AFGHANISTAN MISSION-WIDE PROGRAMMATIC PESTICIDE EVALUATION REPORT AND SAFER USE ACTION PLAN (P-PERSUAP)

JUNE 2016

This document was produced for the United States Agency for International Development (USAID). It was prepared by Andrew Harvey, M. Zaki Afshar and Stella Siegel, of The Cadmus Group, Inc. under the Global Environmental Management Support Project (GEMS II), award AID-OAA-M-13-00018. Until and unless this document is fully approved under 22 CFR 216, the contents do not necessarily reflect the views of USAID or the United States Government.
Cover photo: Khoja Doh Koh field day (Credit: A. Harvey).
INITIAL ENVIRONMENTAL EXAMINATION

(P-PERSUAP)

PROGRAM/ACTIVITY DATA
Activity Location:/Country Code: Afghanistan (306)
Activity Name: ALL USAID/AFGHANISTAN PROGRAMS
Activity Number: MULTIPLE
Life-of-Activity Funding: est. $6.4 Billion
Period Covered: current date to expiration date as below
IEE Prepared by: Andrew Harvey, Ph.D. (lead) with Mohammed Zaki Afshar and Stella Siegel, GEMS II
Current Date: 30 June 2016
Expiration Date: 30 June 2021
IEE Amendment (Y/N): YES – amends all current USAID/Afghanistan IEEs covering activities with potential pesticide use

SUMMARY OF ENVIRONMENTAL THRESHOLD DECISION (Place X where applicable)

<table>
<thead>
<tr>
<th>Categorical Exclusion</th>
<th>[ ]</th>
<th>Deferral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Determination</td>
<td>[ ]</td>
<td>Negative Determination</td>
</tr>
<tr>
<td>Negative Determination w/ Conditions</td>
<td>[X]</td>
<td>Exemption</td>
</tr>
</tbody>
</table>

SCOPE AND PURPOSE

This mission-wide Programmatic Pesticide Evaluation Report Safer Use Action Plan (P-PERSUAP) addresses the requirements of 22 CFR 216.3(b) ("Pesticide Procedures") regarding the procurement, use and support for use of pesticides on USAID/Afghanistan programs. As such, it (1) establishes the set of pesticides for which procurement, use or support for use is authorized across all USAID/Afghanistan programs; and (2) establishes the conditions under which the authorized pesticides may be procured, used, or their use supported to best ensure user, consumer and environmental safety. It amends all USAID/Afghanistan IEEs covering activities that may involve the use of pesticides.

**THRESHOLD DECISION/ACTION TAKEN**

A **Negative Determination with Conditions** is issued for procurement, use and support to the use of pesticides across the USAID/Afghanistan portfolio, subject to compliance with the SAFER USE ACTION PLAN that comprises section 6 of the document.

As such:

Upon approval of this PERSUAP, pesticides containing active ingredients (AIs) listed in Table 6.1 are permitted for procurement/use/support by USAID Afghanistan projects. Procurement, use of or support for the approved pesticides **must be** in compliance with (1) the AI-specific uses and conditions in Table 6.1, and (2) the safer use conditions enumerated in Section 6.3 for IPs and 6.4 for USAID.

In **summary**, Implementing Partners (IP) conditions require that:

- Pesticide products procured, used or recommended for use must be labelled in a national language (Pashto or Dari) and include specified essential information.
- Basic training in safer use must be provided broadly to those using, selling, financing or providing extension services involving pesticides with USAID funding. Training must be reported to the AOR/COR. Advanced training is required for certain AIs and products.
- Pesticides for plant protection must be part of an IPM scheme governed by crop- and pest-specific IPM-based pest management plans.
- Projects must assure use per label, including the correct use of appropriate PPE (per label) for all pesticide use under their direct control. Otherwise, projects must assure access to, proper use and maintenance of appropriate PPE and use per label to the greatest degree practicable.
- Existing pesticide inventory reporting is required via a provided form.
- In addition to any other procurement requirements, projects seeking approval to purchase pesticides must certify that such procurement is compliant with this PERSUAP and provide other specified information for AOR/COR review and clearance via a provided form.
- Record-keeping, reporting on compliance with the above conditions as part of regular project implementation reporting, and pass-down of all above requirements to subcontractors, grantees and sub-grantees is required.

In **summary**, conditions for USAID/Afghanistan require that:

- USAID/Afghanistan put in place effective internal procedures to review pesticide use plans and pesticide procurement requests submitted by IPs. The MEO must review and approve all procurement requests.
- Per ADS 204.3.4, AORs/CORs must assure that the requirements established by section 6.3 (IP Conditions, summarized above) are funded, implemented, and monitored.
- Technical Offices, working with OAA, must ensure that contract and award language requires compliance with the conditions established by this PERSUAP for each relevant project.
- USAID/Afghanistan must assure that all relevant mission staff receive an internal short-format (~1–2 hour) training on the requirements established by this PERSUAP.
- At such time that pesticides are registered under Afghan’s National Pesticide Law, USAID/Afghanistan must update this PERSUAP.

**NOTE:** Table 6.1, IP and USAID Conditions are reproduced in full in the Executive Summary.
APPROVAL OF ENVIRONMENTAL ACTIONS

CLEARANCE:
Acting Mission Director
Signed: [Signature]
Date: 8/15/2016

CONCURRENCE:
Bureau Environmental Officer (OAPA)
Signed: [Signature]
Date: 9/1/16

ADDITIONAL CLEARANCES:
Mission Environmental Officer
Signed: Cleared in tracker
Harry Bottenberg
Date: 7/12/2016

Regional Environmental Advisor for Central & South Asia & OAPA
Signed: cleared by email
Andrei Barannik
Date: 7/21/2016

Office of Program and Project Design Director
Signed: Cleared by email
Ophelia Oddo
Date: 7/24/2016

Acting Deputy Mission Director
Signed: [Signature]
Kent Larson
Date: 8/15/2016

Acting Resident Legal Officer Director
Signed: Cleared by email
John ‘Greg’ Butler
Date: 8/7/2016

Office of Agriculture Director
Signed: Cleared by email
Gary Robbins
Date: 7/31/2016

Office of Economic Growth Director
Signed: [Signature]
Loren Stoddard
Date: 8/15/2016

Office of Infrastructure Director
Signed: Cleared by email
Jeremiah Carew
Date: 8/8/2016

Office of Gender Director
Signed: [Signature]
Susan DeCamp
Date: 8/15/2016

Acting Office of Health Director
Signed: Cleared by email
Ahmed Atteg
Date: 8/9/2016

Office of Education Director
Signed: Cleared by email
Jennifer Nikolaeff
Date: 8/7/2016
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EXECUTIVE SUMMARY

PESTICIDE NEEDS IN USAID/AFGHANISTAN PROGRAMS:

Effective pest management is required to achieve intended development outcomes in USAID/Afghanistan programs in agriculture, health and other sectors. Even in the context of USAID's policy commitment to integrated pest management (IPM), effective pest management often requires the use of products defined as pesticides by the US Environmental Protection Agency (EPA).

For example, in the health sector, disinfectants and sterilants are required to control infection. Pest management needs for agricultural activities are detailed in Annex A: Pests and Diseases of Target Crops and Available and Recommended Control Methods. Agricultural commodities in storage or processing plants may also require protection with fumigants and rodenticides.

REGULATORY REQUIREMENTS ATTENDANT TO USE OF OR SUPPORT FOR PESTICIDES ON USAID PROJECTS

USAID's Pesticide Procedures. Procurement or use of pesticides on USAID-funded or managed activities requires compliance with the Agency’s pesticide procedures, 22 CFR 216.3(b). In summary, this US federal regulation mandates that a pesticide may only be approved for procurement or use following an analysis of 12 specified factors focused on need and risk; additional, more rigorous analytical requirements attach to pesticides not approved by EPA for same or similar uses, or which are designated by EPA as restricted-use. Approval—which requires mission director clearance and Bureau Environmental Officer (BEO) concurrence—of any given pesticide under these procedures in almost all cases is contingent on specified restrictions and safer use requirements.

Pesticide Evaluation Reports and Safer Use Action Plans (PERSUAPs) are generally the instrument by which the pesticide procedures are addressed. Once approved, PERSUAPs amend the Reg. 216 documentation (IEEs or EAs) for the subject projects/activities and the conditions they establish become binding.

Generally, USAID is moving towards mission- or sector-level PERSUAPs rather than project-specific ones. This is intended to reduce redundant preparation effort, simplify compliance oversight, and enhance consistency.

Afghanistan’s Regulation of Pesticides: The Government of the Islamic Republic of Afghanistan (GoA) has enacted legislation to regulate the sale and use of pesticides (“Pesticide Law.” Published 27/07/1394 (19 Oct 2015). Official Gazette No. 1190. Unofficial English translation provided in Annex D). However, the regulatory system has not yet been put in place. Therefore, at this time, there are no pesticides registered for importation or sale in Afghanistan. The Plant Protection and Quarantine Department (PPQD) prohibits the import or sale of chemicals listed as Persistent Organic Pollutants (POPs) under the Stockholm Convention and those requiring Prior Informed Consent (PIC) under the Rotterdam Convention.

PURPOSE AND SCOPE

In compliance with USAID’s Pesticide Procedures (22 CFR 216.3(b)), this PERSUAP:

- Establishes the set of pesticides for which procurement, use or support for use is authorized across all USAID/Afghanistan programs.
- Establishes the conditions under which the authorized pesticides may be procured, used, or their use supported to best ensure user, consumer and environmental safety.

These requirements come into effect upon approval of the PERSUAP. This PERSUAP supersedes and replaces the USAID/Afghanistan mission PERSUAP approved in 2013.1

In addition to current projects/activities, this PERSUAP is designed to provide for the needs of future USAID/Afghanistan projects with the same or similar pest management needs.

The following crop production value-chains are addressed by this PERSUAP: wheat, oilseeds including flax, sesame safflower, canola and sunflower, potatoes, vegetables, grapes, stone fruit and almonds, apples and other pome fruit.

In addition, the PERSUAP addresses seed treatment and the use of pesticides for postharvest storage, as well as use of pesticides for treatment of livestock. This PERSUAP also provides for the use of disinfectants and sterilants by USAID-funded health projects.

Should future projects require the procurement, use or support to use of pesticide active ingredients (AIs) not authorized by this PERSUAP, or for uses not authorized by this PERSUAP, an amendment to this PERSUAP will be necessary.

STRUCTURE AND METHODOLOGY

Sections 1 and 2 provide an introduction to the PERSUAP purpose and scope and pesticide management needs across the USAID/Afghanistan portfolio.

Section 3 gives a brief account of Afghanistan, its geography, economy and governance. In particular, it describes agricultural practices, and the system of environmental protection and pesticide regulation.

The Pesticide Evaluation Report (PER, Sections 4 and 5) identifies those pesticide active ingredients (AIs) that are authorized for procurement/use/support on USAID/Afghanistan activities and specifies mandatory safer use conditions to best ensure safety. This is established by the 12 point risk evaluation required by 22 CFR 216.3(b) of a candidate AI list based on the needs of the projects, products available on the local market and known pesticide use within the region. This assessment takes account of the current state of the pesticide retail sector in Afghanistan and, in particular, problems of quality and labelling. The PER is intended for USAID reviewers; Implementing partners (IPs) and COR/AORs generally need not refer to this section.

The Safe Use Action Plan (SUAP; Section 6) provides a succinct, definitive stand-alone statement of compliance requirements for IPs and for USAID staff. These requirements are synthesized or follow directly from the 12-factor analysis.

PESTICIDES APPROVED FOR USE/SUPPORT VIA THIS PERSUAP

Upon approval of this PERSUAP, pesticides containing AIs listed in Table ES-1 (at end of this Executive Summary) are permitted for procurement/use/support by USAID Afghanistan projects. These pesticides have an identified use within an Integrated Pest Management (IPM) scheme; are registered by EPA; and are chosen conservatively with respect to their environmental and human health risk profiles*, with specific risk-reducing conditions specified as appropriate.* Note that Table ES-1 is a duplicate of Table 6.1 in the SUAP.

*The regulatory status of all pesticides considered for approval is given in Table 5.1. Human health and ecological toxicological summaries are given in Annex B.

MANDATORY CONDITIONS FOR PROCUREMENT/USE/SUPPORT OF APPROVED PESTICIDES.

Procurement, use of or support for the approved pesticides must be in compliance with (1) the AI-specific uses and conditions in Table ES-1, and (2) the safer use conditions enumerated in Section 6.3 for IPs and 6.4 for USAID. Conditions are imposed BOTH on USAID and on IPs.

These conditions are reproduced in their entirety in the remainder of this section:

IP Conditions. The conditions for Implementing Partners (IPs) are as follows:

Mandatory safer use conditions for IPs are as follows. They are synthesized or follow directly from the PER analysis:
1. Only pesticides with approved active ingredients can be procured, used or recommended for use with USAID funds. These pesticides are enumerated in Table ES-1, below. Support must be in compliance with (1) the listed use(s) and (2) any specific conditions enumerated in Table ES-1.

**NOTES:**

<table>
<thead>
<tr>
<th>Multiple AIs in one product</th>
<th>Where a pesticide product contains more than one AI, the product can only be used when all its AIs are approved by this PERSUAP.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop demonstrations and trials</td>
<td>Crop demonstrations and trials will use only approved AIs. The sole exception is where the purpose of the trial is evaluate a new pesticide not on the list, in which case a waiver must be obtained from the MEO.</td>
</tr>
<tr>
<td>Finance that may be used for purchase of pesticides</td>
<td>Projects providing finance that may be used for the purchase of pesticides will ensure that beneficiaries receive information (see Training below) concerning permitted pesticides and their safe and effective use.</td>
</tr>
<tr>
<td>Pesticides procured under 2013 PERSUAP</td>
<td>Projects that procured pesticides approved by the 2013 PERSUAP but not approved by this PERSUAP may utilize these pesticides consistent with the other conditions listed below. However, no further procurement of such pesticides is permitted.</td>
</tr>
<tr>
<td>EPA-analogous formulation</td>
<td>Products procured with USAID funds must be of a formulation, standard and quality comparable to those approved for use in the US by US EPA.</td>
</tr>
</tbody>
</table>

2. Pesticide products procured, used or recommended for use must be labelled in a national language (Pashto or Dari) and include the following essential information:

- name and concentration of active ingredient
- type of formulation
- instructions for use
- user safety information
- safety periods for re-entry and harvest
- manufacturer and country of origin.

Where products meeting these requirements are not available locally, projects will procure abroad OR the project must translate and provide this information in the appropriate local language.

3. Basic training in safer use must be provided broadly. Within 90 days of approval of this PERSUAP, all project staff and individuals/organizations handling, using, selling, financing or providing extension services involving pesticides with USAID funding must successfully complete a safer use training appropriate to the activity that: (1) is delivered by appropriately qualified trainers, and (2) addresses all mandatory training elements specified in Annex C. Successful completion must be determined by a satisfactory score on an individual assessment instrument.

4. Advanced training required for certain AIs and products. Only individuals who have successfully completed a relevant, advanced (“RUP-level”) training may use USAID funds to apply: (1) products noted as requiring such training in Table ES-1; or (2) any product labeled with a skull and crossbones, the words DANGER and/or POISON.

At such time as MAIL may have a certified pesticide applicator program, a MAIL certification will meet this requirement, as will an equivalent US or EU certification. Otherwise, the MEO must review the content of any training program and the credentials of the trainers to determine whether the training program provides necessary knowledge and skills. Successful completion must be determined by a satisfactory score on an individual assessment instrument.

5. Pesticides for plant protection must be part of an IPM scheme. USAID-funded pesticide use and extension for plant protection (except emergency locust control) must be governed by a set of locally adapted, crop- and pest-specific IPM-based pest management plans. Such plans specify which pesticides are to be used and under what circumstances. It is the responsibility of implementing partners to develop such plans. Annex A provides draft plans as a starting point.
6. Appropriate Personal Protective Equipment (PPE). Projects must provide and assure the correct use of appropriate PPE (per label) for all pesticide use under their direct control. Otherwise, projects must assure access to, proper use and maintenance of appropriate PPE to the greatest degree practicable. Normally this will consist of:

- hat
- overalls
- respirator or disposable mask
- rubber gloves (solvent resistant)
- rubber boots (solvent resistant).

Note: Experience has shown that PPE use can be regarded as a status symbol and encouraged on that basis.

7. Observance of label instructions and safe pesticide purchase, handling, storage and disposal practices. Similarly, for pesticide use under their direct control, projects must assure use per label (including re-entry intervals) as well as safer pesticide transport, handling and disposal practices as per the IDEA-NEW Pesticide Retailer Handbook. Otherwise projects must take all practicable measures to assure use per label and safer pesticide transport, handling and disposal practices.


8. Existing pesticide inventory reporting. Within 45 days of approval of this PERSUAP, agricultural projects must report existing pesticide inventories to their AOR/COR using FORM 1 (Annex E). If products in inventory are compliant with the 2013 PERSUAP or this 2016 PERSUAP, they may be used subject to other conditions in this section. All other products in inventory must be appropriately disposed of (consultation with MEO required). No new procurement can be made that is not compliant with this 2016 PERSUAP.

9. Pre-procurement planning requirement. Prior to requesting authorization to procure pesticides (see condition 10, below), projects must conduct pesticide planning with reference to their workplan and project activities that require pesticides. (e.g.: Demonstration farms; Farmer Field Schools; Input distribution; Finance; Research and/or other activities requiring pesticides). Specifically:

- Agricultural projects will identify crops involved and develop pest management plans.
- All projects, including agricultural, will identify: anticipated pesticide AIs required; categories of personnel who will apply the pesticides; anticipated locations of use; PPE required and training needs by category (e.g. Project staff; MAIL staff; agricultural input-retailers etc. farmer field school participants; beneficiaries of credit/finance.; etc.).

10. Pesticide procurement authorization. Prior to procuring pesticides, projects must submit FORM 2 (Annex E) to the AOR/COR and receive his/her clearance for the subject procurement. Form 2 provides the following information.

- The active ingredient, which must be approved by this PERSUAP.
- The name of the product to be procured.
- The label of the product to be procured, ensuring that the requirements of condition #2, above, are met.
- The mode by which it is to be procured.

No pesticide purchases are authorized without AOR/COR clearance via Form 2: Note this requirement is additional to and not in lieu of any other pesticide procurement clearance/approval requirements.

11. Record-keeping & resistance monitoring. Projects procuring and using pesticides must:
- maintain records of their stocks (type and quantity) and record and monitor their use (including date of use, application method, and location).
- monitor pesticide effectiveness for development of resistance. See Annex C.8 for a suggested form for monitoring and record keeping.

Projects providing pesticide related training and certification must maintain records of their trainings, certifications and trainees.

12. Regular implementation reporting. The status of implementation of the above-listed conditions must be addressed in regular project implementation reporting. (E.g. quarterly or 6-month reports.) This reporting must include stocks and use reporting, and summary reporting of pesticide trainings, including purpose, dates and type of training, number and type of trainees, and number successfully completing the training.

13. Pass-down to subcontractors and grantees. All above-listed conditions must be passed down to subcontractors and (sub)grantees. Prime contractors and grantees must assure that sub-contractors/subgrantees have capacity to implement these conditions.

USAID conditions. Mandatory safer use conditions and responsibilities that apply to USAID/Afghanistan technical offices and AORs/CORs are as follows:

1. USAID/Afghanistan must put in place effective internal procedures to review pesticide procurement requests submitted by IPs. The MEO must review and approve all procurement requests before the AOR/COR can clear.

2. Per ADS 204.3.4, AORs/CORs must assure that the requirements established by section 6.3 are funded, implemented, and monitored.

3. Technical Offices, working with OAA, must ensure that contract and award language requires compliance with the conditions established by this PERSUAP for each relevant project.

   Note: this requirement is satisfied by general contract language requiring compliance with applicable Reg. 216 documentation.

4. USAID/Afghanistan must assure that all relevant staff receive an internal short-format (~1–2 hour) training on the requirements established by this PERSUAP.

5. At such time that pesticides are registered under Afghan’s National Pesticide Law, USAID/Afghanistan update this PERSUAP.

PESTICIDES CONSIDERED BUT REJECTED FOR PROCURMENT/USE/SUPPORT.

To document the decision-making process and to support consideration of future amendment requests, the PER analysis sets out the full list of active ingredients (AIs) evaluated and, in table 5.3, those rejected for use/support and the reasons for rejection.

These rejected AIs are in some cases registered by EPA, but are rejected for use or support in USAID/Afghanistan programs for a variety of reasons such as prevalence of these AIs in products designated by EPA as Restricted Use Products due to high human or ecological toxicity.

Rejected pesticides also include pesticides listed by the Stockholm Convention and the Rotterdam Convention. These banned pesticides are often found in the market in Afghanistan and known to still be used in the region. Afghanistan is a party to both conventions.

Note that ONLY pesticides specifically approved by this PERSUAP (i.e. listed in Table ES-1, below) may be used or supported on USAID/Afghan projects.

Changes from the 2013 PERSUAP are noted in the tables of both approved and rejected pesticides.
TABLE ES-1: PESTICIDES (ACTIVE INGREDIENTS) APPROVED FOR PROCUREMENT/USE/SUPPORT BY ACTIVITIES IN AFGHANISTAN

**NOTE:** This table is identical to table 6.1 in the main text of this PERSUAP.

<table>
<thead>
<tr>
<th>ACTIVE INGREDIENT (AI)</th>
<th>USES</th>
<th>AI-SPECIFIC CONDITIONS</th>
<th>STATUS IN 2013 PROGRAMMATIC PERSUAP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Disinfectants/Sterilants</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chlorhexidine</td>
<td>Antiseptic (sold over counter in US)</td>
<td>For use in health facilities only by our under supervision of qualified clinical/laboratory staff.</td>
<td>Not reviewed</td>
</tr>
<tr>
<td>Chlorine</td>
<td>Disinfectant for clinical hygiene</td>
<td>For use in health facilities only by our under supervision of qualified clinical/laboratory staff.</td>
<td>Approved for water treatment</td>
</tr>
<tr>
<td>Chloroxylenol</td>
<td>Disinfectant for clinical hygiene</td>
<td>For use in health facilities only by our under supervision of qualified clinical/laboratory staff.</td>
<td>Not reviewed</td>
</tr>
<tr>
<td>Ethanol</td>
<td>Disinfectant for clinical hygiene</td>
<td>For use in health facilities only by our under supervision of qualified clinical/laboratory staff.</td>
<td>Approved as clinical disinfectant</td>
</tr>
<tr>
<td>Phenol</td>
<td>Disinfectant for clinical hygiene</td>
<td>For use in health facilities only by our under supervision of qualified clinical/laboratory staff.</td>
<td>Approved as clinical disinfectant</td>
</tr>
<tr>
<td>Sodium hypochlorite</td>
<td>Disinfectant for clinical hygiene</td>
<td>For use in health facilities only by our under supervision of qualified clinical/laboratory staff.</td>
<td>Approved as clinical disinfectant</td>
</tr>
<tr>
<td><strong>Herbicides</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2,4-D</td>
<td>Selective herbicide for later treatment against broad-leaved weeds in cereal crops</td>
<td>Only to be applied by operators with RUP-level training and appropriate PPE.</td>
<td>Approved</td>
</tr>
<tr>
<td>Clethodim</td>
<td>Selective post-emergence herbicide against grass weeds in broad-leaved crops</td>
<td>Approved</td>
<td></td>
</tr>
</tbody>
</table>
### TABLE ES-1: PESTICIDES (ACTIVE INGREDIENTS) APPROVED FOR PROCUREMENT/USE/SUPPORT BY ACTIVITIES IN AFGHANISTAN

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<th>USES</th>
<th>AI-SPECIFIC CONDITIONS</th>
<th>STATUS IN 2013 PROGRAMMATIC PERSUAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clodinafop-propargyl</td>
<td>Selective herbicide against grass weeds in cereal crops</td>
<td></td>
<td>Not reviewed</td>
</tr>
<tr>
<td>Dicamba</td>
<td>Selective herbicide for pre- &amp; post-emergence treatment against broad-leaved weeds in cereals</td>
<td>Only to be applied by operators with RUP-level training and appropriate PPE</td>
<td>Approved</td>
</tr>
<tr>
<td>Fenoxaprop-p-ethyl</td>
<td>Selective herbicide against grass weeds in cereal crops</td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Glyphosate</td>
<td>Broad-spectrum herbicide to kill all weeds and for zero-tillage</td>
<td>Only to be applied by operators with RUP-level training and appropriate PPE</td>
<td>Approved</td>
</tr>
<tr>
<td>MCPA, 2-ethyl hexy ester</td>
<td>Selective herbicide for early treatment against broad-leaved weeds in cereal crops</td>
<td>Only to be applied by operators with RUP-level training and appropriate PPE</td>
<td>Not reviewed</td>
</tr>
<tr>
<td>Oxyfluorfen</td>
<td>Selective herbicide for pre- and post-emergence control of a wide spectrum of annual broadleaf weeds and grasses</td>
<td></td>
<td>Not reviewed</td>
</tr>
<tr>
<td>Pendimethalin</td>
<td>Selective herbicide for pre- &amp; post-emergence control of grass &amp; some broad-leaved weeds</td>
<td></td>
<td>Not reviewed</td>
</tr>
<tr>
<td>Sethoxydim</td>
<td>Selective post-emergence herbicide against grass weeds in broad-leaved crops</td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Sulfosulfuron</td>
<td>Herbicide for annual grass and broad-leaved weed control in cereals and other crops</td>
<td></td>
<td>Not reviewed</td>
</tr>
</tbody>
</table>

**Fungicides**

<table>
<thead>
<tr>
<th>Active Ingredient (AI)</th>
<th>USES</th>
<th>AI-Specific Conditions</th>
<th>Status in 2013 Programmatic PERSUAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azoxystrobin</td>
<td>Fungicide for control of Powdery Mildew on grape-vines</td>
<td>Only to be applied by operators with RUP-level training and appropriate PPE</td>
<td>Approved</td>
</tr>
</tbody>
</table>
TABLE ES-1: PESTICIDES (ACTIVE INGREDIENTS) APPROVED FOR PROCUREMENT/USE/SUPPORT BY ACTIVITIES IN AFGHANISTAN

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<th>STATUS IN 2013 PROGRAMMATIC PERSUAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boscalid</td>
<td>Fungicide for control of Powdery Mildew on vegetables and anthracnose on almonds</td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Carboxin</td>
<td>Fungicide used as a mixture with thiram (Vitavax)</td>
<td>Use only as seed treatment</td>
<td>Approved as mixture with thiram</td>
</tr>
<tr>
<td>Copper hydroxide</td>
<td>Fungicide for the control of Downy Mildew on grapes</td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Copper oxychloride</td>
<td>Fungicide for prevention of anthracnose in grapes</td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Copper sulfate</td>
<td>Dormant season treatment of fruit trees</td>
<td>Use only in Bordeaux Mixture for dormant season treatment of fruit trees.</td>
<td>Approved for use as Bordeaux Mixture</td>
</tr>
<tr>
<td>Kresoxim-methyl</td>
<td>Fungicide for control of Powdery Mildew on grapevines</td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Mancozeb</td>
<td>Systemic fungicide for treatment of Early Blight in potatoes and treatment of fungal diseases in vegetables &amp; in nurseries</td>
<td>Only to be applied by operators with RUP-level training and appropriate PPE. May not be used in home vegetable plots</td>
<td>Approved</td>
</tr>
<tr>
<td>Metalaxyl</td>
<td>Systemic fungicide used as a soil treatment for control of soil-borne pathogens, and as a seed treatment to control downy mildews</td>
<td>Only to be applied by operators with RUP-level training and appropriate PPE.</td>
<td>Approved for use as a mixture with mancozeb</td>
</tr>
<tr>
<td>Propiconazole</td>
<td>Systemic fungicide</td>
<td></td>
<td>Not reviewed</td>
</tr>
<tr>
<td>Quinoxyfen</td>
<td>Fungicide for control of Powdery Mildew on grapevines</td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Sodium metabisulfite</td>
<td>Protection of packaged grapes and apricots and other crops against fungus</td>
<td>Use only in Sulfur Pads</td>
<td>Not reviewed</td>
</tr>
<tr>
<td>Sulfur</td>
<td>Protective treatment of grapevines, apricots and</td>
<td></td>
<td>Approved</td>
</tr>
</tbody>
</table>
### TABLE ES-1: PESTICIDES (ACTIVE INGREDIENTS) APPROVED FOR PROCUREMENT/USE/SUPPORT BY ACTIVITIES IN AFGHANISTAN

**NOTE:** This table is identical to table 6.1 in the main text of this PERSUAP.

<table>
<thead>
<tr>
<th>ACTIVE INGREDIENT (AI)</th>
<th>USES</th>
<th>AI-SPECIFIC CONDITIONS</th>
<th>STATUS IN 2013 PROGRAMMATIC PERSUAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tebuconazole</td>
<td>Systemic fungicide for control of Powdery Mildew in grape-vines</td>
<td>Approved</td>
<td></td>
</tr>
<tr>
<td>Thiram (TMTD)</td>
<td>Fungicide used as a mixture with carboxin (Vitavax)</td>
<td>Use only as seed treatment</td>
<td>Approved for use as mixture with carboxin</td>
</tr>
</tbody>
</table>

**Insecticides**

<table>
<thead>
<tr>
<th>ACTIVE INGREDIENT (AI)</th>
<th>USES</th>
<th>AI-SPECIFIC CONDITIONS</th>
<th>STATUS IN 2013 PROGRAMMATIC PERSUAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetamiprid</td>
<td>Systemic insecticide for use against sap-sucking pests</td>
<td>Approved</td>
<td></td>
</tr>
<tr>
<td>Azadirachtin (neem oil)</td>
<td>Low toxicity protection against a range of insect pests</td>
<td>Approved</td>
<td></td>
</tr>
<tr>
<td>Bacillus thuringiensis-BT</td>
<td>Control of lepidopterous pests of vegetables</td>
<td>Approved</td>
<td></td>
</tr>
<tr>
<td>Beauvaria bassiana</td>
<td>Control of Sunn Pest &amp; Colorado Beetle</td>
<td>Approved</td>
<td></td>
</tr>
<tr>
<td>Bifenthrin</td>
<td>Acaricide for control of Spider Mite</td>
<td>Not reviewed</td>
<td></td>
</tr>
<tr>
<td>Carbaryl</td>
<td>Control of cutworm on vegetables</td>
<td>Use only as powder for cutworm control</td>
<td>Approved</td>
</tr>
<tr>
<td>Chlorantranilipole</td>
<td>Mainly for control of pest Tuta Absoluta on wide range of crops, particularly tomatoes (products such as Coragen, Rynaxypyr)</td>
<td>Do not use near sources of water</td>
<td>Not reviewed</td>
</tr>
<tr>
<td>Cypermethrin</td>
<td>Broad spectrum insecticide/acaricide for control of ecto-parasites on livestock</td>
<td>Use only as pour-on</td>
<td>Not reviewed for this use</td>
</tr>
<tr>
<td>Cypermethrin (alpha)</td>
<td>Broad spectrum contact insecticide</td>
<td>Extremely toxic to aquatic organisms. Do not use near sources of water. Some EC products are RUP and should be used only by trained professionals. Most zeta-</td>
<td>Approved</td>
</tr>
<tr>
<td>Cypermethrin (beta)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*All entries are based on information provided in the PERSUAP report.*
### TABLE ES-1: PESTICIDES (ACTIVE INGREDIENTS) APPROVED FOR PROCUREMENT/USE/SUPPORT BY ACTIVITIES IN AFGHANISTAN

