

## PEST SITUATION OF GENERAL CROPS, VEGETABLES & ORCHARDS FOR 2<sup>ND</sup> FORTNIGHT OF NOVEMBER, 2018

<u>OUTLINE</u>	
1.	Pest situation of general crops
2.	Pest situation of vegetables
3.	Pest situation of orchards
4.	Pest Forecast for next fortnight
5.	Recommendations
6.	Economic Threshold Levels (ETLs)

### 1- PEST SITUATION OF GENERAL CROPS

#### BAJRA

**Borer:** The infestation below has been observed in District Layyah.

#### BARSEEM

**Armyworm:** The infestation has been observed in District Multan, Vehari, Bahawalpur, R.Y.Khan and T.T. Singh.

**Jassid:** The infestation below has been observed in District D.G.Khan

**Whitefly:** The infestation below has been observed in District Multan, Lodhran, Bahawalpur, R.Y.Khan, Rajanpur

**Aphid:** Its infestation has been observed below ETL in District Mianwali, Khushab, Bhakkar.

**Root rot:** Its incidence has been observed in District Lahore and Gujrat.

#### CANOLA

**Whitefly:** The infestation below has been observed in District Sahiwal.

**Aphid:** Its infestation has been observed below ETL in District Khushab and Chiniot.

#### GRAM

**American Bollworm:** The infestation below has been observed in District Sahiwal.

## **MAIZE**

**Aphid:** The infestation below has been observed in District D.G. Khan and Khushab

**Borer:** The infestation below has been observed in District Multan, Khanewal, R.Y.Khan, Muzaffar Garh, Rajanpur.

**Pyrrilla:** The infestation below has been observed in District R.Y.Khan

**Hopper:** The infestation below has been observed in District Bahawalnagar

**Stem Borer:** The infestation below has been observed in District Bahawalpur, Rawalpindi, Sheikhupura, Bhakkar and Kasur.

**Jassid:** The infestation below has been observed in District Lodhran, Muzaffar Garh.

**Heliothis:** Its infestation has been observed below ETL in District Bhakkar.

## **LUCERN**

**Whitefly:** The infestation below has been observed in District Lodhran, Bahawalpur

**Armyworm:** The infestation has been observed in District Bahawalnagar.

## **SARSOON, RAYA**

**Whitefly:** The infestation below has been observed in District Bahawalpur, R.Y.Khan

**Armyworm:** The infestation has been observed in District Vehari, Bahawalpur

## **SORGHUM**

**Borer:** The infestation below ETL has been observed in District Okara, Bahawalpur

**Shoot fly:** Its infestation has been observed below ETL in District Jhang.

## **SUGARCANE**

**Stem borer:** Its infestation has been observed below ETL in District Jhelum.

**Red rot:** Its incidence has been observed in District Chakwal and Attock.

**White fly:** Its infestation has been observed below ETL in District Hafizabad and Gujrat

## **MILLET**

**Grain mold:** Its incidence has been observed in District Bhakkar.

## **OLIVE**

**Anthracnose:** Its incidence has been observed in District Rawalpindi.

## **BRASSICA**

**Aphid:** Its infestation has been observed below ETL in District Rawalpindi.

## **PEST SITUATION OF VEGETABLES**

### **ASH GOURD**

**Whitefly:** The infestation below ETL has been observed in District R.Y.Khan

**Downey Mildew:** The incidence has been observed in District R.Y.Khan

### **BITTER GOURD**

**Whitefly:** The infestation below ETL has been observed in District Lodhran

**Downy mildew:** Its incidence has been observed in District Gujrat.

### **BRINJAL**

**Fruit Borer:** The infestation below ETL has been observed in District Multan, Vehari, Lodhran, Bahawalpur, R.Y.Khan, Muzaffar Garh, Sheikhpura, Kasur, Chakwal

**Jassid:** The infestation above ETL has been observed in District Bahawalpur & below ETL has been observed in District Multan, Vehari, Lodhran, Bahawalpur, R.Y.Khan, D.G Khan, Muzaffar Garh, Faisalabad, Jhang, Gujrat, Jhelum.

