



Major Diseases of Coconut in Eastern Region of India and Their Management

* P. N. Meena¹, A. N. Tripathi¹, B. S. Gotyal¹, V. Ramesh Babu¹, K. Selvaraj¹ and S. Satpathy²

¹Scientist, ² Principal scientist, Crop Protection Division, Central Research Institute for Jute and Allied Fibres, Barrackpore, Kolkata, -700120, West Bengal, India

*Email of corresponding author: pnsheera@yahoo.co.in

The coconut palm (*Cocosnucifera Linn.*) is the most useful palm in the India. In northern region of West Bengal the major devastating diseases prevalent on coconut are *leaf rot*, *fruit rot*, and *bud rot diseases*. Due to seed borne, soil borne as well as air borne nature of these fungal diseases, the plants are infected from seedling to older stage and causes immense losses in fruit yield of coconut. Cleaning of crown, appropriate spacing of palms in orchard, adequate drainage facilities, use of botanical pesticides and application of effective less pathogen resistant fungicidal spray effectively control the diseases.

Introduction

The coconut palm (*Cocosnucifera Linn.*) is the most useful palm in the world. Every part of the tree is useful to human life for some purpose or the other. Hence, the coconut palm is endearingly called 'kalpavriksha' meaning the tree of heaven. It provides nutritious food, oil for edible and non-edible uses, fibre for commercial purpose and shell for fuel and making of coir in industrial uses. Coconut is cultivated in 18 states and 3 Union Territories in India. Almost 90% of total area under coconut cultivation and 93% of total production falls within four southern states of Andhra Pradesh, Karnataka, Kerala and Tamil Nadu. There are other traditional states where more area can be brought under coconut cultivation; especially states like West Bengal, Goa, Maharashtra and Gujarat having good agro climatic conditions and coastal line offer good potential. Coconut is mainly confined to tropical climate mostly between 20°N 20°S latitudes and requires an average rainfall of about 2000 mm per year which is ideal for their proper growth and maximum production. It is growing with different cropping combination in rural area where it provides extra remuneration to farmers. The coconut palm exerts a profound influence on the rural economy of many states where it is grown extensively besides providing livelihood to million people. In the present scenario of climatic change this valuable plant is devastated by several fungal, bacterial, viral, viroids and phytoplasmal diseases that not only deteriorate the quality of fruits but also reduced the vigour and yield of palms. In northern region of West Bengal the major devastating diseases prevalent on coconut are *leaf rot*, *fruit rot*, and *bud rot diseases*. Due to seed borne, soil borne as well as air borne nature of these fungal diseases the plants are infected from seedling to older stage and farmers of this region are suffering from immense losses

in fruit yield of coconut. Hence, it is customary for the farmers to have cognizance that how to timely manage these setback diseases, for the farmers' income to attain acme.

a) Fruit rot: It is caused by *Phytophthora omnivorum*. This disease is observed frequently on fruit part of palms in every country where coconut is grown. Its severe incidence causes considerable loss in yield.

Symptoms: Deep rotting and frequently fall down of affected immature nuts are the primary symptom of the disease. In infected plants discolored area is developed near the stalks then a small water-soaked and darker green area spread on rest of the surface of the nut and completely cover it. After the lesions turn brownish in colour and develop depressions due to the decay of the underlying tissues. Whitish matty growth of fungus appear on the infected surface of nuts. The rot extends into the husk and often even into the endosperm cavity if the shell has not hardened. When infection is severe the axis of the inflorescence gets affected and shedding of female flowers occurs.

Etiology: This disease is soil borne in nature and prone to attack in rainy season when the atmospheric conditions are favorable for its growth. The infection takes place on every tender tissues of palm in the presence of moisture and in humid atmosphere. The pathogen penetrates in fruit through the mesocarp and ramifies in that region which results of shedding of immature nuts. The pathogen also survives in the fruit stalk during the dry weather.

Control measures:

- ❖ Regular cultural and manurial practices in every weak maintain the palms in normal vigour.
- ❖ Spray of Bordeaux mixture @ 1% or copper oxychloride preparation @0.5% on the crown of palms, once before the monsoon and twice later on at intervals of 40 days found to be more effective for managing the disease.
- ❖ The affected crown of palms should be given a thorough cleaning and infected shaded nuts should be collected and burnt them.
- ❖ Prophylactic spray of the fungicide protect the healthy neighboring palms.

b) Leaf rot: It is caused by *Bipolaris halodes*. This disease mostly confined to northern and southern part of West Bengal where coconut palms are grown.

Symptoms: The symptoms of the disease are manifested by appearance of blackened and shriveled distal ends of the leaflets in the central spindle coupled with few of the younger leaves. Later the affected portion of leaves gives a fan-like appearance. Each new leaf of the diseased tree gets infected and all the leaves of the tree show disease symptoms. The reduction in leaf surface adversely affects the yield.

Control measures:

- ❖ Prepare fungicide solution of Hexaconazol@ 1% (3g in 300ml water) and pour to near the base of spindle leaf.
- or
- ❖ 250g neem cake powder formulation mixed with equal proportion of sand and spread around the base of the palms.
- or

❖ Spraying with Bordeaux mixture @ 1% or copper oxychloride@ 0.5% formulations on leaves in January, April-May and September months.

or

❖ Removing the rotten portions from the spear and the two adjacent leaves

c) Bud Rot: It is caused by *Phytophthora palmivora*. Younger coconut palms are more prone and susceptible to this disease particularly during monsoon season when the temperature is low and humidity is very high. Yellowing of one or two younger leaves and appearance of black spots on spindle leaves are earlier symptom of disease. Later on basal tissues of the leaf gets rotted quickly and can be easily separated from the crown. Infection spreads to the older leaves all the spots are irregular and give water soaked symptoms. The tender leaf base and soft tissues get rotted emitting a foul smell. The rotting slowly and gradually progresses downwards, finally affecting the meristem tissue and killing the palms. This is accompanied by drooping of successive leaves. While, nuts that are retained on the palm may grow to maturity. This fungus perpetuates on the host debris and becomes active and infecting the tender host tissue during favorable climatic conditions.

Control measures

❖ Removal of the affected tissue portion of the crown region and drenching with copper oxychloride@0.25%.

or

❖ Dissolve 100 gm of copper sulphate and 100 gm of quick lime each in 500ml water separately and mix to form 1 liter of Bordeaux paste and apply on to the infected portion which protects shoot emergence of palms.

or

❖ Provision of proper spacing between the palms and adequate drainage facilities is a pre-requisite condition for effective management of bud rot disease in coconut orchards.

Conclusion

Fungal diseases cause maximum losses in coconut fruits yield. Various strategies including cleaning of crown, appropriate spacing of palms in orchard, adequate drainage facilities, use of botanical pesticides and application of effective less pathogen resistant fungicidal spray reduces these setback diseases.