



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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Mohammed Karim Kashmiri



AGRICONSULTING S.p.A.

In Consortium with



ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA



Dipartimento di Scienze delle Produzioni Vegetali,
del Suolo e dell'Ambiente Agroforestale

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	<i>Incentives Driving Economic Alternatives for the North, East, and West</i>
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
PHDP II	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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- Thanks for Naseer Omarkhil to provide me pictures from National collections of Badam Bagh PHDC.
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- Thanks for Mr.Fazil Haq Wafa Agro-business officer in IDEA – NEW to sent me IPM presentations.
- Thanks for Shamsurahman Shams responsible of PBTL to provide me information regarding Pest and diseases existed National collections of six PHDC and recognized by PBTL.

1. Executive summary

This is the first mission of the IPM Expert covering the period of October 2014. Based on the TORs assigned. The consultant coordinated with Haji Qudos Project Coordinator of MoAIL-PHDCs and visited Badam Bagh PHDC, Kabul and Farm-e-Jadid, Jalalabad PHDC, Nangarhar Province. 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>
Badam Bagh PHDC	17 th	Kabul	Visited NC
Farm-e-Jadid PHDC	Jalalabad	Nangarhar	Visited NC

List of person met

<u>Name</u>	<u>Position</u>	<u>Location</u>	<u>Remarks</u>
Haji Qudos	Project Coordinator MoAIL-PHDCs,	Badam Bagh, PHDC, Main office, Kabul	
Naseer Ahmad Omarkhil	Field Horticulturist,	Badam Bagh, PHDC, Farm	
Saifuddin Ahadi	Assistant Field Horticulturist,	Badm Bagh, PHDC, Farm	
Said Ahmad	Intern , PHDC Kabul	Badam Bagh, PHDC, Farm	
Sardar Mohammad	Horticulturist MAIL	Badam Bagh, PHDC, Farm	
Faridullah	Horticulturist MAIL	Badam Bagh, PHDC, Farm	
Tahir Habib	PPQD acting director	Main Office, Badam Bagh Kabul	
Gholum Nabi	Head Pesticide Department PPQD, MAIL	Main Office, Badam Bagh, Kabul	
Khadim Hussain Hamdam	Senior Orchard Management Officer	NHLP Main Office, MAIL, Jamal Mina, Kabul	
Gholum Rasool	Marketing Coordinator	NHLP Main Office, MAIL, Jamal Mina, Kabul	
Aziz Saeedi	Project Manager HPS SO4, ANHDO	PHDC, Jalalabad	
Mumtaz Ahmad	Field Horticulturist	PHDC, Farm-e-Jadid, Nangarhar	
Mr Latif	National collection Officer	DAIL Staff, PHDC, Farm-e-Jadid, Nangarhar	Works in PHDC
Mr. Nazir	Extension officer	DAIL Staff, PHDC, Farm-e-Jadid, Nangarhar	Works in PHDC
Ghosuddin. Boura	Regional officer, IDEA-NEW	IDEA-NEW Office, Jalalabad, Nangarhar Province	
Assadullah Sultanzoi	Technical Advisor, IDEA-NEW	IDEA-NEW Office, Jalalabad, Nangarhar Province	
Fazil Haq Wafa	Agro-Business Officer, IDEA-NEW	IDEA-NEW Office, Jalalabad, Nangarhar Province	
Abdul Ghafar Ahmadi	Community Development Officer in IPM Project, FAO	FAO sub-Office Jalalabad, Nangarhar Province	
Rahmat Gul Serat	Regional Coordinator, NHLP	Jalalabad, Nangarhar Province	
Mr.Ehsan	IPM officer, NHLP	Jalalabad, Nangarhar Province	
Shamsurrahman Shams	Head of Plant Biotechnology Lab (PBTL)	Badam Bagh, Kabul	

2. Observations and recommendations made during the reporting period

2.1.. BadamBagh PHDC (Kabul)

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 manager and the staff of the Biotechnology laboratory (PBTB).

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

Species	Pests and diseases or disorders	Location	Remarks
Apple	Codling moth,	NC	few trees
	Woolly aphid	NC	few trees
Cherry	Fruit fly	NC	few trees
	Root Nematode	NC	mild attack in few trees
Peach	Brown aphid	DO	few trees
Apricot	Gummosis	NC	present in some trees

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.

Codling Moth control:

- Control of codling moth use lime sulfur during orchards dormancy or before bud burst.
- Use different methods for control of pest and diseases (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.

Woolly apple aphid control:

- During winter time the woolly apple aphid during winter time from tree tops goes down in the soil, feed on roots and make galls. It is important to control them before this happen by applying a selective pesticide (like for example Confidor).
- Use resistant root stock for example: MM111 (Malling Merton 111)
- This rootstock is resistant to woolly apple aphid, intermediate tolerant to crown rot, fire blight and apple scab. It is also resistant to Phytophthora and tolerant to latent viruses Prune infected branches which are damaged by Woolly apple aphid during spring time.
- Those who start new orchards should be aware that M9 & B9 rootstocks are susceptible to fire blight and woolly apple aphid and use them with grafted varieties that are tolerant or resistant (these are available with the NC and will be recommended later.

Almond Mites control:

- Wash all infested trees wash with high pressure water then under the trees apply a little quantity sulfur powder as a mist can effective.
- 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. Last year the PHDC Manager controlled the pest by spraying N - V - Ron organic oil insecticide and pesticide (2% Emulsifier 98% Paraffinic) which was the best product for controlling of pest and diseases problems in various fruit species and the results was satisfactory.

Cherry root nematode control:

Although root nematodes are a minor problem it is necessary to keep them under control. The PBTL tested a sample for one cherry tree of the PHDC and diagnosed the presence live nematode - MOTILE) on 4April2014.

