

STATE OF UTAH
Annual Report for Calendar Year 2005
to the W-6 Technical Committee
Compiled by Kevin B. Jensen

Germplasm Activities of Carolena Barlow (Finney Farm, Hildale, UT) - Order number: 171891 - *Ipomoea batatas* var. *batatas*; **Order number: 171548** - *Coreopsis tripteris*, *Oenothera drummondii*, *Rudbeckia* sp.; **Order number: 170772** - *Malus domestica* - for apple scion; **Order number: 170648** - *Cucumis melo*, *Cucumis melo* subsp. *melo*, *Cucumis sativus* var. *sativus*, *Daucus carota*, *Spinacia oleracea*.

No Report Submitted

Germplasm Activities of Shaun Bushman (USDA/ARS, Logan, UT) - Order number: 176414 - *Hordeum vulgare* subsp. *vulgare*; **Order number: 173704** - *Elytrigia elongata*; **Order number: 169958** - *Leymus mollis*.

I ordered seed for *Thinopyrum elongatum* and *Leymus mollis*. These were requested so that I could subject them to sulfonylurea herbicides. I assessed their level of tolerance to three such herbicides, and intend to submit a manuscript this fall. The former is a diploid of the E genome, and *Leymus mollis* is a diploid possibly of the Xm genome.

Germplasm Activities of John G. Carman (Utah State Univ., Logan, UT) - Order number: 170146 - *Sorghum bicolor* - Studies of plant embryology; **Order number: 170130** - *Sorghum arundinaceum*, *Sorghum bicolor* - Studies of plant embryology.

No Report Submitted

Germplasm Activities of Julie Chard (Utah State Univ., Logan, UT) - Order number: 172867 - *Hordeum vulgare* subsp. *vulgare*; **Order number: 171993** - *Triticum timopheevii* subsp. *timopheevii*, *Triticum turgidum* subsp. *turanicum*; **Order number: 171804** - *Triticum aestivum* subsp. *aestivum*, *Triticum turgidum* subsp. *durum*.

Seed was obtained for use in studies of pubescence effects on water use efficiency (WUE) in wheat and barley. Seeds were germinated (germination data available) and plants were grown to maturity. Each accession was rated for the amount of pubescence by feel (pubescence-by-feel data available). Pubescence among accessions of wheat was variable. Pubescence of the barley line (Order 172867) was minimal. Magnified photographs were taken of leaf surfaces of selected accessions. Photosynthesis data (Li-Cor 6400 system) and spectral transfectance data (ASD Field-Spec Pro system) were collected for selected accessions. No correlation between pubescence and WUE was readily apparent and the project was terminated.

Germplasm Activities of Brad Geary (Brigham Young Univ., Provo, UT) - Order number: 174866 - *Avena strigosa*, *Secale strictum subsp. anatolicum*; **Order number: 174862** - *Phaseolus vulgaris* - for educational purposes; **Order number: 174728** - *Triticum aestivum subsp. aestivum*.

These seed were ordered for making media for growth of pathogenic fungi. All remaining seed has been destroyed.

Seed was planted and grown to produce plants that were used in a class. The plants were used to show the effects of *Fusarium spp.* on beans. Students were able to experience firsthand the detrimental effects of *Fusarium spp.*

Seed was planted and grown to produce plants that were used in a class. The plants were used to show the effects of *Pseudocercospora* on wheat. Students were able to experience firsthand the detrimental effects of *Pseudocercospora*.

Germplasm Activities of Rachael Gibson and Dan Drost (Utah State Univ., Logan, UT) - Order number: 171636 - *Allium cepa*.

Producing Sweet Onions in Utah: Initiating a Cultivar Screening Program

The objective of this project was to screen commercially available cultivars and germplasm accessions for their sweetness and adaptability to long day conditions in northern Utah. Those varieties which perform the best under these conditions will be considered for a breeding program focused on producing an onion that can be commercially grown by Utah onion growers as certified sweet.

Materials and Methods

Forty seven different commercially available cultivars and nine germplasm lines from the National Plant Germplasm System were obtained and assessed for their adaptability to northern Utah's daylength conditions. All of the seed was mechanically planted except the germplasm lines and NuMex Starlite, which all had low amounts of seed. These varieties were evaluated as a separate group because of this different treatment. A field 180 feet long and 140 feet wide was prepared for planting by applying 200 lb./acre of potassium sulfate, 150 lb./acre of ammonium phosphate and raising beds at the Greenville Farm in Logan, Utah in the fall of 2004. Beds were roughly 38 inches in width, containing two double rows, 12 inches apart and seeds spaced 3 inches in row. One bed was planted using two single rows, as it was necessary to hand plant the lines with low amounts of seed.

