



Centurion
UNIVERSITY

*Shaping Lives...
Empowering Communities...*

Domain

Smart Agriculture

Course

Management of high-value cut-flowers

Project topic

Pest-disease management of Dendrobium orchid



Centurion
UNIVERSITY

Shaping Lives...
Empowering Communities...

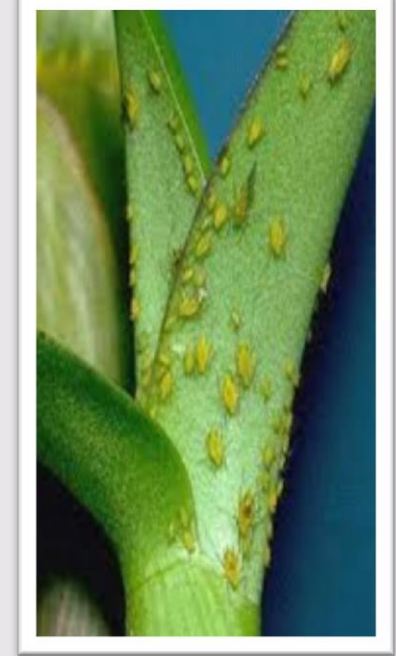
Insects



Toxoptera aurantii



Macrosiphum sp.



Aphids

Generally two types of aphid may attack.

Yellow aphid: *Macrosiphum sp.*

Pale yellowish green to bright greenish yellow coloured, measuring 2-3 mm in length, winged or wingless.

Black aphid: *Toxoptera aurantii*

2-3 mm in length, winged or wingless, form colonies on flower bud and flower. ***Damage Symptoms***

Both the aphids cause sticky leaves symptom due to secretion of honeydew and ultimately the cause deformation of shoots.

- **Chemical control**

Imidachloprid @ 0.5 ml per litre of water or

Dimethoate @ 1.5 ml/ litre of water or

Acephate @ 0.75 g per litre of water or

Thiomethoxam @ 0.5 g per litre of water.

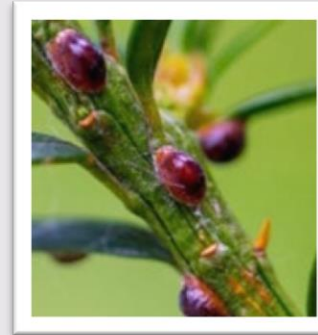
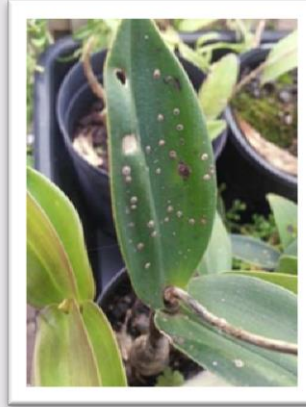
- Other than chemical management, hanging of yellow sticky trap is also beneficial.



Centurion
UNIVERSITY

Shaping Lives...
Empowering Communities...

Scale insect: *Diapsis boisduvali*



Damage Symptoms

The insect damages the plant by secretion of honeydew which leads to development of sooty mould. Further, they cause yellow spots on leaves. Moreover, drooping leaves are the common damage symptoms of the pest.

Management

- **Chemical control**

Dimethoate @ 1.5 ml/ litre of water or

Chloropyriphos @ 2.1 ml/ litre of water or

Dichlorovos @ 1.0 ml/ litre of water.

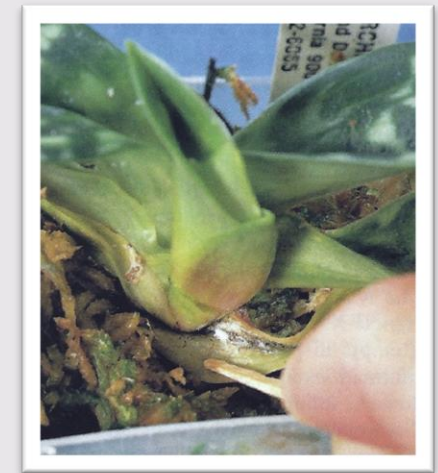
- Maintenance of sanitation and regular care is necessary to manage scale insect. Prompt pruning and burning of infested plant parts reduces further spread.
- Scales can be removed by rubbing the scurf encrustation with toothbrush or cotton swab dipped in 70% Isopropyl alcohol or methylated sprit. Manual removal of scales with fingernails or with a thin piece of wire is beneficial.



Centurion
UNIVERSITY

Shaping Lives...
Empowering Communities...

Mealy bug *Pseudococcus maritimus*



These bugs are soft, filamentous pink or yellow coloured bodies covered with white powdery waxy excretions. Their favourite positions are leaf axils, the undersides of leaves and on bulbs. Both young and adults suck the sap from leaves and petioles and secrete honey dew that attracts ants.

Damage Symptoms

Mealy bug infestations cause sooty mould on leaves and tender shoots. Attacked plant shows reduced growth and wilting.

Management

- **Chemicals**

Dimethoate @ 1.5 ml/ litre of water or

Chloropyrifos @ 2.1 ml/ litre of water or

Dichlorovos @ 1.0 ml/ litre of water. In case of severe attack, pesticides can be sprayed after 2 weeks interval.

- For control of mealy bug it is wise to concentrate on cultural management. Collection and destruction of infected plant part reduces the infestation spread of pest.



Centurion
UNIVERSITY

Shaping Lives...
Empowering Communities...

