ISTA Seed Storage Technical Committee

Annual Activity Update

Jayanthi Nadarajan

Chair Seed Storage Committee

Committee Membership

	COMMITTEE MEMBERSHIP LIST		
		Country	Active since
1	Chair: Jayanthi Nadarajan	New Zealand	2019
2	Vice-Chair: Steven Groot	Netherlands	2016
3	Andreas Börner	Germany	2010
4	Sershen Naidoo	RSA	2011
5	Christina Walters	USA	
6	Xiang-Yun Yang	China	2011
7	G V Jagadish	India	2019
8	Nelson Barbosa Machado-Neto	Brazil	2022
9	Umarani Sinniah	Malaysia	2022
10	Louise Colville	UK	2022
11	Elisa Monteze Bicalho	Brazil	2022
12	Irfan Afzal	Pakistan	2022
13	Vacant*		
14	Vacant*		
15	Vacant*		
	ECOM Liaison Officer: Keshavulu Kunusoth		

Introducing new members

Peterson W. Wambugu

- Currently working with the Kenya Agricultural and Livestock Research Organization (KALRO), based at the Genetic Resources Research Institute, and in charge of conservation.
- A plant genetic resources scientist with a background in seed science, molecular genetics and conservation.
- Joined the ISTA STO TCOM to contribute for the understanding the seed storage behaviour of diverse species as a basis for supporting their long-term conservation.

Karen Sommerville

- Rainforest Seed Conservation Scientist, Botanic Gardens of Sydney
- Development of new scientific knowledge on optimum storage of recalcitrant seeds
- Development of effective storage methods for short-lived, intermediate, oily, primed seeds and exceptional species.

Filippo Guzzon

- Research Specialist, European Corporative Programme for Plant Genetic resources (ECPGR) c/o Alliance of Biodiversity International and CIAT, Rome.
- Currently working on the PRO_GRACE project (that aims at conceptualizing a European Research Infrastructure (RI) on PGR conservation and use)
- Research on seed storage of economically and culturally important tree species in tropical areas
- Research on intraspecific differences in seed longevity in large seed collections.

STO TCOM Objectives

To develop and/or improve effective medium- and long-term seed storage techniques

To continue to generate knowledge and deliver innovations in seed storage

To play a role as a centre of knowledge creator and technology transfer platform

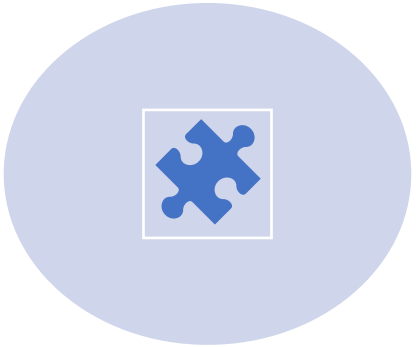
Activity report on the committee's work programme

KNOWLEDGE AND TECHNOLOGY DEVELOPMENT

PUBLICATIONS

SEMINARS

WORKSHOPS



SPECIAL PROJECTS

Seed Storage Handbook - update

Chapter	Heading	Completion of 1st Draft
1	Seed storage biology – perspective	5%
2	Seed moisture content and storage	60%
3	Seed storage temperature	70%
4	Seed storage environments	80%
5	Seed packaging	70%
6	Cryostorage of seeds and axis	90%
7	Prediction of seed storage behaviour	50%
8	Estimation of seed longevity	40%
9	Seed pest, pathogens and beneficial microbiomes and storage	30%
10	Oxidative modifications during seed storage	90%
Appendix	Known seed storage behaviour – from RBGKew SID	100%

Scientific publications (26 publications in 2023)