Onions were planted on April 13, 2005 with each variety taking one and a half rows, except for the 9 germplasm lines and five cultivars which had limited amounts of seed. Four beds included the sweet Spanish type, Vaquero, which served as the control against environmental bias. Nitrogen was applied at 25 lb./acre (ammonium nitrate) for eight weeks, from July 6 to August 19. Water was

applied with a drip system five days a week as necessary. Three different herbicides were used: Goal, 250 mL/acre; Buctril, 375 mL/acre; and Select, 180 mL/acre. There were four applications of Goal, two of Buctril, and two applications of Select. Beds were hand weeded as needed.

Four different plots, three feet in length, were evenly spaced across the length of the field. These plots were used to monitor stand counts and tops down. Stand counts were taken at random times throughout the growing season, on May 16 and 25, July 1, and September 18. Tops down counts were taken twice a week from July 28 to September 25.

Approximately twenty eight plants of each variety were monitored for leaf number and bulbing maturity. These plants were selected randomly by marking a plant at evenly spaced intervals across the length of each bed. Leaf counts and bulbing maturity were monitored from these plants. Leaf counts occurred once in the field on July 22. Bulbing was monitored beginning on June 28, and continued once a week from July 14 to Sept 5.

Refractometer readings were taken from 28 plants of most of the varieties. The plants of each variety for this test were chosen from four different areas down the length of the field. A core sample through the equator of the bulb, 10mm in diameter, from each of these plants was taken, and the juice extracted with a garlic press. Leaf number, bulb and neck diameters, as well as bulb shape were monitored using these same plants.

Onions varieties for storage and continued evaluation were harvested by hand, and selection based upon their performance in leaf number, bulb size, maturity, and sugar content. Specific onion bulbs within harvested varieties were chosen visually on September 9 based upon leaf number, bulb size and bulb to neck ratio.

Results and Discussion

Leaf Number

Plant varieties were separated into three general categories based upon their average production of leaves by the end of the growing season: 1-2 leaves, 3-4 leaves, and 5 or more leaves. Varieties which produced two or less leaves were considered the varieties which are quite sensitive to Utah's long daylength. Since bulbing is triggered early, the plants do not continue to produce leaves. These cultivars are not adapted to daylength in our area. These varieties include: Chianti, Georgia Boy, Mr. Buck, Ohoopee Sweet, Pumba, Sapelo Sweet, Southern Belle, Sweet Advantage, Timon, NuMex BR1, NuMex Dulce, NuMex Mesa, Don Victor, Early Supreme, Excalibur, Excel, Nikita, Nirvana, Prowler, Safari, Sweet Melody, Sweet Vidalia, Calera, Century, Cirrus, Cougar, Ebano, La Joya, Mercedes, Pegasus, Stratus, PI 272255 95CI, PI 272257 02CI, and PI 430371 83GI.

Plants that had three to four leaves seemed to have some adaptability to our daylength because they were able to grow more leaves in the same amount of time as the other varieties while still not reaching the capabilities of others. These varieties include: Desert Sunrise, NuMex Sunlite, NuMex Vado, Aspen, Caballero, Guadalupe, and Leona.

Plants which averaged four or more leaves were considered the most adapted to our daylength, as they were in a category that grew the most leaves. These varieties include: Exhibition, Walla Walla, NuMex Arthur, NuMex Crispy, NuMex Freedom, NuMex Starlite, Candy, Sierra Blancé, Utopia, PI 200874 92GI, PI 264326 91CI1, PI 269415 91CI1, PI 271309 91GI, PI 288079 95GI1, and PI 288909 92CI1.

Date to 100% bulbing and Date to 80% Tops Down

Bulbing and tops down are important indicators of plant maturity. The dates at which these

events occur indicate when plants are being triggered to begin bulb sizing and how long it takes them to reach full size. Because leaf number is directly related to bulb size, later bulbing is desired so that the plant has adequate time to develop the necessary leaf area to create a larger bulb.

