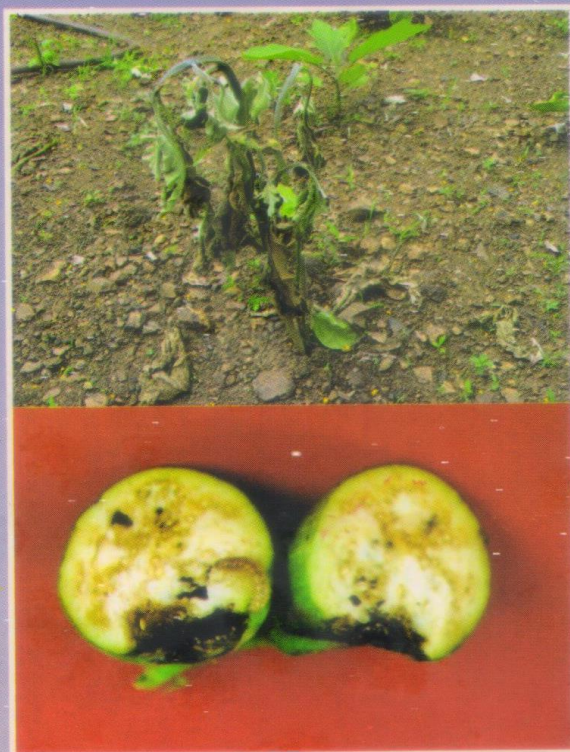


PEST AND DISEASES OF BRINJAL IN ANDAMAN & NICOBAR ISLANDS AND THEIR MANAGEMENT



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PESTS

Fruit and shoot borer (FSB): *Leucinodes orbonalis*

The pest attacks brinjal crop from nursery stage onwards. Initially it attacks shoots and later on with the onset of flowering it shifts to fruits. The bored shoots droop and boreholes are plugged with excreta.



Shoot infection

The larvae bore into the

fruits and feeds internally on the tissues and causes crop loss up to 90 % in unprotected conditions. The adult of FSB is whitish coloured moth measuring 1.5 cm and it lays eggs on



Fruit infection

shoots and fruits. Larvae are pinkish in colour, active throughout the year, but more during monsoon period. The larvae pupate on the fruits, inside soil and in crop debris.

Management

- Ploughing of soils in summer helps in exposing the pupa of pest to natural enemies like birds
- Plant tolerant varieties like DPL-B5, Arka Keshav, BB-93C and BB-45 C of brinjal, they are found tolerant to fruit and shoot borer and bacterial wilt as well
- The drooped infested shoots are to be pruned weekly with sharp razor below the point of borer attack to exclude the

pest. The bored fruits, shoots are to be destroyed by deep burial or burning and this alone saves the crop to the tune of 67 % from pest. The crop residues are to be burnt after uprooting to avoid carryover of pest in succeeding crop



Shoot Clipping

- Pheromone lure traps are to be deployed @ 1 trap/ 100 m² to trap the male moths. Each trap lasts for 15-20 days in these Islands. The trap has to be deployed at canopy height, raising it up as the crop grows
- Release *Trichogramma* egg parasitoid @ 50,000/ acre to parasitize the eggs of fruit and shoot borer

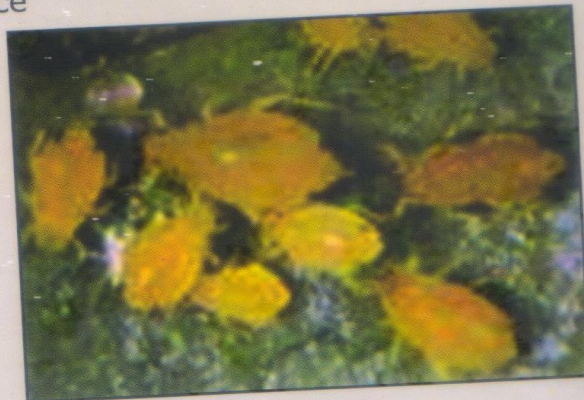


Pheromone trap

- Intercropping with maize, sowa and *Hibiscus subdariffa* reduces pest incidence
- In home garden sprinkling of ash over plant reduce pest incidence

Aphids: *Aphis gossypii*

Aphids are small, soft and yellowish green or greenish brown in



Aphid adult

colour. They are found in colonies on the under surface of the leaves. They feed on leaves and stem by sucking the plant sap. Black sooty mold develops on the sugary secretion of the aphid, covering the plants and reducing photosynthesis. As a result infested plant becomes weak. This pest occurs in all stages of crop.

Management

- These aphids are readily fed upon by syrphids and coccinellids. To encourage natural enemies marigold can be planted randomly in the field to provide shelter for natural enemies
- In severe infestation (>10 % damage) systemic insecticide like Dimethoate can be sprayed @ 1.5 ml/ lt of water
- Avoid application of excessive nitrogen
- Generally after heavy showers the incidence of this pest gets diminished

Leaf hopper: *Amrasca biguttula biguttula*

This is sucking pest colonizing the under surface of leaf. The green colour nymphs and adult suck the plant sap leading to cupping of the leaf. In severe infestation due to phytotoxemia hopper burn symptoms can be seen on leaf edges. The leaf becomes mottled, crinkled due to severe infection reducing the photosynthetic area.