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<th>AI-SPECIFIC CONDITIONS</th>
<th>STATUS IN 2013 PROGRAMMATIC PERSUAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>CYPHERMETHRIN</td>
<td>Contact insecticide for control of adult locust swarms. Apply by ULV</td>
<td>May only be used for migratory pest control by, or under the supervision of, Plant protection quarantine Department (PPQD) staff and with appropriate PPE.</td>
<td>Approved</td>
</tr>
<tr>
<td>DELTAMETHRIN</td>
<td>Persistent stomach poison insecticide poison applied by ULV as barriers against marching locust hoppers (larvae)</td>
<td>May only be used for migratory pest control by, or under the supervision of, Plant protection quarantine Department (PPQD) staff and with appropriate PPE.</td>
<td>Approved</td>
</tr>
<tr>
<td>DIFLUBENZURON</td>
<td>Acaricide for control of Spider Mite</td>
<td>Use only as seed treatment</td>
<td>Approved</td>
</tr>
<tr>
<td>IMIDACLOPRID</td>
<td>Systemic insecticide for seed treatment to protect emerging seedlings against aphids</td>
<td>Approved</td>
<td></td>
</tr>
<tr>
<td>INSECTICIDAL SOAP</td>
<td>Non-toxic treatment against aphids</td>
<td>Approved</td>
<td></td>
</tr>
<tr>
<td>MALATHION</td>
<td>Broad spectrum contact insecticide</td>
<td>Only to be applied by operators with RUP-level training and appropriate PPE</td>
<td>Approved</td>
</tr>
<tr>
<td>MINERAL OIL</td>
<td>Horticultural oil for preventive treatment of fruit trees against overwintering pests</td>
<td>Use as dormant season oil spray</td>
<td>Approved</td>
</tr>
<tr>
<td>SPINOSAD</td>
<td>Contact insecticide for control of Colorado Beetle and Melon Fly</td>
<td>Only to be applied by operators with RUP-level training and appropriate PPE</td>
<td>Approved</td>
</tr>
<tr>
<td>ALUMINUM PHOSPHIDE</td>
<td>Fumigation of commodities in transport or storage</td>
<td>Use only in accordance with USAID Food Commodity Fumigation PEA. Requires separate approval of the MEO.</td>
<td>Approved</td>
</tr>
<tr>
<td>ACTIVE INGREDIENT (AI)</td>
<td>USES</td>
<td>AI-SPECIFIC CONDITIONS</td>
<td>STATUS IN 2013 PROGRAMMATIC PERSUAP</td>
</tr>
<tr>
<td>-----------------------</td>
<td>------</td>
<td>------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td><strong>Acaricide</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acequinocyl</td>
<td>Acaricide for control of Spider Mite</td>
<td>Not reviewed</td>
<td></td>
</tr>
<tr>
<td><strong>Synthetic pheromones</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(E,E)-8,10-Dodecadien-1-ol SPLAT-Cydia</td>
<td>Synthetic pheromone for control of Codling Moth by Mating disruption</td>
<td>Pheromones are not regulated in the US, however Pheromone formulations and Pheromones contained in solid matrix dispensers which are placed in large numbers are regulated. SPLAT-Cydia is registered in the US</td>
<td>Approved</td>
</tr>
<tr>
<td>7,9,11-Dodecatrien-1-ol, formate SPLAT-eC</td>
<td>Synthetic pheromone for control of Carob Moth by Mating disruption</td>
<td>Pheromones are not regulated in the US, however Pheromone formulations and Pheromones contained in solid matrix dispensers which are placed in large numbers are regulated. SPLAT-EC registered in the US</td>
<td>Approved</td>
</tr>
<tr>
<td><strong>Molluscide</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metaldehyde</td>
<td>Molluscide for control of slugs and snails on vegetables</td>
<td>Approved</td>
<td></td>
</tr>
<tr>
<td><strong>Rodenticides</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brodifacoum</td>
<td>Rodenticide for control of rats &amp; mice in buildings</td>
<td>Use only in secure bait stations</td>
<td>Approved</td>
</tr>
<tr>
<td>Bromadiolone</td>
<td>Rodenticide for control of rats &amp; mice in buildings</td>
<td>Use only in secure bait stations</td>
<td>Approved</td>
</tr>
</tbody>
</table>

http://www.usaidgems.org/fumigationpea.htm
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<th>AI-SPECIFIC CONDITIONS</th>
<th>STATUS IN 2013 PROGRAMMATIC PERSUAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warfarin</td>
<td>Rodenticide for control of rats &amp; mice in buildings</td>
<td>Use only in secure bait stations</td>
<td>Approved</td>
</tr>
<tr>
<td>zinc phosphide</td>
<td>Rodenticide for control of rats &amp; mice in buildings</td>
<td>Use only in secure bait stations</td>
<td>Not reviewed</td>
</tr>
</tbody>
</table>
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<tr>
<th>ACRONYMS</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAEP</td>
<td>Afghanistan Agricultural Extension Project</td>
</tr>
<tr>
<td>AAIP</td>
<td>Afghanistan Agricultural Inputs Project</td>
</tr>
<tr>
<td>ABADE</td>
<td>Assistance in Building Afghanistan by Developing Enterprise</td>
</tr>
<tr>
<td>ACE</td>
<td>Agriculture Credit Enhancement</td>
</tr>
<tr>
<td>ADF</td>
<td>Agricultural Development Fund</td>
</tr>
<tr>
<td>ADP/N</td>
<td>Alternative Development Project North</td>
</tr>
<tr>
<td>ADP/SW</td>
<td>Alternative Development Project South-West</td>
</tr>
<tr>
<td>AFSA</td>
<td>Afghan Farm Service Alliance</td>
</tr>
<tr>
<td>AI</td>
<td>Active Ingredient</td>
</tr>
<tr>
<td>AO</td>
<td>Assistance Objectives</td>
</tr>
<tr>
<td>AOR/COR</td>
<td>Agreement Officer Representative/Contract Officer Representative</td>
</tr>
<tr>
<td>ARTF/SEHAT</td>
<td>Afghanistan Reconstruction Trust Fund /System Enhancement for Health Action in Transition</td>
</tr>
<tr>
<td>ASAP</td>
<td>Accelerating Sustainable Agriculture Project</td>
</tr>
<tr>
<td>BEO</td>
<td>Bureau Environmental Officer</td>
</tr>
<tr>
<td>BPHS</td>
<td>Basic Package of Health Service</td>
</tr>
<tr>
<td>CAA</td>
<td>Clean Air Act</td>
</tr>
<tr>
<td>CABI</td>
<td>Centre for Agriculture and Bioscience International (Canada)</td>
</tr>
<tr>
<td>CBD</td>
<td>Convention on Biological Diversity</td>
</tr>
<tr>
<td>CCP</td>
<td>Central Contraceptive Procurement</td>
</tr>
<tr>
<td>CFR</td>
<td>Code of Federal Regulations</td>
</tr>
<tr>
<td>CHAMP</td>
<td>Commercial Horticulture &amp; Marketing Development Program</td>
</tr>
<tr>
<td>CIMMYT</td>
<td>Centro Internacional de Mejoramiento de Maiz y Trigo (International Maize and Wheat Improvement Center)</td>
</tr>
<tr>
<td>CSO</td>
<td>Central Statistical Office</td>
</tr>
<tr>
<td>DAAIL</td>
<td>Department of Agriculture, Irrigation and Livestock</td>
</tr>
<tr>
<td>DCAR</td>
<td>Delegated Cooperation on Nutrition</td>
</tr>
<tr>
<td>DCHA</td>
<td>Democracy, Conflict, and Humanitarian Assistance</td>
</tr>
<tr>
<td>DEWS</td>
<td>Disease Early Warning System</td>
</tr>
<tr>
<td>DFATD</td>
<td>Department of Foreign Affairs, Trade and Development (Now Global Affairs)</td>
</tr>
<tr>
<td>DHS</td>
<td>(Afghanistan) Demographic Health Survey</td>
</tr>
<tr>
<td>EC</td>
<td>Emulsifiable Concentrate</td>
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<tr>
<td>EMMP</td>
<td>Environmental Mitigation and Monitoring Plan</td>
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<td>US Environmental Protection Agency</td>
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<td>Expatriate Pesticide Expert</td>
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<td>EPHS</td>
<td>Essential Package of Hospital Service</td>
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<td>FAQ</td>
<td>Food and Agriculture Organization</td>
</tr>
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<td>FFS</td>
<td>Farmer Field Schools</td>
</tr>
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<td>FIFRA</td>
<td>Federal Insecticide, Fungicide and Rodenticide Act</td>
</tr>
<tr>
<td>FtF</td>
<td>Feed the Future</td>
</tr>
<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
</tr>
<tr>
<td>GoA</td>
<td>Government of the Islamic Republic of Afghanistan</td>
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<tr>
<td>GIZ</td>
<td>Gesellschaft fur Internationale Zusammenarbeit (formerly known as GTZ)</td>
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<td>GTZ</td>
<td>Gesellschaft fur Technische Zusammenarbeit</td>
</tr>
<tr>
<td>GUP</td>
<td>General Use Pesticides</td>
</tr>
<tr>
<td>HACCP</td>
<td>Hazardous Analysis Cortical Control Point</td>
</tr>
<tr>
<td>HDI</td>
<td>Human Development Index</td>
</tr>
<tr>
<td>HEMAYAT</td>
<td>Helping Mothers and Children Thrive</td>
</tr>
<tr>
<td>HLP</td>
<td>Horticulture and Livestock Project</td>
</tr>
<tr>
<td>IDEA-NEW</td>
<td>Incentives Driving Economic Alternatives – North, East, West</td>
</tr>
<tr>
<td>IEE</td>
<td>Initial Environmental Examination</td>
</tr>
<tr>
<td>IGR</td>
<td>Insect Growth Regulator</td>
</tr>
<tr>
<td>ILGNR</td>
<td>Improving Livelihoods and Governance through Natural Resource Management</td>
</tr>
<tr>
<td>INL</td>
<td>International Narcotics and Law Enforcement Affairs</td>
</tr>
<tr>
<td>IP</td>
<td>Implementing Partner</td>
</tr>
<tr>
<td>IPM</td>
<td>Integrated Pest Management</td>
</tr>
<tr>
<td>IPMP</td>
<td>Integrated Pest Management Plan</td>
</tr>
</tbody>
</table>
SECTION 1. INTRODUCTION

Between 1974 and 1976, over 2,800 Pakistan malaria spray personnel were poisoned (five fatally) by insecticide mishaps on a USAID/WHO anti-malaria program. In response to this and other environment, health and safety incidents arising from USAID programs, a lawsuit was brought by a coalition of environmental groups against USAID over the Agency’s lack of environmental review/safeguard procedures for overseas projects. In response, USAID developed 22 CFR 216. This US federal regulation requires a pre-implementation environmental impact assessment process for almost all USAID activities.

USAID’s Pesticide Procedures. Where a USAID-funded activity involves procurement, use or support to the use of pesticides, the regulation imposes specific, additional requirements per 22 CFR 216.3(b), referred to as USAID’s Pesticide Procedures. In summary, the pesticide procedures mandate that a pesticide may only be approved for procurement or use following an analysis of 12 specified factors focused on need and risk (see box at right). Additional, more rigorous analytical requirements attach to pesticides not approved by the United States Environmental Protection Agency (EPA) for same or similar uses, or which are designated by EPA as restricted-use. Approval—which requires mission director clearance and Bureau Environmental Officer (BEO) concurrence—of any given pesticide under these procedures in almost all cases is contingent on specified restrictions and safer use requirements.

Pesticide Evaluation Reports and Safer Use Action Plans (PERSUPs) are generally the instrument by which the pesticide procedures are addressed. Once approved, PERSUAPs amend the Reg. 216 documentation (IEEs or EAs) for the subject projects/activities and the conditions they establish become binding.

Generally, USAID is moving towards mission- or sector-level PERSUAPs rather than project-specific ones. This is intended to reduce redundant preparation effort, simplify compliance oversight, and enhance consistency.

When registering pesticide active ingredients (AIs), EPA develops a Registration Eligibility Decision Document (RED) that describes the use profile including the purposes for which the pesticide may be used (types of pests, food uses such as crops and non-food uses such as wood treatment, veterinary use), and the method by which it may be applied. Pesticide product Material Safety Data Sheet (MSDS) and Labels include all the relevant information about the product including its toxicity and precautions such as PPE required, product toxicity to humans and environment and safety periods, and in the case of a Restricted Use Pesticide (RUP), the qualifications of the user. US EPA makes these stipulations within a context of adequate education, an effective technical training capacity, legislative protection of workers and the general public, and law enforcement. These conditions may not apply or be consistent in practice in many host countries of USAID projects and this is notably true of Afghanistan. The PERSUAP, therefore, gives an opportunity to analyse needs and available pesticides in the host country for USAID programs, consider practices for application and handling in a context relevant to proposed usage in the
country, consider what additional risks exist, and identify mitigating measures that are consistent with the capacity within the host country to apply safely, store, and monitor pesticide use.

**AORs/CORs are responsible** for assuring that environmental compliance requirements for their programs are met, including compliance with PERSUAPs. As for all environmental compliance matters, guidance and assistance with PERSUAP compliance is available from the Mission Environmental Officer (MEO), Regional Environmental Officer (REO), and the Bureau Environmental Officer (BEO).

**Afghanistan’s Regulation of Pesticides:** The Government of the Islamic Republic of Afghanistan (GoA) has enacted legislation to regulate the sale and use of pesticides (“Pesticide Law.” Published 27/07/1394 (19 Oct 2015). Official Gazette No. 1190. Annex D). However, the regulatory system has not yet been put in place. Therefore, at this time, there are no pesticides registered for importation or sale in Afghanistan. The Plant Protection and Quarantine Department (PPQD) prohibits the import or sale of chemicals listed as Persistent Organic Pollutants (POPs) under the Stockholm Convention and those requiring Prior Informed Consent (PIC) under the Rotterdam Convention.

**1.1 PURPOSE AND SCOPE**

In compliance with USAID’s Pesticide Procedures (22 CFR 216.3(b)), this PERSUAP:

- Establishes the set of pesticides for which procurement, use or support for use is authorized across all USAID/Afghanistan programs.
- Establishes the conditions under which the authorized pesticides may be procured, used, or their use supported to best ensure user, consumer and environmental safety.

These requirements come into effect upon approval of the PERSUAP. This PERSUAP supersedes and replaces the USAID/Afghanistan mission PERSUAP approved in 2013.2

In addition to current projects/activities, this PERSUAP is designed to provide for the needs of future USAID/Afghanistan projects with the same or similar pest management needs.

The following crop production value-chains are addressed by this PERSUAP: wheat, oilseeds including flax, sesame safflower, canola and sunflower, potatoes, vegetables, grapes, stone fruit and almonds, apples and other pome fruit.

In addition, the PERSUAP addresses seed treatment and the use of pesticides for postharvest storage, as well as use of pesticides for treatment of livestock. This PERSUAP also provides for the use of disinfectants and sterilants by USAID funded health projects.

Should future projects require the procurement, use or support to use of pesticide AIs not authorized by this PERSUAP, or for uses not authorized by this PERSUAP, an amendment to this PERSUAP will be necessary.

**1.2 STRUCTURE**

The **Introduction** gives a brief account of Afghanistan, its geography, economy and governance. In particular, it describes agricultural practices, and the system of environmental protection and pesticide regulation.

The **Pesticide Evaluation Report (PER, Sections 4 and 5)** identifies those pesticide active ingredients (AIs) that are authorized by USAID and specifies the conditions under which they may be used to ensure safety. This is established by the 12 point risk evaluation (22 CFR 216.3(b)) of a candidate list based on the needs of the projects, products available on the local market and known pesticide use within the region. This assessment takes account of the current state of the pesticide retail sector in Afghanistan and, in particular, problems of quality and labelling. The PER is intended for USAID reviewers; Implementing partners (IPs), COR/AORs generally need not refer to this section.

6.4) for assigning responsibilities and timelines for implementation of these requirements. Each project subject to this PERSUAP must complete this SUAP template and submit to its Agreement/Contract Officer’s Representative (A/COR) and Mission Environmental Officer (MEO) for approval. Experience across USAID shows that a consistent, clear system for planning and tracking PERSUAP compliance is essential to achieving compliance—and thus successfully controlling pesticide risks in USAID programs

1.2 DEFINITION OF PESTICIDES AND INTEGRATED PEST MANAGEMENT,

DEFNITION OF PESTICIDES

In implementing its Pesticide Procedures, USAID is bound by the definition of “pesticide” utilized by EPA and as established by the US Federal Fungicide, Insecticide, and Rodenticide Act (FIFRA). Per this definition, pesticides are agents used to kill or control (including repel) any pest, including insects, rodents or birds, unwanted plants (weeds), fungi, or microorganisms such as bacteria and viruses. The term “pesticide” applies to insecticides, herbicides, fungicides, microbicides, rodenticides, and various other substances used to control pests. Most pesticides are by design poisons, and their use entails a degree of risk to the environment including humans, animals, birds, fish, bees, and other living organisms.

USAID POLICY: INTEGRATED PEST MANAGEMENT (IPM)

Since the early 1990s USAID has been committed to the philosophy and practice of IPM as official policy. There is not a single standard international definition for IPM, but there is wide agreement on its basic elements.

• IPM is an ecosystem-based strategy that focuses on long-term prevention of damage from pests.
• It employs a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties to minimize pest damage.
• Pesticides are used only after monitoring indicates they are needed according to established guidelines, and treatments are made with the goal of removing only the target organism.
• Pest control materials are selected and applied in a manner that minimizes risks to human health, beneficial and non-target organisms, and the environment.

IPM is strongly promoted as part of 22 CFR 216.3(b) Factor C (see Box 1).

1.3 DEVELOPMENT OF THIS PERSUAP

USAID Afghanistan is currently implementing or planning to implement a number of agriculture, economic growth and health projects that either are using pesticides or have the potential need to do so. Other sectors such as infrastructure and education have not reported the need to use pesticides in their activities. In 2013, an “umbrella” or Programmatic PERSUAP (P-PERSUAP) was prepared and approved to avoid duplication of effort and ensure a consistent approach across the mission’s programs. Now that two years have elapsed, USAID decided to fully update the PERSUAP to take account of changes in mission programs and the regulatory environment.

This update, resulting in the current document, was undertaken as a USAID/Afghanistan-commissioned activity under the Global Environmental Management Support (GEMS II) project. GEMS II is a global program implemented under a USAID E3 Bureau contract that provides environmental compliance, management, and sound design support to USAID’s Environmental Officers, individual agency operating units, and their projects and programs.

The team for the PERSUAP update consisted of an Expatriate Pesticide Expert (EPE, Andrew Harvey, Ph.D.) and an Afghan National Pesticide Expert (ANPE, M. Zaki Afshar) with support from GEMS II home office. The principal contacts at the Mission and Office of Afghanistan and Pakistan Affairs (OAPA) office were the Office of Program and Project Development, MEO and Deputy MEO, Technical Officer Directors, and A/CORS. The EPE travelled to Afghanistan in late November 2015 for two working weeks on the ground.

The Scope of Work was to:

a) Review the current IEEs, Mission 2013 P-PERSUAP, other relevant PERSUAPs and other documents relating to potential use of pesticides, and Agency’s best practice with “programmatic PERSUAP,” e.g. those prepared for USAID-funded activities in Kyrgyzstan, Tajikistan, Pakistan and other locations throughout the Central and South Asia.

b) Prepare an outline with Table of Contents (TOC) for a PERSUAP Update document to be concurred by the BEO/OAPA and cleared by USAID/Afghanistan. This should include a short (one to two paragraphs) description of what would be contained in each section.

c) Present to USAID/Afghanistan, for approval, a work plan for the development of the PERSUAP Update within 5 work days after the award.

d) Identify natural resources (water, soil, air) and biodiversity (sensitive areas and parks, rare species, natural bodies of water) that may be at risk from pesticide use, and identify measures to mitigate risks.

e) Evaluate PERSUAP implementation challenges with A/CORs, implementing partners, provincial and national policymakers, pesticide sales systems, pesticide storage systems, pesticide use systems, pesticide labelling, transport and clean-up, and pesticide/container disposal systems.

f) Identify environment and safety standard linkages to certification and trade issues such as International Organization for Standardization (ISO) 14000 and Hazardous Analysis Cortical Control Point (HACCP,) and review national obligations and their implementation under ratified international environmental agreements and conventions.

The following workplan was developed.

<table>
<thead>
<tr>
<th>TABLE 1.1. WORKPLAN</th>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>Review the project documentation</strong></td>
<td>Form an overview of the PERSUAP needs of the program</td>
</tr>
<tr>
<td><strong>Update pesticide data</strong></td>
<td>Check for any changes in the EPA registration status of the 2013 PERSUAP list of approved pesticides. Update database (list of candidate chemicals, regulatory status, status in other PERSUAPs, human and environmental toxicology etc.)</td>
</tr>
<tr>
<td><strong>Survey of pesticide dealers</strong></td>
<td>Survey (to be carried out by NPE) Analysis (to be carried out by EPE)</td>
</tr>
<tr>
<td><strong>Questionnaire to projects</strong></td>
<td>Distribution (by MEO) Analysis (to be carried out by EPE) paying particular attention to:</td>
</tr>
<tr>
<td></td>
<td>Change in value-chains and possible requirements for chemicals in processing and preservation of produce;</td>
</tr>
<tr>
<td></td>
<td>Possible increased need for pesticides in livestock husbandry;</td>
</tr>
<tr>
<td></td>
<td>Need for training of project staff in order to comply with PERSUAP;</td>
</tr>
<tr>
<td></td>
<td>Need for training given to beneficiaries to comply with PERSUAP.</td>
</tr>
<tr>
<td><strong>Interview project CoPs (or other senior staff)</strong></td>
<td>How is the PERSUAP utilized in their work? Are there products that they wanted to use but couldn’t? Have they complied with the requirement for training? Any progress on improving agricultural retailers? Any developments in improving IPM? What are the needs of Health Projects for products requiring PERSUAP?</td>
</tr>
<tr>
<td></td>
<td>Project staff not available</td>
</tr>
</tbody>
</table>
Interview government regarding progress on regulation

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interview government regarding progress on regulation</td>
<td>Head of Plant Protection and Quarantine Dept. Ministry of Agriculture, Irrigation and Livestock (MAIL) Deputy Minister if available NEPA</td>
<td>6th Dec PPQD</td>
</tr>
<tr>
<td>Interviews with other relevant agencies</td>
<td>Food and Agriculture Organization (FAO) (IPM project) World Bank UNEP Dutch Committee for Afghanistan</td>
<td>29th Nov-10th Dec</td>
</tr>
<tr>
<td>Review environmental information</td>
<td>Endangered species list Protected areas Vulnerable habitats</td>
<td>29th Nov – 10th Dec</td>
</tr>
<tr>
<td>Draw up revised Pest Management Plans</td>
<td>Assess needs of projects Draft crop-based PMPs Draw up revised pesticide list and collate regulatory and toxicology information. Draw up revised recommendations for mitigation.</td>
<td>5th Dec – 20th Jan</td>
</tr>
<tr>
<td>Meet OAG and other relevant Mission staff</td>
<td>Discuss compliance with 2013 PERSUAP. Discuss implementation of recommendations in revised PERSUAP</td>
<td>3rd Dec</td>
</tr>
<tr>
<td>Prepare updated document</td>
<td>Submit conclusions to MEO, UNEP, NEPA, Ministry of Agriculture, Irrigation and Livestock (MAIL) for discussion and comments Prepare draft for submission to MEO. Revise draft and edit final version</td>
<td>22nd 30th Dec -</td>
</tr>
</tbody>
</table>

While working in Kabul, the EPE was based at the UNEP office and benefited from UNEP’s connections with in-country environmental protection agencies and organisations as well as interaction with the consultant team undertaking an Environmental Threats and Opportunities Assessment (ETOA) for USAID/Afghanistan, whose work overlapped in Kabul and was also based with UNEP.

SECTION 2. USAID/AFGHANISTAN PROGRAMMING.

As noted above, this PERSUAP covers both current USAID/Afghanistan programs and foreseeable future programming. This section summarizes current programs with need and potential need for pesticide use.

2.1 USAID AGRICULTURAL PROGRAM

USAID assistance in Afghanistan to the agricultural sector focuses on helping to create farm and non-farm jobs, increasing incomes, and strengthening Afghans’ confidence in their own government. USAID programs improve productivity, regenerate agribusiness, rehabilitate watersheds and irrigation infrastructure, and increase the capacity of the Afghan Ministry of Agriculture, Irrigation and Livestock MAIL to deliver services effectively. By working with farmers and agricultural businesses on the continuum from “farm-to-fork” or agricultural value chains, USAID helps them overcome obstacles hindering production, processing, or marketing and sales of agricultural products. By intervening in critical bottlenecks—such as providing assistance in improving packaging or helping to connect farmers to markets—USAID is helping Afghans achieve significant impacts on agricultural yields, incomes, and jobs.

The USAID/Afghanistan Agriculture Program has established more than 481 veterinary field units, administered 26 million vaccinations to 12.8 million livestock, trained more than 2.1 million men and women in improved farm and business skills, established a $100 million Agricultural Development Fund to provide loans to Afghan farmers, brought 316,000 hectares of illicit crops under alternative cultivation, established 18 farm service centers that provide access to high quality seeds, tools, equipment and
chemicals, and serve as centers for access to market and technical information, and facilitated $325 million in increased sales of legal farm and non-farm products.

TABLE 2.1 CURRENT AND PLANNED PROJECTS WITH POTENTIAL PESTICIDE USE IN AFGHANISTAN

<table>
<thead>
<tr>
<th>ABBREVIATION</th>
<th>PROJECT NAME</th>
<th>START</th>
<th>END</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAEP II</td>
<td>Afghanistan Agricultural Extension Program</td>
<td>1-Oct-14</td>
<td>30-Sep-17</td>
</tr>
<tr>
<td>ACE-II</td>
<td>Expanding Access to Credit for Agriculture Sector in Afghanistan</td>
<td>23-Jun-15</td>
<td>22-Jun-18</td>
</tr>
<tr>
<td>CBCMP II</td>
<td>Capacity building and change management program II</td>
<td>10-Jul-14</td>
<td>9-Jul-17</td>
</tr>
<tr>
<td>CHAMP</td>
<td>Commercial Horticulture &amp; Marketing Development Program</td>
<td>1-Feb-10</td>
<td>30-Dec-16</td>
</tr>
<tr>
<td>KFZ</td>
<td>Kandahar Food Zone</td>
<td>31-Jul-13</td>
<td>30-Aug-16</td>
</tr>
<tr>
<td>RADP-N</td>
<td>Regional Agriculture Development Program North</td>
<td>21-May-14</td>
<td>20-May-19</td>
</tr>
<tr>
<td>RADP-S</td>
<td>Regional Agriculture Development Program South</td>
<td>7-Oct-13</td>
<td>6-Oct-18</td>
</tr>
<tr>
<td>RADP-W</td>
<td>Regional Agriculture Development Program West</td>
<td>6-Aug-14</td>
<td>5-Aug-19</td>
</tr>
<tr>
<td>SAAF</td>
<td>Strengthening Afghan Agriculture Faculties Program</td>
<td>25-Mar-11</td>
<td>31-Dec-16</td>
</tr>
<tr>
<td>ABADE</td>
<td>Assistance in Building Afghanistan by Developing</td>
<td>16-Oct-12</td>
<td>16-Oct-16</td>
</tr>
<tr>
<td>SWIM</td>
<td>Strengthening Watershed and Irrigation Management</td>
<td>3-Sept-16</td>
<td>3-Sept-21</td>
</tr>
</tbody>
</table>

AGRICULTURAL RESEARCH AND EXTENSION PROGRAM (AAEP II)

AAEP II continues the work of AGRED, providing extension and advisory services to Afghan farmers and to build the capacity of the Government of the Islamic Republic of Afghanistan (GoA) through (MAIL) and its Provincial Directorates (DAILs) to develop sustainable extension and advisory services.

The IEE for this project determines that a PERSUAP will be required for part of its activities, which will include variety trials and other field experiments. Its requirement can be inferred from the known crops and their associated pest, disease and weed problems. Therefore, subject to annual revision, this PERSUAP can make provision for the project’s needs.

EXPANDING ACCESS TO CREDIT FOR AGRICULTURE SECTOR IN AFGHANISTAN (ACE II)

In July 2010, a $100 million USD grant to Afghanistan’s MAIL established the Agricultural Development Fund (ADF) to provide credit to small commercial farmers and agribusinesses. The Agricultural Credit Enhancement (ACE) program established and managed the ADF until it was transferred to the Afghan government. Throughout its course the program provided $60.7 million USD in loans directly benefiting more than 31,000 farmers.

The goal of ACE-II is to build upon results achieved by the previous program to expand access to agriculture-related credit as a necessary condition for a thriving agricultural economy. This in turn will increase agriculture sector jobs and increase the commercial viability of small-and medium-size farms and agribusinesses.

ACE provided finance to agricultural input suppliers, agricultural processors and small farmer credit unions which could be used to purchase pesticides. As such, it required a PERSUAP. However, ACE II is no longer a primary lender and so this no longer applies.
REGIONAL AGRICULTURAL DEVELOPMENT PROJECTS (RADPS)

The objective of the RADPs is to improve food and economic security for rural Afghans in targeted areas. The focus is on improving productivity and profitability for targeted value chains to be selected from the wheat, high-value crop, and livestock sectors. This sustainable agricultural development program will support the growth of the licit economy, including providing alternatives to poppy cultivation.

There are three projects within this program, covering the South, North, and West. They have a long-term, geographic agricultural development focus and utilize similar approaches, including working with the provincial departments of MAIL, the DAILs.

The RADPs require the use of pesticides, subject to annual update, this PERSUAP makes provision for their needs.

COMMERCIAL HORTICULTURE AND AGRICULTURE MARKETING PROGRAM (CHAMP)

CHAMP began in February 2010 and was extended twice, in June 2012 and December 2014, and will be extended again in 2016.

The project was conceived to achieve USAID’s objectives of boosting agricultural productivity and food security, providing market opportunities, and decreasing the country’s poppy production. Since 2010, CHAMP has worked to reduce poverty among rural Afghan farmers by helping them shift from relatively low-value subsistence crops, such as wheat, to high-value perennial crops such as fruit and vegetables. CHAMP has worked in half of the provinces of Afghanistan, providing training in best agricultural practices, building storage facilities such as cool rooms and raisin drying facilities, and helping grape farmers convert from traditional ground-based vineyards to higher output trellis systems. CHAMP had an approved PERSUAP, which was superseded by the 2013 P-PERSUAP.

KANDAHAR FOOD ZONE PROGRAM (KFZ)

The purpose of KFZ is to strengthen and diversify licit rural livelihoods in targeted districts by identifying and addressing the root causes and sources of instability that lead to opium poppy cultivation. This will be accomplished through stabilization and alternative livelihood activities that will encourage licit behavior on the part of targeted communities. KFZ is one component of a multi-agency and multi-sectoral effort to address opium poppy cultivation and processing in Kandahar Province. USAID’s KFZ efforts will complement additional efforts by the State Department’s Bureau for International Narcotics and Law Enforcement Affairs (INL) in the areas of counter-narcotics public information, governor-led eradication, and drug demand reduction. There are two components to the KFZ program. The first component focuses on local level interventions to be implemented through a mechanism that identifies and addresses the drivers of poppy cultivation in targeted districts. This will be achieved through a tailored package of interventions developed in close collaboration with affected communities and under the leadership of the Ministry of Counter Narcotics (MCN). The second component will support capacity building within the Ministry to improve management of its Alternative Livelihood program, including policy development, stability assessment, program design, implementation, management, and monitoring and evaluation. The KFZ program is anticipated to support counter narcotics efforts in areas with high levels of poppy cultivation in Kandahar province. As with other short-term stabilization programs targeting contested areas, KFZ will emphasize both speed and flexibility in program mobilization and implementation to adapt to rapidly changing security environments. To optimize effectiveness, KFZ interventions will be carefully aligned with the poppy production timeline and the governor-led eradication program.

2.2 USAID HEALTH PROGRAM

| TABLE 2.2 USAID HEALTH PROJECTS IN AFGHANISTAN |
| PROJECT | START DATE | END DATE |
| Challenge TB | 1/1/2015 | 12/31/2020 |

Improves TB control in Afghanistan by increasing case detection, improving treatment, and strengthening the Ministry of Public Health’s ability to coordinate and
<table>
<thead>
<tr>
<th>PROJECT</th>
<th>START DATE</th>
<th>END DATE</th>
<th>ACTIVITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strengthening Pharmaceutical Services (SPS)</td>
<td>8/28/2011</td>
<td>8/27/2015</td>
<td>Improves the MoPH ability to regulate and assure the quality of pharmaceutical products entering and used within the country and to ensure essential medicines are available in public sector health facilities in 13 USAID-supported provinces.</td>
</tr>
<tr>
<td>Helping Mother’s and Children Thrive (HEMAYAT)</td>
<td>1/7/2015</td>
<td>1/6/2020</td>
<td>Delivers high-impact health care to families in rural and difficult-to-reach areas where maternal, newborn, and child morbidity and mortality is high and utilization of maternal and child health services is low.</td>
</tr>
<tr>
<td>Polio Eradication and Disease Early Warning System (DEWS)</td>
<td>7/1/2014</td>
<td>9/30/2018</td>
<td>The project implements infectious disease monitoring, outbreak investigations, disease control coordination, logistical support and quality control.</td>
</tr>
<tr>
<td>Afghanistan Demographic Health Survey (DHS)</td>
<td>9/9/2013</td>
<td>9/8/2018</td>
<td>Gathers comprehensive demographic and health information of its citizens.</td>
</tr>
<tr>
<td>Central Contraceptive Procurement (CCP)</td>
<td>3/11/2014</td>
<td>12/31/2020</td>
<td>Provides a simplified mechanism for the transfer, obligation and disbursement of all USAID funds designed for contraceptive and condom procurement.</td>
</tr>
<tr>
<td>Weekly Iron Folic Acid Supplementation (WIFS)</td>
<td>11/7/2014</td>
<td>12/31/2017</td>
<td>Combats iron-deficiency anemia by providing weekly supplements and biannual treatment of parasites to girls in and out of school.</td>
</tr>
<tr>
<td>Routine Immunizations</td>
<td>9/1/2013</td>
<td>9/30/2015</td>
<td>USAID and CDC entered into an Inter-Agency Agreement (IAA) to join with the Ministry of Public Health and other donors to strengthen routine immunization in Afghanistan.</td>
</tr>
<tr>
<td>Leadership Management and Governance (LMG)</td>
<td>9/25/2012</td>
<td>12/31/2015</td>
<td>Providing direct assistance through Afghanistan’s national budget to support the ministries to implement their own service delivery efforts.</td>
</tr>
<tr>
<td>DELIVER</td>
<td>9/30/2010</td>
<td>9/29/2015</td>
<td>DELIVER acts as the procurement mechanism for both the commodities ordered through CCP as well as the essential drugs used in the BPHS/EPHS facilities in the 13 USAID-funded provinces.</td>
</tr>
<tr>
<td>Delegated Cooperation on Nutrition (DCAR)</td>
<td>12/19/2014</td>
<td>12/19/2016</td>
<td>Supports an ongoing nutrition program in Afghanistan. Global Affairs Canada is funding two projects with the aim of building the capacity of service providers and households to prevent and treat malnutrition in nine provinces.</td>
</tr>
<tr>
<td>PROJECT</td>
<td>START DATE</td>
<td>END DATE</td>
<td>ACTIVITY</td>
</tr>
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</tr>
<tr>
<td>Enhancing Community Access &amp; Utilization of Zinc and ORS for Childhood Diarrhea Management</td>
<td>7/21/2015</td>
<td>7/20/2020</td>
<td>Scaling up oral rehydration solutions</td>
</tr>
<tr>
<td>To improve Family Planning Status of men and women of reproductive age</td>
<td>5/20/2015</td>
<td>4/1/2016</td>
<td>Increasing access to reproductive health services, including voluntary family planning, has profound health, economic and social benefits for families and communities</td>
</tr>
<tr>
<td>ARTF (Afghanistan Reconstruction Trust Fund) - System Enhancement for Health Action in Transition (SEHAT)</td>
<td>1/10/2015</td>
<td>9/30/2019</td>
<td>Partnership with WB, expand the scope, quality, and coverage of basic health and essential hospital services</td>
</tr>
<tr>
<td>HPP (MoPH)</td>
<td>9/25/2011</td>
<td>8/31/2015</td>
<td>Health Policy</td>
</tr>
</tbody>
</table>

## INTEGRATED HEALTH SERVICES

### AND SYSTEM STRENGTHENING PROGRAM, PHASE 1 (IHSSSP I)

USAID’s IHSSP project, designed by the USAID/Afghanistan Office of Social Sector Development (OSSD), is the first phase of two, spanning ten years, and designed to meet ongoing health needs and challenges. It encompasses both on- and off-budget activities over a five-year period (2014-18) and will result in the award of an on-budget project through the ARTF/SEHAT and off-budget technical assistance projects designed to support the accelerated transition of selected assistance activities to Ministry of Public Health (MoPH) on-budget programs as well as the continued strengthening of MoPH capacity to manage its expanded on-budget program. IHSSSP I will continue to improve access to, and availability of, quality Basic Package of Health Services (BPHS) and Essential Package of Hospital Services (EPHS), particularly for women and children. It will also place special emphasis on strengthening community participation in order to ensure improved governance and accountability, as well as increasing sustainability through health care financing schemes and public-private partnerships. In addition, the program will increase demand for quality services and promote healthy behavior. Increased MoPH stewardship at both the central and provincial levels is a high priority for increased sustainability and institutionalization of the health program. Finally, the program will further strengthen the private sector’s ability to provide quality services and products at affordable prices.

The Basic Package of Health Services (BPHS) and Essential Package of Hospital Services (EPHS) may include the provision of microbicides that are classified by US EPA as pesticides. This PERSUAP makes provision for the procurement and use of such materials in the clinical environment.

## 2.3 ECONOMIC GROWTH PROGRAM

### ASSISTANCE IN BUILDING AFGHANISTAN BY DEVELOPING ENTERPRISES (ABADE)

Assistance in Building Afghanistan by Developing Enterprises (ABADE) is a four-year project which commenced in October 2012. ABADE primarily works with the private sector to strengthen the productivity of enterprises focused on sustained growth and job creation. ABADE’s objectives are to increase domestic and foreign investment, stimulate employment and improve sales of Afghan products. ABADE is designed to complement other USAID programs that are focused on improving the business enabling environment, increasing the workforce, and facilitating access to finance. Its alliances with Small and Medium Enterprises (SMEs) will accelerate productivity and job creation by mitigating risk and leveraging contributions from private companies via alliances. The project has three components: 1: SME and Public-Private Innovation Alliances; 2: Technical Assistance and Business Advisory Services and 3: Business Enabling Environment:

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To date ABADE has not allowed its grantees to use Rodenticides. ABADE has allowed grantees to procure and use disinfectants approved in the 2013 PERSUAP.

### 2.4 OTHER DONOR-SUPPORTED AGRICULTURE PROJECTS WITH POTENTIAL PESTICIDE USE IN AFGHANISTAN

#### GIZ (FORMERLY GTZ)

GIZ are implementing the Baghlan Agricultural Project (from 2011). It works in Pul-i-Khumrin and Baghlan-i-Jedid districts and is, expected to extend to Nahrin, Dahan-i-Ghori and Doshi districts. There are four components:

- Plant Production: wheat, potatoes, onions and stone fruit
- Irrigation (small infrastructure, water users associations)
- Livestock, sheep meat, wool spinning, poultry, fish ponds
- Capacity Building DAIL, DRRD, intern programme.
- Farmer Field Schools and Farmer Business Schools

The project makes use of demonstration plots and provides seeds, tools, sprayers and PPE for use on the demonstration plots. All purchases of pesticides must be approved by GIZ. The following pesticides have been purchased: Vitavax, Copper oxychloride, deltamethrin, terapur (nitroaniline herbicide) cypermethrin, zineb and mancozeb. Zineb is not registered for use by US EPA. Deltamethrin, cypermethrin and mancozeb are authorized by this P-PERSUAP with restrictions on use. “Terapur” cannot be identified.

#### IBRD (WORLD BANK)

IBRD supported the Horticulture and Livestock Project that was initiated in 2008. It was initially implemented by GTZ (now GIZ) but has since been handed over to MAIL. This project included an IPM component, implemented by FAO until 2010. This project made the first draft of the pesticide law now in law.

The project, now the National Horticulture and Livestock Project (NHLP), has funding until 2019. It works in 250 districts and covers perennial horticulture, vegetables and cereals. With Centre for Agriculture and Bioscience International Canada (CABI), it has established 22 plant health clinics with basic equipment such as microscopes and staffed by graduates. It conducts bazaar days and farmer field schools (FFS), with 6000 lead farmers. It coordinates with the USAID RADPs. It has formed producer associations for almonds, melons and grapes.

IBRD is now implementing the Afghanistan Agricultural Inputs Project (AAIP), formerly Improving Agriculture Inputs Delivery System Project, with an emphasis on infrastructure and capacity building. It will strengthen the Quarantine system by establishing quarantine stations at Badam Bagh (Kabul HQ), Kabul Airport, Kabul Customs, Kabul Post Office, Sher Khan Bandar in Kunduz (for Tajikistan border), Hairaton in Balkh (for Uzbekistan border), Aqina in Faryab (for Turkmenistan border), Torgundi in Herat (for Turkmenistan border), Islam Qala in Herat (for Iran border), Zaranj in Nimruz (for Chahar Bahar port in Iran), Spin Boldak in Kandahar (for Pakistan border), Ghalam Khan in Khost (for Pakistan border) and Torkham in Nangahar (for Pakistan border). These stations will not use chemical fumigation. Instead they will use a heat and cold system of sterilization.

