



Sensitive plant invades the north

Giant sensitive plant, *Mimosa pigra*, has been advertised by a seed-marketing company in Hawaii as 'an interesting conversation piece', due to the ability of its leaves to close when touched, and later re-open. Residents of the Northern Territory, however, aren't so readily amused by such antics. For them, *M. pigra* is more of a menace than a pet.

This woody thorny shrub forms dense thickets up to 6 m high, making areas of land inaccessible for animals and man. In the Northern Territory it grows beside billabongs and river banks, blocking off access to irrigation and stock watering points, and in wetland areas it suppresses vegetation. Thorny walls of weed also interfere with cattle-mustering and recreation activities.

The plant is mainly concentrated along the Adelaide River, east of Darwin, where it now covers an estimated 8000 ha. From

there it has spread to sites in the Batchelor-Rum Jungle area, the lower Mary River, the Daly, Reynolds, and Finnis Rivers, Kakadu National Park, and a number of locations around the city of Darwin. It has not been reported from anywhere else in Australia.

From South America

Like many of Australia's tropical weeds, giant sensitive plant is a native of tropical Central and South America. Many years

Mimosa pigra forms thick, impenetrable walls of thorny vegetation. The pictures show its progress on an area of the Adelaide River flood-plain between 1978 (top) and 1981.

ago, it spread to Java and other islands north of Australia. In Thailand, agriculturalists introduced the plant to stabilize rice paddy irrigation channels, but it soon became a problem itself. Although it was not noticed on the Adelaide River until the mid '50s, it appears to have reached our shores some time during World War II. It was officially declared a noxious weed in 1966.

The Northern Territory Department of Primary Production has been carrying out research on *M. pigra* with the aim of controlling the weed. Mr Ian Miller, Mr Laurie Nemestothy, and Mr 'Lofty' Pickering, all from the Department, have studied its history and spread in the Northern Territory, and outlined the many factors that have contributed to its increase.

After heavy floodwaters spread the seed, a massive outbreak occurred.

Water movement has been largely responsible for its spread along the Adelaide River, the main area of infestation. In the mid 1970s, after heavy floodwaters had spread the seed, a massive outbreak of *M. pigra* occurred.

Trampling and grazing of native vegetation by buffalo and other feral animals have encouraged the plant to establish.

Seed pods, each containing many seeds, break up into small segments that float and are easily carried downstream or out onto adjacent plains during floods. The seeds have also been spread by unwitting dispersal agents — cattle, horses, buffalo, wallabies, motor vehicles, and man. Seeds can also be spread in river sands that are transported for commercial or private use.

Giant sensitive plant produces very large quantities of seed. In Thailand, Dr P. Wanichantakul and Dr S. Chinawong found that, under ideal conditions, a plant can produce about 95 000 seeds per year. The seeds may remain viable in the ground for up to 10 years or more because of their hard outer coat.

The plants tolerate both flood and drought. Timely burning, however, impedes their development, thus delaying seeding, and very hot fires can kill plants. But, since 1965, pastoralists have reduced



Biological control of giant sensitive plant. The adult beetles of this species feed on young shoots (left) while the larvae graze shoots at the apex of the stem.

