State of New Mexico

Annual Report for Calendar Year 2016
to the W-6 Technical Committee

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Twenty-three individuals from New Mexico placed 35 orders and received 895 accessions from the NPGS in 2016. The first section of this report highlights germplasm quality problems that were encountered by these users, where the specific accessions and nature of the problems are identified. The second section of the report provides details concerning the use of all plant materials by scientists, farmers, and the general public in New Mexico.

Problems Encountered with NPGS Germplasm:

Dr. Naveen Puppala reported that eleven Arachis accessions had zero germination: PI 664993; PI 664994; PI 672841; PI 672857; PI 672858; PI 672859; PI 672860; PI 672861; PI 672863; PI 672864; PI 672865.

Dr. Ian Ray reported one Medicago accession with <5% germination: PI 494662.

NPGS Germplasm Use in New Mexico: Users requesting >20 accessions highlighted in bold

Allen, Kresha; General Public, Los Lunas, New Mexico: received one accession each of Poa pratensis and Nepeta cataria to evaluate in an herb garden for adaptability.

Connally, Abraham; Opuntia Group, Loving, New Mexico: received 10 Opuntia accessions to evaluate for cold hardiness and utility as forage.

Facette, Michelle; University of New Mexico, Albuquerque, New Mexico: received 29 Zea mays accessions for genetic studies to characterize natural variation in stomatal shape, morphology, and function. All accessions germinated well.

Higgins, Charlie; Farmer, Farmington, New Mexico: received 7 wild Solanum accessions in good condition. These were exposed to natural flights of potato psyllid during the growing season. Texas A&M University tested the tubers for the zebra chip pathogen, Candidatus Liberibacter solanacearum and found no infection. Thus, these wild species may have escaped infection, or may possess resistance to this disease.

Hunt, Henry: General Public, Santa Fe, New Mexico: received 25 Malus accessions to provide apple scion wood for his personal orchard.

Kaur, Harpreet; New Mexico State University, Las Cruces, New Mexico: received 4 Medicago accessions to be used as standard checks for conducting Ph.D. research on high resolution genetic mapping of alfalfa genome regions controlling resistance to Phytophthora medicaginis and salt tolerance. Both research projects are in progress and results will be published at a future date.

Lombard, Kevin; New Mexico State University, Farmington, New Mexico: received 130 wild Solanum accessions to evaluate for frost sensitivity in the four-corner region of New Mexico.

Lykins, Richard; General Public, Rio Rancho, New Mexico: received 48 Malus and 17 Prunus accessions to provide apple and cherry scion wood for his personal orchard.

Montgomery, Randall; New Mexico State University, Las Cruces, New Mexico: received 56 Zea mays accessions primarily representing older southwestern U.S. maize landraces or heirloom varieties. These will be evaluated for agronomic characteristics to determine their use as potential genetic donors to improve both drought and salinity tolerance in modern hybrids. This work will elucidate more efficient selection methodologies to better enable advancement for abiotic stress tolerance in the NMSU and other corn breeding programs.

Nguyen, Hau; New Mexico Consortium, Los Alamos, New Mexico: received one Nicotiana accession to conduct genetic research in tobacco plants for large scale protein expression and purification, as well as, a model for gene editing.

Pratt, Richard; New Mexico State University, Las Cruces, New Mexico: received 25 Hordeum accessions for cover crop varietal development.

Pratt, Richard; New Mexico State University, Las Cruces, New Mexico: received 20 Zea mays accessions to conduct field observations for potential variety development. Specifically, these materials will be evaluated for their potential to serve as potential testcross parents (testers) and parents for ear rot resistant synthetic population formation.

Pratt, Richard; New Mexico State University, Las Cruces, New Mexico: received 16 Solanum accessions to conduct heat tolerance evaluation for tomato varietal development.

Pratt, Richard; New Mexico State University, Las Cruces, New Mexico: received 32 Zea mays accessions to conduct botanical/taxonomic investigations of borderlands maize.

Puppala, Naveen; New Mexico State University, Clovis, New Mexico: received 37 Arachis accessions which will be used initially for seed increase and subsequently evaluated for resistance to Sclerotinia disease. Accessions which demonstrate some degree of resistance will subsequently be evaluated for their potential as parents to improve current NMSU breeding lines and varieties for disease resistance. Among the accessions received, 11 did not germinate, and these are listed at the beginning of this report.

Ray, Ian; New Mexico State University, Las Cruces, New Mexico: received 193 diploid Medicago accessions which will be evaluated under limited irrigation field conditions in 2017-2019. Superior performing diploids will then be mated with elite tetraploid alfalfas, and their unilateral hybrid progeny evaluated to determine if diploid germplasm possesses useful alleles to improve cultivated tetraploid alfalfa productivity in drought prone environments. To date, one accession was identified with low germination and this is listed at the beginning of this report.

Reed-Allen, Brittany; Clovis Gardening Club, Clovis, New Mexico: received 1 Fragaria and 1 Solanum accession which have been planted in a community garden for public education demonstrations. The Clovis Gardening Club objectives are to use these crops, and others, to educate the community about gardening, the use of heirloom varieties, and sustainable gardening practices.

Rockers, Bill; General Public, Alamagordo, New Mexico: received one Hordeum and two Tricitum accessions to evaluate their adaptability to southwestern US climates.

Simcox, Joseph; The Rare Vegetable Seed Consortium, Belen, New Mexico: received 76 Solanum and 42 Cucurbita accessions. The express intention of the Rare Vegetable Seed Consortium is to develop and promote food plant diversity. Consortium members grow-out and evaluate new accessions and aim to introduce them into greater public use or commercialization. Simultaneously, The Consortium's goal is to record and archive information on these accessions to compile a written resource documenting world food plant diversity, ethnobotanical uses, and geographic transmission of germplasm throughout history.

Stinziano, Joseph: University of New Mexico, Albuquerque, New Mexico: received 18 Zea mays and 3 Brassica accessions for botanical/taxonomic investigations. For both genera, research is focusing on the effects of leaf cuticle properties on photosynthetic gas exchange parameters. All accessions germinated well.

The following individuals provided no information about the intended use, or outcomes obtained, from the accessions that were ordered in 2016: Hynek, Eric (2 Zea mays accessions); Koger, Ken, (13 Punica accessions); Martinez, Ronald (14 Malus accessions); Nguyen, Cristina (1 Glycine, 2 Poa, and 1 Glycyrrhiza accessions); Nunez, Sylvia (1 Chaenomeles accession); **Padilla, Jennifer** (45 Ficus, 9 Punica, and 10 Vitis accessions).

PUBLICATIONS:
No NM recipients of NPGS germplasm in 2016 provided information about published research reports resulting from the evaluation of the materials that they received.