



# Management of Coconut Gardens in Flood Affected Areas

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## Introduction

Agriculture sector in Kerala state has been badly hit by the recently occurred flood and huge crop loss has been reported. The preliminary assessment of loss by the State Department of Agriculture has indicated an economic loss of more than Rupees 5600 crores due to the damage of crops in about four lakh farm holdings covering about 146000 ha. Coconut also suffered loss due to the heavy rain and flood situation prevailed in the state. The preliminary assessment report indicated that about 12 lakh coconut trees were damaged in about 7000 ha of area causing an economic loss of about 63 crores of rupees. Concerted efforts are being made for the revival of agriculture sector in the state and farmers need all support for the same. The need of the hour is to enable farmers to adopt appropriate crop

management practices in the post flood scenario to protect the crops and to avoid further loss. Effective strategies are to be formulated for implementing suitable location specific interventions for promoting adoption of scientific practices for improving soil and crop health.

## Nature of damage

In many localities, especially in the sloppy terrains, the fertile top soil has been washed off from coconut gardens due to the heavy rain resulting in extensive leaching of nutrients which would adversely affect crop health. Landslides occurred in some localities in the hilly areas caused widespread destruction of farm land and coconut gardens have been wiped out. Incidence of fungal diseases like bud rot and nut fall got flared up due to the continuous heavy

rainfall. Coconut gardens remained waterlogged for a long period in many localities due to the heavy rain and flood and coconut palms have shown yellowing of leaves since the feeder roots were affected resulting in restricted or impaired nutrient uptake. In such waterlogged areas the physical, chemical and biological properties of soil in the coconut gardens have been adversely affected. Intercrops such as pepper, nutmeg and cocoa are also damaged to the heavy rain and water logging. Nutmeg trees and pepper vines have dried in many places mostly because of the damage to roots and subsequent fungal infection. In cocoa crop loss due to fungal diseases viz., black pod disease and die back disease have been observed in many localities across the state. Arecanut palms grown as mixed crop along with coconut also suffered crop loss due to the incidence of fungal disease; fruit rot disease and nut fall due to the heavy rainfall and water logging condition in the garden. Farmers could not adopt timely spraying of fungicides due to the continuous rain. Similarly crops like banana, cassava, elephant foot yam, etc intercropped in coconut gardens also were damaged due to flood. In many localities, large scale deposition of silt has occurred in coconut gardens. Coconut gardens located adjacent to river bed are deposited mostly with sand and in far off places with silt and clay particles. Gardens deposited with sand may show decreased soil fertility whereas in other orchards where silt and clay are deposited can increase soil fertility and thus crop productivity. However, it is also necessary to analyse whether heavy metal toxicity is caused to palms due to the silting through flood water from contaminated rivers. After flood water recede from the field the silt and clay deposits form into a hard pan on soil surface adversely affecting the structure of the soil. Aeration in the soil and movement of water into and out of the soil are adversely affected by the formation of hard pan.

### Crop management practices

The following measures are suggested to improve the soil/crop health in coconut gardens:

#### ► *Field/crop sanitation*

- Sanitation drive has to be taken up to clear fallen coconut trees and completely damaged and dried up inter/mixed crops and other accumulated biomass to prevent insect pest breeding and fungal spore multiplication in the garden
- Remove the fallen and fungal infected immature

nuts in coconut garden and spray the bunches with 1% Bordeaux mixture.

#### ► *Crop health management*

- In the bud rot affected coconut palms, remove the infected tissues of the spindle completely. Two or three healthy leaves adjacent to the spindle may have to be removed, if necessary, for easy removal of all rotten portions and thorough cleaning. After removing the affected tissues apply 10% Bordeaux paste and cover the wound with a polythene sheet to prevent entry of rain water. The protective covering has to be retained till normal shoot emerges. Destroy the infected tissues removed by burning or deep burying in the soil and spray 1% Bordeaux mixture to the surrounding palms.

