



Centurion
UNIVERSITY
*Shaping Lives...
Empowering Communities...*

Center for Smart Agriculture

Production management of medicinal and aromatic crops



Module 3: Nursery raising

Session 13: Cure and management of seedlings



Centurion
UNIVERSITY

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

Aloe

Pests and diseases

Major insect : Mealy bug

Major diseases : Leaf spot, Leaf rot and Anthracnose



Centurion
UNIVERSITY
*Shaping Lives...
Empowering Communities...*

Tulsi

Diseases and pests

Diseases

The plant is susceptible to powdery mildew caused by *Oidium* spp., seedling blight caused by *Rhizoctonia solani* and root-rot caused by *Rhizoctonia bataticola*.

Pests

Among the insects, the larvae of leaf-rollers sticking to the under surface of the leaves fold them backwards lengthwise



Centurion
UNIVERSITY
*Shaping Lives...
Empowering Communities...*

Periwinkle

Rhizoctonia stem and **root rot** on perennial groundcover vinca.

...

Botrytis blight stem canker on annual vinca. ...

Tomato spotted wilt virus symptoms on annual vinca.



Centurion
UNIVERSITY
Shaping Lives...
Empowering Communities...

Coleus

DISEASES

Like other crop plants *C. forskohlii* plant is susceptible to many diseases like leaf spots, leaf blight, root rot and wilt and root knot. Of these root- rot/wilt and root knot are the major diseases, affecting complete damage to tubers.

Leaf spot disease of *C. forskohlii*

Leaf spot lesions are initially brown and punctiform, becoming elliptic, subcircular to irregular and pale brown in colour. They were well delimited with a dark brown rim (up to 5 mm in diameter), distributed on the lamina, sometimes coalescing and leading to extensive necrosis and yellowing. A dematiaceous fungus (*Corynespora cassiicola*) was consistently found sporulating in the centre of the lesions. Leaf spot caused by *Botryodiplodia theobromae* has also been reported.

Blight disease of *C. forskohlii*

Blight disease is common during monsoons or during period of high humidity. Symptoms include water soaked leaf spots that increased rapidly in size becoming light tan to brown and later necrotic. Severe infection results in defoliation and death of the plants. *Rhizoctonia solani* has been reported to cause the leaf blight of *C. forskohlii* . stem blight caused *Phytophthora nicotianae* var. *nicotianae*.



Centurion
UNIVERSITY
Shaping Lives...
Empowering Communities...

Root-rot/wilt disease of *C. forskohlii*

Root rot/ wilt is the major disease of *C. forskohlii* causing heavy losses (>50%) in south India. Root rot is a disease caused by a variety of fungi/bacterium species that love standing water. Disease show various symptoms like yellowing and wilting of leaves, brown to black roots, oozing, putrefaction and decaying of roots and unhealthy plants. The disease has been reported to be caused by the following :

The fungal pathogen causing the disease is *Fusarium chlamydosporum*. The symptoms include gradual yellowing marginal necrosis and withering of leaves followed by loss in vigour and premature death. Such plants show discoloration of roots and complete decaying of tap and lateral root system. The bark of such plants is easily peeled off. Such affected plants are finally killed due to severe root and collar rots. The infected tubers show rotting and emit bad odour. *Fusarium solani* causing root-rot of *C. forskohlii*

Ralstonia solanacearum was reported to be causing vascular wilt of *C. Barbatus*. The symptoms include initially brown later on becomes black roots due to decaying, oozing and putrefaction of roots.

Root-rot caused by *Macrophomina phaseolina* has also been reported in *Coleus forskohlii*. The symptoms observed are yellowing and drooping of the leaves, blackening of the stem, rotting of the roots and basal stem and peeling of stem bark and root epidermis. The presence of black sclerotia is observed on the rotted portion



Centurion
UNIVERSITY
*Shaping Lives...
Empowering Communities...*

Root knot disease of *C. forskohlii*

The disease is caused by microscopic, parasitic, soil-inhabiting nematodes also known as eelworms, belonging to the genus *Meloidogyne*. These nematodes burrow into the soft tissues of root tips and young roots and cause nearby root cells to divide and enlarge. Four different types of *Meloidogyne* species are common: *M. javanica*, *M. incognita*, *M. hapla* and *M. arenaria*.

