



PHDP II
Technical assistance to MAIL
to strengthen the planting material and horticulture industry in Afghanistan
(Europe Aid/129-320/C/SER/AF/2)

Mission report on
Integrated Pest Management

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AGRICONSULTING S.p.A.

In Consortium with



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DiPSA



List of Abbreviations

ANSA	Afghanistan National Standards Authority (ANSA)
AIMP	Agriculture Market Infrastructure Project
AKF	Aga Khan Foundation
ANHDO	Afghanistan National Horticulture Development Organization
ANDS	Afghanistan National Development Strategy
ANNGO	Afghanistan National Nursery Growers' Organization
ARD	Agriculture and Rural Development Cluster
ASAA	AybakSamanagan Almonds Association
AAIDO	Afghanistan Almond Industry Development Organization
AWP	Annual Work Plan
BBF	BadamBagh farm
PBLT	Plant Biotechnology Laboratory of BadamBagh
CAV	Centro Attività Vivaistiche, Bologna, Italy
CHAMP	Commercial Horticulture and Agricultural Marketing Programme
CPG	Citrus Promotion Group
DAIL	Directorate of Agriculture, Irrigation & Livestock (Provincial and District level)
DANIDA	Danish Cooperation
DFID	British Cooperation
DIPSA-UNIFI	Dept. of Plant, Soil and Environmental Science of the University of Florence
DiSTA-UNIBO	Dept. of Agro environmental Sciences and Technologies of the University of Bologna
DM	Deputy Minister
DO	Demonstration Orchards
DUS-Test	Distinct (D) from any others, sufficiently uniform (U) and stable (S)- refers to new plant varieties -
EC	European Commission
ECD	European Commission Delegation
ELISA	Enzyme-linked Immune-absorbent Assays
EPAA	Export Promotion Agency of Afghanistan
EPPO	European Plant Protection Organization
ex situ	Refers to germplasm material that is removed from its original location and is maintained at a central location
EU	European Union
EU- Transition Project	Support to Capacitate MAIL in Transition for Sustainable Public Services Delivery- 2013-2016 (Europe Aid/133-537/C/SER/AF)
FAO	Food and Agriculture Organization of the United Nations
FFS	Farmer Field School
FOD	Farmers Organization Development
GDP	Gross Domestic Product
GHP	Good Hygiene Procedures
HACCP	Hazard Analysis and Critical Control Point
HCDP	Consultancy services for Facilitating the Management of and technical assistance delivery under the Horticulture Cooperative Development Project

HPS	ANHDO/RI Horticulture Private Sector Development Project (EU funded)
HVP	ANHDO Horticulture Value Chain Project (AFD funded)
HRD	Human Resources Development
ICARDA	International Center for Agricultural Research in the Dry Areas
IDEA NEW	Incentives Driving Economic Alternatives for the North, East, and West
in situ	Selected germplasm material kept in the original place where it was found
IPM	Integrated Pest Management
JICA	Japan Cooperation
LML	Landell Mills Limited
MCPD	Multi-Crops Passport Descriptors
MAIL	Ministry of Agriculture, Irrigation and Livestock
MOC	Ministry of Commerce
MPH	Ministry of Public Health
MRRD	Ministry of Rural Rehabilitation and Development
MSN	Mother Stock Nursery
NC	National Collection of fruit varieties of Afghanistan
NDF	National Development Framework
NGA	Nursery Growers' Association
NGO	Non-Governmental Organization
NHLP	National Horticulture and Livestock Project (World Bank)
NPP	National priority program
PHDPH	Perennial Horticulture Development Project, second phase [<i>Provision of Technical Assistance to the Afghan Ministry of Agriculture, Irrigation and Livestock to contribute to strengthen the planting material and horticulture industry</i> (Europe Aid/129-320/C/SER/AF)]
PHDCs	Perennial Horticulture Development Centers
PICU	Project Implementation and Coordination Unit
PRT	Provincial Reconstruction Team (international military personnel)
PSC	Project Steering Committee
QC	Quality Control
SME	Small and Medium Enterprises
SO	Specific Objective 1, 2, 3, etc. (or component) of ANHDO HPS and HVP projects
SOP	Standard Operating Procedures
TL	Team Leader
ToR	Terms of Reference
UPOV	Union for the Protection of New Varieties of Plants
USAID	United States Agency for International Development
USDA	United States Department of Agriculture