#### ► *Soil health management*

Wherever top soil loss have taken place in coconut gardens due to flooding/washing off soil, addition of organic manures and application of nutrients must be carried out.

- Compost/FYM/green leaves @ 50 kg/palm may be applied
- 1 kg Mureate of potash may be applied per palm
- Application of 500g common salt/palm also will be beneficial

Improving aeration in the soil

Wherever compaction has occurred due to prolonged water stagnation and silt deposition

- Liming for loosening of the soil have to be undertaken. 1 kg lime and 500 g Magnesium sulphate or 1 kg dolomite must be applied in the basin.
- Apply 5 kg neem cake enriched with Trichoderma in the basins of coconut palms.

Drainage

- Importance must be given to provide adequate drainage in coconut gardens where water stagnation has taken place.

#### ► *Stabilisation of land slide sites*

Wherever complete land mass have been destroyed and crops including coconut have been washed off due to landslide interventions for stabilisation of the area have to be undertaken including the following:

- Maintain the naturally formed water course after the land slide
- Convert the steep bed slope into a series of near level slope by making check dams using boulders

available nearby

- Convert the water course to a vegetative waterway; by seeding with close, fast growing grass species to check further erosion in the erosion prone area within the land mass subjected to land slide
- Wherever possible retaining wall for side protection ; coir geotextiles ideal for immediate protection.



## Management of inter/mixed crops

### ▶ *Pepper:*

- Provide adequate drainage in the field.
- Drench Potassium Phosphate 0.3 % or Copper oxy chloride 0.2% at the base of the vine
- Spray Bordeaux mixture 1% on the foliage as a protective measure
- In cases where feeder root damage is suspected, foliar nutrition may be attempted by spraying foliar application of 1 Per cent solution of 19:19:19

### ▶ *Nutmeg and clove:*

- Provide proper drainage facility in the field
- Ensure field sanitation by removing dead and decaying branches and other debris from the field
- In trees with severe leaf fall and or drying cut and remove the completely affected branches and apply Bordeaux paste
- Spray 1% Bordeaux mixture on the foliage
- Drench the tree basin with Copper oxy chloride 0.2 per cent
- Observe the tree trunk and branches for symptoms of shot hole borer infestation and apply insecticides if necessary to control the pest

Cocoa

- Remove completely dried and damaged trees
- Collect and destroy fallen and black pod disease affected pods
- Cut and remove dried-up branches affected by die-back disease and apply 10% Bordeaux paste for wound dressing and spray the treated trees and remaining healthy plants with 1% Bordeaux mixture
- Drench the tree basin with 1% Bordeaux mixture

### ▶ *Arecanut*

- Collect and destroy the fallen nuts, dried bunches

and inflorescences affected by fungal infection

- Spray 1% Bordeaux mixture to the bunches
- Provide proper drainage facility in the field

## Soil analysis

A detailed soil analysis for physical, chemical and biological properties must be carried out and suitable soil health improvement interventions must be worked out.

### *Quantification/characterization of crop loss*

Efforts should be made for proper quantification/characterization of crop loss and to implement schemes to provide compensation for the farmers accordingly and also schemes to facilitate adoption of technological interventions to solve the field problems and revive coconut farming in flood affected areas.

### *Location specific interventions and community action*

Location specific interventions for soil/plant health in coconut gardens in the flood affected areas must be implemented with the active involvement of farming community. FPOs in coconut sector including the three-tier system of Coconut Producer Society-Coconut Producer Federation-Coconut Producer Company facilitated by Coconut Development Board (CDB) and FPOs promoted by State Department of Agriculture under the ongoing 'Keragramam' project can play a significant role in mobilising coconut farmers for community action to implement interventions related to crop management practices in flood affected areas with the support of LSGs through decentralised planning and development agencies like CDB and Department of Agriculture through their schemes implemented for coconut development. ■