monitoring forms, and measures to monitor the efficacy of pesticides. These should be provided to subsequent volunteers so that they can build on and strengthen these resources (Type 1 and 2 assignments).
7. Given the low level of understanding of pesticide impacts on human health and the environment, the lack of knowledge on IPM and safe pesticide use, as well as other pesticide issues cited by F2F Country Offices (see PER), F2F IPs shall consider recruiting volunteers (through F2F in-country hosts) for assignments in pesticide safe use and IPM.
8. Any USAID mission-wide or sector-wide PERSUAPs for a given country shall be kept in the F2F IP country offices. Where USAID Missions have produced sector or mission-wide PERSUAPs, F2F IPs will consult with both PERSUAPs and use the PERSUAP that is most up to date with regard to EPAs registry.

The list of approved pesticides in the applicable PERSUAP should be sent to Types 1 and 2 volunteers Liberia, Haiti, and Guatemala IPs sent mission or sector-wide PERSUAPs; however other USAID bilateral missions may also have these documents.

9. F2F Country Offices shall provide oversight to ensure that F2F volunteers understand and implement the mitigation measures (1 to 11 in section 4.2.3) in the SUAP.
10. If any F2F program intends to provide assistance for the use or procurement of pesticide active

¹³ The F2F Implementer found that Angola does not have a list of approved pesticides.

ingredients other than those approved in Attachment A, Table 2 (or in the governing mission or sector-wide PERSUAP), an amendment to this Programmatic PERSUAP must be prepared and approved by the BFS Bureau Environmental Officer (BEO) and other USAID geographic BEO as appropriate, prior to providing such assistance.

4.2.2 The following recommendation shall be implemented by VEGA's SPSP

1. In VEGA's role as focal point to gather and disseminate success stories, best practices, and lessons learned from F2F LWA implementers and SPSP sub-grant implementers, VEGA shall gather and disseminate success stories and lessons learned on pesticide use, training, and IPM practices, and recommendations to help ensure wider implementation by F2F IPs of pesticide best practices.
2. In coordination with F2F IPs, VEGA shall identify knowledge gaps in pesticide safe use, IPM, and other pesticide-related issues (including in implementation of the SUAP), and recommend needed capacity strengthening targeted at specific countries and stakeholders, as determined by the gap analysis. F2F beneficiaries to be trained may include farmers, extension officers, input dealers, etc. In addition, VEGA shall recommend training of F2F in-country staff (in SUAP implementation, pesticide safe use, IPM and recordkeeping, etc.), if determined necessary by the gap analysis.

Recommendations should also include types of training and recommended measures to provide the training.

4.2.3 The following recommendations shall be implemented by F2F volunteers to minimize or avoid any potential irreversible long-term adverse effects on human health and the environment¹⁴

F2F Country Offices shall provide oversight to ensure that these measures are implemented; and shall report to USAID AOR/CORs and MEOs in semi-annual reports on implementation of these measures. F2F Country Offices are expected to work closely with F2F volunteers to ensure that volunteers understand the measures outlined in the SUAP and attachments, and that volunteers are submitting information needed by the Country Office so that they can adequately monitor and report on SUAP measures. Ultimately, F2F Home Offices are responsible to USAID for ensuring implementation of SUAP measures.

These mitigation measures have been adapted to the F2F Program methodology. To various degrees, the SUAP recommendations apply to all F2F volunteers—in particular, Types 1, 2, and 4 assignments, as described above. No volunteers will be involved in procuring pesticides, although a volunteer's recommendations about a pesticide may lead to procurement.

This Programmatic PERSUAP and the following recommendations cover F2F volunteer technical assistance and the associated administrative, consultant, training, and technical assistance under the F2F Programs. This includes the core country F2F projects, flexible assignments, and volunteer services under Associate Awards and other mechanisms whereby Missions or other offices fund F2F programs.

Any F2F volunteer who will be providing assistance as part of a USAID project shall ensure compliance with the project-level PERSUAP, if one exists. If there is an existing project-level PERSUAP, it will take

¹⁴ as identified in the Programmatic Pesticide Evaluation Report (factors (a) to (l)).

precedence over this Programmatic F2F PERSUAP, if and only if it is more up to date than this PERSUAP. If there is no such PERSUAP, the F2F volunteer shall comply with the F2F Programmatic PERSUAP, as described below.

If any F2F program intends to provide assistance for the use or procurement of pesticide active ingredients other than those approved in Attachment A, Table 2 (or in the case of an approved mission or sector-wide PERSUAP, other than the pesticides approved therein), an amendment to this Programmatic PERSUAP must be prepared and approved by the Bureau of Food Security Bureau Environmental Officer (BEO) and other geographic BEO as required by the BFS/BEO prior to providing such assistance.

1. F2F volunteers shall provide assistance for the use or procurement of pesticides only within the context of an IPM approach. For volunteers' reference, Attachment F includes general recommendations on IPM. F2F country offices are required to retain a list of IPM practices that were submitted as supporting documentation (questionnaires) for this PERSUAP. Volunteers, whose assignments will include advice/recommendations on specific pesticides (Type 1 Assignments), as well as those who may provide advice on safe use of pesticides (Type 2 Assignments), should obtain a copy of these IPM practices. Volunteers with specific knowledge in IPM should build on and strengthen these practices, and shall provide documentation in this regard to the F2F country office.
2. F2F volunteers shall recommend and encourage the use of USEPA registered, least toxic pesticide active ingredients (WHO Toxicity Class II and above) in conjunction with an IPM approach. F2F volunteers shall only provide recommendations for the use or procurement of pesticide active ingredients listed in Attachment A, Table 2 all of which are USEPA registered and WHO toxicity class II and above. This requirement applies to recommendations about the use or procurement of specific active ingredients; volunteers may provide general advice on safe use of pesticide active ingredients; and they shall actively and strongly discourage the use of highly toxic chemicals not listed in Attachment A, Table 2.

Where USAID Missions have produced sector or mission-wide PERSUAPs, the list of approved pesticides in a sector or mission-wide PERSUAP shall be used if it is more up to date than this PERSUAP. Once Mission PERSUAPs expire, the F2F PERSUAP approved pesticide list governs. This will help ensure consistent messages are given to USAID beneficiaries, and should also help ensure F2F volunteers are not hampered in their recommendations. F2F volunteers however, must comply with all other requirements in the F2F SUAP.

3. F2F volunteers shall recommend and encourage the use only of products made up of least toxic active ingredients. Attachment A lists active ingredients that F2F volunteers may specifically recommend. F2F volunteers shall provide specific recommendations for pesticide products that are comprised only of the active ingredients in Attachment A, Table 2.

In the case where a sector or mission-wide PERSUAP exists, F2F volunteers should use the most up to date PERSUAP, that is the Mission PERSUAP or this PERSUAP.

4. F2F volunteers shall recommend and encourage the use only of pesticide products that are GUPs or the equivalent and that are USEPA toxicity level II and above or the equivalent. Of the pesticide products that F2F volunteers may recommend, none shall be Restricted Use Pesticides (RUP), or products that are the equivalent of an RUP, if not USEPA registered. In accordance with 22 CFR 216, this PERSUAP covers only the use and procurement of General Use Pesticides (GUPs). In addition, F2F pesticide products that are recommended by volunteers shall be

USEPA toxicity level II or above, or if not USEPA registered, a product equivalent to USEPA II or above. F2F volunteers shall not provide recommendations for the use or procurement of pesticide products that are EPA toxicity level I or the equivalent. In addition, the volunteer also must ensure that the product is registered by USEPA for the same or similar use (crop and insects/diseases) as that which the volunteer is recommending it.

Volunteers must use the approved list of pesticides in Attachment A, Table 2 in this PERSUAP or the approved list of pesticides in Mission PERSUAPS, whichever is more up to date.

5. F2F volunteers shall provide advice and recommendations for specific pesticides only in conjunction with recommendations for appropriate protective gear, and other safety precautions to mitigate pesticide impacts to human health (Attachment B). Volunteers should be aware of the limited accessibility to protective gear in many cases, and should be prepared to identify measures to access protective gear if unavailable. F2F volunteers should also be aware of the lack of intact (completely missing, missing some information, or counterfeit) labeling in some F2F countries. Given that pesticide labels may be unreliable in many F2F countries, volunteers should be prepared to provide alternative advice on protective gear and on other safety precautions to minimize impacts to human health (see Attachment B). For Type 1 assignments, Attachment A provides toxicity information for active ingredients such as acute toxicity, carcinogenic potential, endocrine disruptor, etc. Where these concerns are noted, F2F volunteers should recommend least toxic pesticides and the appropriate safety precautions (Attachment B); Attachment B offers information on best practices to mitigate adverse effects of pesticides on human health.

Based on lessons learned, F2F volunteers may wish to consider recommending and/or providing training on repair and maintenance of equipment for community-based artisanal workshops since they are often the ones a farmer will go to for repairs; and/or creating a committee and/or a fund, into which participants pay a portion of the cost for appropriate safety equipment which they could then rent out as needed. The committee would also provide training to ensure proper use of the equipment.

6. F2F volunteers shall provide advice and recommendations for specific pesticides only in conjunction with recommendations to mitigate impacts on the environment (Attachment C). For Type 1 assignments, volunteers should refer to Attachment A, Table 2 for chemicals with the potential to contaminate groundwater, and should tailor recommendations and environmental safeguards accordingly (Attachment C contains guidance for this). In addition, Attachment C offers best practices to mitigate environmental harm; these should be referred to, and recommended, as appropriate, by Types 1 and 2 volunteers.
7. F2F volunteers shall recommend the use only of pesticides that are approved by the host country government, when they exist. Volunteers whose assignments will require providing advice/recommendations on the use of specific pesticides (Type 1 assignments) should see Attachment D for information about acquiring these government lists. Lists of approved/registered pesticides for each country are required to be kept at F2F country offices. Most host country government-approved lists cover AIs and products.
8. F2F shall work with volunteers whose assignments will involve providing recommendations and advice on specific pesticide active ingredients and products to be sure that the the www.epa.gov site for recent actions/decisions taken by USEPA is reviewed. Any changes to USEPA registration status and other decisions taken by USEPA shall take precedence over Attachment A “approved” pesticides or where a mission or sector-wide PERSUAP exists, to the approved

pesticide list therein. If possible, this review should be conducted prior to travel since the volunteer may not have access to adequate internet once in-country. Any reviews and revisions must be notified to the BFS BEO.

9. F2F volunteers shall not recommend and shall strongly discourage the use of chemicals listed in Attachment E of the SUAP. Attachment E contains:
 - (a) The 29 pesticides listed in Annex III of the Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals and Pesticides in International Trade. These pesticides have been banned or severely restricted for health or environmental reasons by Parties to the Rotterdam Convention.
 - (b) “POPs Treaty” chemicals. Under the Stockholm Convention, also known as the “POPs Treaty,” countries agree to reduce or eliminate the production, use, and/or release of 12 POPs.
 - (c) Organophosphate pesticides (OPs) of primary concern. OPs are among the most acutely toxic pesticides, with most of these chemicals classified by US EPA as toxicity class I (highly toxic) or toxicity class II (moderately toxic).
10. F2F volunteers shall provide training in and shall leave host country partners with the applicable tools (see Attachment G) they will need once the volunteer departs the country. Tools to monitor various parameters of pesticide use and pest and disease infestation such as scouting protocols, IPM monitoring forms, and measures to monitor the efficacy of pesticides will be useful, once a volunteer departs, to help ensure that the volunteer’s recommendations on safe use and IPM will be implemented. Volunteers who prepare monitoring plans and forms shall submit them to the F2F Country Office so that future volunteers can build on them, and so that F2F Country Offices can report in semi-annual reports, on their preparation and updating.
11. Prior to or upon arrival in country in-country, F2F volunteers (Type I) shall collect MSDSs for pesticides they expect to recommend and shall submit to F2F country offices. The MSDSs should be translated into local languages where necessary and cost effective. These shall be kept on file in the local office. The MSDSs can be used as a training tool for F2F beneficiaries and may also be useful for F2F country staff.

4.3 Monitoring and Reporting

The following are the reporting requirements for Types 1, 2, 3, and 4 assignments, and for F2F IP (country offices and home offices). F2F Country Offices are responsible for ensuring F2F volunteers understand, implement, and provide adequate reports on SUAP measures.

4.3.1 F2F Implementing Partner Reporting to USAID/BFS AOR/COR

F2F Home Offices are ultimately responsible for ensuring implementation of SUAP measures and reporting to USAID. In addition, F2F Home Offices are responsible for providing the PERSUAP and Attachments, as noted above, to the volunteers, although certain information may be best obtained from the Country Office (Host Country list of approved pesticides; scouting plans developed by volunteers; etc.). The division of labor is up to the individual F2F IP; but the IP Home Office shall ensure that the required information is provided to each type of F2F volunteer.

In a separate section (Environmental Compliance) of the IP’s semi-annual reports, F2F partners shall report on:

1. The types of assignments that have involved pesticides (i.e., the number of Types 1, 2, and 4 assignments, and a general description of activities that involved pesticides).
2. Key findings and recommendations from F2F volunteer reports regarding limitations and successes of the PERSUAP, and recommendations for additional technical assistance and training needed to improve pest and pesticide management practices.

In a separate section (Environmental Compliance) of VEGA's semi-annual reports, VEGA shall report on:

1. Actions they have taken to assess and disseminate lessons learned and best practices in F2F pesticide use and management.
2. Based on this, the need/utility of an F2F volunteer to address priority pesticide management needs.

4.3.2 Volunteer Reporting

Volunteer end of trip reports, as described below, shall be submitted to the F2F Country Office.

Reporting by:

Type 1 Volunteer Assignments

Brief report shall include a description of the volunteer's activities involving pesticides and all or some of the following:

1. Any pesticides that the F2F country program should be able to recommend/use that are not included in Attachment A, Table 2 or the approved list from a sector or mission-wide PERSUAP (Are there gaps in the list of pesticides that are needed for the specific value chains?)
2. Any highly toxic pesticides that F2F volunteer witnessed in use (pesticides listed in Attachment E), and any poor pesticides practices that volunteer has witnessed.
3. Limitations and successes of the PERSUAP (Was the information in the SUAP adequate; did the SUAP and its attachments help the F2F volunteer to be well-prepared to recommend and train in pesticide use; was any needed information missing?)
4. Recommendations on additional technical assistance and training needed to improve pest and pesticide management practices.
5. Tools, forms, and plans provided to F2F recipients to assist with implementing the volunteer's recommendations
6. New recommendations on IPM practices and feedback on the effectiveness of IPM practices used locally.

Type 2 Volunteer Assignments

Brief report shall include a description of the volunteer's activities involving pesticides and all or some of the following:

1. Limitations and successes of the PERSUAP (Was the information in the SUAP adequate; did the SUAP and its attachments help the F2F volunteer to be well-prepared for the pesticide situation in the country; did the SUAP and its attachments help the volunteer to provide sound advice on pesticide use?)
2. Recommendations on additional technical assistance and training needed to improve pest and

- pesticide management practices.
- 3. New recommendations on IPM practices and feedback on the effectiveness of IPM practices used locally.

Type 3 Volunteer Assignments

No reporting required

Type 4 Volunteer Assignments

Reporting as required by the project-level PERSUAP; or if no project-level PERSUAP, reporting as required above for Types 1, 2, and 3 assignments, as applicable.

ENVIRONMENTAL MITIGATION & MONITORING PLAN FOR IPS AND VEGA

Environmental Mitigation & Monitoring Plan: F2F Implementing Partners

F2F IP shall identify an F2F staff person who will be responsible for oversight of the EMMP. This person will ensure that mitigation measures are monitored and reported on in accordance with the EMMP framework.

TABLE 2: ENVIRONMENTAL MITIGATION & MONITORING PLAN: F2F IPS

PERSUAP Mitigation Measure	Monitoring Indicator	Monitoring and Reporting Frequency
Pesticide-Related Mitigation Measures from the F2F IEE		
The syllabus for each training event will be submitted to the Mission Environmental Officer and the USAID F2F AOR/COR for review and comment.	Syllabus is submitted and comments and guidance provided, when needed.	Review/approve when each training syllabus is prepared. Report on in Semi-Annual Report when each review/approval occurs.
A representative from USAID (preferably the Mission) should attend the training sessions to the extent possible.	Mission representative attends training course.	Attend when trainings occur. (F2F IP is responsible for notifying USAID AOR/COR of trainings) Report on in Semi-Annual Report when training occurs.

PERSUAP Mitigation Measure	Monitoring Indicator	Monitoring and Reporting Frequency
All IPs will be provided with and will familiarize themselves with the environmental brochures (attached to the F2F IEE).	IP staff review environmental brochures.	Monitor and report on annually that IP staff have reviewed the environmental brochure.
The syllabus for each training event will be submitted to the Mission Environmental Officer and the USAID F2F AOR/COR for review and comment.	Syllabus is submitted and comments and guidance provided, when needed.	Review/approve when each training syllabus is prepared. Report on in Semi-Annual Report when each review/approval occurs.

Mitigation Measures based on the Pesticide Evaluation Report

F2F IPs shall retain a copy of this PERSUAP in their headquarters and at all country offices.	PERSUAP is available in HQ and F2F country offices.	Monitor and report on annually that PERSUAP is available.
IPs shall send sections of the PERSUAP and attachments to F2F volunteers, based on the type of assignment, as described in the SUAP.	Information (based on type of assignment, as described in the SUAP), is sent to F2F volunteers.	Monitor as each volunteer is recruited that prescribed information is sent. Report annually
<p>(a) Individual country lists of approved/registered pesticides shall be kept on file at the F2F country office, and shall be provided to F2F volunteers who may be recommending and advising on specific pesticide active ingredients and products as part of their assignment (Type I assignments). These documents will be submitted to the F2F AOR/COR for use in revised annexes to the PERSUAP.</p> <p>(b) For all F2F countries, where there is an approved list of pesticides (as of December 2013, this includes all F2F countries except Angola), this list must be provided to the F2F Volunteer (Type I assignments only) prior to or upon arrival of the volunteer in-country.</p> <p>(c) For F2F assignments in countries with no nationally approved list of pesticides (besides Angola, this might include flex assignment countries and other countries added over the LOP), the F2F IP shall obtain a letter from the government stating that there is no list of government approved pesticides, and noting any specific measures that should be taken when F2F volunteers recommend pesticides.</p>	<p>(a) Host country list of registered pesticides is available at F2F country offices.</p> <p>(b) The list of host country registered pesticides is provided to all Type I volunteers.</p> <p>(c) For Angola and any other countries without an approved list, government letter has been obtained.</p> <p>(d) F2F Angola IP's activities to encourage development of a volunteer SOW to establish government authorized list of pesticides.</p>	<p>(a) Monitor and report on annually that list is available.</p> <p>(b) Monitor as each Type I volunteer is recruited that list has been provided. Report on annually.</p> <p>(c) Monitor and report on annually that letter has been obtained and is up to date.</p> <p>(d) Monitor and report on annually about progress and success in recruiting a volunteer.</p>

PERSUAP Mitigation Measure	Monitoring Indicator	Monitoring and Reporting Frequency
(d) The F2F office in Angola should consider encouraging their partners to develop an F2F SOW to help establish a database of government authorized pesticides.		
(a) IPM practices, submitted in the PERSUAP questionnaire, shall be retained in F2F country office files; and (b) They should be built on and strengthened by knowledgeable F2F volunteers. (c) F2F volunteers whose assignments involve direct or indirect assistance for the use or procurement of pesticides should receive a copy of these practices for the specific country (Types 1 and 2 assignments).	(a) IPM practices are available in F2F host country offices. (b) F2F volunteers strengthen the IPM information. (c) List of IPM practices is provided to F2F Types 1 and 2 volunteers.	(a) Monitor and report on annually. (b) Monitor following Type 1 volunteer assignments and report on annually. (c) Monitor when Types 1 and 2 volunteers are recruited that they have received the list and report on annually.
IPs shall keep on file in country offices Material Safety Data Sheets (MSDS) for review and use of in-country staff and F2F volunteers.	MSDSs are available in F2F host country offices and are translated into local languages, where necessary.	Monitor and report on annually
(a) F2F IPs shall retain in country offices all tools, forms, protocols, and plans that volunteers develop such as: scouting protocols, IPM monitoring forms, and measures to monitor the efficacy of pesticides. (b) These should be provided to subsequent volunteers so that they can build on and strengthen these resources (Type 1 and 2 assignments).	(a) IPM tools, forms, protocols, and plans are available in F2F country offices. (b) IPM tools, forms, protocols, and plans are provided to Type 1 & 2 (for relevant tools) volunteers.	(a) Monitor and report on annually (b) Monitor as Type 1 and 2 volunteers are recruited and report on annually
Given the low level of understanding of pesticide impacts on human health and the environment, the lack of knowledge on IPM and safe pesticide use, as well as other pesticide issues cited by F2F Country Offices (see PER), F2F IPs shall consider recruiting volunteers (through F2F in-country hosts) for assignments in pesticide safe use and IPM.	F2F IP's activities to encourage volunteers in safe use and IPM	Monitor and report on annually about progress and success in recruiting volunteers that improve overall understanding of pesticides impact on human health and environment and improve knowledge of IPM.
In F2F IP country offices, any USAID mission-wide or sector-wide PERSUAPs for that country shall be kept on file. Missions will consult with both PERSUAPS and use the PERSUAP that is most up to date with regard to EPAs registry. This means that the approved list of pesticides in	Where a mission or sector-wide PERSUAP is considered appropriate to supercede the F2F PERSUAP, the approved pesticide lists must be provided to F2F Types 1 and 2 volunteers in place of the approved pesticide list in the F2F PERSUAP (up to the	Monitor and report on annually a) which list is provided to Types 1 and 2 volunteers, and b) that relevant lists are provided as required.

