

# Integrated management of Ganoderma wilt / Thanjavur wilt - Need for farmer participatory intervention

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Ganoderma wilt affecting coconut was first observed in Thanjavur district of Tamil Nadu during 1952 and hence termed as Thanjavur wilt. In Karnataka, it is known by the popular Kannada name 'Anabe roga'. The disease is mainly prevalent in lighter soils in the coastal districts than in heavy soils. Recent studies and reports indicate that Thanjavur wilt disease is prevalent in some localities in Kerala state also.

## Symptoms

- Yellowing of the leaves of lowest leaf whorl, decay and death of fine roots.
- Later, bleeding patches appear at the base of the stem near the ground level, roots decay extensively and there is no new bunch production.
- As the disease advances leaves droop in the outer whorl followed by heavy button shedding and barren nuts.
- Ultimately, all the leaves droop and fall off leaving the decapitated stem with the formation of fruiting body near the base of palm.

## Etiology

Ganoderma disease of coconut is caused by two Ganoderma species, *G. Applanatum* (pers.) Pat., and *G. lucidum* (leys) Karst. These were isolated from roots of infected palms irrespective of the extent of bleeding symptom. The pathogenicity of *G. lucidum* has been established by inoculating the fungus in the trunk region. Ganoderma wilt disease is prevalent in sandy or sandy loam soils in coastal areas where coconut is grown under rainfed conditions and also in neglected plantations. Lack of soil moisture during summer months, water logging in rainy seasons, presence of old infections in the gardens and neglect of cultural operations were found to be conducive to the spread of the disease. The disease incidence was more between March and August. Trunk infestation with the scolytid beetle, *Xyleborus perforans* and the weevil, *Diocalandra stigmaticollis* accelerate the death of the palm.



Drying and drooping of lower leaves



Bleeding patches at basal portion



Fruiting body at basal portion

### Disease Management

- Removal of dead palms, palms in advanced stages of the disease and destruction of the bole and root bits of these palms.
- Soil test based application of fertilizers and soil amendments
- Regular basin irrigation during summer months. In water scarce areas drip irrigation may be adopted.
- Mulching for moisture conservation with coir dust, coconut husks, green leaves, dried leaves, organic wastes or dried coconut leaves. Mulching should be done before the end of north east monsoon and before the top soil dries up.
- Isolation of diseased palms from healthy palms by digging isolation trenches of 1 m deep and 60 cm wide.
- Avoid flood irrigation or ploughing in infected gardens to prevent spread of the inoculum.
- Raising banana as intercrop wherever irrigation is possible since root exudates of banana has the property to suppress the fungal pathogen causing Thanjavur wilt disease.
- Soil application of *Trichoderma harzianum* (CPTD 28) enriched neem cake @ 5 kg/palm at quarterly intervals up to one year, irrigate the palms once in a week followed by mulching around the palm basin.

or

Root feeding of *Hexaconazole* @ 2% (100 ml solution per palm) at quarterly intervals and soil drenching @ 0.2% of *Hexaconazole* (40 l solution per palm) or with 40 L of 1 per cent Bordeaux mixture.

#### Method of mass production of *Trichoderma* in neem cake

- Salt free neem cake to be powdered to about 1 to 2 cm size and mix by sprinkling the water and moisture level should be maintained to 50%.
- Inoculate with *Trichoderma harzianum* talc powder at the rate of 1Kg per 100Kg of neem cake and cover with wet gunny bag.
- Incubate for seven days with the intermittent mixing once in two days and maintain the moisture level up to 50%.

#### Field level scenario and suggestions for adoption of IDM strategies

Recent studies and reports indicate that Thanjavur wilt disease is prevalent in some localities in Kerala state also. In a study conducted recently by ICAR-CPCRI in Kasaragod district, the incidence of Thanjavur wilt was assessed in terms of percent palms showing symptoms of the disease. Highest incidence was observed in Pilicode (4%) gramapanchayath followed by Pallikkere (1.6%) and Padanne (1.5%). The disease was more prevalent in Northern laterite agro-ecological unit of the district. The region is characterized by more dry spells and higher temperature and laterite soils which

favours the pathogen causing the disease. Diagnostic field visit conducted by team of scientists from CPCRI also confirmed the incidence of Thanjavur wilt disease in various localities of Kozhikode district including various panchayats of Kunnummal block and Thodannur block. Severe moisture stress experienced during March, April and May months during this year was a major reason for drying and drooping of coconut leaves. Palms affected by moisture stress also succumbed to Thanjavur wilt. Hence, care should be taken to take up moisture conservation practices in coconut gardens. Mulching is an important practice for moisture conservation. The coconut basins can be mulched with coir dust, coconut husks, green leaves, dried leaves, organic wastes, and dried coconut leaves. Mulching should be done before the end of north east monsoon and before the top soil dries up.

The study conducted in Kasaragod district also revealed that the level of adoption of control measures against Thanjavur wilt disease was very low. Farmers perceived that unlike stem bleeding disease, coconut palms affected by Thanjavur wilt succumb to death easily and hence is more damaging. It was observed that vast majority of farmers in whose gardens the disease was observed were not aware about the symptom of the disease or about the control measures to be adopted. Besides, it was also observed that farmers have not adopted the integrated nutrient management practices required for coconut. Most of them applied only organic manures and that too not in sufficient quantity. Deficiency of potassium in the soil is known to make plant more susceptible to moisture stress, diseases and pest attack. In general, soil related constraints viz., soil acidity and inadequacy/imbalance of nutrients are found



Mixing of neem cake and *Trichoderma* talc formulation



adversely affecting coconut production in most of the coconut growing areas. Potassium deficiency is observed in many of the coconut gardens. It is always advisable to apply the nutrients based on soil test results. Apart from major nutrients, need based application of secondary nutrients like Magnesium and micronutrients like boron, zinc etc may also be taken up on priority basis.

Extension activities to create awareness among the coconut growers about various aspects of integrated management of Thanjavur wilt disease are to be organised on a priority basis. Demonstration plots on integrated management of Thanjavur wilt, management of nutrient deficiencies and moisture stress can be laid out in farmers'

plots in selected localities as part of ongoing technology transfer initiatives under ATMA with technical support from research organisations like ICAR-CPCRI. Active participation of coconut farmers in such extension activities can be ensured through the Coconut Producer Societies functioning at grass root level. Frontline Demonstrations (FLDs) on integrated management of Ganoderma wilt of coconut was conducted in selected farmers gardens at Periya village in Kasaragod district. Disease management practices including bi-monthly application of Trichoderma enriched neemcake @5kg/palm were demonstrated. In the demonstration plots the disease index of affected palms was reduced to 15.2 compared to the pre-treatment disease index of 46.

Availability of inputs, both in quality and quantity, required for the management of Thanjavur wilt disease can be ensured through the ongoing decentralised people's planning programme of Local Self Governments utilising the provision for formulation and implementation of location specific scheme.

#### Conclusion

Taking into cognizance the field level scenario reported from some localities in Kerala state, it is imperative that appropriate measures are taken on priority basis for the integrated management of Thanjavur wilt disease to avoid crop loss. Apart from prophylactic and curative measures, agrotechniques such as integrated nutrient management and moisture conservation practices also should be given adequate attention for effectively managing the disease. Farmer participatory extension initiatives are to be implemented to create awareness among coconut growers about the integrated management of the disease. ■



*Trichoderma enriched neemcake*