

State of Montana
Annual Report for Calendar Year 2013
to the W-6 Technical Committee
Compiled by J. M. Martin

Montana received 1699 accessions from National Plant Germplasm System during 2013. These were distributed to 29 individuals. Twelve individuals were affiliated with the Montana University System and the remaining 17 were private individuals. *Triticum* species comprised the largest proportion of germplasm accessions (70%).

Tom Blake, Dept. of Plant Sciences, MSU-Bozeman received 77 *Avena sativa* 56 *Secale cereal*, and 1 *Hordeum vulgare*. The oats are hullless oat accessions that could be used for gluten free food products. The *Secale cereal* are rye accessions that could be used in the rapidly growing craft distilling industry. All the craft brewers use some rye malt. The oat and rye accessions were increased in observation plots in 2013. The barley is [Maris Otter, a variety lots of craft brewers think they want.](#)

Jamie Sherman, Dept. of Plant Sciences, MSU-Bozeman, received 2 *Hordeum vulgare* accessions. These two barley lines have been reported to have increased recombination in certain regions. These lines have been crossed to Betzes barley. He recombinant inbred lines will be genotyped with the SNP chip to evaluate genome wide recombination.

Luther Talbert, Dept. of Plant Sciences, MSU-Bozeman, received 994 *Triticum* accessions. The accessions are winter wheat landraces collected from areas of the world where the wheat stem sawfly is a historical problem. The goal is to identify novel genes for resistance from this set of landraces to incorporate into current spring wheat cultivars. The lines have all been planted at two sawfly-infested sites. Data on sawfly infestation and cutting will be collected at the end of the season.

Nancy Blake, Dept. of Plant Sciences, MSU-Bozeman received 190 *Triticum turgidum* subsp. *Dicoccoides* accessions. These were planted at wheat stem sawfly infested location to determine if any of them show reduced sawfly cutting. The trial suffered severe hail damage prior to obtaining any data on sawfly cutting in 2013.

Riyadh Alkhafaji, Dept. of Plant Sciences, MSU-Bozeman received two *Triticum aestivum* accessions. These wheat lines have been reported to have resistance to root lesion nematode. They will be used in crosses to study inheritance of resistance.

Alice Pilgeram, Dept. of Plant Sciences, MSU-Bozeman, received 92 *Solanum* accessions. These are being used in an on-going project to identify a high amylose (low glycemic index) potato.

Matt Lavin, Dept. of Plant Sciences, MSU-Bozeman received 1 *Aeschynomene evenia* accession. He has plans to do a molecular systematic study of the genus *Aeschynomene*. He has not done anything with this germplasm yet.

Chaofu Lu, Dept. of Plant Sciences, MSU-Bozeman received 50 *Ricinus communis* (castor bean) accessions. He is using these to study the fatty acid profile in castor bean.

Chengci Chen, Central Agricultural Research Center, MSU, Moccasin, MT received 14 *Vicia faba* accessions. He reports the entries were severely infected with disease in 2013. He did not harvest seed. He reports he has given up on faba bean for central Montana.

Perry Miller, Dept. of Land Resources and Environmental Sciences, MSU-Bozeman received 54 *Vicia faba* accessions. Recent field experience in Saskatchewan, and the scientific literature indicate that faba bean is a superior N-fixer compared with pea. Large seed size limits the economic fit for faba bean as a cover crop. They obtained faba bean lines from the USDA world collection and grew them near Bozeman in 2013, resulting in several lines with seed size 50% smaller than the Saskatchewan line SSNS-1. Several of the lines are a mix of dark and light skinned seed; it is possible that dark-skinned (high tannins) faba beans would emerge better from soil without fungicidal seed treatment. They will test the N fixation ability of faba bean compared with pea, and to study emergence, plant growth, N fixation, and seed yield as affected by color of the seed coat and seed size. Development of a true small-seeded faba bean variety would be popular as a legume cover crop or within cover crop mixes, if there truly is an N-fixing advantage for faba bean over pea.

Lauren Walter, Division of Biological Sciences, University of Montana, Missoula, MT received 2 *Pisum sativum* (pea) accessions. They are using these accessions in studies with the pathogen *Aphenomyces euteiches*.

