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# Establishment of tree protection helpline for the State of Kerala

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# ABSTRACT

The project was initiated to help tree growers by giving them advice on pest and disease management associated with tree crops. Both the private sector and public sector tree growers were expected to be benefited by this service. During the study period most of the queries received were from the Forest Department. The pest and disease problems were associated with teak and eucalypts. The data indicated the need for popularising the activities of the helpline so as to extend the service to more clients.

# 1. INTRODUCTION

KFRI had been attending to several tree management problems in the past, which were referred by the Kerala Forest Department, Public Sector Undertakings and individuals. Attending to these problems is an important activity of KFRI. However it was not brought under the project mode so far. This essentially meant that there existed no single window for attending to queries. Moreover, this extension service offered by KFRI was known to a minority among the general public making the service highly restricted to people who already knew about KFRI. In Kerala Forest Department also, the field staff depended on the routine official procedures to get access to KFRI for information, testing and recommendations. The situation is such that many of the prospective clients are ignorant of the extension service provided by KFRI.

Over the past thirty years, KFRI scientists have generated valuable and application oriented information on forestry practices (KFRI, 2005). The vast experience possessed by KFRI has to be shared with the public interested in growing forest trees. The current project attempts to use the collective wisdom within the Institute in a focused manner to attend to the diverse pest and disease problems of trees in the State of Kerala. It is expected that the other disciplines like tree physiology, soil science and silviculture will be co-opted into the project as and when necessary.

The project envisaged to provide a single widow approach to the tree protection needs of the State. It will bank heavily upon the expertise at KFRI while also be in possession of state-of-the-art remedies and techniques developed in and outside the country. Specific objectives of the project were:

1. To establish a helpline centre at KFRI to address tree health problems in the forestry sector for the benefit of the Government and public.
2. To suggest non-hazardous management practices for tree health problems.

The project activities also included:

1. Compilation of pest and disease problems attended by KFRI in the past
2. Compilation of information on probable pest and disease problems. Information will be collected from research reports, field guides, extension bulletins etc.

## 2. MATERIALS AND METHODS

### Compilation of data on tree health problems attended by the Institute in the past

During the past several years, KFRI has attended to several pest problems reported from the forest plantations. A compilation of the data on the pest problems will be attempted to throw light on the important pest problems occurring in the forest plantations.

### Setting up of a Tree Protection Helpline

A Helpdesk with a dedicated telephone line will be established and the telephone number will be announced to the public. During the working hours of the Institute, calls for help from the clients will be attended and details of the problem will be recorded in a specified format. Wherever approved readymade answer is available recommendation will be passed on to the client immediately. The questions/queries which require examination by concerned subject expert will be processed further. The recommendation will be entered in the database and conveyed to the client over phone/letter. Detailed field information required if any will be gathered from the client directly or through field visit. The clients will be contacted later as part of the follow-up action.

# 3. RESULTS AND DISCUSSION

## Compilation of pest and disease problems attended by KFRI in the past

An attempt was made to compile the pest problems referred by the Forest Department with reference to different tree crops in plantations. Eighty-one que ries received on pest problems were examined. The period covered is 25 years from 1978 to 2003. This gave an idea of the importance of the pest problems as perceived by the Forest Department. The perceived impact as indicated by the number of queries did not match with the real pest status of a particular insect species in all instances.

The relative ranking of the pests of each species based on the number of queries received and the actual pest status are presented Table 1.

### Eucalyptus spp.

Termites appeared to be the major pests for both E. *tereticortiis* and E. *grandis.*Termites are recognised as the major problem in the establishment of eucalypts plantations. During the first year after transplanting polybag raised seedlings in the field. death upto 80% of the transplants have been recorded (Nair and Varma, 1981). The sapling borer. *Sahyadrassus molabaricus* is the second in importance based on the number of queries received. However, in reality it is a minor pest which sometimes causes breakage of stem of saplings. Although a query was received on the bagworm, *Pteroma plagiophleps* as a pest, it is not recognised as a pest of *Eucalyptus.*

### *Tectona grandis*

The white grub, *Holotrichia* sp. was ranked as first based on the queries received. It is an important pest in teak nurseries. The grubs feed on the roots