PERSUAP Mitigation Measure	Monitoring Indicator	Monitoring and Reporting Frequency
<p>Attachment A, Table 2 in this PERSUAP may supercede the approved list of pesticides in Mission PERSUAPS. Once the mission or sector PERSUAP expires, the F2F PERSUAP approved pesticide list governs. Any USAID mission-wide or sector-wide PERSUAPs for that country shall be kept in F2F IP country offices. Liberia, Haiti, and Guatemala IPs sent mission or sector-wide PERSUAPs; however other USAID bilateral missions may also have these documents.</p>	<p>deadline date of the mission or sector-wide PERSUAP, and thereafter, the F2F list governs.)</p>	
<p>If any F2F program intends to provide assistance for the use or procurement of pesticide active ingredients other than those approved in Attachment A, Table 2 (or in the governing mission or sector-wide PERSUAP), an amendment to this Programmatic PERSUAP must be prepared and approved by the BFS BEO prior to providing such assistance.</p>	<p>F2F Volunteer Reports indicate that F2F volunteers recommend/train in/use only those pesticides in approved lists based on relevant PERSUAP.</p> <p>Amendment is prepared and approved for any additional pesticides to be used/procured.</p>	<p>Monitor as Types 1 and 2 volunteers submit reports and report on as necessary in Semi-Annual Reports (the need to add any pesticides to the approved list; and submission of Amendment and approval).</p> <p>Monitor and resport on need for, preparation of, and approval of Amendment.</p>
<p>F2F Country Offices shall provide oversight to ensure that F2F volunteers understand and implement the mitigation measures (1 to 9 in section 4.2.3) in the SUAP.</p>	<p>Guidance and oversight are provided to F2F volunteers</p>	<p>Monitor as volunteers are recruited, and report in Semi-annual reports on implementation of mitigation measures for F2F volunteers (1 to 9 in SUAP).</p>
<p>F2F volunteers submit reports as required in the SUAP (see Section 4.3.2 for the reporting requirements for Types 1-4 volunteers).</p>	<p>Volunteer reports are submitted to F2F IP</p>	<p>Monitor as Types 1 and 2 volunteers complete assignments and reports. Report on annually.</p>
<p>In a separate section (Environmental Compliance) of the IP's semi-annual reports, F2F partners shall report on:</p> <p>(1) The types of assignments that have involved pesticides (i.e., the number of Types 1, 2, and 4 assignments, and a general description of activities that involved pesticides).</p> <p>(2) Key findings and recommendations from F2F volunteer reports regarding limitations and successes of the PERSUAP, and recommendations for additional technical assistance and training needed to improve pest and pesticide management practices.</p>	<p>EC section is included in each Semi-Annual Report with the required information.</p>	<p>Semi-Annual Reporting</p>

Environmental Mitigation and Monitoring Plan: VEGA

TABLE 3: ENVIRONMENTAL MITIGATION & MONITORING PLAN: VEGA

PERSUAP Mitigation Measure	Monitoring Indicator	Monitoring and Reporting Frequency
<p>In VEGA’s role as focal point to gather and disseminate success stories, best practices, and lessons learned from F2F LWA implementers and SPSP sub-grant implementers, VEGA shall gather and disseminate success stories and lessons learned on pesticide use, IPM practices, training, and recommendations to help ensure wider implementation by F2F IPs of pesticide best practices.</p>	<p>In VEGA’s role as focal point to gather and disseminate success stories, best practices, and lessons learned from F2F LWA implementers and SPSP sub-grant implementers, VEGA shall gather and disseminate success stories and lessons learned on pesticide use, IPM practices, training, and recommendations to help ensure wider implementation by F2F IPs of pesticide best practices.</p>	<p>In VEGA’s role as focal point to gather and disseminate success stories, best practices, and lessons learned from F2F LWA implementers and SPSP sub-grant implementers, VEGA shall gather and disseminate success stories and lessons learned on pesticide use, IPM practices, training, and recommendations to help ensure wider implementation by F2F IPs of pesticide best practices.</p>
<p>(a) In coordination with F2F IPs, VEGA shall identify knowledge gaps in pesticide safe use, IPM, and other pesticide-related issues (including in implementation of the SUAP), and recommend needed capacity strengthening targeted at specific countries and stakeholders, as determined by the gap analysis. F2F beneficiaries to be trained may include farmers, extension officers, input dealers, etc. In addition, VEGA should recommend training of F2F in-country staff (in SUAP implementation, pesticide safe use, IPM and recordkeeping, etc.), if determined necessary by the gap analysis</p> <p>(b) Recommendations should also include types of training and recommended measures to provide the training.</p>	<p>(a) In coordination with F2F IPs, VEGA shall identify knowledge gaps in pesticide safe use, IPM, and other pesticide-related issues (including in implementation of the SUAP), and recommend needed capacity strengthening targeted at specific countries and stakeholders, as determined by the gap analysis. F2F beneficiaries to be trained may include farmers, extension officers, input dealers, etc. In addition, VEGA should recommend training of F2F in-country staff (in SUAP implementation, pesticide safe use, IPM and recordkeeping, etc.), if determined necessary by the gap analysis</p> <p>(b) Recommendations should also include types of training and recommended measures to provide the training.</p>	<p>(a) In coordination with F2F IPs, VEGA shall identify knowledge gaps in pesticide safe use, IPM, and other pesticide-related issues (including in implementation of the SUAP), and recommend needed capacity strengthening targeted at specific countries and stakeholders, as determined by the gap analysis. F2F beneficiaries to be trained may include farmers, extension officers, input dealers, etc. In addition, VEGA should recommend training of F2F in-country staff (in SUAP implementation, pesticide safe use, IPM and recordkeeping, etc.), if determined necessary by the gap analysis</p> <p>(b) Recommendations should also include types of training and recommended measures to provide the training.</p>
<p>In a separate section (Environmental Compliance) of VEGA’s semi-annual reports the following should be reported on:</p> <p>(1) VEGA shall report on actions they have taken to assess and disseminate</p>	<p>In a separate section (Environmental Compliance) of VEGA’s semi-annual reports the following should be reported on:</p> <p>(1) VEGA shall report on actions they have taken to assess and</p>	<p>In a separate section (Environmental Compliance) of VEGA’s semi-annual reports the following should be reported on:</p> <p>(1) VEGA shall report on actions they have taken to assess and</p>

PERSUAP Mitigation Measure	Monitoring Indicator	Monitoring and Reporting Frequency
<p>lessons learned and best practices in F2F pesticide use and management.</p> <p>(2) Based on this, VEGA shall report on the need/utility of an F2F volunteer to address priority pesticide management needs.</p>	<p>disseminate lessons learned and best practices in F2F pesticide use and management.</p> <p>(2) Based on this, VEGA shall report on the need/utility of an F2F volunteer to address priority pesticide management needs.</p>	<p>disseminate lessons learned and best practices in F2F pesticide use and management.</p> <p>(2) Based on this, VEGA shall report on the need/utility of an F2F volunteer to address priority pesticide management needs.</p>

SUAP ATTACHMENTS

Attachment A: Compiled list of active ingredients allowed in F2F programs

Attachment B: Guide to minimizing the impacts of pesticides to human health

Attachment C: Guide to minimizing impacts of pesticides on the environment

Attachment D: Guide to Host Country Registered Pesticides

Attachment E: Pesticides of Global Concern

Attachment F: Guide to IPM Practices

Attachment G: Monitoring Pests and Pesticide Effects

Attachment H: Key Websites for Pesticide and IPM Research

Attachment I: Bullet Points for SOWs

SUAP Attachment A: Compiled list of active ingredients allowed in F2F programs

The table in this attachment lists active ingredients (AI) requested by F2F country programs that are approved for use based on USEPA registration status and toxicity levels. Prior to providing assistance for the use or procurement of these, a volunteer should ensure that it is approved by the host country; and any product that is recommended should be US EPA toxicity level II or above, or the equivalent for non-US EPA registered products.¹⁵ Assistance for the use or procurement of pesticides must be provided within an IPM approach, and judicious use of least toxic pesticides should be encouraged. Protective equipment and safeguards to protect human health and the environment shall be recommended in conjunction with assistance for the use or procurement of pesticides.

AIs not included on this list shall not be recommended or used.¹⁶ If an F2F program wishes to provide assistance for the use or procurement of an AI not included on this list, an amendment to this PERSUAP shall be submitted, at the request of the F2F program, through USAID/BFS. The BFS Bureau Environmental Officer must approve the amendment prior to providing assistance for the use or procurement of an AI not included on the list below.

WHO Toxicity Class

The WHO bases its ratings on the lowest published rat oral LD₅₀, the lethal dose (in milligrams of substance per kilogram of body weight) that kills 50% of the test animals in a standard assay (see table below). WHO gives a hazard ranking of 1a (Extremely Hazardous) to the most hazardous pesticide active ingredients. While the WHO ratings generally reflect acute toxicity, they also take into account other toxic effects such as reproductive and developmental toxicity. WHO 1 (1a and 1b) are considered extremely toxic, and they are rejected for use by this PERSUAP.

WHO does not rank fumigants, a class of gaseous pesticides that are generally extremely hazardous, they instead have a no listing (NL) rating., The WHO also does not evaluate pesticides believed obsolete or discontinued, even though some of these "obsolete" pesticides are currently registered for use in the U.S. (these also have an NL rating).

ATTACHMENT A, TABLE I: EXPLANATION OF WHO TOXICITY CLASSIFICATIONS

WHO Toxicity Classification		Rat LD ₅₀ (mg of chemical per kg of body weight)			
Class	Description	Solids (oral)	Liquids (oral)	Solids (dermal)	Liquids (dermal)
Ia	Extremely hazardous	< 5	< 20	< 10	< 40
Ib	Highly hazardous	5-50	20-200	10-100	40-400
II	Moderately hazardous	50-500	200-2,000	100-1,000	400-4,000
III	Slightly hazardous	> 500	>2,000	>1000	> 4,000
Table 5	Unlikely to present acute hazard in normal use	> 2,000	> 3,000	---	---

¹⁵ This can be verified on the EPA's website <http://www.epa.gov/>, or on the PAN Pesticide Database www.pesticideinfo.org. Implementing Partners should have current lists of host country approved pesticides and provide this to volunteers as needed.

¹⁶ Note: If a chemical name with alpha, beta, zeta, etc. was submitted, for example, beta cyfluthrin, please check under b for beta and c for cyfluthrin—the chemical may be listed either way

WHO Toxicity Classification		Rat LD ₅₀ (mg of chemical per kg of body weight)			
Table 6	Not classified: believed obsolete				
Table 7	Fumigants not classified by WHO				
U	Unlikely to be hazardous				

**NR: not registered; PANNA: Pesticide Action Network North America

The US EPA registers active ingredients and formulated pesticide products. The EPA gives only formulated pesticide products (which often include inert ingredients) acute toxicity rankings. These are reflected in the warning label on the pesticide container. The US EPA gives a warning label of Category 1 to the most acutely toxic pesticide products and Category 4 to the least acutely toxic pesticide products. The different toxicity categories are based on the LC50, the lethal dose (in milligrams of substance per kilogram of body weight) that kills 50% of the test animals in a standard assay. For inhalation exposures, the LC50 is measured as the concentration in air in mg per liter that kills 50% of the test animals.

PAN Bad Actors are chemicals that are one or more of the following: high acute toxicity, cholinesterase inhibitor, known/probable carcinogen, known groundwater pollutant, or known reproductive or developmental toxicant. NOTE: Because there are no authoritative lists of endocrine disrupting (ED) chemicals, EDs are not yet considered PAN Bad Actor chemicals.

In order to identify a "most toxic" set of pesticides, the Pesticide Action Network (PAN) and Californians for Pesticide Reform (CPR) created the term PAN Bad Actor pesticides.¹⁷ These pesticides are at least one of the following:

- Known or probable carcinogens, as designated by the International Agency for Research on Cancer (IARC), U.S. EPA, U.S. National Toxicology Program, and California's Proposition 65 list.
- Reproductive or Developmental Toxins, as designated by the state of California's Proposition 65 list.
- Neurotoxic cholinesterase inhibitors, as designated by California Department of Pesticide Regulation, the Materials Safety Data Sheet for the particular chemical, or PAN staff evaluation of chemical structure (for organophosphorus compounds).
- Known groundwater contaminants, as designated by the state of California (for actively registered pesticides) or from historic groundwater monitoring records (for banned pesticides).
- Pesticides with high acute toxicity, as designated by the World Health Organization (WHO), the U.S. EPA, or the U.S. National Toxicology Program.

PAN Parent Chemicals

The following is from the PAN Pesticide Database website¹⁸ site, and explains the inclusion of parent chemicals in the WHO ratings below. *The parent chemical was chosen on the basis of available toxicity information, where chemicals with the maximum amount of toxicity information assigned to parent status.* Where no toxicity information was available for any member of a group, PAN assigned parent status to the least derivatized member of the group for organic compounds (e.g., benzoic acid would be the parent instead of methyl benzoate), the sodium salt (for compounds with a common anion), or the chloride salt (for compounds with a common cation). For some groups with no obvious parent, assignment of parent status was arbitrary.

¹⁷ Definition on the PAN Pesticide Database: www.pesticideinfo.org,

¹⁸ PAN Pesticide Database: <http://www.pesticideinfo.org/>

The table lists AIs alphabetically. In the case of a combination of two or more AIs, please check the table under each one. For a product with a combination of two or more AIs, please check the table under each one; for a product to be acceptable, all AIs must be USEPA registered, none may be RUPs or the equivalent, and all AIs must be WHO toxicity level II or above.) The table shows USEPA registration status of each AI; pesticides with AIs not registered by the USEPA are rejected for use under this PERSUAP.

ATTACHMENT A, TABLE 2: ACTIVE INGREDIENTS APPROVED FOR USE BY F2F PROGRAMS

Active Ingredients Approved in this PERSUAP ¹⁹	WHO Toxicity Class	Notes on Toxicity
2,4-D 2,4-D Amine 2,4-D dimethylamine	WHO II	Chlorophenoxy acid or ester, Herbicide, Plant Growth Regulator Moderate acute toxicity, possible carcinogen, potential groundwater contaminant Highly toxic to honey bees (see SUAP-Attachment C)
Abamectin	WHO NL	PAN Bad Actor Botanical, Macrocyclic Lactone, insecticide High acute toxicity, developmental/reproductive toxin (high) Highly toxic to honey bees (see SUAP-Attachment C)
Acephate	WHO III	PAN Bad Actor Insecticide, OP Possible carcinogen, potential groundwater contaminant, cholinesterase inhibitor (high) Highly toxic to honey bees (see SUAP-Attachment C)
Acetamiprid	WHO NL	Neonicotinoid insecticide Potential groundwater contaminant
Acetochlor	WHO III	PAN Bad Actor Herbicide, Chloroacetanilide Carcinogen (high)
Alachlor	WHO III	PAN Bad Actor Chloroacetanilide, herbicide Highly toxic to fish (see SUAP-Attachment C)
Ametryn	WHO III	Herbicide, triazine Potential groundwater contaminant
Amitraz	WHO III	PAN Bad Actor Formamidine, insecticide Moderate acute toxicity, possibly carcinogen, developmental/reproductive toxin (high) Highly toxic to fish (see SUAP-Attachment C)
Asulam – Sodium Salt	WHO NL	Herbicide, other carbamate

¹⁹ Products made up of these AIs, that are GUPs or equivalent and that are registered by the host country are approved in this PERSUAP.

Active Ingredients Approved in this PERSUAP ¹⁹	WHO Toxicity Class	Notes on Toxicity
Azadirachtin	WHO NL	Insecticide, nematocide, botanical
Azoxystrobin	WHO U	Fungicide, strobilin Potential groundwater contaminant
<i>Bacillus sphaericus</i>	WHO NL	Insecticide, microbial
<i>Bacillus thuringiensis</i>	WHO NL	Insecticide, microbial
<i>Bacillus thuringiensis</i> (Subsp. <i>Kurstaki</i>)*	WHO NL	Insecticide, microbial
<i>Bacillus thuringiensis</i> var. Aizawai Strain NB 200	WHO NL	Insecticide, microbial
<i>Beauveria bassiana</i>	WHO NL	Insecticide, microbial Currently under review (see the PAN Pesticide Database ²⁰ or check the EPA Office of Pesticide Programs' Pesticide Chemical Search website ²¹ for strains that are USEPA registered)
Bensulfuron methyl	WHO U	Herbicide, Sulfonylurea Potential groundwater contaminant
Bentazon Bendioxide	WHO III	Herbicide, unclassified
Beta cypermethrin	WHO NL	Insecticide, pyrethroid Possible carcinogen
Betacyfluthrin	WHO II	Pyrethroid, insecticide Moderate acute toxicity
Bifenazate	WHO NL	Insecticide, unclassified Potential groundwater contaminant
Bifenthrin	WHO II	PAN Bad Actor Insecticide, pyrethroid Moderate acute toxicity, possible carcinogen, developmental or reproductive toxin (high) Highly toxic to honey bees (see SUAP-Attachment C) Highly toxic to fish (see SUAP-Attachment C)
Bispyribac-sodium	WHO NL	Herbicide, Pyrimidinyl(thio)benzoate Potential groundwater contaminant
Bitertanol	WHO U	Fungicide, Azole Under EPA registration review
Boscalid	WHO NL	Fungicide, anilide Possible carcinogen
Boscalid + Pyraclostrobin	WHO NL	Boscalid: Boscalid: Fungicide, Anilide Possible carcinogen

²⁰ PAN Pesticide Database: www.pesticideinfo.org

²¹ EPA Office of Pesticide Programs' Pesticide Chemical Search
<http://iaspub.epa.gov/apex/pesticides/f?p=CHEMICALSEARCH:1:0>

Active Ingredients Approved in this PERSUAP ¹⁹	WHO Toxicity Class	Notes on Toxicity
		Pyraclostrobin: fungicide, strobilin Potential groundwater contaminant
Bromacil	WHO U	PAN Bad Actor Herbicide, uracil Possible carcinogen, groundwater contaminant (high)
Buprofezin	WHO U	Insect growth regulator, unclassified Possible carcinogen
Captan	WHO U	PAN Bad Actor Fungicide, Thiophthalimide High acute toxicity, high carcinogen Highly toxic to fish (see SUAP-Attachment C)
Carbaryl	WHO II	PAN Bad Actor Insecticide, Plant Growth Regulator, Nematicide N-Methyl Carbamate Moderate acute toxicity, carcinogen and cholinesterase inhibitor and developmental/reproductive toxin (high) Highly toxic to honey bees (see SUAP-Attachment C) Highly toxic to fish (see SUAP-Attachment C) Highly toxic to wildlife (see SUAP-Attachment C)
Carbendazim	WHO U	Fungicide, Benzimidazole Possible carcinogen
Carboxin	WHO U	PAN Bad Actor Fungicide, Carboxamide Developmental/reproductive toxin (high)
Chlorantraniliprole	WHO NL	Insecticide Potential groundwater contaminant
Chlorfenapyr	WHO II	Pyrazole, insecticide Moderate acute toxicity, possible carcinogen
Chlorsulfuron	WHO U	PAN Bad Actor Herbicide, Sulfonylurea Potential groundwater contaminant, developmental/reproductive toxin (high)
Chlorthalonil	WHO U	PAN Bad Actor Substituted Benzene, substituted benzene High acute toxicity, carcinogen (high), potential groundwater contaminant Highly toxic to fish (see SUAP-Attachment C)
Clethodim (Cl/etodim)	WHO NL	Herbicide, Cyclohexenone derivative Moderate acute toxicity, potential groundwater contaminant
Clodinafop-propargyl	WHO NL	Plant growth regulator, Aryloxyphenoxy propionic acid Possible carcinogen

Active Ingredients Approved in this PERSUAP ¹⁹	WHO Toxicity Class	Notes on Toxicity
Clofentezine	WHO U	Insecticide, tetrazine Possible carcinogen
Clopyralid	WHO NL	PAN Bad Actor, herbicide, Pyridinecarboxylic acid, high acute toxicity, potential groundwater contaminant
Copper ammonium acetate (metallic copper)	WHO NL	Fungicide, inorganic copper
Copper Hydroxide	WHO III	Fungicide, Microbiocide, Nematicide, inorganic copper
Copper oxide	WHO II	Fungicide, insecticide, inorganic copper
Copper oxychloride	WHO NL	Inorganic copper fungicide
Copper sulfate (basic)	WHO NL	Fungicide, Algacide, Molluscicide, inorganic copper Moderate acute toxicity
Copper sulfate (Pentahydrate)	WHO II	Algacide, Fungicide, Insecticide, Water Treatment, Molluscicide, inorganic copper
Cottonseed oil	WHO U	Insecticide
Cuprous oxide	WHO II	Fungicide, insecticide, inorganic copper Moderate acute toxicity
Cyanazine	WHO II	PAN Bad Actor Moderate acute toxicity, possible carcinogen, groundwater contaminant and developmental/reproductive toxin (high)
Cyfluthrin	WHO II	Insecticide, pyrethroid Moderate acute toxicity Highly toxic to honey bees (see SUAP-Attachment C)
Cymoxanil	WHO III	Fungicide, unclassified
Cyproconazol	WHO III	PAN Bad Actor Fungicide, azole High carcinogenicity
Cyromazine	WHO U	PAN Bad Actor Triazine insecticide Groundwater contaminant (high)
Dazomet	WHO III	Fumigant, Fungicide, Nematicide, Unclassified Moderate acute toxicity Potential groundwater contaminant Highly toxic to fish (see SUAP-Attachment C)
Deltamethrin	WHO II	Insecticide, pyrethroid Moderate acute toxicity Highly toxic to fish (see SUAP-Attachment C)
Dicamba	WHO III	PAN Bad Actor Herbicide, benzoic acid Developmental/reproductive toxin (high)

Active Ingredients Approved in this PERSUAP ¹⁹	WHO Toxicity Class	Notes on Toxicity
		Highly toxic to birds (see SUAP-Attachment C)
Diclofop-Methyl	WHO NL	PAN Bad Actor Herbicide, Chlorophenoxy acid or ester, Aryloxyphenoxy propionic acid Moderate acute toxicity, carcinogen (high) and developmental/reproductive toxin (high) Highly toxic to fish (see SUAP-Attachment C)
Dicofol	WHO III	PAN Bad Actor Insecticide, OC High acute toxicity, possible carcinogen Highly toxic to fish (see SUAP-Attachment C)
Difenoconazole	WHO III	Fungicide, azole Possible carcinogen
Diflubenzuron	WHO U	Insecticide, Benzoylurea
Dimethenamid	WHO NL	Herbicide, amide Moderate acute toxicity, possible carcinogen
Dimethomorph	WHO U	Fungicide, Morpholine Potential groundwater contaminant
Dimethyl amine salt (MCPA)	WHO NL	PAN Bad Actor Herbicide, Chlorophenoxy acid or ester High acute toxicity, possible carcinogen, potential groundwater contaminant
Dimethylamine salt of 2,4- Dichlorophenyl acetic acid	WHO NL	Herbicide, plant growth regulator, Chlorophenoxy acid or ester Possible carcinogen, potential groundwater contaminant
Diuron	WHO U	PAN Bad Actor Urea herbicide Carcinogen and developmental/reproductive toxin and groundwater contaminant (high)
Emamectin Benzoate	WHO NL	PAN Bad Actor, Macrocyclic Lactone, insecticide
EPTC	WHO II	PAN Bad Actor Herbicide, Thiocarbamate Moderate acute toxicity, cholinesterase inhibitor and developmental/reproductive toxin (high)
Etoxazole	WHO NL	Insecticide, unclassified
Famoxadone	WHO U	Fungicide
Fenitrothion	WHO II	PAN Bad Actor Insecticide, OP Moderate acute toxicity, cholinesterase inhibitor (high) Highly toxic to honey bees (see SUAP-Attachment C)
Fenpropathrin	WHO II	PAN Bad Actor

Active Ingredients Approved in this PERSUAP ¹⁹	WHO Toxicity Class	Notes on Toxicity
		Insecticide, pyrethroid High acute toxicity Highly toxic to honey bees (see SUAP-Attachment C)
Fenpyroximate	WHO NL	Insecticide, pyrazole
Fipronil	WHO II	Pyrazole, insecticide Moderate acute toxicity, possible carcinogen, potential groundwater contaminant
Florasulam	WHO U	Herbicide, Triazolopyrimidine
Fluazifop-p-butyl	WHO III	Herbicide, Aryloxyphenoxy propionic acid
Flubendiamide	WHO NL	Insecticide, Anthranilic diamide
Fludioxonil	WHO NL	Fungicide, unclassified Potential groundwater contaminant Highly toxic to fish (see SUAP-Attachment C)
Flumetsulam	WHO U	Herbicide, Triazolopyrimidine
Fluroxypyr	WHO U	Herbicide, Pyridinecarboxylic acid
Flutriafol	WHO III	Fungicide, azole Potential groundwater contaminant
Folpet	WHO U	PAN Bad Actor Fungicide, Thiophthalimide High carcinogen Highly toxic to fish (see SUAP-Attachment C)
Fomesafen	WHO III	Herbicide, Diphenyl ether Possible carcinogen
Fosetyl Aluminium	WHO NL	PAN Bad Actor Fungicide, unclassified High acute toxicity, potential groundwater contaminant
Fosthiazate	WHO NL	PAN Bad Actor Nematicide, OP Cholinesterase inhibitor (high)
Garlic extract	WHO NL	Insecticide, botanical
Garlic spray	WHO NL	Insecticide, botanical
Glufosinate-Ammonium	WHO NL	Herbicide, unclassified Potential groundwater contaminant
Glyphosate (Isopropylamine salt)	WHO U	Herbicide, Phosphonoglycine Potential groundwater contaminant
Halosulfuron-methyl	WHO NL	Herbicide, Sulfonylurea Potential groundwater contaminant
Hexythiazox	WHO U	PAN Bad Actor Insecto growth regulator, unclassified

Active Ingredients Approved in this PERSUAP ¹⁹	WHO Toxicity Class	Notes on Toxicity
		Carcinogen (high)
Hymexazol	WHO U	PAN Bad Actor Fungicide High acute toxicity, potential groundwater contaminant
Imazapic	WHO NL	Herbicide, Imidazolinone Potential groundwater contaminant
Imidacloprid	WHO II	Neonicotinoid, insecticide Moderate acute toxicity Potential groundwater contaminant Highly toxic to honey bees (see SUAP-Attachment C)
Indoxacarb	WHO NL	Insecticide, unclassified Moderate acute toxicity
Iodosulfuron-methyl sodium salt	WHO NL	Herbicide, Sulfonylurea
Iprodione	WHO U	PAN Bad Actor Dicarboximide, fungicide High carcinogen, potential groundwater contaminant
Isopropyl amine glyphosate	WHO NL	Herbicide, Phosphonoglycine Potential groundwater contaminant
Kresoxim-methyl	WHO NL	PAN Bad Actor Fungicide, strobilurin Carcinogen (high), potential groundwater contaminant
Lambda Cyhalothrin	WHO II	Insecticide, pyrethroid Moderate acute toxicity
Linuron	WHO U	PAN Bad Actor Herbicide, urea Possible carcinogen, potential groundwater contaminant, developmental or reproductive toxin (high)
Mancozeb	WHO U	PAN Bad Actor Fungicide, Dithiocarbamate, Inorganic-Zinc, Carcinogen and developmental/reproductive toxin (high), potential groundwater contaminant
Maneb	WHO U	PAN Bad Actor Dithiocarbamate, fungicide Carcinogen and developmental/reproductive toxin (high) Highly toxic to fish (see SUAP-Attachment C)
Marigold extract (Phytelene of marigold)	WHO NL	Insecticide, botanical
MCPA	WHO III	PAN Bad Actor Chlorophenoxy acid or ester High acute toxicity, possible carcinogen
Mecoprop (MCP)	WHO III	Chlorophenoxy acid or ester, herbicide

