



Native seeds for ecological restoration and the new life of SID (Seed Information Database)



What constitutes native seed for ecological restoration purposes?




A seed batch is appropriate for restoration purposes when its genetic diversity, representative of the population of origin, is preserved, as far as practical, throughout the supply chain and deployed on a restoration site of suitable ecological conditions.

~~SELECTED/IMPROVED VARIETIES~~

~~NATIVE SEEDS~~




Crop and native seed standards: are they different?

SEED OF SELECTED/IMPROVED VARIETIES

-  Long periods of **plant breeding** and selection
-  Seed characteristics such as dormancy and seed fill are substantially altered for **agronomic reliability**
-  Agricultural seed supply chains are designed to maintain the **genetic purity** and **varietal stability**

PRODUCE FOOD/GOODS

NATIVE SEEDS

-  Native seed represents a **broad** array of **genetic diversity** indicative of parental diversity and local adaptation in the wild populations
-  High interspecific **variability** and **logistical complexities**
-  The information of the **seed origin** from the should follow the seed batch through the supply chain to the end user.

RESTORE ECOSYSTEMS

Policy and regulations

POLICY ARTICLE

How policies constrain native seed supply for restoration in Brazil

Danilo I. de Urzedo^{1,2}, Robert Fisher¹, Fatima C. M. Piña-Rodrigues³, Juliana M. Freire⁴, Rodrigo G. P. Junqueira⁵

L 228/10

EN

Official Journal of the European Union

31.8.2010

DIRECTIVES

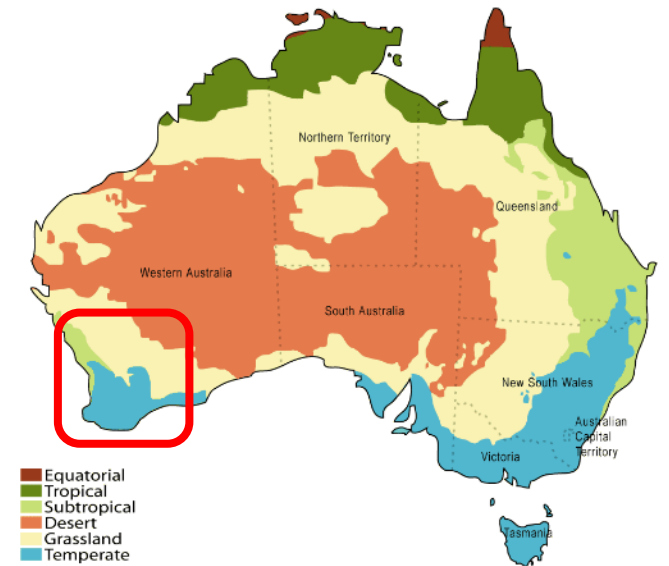
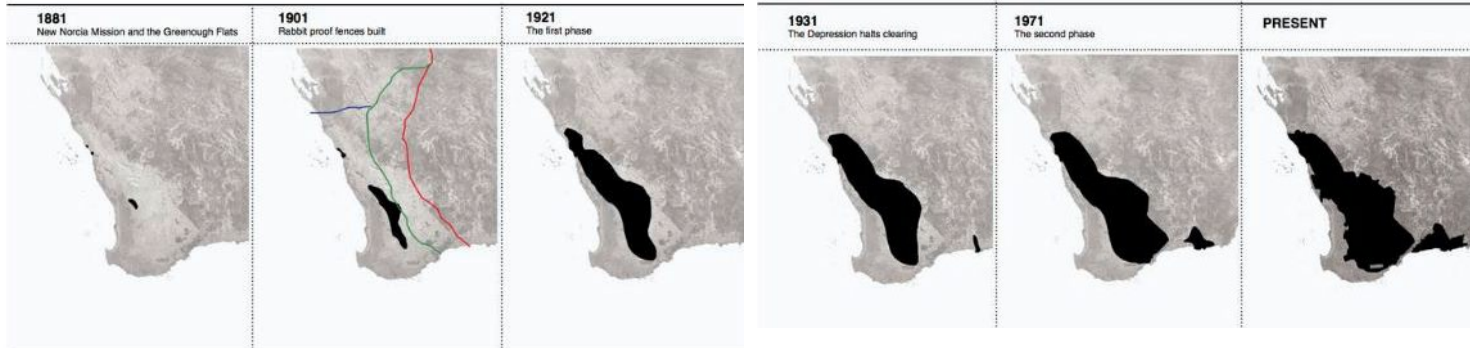
COMMISSION DIRECTIVE 2010/60/EU
of 30 August 2010

