

Conservation & Use of the USDA-ARS National Plant Germplasm System Temperate-Adapted Forage Legume Genetic Resources

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Temperate-adapted forage legumes (TFL), including alfalfa, clover, and trefoil, are important agricultural crops because of their high yields and nutritive quality as well as their ability to fix nitrogen. Changing climatic conditions and emerging pests and diseases threaten world agriculture production while imperiling crop plant germplasm, both in centers of genetic diversity and domestication, and where germplasm collections are managed. To prevent permanent loss, ex situ plant germplasm collections continue to be acquired, conserved and their use promoted. Germplasm collections are characterized/evaluated and mined extensively for potential sources of 'new' and improved traits for plant breeding. A team of scientists and technical support personnel in Pullman and Prosser, WA along with many collaborators play roles in managing the USDA-ARS National Plant Germplasm System's (NPGS) TFL germplasm collection. The collection presently consists of over 13,324 accessions in five priority genera with some initial collections dating back to the early 1900s. The *Medicago* genus consists of 80 taxa and 8,624 accessions and the *Trifolium* genus contains 94 taxa with 3,718 accessions. Trefoil accessions belong to three genera *Lotus*, *Acmispon*, and *Hosakia* with 1,002 accessions in 66 taxa. As seed stocks run low or viability falls below certain thresholds, germplasm is queued for increase. A systematic approach using additional weighted factors is used in determining the order of regenerations. Most regenerations require the use of alfalfa leaf cutter bees, and/or other pollinators in insect-proof isolation cages. Since the deregulation of transgenic alfalfa, sentinel plots at field regeneration sites are now regularly utilized to monitoring gene-flow and potential adventitious presence. Maintaining genetic integrity in accessions is a high priority, and DNA barcoding and phenotypic descriptors are being used to correctly voucher taxa. Recent collaborative and extramurally funded projects on alfalfa have focused on screening for disease resistance and evaluating for agronomic performance with goals of releasing improved germplasm. Requests for small quantities of freely-distributed seed from the NPGS to support research and education purposes are processed but a clear justification for the need is required. All the TLF germplasm, and their accession-associated information, can be freely accessed via the [Germplasm Resources Information Network \(GRIN\)-Global](#) website.

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