Active Ingredients Approved in this PERSUAP ¹⁹	WHO Toxicity Class	Notes on Toxicity
		Possible carcinogen, potential groundwater contaminant
Mefenoxam (Metalaxyl M)	WHO NL	PAN Bad Actor Xylylalanine, Fungicide High acute toxicity, potential groundwater contaminant
Mesotrione	WHO NL	Herbicide, Benzoylcyclohexanedione
Metalaxyl	WHO III	Xylylalanine, Fungicide, potential groundwater contaminant
Metalaxyl M (Mefenoxam)	WHO III	PAN Bad Actor Fungicide, Xylylalanine High acute toxicity, potential groundwater contaminant
Metam Sodium (Metham Sodium)	WHO II	PAN Bad Actor Fumigant, Herbicide, Fungicide, Microbiocide, Algaecide, Dithiocarbamate High acute toxicity, carcinogen and developmental/reproductive toxin (high) Highly toxic to fish (see SUAP-Attachment C)
Metolachlor	WHO III	PAN Bad Actor Chloroacetanilide, herbicide Possible carcinogen, groundwater contaminant (high)
Metribuzine	WHO II	PAN Bad Actor Herbicide, Triazinone Moderate acute toxicity, potential groundwater contaminant, developmental/reproductive toxin (high)
Milbemectin	WHO NL	Insecticide, Macrocylic Lactone Potential groundwater contaminant
Mineral Oil (Petroleum oil, paraffin-based)	WHO NL	PAN Bad Actor Insecticide, Adjuvant Carcinogen (high)
Mixture of mono-potassium and dipotassium phosphonates	WHO NL	Fungicide, microbicide, inorganic
Neem oil, Neem, Neem leaves extract	WHO NL	Insecticide, botanical
Nicosulfuron	WHO U	Herbicide, Sulfonylurea Potential groundwater contaminant
Novaluron	WHO NL	Herbicide, Benzoylurea
Oxyflourfen	WHO U	Herbicide, Diphenyl ether Possible carcinogen Highly toxic to fish (see SUAP-Attachment C)
<i>Paecilomyces lilacinus</i>	WHO NL	Insecticide, microbial

Active Ingredients Approved in this PERSUAP ¹⁹	WHO Toxicity Class	Notes on Toxicity
Pendimethalin	WHO III	Herbicide, 2,6-Dinitroaniline Possible carcinogen Highly toxic to fish (see SUAP-Attachment C)
Penoxsulam	WHO U	Herbicide, Triazolopyrimidine Possible carcinogen, potential groundwater contaminant
Permethrin	WHO II	PAN Bad Actor Insecticide, pyrethroid Highly toxic to honey bees (see SUAP-Attachment C) Highly toxic to fish (see SUAP-Attachment C) Highly toxic to wildlife (see SUAP-Attachment C)
Phenoxaprop-p-ethyl (fenoxaprop-p-ethyl)	WHO NL	Herbicide, Aryloxyphenoxy propionic acid Potential carcinogen, potential groundwater contaminant, possible developmental/reproductive toxin
Profenofos	WHO II	PAN Bad Actor Insecticide, OP Moderate acute toxicity, cholinesterase inhibitor (high)
Propanil	WHO III	Herbicide, Anilide Possible carcinogen, potential groundwater contaminant
Propargite	WHO III	PAN Bad Actor Insecticide, unclassified High acute toxicity, carcinogen and developmental/reproductive toxin (high) Highly toxic to fish (see SUAP-Attachment C)
Propiconazole	WHO II	PAN Bad Actor Fungicide, Azole Moderate acute toxicity, possible carcinogen, potential groundwater contaminant, developmental/reproductive toxin (high)
Propoxycarbazone-Sodium	WHO NL	Herbicide, unclassified Potential groundwater contaminant
<i>Pseudomonas fluorescens</i> A506	WHO NL	Fungicide, microbial
Pyridaben	WHO NL	Insecticide, unclassified Moderate acute toxicity
Pyroxsulam	WHO NL	Herbicide, Triazolopyrimidine
Quinclorac	WHO U	Herbicide, unclassified Potential groundwater contaminant
Quizalofop-P-ethyl	WHO NL	Herbicide, Aryloxyphenoxy propionic acid Highly toxic to fish (see SUAP-Attachment C)
Rotenone	WHO II	Botanical, insecticide

Active Ingredients Approved in this PERSUAP ¹⁹	WHO Toxicity Class	Notes on Toxicity
		Moderate acute toxicity Highly toxic to fish (see SUAP-Attachment C)
Sethoxydim	WHO III	Herbicide, Cyclohexenone derivative Potential groundwater contaminant
Simazine	WHO U	PAN Bad Actor Herbicide, triazine Groundwater contaminant and developmental/reproductive toxin (high)
S-metolachlor	WHO NL	PAN Bad Actor Herbicide, Chloroacetanilide Possible carcinogen, groundwater contaminant (high)
Soap spray	WHO NL	Microbiocide, Insecticide
Sodium carbonate	WHO NL	pH Adjustment, Fungicide, Microbiocide, Herbicide, inorganic
Spinosad	WHO U	Insecticide, Macrocytic Lactone
Spiroxamine	WHO II	Fungicide, unclassified Moderate acute toxicity
Sulfosulfuron	WHO NL	Herbicide, Sulfonylurea Potential groundwater contaminant
Sulphur	WHO U	Inorganic fungicide, insecticide
Tebuconazole	WHO III	Fungicide, azole Moderate acute toxicity, possible carcinogen, possible groundwater contaminant
Terbutylazine	WHO U	Algaecide, Herbicide, Microbiocide, Triazine
Tetraconazole	WHO II	PAN Bad Actor fungicide, azole moderate acute toxicity, carcinogen (high)
Thiacloprid	WHO II	PAN Bad Actor Neonicotinoid, insecticide Moderate acute toxicity, carcinogen (high)
Thiamethoxam	WHO NL	Fungicide, insecticide, Neonicotinoid Potential groundwater contaminant
Thiodicarb	WHO II	PAN Bad Actor Molluscicide, insecticide, N-Methyl Carbamate Moderate acute toxicity, carcinogen and cholinesterase inhibitor (high) Highly toxic to fish (see SUAP-Attachment C) Highly toxic to birds (see SUAP-Attachment C)
Thiophanate methyl	WHO U	PAN Bad Actor Fungicide, Benzimidazole precursor Potential groundwater contaminant

Active Ingredients Approved in this PERSUAP ¹⁹	WHO Toxicity Class	Notes on Toxicity
		Carcinogen and developmental/reproductive toxin (high) Highly toxic to fish (see SUAP-Attachment C)
Thiram	WHO III	PAN Bad Actor Dithiocarbamate, fungicide Moderate acute toxicity, developmental/reproductive toxin (high) Highly toxic to fish (see SUAP-Attachment C)
Triadimefon	WHO III	PAN Bad Actor Fungicide, azole Moderate acute toxicity, possible carcinogen, potential groundwater contaminant, developmental/reproductive toxin (high)
Triadimenol	WHO III	Fungicide, azole Moderate acute toxicity, possible carcinogen
Tribenuron methyl	WHO NL	Herbicide, Sulfonylurea Possible carcinogen
Trichlorfon	WHO II	PAN Bad Actor Insecticide, OP Moderate acute toxicity, carcinogen and cholinesterase inhibitor (high)
<i>Trichoderma harzianum</i>	WHO NL	Fungicide, microbial
<i>Trichoderma viride</i>	WHO NL	Fungicide, microbial
Triclopyr	WHO III	Herbicide, Chloropyridinyl
Tricyclazole	WHO II	Fungicide, azole Moderate acute toxicity, possible carcinogen, possible groundwater contaminant, possible developmental/reproductive toxin
Trifloxystrobin	WHO NL	Fungicide, strobil
Trifloxysulfuron Sodium	WHO NL	Herbicide, Sulfonylurea Potential groundwater contaminant

* See the PAN Pesticide Database, www.pesticideinfo.org, for specific strains that are USEPA registered

SUAP Attachment B: Guide to minimizing the impacts of pesticides to human health

Attachment contains:

1. General guidance on mitigating potential pesticide dangers
2. Mitigation of human toxicological exposures
3. Protective clothing guide

F2F volunteers who assist in the use or procurement of pesticides shall ensure that this assistance is provided concurrent with guidance on mitigating the potential dangers of pesticides on human health. The following guidance is general and is meant to prepare a volunteer for issues s/he may find once s/he goes to the field and to trigger ideas for solutions. The measures below can be –and should be—adapted to the local situation. Assistance for the use or procurement of pesticides must be provided within the context of an overall IPM approach.

I. General Guidance on Mitigating Potential Pesticide Dangers

Measures to ensure safe transport, mixing, use, storage, and disposal

If there are no feasible alternatives to pesticides, take the following measures to mitigate and reduce the risks to human health and the environment. Note that risk is a function of both toxicity and exposure. Reducing risk means (1) selecting less toxic pesticides and (2) selecting pesticides that will lead to the least human exposure before, during, and after use. The key is to *reduce exposure time or the degree of exposure*.

Before use

Transport:

- Separate pesticides from other materials being transported.
- Ensure no spillage during transport.

Packaging:

- Follow international and national norms and guidelines.
- Use packaging (i.e. small containers) adapted to local needs, and always retain the label.
- Eliminate re-use of packaging materials.

Storing:

- Develop strict guidelines for village-level storage.
- Ensure permanent, well-marked labeling.
- Follow and respect national norms.
- Use appropriate language and approved pictograms.
- Keep all pesticide containers, mixed pesticide, sprayed pesticide, pesticide sprayers, and empty pesticide containers away from children. Ensure safe storage—in a clean dry location away from children. Use a well-recognized “danger” symbol to warn people away from areas where pesticides are stored.

Formulating:

- Use appropriate type and concentration
- Only re-use containers to mix pesticides and do not re-use without first cleaning in accordance with safe

practices

During use

Training:

- Should be continuous
- Should identify level and audiences (distributors, farmers, transporters, etc.)

Application equipment:

- Should be adapted to user needs and possibilities
- Should assure maintenance and availability of parts and service

Use protective equipment and clothing:

- Should be adapted to local climatic conditions
- Should be adapted to user needs and resource possibilities
- Should eliminate exposure rather than just reduce it, if at all possible

Be aware of weather conditions:

- Do not spray in strong wind conditions
- Do not spray against wind direction
- Do not apply pesticides if rain is expected

After use

- Know, enforce, respect, and provide training on exclusion or reentry periods after application.
- Assure proper cleaning and rinsing off of:
 - Applicators' preparation and application equipment
 - Applicators' clothing
 - Storage containers
- Train on safe practices in washing and storing pesticide application equipment, containers, and leftover pesticides.
- Assure proper disposal of pesticide containers.
- Develop a workable monitoring and evaluation system for:
 - Health effects on applicators, the local population, and domestic animals
 - Efficacy on target pests
 - Adherence to national and international policies regarding pest management and pesticides
 - Impacts on environment: water, soils, etc.
 - Elimination of pesticide leftovers and containers

Focus on providing protective "buffer zones" around the following:

- Housing
- Environment: water, sensitive areas

2. Mitigation of Human Toxicological Exposures²²

Most pesticide poisonings result from careless handling practices or from a lack of knowledge regarding the safe handling of pesticides. The time spent learning about safer procedures and how to use them is an investment in the health and safety of oneself, one's family, and others. Pesticides can enter the body in four major ways: through the skin, the mouth, the nose, and the eyes. A checklist is given below to help avoid these various routes of overexposure to pesticides. In general, to be safe, keep people and animals away during spraying and out of freshly sprayed crops. Be prepared for an emergency: inform your co-workers/family where you keep information on the product used (MSDS/label), provide an emergency contact, and/or the location of the nearest hospital. Make sure clean water is available for flushing eyes and skin with water in case of contamination.

To avoid dermal (skin) exposure

- Check the label for special instructions or warnings regarding dermal exposure.
- Use recommended protective clothing and other equipment as listed on the label.
- Do not re-enter the area until deposit has dried or re-entry interval is past.

To avoid oral (mouth) exposure

- Check the label for special instructions or warnings regarding oral exposure.
- Never eat, drink, or smoke, chew tobacco while working with any pesticide.
- Wash thoroughly with soap and water before eating, drinking, smoking, or chewing tobacco.
- Do not touch lips to contaminated objects (such as nozzles).
- Do not wipe mouth with contaminated hands or clothing.
- Do not expose food, beverages, drinking vessels, or cigarettes to pesticides.
- Wear a face shield when handling concentrated pesticides.

To avoid respiratory (lungs) exposure

- Read the label to find out if respiratory protection is required.
- If respiratory protection is required, use only an approved respiratory device.
- Stay upwind during application.

To avoid eye exposure

- Read the label to find out if eye protection is required.
- If eye protection is required use goggles to protect eyes or a face shield to protect eyes and face.
- Keep pesticide container below eye level when pouring.

3. Protective Clothing Guide

In addition to the common sense measures above, use of the prescribed protective gear will also help ensure against exposure to pesticides. If a pesticide product is US EPA registered, specific protective gear will be described on the label for each pesticide by EPA toxicity class I, II, III, or IV, with signal word DANGER, WARNING, CAUTION. If the pesticide product is not EPA registered, the label will carry instructions, as required by the regulating authority, regarding safety gear requirements. If the label is missing or the pesticide product was repackaged and no label was provided, an F2F volunteer can identify a similar product and the protective gear required for that. *However, purchase of pesticide product that is re-packaged and unlabelled may not be used by the F2F program and if located in stores, the F2F volunteer must strongly discourage their use.*

²² (as revised from the AgVANTAGE PERSUAP, USAID/Georgia)

The following guide for protective clothing is helpful, but keep in mind that if a product is unlabelled or if it is not EPA registered, it will not have EPA toxicity classes, and a proxy is needed. An F2F volunteer can check on similar products that are EPA registered, and identify the protective gear required. Better to be on the safe side and encourage the use of available protective gear—it is unlikely, as most F2F country programs stated in the submissions for this PERSUAP, that extensive protective gear will be available and accessible to most farmers. An F2F volunteer may need to be innovative in identifying appropriate, acceptable, alternative safety gear.

ATTACHMENT B, TABLE I: PROTECTIVE CLOTHING AND EQUIPMENT GUIDE

Formulations	Label Signal Words		
	Caution	Warning	Danger
Dry	Long-legged trousers and long-sleeved shirt; shoes and socks.	Long-legged trousers and long-sleeved shirt; shoes and socks; wide-brimmed hat; gloves.	Long-legged trousers and long-sleeved shirt; shoes and socks; wide-brimmed hat; gloves; cartridge or canister respirator if dusts in air or if label precautionary statement says <i>Poisonous or fatal if inhaled</i> .
Liquid	Long-legged trousers and long-sleeved shirt; shoes and socks; wide-brimmed hat.	Long-legged trousers and long-sleeved shirt; shoes and socks; wide-brimmed hat; rubber gloves. Goggles if required by label precautionary statement. Cartridge or canister respirator if label precautionary statement says: <i>Do not breathe vapors or spray mists, or Poisonous if inhaled</i> .	Long-legged trousers and long-sleeved shirt; rubber boots, wide-brimmed hat; rubber gloves, goggles or face shield. Canister respirator if label precautionary statement says: <i>Do not breathe vapors or spray mists, or Poisonous if inhaled</i> .
Liquid (when mixing)	Long-legged trousers; long-sleeved shirt; shoes and socks; wide-brimmed hat; gloves; rubber apron.	Long-legged trousers and long-sleeved shirt; shoes and socks; wide-brimmed hat; rubber gloves; goggles; or face shield; rubber apron. Respirator if label precautionary statement says: <i>Do not breathe vapors or spray mist, or Poisonous (or fatal or harmful) if inhaled</i> .	Long-legged trousers and long-sleeved shirt, rubber boots, wide-brimmed hat, rubber gloves, goggles or face shield. Canister respirator if label precautionary statement says: <i>Do not breathe vapors or spray mists, or Poisonous if inhaled</i> .
Liquid (when mixing the most toxic concentrates)	Long-legged trousers; long-sleeved shirt; boots, rubber gloves, water proof wide-brimmed hat.	Water repellant, long-legged trousers and long-sleeved shirt, rubber boots; rubber gloves; rubber apron; water-proof wide-brimmed hat, face shield, cartridge or canister respirator	Water-proof suit, rubber gloves, water-proof hood or wide-brimmed hat. A canister respirator is highly recommended.

SUAP Attachment C: Guide to minimizing impacts of pesticides on the environment

Attachment contains:

1. Mitigation measures to minimize impacts on protected areas
2. Mitigation measures to minimize impacts on non-target ecosystems and organisms
3. General information and recommendations to mitigate impacts on wildlife
4. Safety precautions to protect bees and other pollinators
5. Safety precautions to mitigate impacts on groundwater resources

1. Mitigation Measures to Minimize Impacts on Protected Areas²³

To mitigate any potential impacts to protected areas (PAs), F2F volunteers must have information on hand about the PAs' location in relation to agricultural fields of interest, sensitive ecosystems/habitats and wildlife, important water bodies and wetlands, and climate and soil information. To anticipate protected-area-related pesticide issues that may arise in the field, F2F volunteers can take the following steps, as appropriate, prior to going out in the field:

- Identify national parks, forests, other protected areas, important waterways (including drinking and washing water sources), and habitat of threatened/endangered species in volunteer's work area.
- Link with local environmental authorities (e.g., District Environmental Officers) and environmental NGOs, who may be aware of important ecological features and safeguards that should be taken to minimize environmental impacts of pesticide use.
- Solicit the assistance of an environmental NGO to partner with on field visits

In conjunction with the provision of assistance for the use or procurement of pesticides, F2F volunteers should provide information on mitigation measures, such as the following, to minimize environmental impacts which may be adapted to environmental specifics and the availability of appropriate safeguards:

- A minimum distance of 100 meter buffer area should be allowed between agricultural fields that are sprayed and any protected areas to minimize impact from pesticide spray drift.
- Pesticides should not be used in areas where the water table is in within three meters of the surface.
- Crops that require pesticide treatment should not be planted within 100 meters of bodies of water or wetland areas.
- Pesticides should not be applied in areas adjacent to protected areas unless precautions are taken to ensure that habitat and wildlife (including birds, fish, and other organisms) will not be affected.
- Construct erosion barriers to prevent runoff of soil from agricultural fields into waterways and wetland areas.
- When washing sprayers and disposing of pesticides, measures must be taken to protect waterways, wetlands, and drinking water sources for humans and wildlife. Safe areas for washing and disposing of remaining pesticides should be delineated or created.

²³ National parks, forests, wildlife reserves, etc.

2. Mitigation Measures to Minimize Impacts on Non-target Ecosystems and Organisms

F2F volunteers should provide information on safety precautions to minimize effects of pesticides on non-target ecosystems and organisms in conjunction with the provision of assistance for the use or procurement of pesticides. The information in this section is for use by F2F volunteers and can be used in training and technical assistance, as appropriate. It has been adapted from *Pesticide Effects on Nontarget Organisms* from the University of Florida Extension²⁴, and focuses on the effects of pesticides on non-target ecosystems and organisms and measures to mitigate impacts.

Soil Microorganisms

Soil organisms are responsible for contributing to the decomposition of dead animal and plant material into organic matter, an important component of our soil fraction. Others are involved in the natural control of soil pests. Aside from their direct effects on pest organisms, soil microbes are a major agent in degrading pesticides. The breakdown of pesticides is beneficial for crop rotation and food residue concerns, and provides herbicide selectivity in some instances. The value of certain soil bacteria that have a symbiotic relationship with leguminous plants in fixing nitrogen translates into reduced synthetic nitrogen fertilizer inputs and increased crop yields. Fortunately, the effect of soil-applied pesticides is short-lived; in fact, in some instances they may enhance the population of certain soil microorganisms.

Fish and Wildlife

The most obvious effects of pesticides on fish and other wildlife are direct effects of acute poisoning. At times, pesticides are solely blamed for fish kills; however, in many cases, indirect effects of pesticides that cause dissolved oxygen depletion are the reason for the kill. Pesticides can enter water sources through drift, runoff, soil erosion, leaching, and occasionally, accidental or deliberate release. The table below lists pesticides which are classified as very highly- or highly-toxic to fish. These pesticides, ranging in concentrations of less than 0.1 to 1.0 ppm, can kill fish.

Pesticides can kill birds in several ways: direct ingestion of granules, baits, or treated seeds and direct exposure from sprays; and indirect kills may result from consumption of treated crops, contaminated water, or feeding on contaminated prey. Birds and other wildlife can be poisoned when baits, such as those targeting rodents, are improperly placed or not recovered in a timely fashion. Pellet and granular-formulated pesticides may be mistaken for food and consumed by birds and other wildlife. The table below lists pesticides that are classified as very highly- and highly-toxic to birds. These pesticides have bird acute oral LD50 values ranging from less than 10 to 50 mg/kg of body weight. Some pesticides have been associated with negative effects on the reproductive potential of certain wildlife.

Certain practices can minimize harmful effects of pesticides on fish and wildlife:

- When given a choice of pesticides to control a certain pest, choose one that is relatively non-toxic towards fish and wildlife.
- Pesticide products, with intact labels, should have an “Environmental Hazards” section. This section lists special precautions and measures that should be taken to minimize harmful effects.
- Treat only the areas needing treatment.
- Leave a buffer zone between bodies of water and treated areas.
- If wildlife is present in a certain area, use precaution with placement of baits.

²⁴ *Pesticide Effects on Nontarget Organisms* from the University of Florida Extension can be found at <http://edis.ifas.ufl.edu/pi122>

Plants and Phytotoxicity

Phytotoxicity refers to plant injury. Of all pesticide types as a group, herbicides are considered to have the greatest potential for causing phytotoxicity, since they are designed to control unwanted vegetation. Inert ingredients in pesticide formulations may also be capable of causing phytotoxicity.

There are many species of plants in natural and undeveloped areas that are desirable because they protect the watershed by reducing erosion and runoff; they provide food and cover for wildlife, and are part of an ecosystem's balance. A disruption of this balance may increase the likelihood of undesirable vegetation becoming more prevalent. There are situations where desirable plants are injured because of one or more of the following reasons:

- Excessive application rate
- Inadequate mixing and agitation
- Environmental conditions, such as extreme temperatures and humidity at the time of application
- Plants which are under stress from lack of water and/or nutrients

Positive confirmation of phytotoxicity caused by pesticides can be difficult. Keeping accurate application records can assist in trying to determine if a pesticide is responsible for the suspected injury. Even with accurate records, pesticide injury can easily be confused with environmental disorders.

F2F volunteers should use the following tables to help ensure that assistance for the procurement or use of pesticides will not have an effect on birds or fish. F2F volunteers should recommend pesticides that are the least toxic to birds, fish, and other non-target organisms. F2F volunteers shall only provide assistance for the use or procurement of pesticides in Attachment A; pesticides listed below that are not in Attachment A, Table 2 and are of high toxicity, should be strongly discouraged.

ATTACHMENT C, TABLE I: PESTICIDES CLASSIFIED AS HIGHLY- TO VERY HIGHLY-TOXIC TO FISH

Pesticide	Type*	Toxicity**	Pesticide	Type*	Toxicity**
Alachlor	H	HT	Maneb	F	HT
Aldicarb	I	HT	Maneb + streptomycin	F	HT
Amitraz	I	HT	Metam-sodium	F	HT
Azinphos-ethyl	I	VHT	Methyl parathion	I	HT
Beta-cypermethrin	I	HT	Methyl-isothiocyanate	FM	HT
Beta-cypermethrin	I	HT	Naled	I	HT
Bifenazate	A	HT	Niclosamide	I	HT
Bifenthrin	I	HT	Oxadiazon	H	HT
Bromadiolone	R	HT	Oxyfluorfen	H	HT
Bromoxynil	H	HT	Pendimethalin	H	HT

Pesticide	Type*	Toxicity**	Pesticide	Type*	Toxicity**
Butylate	H	HT	Permethrin	I	HT
Captan	F	HT	Petroleum distillate	I	HT
Carbaryl	I	HT	Pirimiphos-methyl	I	HT
Chloropicrin	FM	HT	Prometryn	H	HT
Chlorothalonil	F	HT	Propargite	I	HT
Chlorpyrifos	I	HT	Pyraclostrobin	F	HT
Dazomet	F	HT	Pyraclostrobin	F	HT
Deltamethrin	I	HT	Pyrazophos	F	HT
Diazinon	I	HT	Quizalofop-ethyl	H	HT
Dichlorvos	I	HT	Resmethrin	I	HT
Diclofop-methyl	H	HT	Rotenone	I	HT
Dicofol	I	HT	<i>Tau</i> -fluvalinate	I	HT
<i>d-trans</i> -allethrin	I	HT	Tefluthrin	I	HT
Endothall	H	HT	Tetramethrin	I	HT
Esfenvalerate	I	HT	Thiodicarb	I	HT
Ethion	I	HT	Thiophanate-methyl	F	HT
Ethoprop	I	HT	Thiram	F	HT
Fenbutatin-oxide	I	VHT	Tralomethrin	I	HT
Fenvalerate	I	HT	Tribufos	D	HT
Fludioxonil	F	HT	Triflumizole	F	HT
Folpet	F	HT	<i>Zeta</i> -cypermethrin	I	HT
Malathion	I	HT			

*Type: A = acaricide; D = defoliant; F = fungicide; FM = fumigant; H = herbicide; I = insecticide; R = rodenticide.