Red spider mite *Brevipalpus phoenicis* *Tenupalpus pacificus*



Adults are 0.4-0.6 mm long. Both nymphs and adults dwell on the lower surface of the leaves. Under dry and warm conditions their attack will be more severe. They feed on flowers and leaves by sucking the sap from epidermal layer.

Damage Symptoms

The injuries due to feeding can be seen as silvery, mottled leaves which turn yellow. In heavy infestation webbing appears on the leaves.

Management

- **Chemicals**

Dicofol @ 2 ml per litre of water or

Ethion @ ml per litre of water or

Dimethoate @ 1.5 ml per litre of water or

Propagite @ 1 ml per litre of water

- Collection and destruction of severely infested plant parts reduce further multiplication of mites. Proper ventilation, irrigation, maintenance of relative humidity and clean cultivation are essential to curtail the mite population.



Centurion
UNIVERSITY

Shaping Lives...
Empowering Communities...

Thrips: *Dichromothrips dendrobii*



This insect is 1-2-mm long, has two pairs of folded, black and white wings. The larvae tend to hide underneath leaves. Thrips damage the plant by sucking the sap from leaves, flower buds or flowers.

Symptoms

It creates brownish spots on crippled flowers and deformed buds, the leaves look silvery, caused by air pockets in the punctured holes, brownish marks underneath the leaves.

Management

- **Chemical**

Dimethoate @ 1.5 ml/ litre of water or
Chloropyrifos @ 2.1 ml/ litre of water or
Acephate @ 0.75 g per litre of water or
Thiomethoxam @ 0.5 g per litre of water or
Dichlorovos @ 1.0 ml/ litre of water.

- All infested plants and flowers should be removed. Hanging of blue sticky trap is beneficial to manage thrips.



Centurion
UNIVERSITY

Shaping Lives...
Empowering Communities...

Slugs and snails

Cryptaustenia verrucosa and *C. heteroconcha*



Slugs and snails often appear as night time visitors in free standing greenhouses. They are attracted by the humid warmth. They can inflict a great deal of damage with huge appetites.

Symptoms

Snails and slugs will eat plant parts like flower buds, leaves, flowers roots and pseudo bulbs and make irregular shapes.

Management

- Plant debris around the orchid pots or beds should be removed. Mechanical collection either early in the morning or in the evening is essential. Drenching the ground portion with 5% salt solution is the most effective method to control the snail population.
- Sprinkling slug baits like Metaldehyde @ 1% is an effective control measure.
- Copper flashing can be affixed to bench legs to inhibit snails and slugs from reaching bench tops from the ground.



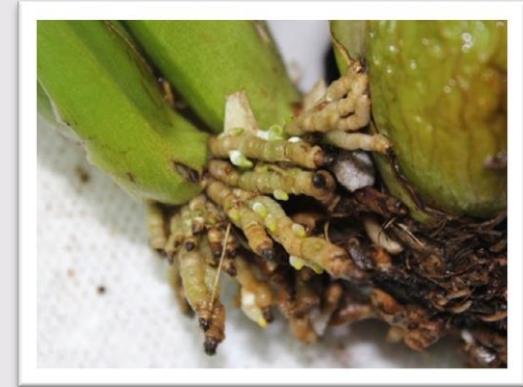
Centurion
UNIVERSITY

Shaping Lives...
Empowering Communities...

Bacterial soft rot

Erwinia carotovora pv. *Carotovora*

Erwinia chrysanthemi



It's a bacterial disease which causes a rapid collapse of stem tissues resulting in leaf loss making infected tissue very soft to touch. When the stems are cut open a pungent odour can be detected. The bacteria are readily spread by sap on hands or cutting tools and by water splash from infected to non-infected plants.

Management

Disease free planting materials should be used. Diseased plants should be removed and sanitation should be maintained. Sterilized potting mixture should be used.

Streptomycin 0.1 g per litre of water should be used for sterilizing the potting mixture and the same antibiotic can also be sprayed to affected crop.



Centurion
UNIVERSITY

Shaping Lives...
Empowering Communities...

Stem rot



Pythium ultimum

Pythium splendens

Phytophthora palmivora

Phytophthora parasitica

It's caused by some soil-borne pathogens. The symptoms of this disease are a rapid collapse and rotting of the stem, roots and leaf tissue. However, this disease starts by rotting of top growth. The disease is characterized by the presence of small yellow cream to brown spherical bodies which are embedded in a dense white fluffy mat of fungal growth.

Management

Sterilized potting media should be used for planting.

Infected plant must be separated to check the spread of the disease.

Reduction of watering is essential during the month of June to September.

Chemical Control

Metalaxyl @ 2 g/l or Copper Oxochloride @ 4 g per litre of water can be used as spray or soil drenching.

Application of contact fungicide e.g. Captan, or Mancozeb alternatively with a systemic base fungicide Metalaxyl is recommended.



Centurion
UNIVERSITY

Shaping Lives...
Empowering Communities...

Leaf spot *Cercospora sp.*



This is fungal disease and the pathogen can be found attacking orchids of all types, resulting in a range of symptoms. Large areas of the leaves turning very pale green with slightly sunken purple coloured spots, present on both upper and lower leaf surfaces. This appears to be the most common symptom. However, this disease can start as yellowish pale brown spots, turning purple black.

Management

Plants need good sanitation to avoid the incidence of the disease. Removal of diseased leaves and plants are essential. Spraying with Carbendazim @ 0.1 % at periodical interval of 2 weeks is advisable.