providing for certain derogations for marketing of fodder plant seed mixtures intended for use in the preservation of the natural environment

(Text with EEA relevance)



Why should we use native seeds?



PLANTS OR SEEDS?



1,000 ha



Target -> 2,000 plant/ha = 2,000,000 plants

Plant survival = 50% —> 4,000,000 plants

Cost per plant\$ 1.00

Cost of planting (per plant).....\$ 0.25

Cost per plant in the ground.....\$ 1.25

\$ 5,000,000

How many seeds are in a kg?

PLS per kg
2,875,000



PLS: 23%



PLS per kg
177,100

PLS: 14%

WHY DON'T WE USE THE
NUMBER OF PURE LIVE SEEDS?

PLS: 10%



Seeds per kg
241,545

Swamp Saltbush
Atriplex amnicola 4.14 mg



Jam
Acacia acuminata 17.00 mg

PLS: 77%

Seeds per kg
58,825

1,000 ha

Seed establishment = ?%



Target -> 2,000 plant/ha = 2,000,000 plants



? kg



100,000 PLS/ha

100,000,000 PLS



RESTORATION ECOLOGY
The Journal of the Society for Ecological Restoration

SER
SOCIETY FOR ECOLOGICAL RESTORATION

ADVANCES IN MINING RESTORATION
RESEARCH ARTICLE

Seed quality and the true price of native seed for mine site restoration

Simone Pedrini^{1,2}, Haylee M. D'Agui¹, Tiana Arya¹, Shane Turner¹, Kingsley W. Dixon¹

129 species

Cost per 1000 PLS.....\$ 6.34 → \$ 634,000

Tot cost of seeding.....\$ 200,000

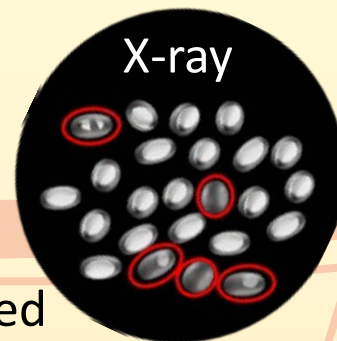
Total cost.....\$ 834,000



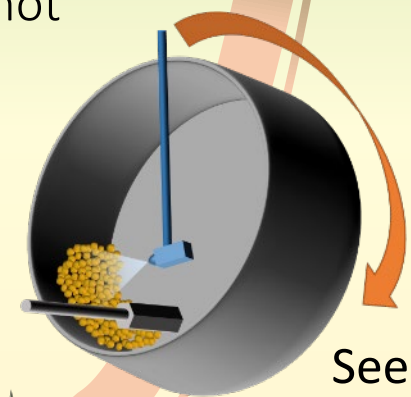
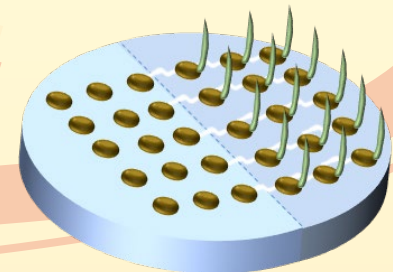
Demand for native seed is growing globally, and seeds are not available in the **quantity, diversity, and quality** required