Pesticide	Type*	Toxicity**	Pesticide	Type*	Toxicity**
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**Toxicity: VHT = <0.1 ppm; HT = 0.1 – 1.0 ppm.

ATTACHMENT C, TABLE 2: PESTICIDES CLASSIFIED AS HIGHLY- TO VERY HIGHLY-TOXIC TO BIRDS

Pesticide	Type*	Toxicity**
Aldicarb	I	HT
Carbofuran	I	HT
Chlorpyrifos	I	HT
Diazinon	I	HT
Dicamba	H	HT
Dichlorvos	I	HT
Dimethoate	I	HT
Ethoprop	I	HT
Metaldehyde	M	HT
Methamidophos	A/I	HT
Methyl parathion	I	HT
Phorate	I	VHT
Pirimiphos-methyl	I	HT
Thiodicarb	I	HT

**Toxicity (Bird LD₅₀): VHT = <10 mg/kg; HT = 10 – 50 mg/kg.

*Type: A = acaricide; H = herbicide; I = insecticide; M = molluscicide.

3. General Information and Recommendations to Mitigate Impacts to Wildlife

The following information is adapted from:

Wildlife and Pesticides - Corn

Authors: William E. Palmer, Peter T. Bromley, and John R. Anderson, Jr.

North Carolina Cooperative Extension Service AG-463-2; and

How Do Pesticides Harm Wildlife?

Most insecticides kill insects by damaging their central nervous systems and can harm wildlife in the same way. Wildlife may be exposed to insecticides by breathing the chemical, swallowing contaminated food or water, absorbing the chemical through the skin or feathers, or by swallowing the chemical when grooming. Some birds may eat granular insecticides, mistaking them for seeds or grit.

Some animals may become sick or die when exposed to pesticides. This is a lethal effect and it is measured as the particular chemical's toxicity. The toxicity of a pesticide to animals is commonly expressed as either its LD50 (lethal dose) or LC50 (lethal concentration). The LD50 of a particular chemical is the dose that kills 50 percent of the animals exposed to it. The LC50 is the concentration of the chemical in the diet, air or water required to kill 50 percent of the animals exposed. LD50s and LC50s are different for every animal species and are determined by laboratory research. For any species, the lower the LD50 or LC50, the higher the toxicity.

Wildlife also may suffer sub-lethal effects from pesticides. In such cases they do not die, but their behavior may be altered or their survival or reproductive abilities affected. For example, in one study, bobwhites that received sub-lethal doses of the insecticide terbufos (Counter) suffered higher mortality from predators. This kind of sub-lethal effect of pesticides is difficult to measure and may be underestimated.

Pesticides and Endangered Species

Exposure to pesticides may pose particular problems for certain endangered species. In fact, the presence of threatened or endangered plants or animals may restrict the use of pesticides in certain areas.

Application Hazards

One of the greatest risks associated with pesticides is the movement of the chemical, through drift or runoff, from the target crop to adjacent wetlands or other sensitive habitats. Most pesticides are applied either as liquids (sprays) or granules. Spray should be applied under conditions that will minimize drift into sensitive habitats.

Drift can be minimized by:

- making ground rather than aerial applications, especially near sensitive habitats;
- using nozzles and spray pressures that produce large spray droplets;
- spraying when the wind will carry the chemical droplets away from sensitive habitats;
- not spraying when wind speed is more than 8 mph; and
- using a drift control agent

Granular pesticides are much less susceptible to drift, but they pose a special threat to some species of wildlife, especially seed-eating birds. Birds may mistake pesticide granules for grit or seed. It takes only a few granules of some insecticides to kill a sparrow-sized bird. When granules are applied, take special care to cover them with soil and completely disk under any spills.

Herbicides and Wildlife

Most herbicides are only slightly toxic to wildlife. (A notable exception is Paraquat.) While herbicides rarely have lethal effects, they can affect wildlife populations indirectly by altering the structure of the habitat. Many species of weeds and brush provide important food or shelter for wildlife. Care should be taken to protect wildlife habitats when applying herbicides.

How Risks Can Be Minimized

- Use Integrated Pest Management practices to decrease pesticide use.
- Use the pesticide least toxic to fish and wildlife.
- Completely cover pesticide granules with soil, especially spilled granules at the ends of rows.
- Minimize drift when applying chemicals near fish and wildlife habitats.
- Avoid spraying over ponds, drainage ditches or other wetlands.
- Use filter strips along drainages to decrease pesticide runoff into streams.
- Never wash spray equipment or containers where rinse water could enter ponds or streams.
- Read and follow the instructions on pesticide labels.

ATTACHMENT C, TABLE 3: THE EFFECTS OF COMMONLY USED INSECTICIDES ON WILDLIFE

Chemical Name	Trade Name(s)	Chemical Group	Effect on Wildlife
Aldicarb	Temik®	Carbamate	Highly toxic to birds, mammals and fish
Carbaryl	Sevin®	Carbamate	Low toxicity for birds, mammals and fish
Carbofuran	Furadan®	Carbamate	Highly toxic to birds, mammals, and fish
Chlorpyrifos	Lorsban®, Dursban®	Organophosphate	Moderately to highly toxic to birds and fish; low toxicity to mammals
Diazinon	Diazinon®, Spectracide®	Organophosphate	Highly toxic to birds; moderately toxic to mammals
Dicrotophos	Bidrin®	Organophosphate	Highly toxic to birds and mammals; moderately toxic to fish
Dimethoate	Cygon®, Dimate®, Dimethoate®	Organophosphate	Highly toxic to birds; moderately toxic to mammals and fish
Disulfoton	Di-Syston®	Organophosphate	Highly toxic to birds, mammals and fish
Malathion	Cythion®	Organophosphate	Low toxicity to birds and mammals; highly toxic to fish
Methomyl	Lannate®	Carbamate	Highly toxic to birds, mammals and fish
Parathion	Several	Organophosphate	Highly toxic to birds, mammals and fish; methyl form slightly less toxic than ethyl form
Permethrin	Ambush®, Pounce®	Synthetic pyrethroid	Low toxicity to birds and mammals; extremely toxic to fish

Chemical Name	Trade Name(s)	Chemical Group	Effect on Wildlife
Phorate	Rampart®, Thimet®	Organophosphate	Highly toxic to birds, mammals and fish
Terbufos	Counter®	Organophosphate	Highly toxic to birds, mammals and fish

Ways to Reduce Pesticide Use

Reducing pesticide use is one of the best ways to protect fish and wildlife resources. Using sound cultural practices reduces pest problems and, therefore, results in lower pesticide use. Cultural practices that decrease the need for pesticides include rotating crops, selecting resistant varieties (when possible), planting and harvesting at the proper time, and using integrated pest management (IPM) techniques. IPM is a farming approach that employs alternative methods of pest control, rather than relying solely on agrichemicals. With IPM, pesticides are used only when the cost of applying a pesticide is outweighed by the cost of pest damage to the crop. This "threshold" must be reached before chemical pest control is economically justified. In this way, IPM practices help to reduce pesticide use and protect wildlife and the environment.

Insecticides

Species that live in and around agricultural fields are exposed to insecticides when they eat granules and chemical residues on plants or in insects. Wildlife that enter crop fields soon after an insecticide has been sprayed are exposed when they inhale its vapor or when the insecticide contacts their skin or eyes.

The effects of insecticides on wildlife and fish can be minimized by using the least toxic alternative. The hazard of an insecticide is based on its toxicity to wildlife, the way it is used, and other characteristics, such as its persistence in the environment. For example, methomyl (Lannate) is acutely toxic to birds and mammals. However, because methomyl does not persist in the field, careful use of this chemical presents only a moderate hazard to wildlife. Wildlife exposed to insecticides rated high toxicity may die or become sick. Insecticides rated moderate may also cause death or sickness, although death is unlikely. Insecticides rated low are unlikely to harm wildlife directly.

Granular Insecticides

Granular insecticides present a serious hazard to birds. Many highly toxic insecticides are formulated as granules, such as fonofos (Dyfonate) and terbufos (Counter). Birds eat granules exposed on the soft surface, mistaking them for food and grit. Ingesting only a few granules of a toxic insecticide can kill a small bird.

To reduce the hazard to wildlife from granular formulations:

- use the least toxic insecticide that will control the insect pest
- fully incorporate granules into the soil

Incorporation is especially important near field edges where many birds search for food and grit. *Disking spilled granules under the soil at row ends* significantly reduces wildlife exposure to the granules. If soil incorporation is not possible, consider using a liquid formulation following the guidelines in the next section.

Liquid Insecticides

Several insecticides that are sprayed on foliage are toxic to wildlife; these include carbofuran (Furadan), methyl parathion, and methomyl (Lannate). Other foliar insecticides are only slightly toxic to most birds and mammals;

for example, malathion, carbaryl (Sevin), esfenvalerate (Asana XL), and permethrin (Pounce or Ambush). However, many of these insecticides are toxic to fish and other aquatic animals.

To reduce danger to wildlife from foliar applications:

- spray only when IPM thresholds are met
- use the least toxic insecticide that will control the insect pest
- minimize drift of insecticides into wildlife habitats

Several studies of aerial applications of pesticides have reported significant drift of material into nearby wildlife habitats. If it is necessary to use highly toxic insecticides, apply them with ground equipment; this will help to minimize drift and reduce the hazard to wildlife. Ground application may also allow wildlife more time to leave the area during the spraying operation.

Spray drift can be minimized by using application equipment with low drift characteristics, replacing inappropriate or worn nozzles, using appropriate pressure and volume for the chosen nozzle, and adding a drift control agent. Ultra-low-volume sprays are more likely to cause drift than low pressure sprays. Avoid spraying when the wind is blowing faster than 8 mph.

Nematicides

Nematicides used on crops include carbofuran (Furadan), ethoprop (Mocap), and terbufos (Counter). All three are highly toxic and therefore potentially hazardous to wildlife. If granular formulations are used, full incorporation is required on the label. Incorporating spilled granules at row ends greatly reduces the danger to wildlife that feed along the edges of treated fields.

Herbicides

Most herbicides used are only slightly toxic to birds and mammals. One exception is paraquat (Gramoxone), which is moderately toxic to birds. When paraquat is sprayed directly on bird eggs it can cause abnormal growth of embryos and has been shown to reduce the hatching success of waterfowl eggs. Some herbicides are very toxic to fish, such as pendimethalin (Prowl) and bromoxynil (Buctril). Care should be taken to ensure ponds and streams are not contaminated with herbicides.

Herbicides can harm or destroy wildlife habitats. Herbicide use can often be reduced by employing IPM practices. Keep records of weed problems and use postemergent herbicides only when needed. New postemergent herbicides (such as Accent or Dimension) may help to reduce costs and the total amount of herbicide needed. When applying herbicides, avoid spraying past the outer row because it wastes chemical and can destroy wildlife habitats.

Also, protecting noncrop areas from herbicides is important. Wildlife, especially small game and song birds, benefit from the cover provided by strip habitats. These strips are linear noncrop areas, such as hedgerows, ditch banks, filter strips, field borders, and fencerows. The vegetation in strip habitats provides wildlife valuable cover for nesting, brood rearing, and escaping from predators. These habitats also allow wildlife safe access to fields during winter months when these fields provide a good source of food.

Mowing strip habitats also reduces their value for wildlife. When field borders, filter strips, ditch banks, and other fallow areas are mowed during spring and summer, wildlife cover is reduced. Consider maintaining strip habitats by mowing only once per year or less frequently if possible. Mow during early spring only. Mowing alternate sides of strip habitats every other year will ensure that cover will be available to wildlife year-round.

4. Safety Precautions to Protect Bees and Other Pollinators

In conjunction with assistance for the use or procurement of pesticides, F2F volunteers should provide information on mitigating the impacts of pesticides on bees and other pollinators. Pesticides vary in their effect on bees and other pollinators.²⁵ The following information is provided to assist F2F volunteers to protect bees and other pollinators.

Most research on the effect of pesticides on beneficial insects has focused on bees. Contact insecticides kill by contact with the organism, and will affect insects that are sprayed. Systemic insecticides that are incorporated by treated plants can contaminate nectar or pollen and kill bees in their hive.

Active ingredients can be ranked for toxicity to bees, but the actual formulation and mode of application provide the ultimate indication for degree of toxicity to bees. A stronger formulation of a pesticide that might be considered highly toxic might be less toxic if applied only to the soil rather than as spray. Dusts and wettable powders are usually more hazardous to bees than emulsifiable concentrates or solutions.

The following is adapted from *Protecting Honey Bees from Pesticides* by Dr. James E. Tew:

Protecting pollinators, especially honey bees, from pesticide poisoning should be part of any pesticide program. The following recommendations can help minimize bee kills.

Pesticides on Blossoms. The blossom is usually the only part of a plant that bees visit. To avoid killing bees, do not apply pesticides hazardous to bees during the blooming period. When the treated area contains the only attractive plants, in bloom within flight range, injury may occur to colonies several miles away. Treating non-blooming crops with a hazardous pesticide when cover crops, weeds, or wild flowers are in bloom within (or near) the treated field may also cause heavy bee losses.

Drift of Pesticides. Drift occurs from nearly all spray or dust applications of pesticides from a short distance to miles downwind. Pesticide dusts drift farther than sprays. Pesticides applied by plane usually drift farther than those applied by ground equipment. Generally, it is less hazardous to apply pesticides near apiaries with ground equipment than by plane. Drift can be reduced by applying pesticides in the evening or early morning when the air is calm.

Time of Application. Ideally, pesticides should be applied when there is no wind and when bees are not visiting plants in the area. The time and intensity of bee visitation to a given crop depends on the abundance and attractiveness of the bloom. For example, apple trees or clover in bloom may be attractive to bees all day while cucumbers and corn are usually attractive in the morning and early afternoon hours. In general, evening or early night applications are the least harmful to bees.

Formulation of Pesticides. Dusts are usually more hazardous to bees than sprays. Wettable powders often have a longer residual effect than emulsifiable concentrates. Granular pesticides seem to present very little hazard. Ultra-low volume (ULV) formulations of some pesticides are much more toxic than regular sprays. No effective repellent has been developed that can be added to pesticides to keep bees from treated areas.

Toxicity of Pesticides. Most agricultural pesticides have been tested for their toxicity to honey bees. However, laboratory and field results do not always coincide, due to peculiarities of bee behavior, length of residual life of the pesticide, or the effects of different formulations.

Insecticides affect bees in one or more ways: as stomach poisons, as contact poisons, and as fumigants. Pyrethroids, organophosphates, and carbamates vary in their toxicity to bees from relatively nonhazardous to very

²⁵ Useful information can be found at the Pesticide Environmental Stewardship website: <http://pesticidestewardship.org/PollinatorProtection/Pages/default.aspx>

hazardous, depending upon the individual material or combination of materials. Some bacteria, protozoans, and viruses that are currently recommended for biological control pose a serious hazard to bees.

Herbicides, defoliant, and desiccants such as paraquat, MAA, and MSMA reportedly were extremely toxic when fed to newly emerged worker honey bees or when sprayed onto older bees in field tests. Most tests have shown other materials in this class to be nonhazardous to bees, except that they kill or damage nectar- or pollen-producing plants.

Fungicides seem to cause little trouble for bees. Captan at field dosages has caused brood damage.

Sex lures, attractants, and other hormones usually cause no problem for bees. Occasionally, a few honey bees and bumblebees have been found in traps containing Japanese beetle lures.

Precautions for Farmers and Applicators

1. Apply pesticides only when needed.
2. Use the recommended pesticide at the lowest effective rate.
3. Use the pesticide least hazardous to bees that will control the pest involved. If all recommended pesticides are equally hazardous to bees, use the one that has the shortest residual effect.
4. Use sprays or granules instead of dusts.
5. Use ground equipment instead of aerial application to apply pesticides near bee hives.
6. Apply pesticides in late afternoon or at night when bees are not working the blooms.
7. Avoid drift of pesticides onto plants that are attractive to bees.
8. Notify beekeepers several days before applying any pesticide that is hazardous to honey bees. This will give them a chance to protect their colonies. However, notifications are not a release of responsibility.

Precautions for Beekeepers

1. Place colonies where they will be away from fields that are routinely treated with hazardous pesticides and will not be subjected to pesticide drifts.
2. Identify your apiary. Post your name, address, and phone number in a conspicuous place near your apiary. Let farmers and custom applicators in your area know where your apiaries are located so they will not unknowingly poison them.
3. Be familiar with pesticides commonly used in your area and what their application dates are.
4. Relocate colonies that are exposed repeatedly to hazardous pesticides. Also, remember that soon after colonies are moved to a new location, foraging bees search for water. They may collect water that has been contaminated with pesticides. To reduce the chance of bee losses, provide clean water near the hives.

ATTACHMENT C, TABLE 44: BEE KILL ESTIMATIONS

Bee Kill Estimation	
0 - 100 dead bees per day	Normal Die-off
200 - 400 dead bees per day	Low Kill
500 - 900 dead bees per day	Moderate Kill
1000 or more dead bees per day	High Kill

Pesticides Toxic to Bees

The following partial list of pesticides represents groups of materials ranked by toxicity to honey bees. Toxicity ranking may vary depending on the formulation of a pesticide.²⁶

Pesticide labels provide important information about toxicity to honey bees and other non-target organisms. However, in some F2F countries, pesticides are re-packaged, and a farmer may purchase pesticides without labels.

The F2F volunteer can provide recommendations to farmers on using best practices—described above—to minimize impacts to pollinators, and should use the below information as a guide for recommending specific pesticides and discouraging the use of more toxic pesticides with the aim of minimizing effects on honey bees. While the F2F volunteer may only recommend pesticide active ingredients in Attachment A, Table 2, the volunteer should *discourage* the use of any of the active ingredients below that are highly toxic to honey bees.

²⁶ Sourcebooks *Farm Chemicals Handbook*, '95, Meister Publishing Company. *Pollinator Protection*, Johansen & Mayer, Wicwas Press, 1990. *The New Pesticide User's Guide*, Bert L. Bohmont, Reston Publishing Company.

Group I. Hazardous: Generally, these materials kill bees on contact during application and for one or more days after application

Highly Toxic

- 2,4-D
- abamectin
- acephate
- azinphos-methyl
- bifenthrin
- carbaryl
- carbosulfan
- chlormephos
- chlorpyrifos
- cyfluthrin
- d-phenothrin
- demeton-s-methyl
- diazinon
- dichlorvos
- dicrotophos
- dimethoate
- esfenvalerate
- ethion
- etrimfos
- fenitrothion
- fenpropathrin
- fensulfthion
- fenthion
- fenvalerate
- flucythrinate
- fonofos
- heptachlor
- lindane
- malathion
- methamidophos
- methidathion
- methiocarb
- mevinphos
- monocrotophos
- naled
- omethoate
- oxydemethon-methyl
- oxydisulfoton
- parathion
- permethrin
- phosmet
- phosphamidon
- propoxur
- pyrazophos
- resmethrin
- tetrachlorvinphos
- tralomethrin

Group II. Moderately Hazardous: These materials can be used with limited damage to bees if not applied on bees in the field or on hives near the field. Correct application rate, timing, and method of application, are factors that can reduce pesticide kills. **HOWEVER, IF NOT APPROVED IN THE PERSUAP, THEY ARE NOT APPROVED FOR USE IN THE USAID F2F PROGRAM.**

Moderately Toxic

- Acetochlor
- Aclonifen
- allethrin
- alphacypermethrin
- ametryn
- bromopropylate
- cinmethylin
- crotoxyphos
- DCPA
- diphenamid
- disulfoton
- endosulfan
- endrin
- ethoprop
- flufenoxuron
- fluvalinate
- formetanate hydrochloride
- mancozeb
- methanearsonic acid
- neburon
- pebulate
- phorate
- pirimiphos-methyl
- sethoxydim
- sulfosate
- terbufos
- thiocyclam hydrogen oxalate
- thiodicarb
- triforin

Group III. Relatively Nonhazardous: These materials can be applied with little harm to bees. Regardless, follow label instructions. **HOWEVER, IF NOT APPROVED IN THE PERSUAP, THEY ARE NOT APPROVED FOR USE IN THE USAID F2F PROGRAM.**

Relatively Non-Toxic

- 2,4-D butoxyethyl ester
- 2,4,5-T
- alachlor
- aldicarb
- aldoxycarb
- alloxidim sodium

- amitraz
- amitrole
- ammoniacal copper sulfate
- anilazine
- anthraquinone
- atrazine
- azadirachtin
- azamethiphos
- azocyclotin
- *Bacillus thuringiensis*
- benomyl
- bentazon
- bitertanol
- Bordeaux mixture
- bromacil
- bromadiolone
- bromofenoxim
- bromoxynil
- buminafos
- bupirimate
- butylate
- butylate
- captan
- captfol
- carbendazim
- carbetamide
- carboxin
- chinosol
- chloramben
- chloranil
- chlorbromuron
- chlordimeform
- chlorflurenol
- chloridazon
- chlormequat chloride
- chlorobenzilate
- chlorophacinone
- chloropicrin
- chlorothalonil
- chlorotoluron
- chloroxuron
- chlorpropham
- clofentezine
- copper oxide
- copper oxychloride
- cyanazine
- cycloate
- cycloxydim
- cyhexatin
- cyproconazole
- dalapon
- daminozide
- dazomet
- DCNA
- desmetryn
- dibromochloropropane
- dicamba
- dichlobenil
- dichlofenthion
- dichloroprop-P
- dichlorprop
- diclofop-methyl
- dicofol
- dienochlor
- diflubenzuron
- dikegulac sodium
- dimethirimol
- diniconazole-M
- dinocap
- diquat dibromide
- dithianon
- dithiocarbamates
- diuron
- dodemorph acetate
- dodine
- endothall
- epoxiconazole
- ethephon
- ethidimuron
- ethion
- ethirimol
- ethofumesate
- ethylfluralin
- fenaminosulf
- fenamiphos
- fenarimol
- fenfuram
- fenpropimorph
- fentin hydroxide
- fenuron
- ferbam
- fluometuron
- fluorodifen
- fluoroglycofen
- folpet
- fosamine ammonium
- fuberidazole
- furalaxyl
- gibberellic acid
- glyodan
- glyphosate
- guazatine
- indole-3-butyric acid
- iprodione
- Isopropalin
- isoproturon
- lenacil
- linuron
- maneb
- MCPA
- MCPB
- mecoprop
- mecoprop-p
- MEMC
- mepiquat chloride
- metalaxyl
- metalaxyl
- metaldehyde
- methamitron
- methazole
- methoxychlor
- methyl bromide
- Metiram
- metobromuron
- metolachlor
- metoxuron
- metribuzin
- monalide
- monolinuron
- monuron
- MSMA
- nabam
- napropamide
- naptalam acid
- naptalam
- nicotine
- nitralin
- nitrapyrin
- nitrofen
- norflurazon
- nuarimol
- oryzalin
- ovex
- oxycarboxin
- oxyfluorfen
- oxythioquinox
- paraquat
- PCNB
- pendimethalin
- phenmedipham
- phosalone

- picloram
- pirimicarb
- PMA
- prochloraz
- procymidone
- profluralin
- prometon
- prometryn
- pronamide
- propachlor
- propam
- propamocarb hydrochloride
- propargite
- propazine
- propineb
- prothiocarb
- pyrethrins
- pyridate
- pyroquilon
- quinclorac
- quizalofop-ethyl
- rotenone
- ryania
- sabdilla
- sethoxydim
- simazine
- sulfur
- TCA
- terbacil
- terbutryn
- terbufos
- terbutryn
- tetradifon
- thiabendazole
- thiophanate-methyl
- thiram
- triadimefon
- triadimenol
- tribufos
- trichlamide
- trichlorfon
- triclopyr
- trietazine
- trifluralin
- triphenyltin hydroxide
- validamycin A
- vernolate
- vinclozolin
- warfarin
- WSSA
- zineb
- ziram

5. Safety Precautions to Mitigate Impacts on Groundwater Resources

Each pesticide has physical characteristics, such as solubility in water and ability to bind to soil particles and be held (adsorbed) by soil so they do not enter the soil water layers and the groundwater table. This data can be found for F2F requested pesticides by checking each pesticide on the PAN website²⁷. The water solubility, soil adsorption, and natural breakdown rates, if available, are included at the bottom of the webpage for each parent chemical. In addition, in Attachment A, Table 2, the potential for groundwater contamination is noted for each “approved” pesticide active ingredient.

