

# Producing high quality seed for Silver Banksia

Silver Banksia once covered large tracts of land across southern Australia but in many regions it now exists as small populations or isolated trees, making it difficult to source high quality seed to restore this important species.

## Species information

Silver Banksia (*Banksia marginata*) derives its name from the silvery underside of the leaves although it is also called honeysuckle and dwarf honeysuckle. It is known to occur from the Eyre Peninsula in South Australia to north of Armidale in NSW, including Tasmania and the Bass Strait Islands. Silver Banksia grows on a range of soils and in different environments ranging from coastal to inland. Although no subspecies are recognised, Silver Banksia varies from a small shrub (1 m) to a very tall tree (12 m). It is an important food source for many birds and animals.



*Silver Banksia* (Photo: Rob Dabal)

## Seed Production Areas

Genetic diversity in small and isolated populations of any species is often low, impacting on the amount of seed being produced and its quality. Consequently, this can make it difficult to collect enough seed for restoration while the low quality of the seed collected

means that it often germinates poorly and fails to thrive. Using this seed for restoration means that we have less to work with so we can't plant as many as we might want to, and, what we plant may not survive.

Seed production areas (SPAs) can help to secure seed supply for restoration. SPAs are like fruit orchards except that they produce native seed. SPAs have several advantages:

- We can select the plants to use so we know that they are genetically diverse.
- We can monitor and control water and nutrients to produce seed more regularly than what occurs naturally.
- We can leave more seed in the bush for natural regeneration for native fauna.

SPAs can be costly to set up and for longer-lived species like Silver Banksia, it may take many years before seed is produced. Consequently it is important that we are confident that high quality seed will be produced.

## The GB CMA Silver Banksia SPAs

The Euroa SPA was established by the Euroa Arboretum in the Goulburn Broken Catchment in 2001 using seed from several small populations and isolated trees in the broader Euroa and Strathbogie Ranges district. A few plants from a declining population at Gulpa Island in NSW were also included.

## Genetic Evaluation

We recently evaluated how much genetic diversity was present in the Euroa Silver Banksia SPA to determine:

1. Whether we needed to add more plants to increase diversity and improve seed quality.
2. If there was a risk of inbreeding among the SPA plants which could affect seed quality.

- Whether there were different genetic groups among the remnant populations and whether these were evenly represented in the Euroa SPA.
- Identify the source populations of plants in the Euroa SPA whose tags had gone missing.



*Silver Banksia plants at Euroa Arboretum SPA  
(Photo: J Begley)*

## Findings

Levels of genetic diversity in the Euroa SPA was similar to that of the remnant populations that we sampled for comparison. While this is a good result, these remnant populations are themselves small with low genetic diversity. Bringing seed from these remnants together into a large breeding population at Euroa has created a larger breeding population that should produce higher quality seed than that collected from these natural populations. However by adding some plants sourced from other, larger populations to this SPA will boost genetic diversity even more.

Inbreeding in the remnant populations was higher than that in the Euroa SPA. This is also a good result and demonstrates that bringing seed from these remnant populations together into a single site has been beneficial and should result in outbred and better quality seed.

Three genetic groups were present among the remnant Silver Banksia populations. There was good representation of two of these groups at Euroa but

some additional material from Blue Range could be added to balance out the representation of the groups. Plants without tags could be assigned to one of the remnants sampled with reasonable confidence. It was also apparent through genetic analysis that a few plants may have had the wrong tag.

## Future research

We still need to do some more research on these SPAs including:

- Checking the levels of genetic diversity and inbreeding in the seed being produced by the SPA. This is because while we have a good genetic foundation at Euroa, how birds and animals move pollen between the trees and from more distant populations can also influence the seed quality.
- Checking the levels of genetic diversity and inbreeding in populations that have been restored using this seed. This is because high plant death in the field can reduce the genetic diversity of a restored population to not much better than the small remnant populations we already have.

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