

## State of New Mexico

### Annual Report for Calendar Year 2020 To the W6 Technical Committee

Compiled by Ian M. Ray

Twenty-one individuals from New Mexico placed 40 orders and received 263 accessions from the NPGS in 2020. The general public was the largest user of this germplasm (56% of accessions), followed by New Mexico State University (44%) and Los Alamos National Lab (<1%). Forty-nine percent of these materials were utilized for research related to crop productivity (e.g., adaptability, heat tolerance, disease resistance) and plant-microbiome interactions, while 27% were used for educational and demonstration programs, and 24% for variety development.

Among the 21 germplasm recipients, eight (28%) provided responses to a follow-up email query while 18 (86%) provided some detailed information about intended use when their order was initially placed.

#### **NPGS Germplasm Use in New Mexico: Users requesting >20 accessions in bold. Concerns and problems noted by yellow highlight**

Bigelow, John: General public, received 8 *Malus* accessions with the intent to establish a heritage apple orchard in Los Ranchos, NM for education and demonstrations on pruning techniques, heritage apple varieties, grafting, etc.

Bowles, Muriel: General public, received 1 *Vaccinium* accession to teach at-risk &/or low-income youth in the La Cruces, NM area how to grow blueberries and manage diseases.

Duncan, Deanna: McKeen Ranch, received 4 *Fragaria* and *Gossypium* accessions to evaluate for growth and productivity near Glenwood, NM.

Goodwin, Lee: Private plant breeder with J&L Gardens, received 12 *Solanum* accessions for breeding efforts to improve tomato disease resistance, brix levels, and cold tolerance for northern NM (Española).

Gunn, Val: General public, received 6 *Gossypium* accessions for educational use and demonstration of growth and development among different Pima cotton varieties near Los Alamos, NM.

Havlik, Charles: New Mexico State University, Los Lunas Ag. Science Center, received 19 accessions of *Capsicum*, *Phaseolus*, and *Zea*. These materials were planted for seed increase and to establish demonstration plots of landrace populations of diverse types of crops that are adapted to the southwestern U.S.

**Hynek, Eric:** General public, Viguita NM, received 22 *Zea mays* accessions to plant demonstration plots of colored corn varieties, with emphasis in landraces utilized by the Sioux, Crow, and Cheyenne.

Jernigan, Tara: Lovington public schools, received 1 *Latuca* accession for planting a demonstration garden.

Kaur, Harpreet and Ian Ray: New Mexico State University received 1 *Medicago* standard check variety for susceptibility to Fusarium wilt as part of a research/extension project to determine the causal agent of damage that was detected in several alfalfa fields in north central NM.

**Lombard, Kevin:** New Mexico State University, Farmington Ag. Science Center, received 22 *Solanum* spp. accessions which were included in a specialty potato variety trial in 2020. He also indicated that data collected from *Solanum* accessions received in previous years had been published. (See end of this report).

Martinez, Michelle: General public, received 2 *Mentha* accessions to include in a community garden in the Albuquerque area for education and demonstration purposes.

Pickens, Brian: General public, received 4 *Parthenium* accessions to evaluate the feasibility of cultivating guayule in the Albuquerque, NM area.

**Pratt, Richard:** New Mexico State University, received 73 *Triticum* and *Vitis* accessions. Twenty-seven diverse *Vitis* accessions will be evaluated to identify heat tolerant varieties for low elevation areas of NM. They will also be evaluated in plant pathological studies for resistance to *Phymatotrichopsis* infection for possible use as rootstock parent. Forty-six *Triticum* accessions will be evaluated in genetic studies to assess adaptation and productivity in low elevation areas of NM.

Ramsey, Christina: General public, received 1 *Gossypium* accession to evaluate in a demonstration garden for its adaptability and edibility in the Roswell, NM area.

Repka, Richard: General public, received 3 accessions of *Capsicum*, *Citrullus*, and *Fragaria* to plant in a community garden to help school age kids be able to watch plants grow and to increase their interest in learning how to grow gardens.

**Sandoval, Loretta:** Zulu's Petals Certified Organic Research Farm, received 29 accessions of *Capsicum*, *Cucumis*, *Solanum* and *Zea*. The 5 *Cucumis* and 5 *Capsicum* accessions will be grown for public education/demonstrations where they will be compared to local adapted varieties for phenotypic features such as pod size and shape. Ten *Solanum* accessions will be evaluated for fruit color and field vigor in low input organic conditions with field trials open for public viewing. Nine *Zea* accessions will be grown in education/demonstration gardens with corn adapted to New Mexico and Teosinte (locally adapted 2 years) in a series of large pots to allow a longer growing season. "Comparison of plant structure and cobs will be performed. The cobs will be evaluated based on kernel numbers, shape and form of cob, and plant characteristics. The plant maturity times will also be recorded for each type. Public field days and classes will be offered to local community (free of charge) including adolescent age group.... 'Races of Maize in

Mexico' will be used as a reference for this work. Plants from each accession will be grown in isolation to prevent cross pollination and depending on the number of plants be [intermated] within an accession.”

Servanto, Sanna: Los Alamos National Lab, received 1 *Zea* accession for research involving the study of plant-microbiome interactions, and methods to create beneficial rhizosphere microbiomes to improve plant drought tolerance.

**Swoszowski-Tran, Kristin:** Ledoux Highland Farm, Mora, NM, received 29 accessions of *Calendula*, *Medicago* and *Zea*. A portion of her response is included below. “I am very interested in comparing particular varieties grown with different carbon sequestering methods (Biochar, hugelkulture, etc.) to determine what might be a satisfactory way to successfully grow some of the varieties that I have selected, and to determine if the effects are significant enough to use that kind of culture situation given the labor to set up such an area.... I am very interested in determining ways to use very minimal irrigation and finding ways to enrich the soil to act as a sponge to hold more water for longer periods of time. I also need varieties/cultivars that can withstand the significantly high pH that we experience in this valley....I am very interested in varieties from climates that are similar to our unique conditions here at 7500 feet, so I have selected things from the Altai and Pyrenees mountainous regions in particular.”

Vogel, Amelia: General public, received 1 *Cucurbita* accession. She expressed dissatisfaction and indicated that incorrect germplasm was sent to her. According to her, she requested *Cucurbita argyrosperma* but received *C. moschata* (PI 634982, Waltham butter squash) instead.

**Ward, Troy:** North Valley Vineyards, received 23 *Vitis* accessions. He indicated that this germplasm will be used for varietal development and breeding research for juice, jelly, and table grapes for agricultural uses of a large Native American tribe.

**No response was provided from the following:**

Stripp, William: General public, received one *Fragaria* accession.

## **PUBLICATIONS:**

Bamberg, J., K.A. Lombard, J. Palta, B.A. Workmaster, and A. Atucha. (2020). Survival of *Solanum jamesii* Tubers at Freezing Temperatures. American Journal of Potato Research, 97, 497-504.