**Whitefly:** The infestation above ETL has been observed in District Bahawalpur & below ETL has been observed in District Lodhran, Bahawalpur, R.Y.Khan, D.G Khan, Muzaffar Garh.

**Mealy bug:** The infestation has been observed in District D.G.Khan

### **CABBAGE**

**Whitefly:** The infestation below ETL has been observed in District Bahawalpur, D.G. Khan, Muzaffar Garh.

**Armyworm:** The infestation has been observed in District Multan, Bahawalpur, Sheikhpura, Faisalabad.

**Jassid:** The infestation below ETL has been observed in District D.G. Khan, Muzaffar Garh.

**Looper:** Its infestation above ETL has been observed in District Sheikhpura.

## **CARROT**

**Whitefly:** The infestation below ETL has been observed in District Multan, Bahawalnagar, R.Y.Khan, D.G Khan, Muzaffar Garh, Rajanpur

**Jassid:** The infestation below ETL has been observed in District D.G. Khan

## **CHILLIES**

**Whitefly:** The infestation below ETL has been observed in District Multan, Pakpattan, Bahawalpur, R.Y.Khan, Rajanpur.

**Jassid:** The infestation below ETL has been observed in District Pakpattan.

**Collar Rot:** The incidence has been observed in District Multan.

**Virus:** The incidence has been observed in District Bahawalpur, R.Y.Khan.

**Wilt:** The incidence has been observed in District Pakpattan.

**CLCV:** Its incidence has been observed in District Jhang.

## **CAULIFLOWER**

**Whitefly:** The infestation below ETL has been observed in District Lodhran, Pakpattan, Bahawalpur, R.Y.Khan, D.G Khan, Muzaffar Garh

**Armyworm:** The infestation has been observed in District Multan, Lodhran, Pakpattan, Bahawalpur, R.Y.Khan, Muzaffar Garh, Rajanpur, Sheikhpura, Chakwal, Nankana, Chiniot, Faisalabad, Ferozwala.

**Jassid:** The infestation above ETL has been observed in District Sahiwal & below ETL has been observed in District Vehari, D.G. Khan and T.T.Singh.

