

Optimizing seed conservation protocols and cryopreservation at the CRF-INIA genebank to reduce genetic erosion

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The CRF-INIA is the Spanish National Centre for Plant Genetic Resources where a duplicate of all seed active collections belonging to the Spanish Network of the National PGR Program should be deposited. First samples date from 1980's. Nowadays, the long term collection (base collection) comprises approximately 39,000 samples. The CRF-INIA genebank also maintains the largest active collection in Spain, with up to 22.000 accessions, mainly of cereals and grain legumes.

At the CRF-INIA genebank the seed conservation protocol follows the FAO/IPGRI recommendations: seed desiccation at 13-15% RH and 20 °C, and storage at -4 or -18 °C, for the active and base collections, respectively. Seed viability monitoring is performed systematically through germination tests. For most species, the current conservation protocol shows good performance (Martín et al. 2014). However, in some plant groups there is an accumulation of samples with low longevity, for which sample regeneration is costly. For example, after 20 or 30 years of storage, some accessions of *Brassica* ssp., *Lactuca sativa* or *Secale cereale*, have shown low seed viability after storage. In some cases, samples with low germination rates might be not only due to low longevity but also to other reasons, such as problems with dormancy interfering with the germination test performance and low initial quality of the samples.

The general aim of this project is to find alternative storage protocols to reduce genetic erosion, present and future, of the conserved material at the CRF-INIA seedbank. Cryoconservation of seeds at different water contents are being tested in species with low seed longevity and of problematic regeneration (rye, onion and cabbage). Results would be compared to the conventional storage at -18 °C after medium/long term storage.

References

Martín, I., Sánchez, S., Guerrero, M., Laina, C., Navarro, S., De la Cuadra, C. 2014. Viabilidad de semillas de diferentes especies cultivadas después de 30 años de conservación en la colección base del CRF-INIA. *Actas de Horticultura* 69: 35-36.