Bulbing response was split into two general categories, those varieties which began bulbing before the 15th of July and those which didn't reach full bulbing response until after that date. All of the varieties were bulbing by the 12th of August. In the early category was: Sweet Advantage, Southern Belle, Mr. Buck, Ohoopee Sweet, Sapelo Sweet, Georgia Boy, Pumba, Timon, Chianti, NuMex BR1, NuMex Crispy, NuMex Dulce, NuMex Freedom, NuMex Starlite, NuMex Sunlite, Early Supreme, Excalibur, Excel, Don Victor, Nikita, Nirvana, Prowler, Safari, Sweet Melody, Sweet Vidalia, Calera, Century, Cirrus, Cougar, Ebano, La Joya, Leona, Mercedes, Stratus, PI 272255 95C1, PI 272257 02C1, PI 430371 83G1, PI 200874 92G1, and PI 271309 91G1.

The late bulbing category included: Exhibition, Desert Sunrise, Walla Walla, NuMex Arthur, NuMex Mesa, NuMex Vado, Aspen, Caballero, Candy, Guadalupe, Pegasus, Sierra Blanca, Utopia, PI 264326 91C11, PI 269415 91C11, PI 288079 95G11, and PI 288909 92C11.

Having the majority of the tops down in a population indicates that bulbs are mature and ready to be harvested. In general, it was thought that this response would match with the bulbing response and result in an early and late category. In many cases this is what occurred, with the early category being those that matured on or before August 18 and the late category including those that matured after that date. Some cultivars did not follow this pattern. In some varieties a late top down date may have occurred because the leaves were not large enough to fall when the neck tissue had senesced. In other cases a variety not maturing may be due to the late planting date compounded with the approach of a short daylength in late August causing the plants to initiate leaf regrowth.

Bulb Diameter

A large bulb diameter is important so that harvest can be done efficiently and that growers can make a profit. In our screening bulbs larger than 40 mm were thought to have the necessary potential to grow well under the conditions which a Utah farmer would put them under. These varieties include: Desert Sunrise, Walla Walla, NuMex Arthur, NuMex Crispy, NuMex Freedom, Aspen, Caballero, Candy, Guadalupe, Leona, Sierra Blanca, Utopia, PI 200874 92G1, PI 269415 91C11, and PI 288079 95G11.

Brix %

High sugar amounts contribute to how sweet an onion tastes. For our study, Brix % readings greater than 8% were considered the sweetest. These varieties included Chianti, Desert Sunrise, Sapelo Sweet, Southern Belle, Sweet Advantage, Timon, Walla Walla, NuMex Freedom, NuMex Vado, Early Supreme, Aspen, Caballero, Calera, Candy, Century, Cirrus, Cougar, Guadalupe, Mercedes, Sierra Blanca, Stratus, PI 200874 92G1, PI 264326 91C11, PI 269415 91C11, PI 271309 91G1, PI 288079 95G11, PI 288909 92C11, PI 272257 02C1, PI 430371 83G1.

Conclusion

Planting in mid April placed heavy environmental pressure upon the lines included in this screening. Typically in northern Utah, onion growers will not plant after April 1. As a result, some lines may be more adapted than was shown, and this was taken into consideration when choosing the lines which will continue to be evaluated in the future. Cultivars chosen according to some adaptation to long day conditions of northern Utah include: Exhibition, Pumba, Sweet Advantage, Walla Walla, NuMex Arthur, NuMex Freedom, NuMex Vado, Aspen, Caballero, Candy, Guadalupe,

Leona, Sierra Blanca, PI 200874 92G1, PI 269415 91C11, PI 288079 95G11, and PI 288909 92C11. These lines and others will be further evaluated in 2006.

Germplasm Activities of James Haggerty (Mendon, UT) - Order number: 175396 - *Allium longicuspis*, *Allium sativum* var. *ophioscorodon*, *Allium sativum* var. *sativum* - Acquiring all available hardneck varieties of garlic.

No Report Submitted

Germplasm Activities of Eric N. Jellen (Brigham Young Univ., Provo, UT) - Order number: 174721 - *Amaranthus caudatus*, *Amaranthus cruentus*, *Amaranthus hybridus*, *Amaranthus hypochondriacus*, *Amaranthus powellii* subsp. *bouchonii*, *Amaranthus powellii* subsp. *powellii*, *Amaranthus retroflexus*, *Amaranthus tuberculatus*. **Order number: 173068** - *Amaranthus caudatus*, *Amaranthus cruentus*, *Amaranthus hypochondriacus*, *Amaranthus tricolor*.

