



## Boneseed Biocontrol Community Nursery

By Susan Ivory, Weed Biological Control Officer

### Establishing a boneseed biocontrol nursery

Establishing a boneseed biocontrol nursery can be a rewarding experience enabling you to become part of a national movement to control boneseed using integrated pest management techniques.

Biocontrol nurseries should only be started if they are associated with an established infestation of boneseed. Release sites for biocontrol agents should be of low priority for weed control and not planned to be disturbed for five years. Low priority areas could include difficult to access areas such as steep slopes or areas of native vegetation where other control methods are not planned.

### Boneseed *Chrysanthemoides monilifera* ssp. *monilifera*

Boneseed is a native of the western Cape region of South Africa. Early records show that boneseed has been used as a garden plant since the 1850's with populations thought to be naturalised in Australia by 1910. Extensive boneseed infestations can be found around Adelaide, the Mount Lofty Ranges and the River Murray region with scattered infestations in the South-East and on the Eyre and Yorke peninsulas. Boneseed is a serious problem in Victoria, Tasmania and parts of New South Wales and Western Australia.

Boneseed is an erect shrub up to 3m high. Leaves are 3-9cm long, an elongated oval shape with irregular toothed edges. The flowers are yellow and daisy like with 5-8 "petals" (ray florets) that cluster at the ends of branches. Fruit is round and fleshy, turns brown when ripe and contains a single seed. The seed is hard, smooth and round and bone coloured when dry. Seedlings can be present all year round depending on favourable conditions though generally plants will germinate March through to May. Plants will usually first flower in their second year.

### Similar looking species

Juvenile boneseed plants can be confused with young native boobiella plants. Seedlings and young foliage of boneseed are covered in white downy hair that is lost as the leaves mature, mature leaves have irregular toothed edges. Boobiella, *Myoporum insulare*, seedlings are not downy and mature leaves have regular fine teeth on the leaf edges. Boobiella flowers are white.

The close relative of boneseed, bitou bush, *Chrysanthemoides monilifera* ssp. *rotundata*, is a low sprawling shrub 1-2m high. Leaves are a broader oval shape with smooth or slightly toothed edges. The most obvious distinction is in the number of ray florets, bitou bush with 11-13 ray florets compared to boneseed with 5-8.



Bitou Bush  
Photo courtesy of Marion Winkler



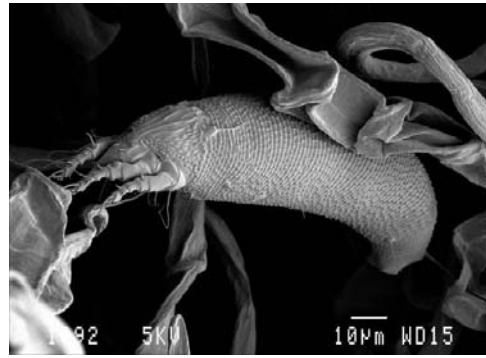
Bitou Bush flower, 11-13 'petals'  
Photo courtesy of Alan Kwok



Native Boobiella  
Photo courtesy of Kerry Brougham

## Boneseed Leaf Buckle Mite

The boneseed leaf buckle mite (BLBM), *Aceria* sp., is a microscopic gall forming mite naturally found in South Africa. Gall formation is initiated by mite feeding in the shoot tip before the young leaf is visible. As the leaf grows, continued feeding by the mite promotes the formation of hairy, white to brown galls (erinea) that are associated with distorted leaf growth (buckles). Erinea provide a feeding site for the expanding BLBM population and shelter from predators and unfavourable environmental conditions. Mature mites will disperse from the erinea when overcrowding occurs or the erineum deteriorates.



Boneseed leaf buckle mite

Photo courtesy of Charnie Craemer and Alan Hall, Plant Protection Research Institute, South Africa

BLBM is a natural enemy of boneseed and has the potential to suppress vigour and/or seed production. Host testing in South Africa has shown that boneseed is the preferred host and that BLBM is safe to introduce into Australia. BLBM was approved for field releases in Australia in July 2008.

## Steps to establish a boneseed biocontrol nursery

1. Make contact with the regional NRM board or SARDI regarding intentions to establish a boneseed biocontrol nursery and confirm that inoculants will be available.
2. Identify a location for the nursery. Established community nurseries that grow indigenous plants are great as they have propagating equipment and facilities to grow and water plants. These nurseries are often enclosed to stop theft and browsing animals. But be aware of the use of chemicals particularly insecticides.
3. Seek an exemption letter from the regional NRM board (see page 4).
4. Have pots (15cm diameter should be fine) and potting mix ready for arrival of seedlings, they will need to be potted immediately.
5. Locate a population of healthy boneseed seedlings. Make sure you have the appropriate permissions for the removal of plants.
6. Hand-pull seedlings, 20-60cm tall, transport in a moistened, cooled plastic bag and transplant singly as soon as possible.
7. Water plants immediately and keep shaded and cool if possible.
8. Shoots can be trimmed on larger plants to leave 3 or 4 lateral buds. This will promote multiple shoot growth and relieve moisture stress on roots during recovery from transplantation.
9. Notify your regional NRM board or SARDI that you are ready to inoculate plants and they will source the BLBM inoculum for you. BLBM comes from interstate as leaf galls and has an almost zero shelf life, so must be applied to plants immediately. BLBM will **not** be sent on a Friday to arrive on a Monday because they will more than likely die over the weekend without an appropriate fresh food source.
10. Inoculate plants immediately using the method described below.
11. Maintain plant health.