1. Prasad C. T., M., Kodde, J., Angenent, G.C., Hay, F.R., McNally, K.L. and **Groot, S.P.C.** (2023). Plant, Cell & Environment, 46, 1962-1980. https://doi.org/10.1111/pce.14581
2. Sripathy, K.V. and **Groot, S.P.C.** (2023) Seed Science and Technology. Biology, Production, Quality (Eds. M. Dadlani, and D.K. Yadava), pp 17-38 Springer. https://doi.org/10.1007/978-981-19-5888-5_2
3. Ranganathan, U., and **Groot, S.P.C.** (2023). Seed Science and Technology. Biology, Production, Quality (Eds. M. Dadlani, and D.K. Yadava), pp 91-108 Springer. https://doi.org/10.1007/978-981-19-5888-5_5
4. Guvvala S. Master Thesis supervised by **Andreas Börner**, Universität Hohenheim, Fakultät Agrarwissenschaften, Institut für Kulturpflanzenwissenschaften (2023) 70 pp.
5. Lohwasser U, **Börner A** (Eds.): Physical, biochemical and molecular methods for determining seed quality: Book of abstracts of the Meeting of the Working Group Seed Science and Certification (GPZ/GPW) and Section IV Seeds (VDLUFA), Nossen, Germany, 7-9 March 2023.
6. Rehman Arif M A, Tripodi P, Waheed M Q, **Afzal I**, Pistrick S, Schütze G, **Börner A.** Plants 12 (2023) 1321. https://dx.doi.org/10.3390/plants12061321
7. **Nadarajan, J.; Walters, C**.; Pritchard, H.W.; Ballesteros, D.; **Colville, L.** Plants 2023, 12, 471. https://doi.org/10.3390/ plants12030471.
8. **Nadarajan, J.**; Esfandiari, A.; Mathew, L.; Divinagracia, J.; Wiedow, C.; Morgan, E. Plants 2023, 12, 2009. https://doi.org/10.3390/plants12102009
9. Van der Walt, K**.; Nadarajan, J**. Plants 2023, 12, 1067. https://doi.org/ 10.3390/plants12051067
10. Jean Carlos Bettoni, Karin van der Walt, Juliana Aparecida Souza, Andrew McLachlan & **Jayanthi Nadarajan** (2023). Zealand Journal of Botany, DOI: 10.1080/0028825X.2022.2158110.
11. Surya Diantina, Craig McGill, Andrea Clavijo McCormick, James Millner, Hugh W. Pritchard and **Jayanthi Nadarajan**. CryoLetters 44(4), 197-207 (2023). https://doi.org/10.54680/fr23410110312.
12. Alfaro Pinto, Alejandra, Craig McGill, **Jayanthi Nadarajan**, Fredy Achila Morales, and Andrea Clavijo McCormick. 2023. Seeds 2, 331-339. https://doi.org/10.3390/seeds2030025.
13. Kai, Y.; Alfaro Pinto, A., Clavijo McCormick, A., **Nadarajan, J**., He, X.Z., MacKay, M., McGill, C. Seeds 2023, 2, 370-381.https://doi.org/10.3390/seeds2030028

14. van der Walt K, **Nadarajan J**, Mathew L, Bettoni JC and Souza JA (2023). Front. Conserv. Sci. 4:1269881. doi: 10.3389/fcosc.2023.1269881
15. **Jayanthi Nadarajan**. Plant Production Science, New Zealand Plant Producers. ISSN 2744-7367. Issue 4. November 2023.
16. **Jayanthi Nadarajan**. New paper: Effective strategies for maire tawake propagation - Biological Heritage NZ (bioheritage.nz)
17. **Jayanthi Nadarajan**. New paper outlines the challenges of preserving maire tawake seeds - Biological Heritage NZ (bioheritage.nz)
18. **Jayanthi Nadarajan**. Plant Production Science, New Zealand Plant Producers. ISSN 2744-7367. Issue 4. November 2023.
19. Daniela Goeten, Rosa Angélica Elias, Luiza Giacomolli Polesi, **Christina Walters**, Miguel P Guerra, Neusa Steiner (2023). Plant Cell, Tissue and Organ Culture, 152: 339-356.
20. Hannah Tetreault, Margaret Fleming, Lisa Hill, Emma Dorr, Kathleen Yeater, Christopher Richards**, Christina Walters** (2023). Crop Science 63: 1481 -1493.
21. Daniela Goeten, Francine L Farias-Soares, Gladys D Rogge-Renner, Maria LT Pereira, **Christina Walters**, Vanildo Silveira, Claudete S Catarina, Miguel P Guerra, Neusa Steiner. (2023). Trees. 1-15.
22. **Walters, C**., Hill, L. M., & Tetreault, H. (2023) ASA, CSSA, SSSA International Annual Meeting, St. Louis, MO. https://scisoc.confex.com/scisoc/2023am/meetingapp.cgi/Paper/148527.
23. Fernández, A., León-Lobos, P., Contreras, S., Ovalle, J.F., **Sershen**, van der Walt, K. and Ballesteros, D. (2023). Frontiers in Forests and Global Change, http://doi.org/10.3389/ffgc.2023.1110431
24. Tahir, A., **Afzal, I.**, Khalid, E., Razzaq, M., and Arif, M.A.R. 2023. Seed Science Research 1–11. https://doi.org/10.1017/S0960258522000289
25. Bakhtavar, M.A., **Afzal, I**., Khalid, E., Jabeen, N., and Jabeen R. 2023. PLoS ONE 18(6): e0287476.
26. **Afzal, I**. 2023. Dawn. May 29, 2023. https://www.dawn.com/news/1756588