We have increased seed of all of the *Amaranthus* accessions we received from the NPGS. We are including their DNA on screening panels for potential microsatellite (SSR) marker-primers we have designed based on sequences derived from several SSR-enriched genomic DNA libraries from *A. hypochondriacus* cv. 'Plainsman'. These markers will initially be used in genetic diversity surveys and in constructing genetic maps for the cultivated amaranths.

Germplasm Activities of Kevin B. Jensen (USDA/ARS, Logan, UT) -

Orchardgrass Breeding: A wide leafed population of orchardgrass has been developed from plant introductions from Northwestern Regions of China. Selection emphasis in all populations is on reduced fiber (high quality), regrowth characteristics, increase seedling establishment, disease resistance, and increased persistence. Selections within PIs 237269 (Denmark), 255168, 305498, 311034 (Poland), and 370668, 440275, AR-468 (USSR) were polycrossed and are currently being evaluated for total forage yield under intensively managed grazing.

Snake River and Thickspike wheatgrass: All accessions from the NPGS were evaluated this year for persistence, plant vigor, seed yield, establishment characteristics, and forage yield. Data was collected in 2005 and a second years data during 2006 will be taken.

Mountain bromegrass: All NPGS accessions have been started in the greenhouse for inclusion in a breeding program this spring/fall. Seed viability varied greatly among accessions (near zero to 100 percent germination).

Germplasm Activities of D. A. Johnson (USDA-ARS, Logan, UT)

Germplasm Collection and Evaluation of *Astragalus filipes*: Work is continuing with *Astragalus filipes* (basalt milkvetch or threadstalk milkvetch) for use in restoration and revegetation efforts in the Intermountain West. During the summer of 2005, efforts were

undertaken to evaluate the agronomic, ecological, and physiological characteristics of 83 seed accessions basalt milkvetch at two sites in northern Utah. Detailed notes on plant growth characteristics, plant vigor, phenology, flowering, biomass production, plant regrowth following clipping, and seed production were obtained for the accessions. Collaborations are continuing with Jim Cane at the USDA-ARS Bee Biology and Systematics Lab at Logan to study pollination and seed predation in basalt milkvetch.

Germplasm Collection and Evaluation of *Dalea ornata* and *D. searlsiae*: Western prairie clover (*Dalea ornata*) and Searls prairie clover (*D. searlsiae*) are North American legumes that represent promising Intermountain legumes for use in restoration and revegetation of deteriorated rangelands in the western U.S. These species are found in sagebrush steppe and pine forest areas across a five-state area of the western U.S. Seed collections of western prairie clover were made in Washington, Oregon, and Idaho during 2005. Seed collections of *D. searlsiae* were also made in Utah and Nevada during 2005.

About 150 plants of each of the 12 accessions of *D. ornata* were started in the greenhouse along with plants of *D. purpurea* for comparison. Seedlings were transplanted to two field sites in northern Utah during May 2005 and will be observed for characteristics such as plant morphology, flower color, plant vigor, forage yield/quality, defoliation tolerance, persistence, and seed yield in 2006. Root nodules of greenhouse-grown plants of *D. ornata* that form infective and effective associations with *D. ornata* plants will be isolated and sent to the Nitragin Company for isolation of infective and effective *Rhizobium* strains for maximizing nitrogen fixation.

GIS Data Extraction Tool: Cooperative work with Chris McGinty, Doug Ramsey, and Chris Garrard at the GIS/Remote Sensing Lab at Utah State University has continued concerning the development of a GIS data extraction tool for germplasm-related research in a 17-state area in the western U.S. The GIS layers developed included: county, land ownership, mean site precipitation, mean minimum temperature, mean maximum temperature, elevation, slope, aspect, Omernik Level III and IV ecoregion designation, and NRCS STATSGO soils and range site description information. By providing latitude and longitude for a specific site, all above information can be extracted for each site. This information will be invaluable to characterize specific collection sites for species that occur in the western U.S. This site information can also be used to develop tools to predict species occurrences at other similar sites. Efforts are currently underway to make this information available on a web server at Utah State University.

Germplasm Collection for Low-Maintenance Turf Germplasm in Inner Mongolia, China:

A proposal that was selected for funding by the USDA Germplasm Exploration Fund in 2004 to collect seeds of low-maintenance turf germplasm in Inner Mongolia, China was again discussed with cooperating scientists from the Grassland Research Institute in Huhhot, Inner Mongolia. They submitted a request to the Chinese Ministry of Agriculture for a joint germplasm collection in Inner Mongolia in 2006. All divisions within the Ministry of Agriculture, except for the Planting Industry Division, gave their approvals for the joint collection. This one non-approval will again make it impossible for a joint U.S.-China germplasm collection trip in 2006. We are

currently discussing if our Chinese counterparts can do the collection and if we can jointly evaluate the collected material.