Brent Sarchet, MSU Agricultural Extension Agent, Helena, MT received 24 *Malus* (apple) accessions. Over the last two years, he has gotten apple scion wood. He has grafted the scion wood and will place some of the cultivars at eight fruit tree research sites that are located across Montana to evaluate their performance. This should occur next year. They will begin collecting data in the following years.

Joseph Schaar, student at MSU-Bozeman, received 5 *Olea europaea* (olive), 2 *Citrus hystrix* (lime), and 3 *Fortunella* (kumquat) accessions. The olive accessions did not root successfully. Three of the 15 lime seeds germinated. He plans to use one surviving seedling as an indicator of whether citrus can survive in a zero energy input greenhouse ecosystem that replicates a zone 9.

Dave Christensen, Big Timber, MT received 3 *Zea Mays* accessions. Mr. Christensen is an amateur corn breeder. He has been breeding corn for short, cool climate conditions for 41 years. Another goal is to develop corn lines with unique cooking qualities. He reports that he has used what he calls heirloom corn varieties from GRIN extensively in his work.

Christine Brissette, Van Wild Conservation Nursery, Missoula, MT received 1 *Limonium sinuatum* (statice) and 1 *Rubus idaeus* subsp. *Idaeus* (American red raspberry) accession. The *Limonium sinuatum* has not been planted yet. The *Rubus idaeus* was transplanted and kept in the greenhouse during the winter

Ed Schultz, Bozeman, MT received 2 *Zea mays* (corn) accessions. He reports the seed was planted in May 2014.

Adam Hauge, Turner, MT received 1 *Hordeum vulgare* (Hana barley) accession. It was planted in a small plot on their farm for observation and seed increase.

Megan Sabo, Bozeman, MT received 1 *Nepeta cataria* (catnip), 2 *Papaver* species (oriental poppy), 1 *Fragaria vesca* f. *semperflorens* (strawberry), 1 *Lonicera caerulea* var. *villosa* (blue-berried honeysuckle), 1 *Rubus occidentalis* (black raspberry), 4 *Malus sieversii* (ancestor of domestic apple). She reported these were used for elementary science projects and demonstrations.

Publications:

Blake, N. K., D. Clark, S. P. Lanning, G. R. Carlson, P. F. Lamb, D. Nash, D. M. Wichman, K. D. Kephart, R. N. Stougaard, J. Miller, J. L. Eckhoff, F. Menalled, E. Davis, and L. E. Talbert. 2013. Registration of 'WB9879CLP' Hard Red Spring Wheat. *J. Plant Registration* 7:205-209.

Carlson, G. R. J. E. Berg, K. D. Kephart, D. M. Wichman, P. F. Lamb, J. H. Miller, R. N. Stougaard, J. L. Eckhoff, N. R. Riveland, D. L. Nash, W. E. Grey, Y. Jin, J. A. Kolmer, X. Chen, G. Bai, and P. L. Bruckner. 2013. Registration of Judee wheat. *J. Plant Registration* 7:191-194.

Carlson, G. R., J. E. Berg, R. N. Stougaard, J. L. Eckhoff, P. F. Lamb, K. D. Kephart, D. M. Wichman, J. H. Miller, N. R. Riveland, D. L. Nash, W. E. Grey, Y. Jin, J. A. Kolmer, X. Chen, G. Bai, and P.L. Bruckner. 2013. Registration of 'Bearpaw' Wheat. *J. Plant Registration* 7:180-183.

Hogg, A.C., K. Gause, P. Hofer, J.M. Martin, R.A. Graybosch, L.E. Hansen, and M.J. Giroux. 2013. Creation of a high-amylose durum wheat through mutagenesis of starch synthase II (SSIIa). *J. Cereal Sci.* 57:377-383.

Shalu, J., N. F. Weeden, L. D. Porter, S. D. Eigenbrode, and K. McPhee. 2013. Finding Linked Markers to *En* for Efficient Selection of Pea Enation Mosaic Virus Resistance in Pea. *Crop Sci.* 53:2392-2399.