NATIVE SEED SUPPLY CHAIN

Seed collection from natural populations




Seed storage








Seed enhancement




Seed planning, sourcing, and procurement

Vicky J. Erickson^{1,2} , Anne Halford³


Collection and production of native seeds for ecological restoration

Simone Pedrini^{1,2} , Paul Gibson-Roy³ , Clare Trivedi⁴, Candido Gálvez-Ramírez⁵, Kate Hardwick⁴, Nancy Shaw⁶ , Stephanie Frischie⁷ , Giles Laverack⁸, Kingsley Dixon¹ 



Ensuring seed quality in ecological restoration: native seed cleaning and testing

Stephanie Frischie^{1,2} , Annette L. Miller³, Simone Pedrini⁴ , Olga A. Kildisheva⁵ 








Seed storage: maintaining seed viability and vigor for restoration use

Marcello De Vitis^{1,2} , Fiona R. Hay³, John B. Dickie⁴, Clare Trivedi⁵, Jaeyong Choi⁶, Rob Fiegenger⁷





Dormancy and germination: making every seed count in restoration

Olga A. Kildisheva^{1,2} , Kingsley W. Dixon³, Fernando A. O. Silveira⁴, Ted Chapman⁵, Alice Di Sacco⁵, Andrea Mondoni⁶, Shane R. Turner^{3,7,8}, Adam T. Cross³ 

Seed enhancement: getting seeds restoration-ready

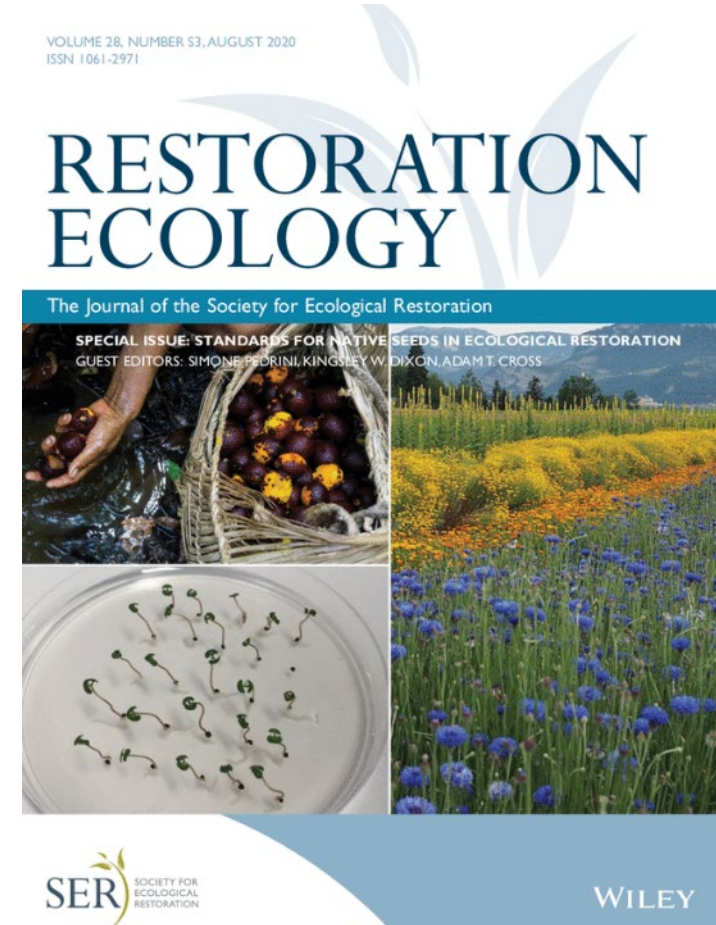
Simone Pedrini^{1,2} , Alma Balestrazzi³ , Matthew D. Madsen⁴ , Khiraj Bhalsing¹ , Stuart P. Hardegre⁵ , Kingsley W. Dixon¹ , Olga A. Kildisheva⁶ 