- Use nematocides if available in the market.
- Start new orchards with resistant or tolerant rootstock.
- The PBTL recommended Furadon (Carbuforan) 5-6kg/ hectare as effective measure to control nematodes.
- The PHDC manager of Kabul applied a liquid solution of Cypermetthrin (2ml/liter) 20litter around the infected tree on the ground also added 6kg farmyard manure per tree (to stimulate vigorous growth) , and got satisfactory results.

Peach fruit flies control:

- Collect all damaged fruit from the trees and those fallen on the ground and dispose them out of the garden.
- Use traps to control adults (sticky traps and pheromone traps)
- Before flowering and bud burst apply a selective pesticide.
- After fruit set spray again with a good pesticide available in the market (i.e. Confidor)

Fruit fly was serious problem on peach fruit last year in Badam Bagh PHDC but this year the attack was moderate. However, the PHDC Manager caught adults of fruit fly and sent them in a laboratory abroad for identification.

Apricot disease control

- Clean infected area with sharp knife, wash with water and use Bordeaux mixture at least two times at an interval of 14 days. In alternative also copper oxy chloride can be effective.
- White wash the trunk of Apricot trees with lime with addition of a little quantity (i.2. two –three spoons) of Fungicide (cupravite blue or copper oxy chloride)

Weed control:

Badam Bagh PHDC has more than 10 hectare of plantation, which is very difficult to keep in control with limited resources. 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.

2.2. Jalalabad PHDC

The major pest and disease observed in the PHD Centre Farm-e-Jadid Jalalabad are as follow:

Species	Pests and diseases or disorders	Location	Remarks
Citrus seedlings	CTV	Shishambag	Observed in 2013 by the PBTL
Citrus	Phytoptora and gommosis	NC	moderate attack (probably caused by water logging)
	Leaf miner	NC	minor atack
	Mites	NC	moderate atack
	Psylla	NC	minor attack
	Caterpillars (white grab) in soil	NC	minor presence
Pomegranate	Fruit fly	NC	minor
	Carob moth	NC	minor
	Sun burn	NC	minor
	Root rot	NC	minor
	Mites	NC	minor (sample sent to a lab)
	Fruit rot	NC	secondary pest; appears after attack of fruit fly
Apricot	Gummosis	DO	moderate (water logging)
	Aphids	DO	Serious attack in Spring
	Mites	DO	moderate atack
Peach nectarine	Thrips	NC	moderate attack
Fig	Stem borer	NC	under control but potentially serious
	Snail	NC	serious attack in Spring
Grape	Powdery mildew	DO	moderate
Loquat	Fire blight	NC	few trees

Recommendations

General: avoid water logging and ensure good drainage. Reduce irrigation volumes and increase frequency

Citrus CTV :

- For citrus CTV control use resistant rootstock and resistant variety
- Use of healthy (certified) planting material, use of tolerant rootstock.
- Control vector of CTV, brown aphid
- Sterilize pruning tools during pruning, budding and grafting
- Protect and treat pruned area with wood glue to avoid attack pest and disease.

Citrus Gummosis and Phytophthora control

- Application of fungicides (like Copper Oxy chloride) can be effective.
- Avoid flood irrigation and water logging

Citrus leaf miner control:

- Remove and burn affected leaves
- Apply pesticides (like f Confidor, Cypermethrin, Dimethoate)

Mite control:

- Wash plants with high pressure water /
- Rain can also be effective and wash out the mites
- Spray of soap solution of 5gm/lit
- Wash the whole tree with lime sulphur during dormancy period.
- Use wettable sulphur 10%
- Spray pesticide like Dicofol, Agrifol.

Psylla control:

- Use resistant varieties if available
- Spray pesticide after fruit setting like Dimethoate, Confidor, Cypermethrin.
- Spray of botanicals insecticides (extract of neem oil) can be effective.

Caterpillar control:

- Hand picking of caterpillar
- Plough during spring time
- Apply selective insecticides to infested area
- Fumigation of the soil

Pomegranate fruit flies, carob moth and sunburn:

- For pomegranate carob moth control practical experience shows that cleaning and removing the mass of old stamens after flowering can deter egg-laying.
- Collect all drop infested pomegranate from garden.
- Remove all damage infected fruit by flies and sooty mould fungus from the trees and carried out from garden.
- Use pheromone trap
- Remove second flowering of pomegranate from the trees.
- Remove small pomegranate fruits from the trees.
- Perform green pruning to avoid fruit sunburn.

Pomegranate fungal disease control:

- Sanitation of Orchards collected all infested fruits on time during the year and has through away from garden.
- Good orchard management and control of insect pest such as filbertworm.
- All damaged fruits by fruit flies and infected by sooty mould fungus should be removed from the garden.

Apricot Gummosis control:

- Clean infected area, wash with water then use Bordeaux Paste also spray copper oxy chloride can effective.
- White wash Apricot trunk with lime and use a little quantity Fungicide (cupravite blue or copper oxy chloride)
- The PBTL recommended Furadon (Carbuforan) 5-6kg/ hectare Avoid flood irrigation or water logging and ensure good drainage

Fig tree stems borer control:

- Mechanical control. The borer larva damage trunk and make gallery ;for control of them clean the hole with wire then soak cotton with gasoline into the hole (fumigant) and close the hole with mud
- White wash the trunk of fig tree with lime and add a little quantity of insecticide (Trichlorfon)
- During pruning time cut off all infected branches and immediately remove them
- Apply Pesticide (Ferudan or Diptrex (Trichlorfon) around the trunk on soil surface then irrigate.
- Light trap during night can be attractive for the adult form of the borer (Long horn beetle))

Snail control:

- Mechanical removal
- Plough the soil during spring time
- **Weed control**