In general, pesticides with water solubility greater than 3 mg/liter have the *potential* to contaminate groundwater; and pesticides with an adsorption coefficient of less than 1,900 have the *potential* to contaminate groundwater (this is also indicated in Attachment A, Table 2). And, pesticides with an aerobic soil half-life greater than 690 days or an anaerobic soil half-life greater than nine days have the *potential* to contaminate groundwater. Pesticides with a hydrolysis half-life greater than 14 days have *potential* to contaminate groundwater. All of these statements are generalizations, but good rough guides to anticipated pesticide behavior in soil and water. However, each pesticide requires individual investigation or research.

As noted in the table in SUAP-Attachment A, some of the proposed pesticides are potential groundwater contaminants. These pesticides in particular, but in general no pesticides, should be mixed, applied, stored, or disposed of adjacent to or upslope from waterways, wetlands or drinking water sources without appropriate safeguards.

Endnotes: Guide to minimizing impacts of pesticides on the environment

1. This document is PI-85, one of a series of the Pesticide Information Office, Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Original publication date November, 2005. Reviewed December 2008. Visit the EDIS Web Site at <http://edis.ifas.ufl.edu>.

²⁷ The PAN website can be found at <http://www.pesticideinfo.org/>

2. Frederick M. Fishel, Associate Professor, Agronomy Department, and Director, Pesticide Information Office; Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL 32611.

Additional information on effects of pesticides on non-target ecosystems and organisms can be found in:

Crop Protection Handbook. 2005. vol. 91. Willoughby, Ohio: Meister Publishing Co.

Fishel, F.M. 2005. Pesticide toxicity profiles. UF/IFAS EDIS Document Series.

http://edis.ifas.ufl.edu/TOPICTOPIC_SERIES_Pesticide_Toxicity_Profiles .

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Olexa, M. T., A. Leviten, K. Samek. 2003. Florida Solid and Hazardous Waste Regulation Handbook: Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). UF/IFAS Circular FE446.

http://edis.ifas.ufl.edu/topic_book_handbook_of_florida_water_regulations .

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Short, D.E., F.A. Johnson and J.L. Castner. 2005. Beneficial insects sheet 1. UF/IFAS EDIS Document SP-88.

Short, D.E., F.A. Johnson and J.L. Castner. 2005. Beneficial insects sheet 2. UF/IFAS EDIS Document SP-89.

Short, D.E., F.A. Johnson and J.L. Castner. 2005. Beneficial insects sheet 3. UF/IFAS EDIS Document SP-05.

SUAP Attachment D: Guide to Host Country Registered Pesticides

F2F volunteers shall only recommend a pesticide that is registered by the host country. F2F volunteers who will provide assistance for the use or procurement of pesticides should request the country list from the F2F country office (Volunteers may be able to find this information online, although many countries do not yet have it available online or even in electronic form.) F2F country offices should provide the most recent government list of approved pesticides to F2F Type 1 volunteers prior to or upon arrival in-country. Volunteers and country staff should ensure that the list reflects the most recent information.

As of the date of this PERSUAP, all F2F IPs submitted a list of registered pesticides except Angola. For Angola, before a Type 1 volunteer can be recruited, the F2F country office should obtain a letter from the host government stating that they do not have a list of pesticides approved for use. This letter may include any provisions that a Type 1 volunteer should take when recommending pesticides. The F2F country office should provide this letter to the volunteer prior to or upon arrival in-country.

For F2F Types 1 and 2 volunteer assignments in non-core countries, the volunteer should check for a host country approved pesticide list prior to travelling; there may be one available online. USAID mission offices are another source of information for non-core F2F country assignments. An existing PERSUAP may have the needed information.

Besides obtaining the list of registered pesticides from the F2F country office, a volunteer may wish to check the links below; others can be found by searching online. These are examples of available online information:

Egypt

The Agricultural Pesticide Committee website lists all 358 pesticides approved by the Agricultural Pesticides Committee for use in the Arab Republic of Egypt.²⁸

Nigeria

Up to date information can be found on the National Agency for Food and Drugs Administration and Control (NAFDAC) website.²⁹

Ghana

The Ghana Environmental Protection Agency is the lead agency responsible for a comprehensive national pesticide regulatory program. As of January 2005 the government list included 62 *Registered* (approved for general or restricted use), 27 *Provisionally Cleared* (temporarily approved but not registered), and 25 *Banned* pesticides. This list and other information may be obtained from the EPA or from Plant Protection and Regulatory Services of the Ministry of Agriculture.³⁰ Separate regulations or approvals may be published for biopesticides.

Kenya

²⁸ The Agricultural Pesticide Committee website can be found at <http://www.apc.gov.eg/en/products/showall.aspx>

²⁹ The National Agency for Food and Drugs Administration and Control of Nigeria can be found at <http://www.nafdac.gov.ng/>

³⁰ The Ministry of Food and Agriculture for the Republic of Ghana website can be found at <http://mofa.gov.gh/site/>

Updates can be found at this website, and access to the Pesticide Database requires a fee; Kenya F2F staff can provide volunteers who need to check the government list with a user name and password for access to the Pest Control Products Board: A Statutory Organization of the Kenya Government website.³¹

³¹ The Pest Control Products Board: A Statutory Organization of the Kenya Government website can be found at <http://www.pcpb.or.ke/>

SUAP Attachment E. Pesticides of Global Concern

This attachment contains the following:

1. Chemicals banned in accordance with the Rotterdam Convention, PIC Procedure
2. The Pesticide Action Network “Dirty Dozen”
3. The “Dirty Dozen” POPs
4. Organophosphate products of concern

While F2F volunteers may only provide assistance for the use or procurement of active ingredients in Attachment A, Table 2, volunteers shall strongly discourage the use of the pesticides on the lists in this attachment. **If additional active ingredients, other than those listed in SUAP Attachment A will be used/recommended in the future, F2F volunteers shall ensure that those listed below are excluded.**

I. Rotterdam Convention, PIC Procedure

The following is from the *Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade*. The chemicals listed in Annex III of the convention include pesticides and industrial chemicals (not included herein) that have been banned or severely restricted for health or environmental reasons by Parties. There are a total of 40 chemicals listed in Annex III, 29 are pesticides (including four severely hazardous pesticide formulations) and 11 industrial chemicals. This information, as well as additional information on the Rotterdam Convention and Prior Informed Consent Procedure can be found on the Rotterdam Convention website, under Chemicals.³²

The pesticides in Annex III of the convention (below) shall not be used or recommended by F2F volunteers. Use of any of them should be strongly discouraged.

ATTACHMENT E, TABLE 5: ANNEX III(**) OF THE ROTTERDAM CONVENTION

Chemical (CAS number(s))
2,4,5-T and its salts and esters (93-76-5) *
Aldrin (309-00-2)
Binapacryl (485-31-4)
Captafol (2425-06-1)
Chlordane (57-74-9)
Chlordimeform (6164-98-3)
Chlorobenzilate (510-15-6)
DDT (50-29-3)

³² The Rotterdam Convention, Annex III Chemicals can be found at <http://www.pic.int/Default.aspx?tabid=1132>

Chemical (CAS number(s))
Dieldrin (60-57-1)
Dinitro-ortho-cresol (DNOC) and its salts (such as ammonium salt, potassium salt and sodium salt) (534-52-1; 2980-64-5; 5787-96-2; 2312-76-7)
Dinoseb and its salts and esters (88-85-7)
1,2-dibromoethane (EDB) (106-93-4)
Ethylene dichloride (107-06-2)
Ethylene oxide (75-21-8)
Fluoroacetamide (640-19-7)
HCH (mixed isomers) (608-73-1)
Heptachlor (76-44-8)
Hexachlorobenzene (118-74-1)
Lindane (58-89-9)
Mercury compounds including inorganic mercury compounds, alkyl mercury compounds and alkyloxyalkyl and aryl mercury compounds ³³
Monocrotophos (6923-22-4)
Parathion
Pentachlorophenol and its salts and esters (87-86-5) *
Toxaphene (8001-35-2)
Tributyltin compounds
Dustable powder formulations containing a combination of : benomyl at or above 7 per cent, carbofuran at above 10 per cent, thiram at or above 15 per cent (17804-35-2; 1563-66-2; 137-26-8)
Methamidophos (Soluble liquid formulations of the substance that exceed 600 g active ingredient/l) (10265-92-6)
Phosphamidon (Soluble liquid formulations of the substance that exceed 1000 g active ingredient/l) 13171-21-6 (mixture, (E)&(Z) isomers)

³³ The CAS numbers can be found at <http://www.pic.int/Portals/5/en/CasNumbers/mercury%20compounds%20CAS%20numbers.pdf>

Chemical (CAS number(s))

23783-98-4

((Z)-isomer)

297-99-4 ((E)-isomer)

Methyl-parathion (emulsifiable concentrates (EC) at or above 19.5% active ingredient and dusts at or above 1.5% active ingredient)

(298-00-0)

Annex III Notes:

* Only the CAS numbers of parent compounds are listed. For a list of other relevant CAS numbers, reference may be made to the relevant decision guidance document.

** As amended by the First Meeting of the Conference of the Parties by its decision RC 1/3 of 24 September 2004

2. Pesticide Action Network (PAN) Dirty Dozen Pesticides

PAN International launched its Dirty Dozen Campaign in 1985 to target a list of extremely hazardous pesticides for bans or strict controls on production and use worldwide, and to advocate their replacement with safe and sustainable pest control methods. The pesticides on the PAN list shall not be used or recommended by F2F volunteers, and use of any of them should be strongly discouraged.

Collectively, Dirty Dozen pesticides cause many deaths and widespread environmental damage every year. Most have been banned or restricted in the industrialized countries because of their known hazards. Yet the Dirty Dozen are still heavily promoted and widely used in many developing nations, where the lack of protective equipment, safety training, and medical services makes their impact even more devastating.

The Dirty Dozen are:

- Aldicarb
- Toxaphene
- Chlordane and Heptachlor
- Chlordimeform
- Chlorobenzilate
- Dbcp
- DDT
- The "Drins" (Aldrin, Dieldrin, and Endrin)
- EDB
- HCH
- Lindane
- Paraquat, Parathion and Methyl Parathion, Pentachlorophenol, and 2,4,5-T

Most of these pesticides qualify as persistent organic pollutants (POPs), which are notable for their toxicity to humans and animals, longevity, and their ability to be transported globally through the atmosphere.

The United Nations Environment Programme (UNEP) has identified a number of the Dirty Dozen chemicals as the initial targets for global elimination under an international treaty signed in May 2000. F2F volunteers should check the status of the UNEP list; no pesticides on this list shall be used or recommended by F2F volunteers, and use of any of them should be strongly discouraged.

Nine of the UNEP targeted chemicals are organochlorine pesticides (aldrin, endrin, dieldrin, DDT, chlordane, heptachlor, hexachlorobenzene, toxaphene and mirex). The industrial chemicals dioxin, furans and PCBs are also on the POPs treaty list (see below). The treaty, which will come into force when ratified by 50 countries, will have provisions to add additional chemicals which meet the agreed-upon criteria for persistence in the environment, bioaccumulation, and transportability.

There is widespread agreement that some of the remaining PAN Dirty Dozen pesticides which are still in use in the United States and other industrialized countries (e.g., lindane and endosulfan) meet these criteria. Other, less persistent but still highly toxic PAN Dirty Dozen chemicals like methyl parathion, pentachlorophenol, paraquat, and 2,4,5-T remain in use in the U.S. or other countries.

3. The "Dirty Dozen" POPs

POP chemicals are targeted because they exhibit a combination of particularly dangerous properties: they are toxic; they are persistent in the environment, resisting normal processes that break down contaminants; they accumulate in the body fat of people, marine mammals and other animals, and are passed from mother to fetus; and they can travel great distances, typically from temperate and tropical regions to the poles, on wind and water currents. Because of this last trait, even though most of these named POPs have been banned or severely restricted in many countries, the only way to provide adequate protection is assuring global elimination. In addition, because they are widely recognized as being impossible to keep from escaping to the environment and causing harm once they are manufactured, the only way to prevent their effects is to not create them in the first place and eliminate those already there. Even very small quantities of POPs can be harmful, causing cancer and developmental disorders, as well as damage to the reproductive, nervous and immune systems. F2F volunteers shall not provide assistance for the use or procurement of any of the following, and should strongly discourage use of any of them:

POP - Date of Definition and Primary Use

- Aldrin - 1949 - Insecticide used against soil pests (primarily termites) on corn, cotton and potatoes.
- Chlordane - 1945 - Insecticide now used primarily for termite control.
- DDT - 1942 - Insecticide now used mainly against mosquitoes for malaria control.
- Dieldrin - 1948 - Insecticide used on fruit, soil and seed crops, including corn, cotton and potatoes.
- Endrin - 1951 - Rodenticide and insecticide used on cotton, rice and corn.
- Heptachlor - 1948 - Insecticide used against soil insects, especially termites. Also used against fire ants and mosquitoes.
- Hexachlorobenzene - 1945 - Fungicide. Also a by-product of pesticide manufacturing and a contaminant of other pesticide products.
- Mirex - 1959 - Insecticide used on ants and termites. One of the most stable and persistent pesticides. Also a fire retardant.
- Toxaphene - 1948 - Insecticide used especially against ticks and mites; a mixture of up to 670 chemicals.
- PCBs - 1929 - Used primarily in capacitors and transformers, and in hydraulic and heat transfer systems. Also used in weatherproofing, carbonless copy paper, paint, adhesives and plasticizers in synthetic resins.
- Dioxins - 1920s - By-products of combustion (especially of plastics) and of chlorine product manufacturing and chlorine bleaching of paper.
- Furans - 1920s - By-products, especially of PCB manufacturing, often with dioxins

4. Organophosphate pesticides (OPs)

OPs are among the most acutely toxic pesticides, with most of these chemicals classified by the US EPA as toxicity class I (highly toxic) or toxicity class II (moderately toxic). In addition, some OP pesticides cause developmental or reproductive harm, some are carcinogenic, and some are known or suspected endocrine disruptors. From the PAN site, the following are *organophosphates of primary concern*, and F2F volunteers shall not provide assistance for the use or procurement of them, and should strongly discourage any use of these products. Residential uses of chlorpyrifos and diazinon were recently banned by the USEPA:

- azinphos-methyl
- chlorpyrifos
- diazinon
- dichlorvos
- dimethoate
- ethephon
- malathion
- methamidophos
- naled
- oxydemeton-methyl

SUAP Attachment F: Guide to IPM Practices

Attachment contains:

1. Mozambique example
2. A General IPM Planning and Design Protocol
3. Non-chemical and less toxic pesticide websites

F2F assistance for the use or procurement of pesticides must be provided only within the context of an IPM approach.

F2F volunteers whose assignments directly or indirectly include pesticide use should be prepared to recommend standard IPM measures as well as identify any locally recommended IPM tactics. F2F volunteers should contact the Ministry of Agriculture in the host country, agricultural institutes, universities, etc. to identify practices and issues related to IPM in the host country. Lessons learned should be identified, and as appropriate, crop protection factsheets may be prepared or if they already exist, can be strengthened or revised based on the volunteer's knowledge and experience. Local languages should be used, sometimes pictorials work best, and local practices that work should be emphasized.

Synthetic chemical pesticides are, and will continue to be, a primary tool used within IPM. Improper handling and misuse of pesticides poses risks to users, bystanders, and the environment. Proper training of all individuals who may use, or may make a decision to use, pesticides will reduce the prevalence of misuse.

I. Mozambique F2F Example

The Mozambique F2F program provided the following example of IPM for use in weed control, which can be adapted and used in many F2F situations.

Insect Management Tactics

Preventative Methods

- Only plant seed that is certified to be free of disease causing organisms
- Destroy crop residue that may harbor disease inoculum by plowing, burning, or physically removing
- Crop rotation to avoid inoculum
- Use a fungicide seed treatment to prevent infection
- Control insects that may transmit a disease agent
- Scout fields to identify diseases present then select resistant cultivar if available
- Increased row width to reduce humidity levels in the plant canopy
- Do not plant crop in a soil that it is not adapted to
- Maintain good soil fertility and pH
- Mow young forage stands first to prevent transmission of disease from older fields
- Clean all harvesting equipment of plant residue before using

Remedial Methods

- Apply a fungicide when economically justified (seldom an economic option in most field crops)

Weed Management Tactics

Preventative or Cultural Methods

- Plant weed-free seed
- Avoid buying and using seed contaminated with weed seed
- Avoid spreading weed-seed contaminated manure on fields, if manure is contaminated spread it on fields that are already contaminated
- Compost manure to destroy weed seed viability
- Ensilage weed infested crops to help destroy weed seed
- Watch for new weed species
- Develop weed management programs based on biology of weeds in the field
- Plant crops into a clean seedbed (free of live vegetation)
- Plant crops in narrow rows when applicable to provide early season crop competition
- Plant crops early to achieve maximum yield and to avoid competition from some summer annual weeds (i.e. later germinators)
- Follow soil fertility guidelines that favor a fast- establishing competitive crop

Remedial Methods (non-herbicide based)

- Moldboard plow where possible to suppress perennials and bury small seeded annual weeds
- No-till fields where possible to suppress large-seeded annuals
- Mow field border areas to prevent weed seed production
- Mow pastures to prevent weed establishment and weed seed production
- Row cultivate once or twice (3 to 5 weeks after planting and two weeks later) to remove weeds between two crops rows and reduce dependence on herbicides
- Hand-hoe or hand-pull isolated weeds to prevent further weed spread

Remedial Methods (herbicide based)

- Plan herbicide program based on weed species and severity
- Use pre-emergence herbicides in a planned weed management program
- Use selective post-emergence herbicides at the lowest effective rate in a timely manner
- Use selective post-emergence herbicides when weeds are most susceptible (i.e. seedling annual weeds)
- Select cost effective herbicides that are the most "environmentally friendly"
- Rotate certain herbicide modes of action (e.g. ALS, ACCase, triazine) to prevent herbicide resistant weeds and weed species shifts
- Apply more than one effective mode of action for certain herbicides (e.g. ALS, ACCase, triazine) when possible to help prevent herbicide resistant weeds
- Spot treat isolated infestations to prevent further weed spread

2. A General IPM Planning and Design Protocol

The following has been adapted from the AgVantage PERSUAP (USAID/Georgia). Depending on the extent of involvement and the length of the assignment, a volunteer may be able to focus on some or all of these elements. The protocol can be adapted for an F2F volunteer's specific situation.

Elements of IPM Program

The basic steps needed in an IPM program are addressed below.

Step 1: Evaluate and use non-pesticide management options first.

Use both preventive and responsive/curative options that are available to manage pest problems. Farmers may prevent pests (and avoid using pesticides) by the way they select plants, prepare the site, plant and tend growing plants. Along with prevention, farmers may respond to or cure the problem via physical, mechanical, or biochemical methods.

General Preventive Interventions:

Plant selection

- choose pest-resistant strains
- choose proper locally-adapted plant varieties
- diversify plant varieties or inter-crop plants
- provide or leave habitat for natural enemies

Site preparation and planting

- choose pest-free or pest-avoidance planting dates (e.g., early planting in rainy season avoids stem borers in cereals)
- enhance/provide shade for shade-grown crops
- assign crop-free (fallow) periods and/or rotate crops
- install buffer zones of non-crop plants and/or physical barriers
- improve soil health
- use and appropriate planting density
- rotate crops
- low-till, no-till

Plant tending/cultivation practices

- fertilize and irrigate appropriately
- remove weeds while small and before sowing crop

Responsive/Curative Interventions:

Physical/mechanical control

- remove or destroy diseased plant or plant parts & pests
- weed
- install traps

Biochemical control

- pheromones (very effective, but not currently easily accessible or economical, however, they are becoming more so)
- homemade botanical pesticides
- repellents

Biological control

- release or augment predators
- release or augment parasite s/parasitoids
- release or augment microbial pesticides

Step 2: Assess IPM Needs and Establish Priorities

In planning IPM, consider crop protection needs, farmers' perceptions of pest problems, pesticide use history and trends, availability of IPM technology, farming practices, access to sources of IPM expertise, support for IPM research and technical assistance, and training needs for farmers and project field extension workers.

Next, identify strategies and mechanisms for fostering the transfer of IPM technology under various institutional arrangements, mechanisms, and funding levels. Define what is available for immediate transfer and what may require rapid and inexpensive adaptation and validation research. During the planning stages of an IPM program, the inputs from experienced IPM specialists will be extremely useful. If possible, set up an initial planning workshop to help define and orient implementation activities, and begin to assign individual responsibilities.

Step 3: Learn and value farmers' indigenous IPM tactics, and link with and utilize all local resources/partners

Most farmers are already using their own forms of IPM, many of which are novel, self-created, adapted for local conditions, and many of which work well. These may include: mechanical and physical exclusion; crop rotation, trap crops, cover crops, and green manures; local knowledge of strategic planting or harvesting times; water, soil, and fertilizer resource management; intensive intercropping with pest-repellent plants; leaving refuge habitat for natural enemies; soil augmentation and care leading to healthy nutrient cycling; transplanting; and weeding.

Accurate assessments of these farmer technologies, as well as of actual losses due to different constraints in farmers' fields are a must, before designing a crop production and pest management program. Crop loss figures provided by small and large farmers alike, and thus projected and reported by international organizations, are often inaccurate and overestimated.

Step 4: Identify key pests for each target crop

Although hundreds of species of organisms can be found in a crop at any one time, only a few of them may cause substantial crop losses, and be considered pests. Become familiar with the key pests of target crops, whether they are primary or secondary pests, how to positively identify them. Monitor their population size, the kind of damage that they cause, and their life cycle. These usually amount to a relatively small number of species on any one crop and can include any combination of insects, pathogens, weeds, diseases, and vertebrates. A few other species, known as secondary or occasional pests, attain damaging status from time to time; especially if over-spraying occurs and kills natural predators that naturally regulate their populations.

The vast majority of insect species found in any one crop are actually predators and parasites of the plant-feeding species. Many farmers may not be aware of these distinctions and must be taught to correctly identify the more common beneficial species, as well as pests, found in their crops. Incorrect identification of beneficial insects, predators or neutral insect species, may lead to unnecessary pesticide applications. This diagnostic phase requires sampling and careful observation. Usually, most key pests are fairly well known by local farmers and government extension personnel. However, a few species may be poorly known or understood because they occur at night, are hidden, or small. These include soil-inhabiting species such as nematodes and insect larvae (wireworms, white grubs, cutworms),

mites, and pathogens (viruses, bacteria, mycoplasma, fungi). In addition, farmers often do not understand the role of some insects as vectors of plant diseases.

Step 5: Use activities and training to promote IPM

A number of activities are very effective in promoting IPM in developing countries:

Learning-by-doing/discovery training programs

The adoption of new techniques by small- and large-holder farmers occurs most readily when program participants acquire knowledge and skills through personal experience, observation, analysis, experimentation, decision-making and practice. First, frequent (usually weekly) sessions are conducted for 10–20 farmers during the cropping season in farmers' fields by trained instructors or extension agents. Because these IPM training sessions take place in the farmers' own environment, (1) they take advantage of the farmers' own knowledge; and (2) the farmers understand how IPM applies to their own farms.

Illustrations and drawings should be used. The underlying idea is to guide farmers with questions to discover important insights and supplying information only when absolutely necessary.

Farmers may also experiment with insect zoos where they can observe natural predators of their pests in action and the impact of pesticide on both. Knowledge and skills necessary for applying IPM are best learned and understood through practice and observation, understanding pest biology, parasitism, predation and alternate hosts; identifying plant disease symptoms; sampling population size; and preparing seed beds.

Recovering collective memory

Pest problems often emerge because traditional agricultural methods were changed in one way or another, or lost. These changes can sometimes be reversed. This approach uses group discussions to try to identify what changes might have prompted the current pest problem.

Smallholder support and discussion groups

Weekly meetings of smallholders, held during the cropping season, to discuss pest and related problems can be useful for sharing the success of various control methods. However, maintaining attendance is difficult except when there is a clear financial incentive (e.g., credit).

Project

Subsidized experiments and field trials at selected farms can be very effective at promoting IPM within the local community. These pilots demonstrate IPM in action and allow comparison with traditional synthetic pesticide-supported cultivation.

Educational material

In many countries, basic written and photographic guides to pest identification and crop-specific management techniques are unavailable or out of date. Such material is essential. Videos featuring graphic pictures of the effects of acute and chronic pesticide exposure, and interviews with poisoning victims can be particularly effective. A study in Nicaragua found videos to be the most important factor in motivating farmers to adopt IPM.

