Ex situ seed banks are a good investment as small deposits drive big returns

Damian Wrigley
National Coordinator
November 2018
Our vision is a future where native plant diversity is valued, understood and conserved for the benefit of all.
• The Council of Heads of Australian Botanic Gardens Inc.
• Not for profit organisation
• Business Plan 2011-2020
• National Steering Committee
• National Coordinator
Global Strategy for Plant Conservation

• 16 Targets to guide plant conservation
• Target 8 and 9
• Flexible framework
• Botanic Gardens and Parties to CBD
• Post-2020 biodiversity framework
### Overview of progress towards the GSPC targets in a selection of countries

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**Key:**
- **Green**: More than 65% progress
- **Yellow**: 30-50% progress
- **Red**: Less than 30% progress
Millennium Seed Bank Partnership

- The Millennium Seed Bank Partnership is the largest plant conservation program in the world.
- Operating in over 84 countries with more than 200 partner organisations.
- Follows an integrated conservation strategy – *ex situ* long term conservation of seeds supporting *in situ* conservation actions.

- CHABG has resigned an MoC for 2018-2023 to continue to participate in the MSBP.
MSBP Seed Conservation Standards

GBDBG
MSBP Seed Use Survey 2018

• MSBP perform an annual survey of partners on all aspects of seed banking

• International seed use is following similar trends

• Annual use of collections - focussed on Botanic Gardens, habitat restoration and seed science.
Kew’s Science Collections Strategy

• First scientific collections strategy in Kew’s history
• New collections must be purposeful
• What and how collections are made must evolve with emerging technologies
• Stakeholder must be able to access collections
Australian Context

- Partner Institutions
- Australian Government
- Millennium Seed Bank Partnership
- Fieldwork Funds
- Global Trees
- C4 Photosynthesis
- *P. cinnamomi*, *A. psidii*
- Crop Wild Relatives

*Acradenia frankliniae*, RTBG
**Phytophthora cinnamomi**

- Genetically diverse collections from species impacted by *P. cinnamomi*
- Collecting in four states
- Secured 60 collections of 27 taxa
- Seed orcharding and restoration

*Prosanthera eurybioides, BGSH*
Western Australian Threatened Flora Seed Centre

Verticordia spicata ssp. squamosa (DBCA)

Banksia brownii (DBCA)
PlantBank, Australian Botanic Garden

- *Persoonia pauciflora*

- Experimental plantings within and outside of native range
- Vegetative propagules vs seedlings
- 1000 plants with 70% survival rate
- Project stewardship of local community
South Australian Seed Conservation Centre

- Project in the swales and swamps of Mt Lofty Ranges
- Seed orchards and translocations
- Germination research

Eryngium ovinum SASCC
Victorian Conservation Seedbank

Ballantinia antipoda

- RBGV orcharded 20,000+ seedlings
- Seeds germinate after sowing given good rains
- Successive sowings may build-up soil/moss seed bank
- Good site selection and future spring rain
WA Seed Technology Centre

- *Androcalva perlaria*
- Limited extant populations over narrow geographic range
- Mining, land degradation and climate change
- Translocations across two locations over time
- Different treatments and considered site selection
Sclerolaena fontinalis, BGSH

Myrtle Rust in Australia
A draft Action Plan

Gavin Phillips in the field, RBGD
Plectranthus acariformis, BBG
Sharing Knowledge

Seed conservation techniques training
New Zealand – Dec 2017 – BBG and RBGDT

Wellington and Auckland Seed Conservation Techniques Training. Image: MSBP
Germination and Dormancy challenges

• Collections tested for viability & most are available for research or restoration.
• Seed dormancy continues to be a challenge
• Availability of germination protocols continues to be a focus

A diversity of annuals near Ninghan, WA, BGPA
Science and Research

• National Seed Science Forum synthesis
• Saving rainforest seeds of S.Pacific
• Seed dormancy and germination
• Seed based tech for restoration
• Understanding and responding to weed invasions

Lasiopetalum moullean, Dr Andrew Crawford, DBCA
Seed Science and Research

Fig. 1. Conceptual diagram demonstrating that seed science, and the cross-cutting themes of the National Seed Science Forum (1) Dormancy and Germination; (2) Establishment and Management; (3) Seed Storoge, Conservation and Utilisation and; (4) Seed Ecology, are fundamental to many fields covered in this special issue (*), and to many other areas of research that are new and emerging, or already published elsewhere (arrows with continuous borders). Future advances across all of these areas will most likely involve greater synthesis and accessibility of data, and engagement and collaboration across multiple sectors (arrows with dashed borders) – with seed science in Australia remaining at the forefront.
National Seed Science Forum

Hosted at PlantBank in 2016

To be hosted by Australian National Botanic Gardens in 2020

National and International seed scientists

Germplasm conservation of native and agricultural floras and the future priorities for seed science
Annual Report 2017-2018

Available on the ASBP website

www.seedpartnership.org.au/about/reports
www.seedpartnership.org.au

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