

# INVASIVES

Newsletter of the Asia-Pacific Forest Invasive Species Network (APFISN)

Vol.4



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The Asia-Pacific Forest Invasive Species Network (APFISN) has been established as a response to the immense costs and dangers posed by invasive species to the sustainable management of forests in the Asia-Pacific region. APFISN is a cooperative alliance of the 32 member countries in the Asia-Pacific Forestry Commission (APFC). The network focuses on inter-country cooperation that helps to detect, prevent, monitor, eradicate and/or control forest invasive species in the Asia-Pacific region. Specific objectives of the network are: 1) raise awareness of invasive species throughout the Asia-Pacific region; 2) define and develop organizational structures; 3) build capacity within member countries and 4) develop and share databases and information.

## FROM THE EDITOR'S DESK

**INVASIVES**, monthly newsletter of the Asia-Pacific Forest Invasive Species Network (APFISN) is intended to share information among countries in the Asia-Pacific region on Forest Invasive Species (FIS) and the threats they pose in the region. It will include information on new threats, available methods of control, ideas on precautionary measures, and news items on workshops, seminars and publications on FIS. If you have any items of news value on FIS to share between national focal points of APFISN and more widely among foresters, agriculturists, quarantine personnel and policy makers, please pass them on to Dr. K.V. Sankaran, APFISN Coordinator, Kerala Forest Research Institute, Peechi- 680653, Kerala, India, e-mail- [sankaran@kfri.org](mailto:sankaran@kfri.org). Your comments and suggestions for improvement of the newsletter are most welcome!

Editor

## THREATS

- *Acacia mearnsii* (black wattle)
- *Mimosa diplotricha* - Giant sensitive plant

## NEW PUBLICATIONS

- Plant invasions: emerging trends and future implications.
- Establishment of *Pareuchaetes pseudoinsulata* (Lepidoptera, Arctiidae), an exotic biocontrol agent of the weed *Chromolaena odorata* (Asteraceae), in the forests of Kerala, India.

## RECENT BOOKS

- Invasive plant species of the world: a reference guide to environmental weeds

## FORTHCOMING SEMINARS/SYMPOSIA/ WORKSHOPS

- Invasive species management: 2006 PREISM Workshop, Washington DC, USA, 19-20 October 2006.
- Biology, ecology and management of world's worst plant invasive species, New Delhi, India, 10-14 December, 2006.

## THREATS

### *Acacia mearnsii* (Black wattle)

*Acacia mearnsii*, a native of south-east Australia, is one of the fast growing leguminous trees of highland tropics (above 600m) widely used as a source of tannin, resins, timber, fuel wood, pulp wood, charcoal, poles and green manure. It is also used for soil erosion control and soil improvement. The species has been introduced in to 25 countries in the tropical and subtropical regions of the globe (South and North America, Asia, Africa, Europe and the Pacific). Extensive areas under black wattle exist in Brazil (200,000 ha), South Africa (2.5 million ha) East Africa (30,000 ha) and India (20,000 ha). In addition, there are unrecorded plantings in agroforestry systems in many countries. Its

multipurpose use and ability to grow in a broad spectrum of soils and sites may have prompted introductions worldwide. Tannin industries based on the species are operated in several tropical and subtropical countries.

Black wattle is an evergreen tree, 6-20 m tall and 10-60 cm in diameter with branchlets shallowly ridged, all parts are pubescent except flowers; leaves are dark olive green, and bipinnate. Flowers are in globular flower heads, 5-8 mm in diameter, pale yellow or cream and fragrant; fruits dark brown pods, 3-10 cm long, finely hairy and usually markedly constricted; seeds black, smooth, elliptic or ovoid 3-5 mm long and 2-3.5 mm wide. The tree grows in disturbed, mesic habitats in a wide range of climates including warm temperate dry climates and moist tropical climates. It is an aggressive coloniser due to its hardy nature and high competitive ability. Black wattle is listed as one of the world's 100 worst weeds.