Committee members seminar presentations

1. **Groot S.P.C.** Seed drying and storage. Invited lecture at MSc course Seed Science and Technology, 19 January 2023, Wageningen University, The Netherlands.
2. **Groot S.P.C.** The growing importance of seed vigour for crop establishment. Webinar to celebrate 50 years of Seed Science and Technology. 23 January 2023, Tamil Nadu Agricultural University, India.
3. **Groot S.P.C.** Rice seed storage. Knowledge transfer visit Thai Rice Department to Wageningen University, The Netherlands, 22 June 2023.
4. **Groot S.P.C.** Seed drying. Perspectives from seed vigour. Workshop at Seed Meets Technology Fair, 26 September 2023, Zwaagdijk, The Netherlands.
5. **Groot S.P.C.** Emerging trends in processing and storage research. 12th National Seed Congress-2023 from the Indian Society of Seed Technology, 12 December 2023, Aurangabad, India.
6. **Groot S.P.C.** Emerging trends in seed storage research. Department of Seed Science and Technology,14 December 2023. ICAR-Indian Agricultural Research Institute, New Delhi, India.
7. **Groot S.P.C.** Advanced techniques for seed drying and storage. Webinar for International Training Programme on “Advanced Post-Harvest Technologies for Seed Quality Improvement”, 19 December 2023. Indo-German Bilateral Cooperation on Seed Sector Development.
8. **Louise Colville**, Tim Marks, Anaité López-Alquijay, Wolfgang Stuppy, **Jayanthi Nadarajan**, Hugh W. Pritchard, Alexandre Monro. 2023. Exceptional desiccation resistance in recalcitrant seeds of the widespread, tropical tree, Brosimum alicastrum. Oral presentation at the 14th ISSS biennal Conference, 3-7 July 2023, Sorbonne Univesity, Paris.
9. Diantina S, **Nadarajan J,** McGill C, Clavijo McCormick A, Millner J and Pritchard HW. 2023. A comparative cryopreservation study of Indonesian and New Zealand epiphytic and terrestrial orchid seeds. Oral presentation given at the Plant Science Central Conference, 4-6 July 2023. Palmerston North, New Zealand.
10. **Afzal, I.** Modern seed storage technology. One day Seminar on Capacity building training on standardization of brassica and sunflower seed production. 28 Feb, 2023, Ayub Agricultural Research Institute, Faisalabad, Pakistan.
11. **Afzal, I.** Seed handling, treatment and Quality Assessment. OCA Capacity Building Session of Seed Producers & Farm groups. 24 June 2023. Multan, Pakistan

The committee members presented at 11 international seminars

The 18th Scientific Seed Symposium, 7-9 March 2023, Nossen, Germany

- A total of 111 participants from 7 countries discussed the topic: “Physical, Biochemical and Molecular Methods for Determining Seed Quality”. The conference was opened by Gerhard Leubner, Professor at Royal Holloway University of London, Great Britain.
- This was followed by 14 further specialist lectures on new methods for determining seed quality. The objects examined included wheat, barley, rye, pea, rapeseed and sugar beet.
- After the lecture program, a workshop on seed diagnostic characteristics in cereals took place.

Contributed by Andreas Börner

Update on planned regional workshops

1. **Regional workshop in Brazil**
   - Will be organised by Nelson Barbosa Machado-Neto
   - could be a hybrid event (webinar + hands-on workshop)
   - Dates yet to be confirmed

2. **Regional workshop in Pakistan**
   - Will be organised by Irfan Afzal
   - Dates yet to be confirmed

E. ISTA Special Project Update

	Status	Collaboration
Use of equilibrium relative humidity measurements for determining the moisture status of stored seeds **Objectives:** i) To assess current use and interest in using seed eRH to assess the moisture status of seeds; ii) To understand the reproducibility of seed eRH measurement in different laboratories around the world iii) Development of a proposal for next steps towards incorporating eRH measurement into the ISTA Rules.	ongoing	ISTA Seed Moisture Committee [Led by Fiona Hay (Moisture Committee) and Jayanthi Nadarajan (Storage Committee)]

ISTA ANNUAL MEETING 2024
01-04 JULY
CAMBRIDGE, UNITED KINGDOM

Thank you

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