Youth education

Promoting and improving the quality of programs on IPM and the risks of synthetic pesticides has been effective at technical schools for rural youth. In addition to becoming future farmers, these students can bring informed views back to their communities.

Organic food market incentive

Promoting organic certification for the rapidly growing organic food market can be a strong incentive to adopt IPM.

Step 6: Partner successfully with other IPM implementers

Many IPM efforts consist of partnerships between two or more organization, e.g., donors, governments, PVOs and NGOs. If these partnerships are not forged with care, the entire project may be handicapped. The following design steps are considered essential.

Articulate the partnership's vision of IPM

Organizations may forge partnerships based on a common commitment to “IPM”—only to discover too late that their visions of IPM differ considerably. It is important that partners articulate a common, detailed *vision* of IPM, centered on the crops and conditions the project will encounter.

Confirm partner institutions' commitment

Often, organizations make commitments they do not intend to (or are unable to) fulfill completely. The extent of commitment to IPM integration into project, design, and thus implementation depends strongly upon the following key variables:

- IPM program integration into larger project - The IPM program may be part of a larger “sustainable agriculture” project. The IPM program must fit into a partner’s overall program. The extent of this integration should be clearly expressed in the proposed annual work plan.
- Cost sharing - Extent of funds or in-kind resources is a good measure of genuine partner commitment.
- Participation of key IPM personnel - Large partner organizations should have staff with expertise in IPM who are assigned specifically to IPM work. In strong partnerships, these staff members are actively involved in the partnership.

Step 7: Monitor the fields regularly

The growth of pest populations usually is related closely to the stage of crop growth and weather conditions, but it is difficult to predict the severity of pest problems in advance. The crops must be inspected regularly to determine the levels of pests and natural enemies and crop damage. Current and forecast weather should be monitored. Farmers, survey personnel, and agricultural extension staff can assist with field inspections.

They can train other farmers to be able to separate pests from non-pests and natural enemies, and to determine when crop protection measures, are necessary.

Step 8: Select an appropriate blend of IPM tools

A good IPM program draws from and integrates a variety of pest management techniques. IPM does not require predetermined numbers or combinations of techniques, nor is the inclusion or exclusion of any one

technique required for IPM implementation. Flexibility to fit local needs is a key variable. Pesticides should be used only if no practical, effective, and economic non-chemical control methods are available. Once the pesticide has been carefully chosen for the pest, crop, and environment, it should be applied only to keep the pest population low. When dealing with crops that are already being treated with pesticides, IPM should aim first at reducing the number of pesticide applications through the introduction of appropriate action thresholds, while promoting appropriate pesticide management and use practices and shifting to less toxic and more selective products and non-chemical control methods. In most cases, NGOs/PVOs will probably need to deal with low to moderate levels of pesticide use. Either way, an IPM program should emphasize preventive measures and protect a crop, while interfering as little as possible with the production process.

Step 9: Develop education, training, and demonstration programs for extension workers

Implementation of IPM depends heavily on education, training, and demonstration to help farmers and extension workers develop and evaluate the IPM methods. Hands-on training conducted in farmers' fields (as opposed to a classroom) is a must. Special training for extension workers and educational programs for government officials and the public are also important.

Step 10: Monitor and Evaluate

First, develop data collection tools, and then collect baseline data at the beginning of the project to identify and determine the levels of all variables that will need to be tracked. These may include numbers and types of pests, predators, and soil microorganisms; relative numbers of all non-target animals (birds, lizards, etc.) that may be negatively impacted if pesticides are used; soil and water samples to determine levels of pesticide residue; soil samples to learn dominant soil types and to predict soil nutrition, requirements, and fertilizer/pesticide activities; pesticides, application and safety equipment available; and, amounts and type of training received by target audiences.

Develop methods for measuring the effectiveness of each IPM tactic used, and of their sum in reducing pest damage and crop losses. Also, develop methods for monitoring environmental health (maintaining and encouraging high levels of predators and soil microorganisms) and human health if pesticides are used. Kits are available for determining the level of cholinesterase-inhibiting pesticides to which farmers and applicators have been exposed. Make checklists for farmers to use when applying pesticides that indicate the type of application and safety equipment used, and the rates at which pesticides were applied.

3. Non-chemical and Less toxic Alternatives

F2F volunteers can investigate the potential use of biological and organic pesticides prior to travelling to the host country, and can encourage their use while in-country. Even biological and organic pesticides must comply with this PERSUAP: they must be registered by the US EPA, WHO Toxicity II or above, the product must be EPA Toxicity Level II or above, they must be registered/approved by the host country.

For biological control products, see company websites:

Koppert <http://www.koppert.com>

Biobest <http://www.biobest.be>

Bio-Bee <http://www.biobee.com/biological-ipm/>

SUAP Attachment G. Monitoring Pests and Pesticide Effects

Attachment contains:

1. Measures to help ensure efficacy of pesticides used/recommended
2. Developing a scouting and record keeping protocol

1. Measures to Help Ensure Efficacy of Pesticides Used/Recommended

The following measures will help ensure the efficacy of pesticides used or recommended. Improved efficacy is expected to reduce the amount of pesticide used, the frequency of use, and result in reduced exposure to pesticides for humans and the environment.

Rotate pesticides to reduce the build-up of resistance

Attachment A, Table 2 includes a wide range of insecticides, herbicides, fungicides, etc. available to F2F volunteers. A sub-set of these will actually be available for F2F volunteers to recommend—those pesticides that are registered by the host country, products that are available and accessible, as well as US EPA toxicity class II or above (or the equivalent). Even with these restrictions, there are a range of families that volunteers should be able to choose from and rotate among to avoid resistance.

F2F volunteers, who provide assistance for the use or procurement of pesticides, shall, concurrently with this assistance, provide recommendations on rotating pesticides to avoid resistance.

F2F volunteers shall provide training to ensure that farmers understand the specific target pests and diseases that each pesticide product is designed to manage.

Many F2F country programs reported that inappropriate pesticides were used for target pests (eg. insecticide to control a plant disease or an insecticide effective only against aphids to control borers). This leads to wastage and loss of production. F2F volunteers shall ensure that not only do they recommend pesticides that are labeled for the target pest, but that they train farmers to understand that pesticides have narrow ranges of efficacy and that for each pest there are specific pesticides.

F2F volunteers shall provide information to farmers to help protect against the use of adulterated and obsolete products.

Most F2F country programs identified adulterated and obsolete pesticides as a significant problem in their countries. Provisions to protect against purchasing and using adulterated and obsolete products will differ, country to country. F2F volunteers should be aware that obsolete and adulterated products may be widely available in the host country, and they should be prepared to recommend provisions, including buying from reputable dealers, and scouting for efficacy—and switching pesticides if scouting indicates—to protect farmers.

2. Developing a scouting and record keeping protocol

The following measures will help F2F volunteers to develop scouting and recordkeeping protocols for F2F recipients. Implementation of good scouting practices and regular recordkeeping will help minimize the need for pesticides, and help ensure that pesticides are used as a last resort protection measure.

Set up a scouting and recordkeeping program for recipients of F2F technical assistance to help monitor the need for pesticide application, pesticide efficacy, and environmental impacts of pesticides.

IPM is a dynamic process, and monitoring is a critical part of an IPM program. F2F volunteers shall help develop a scouting strategy and protocol, and shall train recipients in scouting techniques. IPM tactics should constantly be evaluated and changed in accordance with findings of the monitoring program.

Many websites are available that provide information on scouting and recordkeeping, however most have been developed for use in the US, Australia, and Canada. These however, can be adapted to the local situation.

The following sites provide useful information that can be adapted to the volunteer's and farmers' needs:

BioBee: Pests <http://www.biobee.com/biological-ipm/pests/>

<http://extension.umass.edu/floriculture/fact-sheets/pest-management>

Cornell University: New York State Integrated Pest Management Program

<http://www.nysipm.cornell.edu/publications/bpguide99/>

Infonet-Biovision <http://www.infonet-biovision.org/>

F2F volunteers shall provide training to recipients so that they can collect data on reduction in efficacy and any other noted environmental impacts which should trigger a change to a different pesticide or other method of control; this should be done in conjunction with F2F assistance for the use or procurement of pesticides.

Along with this training, volunteers shall encourage farmers to communicate to neighboring farmers and extension officers any efficacy information gathered by farmers.

Prepare simple monitoring forms (scouting, recordkeeping) so that farmers have the tools to monitor efficacy and environmental impacts once the F2F volunteer leaves the country.

Because F2F volunteers are in-country for only a short period of time, they should leave farmers with the tools to monitor efficacy once the volunteer is gone. A simple monitoring/scouting plan with appropriate forms should be developed to suit the volunteer's and farmers' requirements.

Volunteers who prepare such plans should submit them to the F2F country office so that future volunteers can build upon these monitoring plans. In this way, the monitoring plan will remain a dynamic and up-to-date resource, available for future volunteers.

Volunteers should consider preparing an "IPM Notebook" with scouting forms, scouting records, MSDS sheets, pesticide labels, etc. for reference and use by farmers once the volunteer departs.

Volunteers who prepare such notebooks should submit them to the F2F country office for the use of future volunteers.

SUAP Attachment H: Key Websites for Pesticide and IPM Research

Key Websites for Pesticide Searches

<http://www.pesticideinfo.org> (PAN most complete pesticides database)
<http://extoxnet.orst.edu/pips/ghindex.html> (Exttoxnet Oregon State database)
<http://www.epa.gov/ecotox/> (EPA Ecotox Database)
<http://www.cdpr.ca.gov/docs/pur/purmain.htm> (link to OPP site)
<http://www.epa.gov/oppsrrd1/reregistration/status.htm> (EPA Registr.Eliligib.Decisions)
<http://www.epa.gov/pesticides/biopesticides/> (EPA regulated biopesticides)
<http://www.epa.gov/opprd001/rup/> (EPA restricted use pesticides)
<http://www.epa.gov/pesticides/health/human.htm> (EPA Toxicity Classifications)
<http://www.epa.gov/pesticides/regulating/pestreport.htm> (EPA pesticide product information)
<http://chembiofinder.cambridgesoft.com/CHEMBIOFINDER/Forms/Public/ContentArea/about.htm>
(chemical database & internet search, free & fee)
<http://stats.nerdydata.com/hclrss.demon.co.uk> (compendium of pesticide common names)
http://www.agf.gov.bc.ca/pesticides/f_2.htm (all types of application equipment)
<http://www.who.int/topics/pesticides/en/> (WHO classification)
www.kellysolutions.com (for formulations registration status information)
www.greenbook.net and www.cdms.com for efficacy information and Material Safety Data Sheets found on pesticide labels

CABI Site for Crop Protection Compendium (CPC)

<http://www.cabi.org/cpc/search/?q=crop+pesticides> to enter CABI CPC for crop/pest recs.

Obsolete Pesticides

<http://www.fao.org/ag/AGP/AGPP/Pesticid/Disposal/en/103401/index.html>

Pesticide Toxicity to Honey Bees

<http://www.entm.purdue.edu/Entomology/ext/targets/e-series/EseriesPDF/E-53.pdf>
<http://extension.osu.edu/> (Ohio State Extension site)

Pesticide Toxicity to Natural Enemies (Beneficials)

<http://www.ipm.ucdavis.edu/PMG/r108900111.html>

Biological Pesticides List

<http://www.koppert.com> (a Dutch biologicals company doing business internationally)
<http://www.biobest.be> (a Belgian biologicals company doing business internationally)
<http://www.epa.gov/pesticides/biopesticides/> (EPA's biopesticide list)
<http://www.biobee.com/biological-ipm/> (a biopesticide company in Israel)

PERSUAP Site

<http://www.encapafrica.org/docs.htm> (PERSUAP guidance-archived)

International Conventions

<http://www.pops.int/> (POPs website)
http://www.pops.int/documents/convtext/convtext_en.pdf (POPs Convention text)
<http://www.chem.unep.ch/pops/pdf/redelipops/redelipops.pdf> (reduce & eliminate POPs)

Audio-Visual IPM and SPU resources

http://www.clemson.edu/public/ag_services.html

SUAP Attachment I. Bullet Points for SOWs

The following information is provided for F2F implementers to include in volunteer SOWs.

Type 1 Assignments

These volunteers are expected to provide direct assistance for the use or procurement of pesticides. They will likely recommend and/or provide advice on specific pesticide active ingredients or products, and they may provide training in pesticide use, safe use, and IPM.

Items for Type 1 Assignment SOWs:

- The volunteer shall review the F2F Environmental Brochure and the F2F Programmatic Pesticide Evaluation Report-SafeUse Action Plan (PERSUAP) and shall comply with requirements described in Section 4 of the SUAP when providing “assistance for the procurement or use” of pesticides.
- If a sector or mission-wide PERSUAP exists that is more up to date than the F2F PERSUAP (and thus supercedes the F2F PERSUAP) the F2F volunteer should obtain that document and the approved pesticide list, which supercedes the approved pesticide list in the F2F Programmatic PERSUAP. However, the F2F volunteer must comply with the conditions laid out in the F2F Safe Use Action Plan (SUAP). Information on IPM and the overall country information in the sector or mission-wide PERSUAP can provide useful background information for the consultant.
- The volunteer shall review the guidance in attachments A through H of the F2F PERSUAP and the questionnaire provided by IPs as part of this PERSUAP prior to providing recommendations for the use or procurement of pesticides; and shall be prepared to provide recommendations, based on this guidance, to recipients of F2F technical assistance.
- The IP shall submit all monitoring forms, scouting forms, and other documents the F2F volunteer may develop in regard to pesticide use, pesticide safe use training, and IPM to the F2F country office for use by future F2F volunteers.
- The volunteer shall, at their discretion, provide recommendations to the F2F country office for additional F2F support for pesticide safe use training, IPM, or other pesticide-related topics.

If the volunteer will be providing training in pesticides, IPM, pest management or other pesticide-related topics, the IP shall provide the syllabus for each training event for review and comment by the Mission Environmental Officer and the USAID COTR and shall incorporate any guidance or comment provided.

Consultant shall submit a brief end of assignment report describing activities involving pesticides and the following: (1) Pesticides that the F2F country program should be able to recommend/use that are not included in Attachment A, Table 2; (2) Limitations and successes of the PERSUAP; (3) Recommendations for additional technical assistance and training needed to improve pest and pesticide management practices; (4) Tools, forms, and plans provided to F2F recipients to assist with implementing the volunteer’s recommendations; and (5) recommendations on IPM practices and feedback on the effectiveness of IPM practices used locally

Type 2 Assignments

These volunteers may provide indirect assistance for the use or procurement of pesticides; they are not expected to recommend or provide advice on specific pesticide active ingredients or products. They will

likely be in the field and may have the opportunity to encourage good practices in pesticide use and discourage bad practices.

Items for Type 2 Assignment SOWs:

- The consultant shall review the F2F Environmental Brochure and the F2F Programmatic Pesticide Evaluation Report-Safe Use Action Plan (PERSUAP) and shall comply with requirements described in Section 4 of the SUAP when providing “assistance for the procurement or use” of pesticides. The consultant is not expected to provide recommendations for specific pesticide active ingredients or products, but rather to provide advice, if necessary, on safe use of pesticides, and to discourage poor practices in pesticide use, transport, mixing, storage, application, and disposal.
- The consultant shall review the guidance in attachments B, C, F, and H of the PERSUAP and the information in the pesticide questionnaire that each country F2F Program submitted during preparation of this PERSUAP, and shall be prepared to provide recommendations, based on this guidance, to recipients of F2F technical assistance.
- The consultant shall, at their discretion, provide recommendations to the F2F country office for additional F2F support for pesticide safe use training, IPM, or other pesticide-related topics.

Consultant shall submit a brief report describing: (1) Limitations and successes of the PERSUAP; (2) Recommendations for additional technical assistance and training needed to improve pest and pesticide management practices; and (3) New recommendations on IPM practices and feedback on the effectiveness of IPM practices used locally.

Type 3 Assignments

These volunteers are not expected to be involved in pesticide issues.

Items for Type 3 Assignment SOWs:

- The consultant shall review the F2F Environmental Brochure and be aware of F2F’s legal requirements regarding the provision of assistance for the procurement or use of pesticides. The consultant shall not recommend or provide advice on specific pesticides.

Type 4 Assignments

These volunteers will be working on a USAID project/activity which may have a PERSUAP governing its activities related to the use and procurement of pesticides.

Items for Type 4 Assignment SOWs:

- If a mission or sector-wide PERSUAP for an existing USAID activity is more current than the F2F PERSUAP, the approved pesticides in that PERSUAP will supercede the approved pesticide list in the F2F Programmatic PERSUAP. Should this be the case, the consultant should obtain a copy of the PERSUAP governing that project, and ensure compliance with the Safe Use Action Plan (SUAP) from the F2F PERSUAP. If there is no existing PERSUAP for the USAID project, the consultant shall obtain and review pertinent portions of the F2F Programmatic PERSUAP and comply with the SUAP (based on whether this is a Type 1, 2, or 3 assignment).

If governed by the F2F Programmatic PERSUAP, consultant shall submit a brief report, as required for [Types 1, 2, and 3 assignments].

Attachment J: Background Information to the PER

1. FY 2007-2012 Farmer-To-Farmer Core Countries and Value Chains
2. Screening of all pesticides submitted for approval in the PERSUAP
3. Pesticides rejected in the PERSUAP
4. Scope of Work for the F2F PERSUAP Assignment

ATTACHMENT J, TABLE 6: ACTIVE F2F PROGRAMS (FY2007-FY2012)

Region	Implementing Partner	Countries	Value Chains
Middle East and North Africa Region	ACDI/VOCA	Egypt	Dairy
			Horticulture
		Lebanon	Small Ruminant
			Horticulture
Western Africa	ACDI/VOCA	Ghana	Horticulture
			Staple Foods
		Mali	Staple Foods
			Small Ruminant
		Nigeria	Staple Foods
			Apiculture
Aquaculture			
Eastern Africa	CNFA	Kenya	Oil Seed
			Grain Crops
		Tanzania	Legumes
			Horticulture
			Grain Crops
		Uganda	Oil Seed
Grains Crops			
Europe, Caucasus, and Central Asia	CNFA	Georgia	Dairy
			Fruit and Vegetable
			Hazelnuts
		Moldova	Dairy

Region	Implementing Partner	Countries	Value Chains
			Fruit and Vegetable
		Uzbekistan	TBD
		Tajikistan	Dairy Livestock
Southern Africa	CNFA	Angola	Horticulture
			Legumes
		Malawi	Groundnuts
			Horticulture
		Mozambique	Soya Beans
			Oilseeds
Caribbean Basin	Partners of the Americas	Dominican Republic	Tree Crops
			Horticulture
		Guyana	Non-Traditional Horticulture
			Aquaculture
		Haiti	Horticulture
			Small Livestock
		Nicaragua	Apiculture
Nicaragua	Dairy		
Caribbean Basin	Winrock International	El Salvador	Horticulture
			Dairy
Special Program Support Project	Weidemann Associates		
<i>Kenya: Partnership for Safe Poultry in Kenya</i>	Winrock International	Kenya	Avian Influenza (Partnership for Safe Poultry in Kenya)
<i>South Africa: Institutional Strengthening</i>	Florida A&M University	South Africa	Grapes, Fish and Agricultural Education
<i>Global: Coffee Livelihood Development</i>	Cooperative Coffees, Inc.	Latin America, Africa, Asia	Coffee
<i>Eastern Caribbean: Food Security</i>	FAVACA	Dominic, Grenada, St. Kitts and Nevis	Food Security

Region	Implementing Partner	Countries	Value Chains
Associate Awards	USAID Country Mission Funded		
<i>Angola</i>	CNFA	Angola	Enterprise Development No PERSUAP needed
<i>Lebanon</i>	ACDI/VOCA	Lebanon	Laboratory Development No PERSUAP needed
<i>Ghana</i>	ACDI/VOCA	Ghana	Food Security
<i>Georgia</i>	CNFA	Georgia	Mechanization
<i>Jamaica</i>	ACDI/VOCA	Jamaica	Cocoa and Agricultural Development Project-specific PERSUAP to be prepared
<i>Belarus</i>	CNFA	Belarus	Agricultural Development

List of Pesticide Active Ingredients Requested by F2F Country Programs

Table 2 below lists the active ingredients (AI) of all pesticides requested for approval by F2F country programs. (AIs are listed alphabetically. In the case of a product with a combination of two or more AIs, please check the table under each one; for a product to be acceptable, all AIs must be USEPA registered, none may be GUPs or the equivalent, and all AIs must be WHO toxicity level II or above.) The table shows USEPA registration status of each AI; pesticides with AIs not registered by the USEPA are rejected for use under this PERSUAP. The center column lists WHO acute rankings (see explanation in Attachment A, Table 1). If a requested pesticide's AI is WHO Ia or Ib, it is rejected for use under this PERSUAP. For combinations of active ingredients, if one is not EPA registered or is WHO 1a or 1b, the combination is rejected.

Attachment J, Table 3 is a compilation of all pesticides that are rejected for use under this PERSUAP (especially useful for black and white printers where the color shading in Table 2 does not show up).

Note: If a chemical name with alpha, beta, zeta, etc. was submitted, for example, beta cyfluthrin, please check under b for beta and c for cyfluthrin—the chemical may be listed either way.

Color coding:

Blue: No PERSUAP approval needed: mainly de-wormers, oral or injectable veterinary treatments.

Red: Not registered by the USEPA, WHO 1a or 1b, or otherwise highly toxic and not approved by this PERSUAP (Attachment E contains lists of highly toxic chemicals and explanations.)

