



## Biological control of prickly acacia

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Biological control is the process of introducing the natural enemies of exotic weeds to reduce their growth and reproductive capacity, or to kill them. Biological control agents are the selected natural enemies (insects or diseases), which are used to keep weeds under control.

In 1979, the Department of Lands (now the Department of Natural Resources, Mines and Energy) began surveying potential biological control agents in Pakistan. Further research was initiated in Kenya from late 1989 and, in 1997, a preliminary survey of insect and pathogen fauna on prickly acacia in South Africa was undertaken. The South African survey found over 400 insect species on the trees. From this, a further group of promising insects was identified and a field station was established to assess potential control agents.

To date, research on possible biocontrol agents for prickly acacia has resulted in the introduction of five insects:

- a tip-boring moth *Cuphodes profluens*
- a seed-feeding beetle *Bruchidius sahlbergi*
- the leaf-feeding beetle *Homichloda barkeri*
- two leaf-feeding geometrid (looper) caterpillars *Chiasmia inconspicua* and *Chiasmia assimilis*.

It is anticipated that a sixth insect, *Cometaster pyrula*, a leaf-feeding caterpillar from South Africa, will be released in early 2004.

The tip boring moth, *Cuphodes profluens*, has not been detected in the field and probably did not become established.

The beetle, *Bruchidius sahlbergi*, established successfully and is now widespread. Though its level of predation on seeds can vary from 0 per cent to 80 per cent depending on the availability of mature pods, it appears to be having a minimal impact on the spread of prickly acacia. Populations of *Bruchidius* decline when pods are scarce due to stock grazing, floodwaters or climatic conditions, but there are higher insect populations when there is a permanent reservoir of pods. Seeds also 'escape' predation by the beetle by being eaten by stock.

The leaf-feeding beetle, *Homichloda barkeri*, was released from late 1996 to 1999 but, to date, establishment has not been confirmed.

The two leaf-feeding geometrid (looper) caterpillars (*Chiasmia inconspicua* and *Chiasmia assimilis*) from Kenya were released in late 1998 and June 1999 respectively. Though it's too early to know if these insects have established, there are some indications of establishment of *C. assimilis* in coastal areas.

Exploratory research in Africa has now concluded. However, as it has now been ascertained that the prickly acacia in Australia originated in India, it is hoped to undertake further work in that country over the next few years.

Landholders have been involved in the introduction of biological control agents through release programs conducted by the Department of Natural Resources, Mines and



Energy Tropical Weeds Research Centre. In particular, as insects have become available for release, landholders have helped with their distribution and/or monitoring on properties throughout the prickly acacia range.



NRM&E

▲ Host testing of prickly acacia biological control agents



Jeff Wright

▲ *Homichloda barkeri*



Marta Vitelli

▲ *Bruchidius sahlbergi*



Jeff Wright

▲ *Chiasmia* spp.