This project will also develop regional diagnostic laboratories to serve the quarantine and plant protection services. Support to PPQD will include post-graduate training abroad for plant quarantine technical staff, pesticide technical staff, IPM/diagnostic technical staff, pesticide residue analysis technical staff, and fertilizer technical staff.

#### FAO

FAO has completed Phase I of an IPM project funded by the Government of Norway. It is hoped that funding will be forthcoming for a further phase. This project is based on Farmer Field Schools and is covering a number of crops, including wheat, potatoes, rice and melons. This project does not use, or recommend the use of, any pesticides.
2.5 ANALYSIS OF PERSUAP PRECEDENTS FOR AFGHANISTAN

As noted above, since 2001, USAID has had a large agricultural program in Afghanistan. The IEEs for current and planned agricultural projects are listed in 2.1. Where the date of the IEE is much earlier than the given project date, it is because the IEE applied to a completed project which preceded the one referred to. Note that this list is substantially complete, but may have some gaps where IEEs were not posted to USAID’s Environmental Compliance Database. All of the programs on this list required a valid PERSUAP.

<table>
<thead>
<tr>
<th>PROJECT</th>
<th>OAPA TRACKING NUMBER</th>
<th>SIGNED</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAEP II</td>
<td>OAPA-12-NOV-AFG-0007, Amended by OAPA-16-Dec-AFG-0008</td>
<td>20-Nov-11</td>
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<tr>
<td>AAEP II*</td>
<td>OAPA-14-MAY-AFG-0038</td>
<td>5-May-14</td>
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<tr>
<td>ABADE</td>
<td>OAPA-16-NOV-AFG-0005, Amendment 2 to OAPA-12-MAY-AFG-0033</td>
<td>30-Nov-15</td>
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<tr>
<td>ACE-II</td>
<td>ASIA-10-129</td>
<td>16-Jul-10</td>
</tr>
<tr>
<td>ACE-II</td>
<td>OAPA 13 AUG AFG 0063</td>
<td>29-Aug-13</td>
</tr>
<tr>
<td>ACE-II</td>
<td>OAPA 13 AUG AFG 0062</td>
<td>29-Aug-13</td>
</tr>
<tr>
<td>ACE-II</td>
<td>OAPA-14-JUL-AFG-0061, amended by OAPA-15-JUL-AFG-0024</td>
<td>31-Jul-14</td>
</tr>
<tr>
<td>ACE-II</td>
<td>OAPA-15-JUL-AFG-0024, Amendment 1 to OAPA-14-JUL-AFG-0061</td>
<td>7-Jul-15</td>
</tr>
<tr>
<td>CHAMP</td>
<td>ASIA-10-29, amended by OAPA 12 JAN AFG 0018 - COVT to CHAMP and OAPA-14-JUL-AFG-0060</td>
<td>1-Dec-09</td>
</tr>
<tr>
<td>CHAMP</td>
<td>OAPA-12-JAN-AFG-0018, Amendment 1 to ASIA 10-29</td>
<td>16-Jan-13</td>
</tr>
<tr>
<td>CHAMP</td>
<td>OAPA-14-JUN-AFG-0049, Amendment 2 to ASIA 10-29, amended by OAPA-14-JUL-AFG-0060</td>
<td>19-Jun-14</td>
</tr>
<tr>
<td>CHAMP</td>
<td>OAPA-14-JUL-AFG-0060, Amendment 3 to ASIA 10-29, amends OAPA-14-JUN-AFG-0049</td>
<td>31-Jul-14</td>
</tr>
<tr>
<td>IDEA-NEW***</td>
<td>ANE-08-1209 (Asia-PERS-08-120), amended by OAPA 14 JAN AFG 0021 - IDEA-NEW (Amendment 2), OAPA-15-JAN-AFG-0005 (Amendment 4)</td>
<td>6-Aug-08</td>
</tr>
<tr>
<td>IDEA-NEW</td>
<td>Asia-PERS-10-22, amended by Asia-PERS-10-66</td>
<td>15-Oct-09</td>
</tr>
<tr>
<td>IDEA-NEW</td>
<td>Asia-PERS-10-66, amends Asia-PERS-10-22</td>
<td>16-Mar-10</td>
</tr>
<tr>
<td>IDEA-NEW</td>
<td>OAPA-12-DEC-AFG-0011, Amendment 1 to Asia-IEE-09-88</td>
<td>20-Dec-11</td>
</tr>
<tr>
<td>IDEA-NEW</td>
<td>OAPA-14-JAN-AFG-0021, Amendment 2 to Asia-PERS-08-120</td>
<td>21-Jan-14</td>
</tr>
<tr>
<td>IDEA-NEW</td>
<td>OAPA-14-JUL-AFG-0058</td>
<td>23-Jul-14</td>
</tr>
<tr>
<td>KFZ</td>
<td>OAPA-14-JUL-AFG-0055, Amendment 1 to OAPA-</td>
<td>14-Jul-14</td>
</tr>
</tbody>
</table>

No PERSUAP was submitted or approved for USAID projects in Afghanistan until June 2008 when ADP/N and ASAP submitted documents. ADP/N received approval for a limited PERSUAP covering three insecticides: novaluron (benzoyl-urea), lambda-cyhalothrin (pyrethroid) and imidacloprid (neonicotoid). ASAP submitted a PERSUAP for 144 pesticides, which included three rodenticides, two molluscicides, 52 fungicides, 61 insecticide/acaricides and 22 herbicides.

A PERSUAP for ADP/SW was approved on 10th November 2009. This also analysed 144 pesticides.

In November 2009, IDEA-NEW submitted a PERSUAP for 21 pesticides: seven acaricide/insecticides, six fungicides, six herbicides and two insect pheromone mating disruptants.

CHAMP submitted a PERSUAP in January 2011, but this was not passed to the MEO until March 2013. In April 2013, a memorandum granting retrospective authority to use these products was approved pending the development of a Mission-wide PERSUAP.

ACE, which is a finance project some of whose funds are disbursed for the purchase of pesticides, received MEO permission to use the IDEA-NEW PERSUAP pending the approval of a program-wide PERSUAP.

**TABLE 2.4. PERSUAPS**

<table>
<thead>
<tr>
<th>PROJECT</th>
<th>STATUS</th>
<th>PERSUAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASAP (Accelerating Sustainable Agriculture Project)</td>
<td>Closed</td>
<td>2008</td>
</tr>
<tr>
<td>ADP/N (Alternative Development Project North)</td>
<td>Closed</td>
<td>6 Aug 2008</td>
</tr>
<tr>
<td>ADP/SW (Alternative Development Project South-West)</td>
<td>Closed</td>
<td>21 Oct 2009</td>
</tr>
<tr>
<td>AFSA (Afghan Farm Service Alliance)</td>
<td>Closed</td>
<td></td>
</tr>
<tr>
<td>IDEA-NEW (Incentives Driving Economic Alternatives – North, East, West)</td>
<td>Active</td>
<td>16-Mar 2010</td>
</tr>
<tr>
<td>CHAMP (Commercial Horticulture and Agriculture Marketing Program)</td>
<td>Active</td>
<td>16 Apr 2013</td>
</tr>
<tr>
<td>Program PERSUAP</td>
<td>Active</td>
<td>4 Sep 2013</td>
</tr>
</tbody>
</table>

These PERSUAPs adopted two very different approaches. Those for ADP/N, IDEA-NEW and CHAMP requested a very limited list of products specifically selected for the needs of their work programs. Those for ASAP and ADP/SW gave approval for the use of a wide range of available pesticides.
products, immediately banning the use of those with Toxicity Class I and suspending the use of Class II products until adequate mitigating measures, such as training, could be introduced. This reflected a difference in the scope and workplans of the projects. Whereas CHAMP and IDEA-NEW needed a specific selection for the recommended IPM programs for their training locations, ASAP was supporting a large agricultural retailing program (AgDepots). In 2013, the decision was made to prepare a program-wide PERSUAP (P-PERSUAP) to cover the needs of all projects. This 2013 PERSUAP is the predecessor to this document and is available at http://gemini.info.usaid.gov/egat/envcomp/repository/pdf/39192.pdf.

SECTION 3. ENVIRONMENTAL CONTEXT

3.1 PRIORITY GEOGRAPHIC PLACES/AREAS OF PROJECT INTERVENTION

FIGURE 3.1 AFGHANISTAN MAP

AFGHANISTAN COUNTRY BACKGROUND

Geography Afghanistan is a landlocked country north and west of Pakistan, east of Iran, also bordering China, Tajikistan, Turkmenistan, and Uzbekistan. It lies between latitudes 29° N and 39° N, and longitudes 60° E and 75° E. With an area of 652,230 square kilometres (251,830 sq miles), it is slightly smaller than Texas.

Climate Afghanistan has a continental climate with very harsh winters in the central highlands, the northeast (around Nuristan) and the Wakhan Corridor, where the average temperature in January is below −15 °C (5 F), and hot summers in the low-lying areas of the Sistan Basin of the southwest, the Jalalabad basin in the east, and the Turkestan plains along the Amu River in the north, where temperatures average over 35 °C (95 F) in July.
**Governance**  Afghanistan is an Islamic republic consisting of three branches, executive, legislative and judicial. The UN-sponsored Bonn Conference in 2001 established a process for political reconstruction that included the adoption of a new constitution, a presidential election in 2004, and National Assembly elections in 2005.

The international community remains committed to Afghanistan's development, pledging over $67 billion USD at nine donors' conferences between 2003 and 2010. In July 2012, the donors at the Tokyo conference pledged an additional $16 billion USD in civilian aid through 2015. Most recently, in 2015, an international conference in London reaffirmed international support for the development of Afghanistan.

In December 2004, Hamid Karzai became the first democratically elected president of Afghanistan and the National Assembly was inaugurated the following December. Karzai was re-elected in August 2009 for a second term. In September, Ashraf Ghani, former Finance Minister, was elected president. Abdullah, who polled second in the final ballot, was appointed Chief Executive Officer. Despite gains toward building a stable central government, a resurgent Taliban and continuing provincial instability - particularly in the south and the east - remain serious challenges for the Afghan Government.

**Biodiversity**  Afghanistan has a highly diverse environment, extending from hot sub-tropical desert to permanent snow. As well as the effect of altitude, its biodiversity is increased by its location at the junction of several biogeographical regions: the Irano-Turanian, the Sahara-Sindian, the Himalayan and the Indian, which all contribute elements to its flora and fauna. There is also a high degree of floral endemism, estimated to be approximately 25-30 percent. In addition, its biological importance is enhanced by its position on the migratory pathway of birds between Siberia and the Indian subcontinent. Fragile wetlands in Afghanistan, such as Ab-i-Estada, are crucial to the survival of migrating birds, some of which, such as the Siberian Crane, are endangered.

**Economy**  Natural resources include natural gas, petroleum, coal, copper, chromite, talc, barites, sulfur, lead, zinc, iron ore, salt, precious and semiprecious stones (e.g., emerald, lapis lazuli, red garnet and ruby). The government of Afghanistan claims that the country holds up to $3 trillion USD in proven untapped mineral deposits, which could make it one of the richest mining regions on earth. It also has potential to benefit from the proposed Trans-Afghanistan Pipeline (TAP), which is intended to provide an export route for natural gas for the landlocked Central Asian countries.

Infrastructure, despite massive recent investment, remains poor. According to the Central Statistical Office (CSO), there are 9,468 km of paved road and 24,396 km of unpaved. Communications have been revolutionized by mobile phone systems developed by private companies. There are 24,888,203 mobile phones in the country (CSO).

In the Human Development Report 2014 (UNDP), Afghanistan ranks 169th out of 187 states on the Human Development Index (HDI), a composite measure of welfare. The population is estimated at 31.63 million (World Bank 2015). The dependency ratios defined as the ratio of those in the population not usually in the work force to those who usually are. It can be divided into two elements, the ratio of those of age under 15 to those of age 15 to 64 (91.37% in Afghanistan, 29.4% in USA) and the ratio of those aged 65 and over to those of age 15-64 (4.7% in Afghanistan and 22.2% in USA).

GDP is $20.84bn. Gross National Income per capita is approximately $670 with 35.8% living below the poverty line. Life expectancy (for 2013) was estimated at 61 years. The under-five mortality rate in 2014 was at 94 per 1,000 live births, a fall from 134 in 2001. The maternal mortality rate in 2015 was 396 deaths per 100,000 live births, a considerable fall from 1,050 in 2001 and 536 in 2011 (World Bank 2015).

**ENVIRONMENTAL AND WILDLIFE CONSERVATION IN AFGHANISTAN**

**Environmental Regulation.**  Formal Environmental regulation in Afghanistan falls under the 2007 Environment Law. It is the overarching framework into which all sector specific environmental and natural resource legislation must fit. The National Environmental Protection Agency (NEPA) is the authority primarily charged with implementing it, as guided by the Ministry of Justice.

The Environment Law assigns NEPA the responsibility for coordinating and monitoring conservation and rehabilitation of Afghanistan’s environment. This mandate gives NEPA overall responsibility for implementation of the international multilateral environmental conventions which Afghanistan is party to such as the Convention on Biological Diversity (CBD), Climate Change Convention (UNFCCC), Convention on Desertification (UNCCD) Stockholm Convention on Persistent Organic Pollutants...
(POPS) and more than ten others as of December 2015. Practical delivery of laws and conventions in Afghanistan is thereafter delegated to line ministries and other organs and institutions of the state. For example, the National Biodiversity Strategy and Action Plan is to be delivered in partnership with MAIL and other government organizations, and with the technical and financial assistance of international organizations and NGO partners.

The Environment Law makes reference to the development of Environmental Impact Procedures (EIA تأريخال). These procedures dictate that certain activities that have an adverse impact on the quality of environmental resources require licences or permits from NEPA. These include:

- undertaking an activity or implementing a project, plan or policy that is likely to have an adverse environmental impact;
- discharging into the environment a polluting substance which is likely to cause adverse impact on the environment or human health;
- constructing or operating a waste management storage or treatment facility;
- storing or disposing of hazardous waste;
- hunting or otherwise exploiting a protected or endangered species (see Annex F for list of protected species);
- exporting protected or endangered species;
- accessing the genetic resources of Afghanistan’s biodiversity.

### 3.2 AGRICULTURE IN AFGHANISTAN

**AGRO-ECOLOGICAL ZONES.**

The agro-ecology of Afghanistan is hugely complex on account of its topography Fig. 3.1 shows the land cover of Afghanistan, but it does not reflect the enormous variation in agro-ecology caused by altitude, soil and climate. Following Humln, it is possible to define geographic regions sharing basic climatic similarities (Fig. 3.2). These are:

- Badakhshan Mountains
- Central Mountains
- Eastern Mountains
- Southern Mountains and Foothills
- Northern Mountains and Foothills
- Turkistan Plains
- Herat-Farah Lowlands
- Helmand Valley-Sistan Basin
AGRICULTURE

Agriculture employs about 78 percent of the workforce. At present, it contributes about 24 percent of Gross Domestic Product (GDP) (World Bank). Only 12 percent of its total land is arable. Production is constrained by an almost total dependence on erratic winter snows and spring rains for water. The country is not self-sufficient in the major staple, wheat. In 2007, the country’s fruit and nut exports were at $113 million USD per year but it was said that this could grow to more than $800 million USD per year in 10 years given the proper investment. Afghanistan is known for producing some of the finest fruits, especially pomegranates, apricots, grapes, melons, and mulberry. MAIL is the government department responsible for agriculture.

The Crop Production Index (2004-6 = 100) was 134.5 in 2013, indicating a 34.5 percent rise over a seven year period. Cereal yields average 2,049 kg/ha. The Agricultural Value Added per Worker (estimated in 2005 US$) is $396 (equal to Kenya, 13th from bottom). This is perhaps the most important indicator relating to building a prosperous rural economy.

Despite the progress of the past few years, Afghanistan is extremely poor, landlocked, and highly dependent on foreign aid. Much of the population continues to suffer from shortages of housing, clean water, electricity, medical care, and jobs. Criminality, insurgency, weak governance, lack of infrastructure, and the Afghan Government’s difficulty in extending rule of law to all parts of the country pose challenges to future economic growth.

3.3 PESTICIDES AND THE AFGHANISTAN ENVIRONMENT

The Plant Protection and Quarantine Department (PPQD) of MAIL is the government agency responsible for matters relating to pest control and pesticides. Under the recently enacted Pesticide Law

(Annex D), it will be responsible for implementing pesticide regulation. It also carries out control campaigns against migratory pests such as locusts and Sunn pest.

Afghan farmers have little knowledge about pesticides and particularly the risks associated with their use and have little understanding of the agro-ecology of their crops. They have been dependent for advice on pesticide retailers, NGOs, and PPQD. Not all of this advice has been good. Farmers frequently receive incorrect diagnoses and are encouraged to use pesticides. In general, small producers use various methods and techniques in combination with pesticides to control and manage pests and diseases. Most larger commercial crop growers use conventional control methods that involve intensive use of pesticides notwithstanding the adverse effects on the environment.5

SECTION 4. PER PART I—PEST MANAGEMENT NEEDS, PESTICIDES AVAILABLE, AND MANAGEMENT CAPACITY

This section provides key information that serves as critical input to the 12-factor analysis (per 22 CFR 216.3(b)) undertaken in Section 5. This includes the list of target crops covered and their pest management needs, and candidate pesticides to be assessed for Afghanistan. This section also includes information regarding the local context (e.g., knowledge and awareness of pesticide safe use principles) that is critical to decisions regarding which pesticides can be safely used in Afghanistan.

4.1 IDENTIFICATION OF TARGET ACTIVITIES

Current and planned USAID activities identified as requiring a PERSUAP are as follows.

- Teaching and demonstration farms for a variety of crops.
- On-farm demonstration plots for management of irrigated perennial crops.
- Technical advice and support to small scale farmers for perennial tree crop (including grapevines) management.
- Technical advice and support to small-scale farmers for wheat production (including minimum till practices).
- Technical advice and support to small-scale farmers for production of vegetables.
- Procurement of agricultural inputs (seeds, seedling, and other plant materials, fertilizer, pesticides equipment and machinery).
- Control of ecto-parasites on livestock.
- Support to agricultural processing and storage facilities.
- Matching grants or links to finance mechanisms for purchase of required equipment for cultivation, processing, or marketing of crops to encourage value chain development.
- Provision of inputs (disinfectants/sterilants) to hospitals and clinics.

Grants and Loans: USAID regulations apply to all recipients, direct and indirect, of USG funding. All projects that provide grants and loans for agricultural activities are responsible for ensuring enforcement of the requirements established by this PERSUAP.

4.2 IPM PRACTICES

Crop protection specialists aim to develop pest control methods that are compatible with the goals of sustainable and productive agriculture. To meet these goals, research must integrate a range of complementary pest control methods in a mutually enhancing fashion, namely IPM. IPM focuses on five control areas:

• **Cultural pest control** is the use of farming or cultural practices that make the crop environment less favorable to pest species, for example the choice of sowing and harvest dates to minimize damage, intercropping, vegetation management and crop rotations.

• **Biological control**: is the manipulation, conservation or introduction of natural enemies: predators, parasites, or pathogens.

• **Physical and mechanical control**: the application of direct or indirect measures that kill the pest, disrupt its physiology other than by chemical means, exclude it from an area, or adversely alter the pest’s environment.

• **Host plant resistance**: the breeding and use of crop varieties that are less susceptible to pests (insects, diseases, nematodes, parasitic weed, birds).

• **Judicious use of pesticides**: The purpose of pesticide application is to protect rather than avenge the crop. The use of pesticides has a cost that is not only the price of the product and its application, but its effect on beneficial organisms such as natural enemies and pollinators. The decision to use a pesticide is therefore based on an assessment that the pest population, or expected population, will cause damage that exceeds all these costs: the economic threshold. Determining this requires considerable research and experience. Decision making needs to be based on regular scouting, sometimes supported by pheromone traps where available.

• **Legal/regulatory control**: Enforcement of measures and policies that range from quarantine to land and water management practices. The prevention of the entry and establishment of undesirable plant and animal pests in a country or area and eradication, containment, or suppression of pests already established in limited areas (quarantines). This approach to pest management must involve area-wide operations that include many rural households and are enacted for the common good of both farmers and society at large.

Formally, the development of IPM strategies requires the following steps.

• Identify the major pests, quantify losses caused by them in a given agro-ecosystem and determine the economic thresholds;  
• Study the biology, behavior and population dynamics of the pests to understand the features that may be exploited for pest management;  
• Establish the role of local natural enemies and develop mass-rearing, or mass-culture for disease agents on insects;  
• Study and develop other suitable components of IPM, such as intercropping and other cultural practices;  
• Integrate these components into an appropriate IPM technology and test for compatibility and efficacy under different ecological conditions; and  
• Develop a simple protocol for monitoring the impact of IPM technology in the field.6

In the context of Afghanistan, where much of the technical capacity for the above is lacking, the essential step in IPM is the correct identification of the pests or pathogens to which the various crops are subject and a realistic assessment of the damage they can potentially cause. The establishment of plant clinics by CABI is an important step to achieving this; the information provided in Annex A of this PERSUAP is indicative, but necessarily not definitive.

Once this is known, it is possible to develop a proactive approach to plant protection, rather than responding to infestations after the damage has been done.

• The first element in the plan must be good cultural practices. Healthy plants grown in good conditions are more resistant to pests and diseases. The use of resistant varieties, when available, is also important. (See Annex A.)

• The second element is routine preventive measures such as crop rotation for annual crops, or dormant season spraying with mineral oil for tree crops.
• The third element is the encouragement of natural enemies. These may be reared in a laboratory and released, but more important—and most applicable in the context of Afghanistan—is not killing them by inappropriate pesticide application.
• The fourth element is monitoring for the presence of economically harmful densities of pests that may occur because of favorable conditions. This may be done with pheromone traps or simple examination of the plants.
• The fifth element is the choice of an effective control method should this be necessary. The options may be mechanical removal of the pests, but the selective use of a safe and effective pesticide may be the best option. Annex A provides guidance as to chemical- and non-chemical control measures for common pests of many crops.

4.3 CURRENT PESTICIDE USE/AVAILABILITY

A small survey of 24 pesticide shops (eight in each of Kabul, Herat & Mazar) was conducted during the preparation of this PERSUAP. The purpose was to establish which pesticides were being offered for sale, the formulations, country of origin, language and adequacy of labelling, availability of PPE and application equipment and other goods being sold from the same outlets.

ACTIVE INGREDIENTS

The active ingredients found in products offered for sale are listed in Table 4.1: Results of Market Survey.

<table>
<thead>
<tr>
<th>Active ingredient</th>
<th>Class</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,4-D</td>
<td>Chlorophenoxy acid</td>
<td>Herbicide</td>
</tr>
<tr>
<td>Abamectin (avermectin)</td>
<td>Microbial</td>
<td>Insecticide/acaricide</td>
</tr>
<tr>
<td>Acetamiprid</td>
<td>Chloro-nicotinyl</td>
<td>Insecticide/acaricide</td>
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<tr>
<td>Aluminum phosphide</td>
<td>Inorganic</td>
<td>Fumigant</td>
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<tr>
<td>Bromoxynil</td>
<td>Hydroxybenzonitrile</td>
<td>Herbicide</td>
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<td>Captan</td>
<td>Thiophthalamide</td>
<td>Fungicide</td>
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<td>Carbaryl</td>
<td>Carbamate</td>
<td>Insecticide/acaricide</td>
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<tr>
<td>Carbendazim</td>
<td>Bendizidazole</td>
<td>Fungicide</td>
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<tr>
<td>Carbopenthion</td>
<td>Organo-phosphate</td>
<td>Insecticide/acaricide</td>
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<tr>
<td>Chlorpyriphos</td>
<td>Organo-phosphate</td>
<td>Insecticide/acaricide</td>
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<td>Clodinafop-propargyl</td>
<td>Aryloxyphenoxy propionic acid</td>
<td>Herbicide</td>
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<tr>
<td>Copper oxychloride</td>
<td>Inorganic copper</td>
<td>Fungicide</td>
</tr>
<tr>
<td>Cypermethrin (alpha)</td>
<td>Pyrethroid</td>
<td>Insecticide/acaricide</td>
</tr>
<tr>
<td>Deltamethrin</td>
<td>Pyrethroid</td>
<td>Insecticide/acaricide</td>
</tr>
<tr>
<td>Diazinon</td>
<td>Organo-Phosphate</td>
<td>Insecticide/acaricide</td>
</tr>
<tr>
<td>Diclofop-methyl</td>
<td>Chlorophenoxy acid or ester</td>
<td>Herbicide</td>
</tr>
<tr>
<td>Dicrotophos</td>
<td>Organo-phosphate</td>
<td>Insecticide/acaricide</td>
</tr>
<tr>
<td>Diflubenzuron</td>
<td>Benzoyl urea</td>
<td>Insecticide/acaricide</td>
</tr>
<tr>
<td>Dimethoate</td>
<td>Organo-Phosphate</td>
<td>Insecticide/acaricide</td>
</tr>
<tr>
<td>Active ingredient</td>
<td>Class</td>
<td>Use</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------</td>
<td>-----</td>
</tr>
<tr>
<td>Emamectin</td>
<td>Macrocyclic Lactone</td>
<td>Insecticide/acaricide</td>
</tr>
<tr>
<td>Endosulfan</td>
<td>Organo-chloride</td>
<td>Insecticide/acaricide</td>
</tr>
<tr>
<td>Fenoxaprop-p-ethyl</td>
<td>Propionic acid</td>
<td>Herbicide</td>
</tr>
<tr>
<td>Fenpropathrin</td>
<td>Pyrethroid</td>
<td>Insecticide</td>
</tr>
<tr>
<td>Fenpyroximate</td>
<td>Pyrazole</td>
<td>Insecticide</td>
</tr>
<tr>
<td>Fenvalerate</td>
<td></td>
<td>Insecticide/acaricide</td>
</tr>
<tr>
<td>Flufenoxuron</td>
<td>Benzoylurea</td>
<td>Insecticide/acaricide</td>
</tr>
<tr>
<td>Glyphosate</td>
<td>Phosphonoglycine</td>
<td>Herbicide</td>
</tr>
<tr>
<td>Hexaconazole</td>
<td>Azole</td>
<td>Fungicide</td>
</tr>
<tr>
<td>Hexythiazox</td>
<td>N/a</td>
<td>Insect growth regulator</td>
</tr>
<tr>
<td>Imidacloprid</td>
<td>Chloro-nicotinyl</td>
<td>Insecticide/acaricide</td>
</tr>
<tr>
<td>Indoxacarb</td>
<td>Unclassified</td>
<td>Insecticide</td>
</tr>
<tr>
<td>Lambda cyhalothrin</td>
<td>Pyrethroid</td>
<td>Insecticide/acaricide</td>
</tr>
<tr>
<td>Malathion</td>
<td>Organo-Phosphate</td>
<td>Insecticide/acaricide</td>
</tr>
<tr>
<td>Mancozeb</td>
<td>Dithiocarbamate + inorganic zinc</td>
<td>Fungicide</td>
</tr>
<tr>
<td>Menazon</td>
<td>Organothiophosphate</td>
<td>Insecticide</td>
</tr>
<tr>
<td>Metalaxyl</td>
<td>Xylylalanine</td>
<td>Fungicide</td>
</tr>
<tr>
<td>Metaldehyde</td>
<td>Aldehyde</td>
<td>Molluscicide</td>
</tr>
<tr>
<td>Methidathion</td>
<td>Organo-phosphate</td>
<td>Insecticide/acaricide</td>
</tr>
<tr>
<td>Oxadiazon</td>
<td>Oxydiazole</td>
<td>Herbicide</td>
</tr>
<tr>
<td>Oxydemeton methyl</td>
<td>Organophosphate</td>
<td>Insecticide</td>
</tr>
<tr>
<td>Oxyfluorfen</td>
<td>Diphenyl ether</td>
<td>Herbicide</td>
</tr>
<tr>
<td>Paraquat dimethyl sulphate</td>
<td>Bipyridylum</td>
<td>Herbicide</td>
</tr>
<tr>
<td>Penconazole</td>
<td>Azole</td>
<td>Fungicide</td>
</tr>
<tr>
<td>Profenofos</td>
<td>Organophosphate</td>
<td>Insecticide</td>
</tr>
<tr>
<td>Propargite</td>
<td>Unclassified</td>
<td>Insecticide/acaricide</td>
</tr>
<tr>
<td>Propiconazole</td>
<td>Azole</td>
<td>Fungicide</td>
</tr>
<tr>
<td>Propineb</td>
<td>Dithiocarbamate, Inorganic-Zinc</td>
<td>Fungicide</td>
</tr>
<tr>
<td>Solfunasion</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td>Sulfosulfuron</td>
<td>Sulfonyleurea</td>
<td>Herbicide</td>
</tr>
<tr>
<td>Sulfur</td>
<td>Inorganic</td>
<td>Fungicide</td>
</tr>
<tr>
<td>Tebuconazole</td>
<td>Azole</td>
<td>Fungicide</td>
</tr>
<tr>
<td>Thiram (TMTD)</td>
<td>Carbamate</td>
<td>Fungicide</td>
</tr>
<tr>
<td>Tribenuron methyl</td>
<td>Sulfonyleurea</td>
<td>Herbicide</td>
</tr>
<tr>
<td>Active ingredient</td>
<td>Class</td>
<td>Use</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------</td>
<td>---------</td>
</tr>
<tr>
<td>Trichlorfon</td>
<td>Organo-Phosphate</td>
<td>Insecticide</td>
</tr>
<tr>
<td>Trifluralin</td>
<td>Dinitroanaline</td>
<td>Herbicide</td>
</tr>
<tr>
<td>Zinc phosphide</td>
<td>Inorganic</td>
<td>Rodenticide</td>
</tr>
<tr>
<td>Zineb</td>
<td>Dithiocarbamate</td>
<td>Fungicide</td>
</tr>
</tbody>
</table>

**COUNTRY OF ORIGIN**

Pesticides are imported from various countries to Afghanistan. In the shops reviewed in Balkh, Herat, and Kabul most pesticides came from China, Iran, India, Pakistan, Jordan, Turkey, Malasya and few from Europe. Source of some pesticides could not be established.

**LABELLING**

Many pesticides for sale in Afghanistan do not have labels in the national languages - Dari and Pashtu-, except those from Iran, which are labelled in Farsi (Farsi and Dari are both versions of Persian). Urdu, the language of Pakistan, in which some imported pesticides are labelled, is widely understood. However, others are labelled in English or other languages. This leaves out of account the fact that many farmers are illiterate. Table 4.2 shows the languages on products found during the survey.

**TABLE 4.2. LANGUAGE OF LABELS**

**NOTE: SOME PRODUCTS ARE LABELLED IN MORE THAN ONE LANGUAGE**

<table>
<thead>
<tr>
<th>PROVINCE</th>
<th>PERSIAN</th>
<th>PASHTO</th>
<th>URDU</th>
<th>ENGLISH</th>
<th>TOTAL PRODUCTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balkh</td>
<td>66%</td>
<td>0%</td>
<td>13%</td>
<td>60%</td>
<td>53</td>
</tr>
<tr>
<td>Herat</td>
<td>85%</td>
<td>1%</td>
<td>3%</td>
<td>35%</td>
<td>104</td>
</tr>
<tr>
<td>Kabul</td>
<td>64%</td>
<td>0%</td>
<td>20%</td>
<td>45%</td>
<td>86</td>
</tr>
<tr>
<td>Total</td>
<td>74%</td>
<td>0.4%</td>
<td>11%</td>
<td>44%</td>
<td>243</td>
</tr>
</tbody>
</table>

One very considerable danger is the habit of retailers of dispensing small quantities of pesticides in unlabeled containers, sometimes recycled food containers. Since these are likely to be stored in the home, they may be mistaken for food items and result in poisoning.

**4.4 OTHER GOODS IN SURVEYED PESTICIDE RETAILERS**

Agricultural retailers in Afghanistan seldom sell only pesticides. At the very least, they will be selling veterinary medicines and seeds. The number of surveyed pesticide shops stocking PPE (generally gloves and masks, but also boots), application equipment and other goods is given in Table 4.3.

**TABLE 4.3. OTHER GOODS IN SURVEYED PESTICIDE RETAILERS**

<table>
<thead>
<tr>
<th>PROVINCE</th>
<th>TOTAL</th>
<th>PPE</th>
<th>SPRAYERS</th>
<th>VETERINARY MEDICINES</th>
<th>TOOLS</th>
<th>SEEDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balkh</td>
<td>8</td>
<td>6</td>
<td>6</td>
<td>8</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Herat</td>
<td>8</td>
<td>4</td>
<td>8</td>
<td>6</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Kabul</td>
<td>8</td>
<td>7</td>
<td>8</td>
<td>5</td>
<td>6</td>
<td>4</td>
</tr>
</tbody>
</table>
It was noted that shops selling pesticides often also sold fertilizers and other commodities. Shops selling pesticides were often sited in the bazaar close to food shops and bakeries, creating a danger of contamination.

4.5 PESTICIDE KNOWLEDGE AND AWARENESS

The disruption caused by thirty years of war has resulted in the loss of the normal means by which farmers learn the safe and effective use of pesticides. These would normally include the government advisory service, agricultural training institutions and the private sector trade.

Some attempts have been made to rectify this by NGOs with agricultural programs, in particular, the Swedish Committee for Afghanistan and the Agha Khan Network and donor-funded projects such as those of USAID. PPQD has made progress in improving the capacity of its own staff. However, the general level of farmers’ knowledge remains low and, although there have been improvements in recent years, strengthened by training for pesticide retailers given by USAID projects, the standards of the pesticide trade fall far short of what is desirable.

More recently, the Centre for Agriculture and Biosciences International (CABI) has established an office and laboratory in the MAIL Plant Protection and Quarantine Dept. With funding from a number of donors it has established regional diagnostic “clinics” where farmers can obtain advice on plant protection problems.

The e-Afghan Ag portal was developed to provide reliable information to those helping farmers in Afghanistan. e-Afghan Ag is supported by USAID. UC Davis is the lead institution. Over 70 institutions have contributed content. e-Afghan Ag is considered the most comprehensive collection of practical information available to help the farmers of Afghanistan. The project started with USAID funding managed through USDA. The website is: http://afghanag.ucdavis.edu/other-topic/pests-and-diseases-affecting-crops/.

The scale of the USAID program in Afghanistan and the present state of agriculture and pesticide use mean that USAID projects will have a determining effect on the way pesticides are used in general in the country in the foreseeable future. This is both a responsibility and an opportunity.

4.6 AGRICULTURAL EXTENSION

MAIL remains very far from being able to offer an effective nation-wide agricultural extension service. The reasons for this are:

- Low staff capacity (many of the best-qualified individuals have been recruited by aid agencies or the private sector)
- A defective model of agricultural extension left from the era of Soviet influence.
- Lack of operational funds.
- Insecurity in the rural areas, reducing access for government officials.

In practice, farmers have received extension advice from NGOs, such as the Swedish Committee for Afghanistan and the Agha Khan Network. In recent years, donor support for agriculture has tended to focus on the target of reducing opium production through Alternative Development Projects, such as those funded by USAID. More recently there has been a recognition that a broader based approach to agricultural development is required and this is reflected in the current USAID program. The involvement of CABI greatly enhances the service available to farmers.

A consortium of leading US land grant universities—University of California Davis, Purdue University, University of Maryland and Washington State University—are working with the Afghan MAIL/DAIL to deliver district level extension programs that impact its culture, economy and institutions, and their ability to gain confidence in building a better tomorrow. One of the goals of the project includes building demand driven extension programs.
SECTION 5. PER PART 2—CANDIDATE PESTICIDES AND THE 12-FACTOR ANALYSIS

5.1 LIST OF CANDIDATE PESTICIDES

On the basis of the following criteria, a candidate set of active ingredients was prepared.

1. Inclusion in the 2013 P-PERSUAP,
2. Request by current projects,
3. Availability in the local market as found in the survey,
4. Inclusion in other PERSUAPs in the region.

This candidate set of AIs is presented in Table 5.1

This section applies the analysis of the 12 factors required by 22 CFR 216.3(b) to assess the candidate pesticides for use/support with USAID funds, and to determine the specific conditions attendant to their use.

