



## FACTSHEET

July 2010

For more information on weeds, including use of biocontrol agents contact:

Your local NRM Board  
[www.nrm.sa.gov.au](http://www.nrm.sa.gov.au)

Visit the Biosecurity SA web page:  
[www.pir.sa.gov.au/biosecurity/nrm\\_biosecurity/weeds](http://www.pir.sa.gov.au/biosecurity/nrm_biosecurity/weeds)

Ph 08 8303 9620

Or Weeds Australia:  
[www.weeds.org.au](http://www.weeds.org.au)

## BIOLOGICAL CONTROL OF

# Boneseed

(*Chrysanthemoides monilifera* ssp. *monilifera*)

**Biocontrol agent: Boneseed leaf buckle mite (*Aceria* sp.)**

### BACKGROUND

Boneseed is a serious weed and was first recorded in Adelaide in 1892, having been introduced from South Africa as an ornamental garden plant.

It is very common in parts of the Mt Lofty Ranges, with occasional infestations throughout the State.

Boneseed is an erect perennial shrub to 3 metres (taller in sheltered sites), with a woody trunk and bright yellow, daisy-like flowers. The fruits are dry berries.

As boneseed invasions involve the spread of seed, prevention of seed production is the key to control.

Mature plants produce up to 50,000 seeds per plant and the soil seed bank contains 800 to 2,500 seeds per square metre.

Some seeds remain viable in the soil for at least 10 years, especially those buried deeply.

As part of a national approach to managing this weed, a containment line has been established in South Australia.

Control of infestations on Yorke and Eyre Peninsulas will support eradication efforts in Western Australia and support on-going control efforts in other parts of the state to reduce spread into new locations.

Boneseed infestations on the Yorke and Eyre Peninsulas are relatively small but scattered widely, and there is a high threat of it spreading and expanding its range. It also has the potential to become more abundant within its current range.

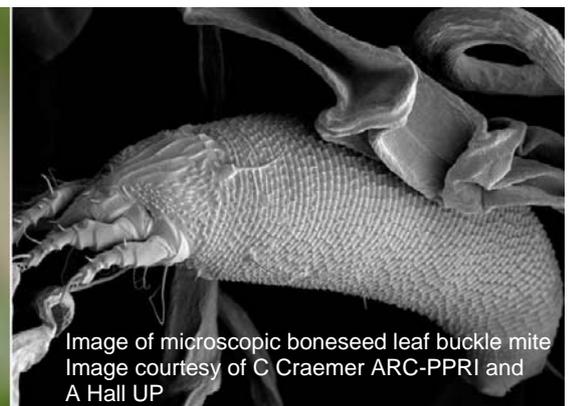
Boneseed is a Weed of National Significance and a declared plant in South Australia. Landowners have a legal responsibility to control it under the South Australian *Natural Resources Management Act 2004*. Regional NRM Boards coordinate and enforce local and regional control programs for declared plants.

### HOW THIS BIOCONTROL WORKS

The boneseed leaf buckle mite is a natural enemy of boneseed and has the potential to suppress vigour and indirectly impact on seed production. It is a microscopic South African gall-forming mite (approximately 0.15 mm long and 0.05 mm wide) that pierces and extracts nutrients and water directly from boneseed leaves.

Gall formation is caused by mites feeding in the shoot tip before the young leaf is visible. As the leaf grows, continued feeding promotes the formation of hairy, white to brown galls (erinea) presented as distorted leaf growth. Erinea provide a feeding site and shelter for the expanding mite population.

Erinea are present on infested plants throughout the year and new ones develop as boneseed grows. It is best to release the mite in autumn and onto healthy and growing shoot tips to induce gall formation.



Galls formed by the boneseed leaf buckle mite  
© State of Victoria, Department of Primary Industries 2009, T Morley.  
Reproduced with permission.

Image of microscopic boneseed leaf buckle mite  
Image courtesy of C Craemer ARC-PPRI and A Hall UP

## Boneseed infestations across SA NRM Boards

- > Adelaide & Mt Lofty Ranges: widespread in the Adelaide hills
- > Eyre Peninsula: isolated patchy populations
- > Northern & Yorke: isolated patchy populations
- > SA Murray Darling Basin: isolated populations along the Murray River
- > South East: isolated infestations on roadsides, reserves and some native vegetation

## RELEASE OF AGENT IN SOUTH AUSTRALIA

Beginning in 2008, the boneseed leaf buckle mite has been released at selected sites in three NRM Regions: Adelaide and Mt Lofty Ranges, SA Murray Darling Basin, and South East. There had been initial success in transference of mites onto field plants but no mites survived into the following season. Releases continued in 2009/2010 with a slight modification to the release protocols.

Community groups are also being encouraged to start nurseries to grow their own boneseed leaf buckle mites.

This will provide such groups with a continuous supply of mites in a timely manner for release onto local boneseed infestations. It also provides the opportunity for 'top-up' re-releases to aid the establishment process.

## OTHER AGENTS USED ON BONESEED

The **bitou tip moth** (*Comostolopsis germana*) feeds on growing tips and was released in the SA Murray Darling Basin and Adelaide and Mt Lofty Ranges Regions. Initial assessments suggest this agent did not establish.

The **lacy-winged seed fly** (*Mesoclanis* sp.) feeds on developing seed and was released in the Adelaide and Mt Lofty Ranges Region, in 1998, 2005 and 2009. Initial assessment indicates that this agent did not establish. New trials are currently being conducted by Department of Primary Industries Victoria that may lead to additional releases.

The **black leaf beetle** (*Chrysolina* sp.), **blotched leaf beetle** (*C. picturata*) and **painted boneseed leaf beetle** (*C. oberprieleri*), which defoliate plants, were released in the Adelaide and Mt Lofty Ranges Region in the early 1990s.

These agents did not establish, nor did the black boneseed leaf beetle in the SA Murray Darling Basin Region.

**Boneseed rust** (*Endophyllum osteospermi*) is in Australian quarantine for host-specificity testing. It works by reducing the plant's vigour and affects the output of seed, plant size and longevity.

Tests show that the rust could impact on boneseed within 9 months of inoculation. This will be followed up with host testing.

## INTEGRATED CONTROL

Integrated weed management aims to maintain or reduce weed densities to manageable levels by utilising a variety of control practices, including biocontrol where appropriate.

Integrated boneseed control can utilise herbicides and fire, in addition to biocontrol.

Burning as a weed control method should only be undertaken if sufficient resources are available and there is a commitment to follow-up control.

In inaccessible locations, or where there is a risk of damage to sensitive native vegetation, conventional control methods may be difficult or impossible to implement. In such cases biocontrol may be the only feasible management option, although alone it will not eradicate the weed. The likely effect is to reduce the growth and rate of spread of the weed, allowing more time for control by other means.

## REFERENCES / LINKS

[Boneseed Best Practice Management Guide](#)

[Biocontrol of Boneseed with the Boneseed Leaf Buckle Mite](#)

[Boneseed Biocontrol Community Nursery](#)

[Boneseed Weed Identification Notes](#)

[Boneseed Weed Management Guide](#)

[10 Year Boneseed Management Plan](#)

[Declared Plants of South Australia](#)

[Integrated Weed Management](#)

### Disclaimer:

This publication is provided for the purpose of disseminating information relating to scientific and technical matters. The Government of South Australia does not accept liability for any loss and/or damage, including financial loss, resulting from the reliance upon any information, advice or recommendations contained in this publication. The contents of this publication should not necessarily be taken to represent the views of the participating organisations.