Affected crops may show slow/stunted growth, yellowing of leaves, wilting of the plant despite adequate soil water content and finally leading to collapse of individual plants.



Centurion
UNIVERSITY

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

Citronella

Pests and Diseases

Pests:

Termites, mites and thrips are minor pests occurring in the crop.

Diseases:

Leaf blight caused by *Curvularia* sp can be controlled by spraying Mancozeb at intervals of 10-15 days. Sheath rot disease caused by *Rhizoctonia solani*



Centurion
UNIVERSITY

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

Lemon Grass

Pests and diseases

Pest infestation is very low for this crop. Several diseases are reported on lemon grass, but none are serious enough to cause major reduction in oil yield.



Centurion
UNIVERSITY
*Shaping Lives...
Empowering Communities...*

Vetiver

Pests and diseases

Pests

There are no serious insect pests except for the ants attack the roots.

Diseases

Very few diseases have been reported on vetiver. During the rainy season the plant is attacked by *Fusarium* spp.



Centurion
UNIVERSITY

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

Rose

Pests and diseases

Pests

Rose plantations are attacked by a number of pests, among which the following are the important ones.

Aphids (*Macrosiphum rosae*): Aphids attack the plants during the flowering period.

Caterpillars: The caterpillars of *Operophtera frumata*, *Malacosoma Neustria*, *Orgyia antique* and *Archips podana* attack the foliage during the summer and the rainy seasons.



Centurion
UNIVERSITY
*Shaping Lives...
Empowering Communities...*

Rose

Pests and diseases

Pests

Red Spider Mites (Tetranychus spp.): Heavy infestation results in the leaves becoming bronzed and falling prematurely.

Rose Thrips (Thrips fuscipennis): Thrips attack is common during the flowering period. Heavy infestation causes a significant loss to the flower-yield.

Caspid Bugs (Lygocoris pubulinus): These pale-green insects suck the sap from the shoot-tips mainly from young flower-buds, causing the flower petals to develop small holes.



Centurion
UNIVERSITY
*Shaping Lives...
Empowering Communities...*

Rose

Pests and diseases

Pests

Rose plantations are attacked by a number of pests, among which the following are the important ones.

Aphids (*Macrosiphum rosae*): Aphids attack the plants during the flowering period.

Caterpillars: The caterpillars of *Operophtera frumata*, *Malacosoma Neustria*, *Orgyia antique* and *Archips podana* attack the foliage during the summer and the rainy seasons.



Centurion
UNIVERSITY
*Shaping Lives...
Empowering Communities...*

Rose

Pests and diseases

Pests

Brown and Scurfy Rose Scale (*Aulacapis rosae*): The scales occur on the stems and suck the sap from the stems, resulting in the drying up of the shoot. The incidence is more during the rainy/autumn season. For control of this insect, foliar sprays of Monocrotophos (0.15%) or Carbaryl (0.3%) is recommended.

Diseases

Black Spot (*Diplocarpon rosae*): The fungus causes black spots on the leaves, due to which the leaves will abscise. Fungicidal sprays with Captan (0.2%) or Mancozeb (0.3%) have been recommended for the control of rust.



Centurion
UNIVERSITY
*Shaping Lives...
Empowering Communities...*

Rose

Pests and diseases

Pests

Powdery Mildew (*Sphaerotheca pannosa*): Small, white, powdery pustules of fungus appear on the leaves, stems and occasionally on the flowers. Dinocap (0.1 to 0.15%) or wettable sulphur (0.4%) should be sprayed at 15 days interval for the control of this disease.

Downy Mildew (*Peronospora sparsa*): Small reddish-purple areas appear on the youngest leaves resulting in leaf distortion. Repeated sprays of Mancozeb (0.2%) or Captafal (0.3%) or Copper Oxychloride (0.3%) should be employed for effective control.



Centurion
UNIVERSITY

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

Rose

Pests and diseases

Pests

Viral Diseases: Rose mosaic is the most common virus disease. Control measure should be followed to kill the various virus vectors.

Rose Rust (*Phragmidium subcorticium*): The disease attacks the leaves, flowers and shoots and causes leaf-fall and abscission of buds. The most important control is to bury the fallen leaves under heaps of soil around the rose bush. The winter rust spores perish due to the development of antagonistic micro-organisms.



Centurion
UNIVERSITY

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

Thank You