DISEASES

1. Bacterial wilt : *Ralstonia solanacearum*

The characteristic symptoms of this disease are wilting, stunting without yellowing of the foliage and finally collapse of the entire plant. The lower leaves may droop first before wilting occurs. The vascular system turns brown and if a segment of the lower stem is cut and squeezed it yields bacterial ooze. In many cases, when nematode infection is also present, the stem at

the base becomes dark brown and constricted, leading to toppling down of the plant. During a continued humid weather when the temperature is also high the most conspicuous symptom seen in tomato is sudden drooping of the leaves without yellowing and rotting of the stem from any point. The roots appear healthy and often well developed however the brown discolouration will be present inside.



Wilted plant



Hairy root in Nematode infected plant

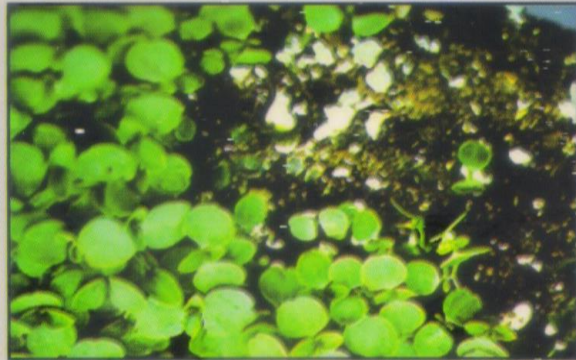
Management

- Always transplant disease free and healthy seedling
- Follow at least three year crop rotation in infested fields with non-host cereals and crucifers
- Always use resistant /tolerant varieties like BB93-C, DPL-B-5, Arka Nidhi and Arka Keshav
- Application of lime during the preparation of the field @ 5-10 kg/ha reduces disease incidence
- Apply neem cake during nursery preparation @ 10-15gms/plant
- Drenching soil with antibiotic Streptocycline solution (200ppm)

- Application of *Pseudomonas fluorescence* as seed priming @10 g/kg seed, seedling dips in the suspension @ 1% for 30-60 minutes before transplanting and soil application @ 2.5kg/ha with same antagonist will also keep this disease under check
- Dip the roots into Rogar 30 EC (1ml/lit) for 3 hours to prevent nematode infection

2. Damping off: *Pythium* spp.

In pre-emergence damping off the young seedlings are killed before they emerge through the soil surface. In case of post-emergence damping off phase the mortality of seedlings is generally very conspicuous. This phase of the disease is characterized by the toppling over of infected seedlings any time after they emerge from the soil until the stem has hardened sufficiently to resist invasion by the pathogen. Infection usually occurs at the ground level or through roots. The infected tissue appears soft and water-soaked. As the disease advances the stem becomes constricted at the base and plants collapse. Seedlings that are healthy looking one day may be collapsed by the next morning.



Damping off in nursery



Root Infection

Management

- Nursery bed should be raised (15-30 cm) from the normal level for better drainage
- Soil disinfection by the transparent polythene in hot sunny days is the most effective approaches for the management of soil borne diseases in nursery beds
- Biological seed treatment with *Pseudomonas* or *Trichoderma* as priming on seeds, soaking of the seeds, seedling dip and dry powder treatment depending on the formulation of bio-control agents
- Soil application of *Trichoderma* / *Pseudomonas fluorescence* @ 2.5kg/ha along with 100gm neem cake/m² is very effective for damping off and root rot disease
- Seed treatment with Carbendazim @ 0.25 % should be preferred over Captan considering the internal seed borne inoculum and nature of pathogens
- After emergence of the seedlings, spray Copper oxychloride followed by thorough spray of Streptocycline @150 ppm

Phomopsis Blight and Fruit rot : *Phomopsis vexans*

The disease is present in one or other form in the seedling stage of the plant to its maturity. In the seedbeds, it appears as damping off after transplanting the leaves coming in contact with soil may get infected and show clearly defined, circular grey to brown spots with lighter colored center. The old spots show numerous black pycnidia. The affected leaves turn yellow and die. Sometimes petioles and stems are attacked and show cankers. The lesions on the stem are dark brown becoming grey in the center as the black

pycnidia develop. Mostly the stem base is attacked and is characterized by construction of the base of a grey dry rot. The skin peels off and the inner tissues are exposed. In strong wind, such plants topple down due to breaking of the main stem.

The fruit is attacked while on the plant, pale, sunken spots develop on the fruit and may progress to cover the entire fruit surface. These spots are also marked by the presence of many black pycnidia. The internal portion of the fruit rots, if the fungus enters the fruit through the calyx, the whole fruit is mummified due to dry rot.

Management

- Healthy seed should be collected from disease free fruits and the crop should be maintained disease free by spraying fungicides
- Removal and destruction of infected crop, practicing crop rotation and summer ploughing help in reducing the initial inoculum thereby delaying the outset of the disease
- The seed can also be treated in hot water at 50°C for 30 minute to remove infection
- Field sanitation by plucking the lower infected leaves and burning of infected crop debris
- Seed treatment with *Trichoderma* @10 g/kg seed and soil drenching with *Trichoderma harzianum* 1 % at 15-20 days after transplanting and repeat it at 20-25 days interval