Seed use in the field: delivering seeds for restoration success

Nancy Shaw^{1,2} , Rebecca S. Barak³, Ryan E. Campbell⁴, Anite Kirmer⁵ , Simone Pedrini⁶ , Kingsley Dixon⁶, Stephanie Frischie⁷ 

International principles and standards for native seeds in ecological restoration

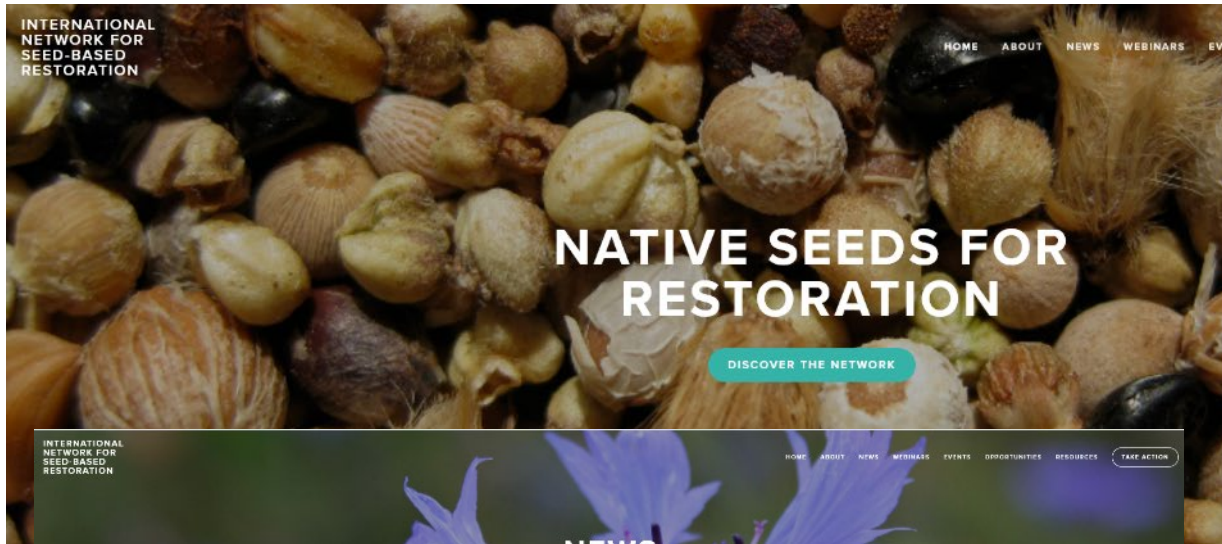
Simone Pedrini^{1,2} , Kingsley W. Dixon¹ 



<https://onlinelibrary.wiley.com/toc/1526100x/2020/28/S3>

INTERNATIONAL NETWORK FOR SEED BASED RESTORATION

650 members
60 countries

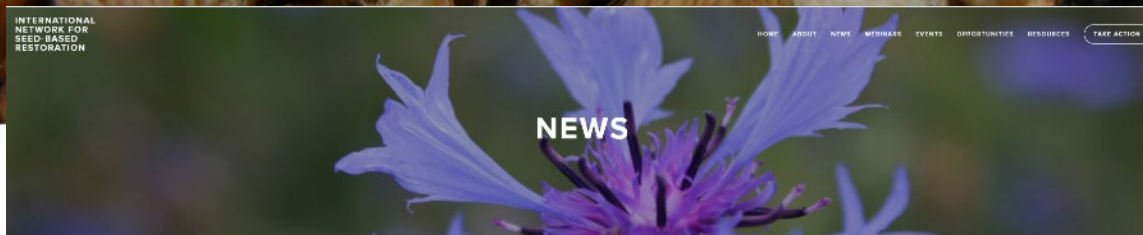


ERE CONFERENCE
9th SEP 2022
ANTE, SPAIN

Society for Ecological Restoration Europe (SERE) Conference 2022
Mon, Sep 5, 2022 9:00 AM - Thu, Sep 8, 2022 5:00 PM
University of Alicante (Spain)
Society for Ecological Restoration Europe (SERE) Conference 2022 in Alicante, Spain

International Society for Seed Science (ISSS): Seed Biology Conference VII

Thu, Sep 8, 2022 11:00 AM - Fri, Sep 9, 2022 5:00 PM
University of Canada (Canada)
The seventh edition of the Seed Biology Conference of the International Society for Seed Science will take place in Laval, Quebec, Canada (Canada) from the 8th to 10th of September, 2022.



