

THE NEED FOR SEED

Seed production systems for
herbs, forbs & grasses

Introduction to **Seed Production Areas (SPA)**

- Used for horticulture & agriculture
- Used for forestry
- Now used to achieve biodiversity restoration outcomes

The Need for Seed

- The grass & groundcover stratum contains a high number of plants per square meter
- We need to apply high seed rates to achieve the desired cover, diversity & limit niche availability to weed species
- Seed from many of the groundcover & grass species isn't available in the quantities required to undertake large scale restoration of grasslands or grassy woodlands

Direct Seeding Top Down vs Bottom Up



Single line seeding of canopy & mid-storey species does not make a grassy woodland

Groundcover Seeding



Seed placement across the entire surface

SPA vs Wild harvest

Why Invest in Seed Production Areas?

SPA Pros

- Reliability of supply
- Able to supply seed of species in quantity that would otherwise be unobtainable
- Quality of seed: optimised conditions for seed production
- Reduces time spent 'searching' for seed sources
- Provenance can be maintained
- Reduces reliance & impact on limited remnant populations

SPA Cons

- Investment cost for infrastructure can be substantial
- Maintenance: even well designed SPAs will require regular maintenance
- Need long term outlook to identify seed requirements throughout the project

Wild Harvest Pros



- Investment is limited to locating & monitoring suitable seed sources
- In good seasons, harvests in quantity of many species can be considerable

Wild Harvest Cons

- Requires considerable knowledge & experience to be able to bulk harvest
- Grasses & groundcovers likely to have weed contamination
- Grassy remnants often in areas 'maintained' by local government
- Seed quality less reliable
- Can 'lose' seed easily

Selecting Species for SPAs

- Not all species will be suitable to seed production areas & careful consideration needs to be made to getting value from a seed production area
- Species that live a long time, reproduce very sporadically, rely mostly on vegetative renewal or require a lot of space for each individual are best avoided

Coloniser Species



- Species that start reproducing in their first or second season get the best return from SPA infrastructure investment
- Species that seed prolifically best value

On & on...



- Species that have a long reproductive season and require multiple field harvests are ideally suited to an SPA
- Species that readily release their seed when its ripe

Traps for new players...



- Avoid dioecious species. The male plants use up valuable space in the SPA
- Plant spacing: will affect production & the ability to maintain & harvest
- Sourcing of genetic material

Short term projects



- Don't bother with a purpose-built SPA if your revegetation project will be completed in one season

What do you want the SPA for?

- ***Small scale:*** tube-stock production (can then include species for vegetative reproduction) & small area direct seeding
- ***Large scale:*** landscape scale restoration that requires bulk seed and mechanical direct seeding techniques

Types of SPA

- Foam box system
- Weed mat system
- Broadacre system

Foam box system



- As used by Grassy Groundcover Restoration Project
- Irrigation mandatory
- Soil mix can be ‘tuned’ to a particular species’ requirements

Weed mat system



- Uses 'cells' of woven weed mat that limits weeds, and acts as a collection medium for released seed
- Irrigation not essential, but recommended for supplementary watering

Broadacre system



- Mainly used for grasses where large quantities of seed
- Irrigation necessary in lower rainfall areas, or where regular rainfall events are unreliable

About irrigation...

- Allowing for irrigation is recommended for all systems
- Will improve reliability of supply, quantity and quality of seed
- Assists establishment of both tube planted and direct seeded SPAs

Harvesting



- Who is going to harvest your SPA?
- Requires reasonable labour input to harvest & process seed
- Large scale SPAs, especially broad-acre grass areas will require specialised equipment

Storage



- Where are you going to store the seed?
- Forb & herb seed doesn't take up much space, but needs a cool, dry vermin free location
- Grass seed is bulky, and a large SPA will produce a lot of seed

A Lot More to Learn!

Using SPAs to supply seed for revegetation & restoration projects has a bright future, but there is a lot more to do...

Maintaining a grass sward for seed production



- Intervening in grass ecology is necessary to ensure they reproduce at full capacity

More species to try!



- SPAs are simply a means to an end: to supply seed for projects
- However, they can also help us to understand more about managing individual species in the landscape, and their seed ecology

Acknowledgements

(yes Paul, it really is about the people!)

- Glenn Christie for introducing me to weed mat 'seed orchards' & Ian Chivers for introducing me to native grass 'Seed Production Areas'.
- Bob Myers, John Stafford, Ian Chivers, Tim Barden, Chris Findlay, Ian Cole, Colin Seis & Glenn Christie for their time on phone & in the field over the years talking through everything from brush harvesters to chemicals.
- The guys at the DENR Urban Biodiversity Unit: Chris, Geoff, Shauna & Ben especially for letting me indulge in impromptu grassland management experiments...
- The team at Dept of Planning, Transport & Infrastructure, esp Jordana Wilson, & the troops at City of Salisbury, particularly Brian Pledger, for believing that we could build seed production areas here & then going and finding the money for it
- & many others...