Introducing...

SEED PRODUCTION AREAS

An Answer to Native Seed Shortages

What is a Seed Production Area?

Seed Production Areas (SPAs) are areas where native plants of known seed source are grown to produce seed. This can be done using a horticultural type method or as part of a mixed biodiversity planting. Greening Australia (GA) is encouraging and assisting landmanagers to establish SPAs to bolster the supply of understorey species and complement the seed sourced from wild populations or Seed Collection Areas (SCAs).

The establishment of SPAs represents an innovative solution to:

- Securing much needed understorey species and improving regional biodiversity
- Ensuring a continued supply of known provenance seed
- Providing opportunities for alternative land use and income
- Planting multi functional vegetation – windbreaks, soil improvement
- Increase the availability and genetic diversity of local native seed
- Providing land managers with a guaranteed purchaser and distributor of seed

Why we need Seed Production Areas NOW

1. There is not enough native seed to meet the ever increasing demand and diversity of our revegetation and restoration work.
2. The quality and quantity of seed collected from wild populations is often unreliable. Harvesting seed from the wild is also constrained by ethics, permits, legislation, licensing and travel time.
3. The drought, plant and seed predation and diminishing healthy stands of remnant vegetation have contributed to this seed shortage.

An ideal Seed Production Area is located close to facilities that enable the site to be easily managed and monitored especially around harvest time.

Greening Australia

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Types of Seed Production Areas

1. Mixed species environment restoration
2. Same species tree lines
3. Mounded rows
4. Mounded rows with full weed mat coverage
5. Containerised boxes
6. Trellised rows
7. Inter row planting

1. Mixed species environment restoration includes seeds or plants of known provenance that are commonly available and either direct seeded or planted as part of revegetation works. This seed production method is suitable for commonly used larger trees and shrubs and is both low risk and low maintenance. The disadvantages are that the site is likely to be remote and therefore harder to manage and harvest. The seed is likely to attract lower market values, although the volumes may be higher. Some farmers utilise the seed from these areas for additional revegetation in a 'grow your own' approach.

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2. Same species tree lines are also suitable for medium to tall shrubs. This method is suitable for larger areas and those with a high disturbance history. These sites have an added advantage of delivering other environmental benefits such as windbreaks, visual screens, habitat corridor linkages and opportunities for crash grazing to suppress weeds.

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3. Mounded rows suitable for herbs, small shrubs and grasses are ideal for smaller intensive areas under 2 ha. The mounds are covered with weed mat or mulch to minimise weed competition and contamination to collected seed. Maintenance between the rows can either be mowing or spraying or a combination of both depending on equipment. Irrigation runs down the centre of the mound on drip irrigation.

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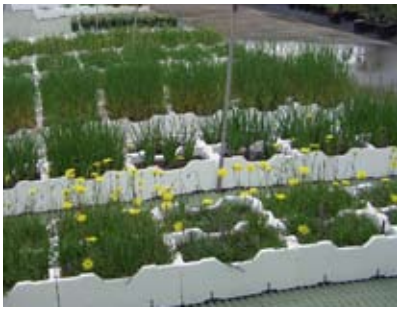
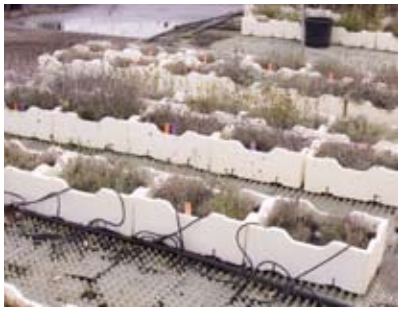
4. Mounded rows with weed mat covering the entire area are suitable for small shrubs, scramblers, creepers, herbs and grasses in areas of high weed infestation and for species that eject or rapidly release seed. The weed mat provides a clean ground surface to assist harvesting. Irrigation runs down the centre of the mound on drip irrigation.