June 16, 2022

A kids guide to ecological restoration

A kids guide to ecological restoration by restoration ecologist Filip Cornelis is available now through Arcadis.

[Read More](#)

May 13, 2022

Call for papers on "Impacts of Climate Change on Long Term Viability of Trees Species with Recalcitrant Seeds"

North Mariana San Martín, Adjunto Profesor in the Departamento de Ingeniería y Ciencia Ambiental at the Pontificia Universidad Católica de Chile is seeking a new article collection, "Impacts of Climate Change on Long Term Viability of Trees Species with Recalcitrant Seeds" on the journal Frontiers in Forests and Global Change. You can learn more about the scope of the topic and its accepted article type here: [Impacts of Climate Change on Long Term Viability of Trees](#)



Southeastern Grasslands Initiative - Seed Program Manager

Wed, Jul 27, 2022, 11:30 PM - Wed, Aug 24, 2022, 1:30 PM

Australian Reg State University's OPENED Southeastern Grasslands Initiative (SGI) invites applications for the SGI Seed Program Manager.



Senior Technical Officer - Greening Australia

Fri, Aug 5, 2022, 12:00 PM - Wed, Aug 17, 2022, 4:00 PM

Greening Australia is Australia's largest environmental nonprofit and is leading the transformation of the nation. With a mission to conserve and restore landscapes and ecosystems through collaborative, science-based and innovative conservation programs, Greening Australia works with a broad range of partners, including some of Australia's largest corporations, to plan, develop and deliver solutions to solve some of our biggest environmental challenges.

<https://ser-insr.org/>



Dr. Ann Karen Meitz

In this webinar, Dr. Ann Karen Meitz of the VFW-Regionessen presents the German situation on Wild seed production. In Germany, a market for regional seed of native wild plants has been established with an annual trade volume of about 200 t in recent years. In order to meet the demand of Federal Natural Conservation Act to apply from 2020 only wild seed in natural surroundings, the market in the next 4 years would need to grow about tenfold. The seed sowing and certification scheme developed in Germany is an interesting model that could be applied in countries where a native seed market is in its infancy of how yet to develop.



Prof. Kingsley Dixon

Smoking kills but it is the magic solution for seed germination of many native seeds. This webinar, presented by Curtin Professor Kingsley Dixon, noted authority on smoke germination, runs through the background and history of this important discovery and the remarkable scientific journey to the discovery of the compounds in smoke that stimulate germination. The webinar also goes through the step-by-step process for building your own smoke apparatus for treating seed and making smoke water.

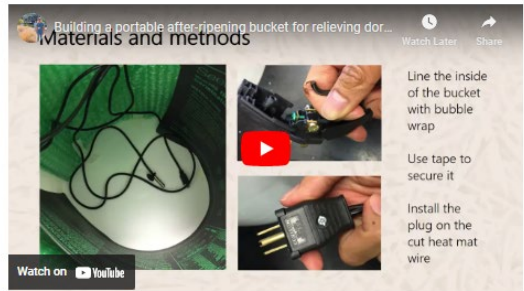


5 Likes Share

Newer Post
NATIVE SEED PRODUCTION IN GERMANY



By Orville C. Baldos, Joseph DeFrank and Scott B. Lukas



The control of both seed storage temperature and humidity is essential for optimizing dry after-ripening of seeds. Manipulating these factors to process small seed batches often require expensive equipment such as incubators and desiccators. To reduce cost, we have devised a portable after-ripening system made from readily accessible components, such as a 5-gallon (18.93 L) plastic bucket (with a screw top lid), bubble wrap insulation, silica gel-based desiccator and a seed germination heat mat (connected to a thermostat). To assess the storage conditions of the DIY (do-it-yourself) after-ripening system, dried seeds and awns of pilgrim (Heteropogon contortus) were

<https://ser-insr.org/webinars>



COMING SOON..