Table 1. Relative importance of pests of each tree species

| Tree species | Total number of queries received | Pest | % queries received | Pest status based on real impact |
|---|---|---|---|---|
| *Eucalyptus teteticornis* | 23 | Termite | 74.0 | Major pest |
| | | *Sahyedrassus malabaricus* (Sapling borer) | 23.0 | Minor pest |
| | | *Pteroma plagiophleps* (Bagworm) | 03.0 | Few sightings only |
| E. *grandis* | 4 | Termite spp | 100 | Major pest |
| *Tectona grandis* | 21 | Holotrichia spp. | 33.3 | Major pest innurseries |
| | | S. *malabaricus* | 28.6 | Minor pest |
| | | *Hyblaea puera* (teak defoliator) | 19.0 | Major pest |
| | | *Eutectona machaeralis* (teak skeletoniser) | 9.5 | Minor pest-wide spread |
| | | *Asphondylia tectoinae (teak gall)* | 4.8 | Minor pest |
| | | *Alcterogystia cadambae* | 4.8 | Major pest but not wide spread |
| *Ailanthus triphysa* | 16 | *Eligma narcissus (defoliator)* | 69.0 | Minor pest - widespread |
| | | *AttevaJabriciella* (leaf webber) | 31.0 | Major pest |
| *Casuarina equisetifolia* | 5 | S. *malabaricus* | 100 | Minor pest |
| *Swietenia macrophylla* | 4 | *Hypsipyla robusta(terminal shoot borer)* | 100 | Major pest |
| *Paraserianthes falcateria* | 4 | *Pteroma plagiophleps* | 50.0 | Major pest |
| | | *Indarbela quadrinotata (bark caterpillar)* | 25.0 | Minor pest |
| | | *Eurema blanda (yellow butterfly, defoliator)* | 25.0 | Minor pest |
| *Accasia auriculiformis* | 1 | *S. malabaricus (stem borer)* | 100 | Minor pest |

causing death of seedlings, usually in patches. In general, it is considered as a minor pest but occasionally causes large scale damage in teak nurseries.

The sapling borer, *Sahyadrassus malabaricus* ranked as second in importance based on the queries received, is not a serious pest of teak. However. this is a conspicuous pest and has hence been reported frequently.

The teak defoliator, *Hyblaea puera* is ranked as third in importance based on the number of queries received. In a study on young plantations it has been demonstrated that defoliation by this pest causes loss of about 44 per

cent of the potential volume increment (Nair *et al.*1985). It should therefore be recognised as the most important pest of teak.

Among the queries received on the teak pests, about 10 per cent were on the teak skeletoniser, *Eutectona machaeralis.* Infestation by this pest generally occurs during the later part of the growth season and the defoliation during this period has found to have no significant effect on volume increment of teak in Kerala (Nair *et al.* 1985).

The teak trunk borer, *Alcterogystia cadambae* ranked as fifth in importance based on the perceived impact infests the trunk of teak trees. Continuously infested trees become useless due to presence of several borer holes (Mathew, 1990).

The gall insect, *Asphondylia tectonae* is only a minor pest since the incidence of this pest is rare and damage caused is negligible.

***Ailanthus triphysa***

The defoliator *Eligma narcissus* comes first in importance based on the number of queries made. It is a conspicuous pest and gives the impression of a serious problem. However, the infestation is sporadic which does not cause a threat to the establishment of plantations. It is therefore only second in importance based on the real impact. Although the leaf webber, *Atteva fabriciella* was second in importance based on the queries received the damages caused by this pest results in either partial death or branching of the trees and retardation of growth (Varma,1986 ; 1991). Considering the economic damage caused this species, it is ranked as the major pest of *Ailanthus.*

*Casuarina equisetifolia*

All the five queries received were on the sapling borer. S. *malabaricus.*

As in the case of eucalypts and teak. damage due to this pest is of minor importance on C. *equisetifolia.*

*Swietenia macrophylla*

In agreement with the perceived impact, the shoot borer. *Hypsipyla robusta* is the pest of S. *macrophylla.* It causes severe damage to saplings resulting in the death of leading shoot affecting the establishment of plantations.

*Paraserianthes falcataria*

The bagworm *Pterotna plagiophleps* perceived as first in importance based on the queries is indeed the major pest of *P. falcataria.* Heavy defoliation by this pest can lead to growth retardation, die-back and even death of trees (Nair and Mathew. 1988).