ATTACHMENT J, TABLE 2: ANALYSIS OF ACTIVE INGREDIENTS REQUESTED BY F2F PROGRAMS

Notes:

- i. No PERSUAP approval needed for oral or injectible veterinary drugs such as anti-parasitics and antibiotics.
- ii. *NR: not registered; PANNA: Pesticide Action Network North America

All Active Ingredients Submitted for Screening	WHO Toxicity Class	USEPA Registration Status* & Notes on Toxicity humans, bees, birds, fish, and wildlife
2,4-D 2,4-D Amine 2,4-D dimethylamine	WHO II	Chlorophenoxy acid or ester, Herbicide, Plant Growth Regulator Moderate acute toxicity, possible carcinogen, potential groundwater contaminant Highly toxic to honey bees (see SUAP-Attachment C)
2-ethyl hexyl ester		EPA: NR
Abamectin	WHO NL	PAN Bad Actor Botanical, Macrocyclic Lactone, insecticide High acute toxicity, developmental/reproductive toxin (high) Highly toxic to honey bees (see SUAP-Attachment C)
Acephate	WHO III	PAN Bad Actor Insecticide, OP Possible carcinogen, potential groundwater contaminant, cholinesterase inhibitor (high) Highly toxic to honey bees (see SUAP-Attachment C)
Acetamiprid	WHO NL	Neonicotinoid insecticide Potential groundwater contaminant
Acetochlor	WHO III	PAN Bad Actor Herbicide, Chloroacetanilide Carcinogen (high)
Alachlor	WHO III	PAN Bad Actor Chloroacetanilide, herbicide Highly toxic to fish (see SUAP-Attachment C)
Albendazole		Oral veterinary drug for worms, no PERSUAP approval needed
Aldicarb	WHO Ia	PAN Bad Actor Insecticide, nematicide N-Methyl Carbamate
Alpha cypermethrin		Insecticide, pyrethroid Moderate acute toxicity, high carcinogenicity, significant risk to non-target organisms
Aluminum phosphide	WHO not classified; but highly toxic	PAN Bad Actor Fumigant, fungicide, inorganic

All Active Ingredients Submitted for Screening	WHO Toxicity Class	USEPA Registration Status* & Notes on Toxicity humans, bees, birds, fish, and wildlife
Ametryn	WHO III	Herbicide, triazine Potential groundwater contaminant
Amitraz	WHO III	PAN Bad Actor Formamidine, insecticide Moderate acute toxicity, possibly carcinogen, developmental/reproductive toxin (high) Highly toxic to fish (see SUAP-Attachment C)
Anilazine		EPA: NR
<i>Aphidius transcaspinus</i> (parasitic wasp)		EPA: NR
Asulam – Sodium Salt	WHO NL	Herbicide, other carbamate
Atrazine	WHO U	PAN Bad Actor Triazine, herbicide Carcinogen and groundwater contaminant (high) Highly toxic to amphibians; banned by the EU
Azadirachtin	WHO NL	Insecticide, nematocide, botanical
Azoxystrobin	WHO U	Fungicide, strobil Potential groundwater contaminant
<i>Bacillus megaterium</i>		EPA: NR
<i>Bacillus sphaericus</i>	WHO NL	Insecticide, microbial
<i>Bacillus thuringiensis</i>	WHO NL	Insecticide, microbial
<i>Bacillus thuringiensis</i> (Subsp. Kurstaki) ³⁴	WHO NL	Insecticide, microbial
<i>Bacillus thuringiensis</i> var. Aizawai Strain NB 200	WHO NL	Insecticide, microbial
<i>Beauveria bassiana</i>	WHO NL	Insecticide, microbial Currently under review ³⁵
Benomyl		EPA: NR

³⁴ See www.pesticideinfo.org for specific strains that are USEPA registered

³⁵ see www.pesticideinfo.org or Or check EPA <http://iaspub.epa.gov/apex/pesticides/f?p=CHEMICALSEARCH:1:0> website for strains that are USEPA registered

All Active Ingredients Submitted for Screening	WHO Toxicity Class	USEPA Registration Status* & Notes on Toxicity humans, bees, birds, fish, and wildlife
Bensulfuron methyl	WHO U	Herbicide, Sulfonylurea Potential groundwater contaminant
Bensultap		EPA: NR
Bentazon Bendioxide	WHO III	Herbicide, unclassified
Beta cypermethrin	WHO NL	Insecticide, pyrethroid Possible carcinogen
Betacyfluthrin	WHO II	Pyrethroid, insecticide Moderate acute toxicity
Bifenazate	WHO NL	Insecticide, unclassified Potential groundwater contaminant
Bifenthrin	WHO II	PAN Bad Actor Insecticide, pyrethroid Moderate acute toxicity, possible carcinogen, developmental or reproductive toxin (high) Highly toxic to honey bees (see SUAP-Attachment C) Highly toxic to fish (see SUAP-Attachment C)
Bispyribac-sodium	WHO NL	Herbicide, Pyrimidinyl(thio)benzoate Potential groundwater contaminant
Bitertanol	WHO U	Fungicide, Azole Under EPA registration review
Boscalid	WHO NL	Fungicide, anilide Possible carcinogen
Boscalid + Pyraclostrobin	WHO NL	Boscalid: Boscalid: Fungicide, Anilide Possible carcinogen Pyraclostrobin: fungicide, strobilin Potential groundwater contaminant
Brodifacoum	WHO Ia	PAN Bad Actor Rodenticide, Coumarin High acute toxicity
Bromacil	WHO U	PAN Bad Actor Herbicide, uracil Possible carcinogen, groundwater contaminant (high)
Bromadiolone	WHO Ia	PAN Bad Actor Coumarin, rodenticide
Bromoxynil	WHO NL	Herbicide, Hydroxybenzotrile Moderate acute toxicity, potential groundwater contaminant, classified as very highly toxic to fish Under EPA reregistration review

All Active Ingredients Submitted for Screening	WHO Toxicity Class	USEPA Registration Status* & Notes on Toxicity humans, bees, birds, fish, and wildlife
Buprofezin	WHO U	Insect growth regulator, unclassified Possible carcinogen
Butachlor		EPA: NR
Captan	WHO U	PAN Bad Actor Fungicide, Thiophthalimide High acute toxicity, high carcinogen Highly toxic to fish (see SUAP-Attachment C)
Carbaryl	WHO II	PAN Bad Actor Insecticide, Plant Growth Regulator, Nematicide N-Methyl Carbamate Moderate acute toxicity, carcinogen and cholinesterase inhibitor and developmental/reproductive toxin (high) Highly toxic to honey bees (see SUAP-Attachment C) Highly toxic to fish (see SUAP-Attachment C) Highly toxic to wildlife (see SUAP-Attachment C)
Carbendazim	WHO U	Fungicide, Benzimidazole Possible carcinogen
Carbofuran	WHO Ib	PAN Bad Actor N-Methyl Carbamate, Insecticide, Nematicide
Carbosulfan		EPA: NR
Carboxin	WHO U	PAN Bad Actor Fungicide, Carboxamide Developmental/reproductive toxin (high)
Cartap		EPA: NR
Cartap Hydrochloride		EPA: NR
Chlorantraniliprole	WHO NL	Insecticide Potential groundwater contaminant
Chlorfenapyr	WHO II	Pyrazole, insecticide Moderate acute toxicity, possible carcinogen
Chlorpyrifos	WHO II	PAN Bad Actor; OP of primary concern Insecticide, nematicide, OP Moderate acute toxicity, cholinesterase inhibitor (high) Highly toxic to honey bees (see SUAP-Attachment C) Highly toxic to fish (see SUAP-Attachment C) Highly toxic to birds (see SUAP-Attachment C) Highly toxic to wildlife (see SUAP-Attachment C)
Chlorpyrifos-methyl	WHO U	PAN Bad Actor; OP of primary concern Insecticide OP

All Active Ingredients Submitted for Screening	WHO Toxicity Class	USEPA Registration Status* & Notes on Toxicity humans, bees, birds, fish, and wildlife
		Cholinesterase inhibitor (high) Highly toxic to honey bees (see SUAP-Attachment C) Highly toxic to fish (see SUAP-Attachment C) Highly toxic to birds (see SUAP-Attachment C) Highly toxic to wildlife (see SUAP-Attachment C)
Chlorsulfuron	WHO U	PAN Bad Actor Herbicide, Sulfonyleurea Potential groundwater contaminant, developmental/reproductive toxin (high)
Chlorthalonil	WHO U	PAN Bad Actor Substituted Benzene, substituted benzene High acute toxicity, carcinogen (high), potential groundwater contaminant Highly toxic to fish (see SUAP-Attachment C)
Clethodim (Cl/etodim)	WHO NL	Herbicide, Cyclohexenone derivative Moderate acute toxicity, potential groundwater contaminant
Clodinafop-propargyl	WHO NL	Plant growth regulator, Aryloxyphenoxy propionic acid Possible carcinogen
Clofentezine	WHO U	Insecticide, tetrazine Possible carcinogen
Clopyralid	WHO NL	PAN Bad Actor, herbicide, Pyridinecarboxylic acid, high acute toxicity, potential groundwater contaminant
Compost tea		No PERSUAP approval needed for compost
Copper ammonium acetate (metallic copper)	WHO NL	Fungicide, inorganic copper
Copper Hydroxide	WHO III	Fungicide, Microbiocide, Nematicide, inorganic copper
Copper oxide	WHO II	Fungicide, insecticide, inorganic copper
Copper oxychloride	WHO NL	Inorganic copper fungicide
Copper sulfate (basic)	WHO NL	Fungicide, Algacide, Molluscicide, inorganic copper Moderate acute toxicity
Copper sulfate (Pentahydrate)	WHO II	Algacide, Fungicide, Insecticide, Water Treatment, Molluscicide, inorganic copper
Cottonseed oil	WHO U	Insecticide
Cuprous oxide	WHO II	Fungicide, insecticide, inorganic copper Moderate acute toxicity

All Active Ingredients Submitted for Screening	WHO Toxicity Class	USEPA Registration Status* & Notes on Toxicity humans, bees, birds, fish, and wildlife
Cyanazine	WHO II	PAN Bad Actor Moderate acute toxicity, possible carcinogen, groundwater contaminant and developmental/reproductive toxin (high)
Cyfluthrin	WHO II	Insecticide, pyrethroid Moderate acute toxicity Highly toxic to honey bees (see SUAP-Attachment C)
Cymoxanil	WHO III	Fungicide, unclassified
Cypermethrin	WHO NL	Insecticide, pyrethroid Possible carcinogen, high risk to aquatic organisms Under EPA reregistration review
Cyproconazol	WHO III	PAN Bad Actor Fungicide, azole High carcinogenicity
Cyromazine	WHO U	PAN Bad Actor Triazine insecticide Groundwater contaminant (high)
Dalapon		EPA: NR
Dazomet	WHO III	Fumigant, Fungicide, Nematicide, Unclassified Moderate acute toxicity Potential groundwater contaminant Highly toxic to fish (see SUAP-Attachment C)
Deltamethrin	WHO II	Insecticide, pyrethroid Moderate acute toxicity Highly toxic to fish (see SUAP-Attachment C)
Diafenthiuron		EPA: NR
Diazinon	WHO II	PAN Bad Actor; OP of primary concern Insecticide, OP Moderate acute toxicity, cholinesterase inhibitor and developmental/reproductive toxin (high) Highly toxic to honey bees (see SUAP-Attachment C) Highly toxic to fish (see SUAP-Attachment C) Highly toxic to birds (see SUAP-Attachment C) Highly toxic to wildlife (see SUAP-Attachment C)
Dicamba	WHO III	PAN Bad Actor Herbicide, benzoic acid Developmental/reproductive toxin (high) Highly toxic to birds (see SUAP-Attachment C)
Dichlorvos	WHO Ib	PAN Bad Actor; OP of primary concern Insecticide, OP

All Active Ingredients Submitted for Screening	WHO Toxicity Class	USEPA Registration Status* & Notes on Toxicity humans, bees, birds, fish, and wildlife
Diclofop-Methyl	WHO NL	PAN Bad Actor Herbicide, Chlorophenoxy acid or ester, Aryloxyphenoxy propionic acid Moderate acute toxicity, carcinogen (high) and developmental/reproductive toxin (high) Highly toxic to fish (see SUAP-Attachment C)
Dicofol	WHO III	PAN Bad Actor Insecticide, OC High acute toxicity, possible carcinogen Highly toxic to fish (see SUAP-Attachment C)
Difenoconazole	WHO III	Fungicide, azole Possible carcinogen
Difethialone	WHO Ia	PAN Bad Actor Rodenticide
Diflubenzuron	WHO U	Insecticide, Benzoylurea
Diglyhus isaea (parasitic wasp)		EPA: NR
Dimethenamid	WHO NL	Herbicide, amide Moderate acute toxicity, possible carcinogen
Dimethoate	WHO II	PAN Bad Actor; OP of primary concern Insecticide, OP High acute toxicity, possible carcinogen, potential groundwater contaminant, cholinesterase inhibitor and developmental/reproductive toxin (high) Highly toxic to honey bees (see SUAP-Attachment C) Highly toxic to birds (see SUAP-Attachment C) Highly toxic to wildlife (see SUAP-Attachment C)
Dimethomorph	WHO U	Fungicide, Morpholine Potential groundwater contaminant
Dimethyl amine salt (MCPA)	WHO NL	PAN Bad Actor Herbicide, Chlorophenoxy acid or ester High acute toxicity, possible carcinogen, potential groundwater contaminant
Dimethylamine salt of 2,4-Dichlorophenyl acetic acid	WHO NL	Herbicide, plant growth regulator, Chlorophenoxy acid or ester Possible carcinogen, potential groundwater contaminant
Dinitro-cresol		EPA: NR
Diphacinone	WHO Ia	PAN Bad Actor Rodenticide, 1,3-Indandione High acute toxicity

All Active Ingredients Submitted for Screening	WHO Toxicity Class	USEPA Registration Status* & Notes on Toxicity humans, bees, birds, fish, and wildlife
Diuron	WHO U	PAN Bad Actor Urea herbicide Carcinogen and developmental/reproductive toxin and groundwater contaminant (high)
Dodemorph-Acetate		EPA: NR
Emamectin Benzoate	WHO NL	PAN Bad Actor, Macrocyclic Lactone, insecticide
Encarsiajormosa (parasitic wasp)		EPA: NR
Endosulfan	WHO II	PAN Bad Actor Insecticide Organochlorine
EPTC	WHO II	PAN Bad Actor Herbicide, Thiocarbamate Moderate acute toxicity, cholinesterase inhibitor and developmental/reproductive toxin (high)
Esfenvalerate	WHO II	Insecticide, pyrethroid Moderate acute toxicity Highly toxic to honey bees and highly toxic to fish
Estazolam		PERSUAP approval not needed
Ethephon	WHO U	PAN Bad Actor; OP of primary concern Plant growth regulator, OP Cholinesterase inhibitor
Ethoprophos	WHO Ia	PAN Bad Actor Insecticide, nematicide, OP High acute toxicity, cholinesterase inhibitor (high), potential groundwater contaminant
Ethylene Dibromide	Fumigant, not classified b	PAN Bad Actor Fumigant, nematicide, halogenated organic High acute toxicity, known carcinogen, developmental/reproductive contaminant
Etoxazole	WHO NL	Insecticide, unclassified
Extracto de Mimosa tenuiflora		EPA: NR
Famoxadone	WHO U	Fungicide
Fenamiphos		Insecticide, nematicide, organophosphorous Under EPA reregistration review
Fenclorim		EPA: NR

All Active Ingredients Submitted for Screening	WHO Toxicity Class	USEPA Registration Status* & Notes on Toxicity humans, bees, birds, fish, and wildlife
Fenitrothion	WHO II	PAN Bad Actor Insecticide, OP Moderate acute toxicity, cholinesterase inhibitor (high) Highly toxic to honey bees (see SUAP-Attachment C)
Fenpropathrin	WHO II	PAN Bad Actor Insecticide, pyrethroid High acute toxicity Highly toxic to honey bees (see SUAP-Attachment C)
Fenpyroximate	WHO NL	Insecticide, pyrazole
Fenthion	WHO II	PAN Bad Actor Insecticide, organophosphorous Highly toxic to bees Under EPA reregistration review
Fenvalerate	WHO II	Pyrethroid, insecticide Moderate acute toxicity, highly toxic to bees and to fish Under EPA reregistration review
Fipronil	WHO II	Pyrazole, insecticide Moderate acute toxicity, possible carcinogen, potential groundwater contaminant
Florasulam	WHO U	Herbicide, Triazolopyrimidine
Fluazifop-p-butyl	WHO III	Herbicide, Aryloxyphenoxy propionic acid
Flubendiamide	WHO NL	Insecticide, Anthranilic diamide
Fludioxonil	WHO NL	Fungicide, unclassified Potential groundwater contaminant Highly toxic to fish (see SUAP-Attachment C)
Flufenoxuron		EPA: NR
Flumetsulam	WHO U	Herbicide, Triazolopyrimidine
Fluroxypyr	WHO U	Herbicide, Pyridinecarboxylic acid
Flusilazole		EPA: NR
Flutriafol	WHO III	Fungicide, azole Potential groundwater contaminant
Folpet	WHO U	PAN Bad Actor Fungicide, Thiophthalimide High carcinogen

All Active Ingredients Submitted for Screening	WHO Toxicity Class	USEPA Registration Status* & Notes on Toxicity humans, bees, birds, fish, and wildlife
		Highly toxic to fish (see SUAP-Attachment C)
Fomesafen	WHO III	Herbicide, Diphenyl ether Possible carcinogen
Formetanate		EPA: NR
Fosetyl Aluminium	WHO NL	PAN Bad Actor Fungicide, unclassified High acute toxicity, potential groundwater contaminant
Fosthiazate	WHO NL	PAN Bad Actor Nematicide, OP Cholinesterase inhibitor (high)
Furadan (Carbofuran)	WHO Ib	PAN Bad Actor Insecticide, nematicide
Furathiocarb		EPA: NR
Garlic extract	WHO NL	Insecticide, botanical
Garlic spray	WHO NL	Insecticide, botanical
Glufosinate-Ammonium	WHO NL	Herbicide, unclassified Potential groundwater contaminant
Glyphosate (Isopropylamine salt)	WHO U	Herbicide, Phosphonoglycine Potential groundwater contaminant
Halosulfuron-methyl	WHO NL	Herbicide, Sulfonyleurea Potential groundwater contaminant
Haloxyfop		EPA: NR
Hexaconazole		EPA: NR
Hexythiazox	WHO U	PAN Bad Actor Insecto growth regulator, unclassified Carcinogen (high)
Hymexazol	WHO U	PAN Bad Actor Fungicide High acute toxicity, potential groundwater contaminant
Hyphomycetes		EPA: NR
Imazapic	WHO NL	Herbicide, Imidazolinone Potential groundwater contaminant

All Active Ingredients Submitted for Screening	WHO Toxicity Class	USEPA Registration Status* & Notes on Toxicity humans, bees, birds, fish, and wildlife
Imidacloprid	WHO II	Neonicotinoid, insecticide Moderate acute toxicity Potential groundwater contaminant Highly toxic to honey bees (see SUAP-Attachment C)
Iminoctadine Tris (Albesilate)		EPA: NR
Indoxacarb	WHO NL	Insecticide, unclassified Moderate acute toxicity
Iodosulfuron-methyl sodium salt	WHO NL	Herbicide, Sulfonylurea
Ioxynil		EPA: NR
Ioxynil Octanoate		EPA: NR
Iprodione	WHO U	PAN Bad Actor Dicarboximide, fungicide High carcinogen, potential groundwater contaminant
Isopropyl amine glyphosate	WHO NL	Herbicide, Phosphonoglycine Potential groundwater contaminant
Ivermectin		EPA: NR
Kasugamycin		Antibiotic: no approval needed in PERSUAP
Kresoxim-methyl	WHO NL	PAN Bad Actor Fungicide, strobilin Carcinogen (high), potential groundwater contaminant
Lambda Cyhalothrin	WHO II	Insecticide, pyrethroid Moderate acute toxicity
Lemon Peel Extract		EPA: NR
Lindane		EPA: NR
Linuron	WHO U	PAN Bad Actor Herbicide, urea Possible carcinogen, potential groundwater contaminant, developmental or reproductive toxin (high)
Malathion	WHO III	PAN Bad Actor; OP of primary concern Insecticide, OP Moderate acute toxicity, possible carcinogen, potential groundwater contaminant, cholinesterase inhibitor (high) Highly toxic to honey bees (see SUAP-Attachment C) Highly toxic to fish (see SUAP-Attachment C)

All Active Ingredients Submitted for Screening	WHO Toxicity Class	USEPA Registration Status* & Notes on Toxicity humans, bees, birds, fish, and wildlife
		Highly toxic to wildlife (see SUAP-Attachment C)
Mancozeb	WHO U	PAN Bad Actor Fungicide, Dithiocarbamate, Inorganic-Zinc, Carcinogen and developmental/reproductive toxin (high), potential groundwater contaminant
Maneb	WHO U	PAN Bad Actor Dithiocarbamate, fungicide Carcinogen and developmental/reproductive toxin (high) Highly toxic to fish (see SUAP-Attachment C)
Marigold extract (Phytelene of marigold)	WHO NL	Insecticide, botanical
MCPA	WHO III	PAN Bad Actor Chlorophenoxy acid or ester High acute toxicity, possible carcinogen
Mecoprop (MCP)	WHO III	Chlorophenoxy acid or ester, herbicide Possible carcinogen, potential groundwater contaminant
Mefenoxam	WHO NL	PAN Bad Actor Xylylalanine, Fungicide High acute toxicity, potential groundwater contaminant
Mesotrione	WHO NL	Herbicide, Benzoylcyclohexanedione
Metalaxyl	WHO III	Xylylalanine, Fungicide
Metalaxyl M	WHO III	PAN Bad Actor Fungicide, Xylylalanine High acute toxicity, potential groundwater contaminant
Metam Sodium (Metham Sodium)	WHO II	PAN Bad Actor Fumigant, Herbicide, Fungicide, Microbiocide, Algaecide, Dithiocarbamate High acute toxicity, carcinogen and developmental/reproductive toxin (high) Highly toxic to fish (see SUAP-Attachment C)
Methamidophos		Organophosphorous, PIC chemical.
Methiocarb	WHO Ib	PAN Bad Actor Insecticide, molluscicide, N-Methyl Carbamate High acute toxicity, cholinesterase inhibitor (high), potential groundwater contaminant
Methyl Bromide Chloropicrin		Phase out under the Montreal Protocol

All Active Ingredients Submitted for Screening	WHO Toxicity Class	USEPA Registration Status* & Notes on Toxicity humans, bees, birds, fish, and wildlife
Methomyl	WHO Ib	PAN Bad Actor Insecticide N-Methyl Carbamate
Metolachlor	WHO III	PAN Bad Actor Chloroacetanilide, herbicide Possible carcinogen, groundwater contaminant (high)
Metribuzine	WHO II	PAN Bad Actor Herbicide, Triazinone Moderate acute toxicity, potential groundwater contaminant, developmental/reproductive toxin (high)
Mevinphos	WHO Ia	PAN Bad Actor Insecticide, organophosphorous
Milbemectin	WHO NL	Insecticide, Macrocyclic Lactone Potential groundwater contaminant
Mineral Oil (Petroleum oil, paraffin-based)	WHO NL	PAN Bad Actor Insecticide, Adjuvant Carcinogen (high)
Mixture of mono-potassium and dipotassium phosphonates	WHO NL	Fungicide, microbicide, inorganic
Monocrotophos		PIC chemical
Neem oil, Neem, Neem leaves extract	WHO NL	Insecticide, botanical
Nicosulfuron	WHO U	Herbicide, Sulfonylurea Potential groundwater contaminant
Nonyl phenol ethoxylate		EPA: NR
Novaluron	WHO NL	Herbicide, Benzoylurea
Olive oil		EPA: NR
Omethoate		EPA: NR
Oxadiazyl		EPA: NR
Oxydemeton-methyl	WHO Ib	PAN Bad Actor; OP of primary concern Insecticide, OP High acute toxicity, potential groundwater contaminant, cholinesterase inhibitor and developmental/reproductive toxin (high)
Oxyflourfen	WHO U	Herbicide, Diphenyl ether Possible carcinogen

All Active Ingredients Submitted for Screening	WHO Toxicity Class	USEPA Registration Status* & Notes on Toxicity humans, bees, birds, fish, and wildlife
		Highly toxic to fish (see SUAP-Attachment C)
<i>Paecilomyces lilacinus</i>	WHO NL	Insecticide, microbial
Paraquat	WHO II	PAN Bad Actor Herbicide, Bipyridylum, High acute toxicity, potential groundwater contaminant PAN “Dirty Dozen”
Paraquat Dichloride	WHO II	PAN Bad Actor Herbicide, Bipyridylum High acute toxicity, potential groundwater contaminant PAN “Dirty Dozen”
Penconazole		EPA: NR
Pendimethalin	WHO III	Herbicide, 2,6-Dinitroaniline Possible carcinogen Highly toxic to fish (see SUAP-Attachment C)
Penoxsulam	WHO U	Herbicide, Triazolopyrimidine Possible carcinogen, potential groundwater contaminant
Permethrin	WHO II	PAN Bad Actor Insecticide, pyrethroid Highly toxic to honey bees (see SUAP-Attachment C) Highly toxic to fish (see SUAP-Attachment C) Highly toxic to wildlife (see SUAP-Attachment C)
Phenoxaprop-p-ethyl (fenoxaprop-p-ethyl)	WHO NL	Herbicide, Aryloxyphenoxy propionic acid Potential carcinogen, potential groundwater contaminant, possible developmental/reproductive toxin
Phorate (Forato)	WHO Ia	PAN Bad Actor Insecticide, nematicide, OP High acute toxicity, cholinesterase inhibitor (high), potential groundwater contaminant
Phosalone	WHO II	PAN Bad Actor Insecticide, organophosphorous
Phosphide (hydrogen phosphide)		Fumigant, insecticide, inorganic
Pirimiphos methyl	WHO III	PAN Bad Actor Insecticide, OP
Polymyxin		EPA: NR
Pretilachlor		EPA: NR

All Active Ingredients Submitted for Screening	WHO Toxicity Class	USEPA Registration Status* & Notes on Toxicity humans, bees, birds, fish, and wildlife
Profenofos	WHO II	PAN Bad Actor Insecticide, OP Moderate acute toxicity, cholinesterase inhibitor (high)
Propanil	WHO III	Herbicide, Anilide Possible carcinogen, potential groundwater contaminant
Propaquizafop		EPA: NR
Propargite	WHO III	PAN Bad Actor Insecticide, unclassified High acute toxicity, carcinogen and developmental/reproductive toxin (high) Highly toxic to fish (see SUAP-Attachment C)
Propargyl		EPA: NR
Propetamphos	WHO Ib	PAN Bad Actor Insecticide, OP
Propiconazole	WHO II	PAN Bad Actor Fungicide, Azole Moderate acute toxicity, possible carcinogen, potential groundwater contaminant, developmental/reproductive toxin (high)
Propineb		EPA: NR
Propoxycarbazone-Sodium	WHO NL	Herbicide, unclassified Potential groundwater contaminant
<i>Pseudomonas fluorescens</i> A506	WHO NL	Fungicide, microbial
Pyridaben	WHO NL	Insecticide, unclassified Moderate acute toxicity
Pyroxsulam	WHO NL	Herbicide, Triazolopyrimidine
Quinalphos		EPA: NR
Quinclorac	WHO U	Herbicide, unclassified Potential groundwater contaminant
Quizalofop-P-ethyl	WHO NL	Herbicide, Aryloxyphenoxy propionic acid Highly toxic to fish (see SUAP-Attachment C)
Rotenone	WHO II	Botanical, insecticide Moderate acute toxicity Highly toxic to fish (see SUAP-Attachment C)

