

State of Montana
Annual Report for Calendar Year 2014
to the W-6 Technical Committee
Compiled by J. M. Martin

Twenty-three individuals received 3,542 plant germplasm accessions during calendar year 2014 in Montana. Nine recipients were from state agencies, one was a commercial company, and 13 were private individuals. Most of the accessions (3,368 or 95%) were *Triticum* species.

Jim Berg, Dept. of Plant Sciences and Plant Pathology, MSU-Bozeman received 10 *Triticum aestivum* accessions. These are historical varieties that will be used in a study to examine changes in winter wheat characteristics over time. The entries were increased in the greenhouse in 2014-15.

Jack Martin, Dept. of Plant Sciences and Plant Pathology, MSU-Bozeman, received 7 *Triticum aestivum* accessions. These were Puroindoline isolines for naturally occurring Puroindoline mutations in the variety Alpowa. They are being used as checks to compare with EMS derived Puroindoline mutations.

Luther Talbert, Dept. of Plant Sciences and Plant Pathology, MSU-Bozeman, received 3368 *Triticum* accessions. These were about equally divided between hexaploid, *Triticum aestivum* and tetraploid, *Triticum turgidum* accessions. These were all scored for stem solidness and a subset for sawfly cutting. The best lines were selected for rescreening in 2015. Crosses were also made with the best lines to generate mapping populations, which are under development. Data reporting procedures have been established through the AFRI funded project.

Mike Giroux, Dept. of Plant Sciences and Plant Pathology, MSU-Bozeman, received 1 *Oriza sativa* accession. The requested accession serves as a control genotype for studies focused on the role of leaf starch in plant productivity. Unfortunately, the study is not designed for and has not identified any specific characteristics or adaptations that would be generally useful. However, one paper describes results using this genotype and transgenic derivatives.

David Sands, Dept. of Plant Sciences and Plant Pathology, MSU-Bozeman, received 12 *Solanum* accessions that represented five different species. They have a project to study variation in amylose content in potato. The accessions were planted in the greenhouse. They screened leaves/tubers for starch or amino acid profile for comparison with commercial potato varieties. They were only used to get comparative numbers.

Brent Sarchet, Lewis & Clark County Agricultural Extension Agent, Helena, MT received 25 *Malus* accessions representing 3 different species. Mr. Sarchet with other extension agents and specialists are evaluating apple varieties for their adaptation to different Montana regions. They have 10 research sites. They are evaluating some of the more recent apple cultivars such as Honeycrisp, Frostbite, etc. They are incorporating some older cultivars, from the germplasm collection. The goal is to release a fruit tree growers guide with preliminarily cultivar evaluations this winter that will be updated every 5 years. They also have a Heritage Orchard Program that

was started 3 years ago. They are now getting DNA from the trees in these 100 plus year old orchards. This data will supplement the Fruit Tree Growers Guide.

Michael Pilarski, Hot Springs, MT received 3 *Oriza sativa* accessions. He reported that the seed was planted late and it did not mature. He was very appreciative for getting the rice germplasm.

Cindy Lekar, Foristell, MT received 1 *Asclepias tuberosa* accession. She did plant the seeds but they did not establish. Her goal with this germplasm is to benefit the butterflies. She reports “I believe these grown plants are wild and established on our farm (after seeing some in the season). So the process did make me more aware of the importance of them. This is not surprising since it is a species of milkweed native to parts of North America.

William Halliburton, Blue Sky Stewardship/Earth Repair Academy, Missoula, MT received 21 *Malus* and 21 *Pyrus* (pear) accessions. He reported these were top-grafted and bench-grafted at a research nursery in Kallispell. Nearly all have survived to this point.

Bob Quinn, Quinn Farm & Ranch Research Institute, Big Sandy, MT received 2 *Triticum aestivum* accessions. The accessions were important historical winter wheat varieties Winalta and Centurk. He is cooperating with people in Italy to determine if individual wheat genotypes are inflammatory or not inflammatory.

Ed Schultz, Bozeman, MT received 4 *Zea mays* accessions. Mr. Schultz is an amateur corn breeder. He has developed early maturing ornamental corn varieties. He gave some specific observations on accessions he received.

PI358585 – Cobs were very short (1 to 2 inches). Very early to mature.

PI213 803 Gaspe Flint – very short plants with lots of tillers. Cobs were about 4 inches. It was slow to mature compared with other entries.

PI 214200 Rutherford. Short plants with big tillers. Cobs were on the end of tillers. It was early to mature.

CUDU – long arching thin leaves that were light yellow. Cobs were 3 to 9 inches. This was crossed with a strain that was earlier to mature.

Marirose Kuhlman Florence, MT received 2 *Gaillardia aristata* (common blanket flower) accessions. The seeds were planted in an outdoor common garden plot. She reported that under field conditions, she had 20% germination of OPGC 3893, and 6% germination of the W6 30198 in 2014. In 2014, all emerged plants stayed in the rosette stage (i.e. did not flower!). As of May 21, 2015, 50% of emerged plants from OPGC 3893 have flowered, and 40% of emerged plants from W6 30198 have flowered.

Brian Wilkins, Butte, MT received 3 *Humulus lupulus* accessions. The goal is to evaluate these hops varieties in the in the high elevation, short growing season in Butte, MT. He reports growing the following hops varieties, three of which were received from NPGS.

- 1) Comet CHUM 1530 *Humulus lupulus*
- 2) Liberty 558869 *Humulus lupulus*
- 3) Orion 617385 *Humulus lupulus*
- 4) Southern Cross 617404 – *Humulus lupulus*

The plants were well established by Fall 2014. He reported the following measurements.

Table 1. Measurements from four hops varieties established at Butte, MT.

	Comet	Liberty	Orion	South Cross
Height (in)	38	22	60	56
Avg No. hop buds per foot	4	2	8	5

Carl Camper, Chateau Stripmine, Forsyth, MT received 11 *Vitis* species and 3 *Raphanus sativus* (radish) accessions. Mr. Camper has added these *Vitis* accessions to his collection. They have an established vineyard in Southeastern MT. The website is: <http://chateaustripmine.info/index.htm>. He is an amateur grape breeder. Some of these accessions are being used for crossing.

Annalise Scheppers, Bozeman, MT requested one *Prunus dulcis* (almond) and one *Prunus persica* (peach). She reports her request was denied.

Joseph Schaar, Bozeman, MT received 7 *Punica granatum* (pomegranate) and 5 *Olea europaea* (Olive). Four of the seven *Punica granatum* were rooted successfully. He reports they are outside in the summer and early fall then over winter for about 800 dormancy hours in a friend's greenhouse. Low light and near freezing temperatures set them into dormancy. They lose all leaves and have come back very healthy and vigorous. The *Olea europaea* did not root successfully.

Publications:

Berg, J.E., P. Hofer, E. S. Davis, R. N. Stougaard, K. D. Kephart, P. F. Lamb, D. M. Wichman, J. L. Eckhoff, J. H. Miller, D. L. Nash, W. E. Grey, Y. Jin, X. Chen and P. L. Bruckner. 2014. Registration of 'SY Clearstone 2CL' Wheat. *Journal of Plant Registrations* 2014 8: 2: 162-164.

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Schlosser, A.J., J.M. Martin, B.S. Beecher, and M.J. Giroux. 2014. Enhanced rice growth is conferred by increased leaf ADP-glucose pyrophosphorylase activity. *J Plant Physiology and Pathology* 2:4.