Potted boneseed plants three weeks after being hand-pulled from the field. Plants tagged and banded for inoculation.  
Photo courtesy of SARDI



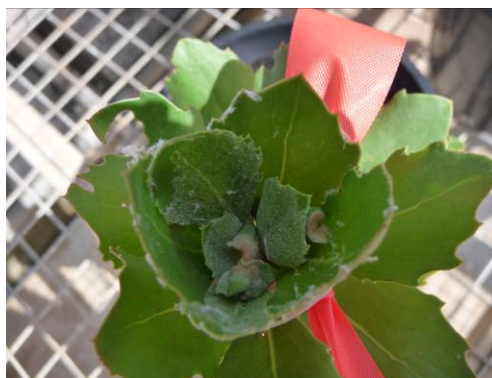
Large boneseed plant trimmed to promote lateral growth.  
Photo courtesy of SARDI

## Inoculating boneseed with BLBM

1. BLBM is released by inoculating healthy, actively growing boneseed shoot tips with fresh BLBM galls harvested from infested plants.
2. Select a healthy shoot tip that terminates with soft, downy young leaves.
3. Flag the shoot with flagging tape and note date of inoculation on the tape.
4. Gently encircle the shoot tip with an elastic band and draw the terminal leaves inwards to form a loose cup.
5. Place 3 or 4 BLBM galls into the base of the cup.
6. Keep records - date inoculum received, date of inoculation, how many galls used per shoot, how many shoots per plant inoculated, when the first new galls appeared.
7. Complete a boneseed leaf buckle mite release form and send a copy to your contact at the regional NRM board and to SARDI.
8. Keep a copy of the release form for future reference.
9. As galls develop continue to inoculate other plants in the nursery always leaving some galls on the donor plant.



Growing tip of boneseed plant formed into a cup.  
Photo courtesy of SARDI



Snipped galls placed into cup to allow mites to move into fresh growing tips on boneseed plant.  
Photo courtesy of SARDI



New erinea visible as patches of white hairs and small leaf distortions in new growth.  
Photo courtesy of Vic DPI



Mature erinea with larger leaf distortions and browning of erinea.  
Photo courtesy of Vic DPI

## What to expect

If the inoculation is successful fresh BLBM galls will appear weeks to months after the release. A cohort of galls may develop on the inoculated shoot tips. They will appear as abnormal patches of leaf hairs associated with irregular leaf distortions. Fresh galls will only develop on young growing leaves, never on old leaves. Galls will develop more quickly in warmer weather than in cooler weather.

Releases into the field are of 3-4 galls per shoot tip and can be made as soon as the nursery has enough galls and is self-sustaining. This may take between 3-12 months depends on how well the mites establish in the culture plants.

## **Exemption to collect and grow boneseed**

Boneseed is declared as a Class 4, Category 2 plant under the *Natural Resources Management Act 2004* and as such there are prohibitions regarding its movement, sale, and cultivation, and requirements to control.

Regulation 30(4) of the *Natural Resources Management (General) Regulations 2005* provides a general exemption so that a person who is participating in a community program to rear and release an agent for a target organism declared under the *Biological Control Act 1986* is exempt from the movement provisions under section 175(1), (2) and (3) of the NRM Act. A person establishing a boneseed biocontrol nursery for boneseed leaf buckle mite is covered by this exemption.

This leaves the issue of cultivation to be resolved. Under section 182(4) of the NRM Act a letter of exemption to control specific declared plants can be sought from the regional NRM board in the NRM region where the plants are to be grown, for a specified address and a specified period of time.

## **Chemicals and biocontrol nursery**

The boneseed leaf buckle mite may be affected by insecticides and in particular by miticides. Do not spray inoculated plants with insecticides. Isolate plants made unhealthy by agents other than the BLBM and seek professional advice and/or destroy plants.

Fertilizers are recommended for potted plants and will promote healthy growth but be aware that you don't want plants to have fast growth but slow healthy growth. This will enable mites to establish in the growing points and grow with the plants.

## **Contact**

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Regional NRM Board: See [www.nrm.sa.gov.au](http://www.nrm.sa.gov.au)

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