



Coconut Bud Rot Disease Management in Coastal Region of Maharashtra

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In Maharashtra State, there was a heavy incidence of bud rot disease on the coconut palms due to heavy rains in July to September, along with gusty winds and intermittent exposure, changes in the environment, i.e., increased humidity and decreased temperature, the shoots or spindle of the coconut palms are bent and broken and the wounds are showing the infection of bud rot disease. Coconut palms are more likely to die if not treated on time. This disease is caused by the fungus *Phytophthora palmivora*. In India in 1906 Butler scientist has recorded bud rot disease of coconut. This disease is mostly found on the west and east coast of India. The disease incidence was reported 0.1 to 6.5 per cent in Kerala (west coast of India) and 0.4 to 6 per cent in Tamil Nadu (east coast of India). A loss of 7 per cent has been recorded. This disease spreads from the nursery plant to the matured palms. But young or juvenile palms (up to 20 years) are more susceptible to this disease.

Infectious diseases – Juvenile palms

The trunk of the plant along with the coconut boll is buried in the ground while planting the seedlings, the fine particles of the soil accompanied by fungal particles along with the water pass through the leaf axils in the shoots of the plants. Wind causes the movement of the spindle. As a result, the soil particles are rubbed against the spindle of the seedlings. This causes injuries to the spindle or shoots and fungal particles enter through these wounds, the fungus grows and the shoots begin to rot.

Disease infestation – Matured palms

During the rainy season, when the heavy wind blows, the upper part of the coconut spindle moves with the wind. The lower part of the needle does not move as much. The part between these two portions often cracks in such cases. Rain water enters through this cracked area. *Phytophthora* is a fungus that lies dormant in this part of the coconut. Since monsoon weather favors this fungus, the fungus grows rapidly in these cracked areas and starts the process of decay. Gradually, the rotting action of the fungus spreads to the shoot and the bud rots.

Symptoms of the disease

All ages palms are susceptible to this disease. Bud rot disease is mostly found in palms under the age of 20 years while the death rate of trees due to this disease is more common in the age group of 15-20 years. Symptoms begin on the central stem (spindle) of the plant. If this disease has occurred, the young plant's newly budding leaves appear pale. If such a leaf is folded gently on the outer side, the leaf appears to be soft. The tissue inside the spindle or shoot leaves rots and emits a foul odor. As the stem side of the shoot is dead, the central shoot or spindle is easily removed with a slight pull. In advanced stages of infection, more leaves are infected. If the disease has reached the next stage, such a leaf will come off if you pull it with a light hand. The stem of this leaf smells like chicken droppings. If this disease

occurs in large palms, the newly emerged leaf (spindle) withers and falls off. Later it starts to look yellowish. If the disease is more severe, this spindle breaks.

Reasons

If the air humidity is above 94 per cent and the temperature is 25 degrees centigrade. If it is less than that the growth of this disease is fast. Rainfall in Konkan from June to September increases with the humidity level (98 - 100%) in the air and this environment is conducive to the growth of this fungus. Also, in the garden where waterlogging or waterlogged places are more likely to cause this disease. Similarly, the incidence of this disease is more in hilly valleys.

Disease cycle

The fungus persists as chlamydo-spores and oospores in infected tissue as dormant mycelium and in crop residues in the soil. The disease is mainly spread by airborne sporangia. Rain also helps spread the disease. Insects (ants and others) and tappers also help spread inoculum from diseased plants.

Management

a Juvenile palms

- 1) When planting a new coconut plant, only the coconut boll should be planted in the ground.
- 2) To prevent the plant from moving due to wind, two sticks of the height of the plant should be fixed at a distance of 45 cm on the south and north sides and the third stick should be tied horizontally on both the sticks on the east side of the plant.
- 3) Riverside plants are sometimes submerged in flood water. Therefore, after the flood water recedes, the shoots of the plants should be washed by spraying water with the help of a pump and the sediment from the leaf blades should be cleaned and 1 per cent Bordeaux mixture should be sprayed on it.
- 4) At the time of exposure, 1 per cent bordeaux mixture or copper oxychloride @ 2.5 grams per liter of water should be pour in all the palms crown. When spraying, fungicide should spray in such a way that it reaches the underside of the spindle. The second spray should be done after of 12 to 15 days after first spray.

b) Matured palms:

In the months of July to September, the palms in the garden should be inspected. If there are symptoms of this disease, the spindle part should be cut near the rotten stem. Remove the entire rotten part and wipe the rest of the wound with a cloth, then pour bordeaux paste or copper oxy chloride @ 2.5 grams per liter of water and wrap the part with a plastic cloth so that it does not get washed away by rain water. Often after the shoots die off, the lower shoots or stems remain green for many months. So, the tree seems to be alive. But such a palm should be cut and destroyed before monsoon. Otherwise, during the rainy season, fungus grow in those rotten shoots and they spread in the garden, so it is necessary to cut down or destroy the tree. If bud rot disease is always found in the garden, it is necessary to plan remedial measures at the beginning of monsoon to avoid the disease. For this, 1 per cent bordeaux mixture or copper oxychloride @ 2.5 grams per liter of water should be sprayed. But dwarf varieties of coconut especially Chaughat Orange Dwarf and Malayan Yellow Dwarf are more sensitive to copper. Therefore, due to the spraying of bordeaux mixture, brown spots appear on the coconut and later the fruit drops. Therefore, to avoid disease on these varieties, at the beginning of rains, the fungicide like Mancozeb should be taken @ 5 gm in perforated plastic bags and two such bags should be tied to the fronds near the coconut spindle. Also, if the disease has occurred in the dwarf variety of coconut, mix fungicide Mancozeb 5g/300ml of water and pour it into the shoot or spindle and covered with plastic cloth to prevent rainwater. Also, in biological management of *Trichoderma viride* @ 5 grams

of talc formulation per liter of water should be infused into spindle or shoots. In addition to this, 50 g each of talc formulation of *Bacillus subtilis* and *Trichoderma viride* per 10 kg of farm yard manure should be applied once at an interval of 6 months to prevent spread of this disease through the soil.





Palm after treatment

Infection of bud rot disease

Palm after treatment