5. Containerised boxes suitable for herbs and grass. This is a highly intensive system requiring good irrigation and infrastructure. Although labour intensive, this approach has the potential to produce high market value seed from species less commonly collected or grown. Growing plants in such a regulated environment means management and harvesting seed is more controllable.





6. Trellised rows suitable for climbers and scramblers and small areas. The system makes harvesting these species easier but requires additional structures.

7. Inter row planting between existing horticultural crops such as orchard or groves is suitable for small shrubs, grasses and grass like plants.

Things to consider when deciding to establish a Seed Production Area

- LAND or area
- TIME, machinery and equipment
- Your availability at harvesting time which is often at Christmas
- WATER availability and quality
- SEED sourced from healthy populations and plants in known localities
- Species selection and the needs of each species
- Market and regional needs of species
- Plant and seed predation from birds, insects and other animals

7 savvy tips on species selection and planting design

Any planting design should allow for optimal plant growth, easy seed collection and site management and not promote excessive competition between plants or opportunities for weed dominance.

1. Plant more than 100 seedlings per species with seed sourced from at least 20 different widely spaced parents. This is the minimum requirement to maintain genetic diversity and produce high quality seed.
2. Consider the impacts of shading and wind when designing a SPA. For example, larger plants on the edges of SPAs can act as a windbreak and/or minimise internal shading.
3. Some genera (such as Grevillea and Callistemon), hybridise easily and should be physically separated or limited to one species per site.
4. Maximise accessibility for management tasks such as watering, mowing, pruning and harvesting by locating the site in close proximity to facilities.
5. Match species selection with local climatic and soil conditions of the site. For example, factor frost hollows and sites that can become boggy or waterlogged.
6. Give every species equal chance of pollination. Block plantings of similar species are much more effective for cross pollination from neighbouring plants than mixing up species or long lines of the one species.
7. Try to locate the site close to natural bush to assist with pollination especially from insects. Be aware however, non local production seed could escape into the bush or hybridise.

Activities that may need to be undertaken in a Seed Production Area

Site preparation	Management	Seed supply
Fencing to exclude stock	Watering *	Monitoring seed ripeness
Ripping	Spot spraying for weeds*	Harvesting
Spraying	Mowing *	Drying
Mounding/ Hilling/ Bedding *	Hand weeding *	Cleaning
Weed matting *	Pruning *	Storage
Tubestock planting *	Netting for bird control *	Selling to Greening Australia
Irrigation *	Pest management e.g. Insects	Site access for related events

** Optional for SPA types 1 & 2*

13 thrifty tips on site establishment and maintenance

1. Fence site off from stock and maintain, where necessary.
2. Maintain firebreaks and ensure vegetative growth remains low.
3. Soil preparation prior to planting should include ripping (up to 6 months in advance) and preferably mounding, particularly when there is poor drainage or waterlogging. Mounds should rise approximately 30cm above ground level.
4. Inter row spacing widths for each species will vary, depending on plant height and form and site aspect. Plant density needs to factor plant type and size of the plant when fully grown and can be planted so foliage is touching at adult stage. Close plantings will maximise space and consolidate management, infrastructure and harvesting.
5. Plastic woven weed mat or similar can be laid to greatly improve weed control. Mulch can also be used with or without weed mat but must not be contaminated with weed seed.
6. Smaller plants will benefit from a reliable watering system such as dripper hose or micro-drip design. Regular watering or irrigation checks include replacing mulch or weed mats (and inspection of irrigation connections, fittings and drippers).
7. Label each block or row using stakes, aluminium tags or other permanent markers to define species and provenance code.
8. Minimise predation damage by rabbits, kangaroos, insects, birds etc... using a combination of deterrents such as fences, tree guards and bird netting.
9. Periodically inspect the site for insect attack especially when seed has set. Wattle and Pea seed is particularly prone to insect and bird attack.
10. Prune plants to limit plant height and encourage large, open crowns to facilitate fruiting and seed production.
11. Ensure plants are healthy and are not suffering from dieback, disease or nutrient deficiency.
12. Replace losses and consider that that some smaller plants and wattles may need replacing after 5 years to maintain yields.
13. *Weed control is critical to the success of any planting*, particularly seed production areas. Weed competition for light, space, water and nutrients will severely limit growth, plant survival and access.