Documentary series on the Native Seed Supply Chain



NATIVE SEED CONFERENCE, WASHINGTON D.C. March 27-30, 2023

<https://appliedeco.org/native-seed-conference/>



The new life of SID (Seed Information Database)



Where am I? > Home > Kew Databases > Seed Information Database

Important update

The Seed Information Database website is not compatible with UK website accessibility law and will not be operating from 1st May 2022. All data currently available via the website will be distributed in an alternative way after this date. For more information click here

Seed Information Database

Search the Seed Information Database

(release 7.1, May 2008)

SID is a compilation of seed biological trait data from the MSBP's own collections and from other published and unpublished sources. Its primary purpose is as an internal source of a variety of seed biological information; for use in large scale analysis and decision support for seed conservation operations.

Citing SID

Search the Seed Information Database

APG Clade

APG Order

Family

Genus

Species

Storage Behaviour

Only find records with data on:

Storage Behaviour Weight Dispersal Germination

Oil Content Protein Content Morphology Salt Tolerance

Seed Information Database

What's new in SID release 7.1?

About the database

Current Modules

- ▶ Storage Behaviour
- ▶ Seed Weights
- ▶ Seed Dispersal
- ▶ Germination
- ▶ Seed Oil Content
- ▶ Seed Protein Content
- ▶ Plant Life-form
- ▶ Seed Morphology (incl. images)
- ▶ Salt Tolerance
- ▶ Seed Viability Constants

Tips for searching the database

Search the Database

Citing the Database

Coming Soon

Useful Links

Feedback

Potential Collaborations

Visit Kew Gardens

- Visit information
- What's on at Kew Gardens
- Family days out
- Xstrata Treetop Walkway
- Weddings & Venue Hire

Kew's Science

- Plant conservation
- Kew & Climate Change
- Millennium Seed Bank
- Global partnerships
- Plant & Fungal Names
- Science Directory

Buy & Support


- Join Kew today
- Shop online
- Wedding venues
- Kew Books
- Image licensing
- Product licensing

About Kew

- Mission & Strategy
- History & Heritage
- Kew magazine
- People
- Kew's partners
- Job opportunities

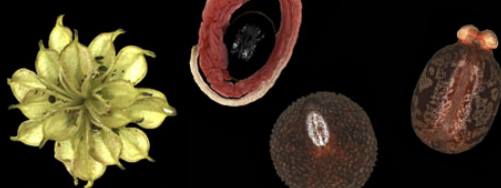
Further Information

- Contact Kew
- FAQ
- Website Accessibility
- Website Information
- Privacy Policy
- Terms & Conditions



international society
for seed science

[Members Area Login](#)



A professional society dedicated to fostering and promoting research, education, and communication in the scientific understanding of seeds.

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Important notice regarding the Seed Information Database

17/12/2021

A recent assessment of the Seed Information Database (SID) for compliance with UK legislation on website accessibility (Public Sector Bodies [Websites and Mobile Applications] Accessibility Regulations 2018; themselves aligned with the Web Content Accessibility Guidelines (WCAG) 2.1 at the AA standard) found the web interface deficient in several respects. Regrettably, due to RBG Kew's need to prioritise its limited resources, we will be unable to remedy the faults; and the SID web interface will be taken down at the end of this financial year (March 2022).

However, we will continue to update SID's data content internally; and this will continue to be available to external users as flat files from [RBG Kew's FTP site](#).