**Aphid:** Its infestation below ETL has been observed in District Khushab.

**Borer:** Its infestation below ETL has been observed in District Mianwali.

## **CUCUMBER**

**Whitefly:** The infestation below ETL has been observed in District Lodhran, Muzaffar Garh.

**Downey Mildew:** The incidence has been observed in District Lodhran, T.T.Singh, Gujrat

**Jassid:** The infestation below ETL has been observed in District Muzaffar Garh.

**Fruit fly:** Its infestation below ETL has been observed in District T.T.Singh

## **CAPSICUM**

**Jassid:** Its infestation below ETL has been observed in District Gujrat.

## **LEMON**

**Leaf miner:** Its infestation below ETL has been observed in District Nankana, Chakwal

## **MUSTARD**

**Whitefly:** The infestation below ETL has been observed in District Bahawalpur

**Aphid:** Its infestation has been observed below ETL in District Bhakkar.

## **MINT**

**Downy mildew:** Its incidence has been observed in District Gujrat.

## **FENUGREEK**

**Leaf miner:** Its infestation below ETL has been observed in District Nankana.

## **GARLIC**

**Snails:** Its infestation below ETL has been observed in District Chakwal.

**Mites:** Its infestation below ETL has been observed in District Chakwal.

## **OKRA**

**Whitefly:** The infestation below ETL has been observed in District R.Y.Khan, .

**Jassid:** The infestation a below ETL has been observed in District Bahawalnagar, R.Y.Khan, T.T.Singh and Jhang.

## **ONION**

**Thrips:** The infestation below ETL has been observed in District Multan, Lodhran, Bahawalpur, D.G.Khan, Rajanpur.

**Whitefly:** The infestation below ETL has been observed in District Muzaffar Garh.

**Downey Mildew:** The incidence has been observed in District Lodhran

**Mites:** Its infestation below ETL has been observed in District Chakwal.

**Thrips:** Its infestation below ETL has been observed in District Khushab.

## **PEAS**

**Whitefly:** The infestation below ETL has been observed in District Multan, Lodhran, Sahiwal, Pakpattan.

**Jassid:** The infestation below ETL has been observed in District Sahiwal.

**American bollworm:** Its infestation below ETL has been observed in District Sialkot.

**Cutworm:** Its infestation below ETL has been observed in District Gujrat.

**Aphid:** Its infestation below ETL has been observed in District Sargodha.

**Root rot:** Its incidence has been observed in District Sheikhpura and Gujrat.

**Wilt:** Its incidence has been observed in District Sheikhpura and Jhelum.

**Leaf miner:** Its infestation below ETL has been observed in District Nankana, Chiniot.

**Cater pillar:** Its infestation below ETL has been observed in District Jhelum.

**Army worm:** Its infestation above ETL has been observed in District Rawalpindi.

## **PEPPER**

**Whitefly:** The infestation below ETL has been observed in District D.G.Khan

## **POTATO**

**Whitefly:** The infestation above ETL has been observed in District Khanewal, & below ETL has been observed in District Multan, Vehari, Lodhran, Sahiwal, Pakpattan, Bahawalpur, Bahawalnagar, Layyah, Kasur, Khushab.

**Jassid:** The infestation above ETL has been observed in District Khanewal, Lodhran & below ETL has been observed in District Vehari, Lodhran, Sahiwal, Pakpattan, Bahawalpur, Layyah, Kasur, Nankana, Chiniot, Faisalabad, Jhang, T.T.Singh.

**Leaf curl virus:** The incidence has been observed in District Layyah

**Early blight:** Its incidence has been observed in District Jhelum, Chakwal, Attock, Sialkot, Gujrat.

**Late blight:** Its incidence has been observed in District Lahore, Chiniot, Kasur.

**Army worm:** Its infestation above ETL has been observed in District Lahore.

**Aphid:** Its infestation below ETL has been observed in District Khushab.

## **PUMPKIN**

**Whitefly:** Its infestation has been observed above ETL in District Faisalabad & infestation below ETL has been observed in District Multan, Pakpattan, Bahawalpur, Bahawalnagar, R.Y.Khan, D.G Khan.

**Armyworm:** The infestation has been observed in District Bahawalnagar.

**Fruit Fly:** The infestation below ETL has been observed in District R.Y.Khan

**Jassid:** The infestation below ETL has been observed in District Pakpattan, D.G.Khan

**Borer:** Its infestation below ETL has been observed in District Mianwali.

**Downy mildew:** Its incidence has been observed in District Gujrat.

## **RADISH**

**Whitefly:** The infestation below ETL has been observed in District Multan, Bahawalpur, R.Y.Khan, D.G. Khan, Muzaffar Garh.

**Jassid:** The infestation below ETL has been observed in District D.G.Khan

**Leaf spot:** Its incidence has been observed in District Khushab.

## **SPINACH**

**Whitefly:** The infestation below ETL has been observed in District Multan, Lodhran, Bahawalnagar, R.Y.Khan, Muzaffar Garh.

**Armyworm:** The infestation has been observed in District Multan, Lodhran, Bahawalpur, Bahawalnagar, R.Y.Khan, Sheikhupura and Rawalpindi