Germplasm Collection for Low-Maintenance Turf Germplasm in Kyrgyzstan:

A proposal was prepared and selected for funding by the USDA Germplasm Exploration Fund to collect seed of low-maintenance turf grass germplasm in Kyrgyzstan during August 1-27, 2006. This collection trip will target the northeastern region of Kyrgyzstan, an area in Central Asia that has a large diversity of germplasm that holds promise for low-maintenance turf applications. Potential low-maintenance turf grasses in the genera *Agrostis*, *Festuca*, *Koeleria*, *Poa*, and *Puccinellia* will be targeted for collection. Our collection team will consist of myself, Dr. Rob Soreng (*Poa* specialist from the Smithsonian Institute in Washington, DC), and germplasm specialists from Kyrgyzstan and the N.I. Valilov Institute of Plant Industry in St. Petersburg, Russia. Seed collections from Kyrgyzstan will add important accessions to the U.S. National Plant Germplasm System for the development of low-maintenance turf species for the U.S.

Ongoing Research Projects Involving NPGS Germplasm: Ongoing collaborative research projects that involve the use of germplasm from the National Plant Germplasm System include: evaluation of carbon isotope discrimination as a selection tool for enhanced water-use efficiency in cool-season range grasses and evaluation of accessions of squirreltail (*Elymus elymoides*) and bluebunch wheatgrass (*Pseudoroegneria spicata*) for response to a gradient of water application.

Germplasm Activities of T. Jones (USDA-ARS, Logan, UT)

In 2005 White River Germplasm Indian ricegrass (*Achnatherum hymenoides*), selected from PI 232329, was recommended for release. A 36-accession collection of bottlebrush squirreltail (*Elymus elymoides* ssp. *elymoides* race C) originating from ID and OR was established for evaluation. Forty-six accessions of native cool-season grasses were collected in two expeditions in 2005, including 19 bluebunch wheatgrass (*Pseudoroegneria spicata*), 10 Indian ricegrass (*Achnatherum thurberianum*), 5 bluegrass (*Poa secunda*), 4 needle-and-thread (*Hesperostipa comata*), 4 bottlebrush squirreltail (*Elymus elymoides*), 2 big squirreltail (*Elymus multisetus*), and 2 Indian ricegrass (*Achnatherum hymenoides*). Nearly 1,800 native grass accessions are now in the collection.

Germplasm Activities of David Kirkwood (Huntington, Utah) - Order number: 176610 -
Fragaria x ananassa.

No Report Submitted

Germplasm Activities of Boyd Kitchen (Vernal, UT) Order number: 175730 -
Pisum sativum

Rachel, age 10, began her genetics study learning about Mendel. She decided to duplicate a portion of his work with peas. She grew two germplasm sources provided from the U.S. National Plant Germplasm System indoors during the winter of 2005-2006 and made some crosses

between the two. She is not certain yet, if the crossing techniques were successful. She is growing out the seed from those crosses this summer to see.

Germplasm Activities of Steve Larson (USDA-ARS, Logan, UT)

Fingerprinted AFLP (DNA) profiles, sequenced the chloroplast psbA-trnH and rps16-trnK intergenic spacer regions, and sequenced the nuclear ribosomal rDNA sequences (ITS) of approximately 360 accessions (720 plants) representing 18 species of *Leymus* wildryes including North American *L. cinereus* (284), *L. triticoides* (23), *L. cinereus* x *L. triticoides* (3), *L. salinus* (10), *L. condensus* (10), *L. flavescens* (9), *L. innovatus* (2), *L. mojavenensis* (2), and *L. mollis* (2) and Eurasian *L. multicaulis* (2), *L. angustus* (2), *L. arenarius* (2), *L. chinensis* (2), *L. akmolinensis* (2), *L. racemosus* (2), *L. ramosus* (2), *L. secalinus* (2), and *L. sabulosus* (2). Results will be used to investigate phylogenetic relationships among *Leymus species* world-wide and phylogeographic patterns of North American *Leymus* wildryes. Specimens are being grown in the field for observation and voucher specimens, which will be submitted to the Utah State University Intermountain Herbarium.