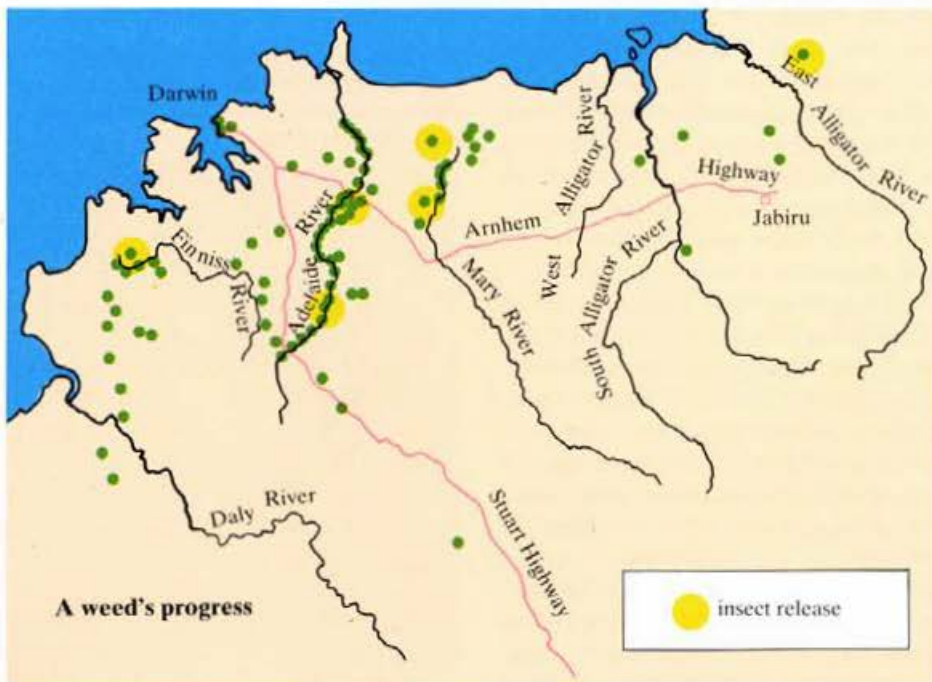
the incidence of fire to protect improved pasture.

M. pigra has invaded areas of black soil flood-plain downstream of the Adelaide River. These areas have potential for a number of industries, mainly rice-farming, controlled buffalo grazing, and tourism.

Insects

Since 1980, CSIRO and the Department of Primary Production have been carrying out research, under the direction of Dr Ken Harley of the Division of Entomology, on biological control of giant sensitive plant. The program has already isolated a number of insects that attack it. Another phase of

Locations of *M. pigra* in late 1983, and the areas where insects have been released for biological control. The main infestation is along the Adelaide River.



the program is focused on finding out more about the weed itself. This work has been assisted by funds from the Australian Centre for International Agricultural Research, through its interest in developing collaborative research on mimosa control between Australia and Thailand.

Dr Mark Lonsdale of the Division of Entomology has begun studying the plant's population dynamics to find detailed answers to questions like what happens to seeds, how many germinate, and how many seedlings reach maturity? The answers will improve understanding of the ecology of the plant and assist in selection of biological control agents.

The insects identified as potential control agents include beetles that feed on the *Mimosa* species in its native range in Central and South America. Mr Richard Kassulke of the Division of Entomology has been examining two species of 'seed weevils' that lay eggs on mature seed pods and whose larvae burrow into the seeds.

Other beetles with potential as control agents feed on foliage, while the larvae graze shoots at the apex of the stem.

After carrying out host-specificity trials in Brisbane, Mr Kassulke sent a batch of seed weevils to the Department of Primary Production for trial in 1983. These beetles have been released in a number of locations in the Top End, and officers from the Department and CSIRO are monitoring their establishment.

So far the insects have survived on the plants over six or more generations. To assess their impact, the Department is carrying out a comprehensive sampling of seed pods on trees and on the ground. Meanwhile, beetles are being mass-reared in both Darwin and Brisbane.

Other possible control agents being tested by Mr Kassulke at the Brisbane laboratories include two moths and two root-feeding insects. These have been sent to Australia by Mr John Gillett, who is studying the weed's natural predators in its home range. He has found that, in Mexico, its natural enemies keep mimosa clumps in check and most of the seed pods are infested with seed-feeding larvae.

Mr Gillett is still looking for other agents, which for example attack foliage and stems, and he is carrying out some host-specificity testing of these potential agents in Mexico.

The collaborative CSIRO and Department of Primary Production biological control trials, together with Dr Lonsdale's study of the weed, should provide an effective solution to this 'Sword of Damocles' hanging over the Top End's flood-plains.

Mary Lou Considine

More about the topic

Mimosa pigra in the Northern Territory. I.L. Miller, L. Nemestothy, and S.E. Pickering. *Northern Territory Department of Primary Production Technical Bulletin No. 51, 1981.*