**Leaf spot:** Its incidence has been observed in District Khushab.

## **SPONGUE GOURD**

**Whitefly:** The infestation below ETL has been observed in District Lodhran

**Jassid:** The infestation below ETL has been observed in District Bahawalpur

## **ROUND GOURD**

**Army worm:** Its infestation above ETL has been observed in District Ferozwala.

**Downy mildew:** Its incidence has been observed in District Gujrat.

## **SWEET POTATO**

**Whitefly:** The infestation below ETL has been observed in District Muzaffar Garh

## **TORI**

**Whitefly:** The infestation below ETL has been observed in District D.G. Khan.

**Jassid:** The infestation below ETL has been observed in District D.G. Khan.

## **TOMATO**

**Borer:** Its infestation below ETL has been observed in District Chakwal.

**Early blight:** Its incidence has been observed in District Khushab and Chakwal.

**Aphid:** Its infestation below ETL has been observed in District Khushab.

**Fruit spot:** Its incidence has been observed in District Rawalpindi.

**Leaf miner:** Its infestation below ETL has been observed in District Khushab.

## **TURNIP**

**Whitefly:** The infestation below ETL has been observed in District Multan, R.Y.Khan, Muzaffar Garh

**Army worm:** Its infestation above ETL has been observed in District Sheikhupura.

**Jassid:** Its infestation below ETL has been observed in District Ferozwala.

## **LUCERN**

**Aphid:** Its infestation below ETL has been observed in District Khushab, Bhakkar.

## **TURMERIC**

**Leaf blotch:** Its incidence has been observed in District Kasur.

## **Vegetable Marrow**

**Whitefly:** The infestation below ETL has been observed in District R.Y.Khan



## PEST SITUATION OF ORCHARDS

### CITRUS

**Leaf miner:** The infestation below ETL has been observed in District Multan, Khanewal, Vehari, Lodhran, Sahiwal, Bahawalpur, R.Y.Khan, Layyah, Sheikhpura, Nankana, Faisalabad, Jhang, T.T.Singh, Sargodha, Khushab, Bhakkar

**Citrus Psylla:** The infestation below ETL has been observed in District Vehari, Bahawalpur, R.Y.Khan and Sargodha.

**Slow Decline:** The incidence has been observed in District Multan, Khanewal, Lodhran, Bahawalpur, Bahawalnagar, R.Y.Khan and Bhakkar.

**Fruit fly:** The infestation below ETL has been observed in District Vehari, Bahawalpur, Bahawalnagar, R.Y.Khan, Layyah, Jhang, T.T.Singh, Sargodha, Mianwali, Bhakkar.

**Gummosis:** The incidence has been observed in District Multan, Bahawalpur, R.Y. Khan, Bhakkar and Sargodha

**Wither tip:** The incidence has been observed in District Multan, Khanewal, Vehari, Lodhran, Sahiwal, Pakpattan, Okara, Bahawalpur, Bahawalnagar, R.Y.Khan, Layyah, Sheikhpura, Faisalabad, T.T.Singh, Sargodha, Jhang, Rawalpindi, Mianwali, Khushab, Bhakkar, Chakwal.

**Citrus Canker** The incidence has been observed in District Multan, Khanewal, Bahawalpur, Bahawalnagar, Layyah, Sheikhpura, Jhang, Sargodha, Mianwali, Khushab, and Bhakkar.

**Malanose:** Its incidence has been observed in District Bhakkar and Sargodha.

**Red scale:** Its infestation below ETL has been observed in District Sargodha.

**Scab:** Its incidence has been observed in District Sargodha.

**Stem borer:** Its infestation below ETL has been observed in District Sargodha.

### MANGO

**Anthracoese:** The incidence has been observed in District Multan, Khanewal, Vehari, Lodhran, Sahiwal, Pakpattan, Okara, Bahawalpur, Bahawalnagar, R.Y.Khan, D.G Khan, Muzaffar Garh, Rajanpur, Chiniot and Jhang.

**Scales:** The infestation below ETL has been observed in District Multan, Khanewal, Vehari, Bahawalpur, R.Y.Khan, Muzaffar Garh.