Please also note that for many years we have shared much of SID's seed functional trait data via the [TRY Plant Trait Database](#), which facilitates bulk data downloads; and we intend to continue periodic updates of that content.

Browse news & events:

- [Events](#)
- [Meetings](#)
- [News](#)

WHY SID MATTERS: INSR ONLINE SURVEY

SID - Seed Information Database

The goal of this brief survey is to estimate the impacts that the closure of SID would have on the global native seed and restoration community.

Name

Short-answer text

Organisation

Short-answer text

Which sector do you work in? *

- Native Seed Supply - collection, farming, processing, testing, sale
- Native Seed Use - Restoration Practitioner
- Conservation Seed Bank
- Research - seed science, restoration ecology
- Education
- Other...

239 responses

SID USERS

161 - Research - seed science, restoration ecology

113 - Conservation Seed Banks

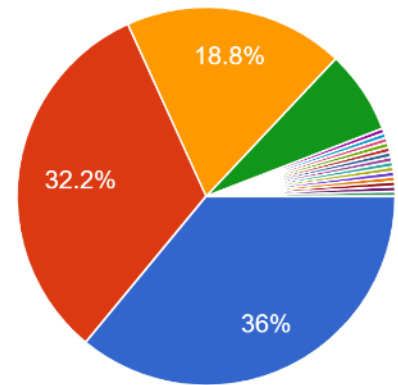
69 - Native Seed Supply - collection, farming, processing, testing, sale

69 - Native Seed Use - Restoration Practitioner

58 - Education

WHY SID MATTERS: INSR ONLINE SURVEY

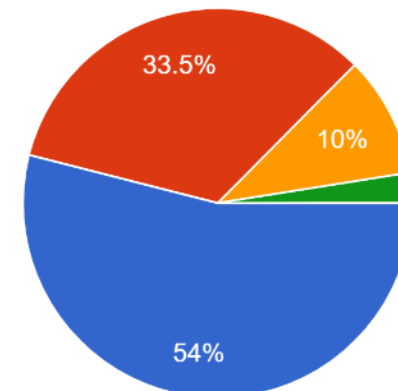
How often do you use SID?



- Few times a year
- Few times a month
- Weekly
- Daily
- Will definitely use it more in the future,...
- at some points in my work year I accept...
- I did not know about it before receiving...
- Use is intense following field trips to c...

▲ 1/3 ▼

How much would SID closure affect your activity?



- Significantly: it'll drastically affect the way I operate
- Somewhat: it'll cause some disruption but it will be manageable
- Moderately: it'll be a minor inconvenience
- Not at all

How often do you use SID? *

- Few times a year
- Few times a month
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- Other...

How much would SID closure affect you activity? *

- Significantly: it'll drastically affect the way I operate
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- Moderately: it'll be a minor inconvenience
- Not at all

If you want, you can tell us more about what SID means for you and what would be the effect of its closure.

Long-answer text

WHY SID MATTERS: INSR ONLINE SURVEY

If you want, you can tell us more about what SID means for you and what would be the effect of its closure.

144 Responses

*“As I work in a seedbank, I regularly refer to SID for species with unknown germination requirements, it is often the first resource I check, **there is nothing else out there like it.**”*

*“We are a small non-profit that both collects our own seed and grows out materials for our restoration projects. We have limited capacity, so the **SID takes out some of the guesswork** when it comes to finding out what kinds of **pre-treatment and temperatures are optimal for germination and storage.**”*

*“SID is one of those resources that is freely available to seed researchers, seed users and restoration ecologists who need to figure things out. As such, it is **a good resource and should be maintained. God knows, the folks doing restoration have it tough enough.**”*



Seed Information Database

SEARCH ABOUT DEFINITIONS ▾ VIABILITY CALCULATORS ▾

Search

 ✕

ser-sid.org

Acknowledgement



Robert Turner



Chid Gilovitz



Fiona Hay