State of New Mexico

Annual Report for Calendar Year 2014
to the W-6 Technical Committee

Compiled by Dave M. Stout and Ian M. Ray

Twenty-seven individuals from New Mexico placed 38 orders to request 569 accessions from the NPGS in 2014. These included: 6 *Achnatherum*, 1 *Arachis*, 27 *Brassica*, 10 *Capsicum*, 1 *Catharanthus*, 42 *Cenopodium*, 1 *Citrullus*, 1 *Crithmum*, 29 *Cucumis*, 12 *Cucurbita*, 2 *Cydonia*, 2 *Ferula*, 25 *Ficus*, 2 *Glycine*, 29 *Gossypium*, 49 *Helianthis*, 1 *Hesperostipa*, 1 *Hibiscus*, 1 *Humulus*, 1 *Hymenocarpos*, 1 *Macrotyloma*, 42 *Malus*, 4 *Malva*, 13 *Ocimum*, 3 *Olea*, 2 *Pennisetum*, 19 *Perilla*, 6 *Phaseolus*, 16 *Phalaris*, 1 *Pisum*, 1 *Prosopis*, 21 *Prunus*, 2 *Punica*, 1 *Pyrus*, 93 *Solanum*, 1 *Sorghum*, 2 *Spartina*, 1 *Trifolium*, 2 *Triticum*, 4 *Vitis*, 3 *Xanthocerus*, and 88 *Zea mays* accessions. Details concerning the use of these materials are provided below.

Joseph Simcox, the Rare Vegetable Seed Consortium, **ordered the most accessions from NM in 2014**. His orders included **282 accessions** representing a diverse array of genera and species, which primarily included the *Brassica, Cucumis, Helianthus, Ocimum, Perilla, Sorghym, and Zea* genera. **This represents 50% of the accessions ordered from NM in 2014.** However, **only minimal information was provided on 10 Brassica accessions** indicating that they would be used in studies of world food plant resources. **No information on the other 272 accessions was provided**.

Brain Alfaro, graduate student at the University of New Mexico, requested 17 *Brassica tournefortii* accessions for a Ph.D. research project to analyze seed mass in U.S. vs. foreign/native accessions, and to evaluate selection response for multiple traits in native and non-native pouplations grown in a greenhouse environment. Two manuscripts are underway from this work which will describe the phenotypes of cultivated, weedy-invasive, and other native populations.

Dr. Sangu Angadi, New Mexico State University, requested 10 *Chenopodium* accessions. Half of the seeds of all accessions were planted in the field near Clovis, NM in fall 2014. None of the fall-planted accessions established in 2014. In spring 2015, the remaining seed of all accessions was planted. Some of these accessions established but were very slow to emerge initially.

Dr. Paul Bosland, New Mexico State University, requested 3 *Capsicum baccatum* and 6 *C. annuum* accessions. The *C. baccatum* accessions were evaluated as part of a Ph.D. research project and were determined to be tolerant to the pathogen, *Verticillium dahliae*. These accessions are being screened with molecular markers to identify markers that are linked to the resistance trait. The *C. annuum* accessions are landraces that were planted with many other populations in the Chile Pepper Institute Teaching Garden to demonstrate phenotypic diversity in *Capsicum* to public and scientific visitors.

Anny Chung, graduate student at the University of New Mexico, requested 5 Achnatherum hymenoides accessions to be grown in soils collected from Utah. Data will be collected to determine the influence of each accession of the Utah-based soil microbial communities. Germination rates were highly variable among the accessions, and overall, were quite low.

Beau Emblem, Whispering Pines 4H group, requested 1 *Trifolium leucanthaum* accession, for 4H education program.

George Farmer, Axle Canyon Ecological Preserve, requested 6 *Chenopodium* accessions (no use specified), and *1 Prosopis* accession which will be evaluated as a possible food crop.

Cameron Golden requested 1 *Phaseolus* and 1 *Arachis* accessions. When planted at Albuquerque, NM, the Phaeolus accession showed 30% germination and the Arachis accession showed 60% germination. Overall, neither accession grew very well in this environment.

Ronald Martinez ordered 17 *Malus* accessions for use in grafting (85% success) to various rootstocks that are suitable to the mountainous region of northern New Mexico. Evaluation will consist of monitoring winter injury, and bloom date to identify materials that will not flower until after spring frost danger is past (i.e. bloom date later than Memorial Day).

Dr. Randy Thornhill, University of New Mexico, requested 1 *Helianthus petiolaris* accession for studying the impact of this species, as a host food, on life cycle changes in an unspecified local moth species. Seed of this accession showed a 30% germination rate.

Larry Sallee, Seed and Light International, requested 1 *Pisum sativum* and 8 *Curcurbita maxima* accessions. The *Pisum* accession was grown in a Navajo school demonstration garden for seed increase and evaluation for its usefulness as an early season vegetable. Seed harvested this year will be planted at more locations next year. The *Curcurbita* accessions were grown in 5 locations on the Navajo nation to identify accessions that are adapted to small garden plots in hot dry environments of the southwest (i.e. productive in diverse soil types, drought resistant, and short season maturity). The larger goal of the project is to identify diverse vegetables that will be readily accepted by Native Americans, and can be easily grown in small plot home gardens to enrich the diets of diabetics within various tribal groups. Specifically, the pulp and seed of the cucurbits will be evaluated for nutritional value, in particular, as a low glycemic vegetable. The accessions evaluated were rugged enough to withstand the harsh conditions of the reservation and will require only minimal inputs to produce useful fruits to improve diets. Seed will be saved from these materials and used for distribution to interested home gardeners and additional testing.

Dr. Ian Ray, New Mexico State University, ordered *2 Spartina pectinata* accessions which were to be evaluated in grant proposal research project that was not funded. Consequently, the materials have not been planted.

Kenneth Whitney, University of New Mexico, requested 16 *Phalaris arundinacea* accessions to be used to evaluate genome size differences between collections made in Europe versus North America. Germination rates were acceptable for 14 accessions, however, PI206463 and PI387928 possessed low germination. In addition, a single plant from PI206463 looked to be an off-type (i.e. low growth habit, dark blue-green color, and possibly wrong species) relative to all the other accessions.

The following individuals provided no information about the intended use, nor outcomes obtained, from the accessions that were ordered: Seth Blowers, Ian Daitz, Martha Davis, Beau and

Melissa Lemoine, Richard Lykins, Eduardo Padilla, Jennifer Padilla, Bob Powers, Dr. Richard Pratt, Erica Renaud, Paul Shave, Debra Sowder, and Dr. Jinfa Zhang.

PUBLICATIONS:
No NM recipients of NPGS germplasm in 2014 provided information about published research reports resulting from the evaluation of the materials that they received.