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Acknowledgements

- Thanks for Ab.Rasool Sabour Kunduz PHDC Manager to provided me pictures from National collections and Dos.
- Thanks for cooperation of Haji QudousProject Coordinator MoAIL-PHDCs.
- Thanks from Ghulam Farooq Sarwari Mazar PHDC Field Horticulturist to provided me some information and good pictures from National collection and Dos.
- Thanks for Sayed Ghulam Mohammad HLP IPM Officer Sub-office in Mazar-e-Sharif to provided me IPM Technical manual on integrated pest management,

1. Executive summary

This is the Second mission of the IPM Expert covering the period of November 2014. Based on the TORs assigned. The consultant coordinated with Haji Qudos Project Coordinator of MoAIL-PHDCs and visited Kunduz and Mazar PHDCs. At the end of the visits some provisional recommendations were given concerning the pests and diseases observed during the reporting period.

List of places visited

<u>Location</u>	<u>District</u>	<u>Province</u>	<u>Remarks</u>
Kunduz PHDC	Kunduz Centre	Kunduz	Visited NC
Mazar –e-Sharif PHDC	Mazar-e-Sharif	Balkh	Visited NC

List of person met

<u>Name</u>	<u>Position</u>	<u>Location</u>	<u>Remarks</u>
Haji Qudos	Project Coordinator MoAIL-PHDCs,	BadamBagh, PHDP, Main office, Kabul	
Ab. Rasool Sabour	Field Horticulturist,	Kunduz, PHDC, Farm	
Ahmad Monir Amini	Assistant of F.H	Kunduz, PHDC, Farm	
Dost Mohd	Pomology lab	Kunduz, PHDC, Farm	MAIL staff
Mohd Asef	Nurseryman	Kunduz, PHDC, Farm	MAIL staff
Said Bahram	Farm Data collector MAIL	Kunduz, PHDC, Farm	MAIL staff
Mohd Nabi Raofi	Agriculture General Director	Kunduz, DAIL	DAIL
Ghulam Mohammad	Acting regional Horticulture Coordinator NHLP	Kunduz,	HLP sub-Office Kunduz

Shokor Wahab	Director of PPQD	Kunduz, Agriculture directorate	DAIL staff
Ab. Matin Noori	IPM Officer	Kunduz, PPQD	DAIL Staff
Ghulam Farooq Sarwari	Field Horticulturist	Mazar, PHDC, Dehdadi Farm	
Ab. Saboor Sadiqpor	Assistant of F.H	Mazar, PHDC, Dehdadi Farm	
Kamal Khan	Head of plant industrial Department	Mazar, PHDC, Dehdadi Farm	DAIL Staff
Ahmad Shah	Pomology lab	Mazar, PHDC, Dehdadi Farm	PHDC/DAIL Staff
Sediqullah	Team leader	Mazar, PHDC, Dehdadi Farm	DAIL Staff
Kateb Shams	Agriculture General Director	Mazar, DAIL	DAIL, Mazar
Islamuddin	Planning Director	Mazar, DAIL	DAIL staff
Haji Aloudding	Head of Quarantine Department	Mazar, DAIL	DAIL staff
Aziz Khan	Head of Epidemic Pest department	Mazar, Plant Protection and Quarantine department	DAIL staff
Ab. Ghani	Head of Pesticide department	Mazar, Plant Protection and Quarantine department	DAIL staff
Shah Mahmood Sadid	IPM Officer	Mazar, FAO	FAO Sub-Office Mazar-e-Sharif
Sayed Ghulam Mohd	IPM Officer	Mazar, HLP	HLP sub-Office Mazar-e-Sharif

2. Observations and recommendations made during the reporting period

2.1. Kunduz PHDC

Observations

The major pest and diseases observed and related recommendations are listed at below:

The consultant performed field visits and collected some information, data and pictures from the PHDC managers, Plant protection and quarantine department Kunduz, DAIL, HLP regional sub-Office located in Kunduz Province.