5.2 THE 12-FACTOR ANALYSIS

FACTOR A: US EPA REGISTRATION STATUS OF THE PROPOSED PESTICIDES

In the U.S., EPA regulates pesticides through the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), as amended and registers both AIs and products. Unless a full 22 CFR 216 Environmental Assessment is conducted, USAID-funded programs are limited to procuring, using, and/or supporting the use of pesticides registered by EPA for the same or similar uses. Emphasis is placed on “similar use” because some crops and their pest species found overseas are not present in the U.S. Therefore, pesticides may not be registered for the exact use required by a USAID activity.

EPA designates some products as restricted use pesticides (RUPs). EPA classifies a particular pesticide product as restricted if it determines that the product may be hazardous to human health or to the environment even when used according to the label. In the U.S., pesticides products that are labeled RUP can only be sold to and used by certified applicators or persons under their direct supervision, and only for those purposes covered by the applicator's certification (such as for row crops, tree crops, or structural pests).

22 CFR 216 requires a full environmental assessment before use of a RUP can be supported with USAID funds, except for RUPs so designated solely for reason of user hazard, as stated in §216.3(b)(1)(ii). RUPs designated solely for reason of user hazard can be authorized for procurement or use with USAID funding on the basis of a user hazard analysis in the PERSUAP. In this case, the recipient government must be made aware of the hazard, and a mitigation action will be made and implemented with additional technical assistance.

The analysis of smallholder pesticide knowledge and awareness in Afghanistan (see Section 4.5) indicates that it would not be appropriate to authorize USAID funds to support user-hazard RUPs for smallholder production. RUP pesticides are allowed in these programs only with a caveat that they will be used, recommended for use, or supported for use by trained pest control specialists. If and when a MAIL-recognized training program is in place, such training must be MAIL-recognized.

A fundamental problem in determining the US regulatory status of pesticides available in Afghanistan is that they do not conform to US standards of labeling and quality. Assessment of active ingredients for this PERSUAP requires an evaluation of likely products on the market against those registered in the US.
Table 5.1 provides the US EPA registration status of all candidate AIs, including the prevalence of AIs in RUP products (19 Jan 2016 RUP Summary Report). Under this Factor A analysis, AIs that are not registered by US EPA are disallowed.

### TABLE 5.1. REGULATORY STATUS OF ACTIVE INGREDIENTS CONSIDERED FOR APPROVAL

<table>
<thead>
<tr>
<th>ACTIVE INGREDIENT</th>
<th>CLASS</th>
<th>RUPs*</th>
<th>EPA REGISTERED</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Insecticides, Acaricides and Pheromones</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(E,E)-8,10-Dodecadien-1-ol pheromone</td>
<td>pheromone</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>(Z,E)-7,9,11-Dodecatrienyl formate</td>
<td>pheromone</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Abamectin (avermectin)</td>
<td>Macrocyclic Lactone</td>
<td>41</td>
<td>Yes</td>
</tr>
<tr>
<td>Acequinocyl</td>
<td>unclassified</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Acetamiprid</td>
<td>chloro-nicotinyl</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Azadirachtin (neem oil)</td>
<td>Botanical</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Bacillus thuringiensis-BT</td>
<td>microbial</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Beauvaria bassiana</td>
<td>microbial</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Bifenthrane</td>
<td>Hydrazine carboxylate</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>Carbaryl</td>
<td>Carbamate</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>Chlordrinphos</td>
<td>organophosphate</td>
<td>46</td>
<td>Yes</td>
</tr>
<tr>
<td>Clofentezine</td>
<td>tetrazine</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Chlorantraniliprole</td>
<td>anthranilic diamide</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Cypermethrin</td>
<td>pyrethroid</td>
<td>8</td>
<td>Yes</td>
</tr>
<tr>
<td>Cypermethrin (alpha)</td>
<td>pyrethroid</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>Cypermethrin (beta)</td>
<td>pyrethroid</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Deltamethrin</td>
<td>pyrethroid</td>
<td>6</td>
<td>Yes</td>
</tr>
<tr>
<td>Diazinon</td>
<td>organophosphate</td>
<td>6</td>
<td>Yes</td>
</tr>
<tr>
<td>Diflubenzuron</td>
<td>benzoyl urea</td>
<td>9</td>
<td>Yes</td>
</tr>
<tr>
<td>Dimethoate</td>
<td>organophosphate</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>Emamectin benzoate</td>
<td>Macrocyclic Lactone</td>
<td>4</td>
<td>Yes</td>
</tr>
<tr>
<td>Endosulfan</td>
<td>Organo-chloride</td>
<td>4</td>
<td>Yes</td>
</tr>
<tr>
<td>Ethion</td>
<td>organophosphate</td>
<td>n/a</td>
<td>No</td>
</tr>
<tr>
<td>Fenpropathrin</td>
<td>pyrethroid</td>
<td>3</td>
<td>Yes</td>
</tr>
<tr>
<td>Fenpyroximate</td>
<td>pyrazole</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Fenvalerate</td>
<td>unclassified</td>
<td>n/a</td>
<td>No</td>
</tr>
<tr>
<td>Flufenoxuron</td>
<td>benzyloxurea</td>
<td>n/a</td>
<td>No</td>
</tr>
<tr>
<td>Imidacloprid</td>
<td>chloro-nicotinyl</td>
<td>23</td>
<td>Yes</td>
</tr>
<tr>
<td>Indoxacarb</td>
<td>unclassified</td>
<td>-</td>
<td>No</td>
</tr>
<tr>
<td>Insecticidal soap</td>
<td>fatty acids</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Lambda cyhalothrin</td>
<td>Pyrethroid</td>
<td>46</td>
<td>Yes</td>
</tr>
<tr>
<td>Malathion</td>
<td>organophosphate</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>Methidathion</td>
<td>organophosphate</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Mineral oil</td>
<td>petroleum</td>
<td>-</td>
<td>No**</td>
</tr>
<tr>
<td>Profenofos</td>
<td>organophosphate</td>
<td>0</td>
<td>Yes</td>
</tr>
</tbody>
</table>

### TABLE 5.1. REGULATORY STATUS OF ACTIVE INGREDIENTS CONSIDERED FOR APPROVAL

<table>
<thead>
<tr>
<th>ACTIVE INGREDIENT</th>
<th>CLASS</th>
<th>RUPs*</th>
<th>EPA REGISTERED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Propargite</td>
<td>unclassified</td>
<td>5</td>
<td>Yes</td>
</tr>
<tr>
<td>Spinosad</td>
<td>Spinosyn Macroyclic Lactone</td>
<td>3</td>
<td>Yes</td>
</tr>
<tr>
<td>Trichlorfon</td>
<td>organophosphate</td>
<td>0</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Note: Mineral Oil is not registered, but mineral based dormant season oils are widely used in the US**

#### Herbicides

<table>
<thead>
<tr>
<th>ACTIVE INGREDIENT</th>
<th>CLASS</th>
<th>RUPs*</th>
<th>EPA REGISTERED</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,4-D</td>
<td>chlorophenoxy acid</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Atrazine</td>
<td>triazine</td>
<td>109</td>
<td>Yes</td>
</tr>
<tr>
<td>bromoxynil phenol</td>
<td>Hydroxybenzonitrile</td>
<td>3</td>
<td>Yes</td>
</tr>
<tr>
<td>Clethodim</td>
<td>Cyclohexenone</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Clodinafop</td>
<td>Aryloxyphenoxy propionic acid</td>
<td>-</td>
<td>No</td>
</tr>
<tr>
<td>clodinafop-propargyl</td>
<td>Aryloxyphenoxy propionic acid</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Dicamba</td>
<td>Benzoic acid</td>
<td>10</td>
<td>Yes</td>
</tr>
<tr>
<td>dichlofop-methyl</td>
<td>Chlorophenoxy acid or ester</td>
<td>3</td>
<td>Yes</td>
</tr>
<tr>
<td>fenoxaprop-p-ethyl</td>
<td>Aryloxyphenoxypropionate</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Glyphosate</td>
<td>Phosphonoglycine</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>MCPA, 2-ethyl hexy ester</td>
<td>chlorophenoxy acid</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>Oxadiazon</td>
<td>oxazolidine</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Oxyfluorfen</td>
<td>diphenyl ether</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>paraquat dichloride</td>
<td>Bipyridylidum</td>
<td>17</td>
<td>Yes</td>
</tr>
<tr>
<td>Pendimethalin</td>
<td>2,6-Dinitroaniline</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Sethoxydim</td>
<td>cyclohexadione</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Sulfosulfuron</td>
<td>sulfonylurea</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Mesosulfuron-methyl</td>
<td>sulfonylurea</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>iodosulfuron-methyl-sodium</td>
<td>sulfonylurea</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>Trifluralin</td>
<td>Dinitroaniline</td>
<td>0</td>
<td>Yes</td>
</tr>
</tbody>
</table>

#### Fungicides

<table>
<thead>
<tr>
<th>ACTIVE INGREDIENT</th>
<th>CLASS</th>
<th>RUPs*</th>
<th>EPA REGISTERED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azoxytrobin</td>
<td>strobin</td>
<td>3</td>
<td>Yes</td>
</tr>
<tr>
<td>Benomyl</td>
<td>bendimidazole</td>
<td>-</td>
<td>No</td>
</tr>
<tr>
<td>Boscalid</td>
<td>aniline</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Captan</td>
<td>thiophthalimide</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Carbendazim</td>
<td>benzimidazole</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Carboxin</td>
<td>Carboxamide</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Ethyl mercury chloride</td>
<td>Organomercury</td>
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<td>No</td>
</tr>
<tr>
<td>Chlorothalonil</td>
<td>Chloronitrile</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>Copper hydroxide</td>
<td>inorganic</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Copper oxychloride</td>
<td>inorganic copper</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Copper sulfate</td>
<td>Inorganic</td>
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<td>Yes</td>
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<tr>
<td>Iprodione</td>
<td>Dicarboximide</td>
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<td>Yes</td>
</tr>
<tr>
<td>kresoxim-methyl</td>
<td>Strobin</td>
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<td>Yes</td>
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<tr>
<td>Mancozeb</td>
<td>dithiocarbamate + inorganic zinc</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Metalaxyl</td>
<td>Xylylalanine</td>
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<td>Yes</td>
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<tr>
<td>ACTIVE INGREDIENT</td>
<td>CLASS</td>
<td>RUPs*</td>
<td>EPA REGISTERED</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------------------------</td>
<td>-------</td>
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</tr>
<tr>
<td>Penconazole</td>
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<td>Propiconazole</td>
<td>azole</td>
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<td>Yes</td>
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<tr>
<td>Propineb</td>
<td>Dithiocarbamate, Inorganic-Zinc</td>
<td>-</td>
<td>No</td>
</tr>
<tr>
<td>Quinoxyfen</td>
<td>Quinoline</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Sodium metabisulfite</td>
<td>Inorganic</td>
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<td>Yes</td>
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<tr>
<td>Sulfur</td>
<td>Inorganic</td>
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<td>Yes</td>
</tr>
<tr>
<td>Calcium polysulfide</td>
<td>inorganic</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Tebuconazole</td>
<td>Azole</td>
<td>1</td>
<td>Yes</td>
</tr>
<tr>
<td>thiram (TMTD)</td>
<td>Carbamate</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Trifloxystrobin</td>
<td>Strobin</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Triflumizole</td>
<td>Azole</td>
<td>0</td>
<td>Yes</td>
</tr>
<tr>
<td>Zineb</td>
<td>dithiocarbamate</td>
<td>-</td>
<td>No</td>
</tr>
</tbody>
</table>

**Molluscicides**

| Metaldehyde       | aldehyde                       | 0     | Yes            |

**Rodenticides**

| brodifacoum       | Coumarin                       | 0     | Yes            |
| bromadiolone      | Coumarin                       | 0     | Yes            |
| warfarin          | coumarin                       | 0     | Yes            |
| zinc phosphide    | inorganic                      | 15    | Yes            |

**Fumigants**

| aluminum phosphide | inorganic                      | 20    | Yes            |
| methyl bromide     | inorganic                      | 40    | Yes            |

**Microbicides**

| chlorhexidine     | Unclassified                   | -     | No             |
| chlorine          | Inorganic                      | 2     | Yes            |
| chloroxylenol     | chlorinated phenolic           | 0     | Yes            |
| ethanol           | Alcohol                        | 0     | Yes            |
| iodine            | Inorganic                      | 0     | Yes            |
| phenol            | Phenolic                       | 0     | Yes            |
| soap              | fatty acids                    | 0     | Yes            |
| Sodium hypochlorite | Inorganic                  | 0     | Yes            |

**Plant Growth Regulators**

| 1-Naphthylacetic acid | Naphthalene acetic acid derivative | 0 | Yes |

* Number of US EPA-designated restricted use pesticide products that include the subject AI.

Of the candidate insecticides/acaricides in Table 5.1, those not registered for use by US-EPA are rejected for use in Afghanistan. These are: flufenoxuron, ethion, clofentezine, fenvalerate, and indoxacarb. Pesticides listed under the Stockholm Convention as Persistent Organic Pollutants (POPs) or under the Rotterdam Convention as requiring Prior Informed Consent (PIC) are also rejected. http://www.fao.org/agriculture/crops/news-events-bulletins/detail/en/item/213936/icode/?no_cache=1. Although endosulfan is registered by USEPA, it is listed as a POP and PIC for international trade. Although mineral oil is not registered as such, many horticultural oils are registered GUPs.
Diazinon, dimethoate, chlorpyrifos, fenpropatrin, propargite, emamectin benzoate are rejected because many products containing them are registered as RUP by US EPA. Cypermethrin and abamectin are registered by US EPA for control of ecto-parasites on livestock as a pour-on dip. They are therefore considered further for this purpose only.

Of the herbicides in Table 5.1, mesosulfuron-methyl and iodosulfuron-methyl-sodium are formulated together as a mixture which is registered by EPA as an RUP. Any mixture of these two active ingredients is rejected for use under this PERSUAP.

Of the fungicides in Table 5.1, Ethyl mercury chloride (also known as Ceresan) is rejected as all Mercury based chemicals are banned under the Minamata Convention to which Afghanistan is a party. Calcium polysulfide (also known as Lime Sulfur) is made by boiling lime with Sulfur. It can cause permanent damage to the eyes and so this process and the use of this pesticide, is not approved.

**FACTOR B: BASIS FOR SELECTION OF PESTICIDES**

The selection of pesticides for review was based on the experience of previous projects and the availability of products on the local market. In view of the danger of the development of resistance, a range of active ingredients has been selected to allow for rotation.

Under Factor A, the regulatory status of the active ingredients was listed and those disqualified on that basis identified. For further consideration pesticides must fulfil the requirements of need, efficacy. And availability. Each of these requirements is addressed below.

**NEED**

Pesticides to be approved must serve a known pest management need for target USAID/Afghanistan activities. Both current and potential future needs are considered by this PERSUAP. The crop-specific requirements for pesticides are given in Annex A. They can be summarized as follows.

**Insecticides/Acaricides.** There is a need for

- Systemic insecticides to protect against sap-sucking pests such as aphids and scale insects.
- Contact insecticides for lepidopterous, coleopterous pests and locusts.
- Acaricides for control of Spider Mite.
- Stomach poisons for control of locusts and Codling Moth.
- Contact insecticide/acaricide for control of ecto-parasites on livestock.

Colorado Beetle is a particularly difficult pest to control. It rapidly develops resistance to any pesticide to which it is persistently exposed. This needs to be countered by rotating different classes of chemical. It also makes it desirable to use non-chemical methods, such as hand-picking, if possible.

Some pests, such as Spider Mite and Whitefly, are often symptomatic of pesticide misuse, since they tend to increase in numbers when their natural enemies are killed by pesticides. However, they may also become a problem in greenhouses and plastic tunnels, where the artificial conditions may favour them and call for chemical control.

The migratory pests, locusts and Sunn Pest, pose a special problem, since their control is beyond the capacity of individual farmers and requires a coordinated national campaign, which is the responsibility of MAIL. USAID has, in the past, supported such campaigns and so provision is made in this PERSUAP for pesticides specifically required for this purpose. The preferred insecticide for locust control is the benzoyl-urea Insect Growth Regulator, diflubenzuron, applied as a persistent barrier to marching hopper (larval) bands. A fast-acting contact insecticide is needed for control of adults and the one preferred for this is deltamethrin in preference to organo-phosphates. Both of these are applied as Ultra-Low Volume (ULV) formulations and should only be used by trained operators.

USAID projects should consider the use of innovative non-toxic methods, such as mating disruption by pheromones. (E,E)-8,10-Dodecadien-1-ol is a synthetic analogue of the pheromone of the Codling Moth and (Z,E)-7,9,11-Dodecatrienyl formate of the Carob Moth and both are commercially available in formulations designed for mating disruption.
Herbicides. A range of herbicides are required by projects.

- Broad-spectrum herbicides to kill all vegetation, especially needed for minimum tillage.
- Selective herbicides to control broad-leaved weeds in cereal crops.
- Selective herbicides to control graminaceous weeds (e.g. Wild Oat) in cereal and broad-leaved crops.

Fungicides. Fungal diseases are a serious constraint on yields. Farmers need fungicides as seed treatment, foliar application and to protect packaged fresh fruit. Details are given in Annex A

A selection of fungicides with varying modes of action is required so that they can be rotated to avoid the development of resistance. Some fungicides, such as sulphur and copper sulfate (as Bordeaux mixture), may be applied routinely as a preventive measure, while others should be reserved for when infection has occurred.

Molluscicides. Slugs and snails may cause damage to vegetables.

Rodenticides. Rodenticides are required to protect stored commodities in buildings against rats and mice.

Fumigants. Although none of the current projects practise, or expect to practise, the fumigation of commodities, it has been decided to make provision for fumigants in case circumstances should require them, or an enterprise supported by USAID in Afghanistan includes fumigation as part of its processes. Only fully trained professional fumigators are approved to use fumigants.

Microbicides. The Health Program of USAID in Afghanistan supports a number of clinical projects that require microbicides whose use requires a PERSUAP. The only microbicides requested by the projects were chlorhexidine, chloroxylenol and ethanol. A wider range of microbicides was considered for inclusion to cover possible future needs.

Efficacy in Local Circumstances

Pesticides must be shown to be effective for crops/seeds under climates/conditions similar to those found in USAID/Afghanistan intervention areas. There are pesticides which have been used effectively in Afghanistan for many years, but some of these are no longer acceptable on grounds of toxicity. The agro-ecology of Afghanistan is similar to that of California and so guidance given by the extension department of UC Davis has been an important resource for choosing new pesticides.

Availability

Locally available pesticides have been considered for inclusion in this PERSUAP, but others that are desirable, but not currently available are also considered. USAID projects have the option of importing products that they particularly wish to see adopted and can encourage local businesses to provide them in the future.

Factor C: Extent to Which the Proposed Pesticide Use Is Part of an IPM Program

All projects involved directly in crop production will develop pest management plans on IPM principles. These will take account of non-chemical methods of control. They will draw on the resources of CABI, FAO and previous USAID projects. In accordance with this PERSUAP, IPs will promote IPM practices in their activities through demonstrations and direct training of farmers, input dealers and extension agents. The existing IP programs and all future agricultural programs will introduce IPM practices to farmers and suggest methods for non-chemical controls. Farmers are expected to adopt IPM and are encouraged to use biological/natural products.

The strategy of USAID partners working with farmers in Afghanistan will be to stress agronomic improvements based on the adoption of better technologies such as improved crop varieties, agronomic practices, and use of indigenous pest control practices.

The IPs must incorporate pesticide management within their core farmer training programs and recommendations. Agricultural activities support should fully incorporate IPM as the basis for effective
pest management. Where an IP has little control over the actions of beneficiaries in the field it will promote and support the use of integrated pest management plans (IPMPs) to the greatest extent practicable.

An IPMP is a systematic plan which brings together different pest control tactics into one program. Direct pesticide use and direct extension activities by USAID/Afghanistan programs will be governed by IPM-based crop-specific IPMPs. The crop-by-crop pest and control measures tables in Annex A are intended to serve as suggestions and drafts of these plans, which will be refined by the agriculture sector IPs.

IPMPs will necessarily be at a level of technical complexity appropriate to the local context, but will embody core IPM principles: emphasis on use of non-chemical controls (building on existing practices), with need-based, targeted use of relative-least-toxicity pesticides.

IP pesticide recommendations must stress to farmers pest recognition minimum application based on monitoring, rather than applying pesticides for blanket protection from seeding to harvest. For promotion of IPM, pesticide accounting programs and decision tools for use of common pesticides need to be implemented by the IPs.

FACTOR D: PROPOSED METHOD OR METHODS OF APPLICATION, INCLUDING THE AVAILABILITY OF APPLICATION AND SAFETY EQUIPMENT

The following methods of application will be used.

ULTRA-LOW VOLUME (ULV)

ULV application disperses the pesticide as a mist of fine droplets (80-100 microns diameter) of a concentrated oil-based formulation. Its advantages are that it can cover a large area quickly (an operator using a hand-held, battery-driven applicator can treat 5 ha per hour and a vehicle mounted sprayer can treat 20 ha per hour) and that it does not require a supply of water. Its disadvantages are that it requires the use of a more concentrated formulation and that it depends of downwind drift to disperse it. This creates potential hazards and so should only be carried out by operators specifically trained in the technique.

This method is used to apply diflubenzuron and deltamethrin for locust and Sunn Pest control. These operations are carried out by teams supervised by PPQD staff and are equipped with PPE consisting of hats, goggles, masks, overalls, rubber gloves and rubber boots.

MANUAL KNAPSACK SPRAYER

This is the most common method of applying water dispersed formulations such as Emulsifiable Concentrate (EC), Soluble Concentrate (SC) and Wettable Powder (WP). They are widely available in shops selling pesticides. PPE is usually available in the same shops (see shop survey Section 4). The greatest hazard occurs when mixing, since this is when the concentrated formulation is handled. The effective use of knapsack sprayers requires training to ensure the correct and even rate of application.

MOTORISED KNAPSACK SPRAYER

These are available in some stores, but their cost is quite a deterrent. They are useful for treating orchards where there is a need to spray higher in the canopy of the trees.

HAND-HELD HYDRAULIC SPRAYERS

These small sprayers are useful in small-scale horticulture, especially in greenhouses or plastic tunnels.

SEED TREATMENT

Seed treatments are usually, but not always, applied as a powder. In Afghanistan, distributors of certified seed do not apply pesticide at packing because of the danger of the seed being eaten. It is usual to include a packet of powder, which is mixed in the bag by the user at the time of sowing.

Seed treatment of a water-borne formulation can also be applied with a knapsack sprayer to seed spread out on a tarpaulin.

**BAIT**

Some pesticides are put out as baits. Highly toxic products, such as rodenticides, must only be put out in secure bait stations.

The molluscicide metaldehyde is put out as a bait. Care must be taken to ensure that domestic and non-target species are prevented from taking it.

Carbaryl granules or powder is used to protect vegetables against cutworm. It is sprinkled on the ground around the stems.

**FUMIGATION**

Fumigation of commodities is a highly dangerous procedure requiring a high quality of training and specialist equipment. Some commodities can be fumigated under gas impermeable tarpaulins. In other cases, vehicles or containers are fumigated with their loads. The most satisfactory method is to use purpose-built fumigation structures. It is essential that fumigation is only carried out as stipulated in USAID guidelines (http://www.usaidgems.org/fumigationpea.htm) and only then with the approval of the MEO, who will ensure that these requirements are fulfilled.

**ANIMAL DIP**

Insecticides or acaricides may be applied to control external parasites on livestock. Traditional dips require special structures and pose problems for the safe disposal of used chemical. This PERSUAP approves the use of “pour-on” formulations, whereby a single dose is applied to the animal’s coat and spreads through it, while not causing any environmental contamination.

**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**

**EXPOSURE**

Humans may be exposed to the risk of pesticide poisoning in the following ways.

- **User.** A user or applicator comes into close contact with pesticides. They may splash on the skin, into the eyes, be inhaled or accidentally ingested (especially when eating or smoking with contaminated hands). Cleaning and unclogging of sprayers also poses a high potential for dermal contact. However, users are best placed to be aware of the risks and to be trained and equipped to be protected against them.

- **Bystander.** The greatest pesticide risk to bystanders, people near to but not engaged in spraying, is wind-borne drift of spray particles, which may be inhaled. In this category may also be included the contamination caused by entering the sprayed area before the pesticide has broken down or by the misuse of empty used pesticide containers. Pesticides stored insecurely in homes may also cause accidental poisoning, especially if pesticides are aliquoted into repurposed bottles. Pesticide awareness needs to be extended beyond users and applicators.

- **Consumer.** Pesticides may be ingested by the ultimate consumer of the harvested crop if a sufficient period between spraying and harvest is not allowed. Systemic pesticides are particularly dangerous in this respect.

- **Environment.** Contamination of the environment, especially water supplies, is a way in which people can be exposed to pesticide poisoning.

**ACUTE TOXICITY**

Acute toxicity refers to the immediate effects (0-7 days) of exposure to a pesticide. Highly acutely toxic pesticides can be lethal at very low doses. Acute toxicity is estimated from the Lethal Dose 50 (LD₅₀), the dose (in milligrams of substance per kilogram of body weight) that kills 50 percent of the test animals in a
standard assay. Toxicity tests are conducted on experimental animals, such as white rats, mice, and rabbits. Because toxicity depends upon body weight, the amount of chemical lethal for a child is less than the amount for an adult. Conversely, it takes more to kill a large animal than a small one. The toxicity of a substance may also depend on the route by which it enters the body: dermal (through the skin), inhalation (through the lungs) or oral (through the digestive tract). The LD$_{50}$ may need to be determined experimentally for all these routes. For inhalation exposures, the LC$_{50}$ is used: the concentration in air in mg per litre that kills 50 percent of the test animals.

Two systems are referred to in this document: the EPA system and the WHO system. EPA also requires that pesticides in categories I-III carry a signal word as in the table. The system used by EPA is based on an evaluation of the formulated product. Therefore there may be more than one classification for an active ingredient depending on concentration and inert ingredients in the formulation. Details of the EPA system are given in Table B.1. The system of WHO is based on the active ingredient alone (see Table B.2).

The ‘signal’ word (e.g. Danger, Warning, Caution) on the pesticide label applies to the most toxic method or route of exposure. Generally, if ingested, class I substances can be lethal to an average-sized adult person at a dose of less than 5 g (0.18 oz.), Class II at 5 - 30 g (0.18 - 1.058 oz.), and Class III at more than 30 g (1.058 oz.).

LONG TERM TOXICITY

Pesticides may also cause long term hazards to human health. Sub-chronic effects are the ability of a toxic substance to cause effects for more than one year but less than the lifetime of the exposed organism. Chronic toxicity is the ability of a substance or mixture of substances to cause harmful effects over an extended period, usually upon repeated or continuous exposure, sometimes lasting for the entire life of the exposed organism. Those that cause most concern are:

- Carcinogenicity. Exposure to some substances may cause the development of cancer.
- Cholinesterase Inhibition. Cholinesterase is an enzyme that breaks down the neuro-transmitter, acetyl-choline in the nervous system. This is a necessary process for controlling nerve transmission and some pesticides, especially, organo-phosphates, work by interfering with it.
- Reproductive or Developmental Toxicity. Some pesticides are known to cause birth defects or interfere with normal development.
- Endocrine Disruption. Many pesticides and industrial chemicals are capable of interfering with the proper functioning of oestrogen, androgen and thyroid hormones in humans and animals.

Assessment of the acute and long-term toxicity of the pesticides being evaluated is summarised in Table B.3 Toxicity of Pesticides provided in Annex.

ECOTOXICITY

Ecotoxicology is the study of how chemicals interact with organisms in the environment. With few exceptions, such as pheromones, pesticides are, by their very nature, toxic to some organisms. They may therefore harm organisms other than the pests at which they are directed. These may include directly beneficial organisms, such as honeybees and other pollinators, the natural enemies of pests, other useful organisms such as fish or rare and endangered organisms making an important contribution to biodiversity. This document provides information, when available on the toxicity of pesticides to important groups of evaluated organisms.

The neo-nicotinyls, imidacloprid and acetamiprid, have recently aroused concern that sub-lethal doses to bees can reduce the viability of colonies. Therefore these pesticides should not be used when crops are in flower. Imidacloprid is often used as a seed dressing and it is unlikely, though not impossible, that this could expose pollinators at flowering to harmful doses.

Methyl bromide is rejected as a fumigant because of its effect on the ozone layer. In the USA, the amount of Methyl bromide produced and imported was reduced incrementally until it was phased out in 2015.
January 1, 2005, pursuant to the obligations under the *Montreal Protocol on Substances that Deplete the Ozone Layer* (Protocol) and the Clean Air Act CAA. All members of the United Nations have ratified the Montreal Protocol.

The ecotoxicity of the pesticides being evaluated is summarised in Table B.7. Ecotoxicity of Pesticides.

**MITIGATING MEASURES TO MINIMISE HAZARDS OF PESTICIDE USE**

- Projects will ensure that staff responsible for pesticide use have access to the necessary safety information found in Materials Safety Data Sheet (MSDS). Where MSDSs are not available in-country from dealers, they can be found online or requested from the manufacturer. Where project staff do not directly supervise pesticide application, the project will prepare information leaflets in the appropriate local languages.

- Projects will ensure that staff and beneficiaries using, storing or transporting pesticides have the PPE appropriate to the task (see Annex C.4).

- USAID will ensure that all projects using pesticides will have adequate training for all those using, storing or transporting pesticides. (see below)

- USAID will promote, through the projects, an improvement in the retail market for pesticides, encouraging the importation and sale of high quality products with adequate labelling in Dari and/or Pashto. It will also provide training to retailers where project funds are likely to be used for retail purchase of pesticides. A system of dealer certification should be considered in consultation with MAIL.

- If possible, projects will promote the use of small single use sachets of pesticides to remove the hazard of smallholders buying or keeping small unlabeled packages of pesticide and the return of used containers to the dealer for safe disposal.

Any products equivalent to EPA RUPs are only allowed for use by trained specialists. Products with acute toxicity class I (Red Label, Words Danger-Poison, skull and crossbones on the pictogram) are rejected by this PERSUAP for use except where specified for use by trained specialists. Products with toxicity class II and potential chronic effects are allowed for use only by trained individuals using appropriate PPE.

Accordingly, the SUAP in Section 6 identifies restrictions on the set of AIs that are supported for use only by trained and certified agricultural or pest control professionals, based on toxicity screening. The SUAP details measures for minimizing pesticide risks. These measures include: adoption of an IPM approach that emphasizes prevention, sanitation and exclusion of pests, use of traditional practices, and utilizing pesticides only as a last resort when other options have failed. Note that the ecotoxicity information in Table B.7. Ecotoxicity of Pesticides also provides a key reference for development of crop- and pest-specific pest management plans.

**FACTOR F: EFFECTIVENESS OF THE REQUESTED PESTICIDES FOR THE PROPOSED USE**

Pest management needs are documented on a crop-by-crop basis in Annex A. For each crop, Annex A identifies pest-specific suggested controls. Two sources of data have been used to specify these proposed uses; while none of these sources is complete on their own, together they offer a high degree of assurance that the pesticides will be effective for their proposed use:

1. The proposed pesticide uses are consistent with their EPA registrations; in each case, EPA has registered these pesticides for use on the same or similar crops and against the same or similar pests. Such registration requires that the efficacy of the pesticides be demonstrated. This demonstration of efficacy is within the U.S. agro-environmental context.

2. The recommended uses follow established practice in Afghanistan or similar agro-ecological environments. They have also been guided by relevant online extension recommendations, in particular, those of UC Davis, which has a well-reputed IPM and agriculture extension

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program, implementation experience in Afghanistan, and has developed an Afghanistan-specific extension/IPM website.

The major obstacle to effective pesticide use in Afghanistan is poor application technique. This can be caused by low quality equipment, or simply lack of operator skill. Many reports of poor pesticide quality or pest resistance are in fact the result of ineffective application. The training program mandated by this PERSUAP is a necessary measure to ensure effective pesticide use.

Nonetheless, development of resistance is a key threat to pesticide effectiveness. The introduction of pesticides and continuous use over time enhances the probability that resistance will develop. The use of pesticides within an IPM framework, as required by this PERSUAP, is a key measure to prevent resistance development.

Monitoring is required to confirm that the pesticides being recommended is performing as expected. Evaluation of pesticide efficacy (and of pest management plans more generally) is a required part of demonstration plot management. Monitoring for and reporting of resistance development is a required element of SUAP compliance reporting. Counterfeit or obsolete products and product adulteration should be addressed by current programs through building awareness among farmers and the introduction of programs promoting quality control.

**FACTOR G: COMPATIBILITY OF THE PROPOSED PESTICIDE USE WITH TARGET AND NON-TARGET ECOSYSTEMS**

The detrimental environmental impact of pesticides consists of the effects of pesticides on non-target species. Over 98 percent of sprayed insecticides and 95 percent of herbicides reach a destination other than their target species, because they are sprayed or spread across entire agricultural fields. Pesticides may find their way into other environments through spray drift, water runoff or in the bodies of moving animals. Aquatic environments are especially vulnerable in this respect.

The environmental fate of pesticides, once applied, depends upon their physical and chemical properties and those of the soil or water in which they find themselves. Some may break down into harmless derivatives in a short time, while others may be so chemically stable as to persist indefinitely. Some may break down, but produce an equally or more toxic by-product. The Stockholm Convention on Persistent Organic Pollutants exists to eliminate the use of such chemicals.

Some pesticides do not readily break down in the bodies of animals and so may be ingested by predators and thus accumulate in the food chain. The organo-chlorine pesticides have been particularly harmful in this respect, causing, until they were banned, a catastrophic decline in populations of raptorial birds.

Depending on their physical and chemical properties, pesticides may be carried into the groundwater, which may be the source on which people depend for their domestic supplies. They may also find their way into drainage systems – streams, rivers and lakes – and harm the organisms in these ecosystems.

The movement of pesticides by leaching and runoff depends on their solubility in water and their ability to adhere to soil components such as clay particles. These properties, together with the vulnerability of habitats into which the pesticides may be translocated must be taken into account when assessing the environmental risks of using particular pesticides. Before applying a pesticide, it is important to become familiar with the area to be treated and its surroundings. Some pesticides are less environmentally friendly than others and may not be selected for sites with special concerns.

Cultivated fields and orchards are themselves functioning ecosystems, dependent for their productivity on many organisms other than the crops themselves. These include pollinators, natural enemies of pests (insects, mites, nematodes, fungi, bacteria, and micro-organisms) and soil organisms necessary for fertility. There are also other plants and animals which are a source of food and also those with a value as contributing to biodiversity. Birds and fish are especially vulnerable to pesticide poisoning. Each pesticide or pesticide class comes with a specific set of environmental concerns.11

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Reference has been made above to the concerns regarding the effects of neo-nicotinyls on bees. Pyrethroids have been found to be especially toxic to fish. Care must be taken to avoid contaminating aquatic habitats with bezoyl-ureas, as they are harmful to crustaceans, essential components of the plankton and most aquatic food chains.

Herbicides are believed to present a bigger concern because of their concentration in the water supply, due to runoff from agricultural use. Herbicides can be slightly, moderately or highly toxic to aquatic organisms. They may cause reduction of sensitive species and abundance of tolerant species. Long term effects of concern include endocrine disruption and carcinogenicity. Resistance of weeds to herbicides is becoming a worldwide problem. All herbicide labels warn the user to keep the product out of lakes and streams. Many herbicides, including glyphosate, carry label statements about groundwater contamination. Care must be taken to ensure that such products are not used where groundwater contamination is likely.

Pesticides that are labeled as natural or organic are not necessarily harmless to humans or the environment. Many are quite safe to use but some have hazards associated with them. Other problems can emerge from poor pesticide management practices. Over time, repeated application increases pest resistance, while its effects on other species can facilitate the pest's resurgence.

The toxicity of pesticides to non-target organisms is a major consideration in the decision as to whether they should be used. The toxicity to aquatic organisms and honeybees of the pesticides assessed by this PERSUAP is given in Table B.7. Ecotoxicity of Pesticides.

**FACTOR H: THE CONDITIONS UNDER WHICH THE PESTICIDE IS TO BE USED, INCLUDING CLIMATE, FLORA, FAUNA, GEOGRAPHY, HYDROLOGY, AND SOILS**

**TOPOGRAPHY**

Afghanistan is a landlocked country north and west of Pakistan, east of Iran, south Tajikistan, Turkmenistan, and Uzbekistan and also bordering China in the extreme north-east. It lies between latitudes 29° N and 39° N, and longitudes 60° E and 75° E. With an area of 652,230 square kilometers (251,830 sq miles), it is slightly smaller than Texas.

