

Florabank Guidelines

best practice guidelines for
native seed collection and use

SECOND EDITION

Florabank Consortium: Australia

Editor: Lucy E. Commander

How to cite these Guidelines

Commander LE (Ed.) (2021) 'Florabank Guidelines – best practice guidelines for native seed collection and use (2nd edn).' (Florabank Consortium: Australia)

Disclaimer

Please be advised that the recommendations presented in this document do not necessarily represent the views of the agencies / organisations in which the authors are employed. These guidelines are subject to change. No responsibility will be taken for any actions that occur as a result of information provided in these guidelines.

Copyright

The copyright for this publication belongs to the Florabank Consortium. Information in this publication may be reproduced provided that any extracts are acknowledged.

ISBN: 978-0-9752191-5-7

The update of the Florabank Guidelines was funded by the New South Wales Government through its Environmental Trust, as part of the Healthy Seeds Project, and administered by the Australian Network for Plant Conservation (ANPC). It was overseen by the **Healthy Seeds Consortium** consisting of representatives from the ANPC, Australian Association of Bush Regenerators, Australian Seed Bank Partnership, Centre for Australian National Biodiversity Research, Greening Australia (GA), NSW Department of Planning Industry and Environment, Royal Botanic Gardens and Domain Trust, and the Society for Ecological Restoration Australasia. The **Florabank Consortium** which will oversee implementation of the Guidelines consists of the Australian National Botanic Gardens, ANPC, CSIRO and GA.



Contents

Module 1 – Introduction

Key points	3
Florabank Guidelines: version 2.....	4
Maintaining and restoring natural systems in Australia: the need for seeds.....	5
Restoration does not replace preservation or protection	8
Regeneration versus reintroduction: the role of seeds?	9
Why do we need native seed-use Guidelines?.....	10
What is the Australian native seed industry?.....	10
The key issues in the seed industry	12
Who should read the Guidelines?	13
What’s in the Guidelines? Where should you start?.....	14
Detailed planning informs species selection for seed-based restoration	16
To find out more.....	20
Glossary	21
Acknowledgements.....	22
Online resources	23
References and further reading	23

Module 2 – Working with Indigenous Australians: Seed Knowledge, Partnerships, Intellectual Property and Permissions

Key points	3
Introduction	4
Traditional and contemporary seed use by Indigenous Australians	4
Partnerships, intellectual property, commercial issues and permissions	6
Concluding remarks.....	11
Acknowledgements.....	11
Online resources	11
References and further reading	12

Module 3 – Approvals, Principles and Standards for Seed Collection

Key points	3
Introduction	4
Section 1 – Legislation.....	4
Section 2 – Guiding Principles	11
Section 3 – Seed standards and accreditation	12
Acknowledgements.....	15
Online resources	15
References and further reading	16

Module 4 – Record Keeping

Key points	3
Introduction	4
Purpose of Record Keeping	4
Reporting Information	5
Record Keeping Concepts	6
Electronic Record Keeping – Concepts and Design	8
Deciding What to Record	11
Collation, Analysis, and Sharing	13
Technology	14
Acknowledgements	17
Online Resources	17

Module 5 – Seed Sourcing

Key points	3
Introduction	4
What is a provenance?	7
Which provenancing strategy should I use?	12
How much to collect?	18
Final note	23
Acknowledgements	23
Glossary	23
Online resources	26
References	26

Module 6 – Seed Collection

Key points	3
Introduction	4
Planning ahead	4
Information about the target species	5
When to collect	8
How much seed to collect	9
Seed collecting methods	10
Seed handling	15
Plant identification and data	16
Seed collecting equipment	17
Acknowledgements	19
Online resources	19
References and further reading	20
Appendix 1. Seed Machinery for seed harvesting	22
Appendix 2. Seed collection information sheet templates	24

Module 7 – Seed Production

Key points	3
Introduction	4
What is seed production?.....	4
The need for SPAs	6
Benefits of SPAs	8
Downsides of SPAs.....	9
Will a SPA be viable?.....	9
Sourcing founding material	13
Designing a SPA	16
Growing systems	23
Crop establishment.....	27
Acknowledgements.....	34
Online resources	34
References and further reading	34
Appendix 1. Sample Audit Sheet used by Murray Local Land Services.....	37

Module 8 – Seed Processing: Post-harvest Drying, Seed Extraction and Cleaning

Key points	3
Introduction	4
Fruits and seeds.....	6
Post-harvest drying	9
Separating seed and non-seed bearing material.....	12
Extracting seeds from fruit.....	13
Cleaning seed lots to improve quality	15
Pre-storage drying.....	17
Hygiene and biosecurity	19
Safety issues	19
Record keeping	19
Concluding remarks.....	20
Acknowledgements.....	22
Glossary	22
Online resources	22
References and further reading	23

Module 9 – Seed Drying and Storage

Key points	3
Introduction	4
Seed storage behaviour	5
Seed longevity in storage	7
Seed drying prior to storage	8
Measuring seed moisture content	11
Seed storage containers	13
Storage temperature	15
Insects and other pests	18
Monitoring seeds in storage	18
Seed store design considerations	19
Acknowledgements	20
Glossary	20
Online resources	21
References and further reading	21

Module 10 – Seed Quality Testing

Key points	3
Introduction to quality testing	4
What happens if seed isn't tested?	6
Seed collection information	7
Qualitative seed tests	7
Acknowledgements	23
Glossary	24
Online resources	25
References and further reading	26

Module 11 – Seed Germination and Dormancy

Key points	3
Introduction	4
Seed germination testing	4
Seed dormancy classification and alleviation	17
Final note	26
Acknowledgements	27
Glossary	27
Online resources	28
References and further reading	29

Module 12 – Seed Enhancement Technologies

Key points	3
Introduction	4
What are seed enhancement technologies?	5
The origins of seed enhancement technologies in agriculture and horticulture and how these are now being used for native seeds.....	6
What SET options are currently available and commonly used with native seeds?	6
What other compounds can be added to benefit SET applications and their effectiveness?	17
Where to now with SETs?	20
Acknowledgements.....	22
References and further reading	22

Module 13 – Nursery Propagation of Tubestock and Restoration Planting

Key points	3
Introduction	4
Why propagate tubestock for restoration?.....	4
When to direct seed and when to plant tubestock?.....	5
Nursery propagation of tubestock	7
Propagation of tubestock from seed and general growing conditions	8
When seeds are not enough – other tubestock propagation approaches	17
Nursery hygiene practices.....	24
Nursery infrastructure.....	25
Timing propagation to match restoration scheduling.....	27
Site preparation, field planting and follow up care and maintenance	29
Acknowledgements.....	33
Glossary	33
Online resources	35
References and further reading	35

Module 14 – Direct Seeding

Key points	3
Introduction	4
What is direct seeding?	4
Should I use direct seeding?	6
Direct seeding approaches	7
Planning direct seeding	9
Identifying and assessing seeding sites	10
Seeding Machinery	12
Seeding Rates	19
Seed treatments	25
Sowing Mixes	26
Post-seeding management	27
Monitoring	27
Record keeping and reporting	28
Acknowledgements	29
Online resources	29
References and further reading	29

Module 15 – Buying and Selling Seeds

Key points	3
Introduction	4
Top tips for seed purchasers	4
Calculating Value for Money Using Testing Data	14
Acknowledgements	16
Online resources	16
References and further reading	16