**Galls:** The infestation below ETL has been observed in District Multan, Vehari, Lodhran, Bahawalpur, Bahawalnagar, R.Y.Khan, Muzaffar Garh

**Malformation:** The incidence in dry form has been observed in District Pakpattan, Bahawalpur.

**Hopper:** The infestation below ETL has been observed in District Bahawalpur, Muzaffar Garh

**Quick Decline:** This is syndrome in which whole plant of mango dies off suddenly. Its incidence has been observed in District Multan, Lodhran, Bahawalpur, Bahawalnagar, R.Y.Khan.

**Gummosis:** The incidence has been observed in District Multan, Bahawalnagar, R.Y.Khan, Muzaffar Garh.

## **GUAVA**

**Fruit fly:** The infestation below ETL has been observed in District Sahiwal, Pakpattan, Sheikhupura, Kasur and Faisalabad, Jhang, Gujrat, M.B.Din, Chakwal and above ETL in district Jhang.

**Anthracnose:** The incidence has been observed in District Sahiwal and Faisalabad

**Decline:** Its incidence has been observed in District Lahore.

**Wilt:** Its incidence has been observed in District Sheikhupura.

## **GRAPES**

**Downy Mildew:** The incidence has been observed in District R.Y.Khan.

**Canker:** Its incidence has been observed in District Chakwal.

## **PEACH**

**Leaf curl virus:** Its incidence has been observed in District Rawalpindi.

**Gummosis:** Its incidence has been observed in District Attock, Chakwal

## **GRAPEFRUIT**

**Wither tip:** Its incidence has been observed in District Chakwal.

## **LETCI**

**Anthraco**se: Its incidence has been observed in District District Lahore and Rawalpindi.

## **POMEGRNATE**

**Canker**: Its incidence has been observed in District Chakwal

**Cracking**: Its incidence has been observed in District Rawalpindi.

## **APPLE**

**Scab**: Its incidence has been observed in District Rawalpindi.

## **APRICOT**

**Gummosis**: Its incidence has been observed in District Chakwal, Attock.

## **STRAWBERRY**

**Weevil**: The infestation below ETL has been observed in District Multan and Sheikhpura

**Root rot**: Its incidence has been observed in District Sheikhpura.

**Army worm**: Its infestation above ETL has been observed in District Sheikhpura.

## **SWEET LIME**

**Wither tip**: Its incidence has been observed in District Chakwal.

## **ORANGE**

Its incidence has been observed in District Chakwal.

### **4. PEST FORECAST FOR NEXT FORTNIGHT**

Forecast of insect pests and diseases is given as under;

## **VEGETABLES FORECAST**

### **WHITEFLY**

It is foretold that its population may decrease on vegetables and crops during the next fortnight.

### **JASSID**

Its population decrease during the coming fortnight due to current weather conditions.

### **THRIPS**

Its population may decrease in the coming fortnight due to current weather conditions.

### **MITES**

Its population may decrease in the coming fortnight due to current weather conditions.

### **FRUIT FLY**

It is foretold that its population may decrease on vegetables and crops during the next fortnight.

### **BORER**

Its population may decrease on Vegetable during next fortnight.

### **ARMYWORM**

Its population may decrease owing to prevailing weather conditions during the coming fortnight.

### **DOWNY MILDEW**

Its incidence may increase owing to prevailing weather conditions which may continue during the coming fortnight.

### **COLLAR ROT**

Its incidence may sustain owing to prevailing weather conditions which may continue during the coming fortnight.

### **VIRUS**

Its incidence may sustain owing to prevailing weather conditions which may continue during the coming fortnight.

## **GENERAL CROPS FORECAST**

### **BORER**

Its population may decrease owing to prevailing weather conditions which may continue during the coming fortnight

### **WHITEFLY**

Its population may decrease owing to prevailing weather conditions which may continue during the coming fortnight

### **ARMYWORM**

Its population may decrease owing to prevailing weather conditions which may continue during the coming fortnight

### **SHOOT FLY**

Its population may decrease owing to prevailing weather conditions which may continue during the coming fortnight

### **Stem Borer**

Its population may decrease owing to prevailing weather conditions which may continue during the coming fortnight

### **Leaf Folder**

Its population may decrease owing to prevailing weather conditions which may continue during the coming fortnight

### **Leaf Roller**

Its population may decrease owing to prevailing weather conditions which may continue during the coming fortnight

### **Blight**

Its incidence may increase due to prevailing climatic conditions in the coming fortnight

## **MANGO ORCHARD FORECAST**

### **GALLS & SCALES**

Their population may decrease due to prevailing climatic conditions in the coming fortnight.