The bark feeder. *Indarbela quadrinotata* and the yellow butterfly *Eurema blanda* are only minor pests.

*Acacia auriculiformis*

The sapling borer *S. malabaricus* the only pest on which a query was made. This is a minor pest.

**Services extended under Helpline**

Queries on pest problems received from the Forest Department were attended and recommendations offered. The queries were mostly on the pest problems in teak and eucalyptus.

*Pest Probles in Teak*

The teak defoliator and teak skeletonzer problems in teak plantations were reported from Kasaragod Range and Edavanna Range. In the case of the teak defoliator application of bacillus biopesticide was recommended. Teak skeletonizer problem did not warrant any control. A fungal problem

on leaves was suspected and reported from Kallarvalley, Ayyappancoil Range which was proved to be a minor gall insect infestation of not much economic importance. Regarding diseases on teak, an instance of pink disease was confirmed in teak plants grown by a private farmer in Manjeri, Malappuram District. Chemical control using Calixin was recommended.

The KFDC Champamkandam Unit reported gall problem in teak which was identified as caused by *Asphondylia tectonae* a dipteran fly. The pest being not of any economic significance no control measure was suggested.

*Pest/disease/weed problems in Eucalyptus sp.*

Pest problems in the two newly established eucalypt plantations at Plakkayam and Ponmudi (Adimaly Forest Range) were reported

Termite : There had been sporadic incidences of termite damage in small saplings. This would have happened because of insufficient pre-planting treatments. The root trainer block should have been dipped in 0.5% Chlorpyriphos 20EC solution, without spilling on the leaves. Chlorpyriphos is available in the market under several trade names such as Dursban, Durmet, Dhanvan, Pyramid, Robon, Thrisul, etc.

Sapling borer: A large number of saplings were found to be infested by the sapling borer *Sahyadrassus malabaricus*. To control the shoot borer, Quinalphos (Ekalux 25 EC) 0.2% solution is to be applied in and around the borer hole using paint brush, after removing he frass cover mat. To preapre 0.2% solution of Ekalux, 8 ml of the insecticide is mixed in one litre of water.

Pink disease: Some of the coppice shoots and newly planted saplings were found to be dried up. Samples were brought to the laboratory and Pink disease was confirmed. Planting of pink disease resistant clones developed

by KFRI is recommended to raise healthy plantation. It would be possible for KFRI to supply the clones if needed.

Gall incidence: Only a few plants in the were found infested by galls. The gall insect, *Leptocybe invasa* (Hymenoptera: Eulophidae) is a new introduction to Kerala. Similar gall incidence report was received from Thachanmala, Agali range. The insect forms typical bump-shaped galls on the leaf midribs, petioles and stems of new growth of several *Eucalyptus* species. Heavy galling prevents further development of the infested growth. Leaves of intensively growing trees may carry over 50 galls per leaf. Mean development time from oviposition to emergence is 132.6 days in room temperature. Control methods yet to be developed. Prospects of using biocontrol agents are being investigated through research programmes coordinated by PDBC, Bangalore.

Weed problem: Incidence of the weed, *Merremia vitifolia* in eucalypt plantations was brought to our attention by KFDC, Champaamkandam Unit. Weedicide application was recommended.

# 4. CONCLUSIONS

The project was initiated to help tree growers by solving pest and disease problems associated with tree crops. Both the private sector and public sector tree growers were expected to be benefited by this service. However, during the reporting period queries were received mostly from the Forest Department.

Technical advices were given to solve health problems reported from the Kerala Forest Department. Most of the queries were on pest problems in teak and eucalypts. However, a new exotic pest problem in eucalypts caused by the gall wasp *Leptocybe invasa* (Hymenoptera: Eulophidae) was reported from two eucalypts plantations. This suggested that new pest problems can be identified by interaction with tree growers.

With a view to strengthen the service, a project proposal was submitted to the Kerala State Council for Science, Technology and Environment. This proposal differed from the current programme as it covered all aspects of tree growing including site selection, species-site matching, planting, thinning , soil testing, fertilization pest, disease and weed management multi-species interactions, landscape level aforestation programmes, tree/wood sample identification, preservative treatments of wood, etc.

The new project (KFRI 584/09) became operational in July 2009 and the activities under this project were merged with the new project.

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