About 63 percent of the land area is mountainous with 27 percent being above 2,500m above mean sea level. The highest peak, Naw Shak, is 7,485m. The Hindu Kush range, the westernmost extension of the Himalaya-Pamir mountain range, divides the country from west to east, while the Suleiman and Karakoram mountains flank the southern border with Pakistan. Major river valleys radiate from these mountains to the north, west and south, creating fertile valleys along which most agricultural and irrigation development occurs (Rout, 2008). All these, with the exception of the Kabul River, which joins the Indus in Pakistan, drain into inland basins.

Afghanistan's mountainous and arid landscape is highly vulnerable to environmental pressures. Drought, floods, deforestation, overgrazing, landslides and erosion present substantial challenges to Afghanistan's agricultural sector. The negative effects must be reduced through improved natural resource management.

**CLIMATE.**

Afghanistan is characterized by a dry continental climate, though the mountains cause many local variations. Temperatures range from minus 45°C in winter to 50°C in summer. The annual distribution of rainfall is that of an essentially arid country, more than 50 percent of the territory receives less than 300 mm of rain. The eastern border regions are an exception, as they lie at the limit of monsoon influence. About 50 percent of precipitation occurs in winter (January to March), much of which falls as snow in the
central mountainous regions. A further 30 percent falls in spring (April to June). Runoff from snowmelt in the spring and summer months, when day temperatures are high, sustains the irrigation systems.\textsuperscript{16}

**Climate Change.** Climate Change is expected to have a number of adverse effects on Afghanistan. Average annual temperature has increased in Afghanistan by 0.6° C between 1960 and 2008. The highest rate of increase occurred during the months of September-November, increasing at an average rate of 0.29° C per decade.\textsuperscript{17}

Mean rainfall over Afghanistan has decreased by slightly (an average rate of 0.5mm per month (2% per decade) since 1960. This is mainly due to decrease of around 2.7mm per month (6.6%) per decade from March to May. But is offset by small increase from June to August and September to November rainfall. The proportion of rainfall that occurs in heavy events has not changed with any consistent trends since 1960. The observed maximum 1 and 5 days rainfalls generally show small decrease from March to May, but increase slightly in other season. Much of the drying is due to decrease in in spring rainfall (UNEP 2015).

Afghanistan relies on winter snowfall in the mountains to replenish the snowfields and glaciers that supply water to its perennial and ephemeral rivers and streams. Reductions of the mountain snowpack and glaciers due to climate change could have a profound effect on Afghanistan’s water resources.\textsuperscript{18}

Reduced snow cover and melting glaciers will reduce resources for hydropower and water supplies. Drier conditions throughout the country will impact on rain-fed agriculture. The impact on pasture will reduce livestock numbers. Human health is expected to be effected by increases in vector-borne diseases such as malaria. Everywhere climate change is expected to lead to unseasonal shocks, and change in timing of the onset of seasons, and rain as well as dry periods. It is these shocks and sudden onset weather conditions that are expected to have the greatest and most difficult to deal with impacts in Afghanistan.

**Soils.** Afghanistan soils are formed under arid and semi-arid climatic conditions. Textural classes are mostly clay loam to sandy loam. Soil pH and calcium carbonate contents are high. Soil organic matter content ranges from 0.2 to 2.5 percent. Water holding capacity is low, permeability and infiltration rates are high. Soil salinity is generally not a problem. Soil fertility tests have shown low levels of nitrogen, variable levels for phosphorus, and adequate levels of potassium. Micronutrients deficiencies for iron, zinc, copper, and boron are common.\textsuperscript{19}

**Hydrology.** Although Afghanistan is located in a semi-arid environment, it is still rich in water resources mainly because of the high mountain ranges such as Hindu Kush and Baba, which are covered with snow. Over 80 percent of the country’s water resources originate in the Hindu Kush mountain ranges at altitudes of over 2,000 m. The mountains function as natural water storage, with snow during the winter and snowmelt in the summer that supports perennial flow in all the major rivers (ICARDA, 2002). The country has five major river basins:

- Kabul river basin
- Helmand river basin and western flowing rivers
- Hari Rod and Murghab river basins
- Northern flowing rivers
- Amu Darya river basin

There are some environmentally important natural wetlands and lakes in Afghanistan (Favre and Kamal, 2004).

Afghanistan’s water resources are still not efficiently used. It is not fully understood, however, how much of this ‘potential’ resource can be accessed without damage to livelihoods and ecosystems. For example, it is not fully known how much of the groundwater can be extracted without leading to an excessive decline

\textsuperscript{16} ibid

\textsuperscript{17} http://sdwebx.worldbank.org/climateportal/home.cfm?page=country_profile&CCode=AFG&ThisTab=ClimateBaseline

\textsuperscript{18} http://www.earthmagazine.org/article/dry-and-ravaged-land-investigating-water-resources-afghanistan

\textsuperscript{19} http://afghanag.ucdavis.edu/natural-resource-management/soil-topics
in groundwater levels, which may result in a stage of ‘water mining’ (Qureshi, 2002). Problems may arise in the Kabul and Eastern Helmand river basins.20

**Biodiversity.** The fauna of Afghanistan is not exceptionally diverse. There are 137–150 species of mammals, 428–515 birds, 92–112 reptiles, only 6–8 amphibians, 101–139 fish, and 245 butterflies. However the botanical endemic diversity is extraordinarily high. There are 3500–4000 vascular plant species native to Afghanistan, of which it is estimated that fully one third, some 1200 species, are endemic. Of these species, there are at least 7 neolithic founder crop species, used by agriculture for over 7,000 years in this region.

Variation in the estimates of species numbers results from uncertainty in taxonomy and the questionable validity of some records. Only seven vertebrate species (Mammals, none; Birds, Afghan Snow Finch [Montifringilla theresae]; Reptiles, Leviton’s Gecko [Asiocolotes levitoni], Cyrtopodion voraginosus, Eremias aria, Point-snouted Racerunner [Eremias afghanistanica], Amphibians, Paghman Mountain Salamander [Batrachuperus mastersi]; Fish, Triplophysa farwelli) are known to be endemic to Afghanistan, but estimates for endemic plant species range as high as 30 percent (Breckle 2007). Much more basic biological survey work and analysis needs to be done to understand fully the diversity of the country’s biota.

Biodiversity appears to be declining at an accelerating rate throughout Afghanistan. Satellite images and assessment of commercial wood volumes show that forests, both closed forest and open woodlands, are rapidly disappearing. Overgrazing and shrub collection for fuel is markedly reducing plant biomass and altering plant communities. Diversion of water and increasingly frequent drought is drying wetlands and rivers with unknown effects on aquatic biodiversity. The ubiquity of guns following years of war is leading to the loss of large mammals throughout much of the country (NEPA State of the Environment Report 2008). Ecological footprint analysis shows that Afghanistan’s per capita biocapacity is declining. Large scale remote sensing analysis suggests that nearly 8,000 km² of land was degraded between 1981 and 2003.

Immediate threats to Afghanistan’s biodiversity are land encroachment, over-hunting, deforestation, overgrazing, shrub collection, dry-land farming, water diversion and climate change. All of these have worsened in recent years. Exploitation by warlords have aggravated all these and prevented the enforcement of conservation measures. UNEP/NEPA 2014 State of the Environment Report (in Dari).

Afghanistan lies on a major bird migration route between Siberia and the Indian sub-continent. Twice a year, vast numbers of birds of many species, including waterfowl, raptors and cranes, pass through the country and depend for their survival on wetlands and other critical habitats in Afghanistan, making their conservation a matter of international importance.

**Vulnerable habitats.** The following vulnerable habitats are identified in Afghanistan’s National Biodiversity Strategy and Action Plan.

**Desert and grassland.** These dry habitat types are widespread in Afghanistan, and are often degraded by livestock grazing. In particular regions across the Central Highlands and northern slopes of the Central Highlands are particularly vulnerable.

**Woodlands.** Closed oak and conifer forests are limited to the eastern, monsoon-influenced part of Afghanistan (Nangahar, Kunar, Nuristan, Paktia, Laghman), where they are threatened by illegal logging see Fig. 5.1)

**Wetlands.** Afghanistan has a very limited area of lakes and marshlands. The Kol-e-Hashmat Khan wetland is the only remnant of the once extensive Kabul marshes. It was declared a waterfowl reserve in the 1930s but is currently threatened by water diversion, indiscriminate hunting and other disturbances. Dasht-e Nawur in Ghazni, Sistan in Helmand, and Darqad areas of Takhar are wetlands of global importance and are under pressure from climate change impacts, mismanagement of water resources and pollution.

**Rivers.** River systems and associated seasonally flooded areas also are very limited in extent in Afghanistan, but nevertheless provide important biodiversity habitat.

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20 ibid
The eco-regions at highest threat are in an arc around the country’s mountain chain and are the open and closed woodlands. Lawlessness presents the major underlying challenge to biodiversity conservation and ultimately to the quality of life of Afghans.

### TABLE 5.2. STATUS OF TERRESTRIAL BIOMES IN AFGHANISTAN

<table>
<thead>
<tr>
<th>BIOME</th>
<th>AREA (KM²)</th>
<th>% OF COUNTRY</th>
<th>% OF BIOME ENDANGERED</th>
<th>% OF BIOME VULNERABLE</th>
<th>% OF BIOME STABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subalpine &amp; Alpine</td>
<td>106,584</td>
<td>17</td>
<td>0</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>Desert &amp; Semi-desert</td>
<td>252,044</td>
<td>39</td>
<td>27</td>
<td>73</td>
<td>0</td>
</tr>
<tr>
<td>Open Woodlands</td>
<td>240,745</td>
<td>37</td>
<td>60</td>
<td>38</td>
<td>2</td>
</tr>
<tr>
<td>Evergreen Forest &amp; Woodland</td>
<td>49,124</td>
<td>8</td>
<td>70</td>
<td>26</td>
<td>4</td>
</tr>
</tbody>
</table>

**FIGURE 5.1 DEFORESTATION IN EASTERN AFGHANISTAN**

Protected areas. Two National Parks, Band-e Amir, in Bamiyan province and Wakhan Corridor have been legally protected, and one International Union for Conservation of Nature and Natural Resources (IUCN) Category V landscape conservation area (Shah Foladi Mountains in Koh-e Baba), has been legally protected, and there are plans for 15 other special protected parks and conservation areas by 2020. Other important areas which receive some level of protection are shown in Fig. 5.2.
Agricultural land use. Agricultural land was estimated to be 58.1 percent of the total land area by the World Bank in 2012. Agricultural irrigated land (percent of total agricultural land) in Afghanistan was last estimated at 5.47 percent. Agricultural irrigated land refers to agricultural areas purposely provided with water, including land irrigated by controlled flooding. Arable land (percent of land area) in Afghanistan was last estimated at 11.9 percent. The destruction of the forests to create agricultural land, logging, forest fires, plant diseases, and insect pests are all causes of the reduction in forest coverage. Illegal logging and clear-cutting by timber smugglers have exacerbated this destructive process. There is currently a ban on cutting new timber in Afghanistan. Population in Afghanistan is increasing, and highly destructive practices that damage soil, water and biodiversity are becoming more common.21

FACTOR I: THE AVAILABILITY AND EFFECTIVENESS OF OTHER PESTICIDES OR NON-CHEMICAL CONTROL METHODS

IPM has a long, if somewhat checkered, history in Afghanistan. During the 1970s, FAO supported the PPQD in developing plant protection and adopted what was essentially an IPM approach which included, among other activities, the identification of pests and diseases and the introduction of *Aphelinus mali* as a natural enemy of Woolly Aphid (*Eriosoma lanigerum*). These activities fell into abeyance during the years of conflict and although FAO maintained a presence through the 1990s, after the departure of Soviet forces, the emphasis was, of necessity, on emergency control of migratory pests such as locusts and Sunn Pest. Even so, non-chemical methods, such as the use of sweep nets to control Sunn Pest and mechanical control of locusts were introduced.

FAO has implemented an IPM project funded by the government of Norway. Here, the emphasis is on Farmer Field Schools (FFS) and is directed towards specific crops: potatoes, wheat, melons and rice. The methods adopted are entirely non-chemical and include, for example, animal-drawn hoes for weed control in wheat, plastic mulch and bagging for control of melon fly (*Myciicarpis pardiina*). This project worked closely with PPQD and the DAILs. Phase I of this project is completed and it is hoped that funding for Phase II will be forthcoming.

An IPM element was included in the World Bank Horticulture and Livestock Project, which commenced in 2008. This focused on perennial crops such as almonds, apricots and grapes. The project as a whole was implemented by GIZ with FAO implementing the IPM element. This project now continues as the

National Horticulture and Livestock Project, implemented by GoA MAIL. Its scope covers tree crops (including grape vines), vegetables and cereals. It is developing Pest Management Plans for all crops.

The Centre for Agriculture and Biosciences International (CABI) now has a base in PPQD. With a variety of funding sources, it has set up 68 Plant Health Clinics. These use a standard reporting format for recording farmer enquiries (see Annex E for English language version) and these will be the basis of a national plant protection database. It has also set up diagnostic laboratories in Kabul, Pul-i-Khumri, Takhar, Bamiyan and Aybak. It will undertake a national survey of plant pests and diseases; this is a necessary step to acceding to the International Plant Protection Convention, which also has implications for WTO membership. At its base in PPQD it has a biocontrol lab producing insect parasitoids (Trichogramma), Nuclear Polyhedrosis Virus (NPV) and Trichoderma, a fungus for sterilising soil. The arrival of CABI is a real game changer for plant protection in Afghanistan and projects should collaborate with and support their work as much as possible.

USAID projects have adopted an IPM approach to pest and disease control where these have been needed by their activities. ADP/N implemented control of Codling Moth based on pesticide application timed from the UC Davis online development model using pheromone traps and temperature data from the Afghanistan Dept. of Meteorology. It also introduced dormant season spraying of fruit trees to prevent Shothole disease in apricots and bacterial canker in several species. IDEA-NEW developed pest and weed management strategies for wheat, grapevines, stone fruit and vegetables.

Of the current projects, AGRED has been followed by AAEP II, a key component of which is the establishment of provincial model teaching farms in five core provinces (Balkh, Herat, Kabul, Nangahar, and Kunduz). This includes providing small grants for lead farmers to replicate good practices on their farms where other farmers can learn. Training pest management is part of this program.

CHAMP has facilitated FFS with participation of 12,794 farmers of Apricot, Almond, Apple, Grape and Pomegranate. With our oversight they have provided training on pesticides application methods, time, control of different pest and diseases of above-mentioned crops and safe application of pesticides. Moreover, CHAMP has produced videos on the safe use of pesticides, and re planning to disseminate these videos in the coming month.

RADP-W has given IPM training on stone fruits IPM For Stone Fruits (Peaches, Plums, Apricots, Almonds)

RADP-S has provided training in pesticide safety and IPM and weed control for orchards, vineyards, wheat and vegetables.

RADP-N has provided training on integrated control of weeds in wheat and included safe transportation, application, and disposal of hazardous products. It has also trained farmers in melon fly control by plastic mulching, pupa collection, melon bagging, and safe application of pesticides. It also provided training to agriculture retailers from Badakhshan, Baghlan, and Kunduz provinces.

USAID projects should consider the use of innovative non-toxic methods, such as mating disruption by pheromones. (E,E)-8,10-Dodecadien-1-ol is a synthetic analogue of the pheromone of the Codling Moth and (Z,E)-7,9,11-Dodecatrieny1 formate of the Carob Moth and both are commercially available in formulations designed for mating disruption.

**FACTOR J: THE REQUESTING COUNTRY’S ABILITY TO REGULATE OR CONTROL THE DISTRIBUTION, STORAGE, USE AND DISPOSAL OF THE REQUESTED PESTICIDE**

**PESTICIDE REGISTRATION PROCESS**

An Afghanistan pesticide law was written in 1979. A new law was drafted under the World Bank Horticulture and Livestock Project (HLP) in 2009 and, after extensive review and revision, enacted in 2015. (See Annex D for unofficial English translation.) The pesticide regulatory regime is still at an early stage of development and, as yet there, is no functioning system to register active ingredients and products, importers, distributors or vendors. Pesticide commerce and trade is thus virtually unregulated.

The main problems relate to the quality of products imported for sale on the local market and the standard of labelling.
• Since there is at present no practical regulation of pesticide sales and no analytical capacity in the country, there is no guarantee that products offered for sale contain the active ingredients which they claim.
• Even if they do, there may be serious problems of quality. They may contain impurities: isomers with undesirable properties, precursors that have not been fully converted, side products or breakdown products.
• Much of the efficacy of a pesticide depends on its formulation. Poorly formulated products may be ineffective, leading to need for repeated application and contributing to pest resistance.
• Labels may not be in the local languages (see Section 4).
• Labels may lack important safety information, such as acute toxicity, necessary PPE, re-entry times, harvesting times etc.
• Labels may lack important information on use: crops, pests, dosage etc.

USAID projects must take responsibility for ensuring that only products of known quality are used and that necessary labelling or instructional leaflets are provided. If necessary, they should procure pesticides abroad and arrange their importation.

RELEVANT INSTITUTIONS AND REGULATORY ENFORCEMENT

Overarching responsibility for environmental protection lies with the National Environmental Protection Agency (NEPA), but the government body responsible for implementing pesticide regulation is the PPQD of MAIL. PPQD does not possess the capacity of laboratory equipment or trained personnel to regulate pesticide trade.22

INTERNATIONAL CONVENTIONS AND TREATIES

Afghanistan has acceded to the International Plant Protection Convention (IPPC), a multilateral treaty overseen by the FAO that aims to secure coordinated, effective action to prevent and to control the introduction and spread of pests of plants and plant products. It is also a signatory to conventions that control the distribution of banned pesticides, namely.

• The Stockholm Convention on Persistent Organic Pollutants (POPs)
• The Rotterdam Convention, a multilateral treaty to promote shared responsibilities in relation to importation of hazardous chemicals, and
• The Minamata Convention on Mercury. This global treaty to protect human health and the environment from the adverse effects of mercury effectively phases out all mercury-containing pesticides.

FACTOR K: THE PROVISIONS MADE FOR TRAINING OF USERS AND APPLICATORS

Training is the chief factor in ensuring safe and effective pesticide use by USAID projects. In the past, projects have provided training of very variable quality. It is therefore very strongly recommended that there is a program-wide training policy with a common syllabus, implemented by a dedicated, trained team of trainers.

Training must be directed to the following groups.
• Project staff who will apply or handle pesticides, or serve as extension agents;
• Beneficiary farmers who will use/apply pesticides;
• Those being trained as extension agents by the projects;
• Enterprises or cooperatives receiving USAID-funded loans or other credit support that deal in or use pesticides
• Beneficiary agro-input dealers.

Training topics must include the following; see Annex C for more detail on several of these topics and the Pesticide Retailer Handbook developed by the USAID/Afghanistan IDEA-NEW project for fuller treatment and curriculum (www.usaidgems.org/Documents/complianceTopics/IDEA-NEW_PesticideRetailerHandbook.docx). Brief refresher training must be provided at least annually.

• Definition of pesticides.
• Pesticide risks and the understanding that pesticides are bio-poisons.
• Concepts of AIs vs. formulated products.
• Classes of pesticides and the concept that specific pesticides are effective only against a certain class of organism.
• Concept of proper application rates and pesticide resistance and techniques for avoiding misapplication.
• Survey of the core elements of Safe Pesticide Use: IPM, Safe Purchase, Transport, Storage, Mixing, Application, Reentry and Pre-harvest intervals, Clean-up and Disposal, including specific treatment of PPE.
• Pesticide first aid and spill response.
• Reading and interpreting pesticide labels -- particularly to understand PPE requirements and other precautions, dosage rates, and to identify AIs and expiration dates.
• Proper sprayer operation and maintenance.
• Record keeping and monitoring.

All training must include a pre- and post-course evaluation of the participants. Participants will only be accepted as “trained” if their evaluation is satisfactory. Brief refresher training must be provided at least annually.

The application of certain, higher-risk products requires training beyond the basic level (see Table 6.1 for products so designated.) Such “RUP-level” training may be satisfied by an eventual MAIL certification program (at such time as one exists), or by a US or EU applicator certification. Otherwise, the USAID/Afghanistan MEO will be required to determine whether any given training or certification is sufficient for these designated higher-risk AIs.

FACTOR L: THE PROVISIONS MADE FOR MONITORING THE USE AND EFFECTIVENESS OF THE PESTICIDES

MONITORING USE AND EFFECTIVENESS

The use of these pesticides will be monitored as part of the projects’ crop management extension program. Any incidents reported by program staff or farmers will be followed up on by M&E staff.

The project must maintain records of all pesticide use, monitor pesticide effectiveness, and scout for resistance. Training in monitoring must be provided to farmers. Where literacy or language is a limiting factor, training should be developed to address this concern. Some products are considered low risk for resistance development, while others allow a limited number of applications per season because of the high risk of resistance development, and must alternate with pesticides from different chemical groups.

IPs will be required to report as stipulated in Section 6.

As part of this reporting, IPs directly supporting farm-level pesticide use or extension will be required to report on instances observed of pesticide resistance. USAID monitoring and evaluation field visits will examine pesticide compliance.

5.3 PESTICIDES CONSIDERED BUT REJECTED

Synthesizing across the foregoing PER analysis, Table 5.3 lists those active ingredients whose use by USAID projects was specifically considered but rejected. This list includes not only candidate pesticides as listed in Section 5, but other chemicals whose importation into Afghanistan is banned in compliance with international agreements or which are believed might be available in the region and illicitly imported. The grounds for rejection are also listed. This information is provided to support evaluation of future requests for amendment of this PERSUAP.
<table>
<thead>
<tr>
<th>ACTIVE INGREDIENT</th>
<th>RUPS*</th>
<th>US EPA REGISTRATION</th>
<th>REASON FOR REJECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,4,5-T and its salts and esters</td>
<td>No</td>
<td></td>
<td>Rotterdam Convention requiring PIC and banned in Afghanistan</td>
</tr>
<tr>
<td>Alachlor</td>
<td>20</td>
<td>Yes</td>
<td>Rotterdam Convention requiring PIC and banned in Afghanistan</td>
</tr>
<tr>
<td>Atrazine</td>
<td>109</td>
<td>Yes</td>
<td>Toxicity</td>
</tr>
<tr>
<td>Bromoxynil phenol</td>
<td>3</td>
<td>Yes</td>
<td>Long Term Toxicity</td>
</tr>
<tr>
<td>Clodinafop</td>
<td>0</td>
<td>No</td>
<td>Not EPA registered</td>
</tr>
<tr>
<td>Diclofop-methyl</td>
<td>3</td>
<td>Yes</td>
<td>Long Term Toxicity</td>
</tr>
<tr>
<td>Dinoseb and its salts and esters</td>
<td>No</td>
<td></td>
<td>Rotterdam Convention requiring PIC and banned in Afghanistan</td>
</tr>
<tr>
<td>Oxadiazon</td>
<td>0</td>
<td>Yes</td>
<td>Long Term Toxicity</td>
</tr>
<tr>
<td>Paraquat dichloride</td>
<td>17</td>
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<td>Acute Toxicity</td>
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<td>Trifluralin</td>
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<td>Binapacryl</td>
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<td>Captafol</td>
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<td>Captan</td>
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<td>Yes</td>
<td>Long Term Toxicity</td>
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<td>Carbendazim</td>
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<td>Yes</td>
<td>Long Term Toxicity</td>
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<tr>
<td>Iprodione</td>
<td>0</td>
<td>Yes</td>
<td>Long Term Toxicity</td>
</tr>
<tr>
<td>Mercury compounds including inorganic and organometallic mercury compounds</td>
<td>None</td>
<td></td>
<td>Rotterdam Convention requiring PIC and banned in Afghanistan in accordance with Minamata Convention</td>
</tr>
<tr>
<td>Pentachlorophenol and its salts and esters</td>
<td>5</td>
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<td>Rotterdam Convention requiring PIC and banned in Afghanistan</td>
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<td>Propineb</td>
<td>0</td>
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<td>Not EPA registered</td>
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<td>Ethylene dichloride</td>
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<td>Ethylene oxide</td>
<td>0</td>
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<tr>
<td>Methyl bromide</td>
<td>40</td>
<td>Yes</td>
<td>Montreal Protocol</td>
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<tr>
<td>Chlordecone</td>
<td>No</td>
<td></td>
<td>Stockholm Convention Annex A. Elimination</td>
</tr>
<tr>
<td>Chlordimeform</td>
<td>No</td>
<td></td>
<td>Rotterdam Convention requiring PIC and banned in Afghanistan</td>
</tr>
<tr>
<td>ACTIVE INGREDIENT</td>
<td>RUPS*</td>
<td>US EPA REGISTRATION</td>
<td>REASON FOR REJECTION</td>
</tr>
<tr>
<td>------------------------</td>
<td>-------</td>
<td>----------------------</td>
<td>---------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1,2-dibromoethane (EDB)</td>
<td>No</td>
<td></td>
<td>Rotterdam Convention requiring PIC and banned in Afghanistan</td>
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<tr>
<td>Abamectin (avermectin)</td>
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<td>Yes</td>
<td>Acute Toxicity</td>
</tr>
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<td>Aldicarb</td>
<td>2</td>
<td>Yes</td>
<td>Rotterdam Convention requiring PIC and banned in Afghanistan</td>
</tr>
<tr>
<td>Aldrin</td>
<td>No</td>
<td></td>
<td>Rotterdam Convention requiring PIC and banned in Afghanistan. Stockholm Convention Annex A. Elimination</td>
</tr>
<tr>
<td>Chlordane</td>
<td>No</td>
<td></td>
<td>Rotterdam Convention requiring PIC and banned in Afghanistan. Stockholm Convention Annex A. Elimination</td>
</tr>
<tr>
<td>Chlorobenzilate</td>
<td>No</td>
<td></td>
<td>Rotterdam Convention requiring PIC and banned in Afghanistan</td>
</tr>
<tr>
<td>Chlorpyriphos</td>
<td>46</td>
<td>Yes</td>
<td>Long Term Toxicity</td>
</tr>
<tr>
<td>Clofentezine</td>
<td>0</td>
<td>No</td>
<td>Not EPA registered</td>
</tr>
<tr>
<td>DDT</td>
<td>No</td>
<td></td>
<td>Rotterdam Convention requiring PIC and banned in Afghanistan. Stockholm Convention Annex A. Elimination</td>
</tr>
<tr>
<td>Diazinon</td>
<td>6</td>
<td>Yes</td>
<td>Long Term Toxicity</td>
</tr>
<tr>
<td>Dieldrin</td>
<td>No</td>
<td></td>
<td>Rotterdam Convention requiring PIC and banned in Afghanistan. Stockholm Convention Annex A. Elimination</td>
</tr>
<tr>
<td>Dimethoate</td>
<td>1</td>
<td>Yes</td>
<td>Long Term Toxicity</td>
</tr>
<tr>
<td>Dinitro-ortho-cresol (DNOC) and its salts</td>
<td>No</td>
<td></td>
<td>Rotterdam Convention requiring PIC and banned in Afghanistan</td>
</tr>
<tr>
<td>Emamectin benzoate</td>
<td>4</td>
<td>Yes</td>
<td>Acute Toxicity</td>
</tr>
<tr>
<td>Endrin</td>
<td>No</td>
<td></td>
<td>Stockholm Convention Annex A. Elimination</td>
</tr>
<tr>
<td>Ethion</td>
<td>0</td>
<td>No</td>
<td>Not EPA registered</td>
</tr>
<tr>
<td>Fenpropathrin</td>
<td>3</td>
<td>Yes</td>
<td>Acute Toxicity &amp; Ecotoxicity</td>
</tr>
<tr>
<td>Fenvalerate</td>
<td>0</td>
<td>No</td>
<td>Not EPA registered</td>
</tr>
<tr>
<td>Flufenoxuron</td>
<td>0</td>
<td>No</td>
<td>Not EPA registered</td>
</tr>
<tr>
<td>Heptachlor</td>
<td>No</td>
<td></td>
<td>Rotterdam Convention requiring PIC and banned in Afghanistan. Stockholm Convention Annex A. Elimination</td>
</tr>
<tr>
<td>Hexachlorobenzene</td>
<td>No</td>
<td></td>
<td>Rotterdam Convention requiring PIC and banned in Afghanistan. Stockholm Convention Annex A. Elimination</td>
</tr>
<tr>
<td>Indoxacarb</td>
<td>0</td>
<td>No</td>
<td>Not EPA registered</td>
</tr>
</tbody>
</table>
### TABLE 5.3. AIs SPECIFICALLY CONSIDERED BUT REJECTED

<table>
<thead>
<tr>
<th>ACTIVE INGREDIENT</th>
<th>RUPS*</th>
<th>US EPA REGISTRATION</th>
<th>REASON FOR REJECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lambda cyhalothrin</td>
<td>46</td>
<td>Yes</td>
<td>High ecotoxicity</td>
</tr>
<tr>
<td>Methamidophos (certain formulations)</td>
<td>No</td>
<td></td>
<td>Rotterdam Convention requiring PIC and banned in Afghanistan</td>
</tr>
<tr>
<td>Methidathion</td>
<td>0</td>
<td>Yes</td>
<td>Acute Toxicity</td>
</tr>
<tr>
<td>Mirex</td>
<td>No</td>
<td></td>
<td>Stockholm Convention Annex A. Elimination</td>
</tr>
<tr>
<td>Monocrotophos</td>
<td>No</td>
<td></td>
<td>Rotterdam Convention requiring PIC and banned in Afghanistan</td>
</tr>
<tr>
<td>Parathion</td>
<td>No</td>
<td></td>
<td>Rotterdam Convention requiring PIC and banned in Afghanistan</td>
</tr>
<tr>
<td>Pentachlorobenzene</td>
<td>No</td>
<td></td>
<td>Stockholm Convention Annex A. Elimination</td>
</tr>
<tr>
<td>Phosphamidon (certain formulations)</td>
<td>No</td>
<td></td>
<td>Rotterdam Convention requiring PIC and banned in Afghanistan</td>
</tr>
<tr>
<td>Profenofos</td>
<td>0</td>
<td>Yes</td>
<td>Long Term Toxicity</td>
</tr>
<tr>
<td>Propargite</td>
<td>5</td>
<td>Yes</td>
<td>RUP label &quot;1 Danger&quot;</td>
</tr>
<tr>
<td>Toxaphene</td>
<td>No</td>
<td></td>
<td>Stockholm Convention Annex A. Elimination</td>
</tr>
<tr>
<td>Trichlorfon</td>
<td>0</td>
<td>Yes</td>
<td>Long Term Toxicity</td>
</tr>
<tr>
<td>α- and β- Hexachlorocyclohexane</td>
<td>No</td>
<td></td>
<td>Stockholm Convention Annex A. Elimination</td>
</tr>
<tr>
<td>Fluoroacetamide</td>
<td>No</td>
<td></td>
<td>Rotterdam Convention requiring PIC and banned in Afghanistan</td>
</tr>
</tbody>
</table>

### 5.4 ALLOWED PESTICIDE ACTIVE INGREDIENTS

Pesticide AIs not rejected by the analysis are approved for procurement, use and/or support for use under this PERSUAP. Table 6.1 (following section) lists these AIs, the uses for which they are approved, and any conditions or limitations specific to the subject AI that emerge from the PER analysis.

As described in the following section, procurement, use and support to use is subject to these AI-specific conditions AND to the conditions for IPs and USAID set out in sections 6.3 and 6.4. These conditions likewise emerge or follow from the PER analysis.

Notwithstanding an AI’s “approved” status, Class I products (i.e. those labeled with skull and crossbones, the word DANGER and/or POISON or equivalent) may only be used by operators with RUP-level training and appropriate PPE, as certified by MAIL (at such time as a professional pesticide applicator certification program may exist), an appropriate US or EU certification, or by the USAID MEO.
SAFE USE ACTION PLAN (SUAP)

6.1 INTRODUCTION

This Safe Use Action Plan is the definitive, stand-alone statement of pesticide compliance requirements and is synthesized from the PER analysis. Its contents are as follows:

- Section 6.2 lists allowed pesticide AIs, their approved uses, and conditions specific to certain AIs.
- Section 6.3 sets out the mandatory safe use conditions for IPs attendant to procurement/use/support of these pesticides.
- Section 6.4 sets out mandatory conditions that apply to USAID/Afghanistan technical offices and AORs/CORS.
- Section 6.5 provides recommendations for USAID/Afghanistan programming.

6.2 APPROVED PESTICIDES

Upon approval of this PERSUAP, the below-listed pesticides (as AIs) are permitted for procurement/use/support in USAID/Afghanistan activities, SUBJECT to compliance with:

1. any conditions specified for the subject AI in the table below; AND
2. conditions specified in sections 6.3 for implementing partners AND
3. conditions specified in section 6.4 for USAID.

Human health and ecological toxicological summaries for each AI are presented in Annex B. All are EPA-registered.