### **THRIPS**

Their population may decrease due to prevailing climatic conditions in the coming fortnight.

## **HOPPER**

Their population may decrease due to prevailing climatic conditions in the coming fortnight.

## **FRUIT FLY**

Their population may decrease due to harvesting and prevailing climatic conditions in the coming fortnight.

## **QUICK DECLINE**

Its incidence may sustain due to current climatic conditions.

## **ANTHRACNOSE**

Its incidence may increase due to prevailing climatic conditions in the coming fortnight.

## **GUMMOSIS**

Its incidence may sustain due to prevailing climatic conditions in the coming fortnight.

# **CITRUS ORCHARD FORECAST**

## **CITRUS PSYLLA**

Its infestation may decrease due to prevailing climatic conditions in the coming fortnight.

## **LEAFMINER**

Its infestation may decrease due to prevailing climatic conditions in the coming fortnight.

## **WITHERTIP**

Its incidence may increase due to prevailing climatic conditions in the coming fortnight.

## **CITRUS CANKER**

Its incidence may increase due to current climatic conditions during the next fortnight.

## **LEAF FALL**

Its incidence may increase due to current climatic conditions during the next fortnight.

## **SLOW DECLINE**

Its incidence may sustain due to current climatic conditions during the next fortnight.

## **GUMMOSIS**

Its incidence may sustain due to current climatic conditions during the next fortnight.

## **GUAVA**

### **ANTHRACNOSE**

Its incidence may increase due to current climatic conditions during the next fortnight.

### **FRUITFLY**

Their population may sustain on Guava due to prevailing climatic conditions in the coming fortnight.

## **5. RECOMMENDATIONS**

### **GENERAL RECOMMENDATIONS**

Motivate the farmers to follow the following recommendations.

- Keep fields free from weeds.
- Remove all plant debris and remains of vegetables immediately after harvest.
- Use suitable fungicides for the control of diseases on crops and vegetables.
- The control of armyworm on different vegetables / fodders is very necessary to check its multiplication by hand picking and graze the infected leaves. For its control suitable insecticides like IGR's should be used in consultation with field staff of Pest Warning and Extension Wing.
- Fallow fields should be ploughed up to destroy pupae of bollworms especially heliothis and armyworm.
- For jassid control, apply imidacloprid 25 WP@ 75gm/acre or imidacloprid 200 SL@ 60ml/acre or thiamethoxam 25 WDG@ 24gm/100 LOW.
- Mango orchards with heavy infection of anthracnose should be treated twice with suitable fungicides.
- Orchards should be treated with suitable pesticides thrice a year for the control of insect pests and diseases i.e. before flowering, after fruit setting and harvesting.
- For the control of fruit flies, keep the field neat and clean by eradicating the weeds, picking up of infested fruits and burying them properly and install pheromone (methyl eugenol) traps @ 3-5 traps /acre.

**FOR ONION THRIPS**

- After harvesting remove & destroy the plant debris in ground
- Use early & quick maturing varieties
- Eradicate the weeds
- Spray spirotetramat+biopower(Movento)240 SC@ 125+125ml/acre
- Spray gamma cyhalothrin (Proaxis) 60 CS@ 100 ml/acre.