Species profile for one of our most wanted

Immature fruit

Seed

Name:	*Daviesia mimosoides* or Narrow leaf Bitter pea
Seed demand:	High. Estimated market price for provenance seed: $1.60/gram
Habit:	Multi-stemmed, fast growing open-branched erect shrub
Site preference:	Well drained soils; tolerates frost, resents poor drainage
Plant spacing:	1–2 m high at 1.5 m apart
Life expectancy:	6 to 8+ years under favorable conditions, peak seed production: 2–4 years.
Fruit and seed type:	The fruit is a triangular-shaped flattened pod containing 1 to 2 small hard dark-brown to black mottle coloured seeds. Size approximately 2.5mm x 1mm wide.
Estimated volume at fill maturity on a healthy plant:	50 to 100g
Harvest time:	Early Dec to late Jan. Ripe pods are light-brown, brittle and rattle when shaken.
Seed collection:	Monitor very closely as seeds eject from pods within 1–2 days of maturity.
Seed viability:	Several years if stored correctly.

Harvesting Seed

Land mangers who decide to invest land, resources and time into establishing, managing and harvesting from a seed production area need to learn about the growth habits, management requirements, harvest times and collection techniques for each species.

Producing Quality Seed

Genetic diversity of your seed production area is essential for good quality seed.

The genetic quality of the seed produced is more important than the quantity and should have high viability and genetic diversity. Seed collected from inferior plants or compromised through poor seed production area design may actually reduce genetic diversity and reduce the resilience of plants to adapt to changing environmental conditions.

If possible keep records of which plants in your seed production area came from which parent population in the wild.

For more information on the importance of genetics in seed production areas refer to the Greening Australia brochure *Sex in Seed Production Areas.*

9 nifty tips for harvesting and storing seed

1. Plants hold onto seed for different periods. Some like wattles and pea species expel seed rapidly, while others such as Eucalypts, Tea Tree, Hakea and Banksia can hold seed for a lot longer.
2. Most understorey species fruit can be removed by hand or cut with secateurs.
3. Keep in mind that a lot of harvesting will occur over the Christmas and summer break and that hot weather conditions can rapidly ripen seed.
4. If you are unavailable to monitor and collect seed from small plants such as pea species when mature, open weave material such as stockings can be placed over the fruit to catch seed.
5. Temporarily store seed in porous materials such as paper bags, hessian or stockings. Sealed plastic bags can be used for long term storage as long as the seed is fully dry.
6. Bugs can eat a lot of seed in a short time, so it is important to treat the seed to avoid insect attack. Carbon dioxide or refrigeration is commonly used to kill bugs.
7. Some seed can cause irritation during harvesting, drying and processing such as Kurrajong, Cassinia and some grasses.
8. Drying fruit should occur in a well ventilated, dry, shady position away from insects and may need to be shaken to release seed from fruit.
9. Screens and sieves are the most common tools used in seed cleaning and seed must be completely dry for storage.

The Need for Seed…

Cleaned and stored seed

Seed for direct seeding

Seed for tubestock

Where does all the seed go?

Community participation

Research and understorey enhancement planting

Restoration and revegetation work

Contacts

- Greening Australia nationwide: **www.greeningaustralia.org.au**
- Greening Australia (Capital Region): **Bindi Vanzella 02 6253 3035**
  Offering seed production area partnerships in the Capital Region
- Florabank – **www.florabank.org.au** or call **02 6202 1600**
  Florabank helps people across Australia exchange information and ideas about native seed.

Produced by Greening Australia Capital Region

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