<table>
<thead>
<tr>
<th>ACTIVE INGREDIENT</th>
<th>USES</th>
<th>CONDITIONS</th>
<th>STATUS IN 2013 PERSUAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorhexidine</td>
<td>Antiseptic (sold over counter in US)</td>
<td>For use in health facilities only by our under supervision of qualified clinical/laboratory staff.</td>
<td>Not reviewed</td>
</tr>
<tr>
<td>Chlorine</td>
<td>Disinfectant for clinical hygiene</td>
<td>For use in health facilities only by our under supervision of qualified clinical/laboratory staff.</td>
<td>Approved for water treatment</td>
</tr>
<tr>
<td>Chloroxylenol</td>
<td>Disinfectant for clinical hygiene</td>
<td>For use in health facilities only by our under supervision of qualified clinical/laboratory staff.</td>
<td>Not reviewed</td>
</tr>
<tr>
<td>Ethanol</td>
<td>Disinfectant for clinical hygiene</td>
<td>For use in health facilities only by our under supervision of qualified clinical/laboratory staff.</td>
<td>Approved as clinical disinfectant</td>
</tr>
<tr>
<td>Phenol</td>
<td>Disinfectant for clinical hygiene</td>
<td>For use in health facilities only by our under supervision of qualified clinical/laboratory staff.</td>
<td>Approved as clinical disinfectant</td>
</tr>
<tr>
<td>Sodium hypochlorite</td>
<td>Disinfectant for clinical hygiene</td>
<td>For use in health facilities only by our under supervision of qualified clinical/laboratory staff.</td>
<td>Approved as clinical disinfectant</td>
</tr>
</tbody>
</table>

Herbicides
### TABLE 6.1 PESTICIDES (ACTIVE INGREDIENTS) APPROVED FOR PROCUREMENT/USE/SUPPORT

<table>
<thead>
<tr>
<th>ACTIVE INGREDIENT</th>
<th>USES</th>
<th>CONDITIONS</th>
<th>STATUS IN 2013 PERSUAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,4-D</td>
<td>Selective herbicide for later treatment against broad-leaved weeds in cereal crops</td>
<td>Only to be applied by operators with RUP-level training and appropriate PPE.</td>
<td>Approved</td>
</tr>
<tr>
<td>Clethodim</td>
<td>Selective post-emergence herbicide against grass weeds in broad-leaved crops</td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Clodinafop-propargyl</td>
<td>Selective herbicide against grass weeds in cereal crops</td>
<td></td>
<td>Not reviewed</td>
</tr>
<tr>
<td>Dicamba</td>
<td>Selective herbicide for pre- &amp; post-emergence treatment against broad-leaved weeds in cereals</td>
<td>Only to be applied by operators with RUP-level training and appropriate PPE</td>
<td>Approved</td>
</tr>
<tr>
<td>Fenoxaprop-p-ethyl</td>
<td>Selective herbicide against grass weeds in cereal crops</td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Glyphosate</td>
<td>Broad-spectrum herbicide to kill all weeds and for zero-tillage</td>
<td>Only to be applied by operators with RUP-level training and appropriate PPE</td>
<td>Approved</td>
</tr>
<tr>
<td>MCPA, 2-ethyl hexy ester</td>
<td>Selective herbicide for early treatment against broad-leaved weeds in cereal crops</td>
<td>Only to be applied by operators with RUP-level training and appropriate PPE</td>
<td>Not reviewed</td>
</tr>
<tr>
<td>Oxyfluorfen</td>
<td>Selective herbicide for pre- and post directed control of a wide spectrum of annual broadleaf weeds and grasses</td>
<td></td>
<td>Not reviewed</td>
</tr>
<tr>
<td>Pendimethalin</td>
<td>Selective herbicide for pre- &amp; post-emergence control of grass &amp; some broad-leaved weeds</td>
<td></td>
<td>Not reviewed</td>
</tr>
<tr>
<td>Sethoxydim</td>
<td>Selective post-emergence herbicide against grass weeds in broad-leaved crops</td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Sulfosulfuron</td>
<td>Herbicide for annual grass and broad-leaved weed control in cereals and other crops</td>
<td></td>
<td>Not reviewed</td>
</tr>
</tbody>
</table>

**Fungicides**

<table>
<thead>
<tr>
<th>Active Ingredient</th>
<th>Uses</th>
<th>Conditions</th>
<th>Status in 2013 PERSUAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Azoxyostrobin</td>
<td>Fungicide for control of Powdery Mildew on grapevines</td>
<td>Only to be applied by operators with RUP-level training and appropriate PPE.</td>
<td>Approved</td>
</tr>
<tr>
<td>Boscalid</td>
<td>Fungicide for control of Powdery Mildew on vegetables and anthracnose on almonds</td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Carboxin</td>
<td>Fungicide used as a mixture with thiram (Vitavax)</td>
<td>Use only as seed treatment</td>
<td>Approved as mixture with thiram</td>
</tr>
<tr>
<td>Copper hydroxide</td>
<td>Fungicide for the control of Downy Mildew on grapes</td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Copper oxychloride</td>
<td>Fungicide for prevention of anthracnose in grapes</td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Copper sulfate</td>
<td>Dormant season treatment of fruit trees</td>
<td>Use only in Bordeaux Mixture for dormant season treatment of fruit trees.</td>
<td>Approved for use as Bordeaux Mixture</td>
</tr>
</tbody>
</table>
### TABLE 6.1 PESTICIDES (ACTIVE INGREDIENTS) APPROVED FOR PROCUREMENT/USE/SUPPORT

<table>
<thead>
<tr>
<th>ACTIVE INGREDIENT</th>
<th>USES</th>
<th>CONDITIONS</th>
<th>STATUS IN 2013 PERSUAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kresoxim-methyl</td>
<td>Fungicide for control of Powdery Mildew on grape-vines</td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Mancozeb</td>
<td>Systemic fungicide for treatment of Early Blight in potatoes and treatment of fungal diseases in vegetables &amp; in nurseries</td>
<td>Only to be applied by operators with RUP-level training and appropriate PPE. May not be used in home vegetable plots</td>
<td>Approved</td>
</tr>
<tr>
<td>Metalaxyl</td>
<td>Systemic fungicide used as a soil treatment for control of soil-borne pathogens, and as a seed treatment to control downy mildews</td>
<td>Only to be applied by operators with RUP-level training and appropriate PPE. Approved for use as a mixture with mancozeb</td>
<td>Approved</td>
</tr>
<tr>
<td>Propiconazole</td>
<td>Systemic fungicide</td>
<td></td>
<td>Not reviewed</td>
</tr>
<tr>
<td>Quinoxyfen</td>
<td>Fungicide for control of Powdery Mildew on grape-vines</td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Sodium metabisulfite</td>
<td>Protection of packaged grapes against fungus</td>
<td>Use only in Sulfur Pads</td>
<td>Not reviewed</td>
</tr>
<tr>
<td>Sulfur</td>
<td>Protective treatment of grapevines against powdery mildew</td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Tebuconazole</td>
<td>Systemic fungicide for control of Powdery Mildew in grape-vines</td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Thiram (TMTD)</td>
<td>Fungicide used as a mixture with carboxin (Vitavax)</td>
<td>Use only as seed treatment</td>
<td>Approved for use as mixture with carboxin</td>
</tr>
</tbody>
</table>

**Insecticides**

<table>
<thead>
<tr>
<th>Active Ingredient</th>
<th>Uses</th>
<th>Conditions</th>
<th>Status in 2013 PERSUAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetamiprid</td>
<td>Systemic insecticide for use against sap-sucking pests</td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Azadirachtin (neem oil)</td>
<td>Low toxicity protection against a range of insect pests</td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Bacillus thuringiensis-BT</td>
<td>Control of lepidopterous pests of vegetables</td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Beauvaria bassiana</td>
<td>Control of Sunn Pest &amp; Colorado Beetle</td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Bifenzanate</td>
<td>Acaricide for control of Spider Mite</td>
<td></td>
<td>Not reviewed</td>
</tr>
<tr>
<td>Carbaryl</td>
<td>Control of cutworm on vegetables</td>
<td>Use only as powder for cutworm control</td>
<td>Approved</td>
</tr>
<tr>
<td>Chlorantranilipole</td>
<td>Mainly for control of pest <em>Tuta Absoluta</em> on wide range of crops, particularly tomatoes (products such as Coragen, Rynaxypyr)</td>
<td>Do not use near sources of water</td>
<td>Not reviewed</td>
</tr>
<tr>
<td>Cypermethrin</td>
<td>Broad spectrum insecticide/acaricide for control of ecto-parasites on</td>
<td>Use only as pour-on</td>
<td>Not reviewed for this use</td>
</tr>
<tr>
<td>ACTIVE INGREDIENT</td>
<td>USES</td>
<td>CONDITIONS</td>
<td>STATUS IN 2013</td>
</tr>
<tr>
<td>------------------</td>
<td>------</td>
<td>------------</td>
<td>----------------</td>
</tr>
<tr>
<td>livestock</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cypermethrin (alpha)</td>
<td></td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Cypermethrin (beta)</td>
<td></td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Deltamethrin</td>
<td></td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Diflubenzuron</td>
<td></td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Fenpyroximate</td>
<td></td>
<td></td>
<td>Not reviewed</td>
</tr>
<tr>
<td>Imidacloprid</td>
<td></td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Insecticidal soap</td>
<td></td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Malathion</td>
<td></td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Mineral oil</td>
<td></td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Spinosad</td>
<td></td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>Fumigant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aluminum phosphide</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acaricide</td>
<td></td>
<td></td>
<td>Not reviewed</td>
</tr>
<tr>
<td>Synthetic pheromones</td>
<td></td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>SPLAT-Cydia</td>
<td></td>
<td></td>
<td>Approved</td>
</tr>
<tr>
<td>SPLAT-EC</td>
<td></td>
<td></td>
<td>Approved</td>
</tr>
</tbody>
</table>
TABLE 6.1 PESTICIDES (ACTIVE INGREDIENTS) APPROVED FOR PROCUREMENT/USE/SUPPORT

<table>
<thead>
<tr>
<th>ACTIVE INGREDIENT</th>
<th>USES</th>
<th>CONDITIONS</th>
<th>STATUS IN 2013 PERSUAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molluscide</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metaldehyde</td>
<td>Molluscide for control of slugs and snails on vegetables</td>
<td>Approved</td>
<td></td>
</tr>
<tr>
<td>Rodenticides</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brodifacoum</td>
<td>Rodenticide for control of rats &amp; mice in buildings</td>
<td>Use only in secure bait stations</td>
<td>Approved</td>
</tr>
<tr>
<td>Bromadiolone</td>
<td>Rodenticide for control of rats &amp; mice in buildings</td>
<td>Use only in secure bait stations</td>
<td>Approved</td>
</tr>
<tr>
<td>Warfarin</td>
<td>Rodenticide for control of rats &amp; mice in buildings</td>
<td>Use only in secure bait stations</td>
<td>Approved</td>
</tr>
<tr>
<td>Zinc phosphide</td>
<td>Rodenticide for control of rats &amp; mice in buildings</td>
<td>Use only in secure bait stations</td>
<td>Not reviewed</td>
</tr>
</tbody>
</table>

6.3 MANDATORY SAFER USE CONDITIONS FOR IPs

Mandatory safer use conditions for IPs are as follows. They are synthesized or follow directly from the PER analysis:

1. Only pesticides with approved active ingredients can be procured, used or recommended for use with USAID funds. These pesticides are enumerated in Section 6.2 above. Support must be in compliance with (1) the listed use(s) and (2) any specific conditions enumerated in section 6.2 above.

NOTES:

<table>
<thead>
<tr>
<th>Multiple AIs in one product</th>
<th>Where a pesticide product contains more than one AI, the product can only be used when all its AIs are approved by this PERSUAP.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop demonstrations and trials</td>
<td>Crop demonstrations and trials will use only approved AIs. The sole exception is where the purpose of the trial is evaluate a new pesticide not on the list, in which case a waiver must be obtained from the MEO.</td>
</tr>
<tr>
<td>Finance that may be used for purchase of pesticides</td>
<td>Projects providing finance that may be used for the purchase of pesticides will ensure that beneficiaries receive information (see Training below) concerning permitted pesticides and their safe and effective use.</td>
</tr>
<tr>
<td>Pesticides procured under 2013 PERSUAP</td>
<td>Projects that procured pesticides approved by the 2013 PERSUAP but not approved by this PERSUAP may utilize these pesticides consistent with the other conditions listed below. However, no further procurement of such pesticides is permitted.</td>
</tr>
<tr>
<td>EPA-analogous formulation</td>
<td>Products procured with USAID funds must be of a formulation, standard and quality comparable to those approved for use in the US by US EPA.</td>
</tr>
</tbody>
</table>

2. Pesticide products procured, used or recommended for use must be labelled in a national language (Pashto or Dari) and include the following essential information:
• name and concentration of active ingredient
• type of formulation
• instructions for use
• user safety information
• safety periods for re-entry and harvest
• manufacturer and country of origin.

Where products meeting these requirements are not available locally, projects will procure abroad OR the project must translate and provide this information in the appropriate local language.

3. Basic training in safer use must be provided broadly. Within 90 days of approval of this PERSUAP, all project staff and individuals/organizations handling, using, selling, financing or providing extension services involving pesticides with USAID funding must successfully complete a safer use training appropriate to the activity that: (1) is delivered by appropriately qualified trainers, and (2) addresses all mandatory training elements specified in Annex C. Successful completion must be determined by a satisfactory score on an individual assessment instrument.

4. Advanced training required for certain AIs and products. Only individuals who have successfully completed a relevant, advanced (“RUP-level”) training may use USAID funds to apply: (1) products noted as requiring such training in Section 6.2; or (2) any product labeled with a skull and crossbones, the words DANGER and/or POISON.

At such time as MAIL may have a certified pesticide applicator program, a MAIL certification will meet this requirement, as will an equivalent US or EU certification. Otherwise, the MEO must review the content of any training program and the credentials of the trainers to determine whether the training program provides necessary knowledge and skills. Successful completion must be determined by a satisfactory score on an individual assessment instrument.

5. Pesticides for plant protection must be part of an IPM scheme. USAID-funded pesticide use and extension for plant protection (except emergency locust control) must be governed by a set of locally adapted, crop- and pest-specific IPM-based pest management plans. Such plans specify which pesticides are to be used and under what circumstances. It is the responsibility of implementing partners to develop such plans. Annex A provides draft plans as a starting point.

Note: It is strongly recommended, but not required, that pheromone traps, where available, be used to monitor pest levels and that, if possible, UC Davis online models or other techniques should be used to time application of pesticides (http://www.ipm.ucdavis.edu/WEATHER/index.html).

6. Appropriate Personal Protective Equipment (PPE). Projects must provide and assure the correct use of appropriate PPE (per label) for all pesticide use under their direct control. Otherwise, projects must assure access to, proper use and maintenance of appropriate PPE to the greatest degree practicable. Normally this will consist of:

• hat
• overalls
• respirator or disposable mask
• rubber gloves (solvent resistant)
• rubber boots (solvent resistant).

Note: Experience has shown that PPE use can be regarded as a status symbol and encouraged on that basis.

7. Observance of label instructions and safe pesticide purchase, handling, storage and disposal practices. Similarly, for pesticide use under their direct control, projects must assure use per label (including re-entry intervals) as well as safer pesticide transport, handling and disposal practices as per the IDEA-NEW Pesticide Retailer Handbook. Otherwise projects must take all practicable measures to assure use per label and safer pesticide transport, handling and disposal practices.

8. **Existing pesticide inventory reporting.** Within 45 days of approval of this PERSUAP, agricultural projects must report existing pesticide inventories to their AOR/COR using FORM 1 (Annex E). If products in inventory are compliant with the 2013 PERSUAP or this 2016 PERSUAP, they may be used subject to other conditions in this section. All other products in inventory must be appropriately disposed of (consultation with MEO required). No new procurement can be made that is not compliant with this 2016 PERSUAP.

9. **Pre-procurement planning requirement.** Prior to requesting authorization to procure pesticides (see condition 10, below), projects must conduct pesticide planning with reference to their workplan and project activities that require pesticides. (e.g.: Demonstration farms; Farmer Field Schools; Input distribution; Finance; Research and/or other activities requiring pesticides). Specifically:
   - Agricultural projects will identify crops involved and develop pest management plans.
   - All projects, including agricultural, will identify: anticipated pesticide AIs required; categories of personnel who will apply the pesticides; anticipated locations of use; PPE required and training needs by category (e.g. Project staff; MAIL staff; agricultural input-retailers etc. farmer field school participants; beneficiaries of credit/finance.; etc.).

10. **Pesticide procurement authorization.** Prior to procuring pesticides, projects must submit FORM 2 (Annex E) to the AOR/COR and receive his/her clearance for the subject procurement. Form 2 provides the following information.
   - The active ingredient, which must be approved by this PERSUAP.
   - The name of the product to be procured.
   - The label of the product to be procured, ensuring that the requirements of condition #2, above, are met.
   - The mode by which it is to be procured.

   No pesticide purchases are authorized without AOR/COR clearance via Form 2: *Note this requirement is additional to and not in lieu of any other pesticide procurement clearance/approval requirements.*

11. **Record-keeping & resistance monitoring.** Projects procuring and using pesticides must:
   - maintain records of their stocks (type and quantity) and record and monitor their use (including date of use, application method, and location.)
   - monitor pesticide effectiveness for development of resistance. See Annex C.8 for a suggested form for monitoring and record keeping.

   Projects providing pesticide related training and certification must maintain records of their trainings, certifications and trainees.

12. **Regular implementation reporting.** The status of implementation of the above-listed conditions must be addressed in regular project implementation reporting. (E.g. quarterly or 6-month reports.) This reporting must include stocks and use reporting, and summary reporting of pesticide trainings, including purpose, dates and type of training, number and type of trainees, and number successfully completing the training.

13. **Pass-down to subcontractors and grantees.** All above-listed conditions must be passed down to subcontractors and (sub)grantees. Prime contractors and grantees must assure that sub-contractors/sub-grantees have capacity to implement these conditions.

6.4 **MANDATORY CONDITIONS FOR USAID/AFGHANISTAN TECHNICAL OFFICES AND AORs/CORs**

Mandatory safer use conditions and responsibilities applying to USAID/Afghanistan technical offices and AORs/CORs are as follows. They are synthesized or follow directly from the PER analysis:
1. USAID/Afghanistan must put in place effective internal procedures to review pesticide procurement requests submitted by IPs. The MEO must review and approve all procurement requests before the AOR/COR can clear.

2. Per ADS 204.3.4, AORs/CORs must assure that the requirements established by section 6.3 are funded, implemented, and monitored.

3. Technical Offices, working with OAA, must ensure that contract and award language requires compliance with the conditions established by this PERSUAP for each relevant project.

   Note: this requirement is satisfied by general contract language requiring compliance with applicable Reg. 216 documentation.

4. USAID/Afghanistan must assure that all relevant staff receive an internal short-format (~1–2 hour) training on the requirements established by this PERSUAP.

5. At such time that pesticides are registered under Afghan’s National Pesticide Law, USAID/Afghanistan update this PERSUAP.

6.5 RECOMMENDATIONS FOR USAID/AFGHANISTAN

SUPPORT TO RETAILERS

Most project beneficiaries will obtain their pesticides from local retailers. They will probably also seek advice on their use from the same source, especially as many farmers are illiterate. The safe and effective use of pesticides provided by USAID resources is likely to depend on the standards of the agricultural retailers providing them.

It is therefore strongly recommended that, where USAID activities in a district are expected to lead to the use of pesticides, support be given to improve the standards of the local retailers. This should take the form of training and certification and, if necessary, the upgrading of premises to at least a minimum acceptable level. PPQD staff should be included in such training. (See IDEA-NEW Pesticide Retailer Handbook at [www.usaidgems.org/Documents/complianceTopics/IDEA-NEW_PesticideRetailerHandbook.docx](http://www.usaidgems.org/Documents/complianceTopics/IDEA-NEW_PesticideRetailerHandbook.docx)).

Retailers should be provided with informational material such as posters and leaflets to be available in their shops.

DEDICATED TRAINING TEAM

There are significant benefits to consistent pesticide safer use training across USAID/Afghanistan programs. It is recommended that such training be provided by a dedicated team, trained in participatory training methods. Such an effort would begin with outlining training requirements for all training target groups, followed by materials/curriculum development, piloting and roll-out. Target groups are:

- Project staff
- MAIL staff
- Private sector specialist (Ag-retailers etc.)
- Participants in FFS.
- Beneficiaries of input distribution
- Beneficiaries of credit/finance.

In the case that such a dedicated training team is available, no other training involving pesticides should be permitted unless the syllabus and trainers are approved by the MEO.

RESEARCH

The experience of USAID/Afghanistan’s agricultural program indicates there are many opportunities for the introduction of safer and more effective pest management to Afghanistan. These include the following.
• The use of microbial insect pathogens such as *Bacillus thuringiensis*, *Beauvaria bassiana*, Nuclear Polyhedrosis Virus and *Trichoderma*.

• The use of pheromones for monitoring pest density and as mating disruptants.

• The use of coloured sticky traps for vegetable crops under polythene and glass.

• Mass rearing and release of natural enemies such as *Trichogramma* and *Aphelinis*. 
ANNEX A: PESTS AND DISEASES OF TARGET CROPS AND AVAILABLE AND RECOMMENDED CONTROL METHODS

This annex details the primary pests of all target crops on a crop-by-crop basis, available non-chemical control methods, and recommended chemical controls, where these are necessary. As such, this annex contains both information compiled as INPUT to the PER analysis (pests of target crops), and OUTPUTS of that analysis (available non-chemical controls, recommended chemical controls).

This information is intended to serve as the basis for the crop and pest-specific IPM Management Plans required by the SUAP.

This annex is intended to describe the IPM context in which the selected pesticides will be used. It does not purport to be a complete handbook of IPM technique.

WHEAT (TRITICUM SPP.)

FUNGAL DISEASES

Fungal diseases are a problem on wheat in Afghanistan. CIMMYT (International Maize and Wheat Improvement Center) has identified the following diseases as being of particular importance: Karnal Bunt (Neovossia indica), Common Bunt (Tilletia caries, T. foetida), Dwarf Bunt (Tilletia controversa) and Black Point (Helminthosporium sativum, Alternaria spp.).

Control Strategy

These diseases are best prevented by a fungicidal seed treatment with a mixture of thiram and carboxin.

WEEDS

Weeds are the major plant protection problem on wheat in Afghanistan. Crops are typically heavily infested with a number of species. Major graminaceous weeds are: Wild Oat (Avena fatua), Small Canary grass (Phalaris minor), Rye Grass (Lolium sp.), Wild Barley (Hordeum spp.), Johnson Grass (Sorghum halepense), Brome (Bromus spp.), Foxtail (Setaria spp.), Cockspur (Echinochloa spp.), Bulbous Bluegrass (Poa bulbosa), Vernalgrass (Anthoxanthum odoratum) and Nutsedge (Cyperus sp.).

The main broad-leaved weeds are Bedstraw/ Stickyweed (Galium sp.), Brassica cvs, Blue Mustard (Chorispora tenella), Bindweed (Convolvulus arvensis), Shepherds Pursie (Capsella bursa-pastoris), Cornflower (Centaura cyanus), Lambquarters (Chenopodium album), Salvia spp., Sow Thistle (Sonchus asper) and Spurge (Tithymalus turczaninowii).

The most severe problems occur in continuous wheat cropping systems. Land tenure systems aggravate the problem where the farmer puts in the labour and inputs but the long term benefits of weed control accrue to the landowner. Sowing by broadcasting seed also makes weed control more difficult as it does not allow row weeding. Row planting also allows fertiliser to be banded so that it goes to the crop and not to the weeds.

The availability of quality seed is a problem. Production of certified seed is still much less than the country’s needs and, in any case, farmers tend to retain their own seed or exchange it with neighbours (the role of farmers themselves in seed improvement should not be underestimated). However, retained seed tends to be heavily contaminated with weed seeds and so some local capacity for small scale seed cleaning would be a considerable advantage.

WEED IPM

USAID projects will adopt an integrated approach to weed management, combining cultural, mechanical and chemical. These include:

• Seed cleaning (projects should introduce small seed cleaners for farmers’ own retained seed)
• Regular in-field observations, looking for small, emerging weeds and planning for early control.
• Spray herbicides when weeds are small, have not yet done their damage, and can be controlled.
• Crop rotation: particularly utilising both fall and spring sown crops and breaks from cereals. This requires work on spring crops including spring cereals.

• Sowing wide spaced crops in lines allowing fertiliser placement for crop, not weeds, and inter row cultivating – can use a wheel hoe.

• Use shallow pre-cultivations to stimulate and control weeds, particularly for spring-sown crops when there is more time to do this.

• Banding fertiliser to increase crop competitively and reduce weeds.

• Grain for eating must not be cleaned washed into the irrigation system where weed seeds go straight into the fields.

These recommendations apply to other field crops such as oilseeds.

LOCUSTS

Insect pests are an intermittent but sometimes catastrophic cause of losses to wheat. The two most important are locusts and Sunn Pest. There are two species of locust, the Moroccan Locust (Dociostaurus maroccanus) and the Italian Locust (Calliptamus italicus). The Moroccan Locust occurs between 500 and 1500 m of elevation in northern Afghanistan, mainly in Kunduz, Baghlan, Samangan and Balkh provinces. The Italian Locust occurs at higher altitudes, mainly in Sar-i-Pol, Jawzjan, Badghis and Herat provinces.

Locust Control

Locust control is the responsibility of the PPQD of MAIL and there has been an effective strategy developed in cooperation with FAO. Both species have a similar life-cycle. They lay eggs in the ground on rangeland in early Summer at the end of the growing season. These survive the Summer and Winter and hatch in Spring. At high densities, the larvae or hoppers form marching bands that may enter crops and cause total loss. Once the hoppers have moulted into the adult stage, they are able to fly tens of kilometres and at this stage pose the greatest threat, as the rangeland is usually drying up and the only green vegetation is in irrigated cultivations. Successful control at this stage is extremely difficult as a swarm may invade and destroy a crop in a matter of days, if not hours. Even if a swarm is successfully sprayed, it may followed shortly afterwards by another. For this reason, locust control should consist of preventive spraying of hopper bands in the breeding areas. This must be done as soon as possible after hatching because the area occupied by a band of hoppers increases by a factor of 40 over the six week period of larval growth and so the quantity of pesticide required to control it increases in proportion.

Control of hoppers is carried out with diflubenzuron applied by ULV. Diflubenzuron is an Insect Growth Regulator that inhibits the synthesis of chitin and so causes death at ecdydis. It has very low vertebrate toxicity (EPA III, carrying label “Slightly Toxic”), but is sufficiently persistent on the vegetation to be used as barrier treatments or to treat an identified egg field before all the hoppers emerge. This method is less environmentally destructive than mechanically digging up the eggs.

PPQD implements control with trained teams drawn from the local communities and equipped with ULV hand-held, battery-driven applicators and with protective clothing.

SUNN PEST

“Sunn Pest” is a blanket term that includes several species of Shield Bug from the Hemipteran families Pentatomidae and Scutelleridae. The most important is Dobyoris penicillatus, which can cause devastating damage to wheat in Sar-i-Pol, Jawzjan, Badghis and Herat. Like the locusts, it is a migratory pest, but is much more difficult to manage.

The insects overwinter as adults above 2000 m amsl in the Hindu Kush, sheltering in dense masses under stones and bushes. In the early spring they migrate northwards and downhill to the plains of Turkmenistan, where they breed on the ephemeral desert vegetation. As this dries out, the adults migrate south to Afghanistan where they invade the wheat crop at the milky stage. The Sunn Pest population varies greatly from year to year for reasons that are not fully understood, but in some years the damage is catastrophic. Not only is the yield reduced by the insect attack, but the proteolytic enzymes injected into
the grain degrade the gluten and render the flour unusable for making bread. The insects also taint the straw with an offensive smell making it less acceptable for animal fodder.

**Sunn Pest Control**

Control of Sunn Pest is a responsibility of PPQD, but the suddenness of the invasion and the speed at which the crop is damaged mean that in practice effective control must be carried out by the farmers themselves. FAO promoted mechanical control of Sunn Pest using sweep nets, thousands of which were distributed across the region. However, they are labour intensive and unsuitable for the extensive areas of rainfed wheat that are grown across the region. The alternative is spraying with a quick knock-down insecticide, of which the safest and most effective is deltamethrin. ULV application enables larger areas to be treated more rapidly and does not depend on a supply of water.

Other species are *Eurygaster integriceps* and *Aelia* spp. *Eurygaster* has been the subject of research by University of Vermont in collaboration with ICARDA to develop alternative methods of control using fungal pathogens such as *Beauvaria bassiana*. It is not clear at this stage whether it is effective against *Dolycoris*. Were it to be so, it would need to be applied in the breeding areas of Turkmenistan or the hibernating sites in the Hindu Kush.

**OIL SEEDS**

The oilseed crops grown in Afghanistan are: Flax (*Linum usitatissimum*), Sesame (*Sesamum indicum*), Safflower (*Carthamus tinctorius*), Canola (*Brassica napus, Brassica campestris.* & *Brassica rapa*) and Sunflower (*Helianthus annuus*).

The main plant protection problem with oilseeds is weed infestation. Safflower also suffers from two insect pests, an aphid and a beetle.

**Weeds**

Oilseeds are grown in rotation with wheat and so suffer from the same weeds. Major graminaceous weeds are: Wild Oat (*Avena fatua*), Small Canary Grass (*Phalaris minor*), Rye Grass (*Lolium* sp.), Wild Barley (*Hordeum* ssp.), Johnson Grass (*Sorghum halepense*), Brome (*Bromus* ssp.), Foxtail (*Setaria* ssp.), Cockspur (*Echinochloa* ssp.), Bulbous Bluegrass (*Poa bulbosa*), Vernalgrass (*Anthoxanthum odoratum*) and Nutsedge (*Cyperus* sp.).

The main broad-leaved weeds are Bedstraw / Stickyweed (*Galium* sp.), *Brassica* cesum, Blue Mustard (*Chorispora tenella*), Bindweed (*Convolvulus arvensis*), Shepherds Purse (*Capsella bursa-pastoris*), Cornflower (*Centaura cyanus*), Lambquarters (*Chenopodium album*), *Salvia* spp., Sow Thistle (*Sonchus asper* and Spurge (*Tithymalus turczaninowii*).

**Control strategy**

Control of weeds in oilseed crops is integrated into that for wheat, inasmuch as it depends on lowering the weed burden in the soil. However, since oilseeds are broad-leaved plants, the same herbicides cannot be used. If the crop is sown in rows, mechanical weeding can be effective. Herbicides selectively effective against grasses may also be used if necessary.

**SAFFLOWER APHID (UROLEUCON COMPOSITAE)**

This can cause severe losses to safflower.

**Control strategy**

Treatment with soap solution can be effective. If a chemical pesticide application is necessary, a neonicotinoid seed treatment would be most appropriate, protecting the young seedlings and minimising contamination.

**FLOWER BEETLE (OXYTHYREA SP.)**

This insect feeds on the flowers of safflower.

**Control strategy**

Handpicking or sweep-netting is probably sufficient to prevent serious damage.
POTATO (SOLANUM TUBEROSUM)

Potatoes are an increasingly important crop, especially in Bamiyan, but they also have an important role in providing a cash crop and food security in high mountain valleys with limited irrigated land and poor access to markets. The major plant protection problems with potatoes are Early Blight, virus disease and Colorado Potato Beetle.

EARLY BLIGHT (ALTERNARIA SOLANI)

Early blight is primarily a disease of stressed or senescing plants. Symptoms appear first on the oldest foliage. Affected leaves develop circular to angular dark brown lesions 0.12 to 0.16 inch (3–4 mm) in diameter. Concentric rings often form in lesions to produce characteristic target-board effect. Severely infected leaves turn yellow and drop. Infected tubers show a brown, corky dry rot. The fungus can overwinter on plant residues in the field, on tubers and on other solanaceous plants such as tomato, eggplant and some weeds. Spores germinate in warm and wet conditions.

Control strategy

Field sanitation, especially the removal and destruction of plant residues and removal of other solanaceous plants. Use of certified and disease-free seed potatoes. Good crop management with regard to spacing and irrigation.

Monitor the crop for signs of the disease. If it appears early, treat with a systemic fungicide such as one of the approved strobilins.

ANDEAN POTATO MOTTLE VIRUS (APMOV), POTATO LEAFROLL VIRUS (PLRV)

Virus disease is common where seed potatoes are retained over many years by farmers.

Control strategy

Certified disease-free seed potatoes are now available from Bamiyan.

COLORADO BEETLE (LEPTINOTARSA DECEMLINEATA)

Colorado Beetle is a cosmopolitan pest of potato and other solanaceous crops such as tomato. It is a leaf-eating beetle that can cause severe defoliation and so reduce yields. It first appeared in Baghlan province in the 1990s, having probably been introduced from the Soviet Union, where it was endemic. Since then it has spread into Takhar, Badakhshan and Samangan, probably through farmers buying planting material from Baghlan. Its appearance in Badakhshan coincided with the distribution of seed potatoes by the USAID ADP/N project. Attempts by FAO to eradicate it from Baghlan so as to prevent its spread to Bamiyan were unsuccessful.

The beetle overwinters as an adult in the soil, emerging in the Spring. There are several generations depending on the length of the growing season, usually three in Afghanistan.

Control strategy

As with blight, field sanitation, especially the removal and destruction of plant residues, removal of other solanaceous plants and rotation with non-solanaceous crops. Hand picking and destroying the emerging adults in Spring may be effective in small fields. Once the plant becomes large it is impossible to locate and remove all the beetles. There are no specific natural enemies in Afghanistan, although general predators such as coccinellids may attack the eggs.

Insecticide treatment has been widely used to control Colorado Beetle, but it readily develops resistance. An approved neonicotinoid such as acetamiprid, can be an effective systemic insecticide and Spinosad has been widely used against it.

More encouragingly, the fungus Beauvaria bassiana has been developed as a myco-insecticide and commercial formulations are available in US. This may prove to be the most appropriate method in the future.

The FAO IPM project is currently preparing recommendations for potato.
VEGETABLES

Annual horticulture, growing a wide range of crops, is popular in Afghanistan. This is an important sub-sector for development assistance as it represents the most valuable use of irrigated land, is labour intensive and offers culturally acceptable economic opportunities for women.

Popular crops include: carrots, cauliflower, cabbage, broccoli, lettuce, onions, garlic, radish, spinach, turnip, eggplant, okra, peppers, tomatoes, squash, pumpkin, cucumber, zucchini and strawberries.

Techniques such as the use of greenhouses and low tunnels are used to extend the cropping season and take advantage of higher prices.

The vegetable crops share a suite of problems which include fungal diseases such as Damping Off, Fusarium Wilt, Powdery Mildew and Downy Mildew. Insect pests are Cutworms (*Agrotis ipsilon*), Thrips, Whitefly and Aphids. Nematodes are also a problem, in greenhouses. Snails are reported to be a problem with leafy vegetables.

Soil and crop hygiene, including rotation and weed control, are important ways of reducing pest and disease infestation. Sterilising the soil by solarisation is a non-chemical method that may be effective in Afghanistan. During the hottest part of the year, the soil is tilled finely, irrigated, covered with a plastic tarpaulin and left for four to six weeks. The heat destroys weed seeds, bacteria and fungal spores. Planting pots filled with soil can be stacked on a pallet and covered (see UC Davis website for details). Otherwise the soil for propagating seedlings can be sterilised with boiling water or by, if necessary, a fungicide treatment.

It is particularly important, in the case of vegetable crops that are delivered fresh to market and consumed immediately, to avoid contaminating them with pesticide residues. It is very tempting to improve the appearance, and therefore the value, of fresh produce by spraying just before harvest, but this must be strongly resisted.

There are a number of good practices that can reduce the problems of pests and diseases on greenhouses:

- crop rotation to reduce disease transference
- composting manure to reduce pathogen and pest transfer to soil medium
- managed irrigation (by drip irrigation if possible) to control humidity and soil moisture and reduce vulnerability to fungal diseases and reduce water related diseases (mildew and others)
- control irrigation, as excess irrigation causes humidity which can increase plant vulnerability

**CUTWORM (AGROTIS IPSILON)**

The larvae of this noctuid moth conceal themselves in the soil and emerge to feed on the tender stems of young plants, often chewing through them (hence the name).

**Control strategy**

Carbaryl powder (5%) sprinkled on the surface around the plants.

**SOUTH AMERICAN TOMATO MOTH, TOMATO LEAFMINER/BORER (TUTA ABSOLUTA)**

Main host of *Tuta absoluta* is tomato, but some other solanaceous crops (potato, pepper, eggplant) are affected. Caterpillars prefer leaves and stems, but may also occur underneath the crown of the fruit and even inside the fruit itself. The caterpillars attack only green fruit.

Most distinctive symptoms are the blotch-shaped mines in the leaves. Inside these mines both the caterpillars and their dark frass can be found. In case of serious infection, leaves die off completely. Mining damage to the plant causes its malformation. Damage to fruit allows fungal diseases (for example) to enter, leading to rotting fruit before or after harvest.

**Control strategy**

- Allow a minimum of six weeks from crop destruction to planting next crop to prevent carry over
- Between planting cycles cultivate the soil and cover with plastic mulch or perform solarization
- Control weeds to prevent multiplication in alternative weed hosts
- Prior to transplanting install sticky traps with pheromone attractant to mass-trap moths.
- Use pest free transplants
- Inspect crops, please pheromone traps to monitor, start monitoring 2 weeks before planting
- If the pest occurs in hot spots, remove infested leaves (and fruit) with larvae and destroy.
- The predatory bugs *Nesidiocoris tenuis* (Nesibug) and *Macrolophus caliginosus* (Mirical) are effective predators of *Tuta absoluta* eggs and young larvae. A quick establishment of these predatory bugs in the crop is reported to give protection against the pest. Introduce the predatory bugs several times during the first weeks of cultivation in a total dose of 1-2 bugs per m$^2$ or until the bugs are sufficiently established in the crop.

*Bacillus thuringiensis* can kill the caterpillars when they move out of the mines several times in their development. However, note that intensive *B. thuringiensis* sprays can leave residue on the fruit, so should be applied in the early phase of the crop.

Spinosad, abamectin, deltamethrin and imidacloprid have all been used for control. However, there is high risk of pesticide resistance development due to high reproduction capacity, short generation cycle and levels of exposure.

**COTTON BOLLWORM (HELICOVERPA ARMIGERA)**

Bollworm is a cosmopolitan and polyphagous pest of cotton, maize, tomatoes and other crops. The moth lays its eggs on flowers or young fruit and the larvae burrow into it.

**Control strategy**

Sanitation: removal and destruction of susceptible weeds (Malvaceae) and volunteer crops. Trap crops, susceptible crops planted to mature earlier than the target crop, can distract the moths. The trap crop should be uprooted and burned as soon as the eggs have been laid on it.

Natural enemies such as lacewings (Chrysoptera), coccinellids, *Trichogramma* and braconids can normally keep this pest within economic bounds. Bollworm should be monitored by pheromone traps. Should dangerously high moth numbers be detected, immediate application of a non-persistent contact insecticide, such as a pyrethroid, should be made.

**THRIPS (ORD. THYSANOPTERA)**

Thrips can be a serious pest of onions but otherwise rarely do serious damage to other crops although some species are vectors of virus disease. They may however, spoil the appearance of produce and so need to be kept under control.

**Control strategy**

Natural enemies should be encouraged and yellow coloured sticky traps may be effective in greenhouses. Heavier infestations may be treated with a mild insecticide such as mineral oil emulsion or neem extract (azadirachtin). Severe infestations of onions may be treated with an application of spinosad or an approved pyrethroid.