The major pest and diseases found Kunduz PHDC are listed in the following table:

Species	Pests and diseases or disorders	Location	Remarks
Almond	Mite	NC	Mild attack in few trees
	Aphid	NC	Mild attack in few trees
	Leaf moth	NC	Moderate
Almond nursery	Leaf moth	Nursery	Moderate
Peach	Gummosis	DO	Serious
Plum	Gummosis	DO	Mild attack in few trees
	Shot hole	DO	Mild attack in few trees
Apple DO	Root suckers , Water sprout shoots	DO	Minor problem in a few trees
	Aphid	DO	Minor problem in a few trees
Pear	Ants	NC	Mild attack in few trees
	Psylla	NC	Not observed
	Fire blight	NC	Mild attack in few trees
	Mites	NC	Mild attack in few trees
	Aphids	NC	Mild attack in few trees
Grape vine	Frost damage	DO	Seriously damaged fruits
	Powdery mildew	Do	Minor
	Weeds	DO	Minor problem

2.2. Mazar PHDC

The major pest and diseases observed and related recommendations are listed at below:

The consultant performed field visits and collected some information, data and pictures from the PHDC managers, the Plant protection and quarantine department (DAIL) Mazar-e-Sharif as well as taken some information from HLP and FAO Sub-Offices in Mazar-e-Sharif.

The major pest and disease observed in the PHD Centre Dehdadi Farm Mazar-e-Sharif are as follows:

Species	Pests and diseases or disorders	Location	Remarks
Almond	Anthracnose	NC	Serious attack during warm and wet weather
	Shot hole	NC	Minor already controlled by PHDC Manager
	Mite	NC	minor
	Leaf Moth	NC	Moderate (Still not identified)
Apricot	Gummosis	NC	Minor infected in a few trees
	Soil physical problem	NC	SILTY SOIL
Plum	Shot hole	DO	A few trees infected
Apple	Codling moth	DO	Minor attack
	Aphid	DO	Minor attack
	Mite	DO	Minor attack on trees
	Iron deficiency	DO	Minor problem in a few trees
Pear	Incompatibility	DO	Wind break down a few trees
	Lack of Micro nutrient	DO	Moderate problem
	Aphid	DO	Minor problem
Fig	Leaf moth	DO	Moderate attack in trees
	Mite	DO	Moderate attack in Spring and summer

Recommendations

The recommendations provided are just a summary of the measures that can be adopted based on the resources and products available in the market at the time of the observations.

The first general recommendation is that it is important to purchase all pesticides and fungicides from reliable sources and read accurately the labels; especially safety instructions.

Almond Moth

It is important to send the infested almond leaf sample to PBTL or the Plant Protection Lab for identification. The Almond leaf moth is a general problem in Kunduz. The kind of moth that damage leaf is still not identified. During spring time it would help to catch some adults and take pictures of them for identification last generation of adults moth laid eggs on the middle of the leaves which are covered with sticky materials. After hatching the larvae search for a safe place for passing overwinter.

Anthracnose

A few trees of Almond National collection were infected with a fungal disease Which was identified as anthracnose? More sampling and testing may be necessary for a secure identification.

Measures to control Anthracnose:

- Prune dead infected branches.
- Fungicide treatment in Spring (i.e. Captan or Maneb spray at 5-10% bloom or pink bud and repeated every 10 to 14 days
- Avoid wetting the leaves during irrigation (low angle nozzles should be use in case of sprinkler irrigation)

Almond Mite control

- Wash all infested trees with high pressure water then under the trees apply a little quantity Sulphur powder sprayed as a mist.
- Apply Ovicide in spring to control mite eggs before they hatch.
- At the early stage of attack before the Mites damage the leaves use selective acaricide (Miticide). Afghan orchard owners are already using Dicofol, Agrifol, Amitraz, Talstar.
- During hot weather especially summer season mites' outbreaks can be very serious on almond trees. Therefore it is a good prevention to apply winter oil during autumn

Almond leaf moth

- Sanitation of orchard by removing dead and sick branches, leaves, fruits, etc.
- Use attractive traps, light traps, sticky traps, Pheromone traps
- Spray selective pesticide before the adult lay eggs
- Urea spray (at 5%) during autumn
- Collect all fall down leaves and make it compost.
- Spray winter oil during dormant period

Apricot, Peach and Plum Gummosis:

- Clean infected area with sharp knife, wash with water then use Bordeaux Paste or spray copper oxy chloride.
- White wash the trunk of trees with lime with addition of a little quantity (two –three spoons) of Fungicide (Cupravit blue or copper oxy chloride)
- Avoid flood irrigation or water logging and ensure good drainage.
- Green pruning after harvesting fruits and cutting off infected branches.
- Use animal manure 4-5 tons/Jerib to improve the soil

Almond, Peach and Plum shot hole

Shot hole is managed primarily with fungicide treatments before bud burst to protect buds and twigs from infection. In orchards where twig infections are prevalent, the efficacy of the dormant treatment can be improved by pruning out and destroying infected wood. If the orchard is sprinkler irrigated, be sure to angle sprinkler heads low enough to keep from wetting the canopy

- Good sanitation is a key to treating shot hole disease naturally. All infected buds, blossoms, fruits and twigs need to be promptly removed and destroyed. Contaminated leaves around and beneath the tree should be removed as soon as possible.
- Apply a dormant spray of Bordeaux mixture or copper fungicide in late fall In areas where orchards have a history of this disease, spray at leaf fall or from November 15 to December first before winter rains to protect against twig infections. This spray also helps control leaf curl.

Ants problem on Pear National Collection

Treatment with Boric acid

1. Make bait with Boric Acid(Place 1 teaspoon of boric acid and 10 teaspoons of sugar in a bowl and mix it around with a spoon)
- 1.2 Add 2 cups of water to the bowl and stir it until the sugar and boric acid are dissolved.
- 1.3 Soak a cotton ball in the solution and place it in a jar cap or plastic lid.
- 1.4 Look for ant lines - the line of marching ants going into portions of the garden or even into your garden shed - presumably back to the nest. Place the jar caps as close to the nest entrance as possible. The ants will be attracted to the sugar in the cotton ball and will swarm around it, gobbling up the sugar - and the boric acid - at the same time. The ants will die when they return to the nest and spread the boric acid to other ants in the nest as well.

Pear fire blight (Erwinia amylovora)

- Use resistant varieties with resistant rootstocks. Faroid 40 rootstock is resistant to bacterial fire blight
- Prune out infected twigs after harvest.
- Sterilize Pruning tools.
- Use 5% urea spray in autumn.

- Use an integrated approach that combines (a) horticultural practices designed to minimize tree susceptibility and disease spread; (b) efforts to reduce the amount of inoculums in the orchard (c) well-timed sprays of bactericides to protect against infection under specific sets of conditions.
- Apply Copper oxy chloride can be effective

Almond, Apple and Pear aphid

- Remove root suckers and water sprout shoots
- Remove infested twigs mechanically
- Avoid excessive nitrogen which promotes new shoot growth that attracts aphids.
- Spray with winter oil in dormant season
- Spray Neem oil during Spring
- Promote natural enemies (Lacewing , lady beetle, Syrphid fly larvae, Religious mantis)
- Apply liquid soap
- As a last resort spray Confidor

Iron deficiency:

- Use animal manure 4-5 tons/ Jerib for improving of soil conditions and vigour of trees
- Avoid unbalance fertilization (i.e. excessive DAP (Di Ammonium Phosphate).
- Apply iron chelate, Fetrilon 2 gr/liter

Codling Moth control:

- Control of codling moth use lime sulphur during orchards dormancy or before bud burst.
- Use different methods for control of pest (Cultural control, Mechanical control, Physical control, biological control, rotation of inter cropping, applied selective pesticide etc)
- During flowering time when 95% flowers are completed use selective pesticide to control of Major pest existed and observed last year. But avoid flowering time in order to not harm Honey bees and useful insects.
- During bloom period tied cardboard around the trunk of apple, pear, quince trees for control of codling moth larvae and pupa. After 10 days open the cardboard and remove all larvae and pupa and again tied it around the trunk.
- Collect all damaged fruits; fell on the ground and dispose of them carried out of the orchard.

Weed control:

It is important to remove the weeds before they produce seed. There are various methods which could be used alternatively or in combination

i) use of Herbicide (i.e. Round up); ii) manual removal (traditional); mechanical removal disc attached with tractor, mulching, etc.). The PHDCs has recently received some agricultural machinery that with time may improve weed management.