**FOR BORERS**

- Sow resistant varieties
- Install light traps for adult moth collection
- Eradicate weeds
- Conserve and use biological control agents
- Collect infested fruits & bury them in soil
- Spray emmamectin benzoate 5WDG @ 75gm/ acre

**FOR LEAFMINER**

- Remove & bury the infested leaves
- Spray bifenthrin 10% EC @ 250-320ml/100 liters of water
- Spray lufenuron (Match) 50EC 100ml/ 100 liters of water

**FOR JASSID**

- Sow resistant varieties
- Spray nitenpyram 50WDG @ 40gm/ acre

**FOR GALLS & SCALES**

- Remove & bury the infested leaves & twigs if minor attack occurs.
- Spray bifenthrin 10% EC @ 250-320ml/100 liters of water
- Spray spirotetramate 240Sc (Movento) @125ml/200 liters of water.
- Spray priproxyfen 50% Ec&Biopower @200ml /100 liters of water

**FOR FRUIT FLY**

- Use methyl eugenol, the sex pheromone
- Use protein hydrolysate for female collection
- Conserve bio control agent *Opiuslongicaudatus*
- Collect & bury the fallen fruits



- Spread plastic sheet under plant canopy to disrupt its pupation in soil
- Spray Static spinosad ME 53% RB @ 40 gm for 8 plants in an acre (5 gm/ plant).

#### **FOR ANTHRACNOSE**

- Pruning of diseased branches of the tree
- Apply recommended fungicides with consultation of local Agriculture Department.

#### **FOR WITHER TIP**

- Prune & bury the dry twigs & branches
- Use Bordeaux mixture
- Apply 1 Kg ammonium sulphate with 10Kg well rotten farm-yard manure per tree

#### **FOR CITRUS CANKER**

- Select the Root Stock from disease-free tree
- Prune & burn the infected shoots
- During active growth season, apply copper based fungicides to all root stocks, grafted plants & other trees
- Use streptomycin sulphate 72SP @ 100gm/Acre.

#### **FOR QUICK DECLINE, DIE BACK AND GUMMOSIS DISEASE OF CITRUS AND MANGO**

- Make "DAUR" around each plant at a distance of one and half feet to obstruct direct water access to the stem.
- Avoid injuries to plants.
- Apply paste of metalaxyl + mancozeb and lime at 1:8 to the injuries and stem up to 4 feet.
- Apply recommended insecticides on mango and citrus orchards on the appearance of insect pests.
- Apply recommended fungicides on mango and citrus orchards on the appearance of disease symptoms.
- In case of high infection, repeat fungicides application after 15 days interval.

- Control insect pests by applying suitable insecticides in consultation with Field Staff of Pest Warning and Extension Wing.

#### **FOR MEALY BUG MANAGEMENT**

- Monitor its population on every host plant and adopt appropriate control measures in consultation with Pest Warning / Extension Wings of Agriculture Department.
- Add mineral oil (diver) with insecticides at recommended ratio for spray on ornamental plants, field crops and vegetables for its effective control.
- Bury infested plants and weeds carefully in soil.
- Store cotton sticks away from water channels.
- Keep field crops, vegetables, ornamental plants, orchards, field bunds and water channels free from weeds.
- Eradicate weeds at their early stage.
- Prune the shrubs and trees infested with mealy bug.
- Spray recommended insecticides at prescribed doses.

#### **ALTERNATE HOST PLANTS OF MEALY BUG**

<b>Crops</b>	<b>Vegetables</b>	<b>Ornamentals</b>	<b>Weeds</b>	<b>Orchards</b>
Sunflower	Okra	China rose	HazarDani	Citrus
Tobacco	Brinjal	Huddle	Amarantus	Mulbery
Jantar	Tomato	Cotton Rose	Bhakra	Ficus
	Chillies	Gul chain	Mako	Ber
	Pumpkin	Lantana	Sueda	
		Din Ka Raja	Itsit	
		Rat Ki Rani	Karund	
		Anthorium	Aksan	
		Gul-e-Daudi	Bathu	
		Gainda	Puth Kanda	
			Kanghi	