Germplasm Activities of Ethan Nielson (Nielson Research Group, Spanish Fork, UT) -

Order number: 176655 - *Fragaria iinumae*, *F. pentaphylla*, *F. vesca* f. *semperflorens*, *F. vesca* subsp. *vesca*.

Wrong Address Provided

Germplasm Activities of Michael D. Peel (USDA/ARS, Logan, UT) - Order number:

172167 - *Medicago arborea*; **Order number: 170313** - *Sanguisorba minor*, *Sanguisorba minor* subsp. *lasiocarpa*, *Sanguisorba minor* subsp. *magnolii*, *Sanguisorba minor* subsp. *muricata*.

Ninety eight accessions (the entire collection in NPGS) of *Sanguisorba minor* spp. obtained were established as space plants in the field in the spring of 2005. The material is being evaluated and promising germplasm will be used to initiate a breeding program to develop improved cultivars of the species.

Nine accessions of *Medicago arborea* obtained were established in the field in the spring of 2006. The material will be characterized for its potential as a forb in the Inter-Mountain region of the Western USA.

Germplasm Activities of Christian Ricks (Brigha Young Univ., Provo, UT) Order number:

175448 - *Zea mays* subsp. *mays*; **Order number: 175408** - *Hordeum vulgare* subsp. *vulgare*; **Order number: 175269** - *Sorghum bicolor*.

The intent was to extract genomic DNA and amplify out certain prolamin storage proteins to probe a pearl millet cDNA library. But the project was sidetracked and I never used the seeds.

Germplasm Activities of Joseph Robins (USDA/ARS, Logan, UT)

Order number 170098 – *Alopecurus pratensis*

All accessions are being characterized in a common nursery at Richmond, UT. This year accessions will be characterized for maturity, morphological traits, forage yield, forage quality, and seed production. Seed from selected accessions will be planted at Logan and Panguitch, UT next year.

Order number 172466 – *Dactylis glomerata*

Accessions will be characterized for germination traits, ploidy levels, and billbug resistance. Next year accessions will be placed at Panguitch, UT for characterization of winter hardiness.

Order number 175209 – *Pascopyron smithii*

All accessions were placed at Nephi, UT this spring. Data will be collected on a number of agronomic and morphological traits over the next two years.

Germplasm Activities of Dominique Roche (Utah State Univ., Logan, UT) - Order number: 171955 - *Hordeum vulgare subsp. vulgare*; Order number: 171862 - *Hordeum vulgare subsp. vulgare*; Order number: 171859 - *Hordeum vulgare subsp. vulgare*.

No Report Submitted

Germplasm Activities of Terry Tolbert (Escalante, UT) - Order number: 174118 - *Solanum jamesii*.

No Report Submitted

Germplasm Activities of Blair Waldron ((USDA/ARS, Logan, UT) - Order number: 176446 - *Poa pratensis*, *P. pratensis subsp. alpigena*, *P. pratensis subsp. angustifolia* - *Poa pratense* - screening for drought tolerant turf.

Germplasm Activities of Blair Waldron (USDA/ARS, Logan, UT) - Order number: 176446 – *Poa pratensis*, *P. pratensis subsp. Alpigena*, *P. pratensis subsp. Angustifolia* – *Poa pretense* – screening for drought tolerant turf.

Accessions were started in the greenhouse during January 2006, and transplanted to field near Logan, UT in May 2006. They will be evaluated for turf quality and persistence under drought stress (reduced irrigation ~ 40% ET replacement).

Germplasm Activities of Richard R.-C. Wang (USDA/ARS – Logan, UT) – Order number 173699 - *Triticum aestivum subsp. aestivum*; Order number 173245 – *Ipomoea hederacea*,

Ipomoea purpurea; **Order number 172912** – *Aegilops markgrafii*.

Triticum aestivum accessions were used in research to determine if two differentially expressed genes are responsible for higher salt tolerance. Presence or absence of a specific allele of these two genes in the wheat lines was tested by PCR. Molecular results will be analyzed along with results from a field testing of salt tolerance. No publication resulted yet.

The *Ipomoea* accessions were passed on to colleagues who are studying genes involved in anthocyanin biosynthesis. Preliminary in situ hybridization results have been obtained for ANS and UF3GT genes indicating their separate chromosomal locations. A research proposal has been developed by colleagues with aims to physically map 5 or 6 genes and publish papers.

The two *Aegilops markgrafii* accessions have not been used in research yet.

Germplasm Activities of Frank Williams (DePew Grass, Provo, UT) - Order number: 173160 -

No Report Submitted

Publications 2005-06

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