Acacia- a medium sized tree



A branch with flowers

The invasiveness of this species is partly due to its ability to produce large amounts of long-lived seeds (viable up to 50 yrs) which are distributed by birds, cattle, wild animals and rodents. The seeds are triggered to germinate *en masse* by fire. Collection of branches and logs for firewood by local people may also aid in the dispersal of seeds. Black wattle competes and replaces indigenous vegetation including grass communities and reduces carrying capacity of the land. It also increases rainfall interception and transpiration causing a decrease in streamflow. Commercial plantations and invasive stands of black wattle in South Africa are reported to reduce surface stream flow with a net present value of US\$1425 million. Its invasion has resulted in loss of biodiversity, increased soil erosion and destabilization

of riverbanks in the country. Black wattle has invaded grassland, fynbos, savanna and forest biomes in South Africa and is considered a threat to the species-rich Cape Floral Kingdom, and many other biodiversity hotspots. In India, where it was introduced as early as 1831, the species has virtually taken over the shola forests (southern montane wet temperate forests) and grasslands in the southwest region significantly reducing the biodiversity of indigenous flora and fauna. In Hawaii, the tree is considered to cause significant ecological and economic harm.

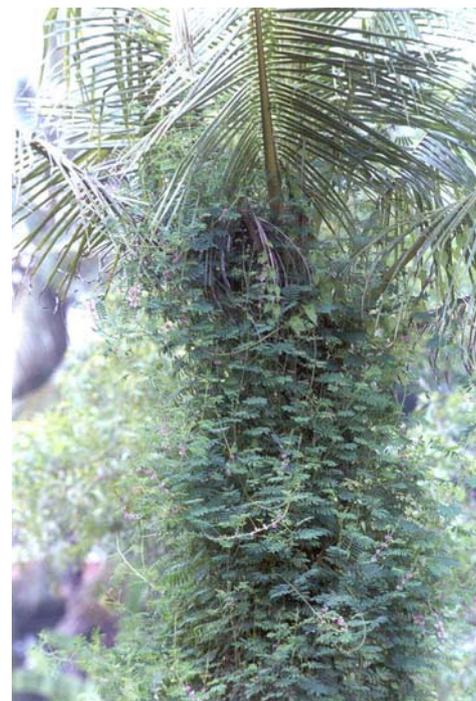
Chemical control measures of black wattle include treatment of the saplings with herbicides such as triclopyr, glyphosate, dicamba and picloram at cut-surface. In large trees, herbicides may have to be applied through drilled holes. Basal bark and stump bark treatments with herbicides are also effective. Biological control of the tree has been attempted in South Africa by introducing a seed-eating weevil *Melanterius maculatus* which caused reductions in seed numbers. A Cecidomyiid gall midge, *Dasineura* sp., has also been identified as a promising bio-control agent in South Africa as it forms flower galls and prevent fruit production without affecting vegetative growth. In an innovative initiative, the South African wattle industry is supporting a breeding programme to produce 'sterile black wattle trees' (triploid trees) through genetic manipulation using gamma rays. If successful, the triploid trees will not produce flowers or seeds, a biological control method which could be practiced with minimum conflict of interest between wattle growers and conservationists.

In those countries where black wattle has not been introduced, to date, quarantine measures should be strengthened to prevent accidental entry. Also, any plans to introduce black wattle in to newer areas may be reconsidered and thwarted

### **Mimosa diplotricha (Giant sensitive plant)**

*Mimosa diplotricha* (commonly called *Mimosa invisa*), a native of Brazil, is a fast growing, thorny, biennial or perennial shrub with angular branching stems that become woody with age. It is widespread in South and Central America, the West Indies, Mexico, Hawaii, Puerto Rico, parts of Africa, India, Southeast Asia, Australia and the Pacific Islands. This species has become a serious invader in agricultural systems, forest plantations and wildlife sanctuaries wherever it has spread. *M. diplotricha* has an extremely fast growth rate and can form dense tangled thickets up to 2 meter in height within a short duration. It can smother indigenous plants and other weeds.

*Mimosa* is a big menace in the Kaziranga National Park in northeast India, where it forms a thorny mat over the natural vegetation, preventing animals from accessing the area and utilizing natural vegetation. The population of the endangered Indian one-horned Rhinoceros has been affected by *Mimosa*. In Australia, it chokes out agricultural crops and grassland causing crop and pasture loss. In short, *M. diplotricha* poses a serious threat to coconut, tea, rubber, pineapple, sugar cane and crop lands and pastures in southeast Asia and the Pacific. The common habitat of the weed is moist soils in tropical and subtropical climates, wet waste lands and disturbed areas, plantations, pastures and cultivated areas. Available reports indicate that a non-protein amino acid (mimosine) present in mimosa plants is hazardous to animals.