**WHITEFLY (FAM. ALEYRODIDAE)**

There are many species of Whitefly that are pests of horticultural crops and some, such as *Bemisia tabaci*, are vectors of virus disease. Severe infestations are often the result of pesticide misuse, killing their natural enemies, and so it is better to avoid, if possible, the use of such chemicals on crops which are susceptible to Whitefly. They are especially a problem in greenhouses (*e.g. Trialeurodes vaporariorum*).

**Control strategy**

The main control strategy for Whitefly is to prevent infestation by encouraging natural enemies such as Coccinellidae, if necessary, in the case of greenhouses, by introducing them. Whitefly are attracted to yellow and so yellow sticky or water traps may be effective in greenhouses. Infestations may also be treated with insecticidal soap.
APHIDS

Brassicas, such as cabbage, broccoli and cauliflower, are extremely vulnerable to *Brevicoryne brassicae*, which forms dense colonies covered with a waxy secretion.

**Control strategy**

It is important to remove alternative hosts, which grow as weeds, and to keep the fields clean. There are many natural enemies such as syrphids, coccinellids and hymenopterous parasitoids, but these, though numerous, often fail to prevent damage. Spraying with an insecticidal soap solution can be beneficial, but may be harmful to cabbage. The use of insecticides may create secondary pest outbreaks by killing beneficial insects. If there are signs of infestation, an approved neonicatinoid such as acetamiprid, may be applied before head formation.

NEMATODES

Nematodes are highly specific in their hosts and so rotation and field sanitation provide effective control. There is a problem in greenhouses where the same crops are crops over many years. Certain plants, such as marigolds, which secrete nematocidal chemicals, may be inter-planted. Sterilising the soil will control nematodes and many other pests and diseases (see reference to solar sterilisation above). The use of synthetic nematocides is not recommended or authorised under this PERSUAP.

POWDERY MILDEW

Powdery mildew is a common disease on many types of plants. There are many different species of powdery mildew fungi (*e.g.*, *Erysiphe* spp., *Sphaerotheca* spp.) and each species only attacks specific plants. Powdery mildew first appears as white, powdery spots that may form on both surfaces of leaves, on shoots, and sometimes on flowers and fruit. These spots gradually spread over a large area of the leaves and stems. An exception is one of the powdery mildews that affects artichokes, onions, peppers, and tomatoes: it produces yellow patches on leaves but little powdery growth. Severely infected plants may have reduced yields, shortened production times, and fruit that has little flavour. Year-round availability of crop or weed hosts is important for the survival of some powdery mildew fungi. Special resting spores are produced, allowing overwinter survival of the species that causes the disease in cucurbits, lettuce, peas, and certain other crops. Moderate temperatures (60° to 80°F) and shady conditions generally are the most favorable for powdery mildew development. Spores and fungal growth are sensitive to extreme heat (above 30°C) and direct sunlight.

**Control strategy**

Powdery mildew is best controlled by prevention. Resistant varieties are available for many crops. Planting in the sun will prevent powdery mildew in many cases, but some crops, especially cucurbits, may require fungicide treatment. Sulphur may be applied as a preventive measure but is not effective once the disease appears. To avoid injuring the plant, do not apply sulphur when air temperature is near or over 30°C and do not apply it within two weeks of an oil spray. If further treatment is necessary, systemic fungicides such as azoxystrobin (or other strobilin) and quinoxyfen should be applied. If more than one application is necessary, use different types of fungicide to prevent resistance.

DOWNY MILDEW

Downy mildew is a disease of many plants caused by infection with fungi of the family Peronosporaceae. Its initial symptoms include large, angular or blocky, yellow areas visible on the upper surface. As lesions mature, they expand rapidly and turn brown. The under surface of infected leaves appears watersoaked. The disease is favoured by wetness and high humidity.

Affected vegetable crops include (with fungus species given in brackets): cucurbits (*Pseudoperonospora* sp.); onion and garlic (*Peronospora destructor*); lettuce (*Bremia lactucae*); cabbage and cauliflower (*Peronospora parasitica*); and spinach (*Peronospora farinosa*).

**Control strategy**

The most important available control strategy is the use of resistant varieties. Crop rotation and the destruction of volunteer plants may help. Seedlings should be treated in the nursery with a fungicide to prevent them bringing the disease into the field.
Monitor the crop for symptoms from an early stage and treat with a fungicide as soon as possible if they appear.

**VERTICILLIUM WILT**

*Verticillium* spp. attack a very large host range including more than 200 species of vegetables, fruit trees, flowers, field crops, and shade or forest trees. Most vegetable species have some susceptibility, including: Oilseed rape (*Brassica napus*), Cauliflower (*Brassica oleracea var. botrytis*), Cabbage (*Brassica oleracea var. capitata*), Pepper (*Capsicum* spp.), Watermelon (*Citrullus vulgaris*), Sweet melons (*Cucumis melo*), Cucumber (*Cucumis sativus*), Pumpkin (*Cucurbita pepo*), Strawberry (*Fragaria chiloensis*) and Eggplant (*Solanum melongena*).

The symptoms are similar to most wilts with a few specifics to *Verticillium*. Wilt itself is the most common symptom, with wilting of the stem and leaves occurring due to the blockage of the xylem vascular tissues and therefore reduced water and nutrient flow. In small plants and seedlings, *Verticillium* can quickly kill the plant.

**Control strategy**

There is no effective control once the disease has occurred in the field. Preventive measures include rotation with broccoli and soil sterilisation. Solarisation is suggested as an appropriate method for Afghanistan. It should be noted that stressed plants are easier to attack than healthy plants, so any conditions that will stress the plant but not directly harm the *Verticillium* will be beneficial for *Verticillium* wilt development.

**FUSARIIUM WILT**

Fusarium wilt is a disease caused by infection with the fungus *Fusarium oxysporum* and produces symptoms such as wilting, chlorosis, necrosis, premature leaf drop, browning of the vascular system, stunting, and damping-off. It affects a wide range of crops and may occur at any stage of growth. It is a soil-borne pathogen but it can also spread through infected dead plant material.

**Control strategy**

The most effective method of control is to plant resistant varieties. Because it can live in the soil for long periods of time, rotational cropping is not a useful control method for this disease. Because *F. oxysporum* spreads faster through soils that have high moisture and bad drainage, improving the soil will reduce the incidence of the disease, as will removing dead plant material at the end of the season.

**“DAMPING OFF”**

Damping off is caused by several soil-borne fungi including *Pythium*, *Phytophthora*, *Rhizoctonia* and *Fusarium*, which infect seedlings and cause them to ‘damp off’ or collapse and decay.

**Control strategy**

Spores of the pathogens are present in all soils and so hygiene and sterilisation are the key to control. If starting plants indoors, in low tunnels, or in greenhouses, plant seeds in sterilised soil. Soil mix must be held at 60°C for at least 30 minutes. Soil can be heated by raising the temperature with boiling water, or by placing moist soil in a clear plastic bag in direct sunlight. See also the reference to solarisation above. Using resistant varieties assists in preventing this disease.

**ONION AND GARLIC NECK AND BULB ROT (*BOTRYTIS ALLII*)**

This disease generally shows itself in storage.

**Control strategy**

Do not apply excessive nitrogen fertiliser. Do not harvest before the crop is mature and the necks well cured. Avoid mechanical damage during harvesting and handling.

**SNAILS**

Snails are reported to be a pest of leafy vegetables such as spinach, lettuce, coriander and red radish. Hand picking may be an effective control, but the use of a molluscicide such as metaldehyde may be necessary.
GRAPES (VITIS VINIFERA)

Grape-vines are the major perennial crop in many parts of Afghanistan and USAID projects are engaged in developing the value chain for dried raisins and fresh table grapes. This involves, among other activities, increasing yields through the adoption of trellising and improved vineyard management. The principal crop protection problems on vines are fungal diseases (such as Powdery Mildew, Anthracnose and Botrytis) and insects (such as mealy bugs and grapevine moth).

POWDERY MILDEW (UNCINULA NECATOR)

Powdery Mildew attacks all green growing parts of the vine, including the leaves, bunches and shoots. The fungus normally survives the dormant period in either protective structures (cleistothecia) or as fungal hyphae inside the dormant buds. It starts to grow as soon as the bud opens and the new leaves and shoots develop. It is not visible with the eye at that early stage. Active growth and development starts with temperatures between 23°C and 32°C. It can grow at low or high humidity.

The first symptoms are normally only seen after fruit set by which time it is too late for effective control and severe losses are inevitable. Control of this disease requires an integrated approach to vineyard management including preventative chemical control using elemental sulphur either as powder or in a wettable formulation.

**Control strategy**

The program commences at 2-3 cm shoot length with applications at regular intervals of 14 days until the berry softening phase (depending on the vine vigour), thereafter it can be done every 21 days only.

- First application 15 kg/ha dusting sulphur
- Second application 20 kg/ha dusting sulfur
- Third application 30 kg/ha dusting sulfur
- Fourth application 30 kg/ha dusting sulfur
- Fifth application 30 kg/ha dusting sulfur
- Sixth application 30 kg/ha dusting sulfur

No applications should be made if the temperature is above 30°C during the day, because this can cause burning of the leaves and berries.

Sulfur should not be applied directly on bunches after pea berry size because the berries are very sensitive to sulfur burn. If disease pressure is high during this phase the dust should be applied on the soil surface, because SO₂ gas release will spread into the foliage and control the fungus.

A heavy application of sulfur is required after the harvest period if symptoms of powdery mildew appear on especially the leaves. These leaves are required for the uptake of reserves by the roots that are vital for the next growing season. The presence of powdery mildew will cause premature loss of leaves that will limit the uptake of nutrients by the roots due to the absence of active leaves.

The application of sulfur less than 42 days before harvest is not allowed.

Systemic fungicides suitable for control of powdery mildew should be used in conditions where sulphur gives inadequate preventative control. It should be understood that an IPM approach to control of powdery mildew includes correct pruning and canopy management to reduce conditions favourable to the disease.

ANTHRACNOSE (GLOEOSPORIUM AMPELOPHAGUM)

Anthracnose is a disease associated with rainy weather during the spring period just after bud break and can cause severe crop losses if not controlled. It is of moderate importance for Afghanistan because there are very few areas in the grape production regions where these conditions prevail.
The fungus survives the dormant winter period on dead shoots left in the vineyard from the previous growing season. It starts development during the spring when the temperature increases, infecting all new green parts on the vine (shoots, leaves) during conditions of regular light rainfall or heavy dew. The spores are splashed or carried by insects onto young shoots. It requires free water for development that can come from rain, over head irrigation, dew or fog. Cool wet weather during spring and early summer are particularly favorable for disease outbreaks. Hot and dry weather retards the spread of the disease.

**Control strategy**

Vineyard hygiene and the removal and burning of canes after pruning are essential for the prevention of this disease.

In a vineyard with a history of Anthracnose infection, a program of preventative chemical control is necessary using a combination of dormant and spring applications.

- Copper fungicides (such as Bordeaux mix, cupric hydroxide, copper oxychloride) and appropriate synthetic fungicides in 2-3 early spring applications at 14 day intervals.

**BOTRYTIS ROT (BOTRYTIS CINEREA)**

Also known as GREY MOULD the fungus attacks many plants. In grapes the most common problem occurs when it attacks the bunch, especially on varieties with compact bunches or when successful fruit set results in more compact bunches than usual. It normally becomes a problem in the vineyard near harvest time when the berries are high in sugar, but also is a major concern after harvest during storage and transit of fresh table grapes.

The fungus overwinters on grapevines as sclerotia (resistant protective structures) on or within canes or old rotted bunches. Wet conditions in early spring are required for the sclerotia to sporulate. Wet weather followed by at least 12-24 hours of free moisture is usually required for infection of young shoots, flowering clusters and leaves. Infection of intact berries depends on their sugar content, persistent free moisture on the surface and prevailing temperatures. Generally cool wet weather of 10-20 hours between 20 and 25 degrees Celsius favors Botrytis development. Growth of the fungus stops at more than 30°C. Vines with very dense canopies that restrict sunlight penetration and air movement is also more sensitive for infection.

**Control strategy**

IPM of Botrytis involves the application of well-timed fungicide treatments integrated with vineyard sanitation and vine canopy management practices. Vineyards in regions subject to late summer rains prior to harvest should apply preventative control strategies.

In vineyards with a history of Botrytis infection, it is necessary to remove sources of the fungus (old bunches that rotted during the previous season, infected canes) from the vineyard before bud break.

Preventative spray

- Systemic fungicide spray during flowering and again 14 days later on the clusters.

- Further sprays should be on the clusters just before bunch closure (while sprays can still penetrate between the berries), at berry softening and if necessary 2 weeks before harvest on very sensitive varieties.

- Post-harvest control on table grapes in cold storage destined for the fresh market depends on pre-harvest control strategies in the vineyard and sulfur dioxide during cold storage.

**MEALY BUG (PLANOCOCCUS FICUS)**

The most important insect pest of grapes in Afghanistan is mealy bug, a very common insect that is found world-wide in all grape growing regions. Its main effect is on the quality of the crop caused by secretion of honeydew causing bunches to become very sticky. Mealy bugs are also the main vector for the transmission of leaf roll virus between plants. Control of the insect is not easy and relies on a combination of chemical and biological methods.
The insect overwinters under the bark or in the soil around the roots, emerging in the Spring. There may be up to six generations and it can reach very high densities if not controlled.

**Control strategy**

Control requires a combination of chemical and biological methods.

- Insect numbers should be monitored early in the growing season by inspection and the use of pheromone traps. High trap catches of males are an indication of a possible outbreak.

- The most effective control is by the many natural enemies, including ladybird beetles and parasitoid Hymenoptera. Insecticide sprays will kill these and so should only be resorted to during the growing season as a last resort if there is a heavy outbreak.

- Ants tend mealy bugs and protect them from natural enemies and so control of ants in the vineyard may be necessary.

- Where vines are known to be infested, preventative dormant season treatment with Winter Oil should be used as this will not damage beneficial insects.

- Weed control in the vineyard will also reduce habitat for mealy bugs.

**GRAPEVINE MOTH (LOBESIA BOTRANA)**

Also known as Grape Berry Moth and Vine Moth it is known to occur in Europe and Central Asia and can result in heavy crop losses if not properly controlled. The insect damages grapes by feeding on flower buds and fruits causing external damage, internal damage and subsequent rotting by fungi such as *Botrytis, Aspergillus, Alternaria, Rhizopus, Cladosporium*, and *Penicillium*.

The insect overwinters as a pupa in a cocoon on the fallen leaves, under the vine bark or in the soil. Adults emerge from April to May when temperatures start to increase. Mating occurs in flight and soon after, females lay eggs which hatch in 6 to 9 days. The larvae feed on the blossoms and young fruits for about 3 weeks and then spin a silky web inside and around grape bunches before pupation.

Numerous predators and parasitoids are reported in the European literature. Among the parasitoids are four species of tachinid flies and nearly 100 species of parasitic wasp in the ichneumonid, braconid, pteromalid and chalicoid families. The parasites that are reported to cause the greatest impact are those attacking the overwintering pupa. In Spain these include the pteromalids *Dibrachys affinis* and *D. cavus*, which are reported to cause up to 70% pupal mortality, whereas in Italy the ichneumonids *Dicaelotus inflexus* and *Campoplex capitator* are the most important.

At the end of June or early July the second flight occurs and adult moths begin laying eggs on the mature grape berries for the second generation. Each larva usually destroys several grapes. There can be up to three generations, depending on the region. In the third generation the eggs are laid in ripening fruit and this is where the serious *Botrytis* problems occur.

**Control strategy**

The basis of long term control lies in a combination of biological and chemical control strategies. It has similarities with mealy bug control, because any insecticide spray during the growing season will kill the natural enemies.

- Monitoring adult moth densities with pheromone traps.

- Monitor eggs and larvae by searching on the peduncles of the vines one week after the first moths appear in the pheromone traps.

- Time insecticide spraying to coincide with larval emergence. Use low toxicity insecticides such as insect growth regulators, spinosyns, and *Bacillus thuringiensis*. Apply insecticide before bunch closure.
STONE FRUIT & ALMOND (PRUNUS SPP)

The most commercially important stone fruit crop in Afghanistan is apricot (Prunus armeniaca). Peach (Prunus persica) is also widely grown. Cherry (Prunus avium) and plum (Prunus domestica) are becoming increasingly important as the high altitude areas, where they are best grown, gain access to the market. Almond (Prunus amygdalus), a major export crop, is closely related biologically to these and may be considered together with them. Most of the principles recommended here apply also to other minor perennial crops.

Before considering the control of individual pests and diseases, it is important to emphasise one aspect of IPM in orchards, namely healthy trees. Trees that are correctly pruned, irrigated, drained and fertilised resist many of the diseases and pests that are frequently seen. Orchard hygiene, the removal and burning of plant residues such as prunings, fallen fruit and leaves, is an essential step in breaking the cycle of infection and infestation. Painting trunks white prevents sun scorching which leads to fissures allowing the entry of pathogens.

Orchards also require weed control. For preference this should be by mechanical means, but the use of appropriate herbicides may be necessary.

It is also important to mention the effects of pesticide misuse in orchards. Many recorded pests, notably Spider Mite and San Jose Scale, are linked to excessive or inappropriate spraying which kills their natural enemies. Inappropriate spraying also kills pollinators, without which no fruit will be set. As well as honeybees, which themselves produce a valuable product, there are natural pollinators such as Osmia spp.

GUMMOSIS/CANKER

Canker is an infection of the bark either by the bacterium Pseudomonas syringae or the fungus :Phytophthora syringae.

It appears to affect peach most severely. There is no reliable treatment, but it can be prevented by good orchard management and the use of resistant varieties. Since it can also be spread by the use of contaminated pruning tools, care should be taken to disinfect them.

SHOT HOLE DISEASE (WILSONOMYCES CARPOPHILUS)

Shot hole disease may kill buds during winter, and cause spots on fruit and leaves in spring. If severe, leaf drop may occur in spring. Fruit lesions are light brown with dark purple margins and usually are clustered on the upper sides of fruit. Fruit spotting can be severe, and as fruits mature, spots become scab-like and may flake off, leaving roughened areas beneath. Leaf spots fall out (shot hole).

The fungus survives within infected buds and on twigs. Spores are rain splashed, and disease increases during the rainy season. Fruit infection is favored by wet spring weather.

Control strategy

Check in Autumn for fungal fruiting bodies on the leaves. If these are present, spray with Bordeaux mixture before the Winter rains. One application should be sufficient.

APHIDS AND SCALE INSECTS

There are several species of aphid that cause damage to Prunus. These include Myzus persicae (The Peach-Potato Aphid). M. persicae overwinters as eggs on Prunus. The eggs hatch at bud break and the leaves are damaged as they emerged. By the time damage is observed, it is too late to control.

Pterochloroides persicae is the Black Bark Aphid. Unlike M. persicae, it does not attack the leaves or green shoots but is found on second year or older bark.

San Jose Scale (Diaspidiotus perniciosus) is also found in Afghanistan. This pest is a typical symptom of pesticide misuse, as it is normally adequately controlled by natural enemies such as Coccinellid beetles (Ladybirds).

Control strategy
Dormant season treatment with a mineral oil emulsion (Winter Oil) is the most effective preventative measure against all these sap-sucking insects.

**PEACH TWIG BORER (ANARSIA LINEATELLA)**

This pest is recorded in Afghanistan but its status and importance is unknown.

**Control strategy**

Should this pest be a problem, its management can be incorporated into the overall orchard IPM programme. Although Winter Oil alone will not control it, this treatment can be combined with the application of an environmentally acceptable insecticide such as spinosad.

If control is necessary during the growing season, applications of Bt or spinosad or should applied using the online UC Davis calculator to determine timing. Mating disruption with pheromones can also be used during the growing season.

**TREE BORERS (CERAMBYCIDAE)**

These are usually found in badly managed or neglected orchards. Frass and bore holes are visible around the crotch of the tree.

**Control strategy**

Monitor in Spring for signs of frass around the crutch. If this is found hand-spray with Sevin 1ft above and below the crutch two or three times at six week intervals and then paint white.

**POMEGRANATE (PUNICA GRANATUM)**

Pomegranate is a high value export commodity which is being increasingly planted. Its major pest is the Carob Moth (*Ectomyelois ceratoniae*), which lays its egg in the calyx. The larva then burrows into the fruit, feeds on it and destroys it. *E. ceratoniae* is a cosmopolitan and highly polyphagous pest, whose hosts include almonds and figs, which, in northern Afghanistan, are grown with pomegranate in mixed orchards. Almond traders in Mazar-i-Sharif complain of “worms” in stored almonds. Pheromone traps for Carob Moth were placed in the store by IDEA-NEW and were found to catch moths and so it is highly likely that there is a linkage between these two problems. In southern Afghanistan, where pomegranates have been planted in monoculture, this problem is small or absent.

**Control strategy**

Orchard hygiene, the removal and destruction of fallen fruit and “mummies” remaining on the trees is essential for an IPM approach. FAO has recommended bagging and the use of plastic mulch as methods of control. However, a mating disruptant formulation of a synthetic analogue of the Carob Moth pheromone has been developed for use on date palms in California. IDEA-NEW carried out trials over two years in Khulm district (Balkh) and achieved successful control. However, the costs were uneconomic when compared with the yields of these poorly managed orchards. Should this pest become a problem in more productive orchards, this should be considered as an option.

**APPLE (MALUS DOMESTICA) AND OTHER POME FRUIT**

Apple is an increasingly popular crop with a strong demand in the home market. It is grown at higher altitudes such as in Badakhshan and Wardak. Pears (*Pyrus* spp.) and quince (*Cydonia oblonga*) are also grown.

It is necessary to repeat the remarks made above in relation to stone fruit regarding orchard management. Trees that are correctly pruned, irrigated, drained and fertilised resist many of the diseases and pests that are frequently seen. Orchard hygiene, the removal and burning of plant residues, such as prunings, fallen fruit and leaves, is an essential step in breaking the cycle of infection and infestation. Painting trunks white prevents sun scorching which otherwise leads to fissures allowing the entry of pathogens.

Orchards also require weed control. For preference this should be by mechanical means, but the use of appropriate herbicides may be necessary.
Many recorded pests are linked to excessive or inappropriate spraying which kills their natural enemies. Inappropriate spraying also kills pollinators, without which no fruit will be set. As well as honeybees, which themselves produce a valuable product, there are natural pollinators such as Osma spp.

The most important pest species for pome fruit are Codling Moth and Woolly Aphid. Tree borers also attack pome fruit trees and the same recommendations as are given above apply.

**CODLING MOTH (CYdia POMONELLA)**

Codling Moth is the most serious pest of apples in Afghanistan. It also attacks walnut and so, where there are many walnut groves, as in Badakhshan, these are a constant reservoir of this pest. The insect overwinters as a pupa under the bark. The moths emerge in Spring and lay their eggs on fruit. The larvae hatch and burrow into the fruit, leaving a visible “sting” on the surface. The larvae feed on the flesh of the fruit, rendering them unsaleable or causing them to drop prematurely. There may be up to three generations per year.

**Control strategy**

There are a number of mechanical and cultural methods to control Codling Moth but it is doubtful whether they are sufficient to deal with a heavy level of infestation, especially where reinvasion from walnut groves or unmanaged orchards is a problem.

Fallen fruit and those with visible stings and should be removed and destroyed (fed to animals). Corrugated cardboard can be tied round the trunk of the tree. The insects will pupate under the cardboard rather than in the bark and they can be removed and fed to chickens.

An essential element of Codling Moth Management is monitoring with pheromone traps. It is possible that a high density of pheromone traps (two per jerib) may itself be an effective control measure. There are, however, specific pheromone products designed as mating disruptants and these may be preferable and more effective.

Chemical control, if necessary, needs to be carefully timed using data from trap catches, daily minimum and maximum temperatures and the life-cycle calculator on the UC Davis website. Care needs to be taken to avoid killing pollinators and other beneficial insects. Spinosad is recommended by UC Davis and diflu benzuron is used in Europe. A pyrethroid may be used in an emergency, but this risks damage to beneficial insects.

**WOOLLY APHID (ERIOSOMA LANIGERUM)**

The Woolly Aphid is so called because its thread-like waxy secretion resembles wool. Woolly aphids infest roots, trunks, limbs, shoots, and occasionally fruit of apple trees. This aphid is found in colonies on the aerial portions of the tree and on roots during winter. The nymphs migrate up or down the trunk of infested trees during summer and fall. The main injury to young and mature trees is stunting due to the formation of root galls. If populations are high, honeydew and sooty mold will also be problems, and aphids may enter the calyx end of fruit.

**Control strategy**

Woolly Aphid is attacked by natural enemies, of which the most effective is the chalcid parasitoid, Aphelinus mali. FAO in collaboration with CIBC (now CABI) introduced this natural enemy in the 1970s, but misuse of pesticides has caused its disappearance.

A dormant season treatment with Winter Oil is also an effective preventative measure. A severe outbreak may be treated with oil during the growing season if necessary.
ANNEX B. PESTICIDE TOXICOLOGICAL PROFILES

This annex provides both human and ecotoxicology for the pesticides evaluated in this PERSUAP.

TOXICITY TO HUMANS

Table B-3 summarizes the human toxicity profiles of all AIs examined by this PERSUAP, as well as their US EPA registration status. The following sections and tables B-1 and B-2 explain the toxicology terminology and classifications used.

ACUTE TOXICITY

Acute toxicity refers to the immediate effects (0-7 days) of exposure to a pesticide. Highly acutely toxic pesticides can be lethal at very low doses. Acute toxicity is estimated from the LD$_{50}$, the dose (in milligrams of substance per kilogram of body weight) that kills 50% of the test animals in a standard assay. The toxicity of a substance may also depend on the route by which it enters the body: dermal (through the skin), inhalation (through the lungs) or oral (through the digestive tract). The LD$_{50}$ may need to be determined experimentally for all these routes. For inhalation exposures, the LC$_{50}$ is used—the concentration in air in mg per liter that kills 50% of the test animals.

Two systems are referred to in this document: the EPA system and the WHO system. EPA also requires that pesticides in categories I-III carry a signal word as in the table. The system used by EPA is based on an evaluation of the formulated product (Table B.1). Therefore there may be more than one classification for an active ingredient depending on concentration and inert ingredients. Where the EPA assessment of acute toxicity is given in the table as “no consensus”, there is too much variation between the registered products to give a single estimate. The system of WHO is based on the active ingredient alone (Table B.2).

| TABLE B.1. EPA SYSTEM OF CLASSIFICATION OF ACUTE TOXICITY |
|-----------------------------------------------|-----------------|-----------------|-----------------|-----------------|
| TOXICITY CATEGORIES                  | CATEGORY I       | CATEGORY II      | CATEGORY III     | CATEGORY IV     |
| Acute Oral                          | Up to and including 50 mg/kg | > 50 thru 500 mg/kg | > 500 thru 5000 mg/kg | > 5000 mg/kg |
| Acute Dermal                        | Up to and including 200 mg/kg | > 200 thru 2000 mg/kg | > 2000 thru 5000 mg/kg | > 5000 mg/kg |
| Acute Inhalation                   | Up to and including 0.05 mg/liter | > 0.05 thru 0.5 mg/liter | > 0.5 thru 2 mg/liter | > 2 mg/liter |
| Primary Eye Irritation              | Corrosive (irreversible destruction of ocular tissue) or corneal involvement or irritation persisting for more than 21 days | Corneal involvement or other eye irritation clearing in 8-21 days | Corneal involvement or other eye irritation clearing in 7 days or less | Minimal effects clearing in less than 24 hours |
| Primary Skin Irritation             | Corrosive (tissue destruction into the dermis and/or scarring) | Severe irritation at 72 hours (severe erythema or edema) | Moderate irritation at 72 hours (moderate erythema) | Mild or slight irritation at 72 hours (no irritation) |
| Signal Word                         | DANGER           | WARNING          | CAUTION          | None Required   |

<p>| TABLE B.2 WHO SYSTEM OF CLASSIFICATION OF ACUTE TOXICITY |
|-----------------------------------------------|-----------------|-----------------|-----------------|-----------------|
| WHO TOXICITY CLASSIFICATION                  | RAT LD$_{50}$ (MG OF CHEMICAL PER KG OF BODY WEIGHT) |</p>
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<th>CLASS</th>
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LONGER-TERM HUMAN TOXICITY

Pesticides may also cause long term hazards to human health. Those that cause most concern are these.

- **Carcinogenicity.** Exposure to some substances may cause the development of cancer.
- **Cholinesterase Inhibition.** Cholinesterase is an enzyme that breaks down the neuro-transmitter, acetyl-choline in the nervous system. This is a necessary process for controlling nerve transmission and some pesticides, especially, organo-phosphates, work by interfering with it.
- **Reproductive or Developmental Toxicity.** Some pesticides are known to cause birth defects or interfere with normal development.
- **Endocrine Disruption.** Many pesticides and industrial chemicals are capable of interfering with the proper functioning of oestrogen, androgen and thyroid hormones in humans and animals.

Assessment of the acute and long-term toxicity of the pesticides evaluated is summarised in Table B-3.

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<th>DEVELOPMENTAL OR REPRODUCTIVE TOXIN</th>
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### Table B.3 TOXICITY OF PESTICIDES

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<th>ACTIVE INGREDIENT</th>
<th>EPA</th>
<th>WHO</th>
<th>CARCINOGEN</th>
<th>CHOLINESTERASEINHIBITER</th>
<th>DEVELOPMENTAL OR REPRODUCTIVE TOXIN</th>
<th>ENDOCRINE DISRUPTER</th>
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<td>known</td>
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<tr>
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<td>known</td>
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</table>

**ECOTOXICOLOGY**

With few exceptions, such as pheromones, pesticides are, by their very nature, toxic to some organisms. They may therefore harm organisms other than the pests at which they are directed. These may include...
directly beneficial organisms, such as honeybees and other pollinators, the natural enemies of pests, other useful organisms such as fish or rare and endangered organisms making an important contribution to biodiversity. This document provides information, when available on the toxicity of pesticides to important groups of organisms.

### TABLE B.4. CATEGORIES OF ORGANISMS FOR WHICH ECOTOXICITY INFORMATION IS GIVEN

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amphibians</td>
<td>Amphibians such as salamanders or frogs</td>
</tr>
<tr>
<td>Annelida</td>
<td>Sediment-dwelling worms in aquatic habitats</td>
</tr>
<tr>
<td>Crustaceans</td>
<td>Invertebrate animals with protective shells</td>
</tr>
<tr>
<td>Fishes</td>
<td>Fish</td>
</tr>
<tr>
<td>Honeybees</td>
<td>Honeybees, <em>Apis mellifera</em></td>
</tr>
<tr>
<td>Insects</td>
<td>Aquatic insects such as stoneflies and mayflies</td>
</tr>
<tr>
<td>Mammals</td>
<td>Mammals—warm-blooded, vertebrate animals with fur that give birth to live young and nurse them</td>
</tr>
<tr>
<td>Molluscs</td>
<td>Shellfish such as clams, oysters, etc. and snails/slugs</td>
</tr>
<tr>
<td>Phytoplankton</td>
<td>Aquatic plants that form the basis of the food chain</td>
</tr>
<tr>
<td>Zooplankton</td>
<td>Small aquatic animals</td>
</tr>
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</table>

### TABLE B.5. CATEGORIES OF ECOTOXICITY FOR AQUATIC ORGANISMS

<table>
<thead>
<tr>
<th>Toxicity Category</th>
<th>Abbrev</th>
<th>LC₅₀ (UG/L)</th>
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</thead>
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<tr>
<td>Very highly toxic</td>
<td>VHT</td>
<td>&lt; 100</td>
</tr>
<tr>
<td>Highly toxic</td>
<td>HT</td>
<td>100-1,000</td>
</tr>
<tr>
<td>Moderately toxic</td>
<td>MT</td>
<td>1,000-10,000</td>
</tr>
<tr>
<td>Slightly toxic</td>
<td>ST</td>
<td>10,000-100,000</td>
</tr>
<tr>
<td>Not acutely toxic</td>
<td>NAT</td>
<td>&gt; 100,000</td>
</tr>
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### TABLE B.6. CATEGORIES OF TOXICITY FOR HONEYBEES

<table>
<thead>
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<th>Toxicity Category</th>
<th>Abbrev</th>
<th>LC₅₀ (UG/BEE)</th>
</tr>
</thead>
<tbody>
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<td>HT</td>
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<tr>
<td>Moderately toxic</td>
<td>MT</td>
<td>2-10.99</td>
</tr>
<tr>
<td>Slightly toxic</td>
<td>ST</td>
<td>11-100</td>
</tr>
<tr>
<td>Not acutely toxic</td>
<td>NAT</td>
<td>&gt; 100</td>
</tr>
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</table>

Some pesticides do not readily break down in the bodies of animals and so may be ingested by predators and thus accumulate in the food chain. The organo-chlorine pesticides have been particularly harmful in this respect, causing, until they were banned, a catastrophic decline in populations of raptorial birds.

Depending on their physical and chemical properties, pesticides may be carried into the groundwater, which may be the source on which people depend for their domestic supplies. They may also find their way into drainage systems – streams, rivers and lakes – and harm the organisms that constitute these ecosystems.

The ecotoxicity of the pesticides evaluated is summarised in Table B.7. (NB: the abbreviations used in Table B.7 are those given in Tables B.5 and B.6, above. In addition: nd = no data, NL = Not Listed, pot = potential).
<table>
<thead>
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ANNEX C. MANDATORY ELEMENTS OF TRAINING AND PESTICIDE SAFER USE

C.1 TRAINING IN SAFER USE

By far the most important mitigating measure for pesticides is to ensure that those who use them understand them and are competent in handling and using them. It is essential that training to a uniform high standard is available across USAID/Afghanistan projects.

All project beneficiaries who are expected to use USAID resources for pesticides must receive training. Information materials, such as leaflets and posters, in Dari and Pashtu, should be prepared and made available for those projects, such as those providing finance, who lack the relevant technical capacity.

Basic pesticide safer use training must address the following minimum elements.

- Definition of pesticides.
- Pesticide risks and the understanding that pesticides are bio-poisons.
- Concepts of AIs vs. formulated products.
- Classes of pesticides and the concept that specific pesticides are effective only against a certain class of organism.
- Concept of proper application rates and pesticide resistance and techniques for avoiding misapplication.
- Practice-focused training in the core elements of Safe Pesticide Use:
  a) IPM (see C.2, below),
  b) Safe Purchase,
  c) Transport, Storage, Mixing,
  d) Application (see C.5, below), Reentry and Pre-harvest intervals, including specific treatment of PPE (see C.4, below)
  e) Clean-up and Disposal (see C.7, below)
- Pesticide first aid and spill response. (see C.6, below)
- Reading and interpreting pesticide labels -- particularly to understand PPE requirements and other precautions, dosage rates, and to identify AIs and expiration dates. (see C.3, below)
- Proper sprayer operation and maintenance.
- Record keeping and monitoring. (see C.8, below)

All training should include a pre- and post-course evaluation of the participants. Participants will only be accepted as “trained” if their evaluation is satisfactory.

As noted above, the following sections of this Annex contain summary information on specific training topics and safer use practices. See the Pesticide Retailer Handbook developed under the USAID/Afghanistan IDEA-NEW project for more detail on all topics. [www.usaidgems.org/Documents/complianceTopics/IDEA-NEW_PesticideRetailerHandbook.docx](http://www.usaidgems.org/Documents/complianceTopics/IDEA-NEW_PesticideRetailerHandbook.docx).

C.2 TRAINING IN IPM

IPM is an integral part of safe pesticide use and supporting the use of pesticides only within an IPM framework is a core requirement of this PERSUAP. Therefore, pesticide safe use training must build an understanding of IPM fundamentals.

The heart of IPM is an understanding of the relationship between pest injury, damage, yield loss, and economic loss. IPM was developed within the discipline of economic entomology. Farmers who are not trained in IPM may spray a crop upon seeing a single insect in a field or a few brown spots of a disease on a leaf. Pesticides are expensive and should only be used as a last resort and only when economically justified.
Threshold determination. Extension workers and farmers first need to understand the relationship between increasing injury levels and crop yield of each pest which is known as the damage function. A small amount of injury in fact can cause yield gain called overcompensation. In most cases, significant yield loss does not occur until a certain pest density occurs in the field because the crop can compensate for this level of damage. Then there is normally a linear decline in yield with increasing pest density. From this relationship, the economic injury level, economic threshold, or action threshold can be defined in the case of insect pests. Other methods to assess the threat of weeds and crop diseases will need to be developed based on field experience. Certain guidelines can be developed based on experience in neighboring countries.

