

## Research and development of *Pentohbruchus*

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The Australian Agricultural Council approved *Parkinsonia aculeata* as a target for biological control in Australia in 1983, and investigations began with a joint project between the Queensland, West Australian and Northern Territory governments. Between 1983 and 1987, biological control research aimed at finding natural enemies of parkinsonia was undertaken in the southern United States and northern Mexico.

Twelve insect species were identified as potential biological control agents because of the damage they caused. The two with greatest potential were *Mimosestes ulkei*, a seed-feeding beetle and *Rhinacloa callicrates*, a sap-sucking bug. A third insect, the seed beetle, *Pentohbruchus germaini*, was later collected in Argentina. All three were brought to Australia for host specificity testing under strict quarantine.

In 1994 approval was obtained for the release of *Pentohbruchus*. It is a small brown beetle, about 6 mm long, with large hind legs and black mottling on its wings. Individuals can live for up to two months but usually only live for about five weeks. The females lay up to 350 eggs each on parkinsonia pods, and after the eggs hatch the larvae tunnel into the seeds. The larvae will spend their entire development period in one seed and effectively destroy that seed.

- ▶ *Pentohbruchus germaini* eggs laid on a parkinsonia seed pod



Nathan March

- ▲ Field release of biological control agent *Pentohbruchus germaini* at Neumayer Valley, near Burketown



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- ▲ The hole in the seed was made by the emerging *Pentohbruchus germaini* beetle



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In early 1995 mass rearing of *Penthobruchus* started at the Tropical Weeds Research Centre (Charters Towers) and the Alan Fletcher Research Station (Brisbane) of the then Department of Natural Resources. More than 240 000 insects were released at over 125 sites including Winton, Rockhampton, Ayr, Cloncurry, Burketown, Normanton, Townsville, Georgetown and Charters Towers in Queensland. In the Northern Territory over 44 000 beetles were released. *Penthobruchus* has now been introduced to all major parkinsonia infestations in Queensland and has also been spread widely in the Northern Territory.

In the field the presence of *Penthobruchus* is indicated by white eggs under a pale membrane against the darker background of the pods. Round holes in the pods indicate that beetles have emerged.

Initial surveys in north and central Queensland showed that although there is a large variation in the success of the insects, *Penthobruchus* had in some cases destroyed up to 99 per cent of seeds over a season. Recent, ongoing research by CSIRO, however, has shown that although egg densities can be very high, seed mortalities are sometimes low and unlikely to significantly reduce parkinsonia populations in many parts of Australia. The main reason for low seed mortalities appears to be high parasitism of beetle eggs by native wasps.

Existing biological control agents alone will not control parkinsonia. They are just one of the control options that can be incorporated into integrated management practices.