## **FOR WHITEFLY & CLCV**

### **MANAGEMENT OF WHITEFLY**

- Eradicate weeds acting as alternate host plants of whitefly and CLCV and dispose them off carefully.
- Motivate farmers to keep whitefly (vector of CLCV) at the lower ebb on alternate hosts.
- Avoid excessive use of nitrogen in vegetables and other crops.
- Avoid planting of CLCV susceptible ornamental plants.
- Install chrysoperla cards as biological control agent @ 8 cards/ acre. (cards are available at the labs. located in Vehari, Sahiwal&Okara districts)
- For whitefly control, apply any of the following pesticides on spring crops, vegetables and ornamental plants.
- Inoculums of CLCV prevail on various host plants throughout the year, therefore to combat the menace adopt following actions:
  - Create awareness among the farming community to control this menace on alternate hosts.
  - Eradicate weeds and other alternate host plants of CLCV.

### **Key Points**

Keep strict vigilance and scout the field crops, fodders, vegetables and orchards regularly.

**ALTERNATE HOST PLANTS OF WHITEFLY**

CROPS	VEGETABLES	ORCHARDS	WEEDS/ ORNAMENTAL	TREES
Sunflower	Okra	Citrus	Gardenia	Shisham
Tobacco	Brinjal	Litchi	Mako	Shareen
	Cucurbits	Pomegranate	Maina	
	Tomato	Ber (Zizyphus)	Karund	
	Cabbage	Guava	Lehli	
	Cauliflower	Mulberry		
	Peas	Papaya		
	Potato			
	Onion			
	Spinach			

**ALTERNATE HOST PLANTS OF CLCV**

CROPS	VEGETABLES	ORNAMENTAL	WEEDS
Sunflower	Okra	Ornamentals	Leh
Tobacco	Brinjal	Gurhal	Lehli
	Chillies	Chambeli	Mako
	Tomato		Maina
	Potato		Karund / Bathu
	Cucumber		Gardenia
			Hazardani
			Rattan jot
			Sun Kukra

**6- ETLs OF DIFFERENT INSECT PESTS & DISEASES**

Name of Crop	Insect Pest/ Disease	ETL	Name of Crop	Insect Pest/ Disease	ETL
Maize	Shoot fly	5%	Mango	Hopper	5/ Leaf (In Summer) 1/ Leaf (In Winter) 10/ Inflorescence or Twig
	Stem borer	5%		Scales	50 Scales / Leaf
	Helicoverpa	5 % Cobs		Fruit fly	10% damage
	Armyworm	On Appearance		Mealybug	On Appearance
Potato	Jassid	3/Leaf		Mango Midges	10 spots/ twig or inflorescence
	Blight	On Appearance		Gall Farming Insect	10 galls / Leaf
Tobacco	Cutworm	3% Attacked Plants		Malformation	Low-Med-High
Sunflower	Helicoverpa	1/5 Flowers		Anthraxnose	On Appearance
Vegetables	Red Pumpkin Beetle	1/ 10 Plants (at seedling stage) 1/ Plants (at crop stage)	Citrus	Citrus Psylla	6/ Leaf
	Hudda Beetle	4/ Plant		Leaf-miner	10% affected leaves
	Fruit Borer	10%on Brinjal 5% on Tomato		Fruit fly	10% affected fruits
	Diamond Back Moth	3/ Leaf		Withertip	Low-Med-High
	Helicoverpa	5% fruit infestation		Canker	Low-Med-High
	Fruit fly	3 % fruit infestation	Guava	Fruit fly	10% affected fruits (4-5 Pheromone traps/acre)
	Leaf-miner	10 % leaves infested			
	Jassid	1/Leaf on Cucurbits 2/ Leaf on Brinjal 3/ Leaf on Melons			
	Whitefly	5/Leaf on Cucurbits 2/Leaf on Chillies, Cowpeas			
	Aphid	5/Leaf			
	Powdery Mildew	Low-Med-High			
	Downy Mildew	Low-Med-High			
	Wilt	Only seed treatment			
	Root Rot	Only seed treatment			
	Collar Rot	Water must not touch the stem			
	Leaf Spot/ Blight	Spray on appearance			