IPM involves several tiers of integration. First there is the integration between control methods which must be harmonious. A non-harmonious example is the negative effect of pesticides on biocontrol agents. Biocontrol, which is the action of natural enemies against the pest, is free to the farmer so it behooves him not to upset this delicate balance unless absolutely necessary. The next tier of integration occurs between the different pest control disciplines. When one sprays an insecticide, herbivorous insects feeding on weeds are killed. Some fungicides also kill insect pests. Removing weeds forces army worms to feed on the crop. The third tier is integration with the cropping system and farming system. Crops that are well nourished can tolerate more damage. Many crop husbandry practices also affect pests, either positively or negatively. Application of nitrogen fertilizer is an example. On the one hand it can stimulate plant diseases, but on the other nitrogen fertilizer can provide strength of the crop to tolerate insect pest damage.

Pests do not occur in isolation, thus the crop has to deal with multiple pests as well as multiple stresses. A crop that is weak from zinc deficiency or water stress cannot tolerate as much pest damage as a healthier crop. In fact some sucking insect pests explode in abundance on a drought-stressed crop, further exacerbating the problem. The relationship between multiple pests and multiple stresses can be additive \((1 + 1 = 2)\), antagonistic \((1 + 1 = 1)\), or synergistic \((1 + 1 = 3)\). This can occur in terms of yield loss from adding more pests or stresses, or can occur in terms of yield gain when one or more stresses are removed due to an effective curative control effort.

IPM training should provide examples of the different pest control methods beginning with preventative ones, which start with quarantine and cultural crop husbandry methods based on good agronomic practices, which increase the crop’s tolerance for pest injury. Many of these methods fall under the rubric of cultural control. Host plant resistance is another good example of prevention. Other pest control methods can be physical (e.g., a fence to keep out animals), mechanical (e.g., using nets), or biological (e.g., parasitoids, predators, pathogens). Biological methods include natural control and man-induced methods, such as purchasing and releasing natural enemies or using selective pesticides. As a last resort there is chemical control.

Farmers will need to be trained to recognize pests in the field and to be able to assess their densities as well as know several methods of control for each. Training manuals with high-quality, color photos will be essential in the training process. Government-approved, recommended practices need to be published and updated annually in guides given to extension officers.

IPM Research. There are many opportunities for the introduction of safer and more effective pest management to Afghanistan. These include the following:

- The use of microbial insect pathogens such as *Bacillus thuringiensis*, *Beauvaria bassiana*, Nuclear Polyhedrosis Virus and *Trichoderma*.
- The use of pheromones for monitoring pest density and as mating disruptants.
- The use of coloured sticky traps for vegetable crops under polythene and glass.

Mass rearing and release of natural enemies such as *Trichogramma* and *Aphelinus*. 
C.3 UNDERSTANDING PESTICIDE LABELS
AND MATERIAL SAFETY DATA SHEETS

The label of a pesticide container must have all the information about risks as well as information needed for safe and effective use. Additional important details about risks of pesticide products and instructions about safe use can be found in the manufacturer’s MSDS. Labels and MSDS for some pesticides are available online at http://www.cdms.net and http://www.greenbook.net.

The label on a pesticide container has three main functions:

- To tell the user what pest the product can be used on.
- To tell the user how to handle, use, and store the pesticide safely.

By US law, pesticide labels must contain:

- The name of the product.
- Level of toxicity.
- Active ingredients.
- Other ingredients-co-formulants.
- The pests which the product will control.
- The rate of application of the product (how much of it to use).
- The time and method of application.
- Directions for handling the product safely.
- First aid procedures in case of an accident.
- Any special instructions or warnings about its use, transport, storage, or disposal.
- The net contents (weight when packed) of the container.

- To tell the user how and when to apply the pesticide for the best effect.

The pesticide pictogram will provide information about risks and safety measures required including PPE.
**C.4 PROTECTIVE CLOTHING AND EQUIPMENT**

Pesticide safety training must address the types of personal protective equipment (PPE), when they should be worn and why.

<table>
<thead>
<tr>
<th>ROUTE OF EXPOSURE</th>
<th>TOXICITY CLASSIFICATION BY ROUTE OF EXPOSURE OF END-USE PRODUCT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I DANGER</td>
</tr>
<tr>
<td>Dermal Toxicity or Skin Irritation Potential1/</td>
<td>Coveralls worn over long-sleeved shirt and long pants</td>
</tr>
<tr>
<td>Socks</td>
<td>Socks</td>
</tr>
<tr>
<td>Chemical-resistant footwear</td>
<td>Chemical-resistant footwear</td>
</tr>
<tr>
<td>Chemical-resistant Gloves2</td>
<td>Chemical-resistant gloves2</td>
</tr>
<tr>
<td>Inhalation Toxicity</td>
<td>Respiratory protection device3</td>
</tr>
<tr>
<td>Eye Irritation Potential</td>
<td>Goggles5</td>
</tr>
</tbody>
</table>

1 If dermal ≥Toxicity and skin irritation toxicity categories are different, PPE shall be determined by the more severe toxicity classification of the two. If dermal toxicity or skin irritation is category I or II, refer to the pesticide label/MSDS to determine if additional PPE is required.
2 Refer to the pesticide label/MSDS to determine the specific type of chemical-resistant glove.
3 Refer to the pesticide label/MSDS to determine the specific type of respiratory protection.
4 Although no minimum PPE is required for these toxicity categories and routes of exposure, some specific products may require PPE. Read pesticide label/MSDS.
5 “Protective eyewear” is used instead of “goggles” and/or “face shield” and/or “shielded safety glasses” and similar terms to describe eye protection. Eye glasses and sunglasses are not sufficient eye protection.
Note: Where necessary, farmers can make their own PPE. For example a plastic or water repellent apron from the waist to ankle length, can be fashioned from a large piece of plastic purchased in the local market (important if walking through the spray path).

C.5 PROPER SPRAY TECHNIQUE: PROTECTING AGAINST PESTICIDE SPRAY DRIFT

Many farmers apply pesticides with a knapsack sprayer, which means that delivery of pesticides is either in front of the person spraying or to the side, not to the back as is the case with tractor-drawn sprayers. Inevitably pesticide drift will be carried by the wind and potentially settle on sensitive ecosystems such as national parks if they are nearby. Herbicides pose the greatest risk for environmental damage, especially when their drift lands on a neighbors crops and kills or severely damages them.

The potential for drift to travel long distances has been shown with highly residual chlorinated hydrocarbon pesticides, such as DDT, which have moved through the atmosphere and been found in measurable quantities at both poles on earth. Pesticides that can be transported to the earth’s distant poles are bound tightly to dust particles carried high into the atmosphere and transported by jet streams. Their presence only represents a very small percentage of the drift. Spray drift is a mostly local phenomenon, whereby spray droplets move to areas near the field.

There are a number of ways in which pesticide drift can be minimized:

Increase spray droplet size. Fog-sized droplets can travel three miles (4.8 km) while coarse droplets typically travel less than 10 feet (3 meters). To increase droplet size, the farmer can reduce spray pressure (e.g., 30 to 50 pounds per square inch [2-3.5 kg/cm$^2$] with 5 to 20 gallons [19 to 76 liters] of water per acre [.4 ha]), increase nozzle orifice size, use special drift reduction nozzles, and purchase additives that increase spray viscosity.

Distance between nozzle and target. Reduce the distance between the nozzle and the target crop.

Temperature and relative humidity. As pesticides vaporize under high temperature, low relative humidity and/or high temperature will cause more rapid evaporation of spray droplets between the spray nozzle and the target. Evaporation also reduces droplet size, which in turn increases the potential drift of spray droplets. It is best not to spray in the heat of the day to avoid drift problems.

Avoid spraying when the wind speed $\geq 10$ mph (16 km/h). As drift occurs as droplets suspended in the air, it is best to minimize applications during windy days. If spraying has to be done, however, the farmer should spray away from sensitive areas. Local terrain can influence wind patterns, thus every applicator should be familiar with local wind patterns and how they affect spray drift.

Do not spray when the air is completely calm or when a temperature inversion exists. When the air is completely still, small spray droplets become suspended in the warm air near the soil surface and will be readily carried aloft and away from susceptible plants by vertical air movement. Temperature inversion occurs when air near the soil surface is cooler than the higher air. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud and impact plants two miles or more downwind. This cloud can move in unpredictable directions due to the light, variable winds common during inversions.

Application height. Making applications at the lowest height reduces exposure of droplets to evaporation and wind.

C.6 PESTICIDE TRANSPORT AND STORAGE

Where IPs or beneficiary groups will be transporting pesticides, training must address the fundamentals of safe transport of pesticides. (Some of the largest accidents involving pesticides have occurred during
Drivers should be trained on how to deal with and contain spills, and not to transport pesticides with food. Many of the agro-dealers are small and ship their stock individually in relatively small quantities. Agro-dealers should be sensitized about minimizing potential risks during transportation.

**Minimum elements of safe transport are:**

- Keep pesticides away from passengers, livestock and foodstuffs;
- Do not carry pesticides in driver’s compartment;
- Containers must be in good condition;
- Do not transport packages with any leakage; and,
- Transport under cover and protected from rain, and direct sunlight.

Storing pesticides properly protects human and animal health, safeguards wells and surface waters, and prevents unauthorized access to hazardous chemicals. The pesticide label is the best guide to storage requirements for every product. The MSDS provides additional information on normal appearance and odor as well as flash point, fire control recommendations, boiling point, and solubility.

Further, if IP-run pesticide stores exist in an area with fire or emergency services, local first responders

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**Preventative measures are required in pesticide warehouses in order to reduce cases of pilferage, exposure through leakages, theft, and expiration of pesticides. Where IPs or beneficiaries, including agro-dealers, will be maintaining pesticide stores, training must address these practices, as per the best management practices for pesticide storage highlighted in FAO storage manual1 and summarized below:**

- All primary pesticide storage facilities will be double-padlocked and guarded on a 24-hour basis.
- All the storage facilities will be located away from water sources, domestic wells, markets, schools, hospitals, etc. Wastewater from pesticide storage facilities must not be drained directly into public drains but should be pretreated on site.
- Soap and clean water will be available at all times in all the facilities.
- A trained storekeeper will be hired to manage each facility.
- Pesticides will be stacked as specified in the FAO Storage and Stock Control Manual.
- Inventory management will include recording expiration dates of all pesticides and maintaining a “first-in first-out” stocking system.
- All the warehouses will have at least two exit access routes in case of a fire outbreak.
- A non-water-based fire extinguisher will be available in the storage facilities, and all workers will be trained on how to use this device, and how to respond to fire (see below).
- Warning notices will be placed outside of the store in the local language(s) with a skull and crossbones sign to caution against unauthorized entry.
must receive training on how to deal with pesticide fires. The smoke from such a fire is highly hazardous and effluent from water spray can do great harm to the environment. If fire fighters use water to put out a fire in a pesticide storage shed, the runoff will be highly toxic.

C.6 FIRST AID FOR PESTICIDE POISONING

It is important to provide training on recognition of the symptoms of a pesticide poisoning so the victim will receive timely treatment. Contact information of the closest medical facility must be known and available if someone can be possibly poisoned with a pesticide. Quick action could save the victim's life. Farmers must be trained to make sure to take the label and if possible the MSDS on the chemical to the hospital. This will enable the medical professionals to treat the victim properly and promptly.

Training must include the basic elements of pesticide first aid, as per the table below. Wherever possible, personnel at local health facilities should participate in/receive such training.

**TABLE C.2. PESTICIDE POISONING FIRST AID**

<table>
<thead>
<tr>
<th>General</th>
<th>Read the first aid instructions on the pesticide label, if possible, and follow them. Do not become exposed to poisoning yourself while you are trying to help. Take the pesticide container (or the label) to the physician.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poison on skin</td>
<td>Act quickly. Remove contaminated clothing and drench skin with water. Cleanse skin and hair thoroughly with detergent and water. Dry victim and wrap in blanket.</td>
</tr>
<tr>
<td>Chemical burn on skin</td>
<td>Wash with large quantities of running water. Remove contaminated clothing. Cover burned area immediately with loose, clean, soft cloth. Do not apply ointments, greases, powders, or other drugs in first aid treatment of burns.</td>
</tr>
<tr>
<td>Poison in eye</td>
<td>Wash eye quickly but gently. Hold eyelid open and wash with gentle stream of clean running water. Wash for 15 minutes or more. Do not use chemicals or drugs in the wash water; they may increase the extent of injury.</td>
</tr>
<tr>
<td>Inhaled poison</td>
<td>Carry victim to fresh air immediately. Open all doors and windows so no one else will be poisoned. Loosen tight clothing. Apply artificial respiration if breathing has stopped or if the victim's skin is blue. If victim is in an enclosed area, do not enter without proper protective clothing and equipment. If proper protection is not available, call for emergency equipment from your fire department (if available).</td>
</tr>
</tbody>
</table>
Poison in mouth or swallowed

Rinse mouth with plenty of water.
Give victim large amounts (up to 1 quart) of milk or water to drink.
Induce vomiting only if instructions to do so are on the label.

Procedure for inducing vomiting

Position victim face down or kneeling forward. Do not allow victim to lie on his back, because the vomit could enter the lungs and do additional damage.
Put finger or the blunt end of a spoon at the back of victim’s throat or give syrup of ipecac.
Collect some of the vomit for the physician if you do not know what the poison is.
Do not use salt solutions to induce vomiting.

When not to induce vomiting

If the victim is unconscious or is having convulsions.
If the victim has swallowed a corrosive poison. A corrosive poison is a strong acid or alkali. It will burn the throat and mouth as severely coming up as it did going down. It may get into the lungs and burn there also.
If the victim has swallowed an emulsifiable concentrate or oil solution. Emulsifiable concentrates and oil solutions may cause severe damage to the lungs if inhaled during vomiting.

C.7 PROPER PESTICIDE CONTAINER DISPOSAL

Once pesticides have been used, the empty containers need to be properly disposed of. Training must address proper disposal. This table gives a summary of the best practices for doing so.

<table>
<thead>
<tr>
<th>CONTAINER TYPE</th>
<th>DISPOSAL STATEMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metal Containers (non-aerosol)</td>
<td>Triple rinse. Then offer for recycling or reconditioning, or puncture and bury.</td>
</tr>
<tr>
<td>Paper and Plastic Bags</td>
<td>Completely empty bag into application equipment. Then bury empty bag.</td>
</tr>
<tr>
<td>Glass Containers</td>
<td>Triple rinse. Then bury.</td>
</tr>
<tr>
<td>Plastic Containers</td>
<td>Triple rinse. Then offer for recycling or reconditioning, or puncture and bury.</td>
</tr>
</tbody>
</table>

C.8 MONITORING AND DATA RECORD KEEPING

Afghanistan small-scale farmers do not keep records of information on crops grown, production, pest attack, pesticides used, whether the pesticides worked well or not, pest resistance development and pre-harvest intervals to reduce pesticide residues. Certified large-scale commercial and estate farms, on the
other hand, generally keep detailed records. Projects must conduct training programs on monitoring and data record-keeping techniques for pest control and pesticide needs and/or effectiveness.

An example of monitoring and record keeping chart is included below. Suggestions for development of simple charts for monitoring and record keeping can be found at http://www.hobbyfarms.com/crops-and-gardening/crop-record-keeping-charts.aspx.

<table>
<thead>
<tr>
<th>Crop Location</th>
<th>Plot Size</th>
<th>Planted Date</th>
<th>Pests Observed</th>
<th>Infestation Severity</th>
<th>Management Technique</th>
<th>Date/Time Of Application</th>
<th>Notes (Rate Of Application, Weather, Etc.)</th>
<th>Harvested Date</th>
<th>Results</th>
</tr>
</thead>
</table>
ANNEX D.
AFGHANISTAN PESTICIDE LAW: UNOFFICIAL TRANSLATION

Islamic Republic of Afghanistan

Ministry of Justice

Pesticide Law

Official Gazette

------------------------------------------------------------------------------------------------------------------- No. (1190)
Published: 27/07/1394 (19 October 2015)

Unofficial Translation: Abdul Waheed Hannan 01 March, 2016
Legislative Decree of the President of the Islamic Republic of Afghanistan on the signing of the Pesticide Law.

No. (71)
Date: 08/06/1394 (30 Aug 2015)

Article 1:
Pursuant to the provision of Article (79) of the Constitution of the Islamic Republic of Afghanistan, I hereby sign the Pesticide Law of Afghanistan which has been ratified by the Cabinet of the Islamic Republic of Afghanistan within (30) Articles and (6) Chapters, on 04/06/1394 (26 Aug 2015).

Article 2:
The Minister of Justice and the Government Minister on Parliamentary Affairs, are assigned to present/table this decree within (30) days of the first meeting of the National Assembly.

Article 3:
This decree, shall, along with the Cabinet resolution, be promulgated in the official gazette.

Mohammad Ashraf Ghani,
President of the Islamic Republic of Afghanistan


No. (19)
Date: 04/06/1394 (26 Aug 2015).

I hereby, approve the Pesticide Law of Afghanistan which has been ratified by the Cabinet of the Islamic Republic of Afghanistan within (30) Articles and (6) Chapters, in its meeting on 04/06/1394 (26 Aug 2015).

Mohammad Ashraf Ghani,
President of the Islamic Republic of Afghanistan.
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CHAPTER ONE:
GENERAL PROVISIONS

Legal Basis
Article 1
This Act is enacted in pursuant to the Article (14) of the Constitution of the Islamic Republic of Afghanistan.

Objectives
Article 2
The objectives of this Act are:
1. To control the production, import, transport, maintain, distribute and use of pesticides;
2. To prevent risks to human, animal, plant health, resulting from the use of pesticides;
3. To protect plants and environment from the adverse effects of pesticides;
4. To prevent the losses of agricultural products through application of sound techniques.

Descriptions
Article 3
The terms used in this Act shall have the following meaning:

1. "Pests": All living factors such as insects, nematodes, disease (fungus, viruses and bacteria) weeds, that damage plants and agricultural products/fruit, qualitatively and quantitatively.
2. "Pesticides": Chemical substance or mixture of substances used for preventing, controlling or destroying pests, that include:
   - Vectors of human and animal disease factors.
   - Undesirable species of plants and animals, listed in this Act.
   - Substances which may be administered to animals for the control of pests in or on their bodies.
   - Substances intended for use as a plant growth regulator, defoliant and desiccant.
   - Substances applied to crops either before or after harvest to protect the commodity from deterioration during storage and transport.
   - Substances used to eradicate or pacify germs, repellants, pests and sterilizing agents.
3. “Eradication” refers to activities for, neutralizing, destroy of isolate wastes, used tools contaminated with agricultural pesticides. "Label" refer to written, printed or graphic matter on or attached to the immediate package and on every other covering the package containing pesticides.
4. “Package or Packaging” means the container together with the protective wrapping used to carry pesticide products via wholesale or retail distribution to users.
5. “Residue” means any substances in or on food, agricultural commodities or animal feed resulting from the use of a pesticide, including:
   - any derivatives of a pesticide, such as conversion products, metabolites, reaction products and impurities considered to be of toxicological significance; and
   - Residues from unknown or unavoidable chemical source uses.
6. "Premises” mean any land, shop, stall, place, vehicles or other physical location where any pesticide is, manufactured, stored, transported, sold or used.
7. “Distribution” means the process by which pesticides are supplied through trade channels to local or international markets.

8. “Manufacturer” means any legal entity in the public or private sector engaged in the manufacture of a pesticide’s active ingredient or preparing its formulation or product, whether directly or through an agent or through an entity controlled by or under contract with it.

9. “Risk” means a function of the probability of an adverse health or environmental effect, and the severity of that effect, following exposure to a pesticide.

10. “Poison” means a substance that can cause disturbance of structure or function, leading to injury or death when absorbed in relatively small amounts by human beings, plants or animals.

11. “Formulation” means the combination of various ingredients designed to make a product useful and effective for the purpose or purposes claimed.

12. “Agricultural pesticide product” means the pesticide active ingredients and other components, in the form in which it is packaged and sold.

13. “Poisoning” means occurrence of damage or disturbance caused by a pesticide on living organism (human, animal, and plant).

14. “Active ingredient” means the chemically active part of the pesticide present in a formulation.

15. “Permit” refers to a written document issued by the Ministry of Agriculture, Irrigation and Livestock to license the import, export, store, sale and advertising of the pesticide, in accordance with this Act.

16. “Registration Office” refers to an office where a pesticide along with its qualitative and quantitative values is registered.

Implementing Authority
Article 4:
The Ministry of Agriculture, Irrigation and Livestock is responsible for implementing the provisions of this law.

CHAPTER TWO:
DUTIES AND AUTHORITIES

Duties and Authorities of the Department of Plant Protection and Quarantine

Article 5:
The Department of Plant Protection and Quarantine shall have the following duties and authorities:

1. Issue and register permits, listed in this Act;

2. Develop and implement of programs to control, monitor and inspection of pesticides.

3. Develop and implement research programs on pesticides;

4. Approve maximum concentration of pesticide residues in consultation with Pesticide Committee, in accordance with this Act.

5. Establish relations with countries, national, regional and international organizations, in accordance with this Act.

6. Organize and management of meetings of the Pesticide Committee.
7. Accomplish other functions listed in this Act.

The Pesticides Committee
Article 6:
(1) In order to better implementation of provisions of this Act, the Pesticide Committee shall consist of the following members:

a. The Deputy Minister (Technical) of the Ministry of Agriculture, Irrigation and Livestock, who shall act as Chairman;
b. The Head of the Plant Protection and Quarantine Department of the Ministry of Agriculture, Irrigation and Livestock, as deputy chairman;
c. An authoritative representative of the Ministry of Commerce and Industry, as member.
d. An authoritative representative of the Ministry of Public Health (MOPH), as member.
e. Head of Agricultural Research Institute, as member.
f. Director General of Livestock and Animal Health, as member
g. An authoritative representative of the National Environment Protection Agency (NEPA), as member.
h. An authoritative representative of the Afghan National Standards Authority (ANSA), as member.
i. A professor from the Agriculture Faculty of Kabul University, as member.
j. A professor from the Veterinary Faculty of Kabul University, as member.
k. Head of Agricultural Chemistry Division of the Plant Protection Department, as secretary.
l. A professor from the Environment Faculty of Kabul University, as member.

(2) The Pesticide Committee, may invite experts of relevant fields for consultations and technical information, if required, to its meetings.

(3) The manner of convening the Committee meetings, referred to in paragraph (1) of this Act, and its activities, shall be organized in accordance with the procedures, to be approved by the committee.

Functions and Authorities of the Committee
Article 7:
The Pesticide Committee shall have the following functions and authorities:

1. Approve or reject applications for the registration, re-registration, suspension, substitution and removal of pesticides from the relevant registry office.
2. Prepare lists of allowed and prohibited pesticides
3. Review, suspend, substitute or removal of pesticides from the list in accordance with new scientific information, on the request of relevant agency or two committee members.
4. Set forth necessary conditions, pursuant to provisions of this Act, for acquiring permit.
5. Provide advice and set forth criterions for the management and better use of pesticides.
6. Provide advice, pursuant to provisions of this Act, in performing good agricultural practices, determination of fees to be collected for the services provided.
7. Approve maximum limit of residue concentration of pesticides.
8. Make sure the registration of pesticides.
9. Select location for store and use of pesticides.
10. Organize the modality of transporting the pesticide and set forth special conditions.
11. Organize the modality of eradicating unusable pesticide, empty containers and liquids from washing pesticide tools, in an environmentally sound manner.

Appointing Inspectors
Article 8:
(1) The Plant Protection and Quarantine Department, in order to implement the provisions of this Act, shall assign inspectors, whose interests are not opposed to the under inspection matter.
(2) The inspectors, referred to in paragraph (1) shall have the following duties and authorities:
   a) Control and inspect individuals, who produce, import, export, pack, label, sell, distribute, transport, use and advertise pesticides.
   b) Seek information and necessary technical assistance from individuals in order better carry out functions set forth in this Act.
   c) Take samples of any substances to which this Act is applied, and send such samples for analysis to relevant laboratory.
   d) Probe violations/offences against the provisions of this Act, and report to the Pesticide Committee.
   e) Stop all activities contrary to the provisions of this Act.
   f) Confiscate all documents and substances, insinuate violation and considered offence by the provisions of this Act.
   g) Inspectors, referred to in paragraph (1), are required to show the special card, during inspection.

Right of Appeal
Article 9:
(1) Any person, not satisfied with the decision of inspector or the laboratory section, may submit his written objection to the Pesticide Committee within a period of thirty (30) days from the date on which the decision is communicated to him.
(2) The Pesticide Committee, after receiving the appeal, referred to in paragraph (2) of this Article, within (30) days of acceptance or rejection of the appeal, shall make its decision, and that decision shall be the final.

CHAPTER THREE:
PERMITS/LICENSES

Issuance of Permits
Article 10:
(1) Production, import, export, transportation, store, sale and distribution of pesticides, without permit, shall be prohibited.
(2) A Legal entity, in order to obtain a permit, referred to in paragraph (1) of this Article, may submit a written application to the Plant Protection and Quarantine Department.
(3) The Plant Protection and Quarantine Department, shall only issue an import permit to a legal entity, registered in accordance with Afghanistan Law, for a period of one year, provided that the entity:
a) holds a business/trade permit;
b) imports pesticides from international firms of good standing;
c) provides samples of pesticides to be imported for analysis, before importing;
d) appoints professionals holding third level science degree at pesticide sale stores;
e) provides list of retailers and sale agencies associated to the Plant Protection and Quarantine Department;
f) registers pesticides upon import with the Registration Office of the Plant Protection and Quarantine Department;

(4) Affairs related to produce, export, transportation, store, sale, distribution of pesticides and the royalty amounts, referred to in paragraph (2) of this Article, shall be regulated by a separate regulation;

(5) The permit, referred to in paragraph (1) of this Article, is not transferrable;

(6) If the application, referred to in paragraph (2) of this Article, is rejected by the Plant Protection and Quarantine Department, the applicant may submit a written appeal to the Pesticide Committee. The committee decision on acceptance or rejection, is then final.

Purchase without obtaining Permit

Article 11:
Agriculture Cooperatives may purchase necessary pesticides, without a license, proportionate to the land area, in accordance with the recommendations of the relevant technical personnel of MAIL and must undertake to store and use them safely.

Obligations of the Permit/License Holder

Article 12:
The permit/license holder may have the following duties/responsibilities:

(1) Maintain documents related to production, import, export, store, purchase, sale, use, distribution, formulation and other documents related to pesticides, for at least (3) years.

(2) Make available, upon request, documents referred to in paragraph (1) of this Article, to inspectors and public authorities.

(3) Take necessary measures to protect, store and transport any pesticides.

(4) Comply with environmental protection measures.

(5) Import pesticides via ports, where equipment for analysis are available.

(6) Comply with any and all conditions set forth in the permit/license.

Renewal of Permit/License

Article 13:
(1) The holder of permit/license, shall renew the relevant permit within a period of (30) days after the end of the date of expiry. A fine of AFG 500 shall be paid thereafter for each delayed day.

(2) The permit, after the end of expiry date, may be renewed in accordance with relevant regulation, provided that the provisions of this Act are complied.

Termination of Permit/License

Article 14:
The permit/license shall be terminated, if:
(1) Provisions of this Act are not complied with;
(2) Permit/license holder dies or his legal entity is dissolved.
(3) There are safety reasons which justify limiting the trade or use of a pesticide, a premise or other element included in the license.

Returning the Permit/License
Article 15:
When the permit/license holder, is unable to perform his/her duties, he/she shall submit the permit/license along with a written report on the pesticide to the Plant Protection and Quarantine Department.

CHAPTER FOUR:
REGISTRATION OF PESTICIDES

Application for Registration
Article 16:
(1) Any person, desiring to register a pesticide product, shall, according to the provisions of this Act, submit an application for registration to the Plant Protection and Quarantine Department.
(2) The Plant Protection and Quarantine Department, shall register the allowed pesticides in its relevant office.
(3) Any pesticide, which existed prior to enactment of this Act, and considered unusable according to the provisions of this Act, shall receive a special ruling by the Pesticide Committee to determine how much quantity and the time period will be allowed for the exceptional use of this same pesticide, otherwise, shall be immediately banned.

Import of Un-registered Pesticides
Article 17:
The manufacture, import, export, transport, storage, sale, distribution, application, use or advertisement of unregistered pesticides, are all prohibited.
Pesticides, imported in emergency cases, in order to prevent a severe pest outbreak, are excluded from this provision, on authorization from MAIL.

Temporary Research Permits/Licenses
Article 18:
(1) The Plant Protection and Quarantine Department after the approval of the Pesticide Committee, in accordance with the provisions of this Act, may grant a temporary permit to licensed individuals or entities authorizing them to import, formulate or use of pesticide for the purpose of scientific research.
(2) Individuals, referred to in the paragraph (1) of this Article, shall always submit the outcome of their research to the Plant Protection and Quarantine Department.
Use of Pesticides in Emergency Cases

Article 19:
The Plant Protection and Quarantine Department, after the approval of the Pesticide Committee may grant permits to licensed individuals for the use of unregistered product in cases of emergency or a pest outbreak, provided that:

(1) There is no product in the Registry available and affordable in sufficient quantities to manage the pest outbreak causing the emergency.

(2) The permit to use is for a specific time period only, and specified by the Pesticide Committee.

(3) The permit holder and consignments are clearly identified.

Revoking of a Pesticide from the Registry Office

Article 20:
The Pesticide Committee may cancel the registration of a pesticide and remove it from the list when:

(1) It is no longer effective for its intended purpose.

(2) Based on new scientific information that the pesticide presents hazards to human, plant, or animal health or the natural environment.

(3) Other products or management measures become available that are more or equally effective, and less hazardous.

(4) The pesticide becomes banned or restricted in a country with similar governance and ecological circumstances, or by an international agreement or convention that Afghanistan has acceded to.

Ban on Pesticides Usage

Article 21

(1) If the Pesticide Committee has reasons to believe that the use of any registered pesticide may result in risk/injury to human beings, animals or the environment, it may:

   a. Temporarily prohibit the sale, distribution or use of the pesticide, or a specified batch of pesticides.

   b. Specify the area and period of validity in its official notification to an individual or the registration office.

   c. Carry out an investigation of the matter.

(2) According to the results of the investigation, the Pesticide Committee shall order either the removal of the temporary prohibition, or the amendment, suspension, or cancellation of the registration.

Investigation Outcomes

Article 22:

(1) The Pesticide Committee shall carry out investigation on a prohibited pesticide within the period of 3 months and shall, based on the findings of the investigation, decide on temporary prohibition or removal.

(2) In case a pesticide is permanently banned as a result of the investigation and decision of the committee, it shall make a decision on eradication of any existing remaining stock.
CHAPTER FIVE: PROTECTIVE MEASURES

Labeling
Article 23:
All containers of pesticides shall be accompanied by a label in one of the official languages of the Islamic Republic of Afghanistan that includes:

1. Common and trade names, concentration formulation and ingredients of the pesticide.
2. The type of product (e.g. insecticide, fungicide, herbicide, rodenticide).
3. The name of the pest which the pesticide is intended to eradicate and the recommended dosage.
4. The use instructions, application methods, persistency and pre-harvest interval.
5. Warnings and cautionary measures, including signs and symptoms of poisoning and information on safety, health and first aid measures, warning symbols and precautions for environmental protection.
6. The date of manufacture, expiry, batch number and name of the manufacturing country.
7. Other relative technical requirements.

Ban on Commercial Advertisement of the Pesticides
Article 24:
Advertisement of unregistered pesticides, or the use of pesticides restricted to trained operators and technical equipment, is prohibited.

CHAPTER SIX: MISCELLANEOUS PROVISIONS

Establishment of Laboratory
Article 25:

1. The Ministry of Agriculture, Irrigation and Livestock may establish laboratories to carry out pesticide formulations and analysis of samples.

2. The Plant Protection and Quarantine Department shall send the pesticides, collected by inspectors to laboratories, referred to in the paragraph (1) of this Article, for analyses, quality control and registration

Functions of Laboratories
Article 26:

1. The functions of the laboratories, referred to in Article (25) of this Act, shall include:

   a) Providing information to applicants on active ingredients of the pesticide and the amount of residue of the pesticide on agricultural products, for the purpose of registration.

   b) Carry out studies on the presence and eradication of pesticides which are Persistent Organic Pollutants (POPS), harm the environment, are banned or unregistered pesticides.

   c) Support the development of protocols for studies on pesticide residue.

   d) Coordination between pesticide residue and other pesticide related studies, with the National Environmental Protection Agency (NEPA).

2. The pesticide laboratory staff shall preserve the confidentiality of the formulae submitted for analysis.
or test, along with its records.

**Punitive measures**

**Article 27:**

(1) If a person, without holding permit/license or package, serial number and particular label, engaged in importing and selling pesticides, the Plant Protection and Quarantine Department shall, apart from confiscating the pesticide, fine the offender 30% of the total cost of the imported pesticide.

(2) If a person, contrary to the list of the allowed pesticides, without a permit/license imports any pesticide, the Plant Protection and Quarantine Department shall, apart from confiscating the pesticide, fine the offender 30% of total cost of the imported pesticide.

(3) If a permit/license holder, shows indifference in keeping the relevant documents or does not reveal upon request by inspectors, the Plant Protection and Quarantine Department shall close the storage facility of the offender until presentation of the documents. In case of failure to present the required documents within one month, the permit/license may be annulled.

(4) If the permit/license holder does not submit a request for registration of pesticides to the relevant office, and without registration engages in import, store, advertise, sell, distribute, implement and use of pesticides, the Plant Protection and Quarantine Department, shall, considering the type of the offense, order this person to pay 20% of the total cost of the imported pesticides.

(5) If the outcomes of analysis prove contrary to the samples presented, the imported pesticides shall be confiscated and the offender may be fined to pay 20% of the total cost of the imported pesticide.

(6) The Plant Protection and Quarantine Department shall, within (10) days, deposit the collected amount in the government income account.

**Responsibilities of the Agencies**

**Article 28:**

(1) Ministries of Finance and Trade and Industry, the Customs Department and other relevant agencies, shall cooperate with the Ministry of Agriculture, Irrigation and Livestock on the control, import and export of pesticide, and prevent the import of all pesticides prohibited by the provisions of this Act.

(2) Customs officials, required to allow/deny a permit/license holder to import pesticides.

**Propose Regulation and Setting Procedures**

**Article 29:**

The Ministry of Agriculture, Irrigation and Livestock, in order to better implement the provisions of this Act, may propose regulations and set procedures, not adverse to the provisions of this Act.

**Enforcement**

**Article 30:**

This Act shall, from the date of signature, be enacted and promulgated in the official gazette of the Government of the Islamic Republic of Afghanistan.
ANNEX E: FORMS FOR IMPLEMENTING PARTNERS
USAID/AFGHANISTAN 2016 PERSUAP FORM 1:
PESTICIDE INVENTORY

Within 45 days of approval of this PERSUAP, agricultural projects must report existing pesticide inventories to their AOR/COR using this form. If products in inventory are compliant with 2013 PERSUAP, they may be used, otherwise they must be appropriately disposed of (consultation with MEO required). No new procurement can be made that is not compliant with this PERSUAP.

Project ___________________________ Date ___________________________
Contractor ___________________________ Chief of Party ___________________________

<table>
<thead>
<tr>
<th>Active Ingredient</th>
<th>Product Name</th>
<th>Formulation</th>
<th>2016 PERSUAP compliant?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>
### USAID/AFGHANISTAN 2016 PERSUAP FORM 2:
ENVIRONMENTAL AUTHORIZATION TO PROCUCE PESTICIDES

Projects seeking approval to purchase pesticides must submit this form, with an attached copy of the label of the product to be procured, for AOR/COR review and clearance.

**Note: this form is additional to and not in lieu of other compliance and clearance requirements for pesticide purchases**

<table>
<thead>
<tr>
<th>Name of Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff Member Responsible</td>
</tr>
</tbody>
</table>

**Pesticide Product to be Procured:**

- **Name of Product**
- **Active Ingredient (AI)**
- **Formulation**
- **Language of Label (attach label)**
- **Packaging (type and volume)**
- **Quantity to be Procured**
- **Safety Information**
- **Name of Manufacturer**
- **Country of Origin**
- **Source and Mode of Procurement**
- **Purpose**

**Certifications and explanations**

<table>
<thead>
<tr>
<th>AI is authorized by 2016 PERSUAP</th>
<th>YES</th>
<th>NO</th>
<th>If “No,” explain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training carried out</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PPE Provided</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Chief of Party ___________________________ Date _____________

Approved by C/AOR ________________________ Date _____________