*Mimosa* smothering a coconut palm

The stems of *Mimosa* are often 2-6meters long with many randomly recurved prickles, 3-6 millimeters in length . The leaves are bright green, sensitive, and with prickly petioles and rachis. Leaflets number 12 to 30 in opposite pairs. Flowers are pale pink, in fluffy balls (1.2 cm in diameter) and form on a short stalk at the leaf axis. The fruit is a spiny pod with three to four seeds. Seeds are light brown, oval in outline, glossy, smooth,



*Mimosa* - branch bearing flowers

2-3.6 mm long and 2-2.7 mm wide. Seeds, which are known to have a long viability period, are produced in large numbers by individual plants. Dispersal of the seed is through sticking to animal fur or by floating in streams. Transportation of the seed by running water, vehicles, machinery and contaminated earth is also reported.

Mechanical control of *M. diplotricha* has been frustrated by its thorny nature. Chemical control using herbicides such as fluroxypyr, glufosinate ammonium or triclopyr have been effective only in the short-term. Biological

control has been attempted successfully in Australia, Fiji, Papua New Guinea and Western Samoa using a psyllid viz., *Heteropsylla spinulosa*. Investigation of the potential of other insects such as *Psygida walkeri* are currently underway.

#### **FAO to foil rat attack of coconut in Tuvalu**

*Rattus rattus* or black rats, which gnaw through coconut, are a big menace in Tuvalu. Coconut and copra (dried coconut) are the main source of revenue of this tiny island nation in the Polynesian coral archipelago. Damage due to rats to young green nuts is estimated to be over 60 percent. FAO has stepped in with an ecologically-based pest management program. The program involves use of recycled Australian pineapple cans containing suitable tasty baits treated with rodenticide. The cans are hung from wires on coconut trees in such a way that these are easily accessible to rats. Moreover, metal bands are fastened around coconut palm trunks to prevent rats climbing up trees. Another priority is to safeguard the native population of young coconut crabs, a fast-vanishing species, which are one of the wonders of the animal world.

#### **NEW PUBLICATIONS**

Sharma, G.P., Singh, J.S., Raghubanshi, A.S. 2005. Plant invasions: emerging trends and future implications. *Current Science*, 88: 726-734.

Varma, R.V., Amarnatha Shetty, Swaran, P.R., Raju Paduvil, Shamsudeen, R.S.M. 2006. Establishment of *Pareuchaetes pseudoinsulata* (Lepidoptera, Arctiidae), an exotic biocontrol agent of the weed *Chromolaena odorata* (Asteraceae), in the forests of Kerala, India. *Entomon*, 31: 49-51.

#### **RECENT BOOKS**

**Invasive plant species of the world: A reference guide to environmental weeds.** : By E. Weber, Published by CABI, 2003. This book provides a reference guide to 450 major invasive plant species that are harmful to natural areas. Each species has an entry providing information covering lifeform, synonyms and commercial use, geographical distribution, habitats invaded, description morphology, ecology and control. Key references to each species are also provided.

#### **FORTHCOMING SEMINARS/SYMPOSIA/WORKSHOPS**

**Invasive species management: 2006 PREISM Workshop, Washington DC, USA, 19-20 October 2006.** This workshop deals with research on economics of invasive species management. It is expected to bring together researchers, program administrators, policy makers and other stake holders concerned with the management of invasive species. Contact: [webadmin@ers.usda.gov](mailto:webadmin@ers.usda.gov)

**Biology, ecology and management of world's worst plant invasive species, New Delhi, India, 10-14 December, 2006.** The objectives of the symposium are to discuss the state-of-art knowledge on different facets of the world's worst weeds and evolve effective and efficient management systems for the weed infested ecosystems and expose stakeholders to the latest strategies on eradication and control of invasive weeds in managed and natural ecosystems. Contact: Prof. Inderjit, E-mail: [inderjit@cemde.du.ac.in](mailto:inderjit@cemde.du.ac.in)

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Compiled and edited by Dr. K.V.Sankaran, APFISN Co-ordinator on behalf of the Asia-Pacific Forest Invasive Species Network. For more information on the APFISN, please contact your national focal point or the APFISN Co-ordinator or Mr. Patrick Durst, Senior Forestry Officer, FAO Regional Office for Asia and the Pacific, 39 Phra Atit Road, Bangkok. Email: [patrick.durst@fao.org](mailto:patrick.durst@fao.org)

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