

## PROJECT PROFILE

**Title:** Selection of pest resistant trees from wild populations, provenances and exotic trials and progeny tests.

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**Start and Completion dates:** 1994 to 2004

### Objectives:

1. Surveys to detect resistant individuals or races in conditions of pest attack, especially during epidemic infestation.
2. Determining basic factors conditioning resistance and identifying inheritable resistance traits.
3. Preliminary selection of resistant provenances/progenies/candidates or individuals.

**Funding Agency:** ICFRE

**Total budget outlay:** Rs. 3 lakhs

## SUMMARY

Insects are one of the major biological determinants of productivity, as far as monoculture forest plantations are concerned. To the extent possible, the insect pest management strategies to be adopted in forest plantations have to be preventive rather than curative, due to practical difficulty in applying control measures and economic considerations. The control measures adopted have also to be eco-friendly, as the forest ecosystem shelters lot of biodiversity. In this context, host plant resistance has an important role to play in forest pest management. Though much work has been carried out in developing pest resistant crop plants, research in these lines in Forestry gained importance only recently. Resistant trees may be defined as those that are less damaged or less infested than others, under comparable environmental conditions. The mechanisms of resistance include, Antixenosis, Antibiosis and Tolerance. Three tree species of multiple utility viz. *Casuarina equisetifolia*, *Acacia nilotica*, ssp. *indica* and *Albizia lebbek* were taken up to study host plant resistance against important insect pests of the region. The studies were conducted in the Provenance Trials and Progeny Trials of these species, established by Tamil Nadu Forest Department and Institute of Forest Genetics and Tree Breeding, in various places of Tamil Nadu. Out of 61 seed sources of *C. equisetifolia* screened, two seed sources from Kenya and one from Australia were completely free from the infestation of the bark caterpillar, *Indarbela quadrinotata*. Ten seed sources of *C. equisetifolia* were found to exhibit moderate susceptibility to the bark caterpillar. All of the Indian seed sources available in the Provenance Trials of *C. equisetifolia* were highly susceptible to the bark caterpillar. Among 16 progenies of Candidate Plus Trees of *C. equisetifolia*, none was found to be free from infestation of key pests. The seed sources of *C. equisetifolia* seed sources, which were unattacked or showed lower susceptibility had significantly higher level of tannin in their bark. Out of 30 seed sources of *A. nilotica*, ssp. *indica* studied for susceptibility to key pests, *Anomalococcus indicus*, *Sinoxylon* sp. and *Selepa celtis*, the seed source of 'Mathura' origin was found to be free from infestation of all these pests. The scale insect, *A. indicus* showed strong preference for plants with higher protein, carbohydrate and nitrogen content, while the stem borer, *Sinoxylon* sp. exhibited less preference for plants with higher tannin content. The defoliator, *S. celtis* preferred seed sources with higher moisture content in the leaves. Out of 6 seed sources of *Albizia lebbek* screened for infestation of sap sucking pests such as *Psyllids* and *Aphids*, none were free from the pest infestation. The sap-sucking pests showed preference for seed sources with higher carbohydrate and lesser

moisture content in the leaves. The studies reveal that, there is need to screen more seed sources of these tree species from various geographical regions and distribution ranges, so as to find out the ones with pest resistant characteristics.