All Active Ingredients Submitted for Screening	WHO Toxicity Class	USEPA Registration Status* & Notes on Toxicity humans, bees, birds, fish, and wildlife
Sethoxydim	WHO III	Herbicide, Cyclohexenone derivative Potential groundwater contaminant
Simazine	WHO U	PAN Bad Actor Herbicide, triazine Groundwater contaminant and developmental/reproductive toxin (high)
S-metolachlor	WHO NL	PAN Bad Actor Herbicide, Chloroacetanilide Possible carcinogen, groundwater contaminant (high)
Soap spray	WHO NL	Microbiocide, Insecticide
Sodium carbonate	WHO NL	pH Adjustment, Fungicide, Microbiocide, Herbicide, inorganic
Spinosad	WHO U	Insecticide, Macrocylic Lactone
Spiroxamine	WHO II	Fungicide, unclassified Moderate acute toxicity
Steinernema feltiae		EPA: NR
Streptomycin sulphate+ Tetracyclin hydrochloride		Antibiotic: no approval needed in PERSUAP
Sulfosulfuron	WHO NL	Herbicide, Sulfonylurea Potential groundwater contaminant
Sulphur	WHO U	Inorganic fungicide, insecticide
Tebuconazole	WHO III	Fungicide, azole Moderate acute toxicity, possible carcinogen, possible groundwater contaminant
Terbuthylazine	WHO U	Algaecide, Herbicide, Microbiocide, Triazine
Terbuthyn	??	EPA: NR
Tetraconazole	WHO II	PAN Bad Actor fungicide, azole moderate acute toxicity, carcinogen (high)
Thiacloprid	WHO II	PAN Bad Actor Neonicotinoid, insecticide Moderate acute toxicity, carcinogen (high)
Thiamethoxam	WHO NL	Fungicide, insecticide, Neonicotinoid Potential groundwater contaminant

All Active Ingredients Submitted for Screening	WHO Toxicity Class	USEPA Registration Status* & Notes on Toxicity humans, bees, birds, fish, and wildlife
Thiocyclam		EPA: NR
Thiodicarb	WHO II	PAN Bad Actor Molluscicide, insecticide, N-Methyl Carbamate Moderate acute toxicity, carcinogen and cholinesterase inhibitor (high) Highly toxic to fish (see SUAP-Attachment C) Highly toxic to birds (see SUAP-Attachment C)
Thiophanate methyl	WHO U	PAN Bad Actor Fungicide, Benzimidazole precursor Potential groundwater contaminant Carcinogen and developmental/reproductive toxin (high) Highly toxic to fish (see SUAP-Attachment C)
Thiram	WHO III	PAN Bad Actor Dithiocarbamate, fungicide Moderate acute toxicity, developmental/reproductive toxin (high) Highly toxic to fish (see SUAP-Attachment C)
Triadimefon	WHO III	PAN Bad Actor Fungicide, azole Moderate acute toxicity, possible carcinogen, potential groundwater contaminant, developmental/reproductive toxin (high)
Triadimenol	WHO III	Fungicide, azole Moderate acute toxicity, possible carcinogen
Tribenuron methyl	WHO NL	Herbicide, Sulfonylurea Possible carcinogen
Trichlorfon	WHO II	PAN Bad Actor Insecticide, OP Moderate acute toxicity, carcinogen and cholinesterase inhibitor (high)
<i>Trichoderma harzianum</i>	WHO NL	Fungicide, microbial
<i>Trichoderma viride</i>	WHO NL	Fungicide, microbial
Triclopyr	WHO III	Herbicide, Chloropyridinyl
Tricyclazole	WHO II	Fungicide, azole Moderate acute toxicity, possible carcinogen, possible groundwater contaminant, possible developmental/reproductive toxin
Trifloxystrobin	WHO NL	Fungicide, strobilin

All Active Ingredients Submitted for Screening	WHO Toxicity Class	USEPA Registration Status* & Notes on Toxicity humans, bees, birds, fish, and wildlife
Trifloxysulfuron Sodium	WHO NL	Herbicide, Sulfonylurea Potential groundwater contaminant
Vegetable oil	WHO NL	Insecticide
Warfarin	WHO Ib	PAN Bad Actor Rodenticide, Coumarin
Zeta cypermethrin	WHO Ib	PAN Bad Actor Insecticide, pyrethroid High acute toxicity, possible carcinogen
Zinc phosphide	WHO Ib	PAN Bad Actor Inorganic-Zinc, rodenticide

List of Active Ingredients Rejected for use under the F2F Programmatic PERSUAP

For the ease of those with black and white printers, who are unable to print the color coding above, Attachment J, Table 3 lists all active ingredients requested for use by F2F country programs, but that were rejected. The reasons for rejection are included in the last column.

ATTACHMENT J, TABLE 3: ACTIVE INGREDIENTS REJECTED FOR USE UNDER THE F2F PROGRAMMATIC PERSUAP

Active Ingredients Rejected in the PERSUAP	WHO Toxicity Class	USEPA Registration Status (if unregistered) & Notes on Toxicity (reasons for rejection)
2, 4-D Amine		EPA: NR
2,4-D amine		EPA: NR
2-ethyl hexyl ester		EPA: NR
Aldicarb	WHO Ia	PAN Bad Actor Insecticide, nematicide N-Methyl Carbamate
Alpha cypermethrin		Insecticide, pyrethroid Moderate acute toxicity, high carcinogenicity, significant risk to non-target organisms
Aluminum phosphide	WHO not classified; but highly toxic	PAN Bad Actor Fumigant, fungicide, inorganic
Anilazine		EPA: NR
<i>Aphidius transcaaspinus</i> (parasitic wasp)		EPA: NR

Active Ingredients Rejected in the PERSUAP	WHO Toxicity Class	USEPA Registration Status (if unregistered) & Notes on Toxicity (reasons for rejection)
Atrazine	WHO U	PAN Bad Actor Triazine, herbicide Carcinogen and groundwater contaminant (high) Highly toxic to amphibians; banned by the EU
<i>Bacillus megaterium</i>		EPA: NR
Bendioxide		EPA: NR
Benomyl		EPA: NR
Bensultap		EPA: NR
Brodifacoum	WHO Ia	PAN Bad Actor Rodenticide, Coumarin High acute toxicity
Bromadiolone	WHO Ia	PAN Bad Actor Coumarin, rodenticide
Bromoxynil	WHO NL	Herbicide, Hydroxybenzotrile Moderate acute toxicity, potential groundwater contaminant, classified as very highly toxic to fish Under EPA reregistration review
Butachlor		EPA: NR
Carbofuran	WHO Ib	PAN Bad Actor N-Methyl Carbamate, Insecticide, Nematicide
Carbosulfan		EPA: NR
Cartap		EPA: NR
Cartap Hydrochloride		EPA: NR
Chlorpyrifos	WHO II	PAN Bad Actor; OP of primary concern Insecticide, nematicide, OP Moderate acute toxicity, cholinesterase inhibitor (high) Highly toxic to honey bees (see SUAP-Attachment C) Highly toxic to fish (see SUAP-Attachment C) Highly toxic to birds (see SUAP-Attachment C) Highly toxic to wildlife (see SUAP-Attachment C)
Chlorpyrifos-methyl	WHO U	PAN Bad Actor; OP of primary concern Insecticide OP Cholinesterase inhibitor (high)

Active Ingredients Rejected in the PERSUAP	WHO Toxicity Class	USEPA Registration Status (if unregistered) & Notes on Toxicity (reasons for rejection)
		Highly toxic to honey bees (see SUAP-Attachment C) Highly toxic to fish (see SUAP-Attachment C) Highly toxic to birds (see SUAP-Attachment C) Highly toxic to wildlife (see SUAP-Attachment C)
Cypermethrin	WHO NL	Insecticide, pyrethroid Possible carcinogen, high risk to aquatic organisms Under EPA reregistration review
Dalapon		EPA: NR
Diafenthiuron		EPA: NR
Diazinon	WHO II	PAN Bad Actor; OP of primary concern Insecticide, OP Moderate acute toxicity, cholinesterase inhibitor and developmental/reproductive toxin (high) Highly toxic to honey bees (see SUAP-Attachment C) Highly toxic to fish (see SUAP-Attachment C) Highly toxic to birds (see SUAP-Attachment C) Highly toxic to wildlife (see SUAP-Attachment C)
Dichlorvos	WHO Ib	PAN Bad Actor; OP of primary concern Insecticide, OP
Difethialone	WHO Ia	PAN Bad Actor Rodenticide
<i>Diglyhus isaea</i> (parasitic wasp)		EPA: NR
Dimethoate	WHO II	PAN Bad Actor; OP of primary concern Insecticide, OP High acute toxicity, possible carcinogen, potential groundwater contaminant, cholinesterase inhibitor and developmental/reproductive toxin (high) Highly toxic to honey bees (see SUAP-Attachment C) Highly toxic to birds (see SUAP-Attachment C) Highly toxic to wildlife (see SUAP-Attachment C)
Dinitro-cresol		EPA: NR
Diphacinone	WHO Ia	PAN Bad Actor Rodenticide, 1,3-Indandione High acute toxicity
Dodemorph-Acetate		EPA: NR
<i>Encarsiajormosa</i> (parasitic wasp)		EPA: NR

Active Ingredients Rejected in the PERSUAP	WHO Toxicity Class	USEPA Registration Status (if unregistered) & Notes on Toxicity (reasons for rejection)
Endosulfan	WHO II	PAN Bad Actor Insecticide Organochlorine
Esfenvalerate	WHO II	Insecticide, pyrethroid Moderate acute toxicity Highly toxic to honey bees and highly toxic to fish
Ethephon	WHO U	PAN Bad Actor; OP of primary concern Plant growth regulator, OP Cholinesterase inhibitor
Ethoprophos	WHO Ia	PAN Bad Actor Insecticide, nematicide, OP High acute toxicity, cholinesterase inhibitor (high), potential groundwater contaminant
Ethylene Dibromide	Fumigant, not classified b	PAN Bad Actor Fumigant, nematicide, halogenated organic High acute toxicity, known carcinogen, developmental/reproductive contaminant
Extracto de Mimosa tenuiflora		EPA: NR
Fenamiphos		Insecticide, nematicide, organophosphorous Under EPA reregistration review
Fenclorim		EPA: NR
Fenthion		USEPA: NR
Fenvalerate	WHO II	Pyrethroid, insecticide Moderate acute toxicity, highly toxic to bees and to fish Under EPA reregistration review
Flufenoxuron		EPA: NR
Flusilazole		EPA: NR
Formetanate		EPA: NR
Furadan (Carbofuran)	WHO Ib	PAN Bad Actor Insecticide, nematicide
Furathiocarb		EPA: NR
Haloxypop		EPA: NR
Hexaconazole		EPA: NR

Active Ingredients Rejected in the PERSUAP	WHO Toxicity Class	USEPA Registration Status (if unregistered) & Notes on Toxicity (reasons for rejection)
Hyphomycetes		EPA: NR
Iminoctadine Tris (Albesilate)		EPA: NR
Ioxynil		EPA: NR
Ioxynil Octanoate		EPA: NR
Ivermectin		EPA: NR
Lemon Peel Extract		EPA: NR
Lindane		EPA: NR
Malathion	WHO III	PAN Bad Actor; OP of primary concern Insecticide, OP Moderate acute toxicity, possible carcinogen, potential groundwater contaminant, cholinesterase inhibitor (high) Highly toxic to honey bees (see SUAP-Attachment C) Highly toxic to fish (see SUAP-Attachment C) Highly toxic to wildlife (see SUAP-Attachment C)
Methamidophos		Organophosphorous, PIC chemical.
Methiocarb	WHO Ib	PAN Bad Actor Insecticide, molluscicide, N-Methyl Carbamate High acute toxicity, cholinesterase inhibitor (high), potential groundwater contaminant
Methyl Bromide Chloropicrin		Phase out-Montreal Protocol
Methomyl	WHO Ib	PAN Bad Actor Insecticide N-Methyl Carbamate
Mevinphos	WHO Ia	PAN Bad Actor Insecticide, organophosphorous
Monocrotophos		PIC chemical
Nonyl phenol ethoxylate		EPA: NR
Olive oil		EPA: NR
Omethoate		EPA: NR

Active Ingredients Rejected in the PERSUAP	WHO Toxicity Class	USEPA Registration Status (if unregistered) & Notes on Toxicity (reasons for rejection)
Oxadiargyl		EPA: NR
Oxydemeton-methyl	WHO Ib	PAN Bad Actor; OP of primary concern Insecticide, OP High acute toxicity, potential groundwater contaminant, cholinesterase inhibitor and developmental/reproductive toxin (high)
Paraquat	WHO II	PAN Bad Actor Herbicide, Bipyridylum, High acute toxicity, potential groundwater contaminant PAN “Dirty Dozen”
Paraquat Dichloride	WHO II	PAN Bad Actor Herbicide, Bipyridylum High acute toxicity, potential groundwater contaminant PAN “Dirty Dozen”
Penconazole		EPA: NR
Phorate (Forato)	WHO Ia	PAN Bad Actor Insecticide, nematocide, OP High acute toxicity, cholinesterase inhibitor (high), potential groundwater contaminant
Phosalone		PAN Bad Actor, OP
Phosphide (hydrogen phosphide)		Fumigant, insecticide, inorganic
Pirimiphos methyl	WHO III	PAN Bad Actor Insecticide, OP
Polymyxin		EPA: NR
Pretilachlor		EPA: NR
Propamocarb hydrochloride		EPA: NR
Propaquizafop		EPA: NR
Propargyl		EPA: NR
Propetamphos	WHO Ib	PAN Bad Actor Insecticide, OP
Propineb		EPA: NR

Active Ingredients Rejected in the PERSUAP	WHO Toxicity Class	USEPA Registration Status (if unregistered) & Notes on Toxicity (reasons for rejection)
Quinalphos		EPA: NR
<i>Steinernema feltiae</i>		EPA: NR
Terbuthyn	??	EPA: NR
Thiocyclam		EPA: NR
Vegetable oil		EPA: NR
Zeta cypermethrin	WHO Ib	PAN Bad Actor Insecticide, pyrethroid High acute toxicity, possible carcinogen
Zinc phosphide	WHO Ib	PAN Bad Actor Inorganic-Zinc, rodenticide

Scope of Work for the F2F Program PERSUAP

SCOPE OF WORK FOR FARMER-TO-FARMER PROGRAM PERSUAP

This Scope of Work (SOW) describes the services required for the John Ogonowski and Doug Bereuter Farmer-to-Farmer Program for preparation of a Programmatic Pesticide Evaluation Report and Safe Use Action Plan (PERSUAP) to guide activities of the FTF volunteer program activities. The services described herein will enable the above-mentioned program to respond to and comply with the requirements of USAID Regulation 22CFR 216.3(b), USAID’s pesticide procedures and will make it possible for the program to comprehensively contribute to environmental and human health safety on this project, while achieving project goals. Weidemann Associates, Inc. under the FTF Special Program Support Project (SPSP) will provide qualified professionals to guide preparation of a *Pesticide Evaluation Report and Safe Use Action Plan (PERSUAP)*. The PERSUAP provides the technical data and analyses that will be used in preparing a Programmatic Environmental Assessment for the FTF Program, revising the existing Program IEE to reflect the information and requirements laid out in the program-wide PERSUAP.

Background

All USAID activities are subject to evaluation via, at minimum, an Initial Environmental Examination (IEE) and at maximum an Environmental Assessment (EA). And because of high risk concerns presented by pesticides, the USAID environmental regulations require that at least the 12 factors outlined in the Pesticide Procedures described in 22 CFR 216.3 (b)(1)(i) (a through l) be addressed in the PERSUAP for any program that includes assistance for the procurement or use of pesticides. The PERSUAP focuses on the particular circumstances of the program in question, the risk management choices available, and how a risk management action plan would be implemented in the field. Further details about what to include in a PERSUAP are given below.

Why is a local-level assessment such as a PERSUAP needed for USAID pesticide programs? To help in understanding the utility, consider the U.S. system for promoting pesticide safety. When the USEPA registers pesticides for use in the United States, it specifies the manner in which the product can be “safely” used (i.e., with an acceptably small risk), including safety equipment needed when applying the pesticide, how to apply it, the allowed uses, etc. But the context in which EPA makes these registration decisions is important to note. An extensive system of capabilities and resources exist in this country that help give EPA confidence these specifications will be followed and the product will be used appropriately. These include a 97% literacy rate meaning most of the population can read pesticide labels; close control by EPA over the content of the label; training requirements and programs for those pesticide products that require applicator certification; worker protection requirements; occupational safety regulations; and relatively effective federal, state and local enforcement mechanisms.

In allowing the use of certain pesticides in its overseas programs, USAID cannot rely on the same societal capabilities and resources that the USEPA does to assure appropriate use of the product. The preparation of a PERSUAP gives a program manager the opportunity to consider practical actions by which to reduce the risks of using pesticide products in a program, taking into consideration the context in which the products will be used, the particular elements of the program, and the different capacities of the partners involved.

The FTF Program presents unique challenges in complying with the requirements for development of a programmatic PERSUAP. The FTF Program provides voluntary technical assistance to farmers, farm groups, and agribusinesses in countries to promote sustainable improvements in food processing, production, and marketing. The program relies on the expertise of U.S. volunteers from diverse backgrounds—farms, land grant universities, cooperatives, private agribusinesses, nonprofit farm organizations and others to respond to the needs of host country farmers and organizations. Typically, volunteers spend about 20 to 30 days in the host country. Volunteers have completed over 12,000 assignments in 103 countries, since the program began in 1985. Volunteers work on a wide range of activities, providing assistance to host organizations—private farmers, cooperatives and community groups, rural credit institutions, extension services, input supply firms, agribusinesses, and others. Assignments may involve technology transfer, business planning, organizational strengthening, marketing, or environmental conservation.

US NGOs implement the FTF Program. These organizations work closely with overseas USAID missions and local partner organizations, supporting a variety of development programs aimed at reducing poverty and promoting sustainable food security. Local offices of the volunteer program implementers identify hosts and plan assignments, recruit and field volunteers, provide logistics and translation services, as needed, and follow up with host organizations on implementation of volunteer recommendations. Often the volunteer assistance is related to a larger on-going development program.

Most volunteer assignments provide technical assistance services to host organizations under Country FTF Projects in about 20 core countries. (See list of countries and country projects in Attachment A.) Country FTF Projects may involve support service development (extension services, financial services, marketing, input supply, processing), but most focus on development of specific value chains, such as dairy development, horticulture, staple food production, grain and oilseeds, aquaculture, apiculture, agro-forestry and small ruminants.

PERSUAP—Scope and Purpose

Pesticides, if not used properly, can kill and injure humans, as well as environmental resources. Pesticides are defined as synthetic *or natural product-derived* chemical products intended to kill, control, and repel insects, plant diseases, weeds, and other pest organisms. The FTF PERSUAP analysis will cover those pesticides proposed for use in relation to Country FTF Projects. Such pesticides must be, at a minimum:

a) registered by USEPA for the same *or similar* uses without restrictions; b) registered by the local government; and c) available in the country or region. The PERSUAP will also specifically list pesticides that are *rejected for use* and for which use should be discouraged by the FTF Program, with reason(s) for rejection.

The FTF Program typically provides only voluntary technical assistance to host organizations and this in the form of short term voluntary services. Volunteers and the FTF Program implementers have little control over activities carried out by hosts and FTF Programs are not intended to involve any procurement or direct use of pesticides. However, pesticides are used in most agricultural production systems and, even when volunteers are not working directly with pesticides or pest control, attention to pesticide use systems is important to marketing, crop and livestock management, business plan development and other activities with which the volunteer may be involved. Frequently, pesticides are mis-used or mis-handled and volunteers have a need or an opportunity promote safer use through training or advisory services.

USAID Environmental Procedures for pesticide “use” (as provided by USAID Environmental Procedures: Title 22, Code of Federal Regulations Part 216, Reg. 216), state that all projects involving assistance for the procurement or use, or both, of pesticides shall be subject to the procedures prescribed in 22 CFR 216.3 (b)(1)(i)(a-1). Even though the FTF Program and FTF volunteers rarely, if ever, are involved in procurement or direct application of pesticides, “use” is interpreted broadly to include the handling, transport, storage, mixing, loading, application, clean up of spray equipment, and disposal of pesticides, as well as the provision of fuel for transport of pesticides, and providing technical assistance in pesticide management. “Use” is said to occur if training curricula include information on safer pesticide use even if it does not involve actual application of pesticide. It also applies if pesticide procurement is facilitated by credit or loans. USAID also strongly encourages including instruction in IPM and alternatives to pesticides in any training on pesticide use as defined above. Under this approach, pesticides are considered a tool of ‘last resort’ and pesticide choice should as far as feasible be the ‘least toxic’ choices. *This definition of “use” applies throughout this SOW and the resulting PERSUAP.*

The FTF PERSUAP is intended to address crop and livestock protection activities in production as well as in storage and processing. It will cover use of all pesticides--herbicides, insecticides, fungicides, nematocides, rodenticides, miticides, and other pesticides and related chemicals. Specifically, the PERSUAP includes:

1. Documentation on the specific uses of pesticides that comply with 22 CFR 216.3(b)(1)(i)(a through l) for each project activity that “uses” pesticides, including promoting the adoption of particular pesticides and pesticide use technologies supported by USAID; and
2. Mitigative actions as identified in safe use action plans with implementing partner commitments to recommended actions, including capacity building by training, production of simple safety materials like fact sheets and posters, and other means, with defined timelines and assignment of specific responsibilities for actions.

The PERSUAP is typically based on an assessment of the pesticide system from import/production to distribution and use to disposal using a systems analysis approach. This pesticide system analysis provides the backdrop for accurately addressing the 12 parts of Regulation 216’s Pesticide Procedures. The PERSUAP will help FTF volunteers:

1. Ensure compliance with the Agency’s pesticide procedures;
2. Ensure compliance with the host government pesticide importation, testing, storage, use, disposal and registration regulations, laws, policies and procedures;

3. Identify and recommend appropriate mitigative actions for incorporation into the projects' activities;
4. Identify and recommend alternative actions and/or pesticides, as appropriate;
5. Facilitate use of Integrated Pest Management (IPM) with a view of avoiding or reducing unnecessary pesticide risk; and
6. Identify and address key pesticide use issues, particularly those that impact on pesticide utilization by small-scale producers, laborers, and agribusinesses.

Scope of Work

The Weidemann Associates, Inc. FTF Special Program Support Project (Weideman) will prepare a draft programmatic PERSUAP for the FTF Program. This will be undertaken in collaboration with the FTF Program implementers that will have to provide the country-specific details on activities in which volunteers will be involved. The FTF implementing organizations' country staff provide a pragmatic and efficient means of developing the necessary detail required for completion of the FTF PERSUAP. While country and project details vary, there are many similarities in activities and production systems, such that a single programmatic PERSUAP is the preferred approach to meeting regulatory requirements and ensuring a sound approach to implementing the FTF Program.

A PERSUAP basically consists of two parts, a "PER" and a "SUAP." The Pesticide Evaluation Report (PER) section performs the systems analysis of the country's pesticide system from import to ultimate disposal and addresses the 12 informational elements required in the Agency's Pesticide Procedures. The Safe Use Action Plan (SUAP) puts the conclusions and recommendations reached in the PER into a plan of action, including assignment of responsibility to appropriate parties connected with the pesticide program.

The FTF Programmatic PERSUAP shall include:

- A. PERSUAP for FTF Project (See Attachment C guidelines) including:
 1. Documentation on the specific uses of pesticides that will comply with 22 CFR 216.3(b)(1)(i) for each activity concerned with procurement or use of pesticides, including promoting the adoption of particular pesticides and pesticide use technologies supported by USAID, addressing the 12 Regulation 216 Pesticide Procedure elements:
 - a. USEPA registration status of the proposed pesticides.
 - b. Basis for Selection of Pesticides.
 - c. Extent to which the proposed pesticide use is, or could be, part of an IPM program.
 - d. Proposed method or methods of application, including the availability of application and safety equipment.
 - e. Any acute and long-term toxicological hazards, either human or environmental, associated with the proposed use, and measures available to minimize such hazards.
 - f. Effectiveness of the requested pesticide for the proposed use.
 - g. Compatibility of the proposed pesticide use with target and non-target ecosystems.

- h. Conditions under which the pesticide is to be used, including climate, flora, fauna, geography, hydrology, and soils.
- i. Availability of other pesticides or non-chemical control methods.
- j. Host country's ability to regulate or control the distribution, storage, use, and disposal of the requested pesticide.
- k. Provision for training of users and applicators.
 - l. Provision made for monitoring the use and effectiveness of each pesticide.
- 2. Safe Use Action Plan: Recommendations for mitigative actions to enhance human and environmental safety (compile the recommendations relevant to the above 12 elements, as appropriate)

Level of Effort=20 days (no travel required)