

STATE OF COLORADO

Annual Report for Calendar Year 2006 to the W-6 Technical Committee

Compiled by Mark A. Brick

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Orders for germplasm from the NPGS constituted delivery of accessions from both clonal repositories and Plant Introduction Stations. 1506 accessions were requested that constituted 67 orders which was a slight increase over the previous year. Orders were made from the following locations: COR, DAV, GEN, GSTR, MAY, NSGC, NC7, NR6, RIV, S9, PARL, and W6.

The following is a report of germplasm activities in Colorado during the 2006 calendar year from scientists that responded to a request for information.

1. Mike Kintgen at the Denver Botanic Gardens received the following plants *Carpinus caroliniana* and *hydrangea arborescens*. He ordered that material last year and either planted in the gardens or gave it to a fellow horticulturist to plant. They observed the following:
 - The *Carpinus* did well establish 2 out of 3 look great this spring. The third died because it was left in a pot over the winter. The *Carpinus* however did not exhibit any noteworthy fall color. (if I remember right it was a selection for reddish fall color) However it was a poorer year for fall color in 2006 than other years. We will continue to observe this tree in the future years for fall color.
 - The *Hydrangea* did not survive as we have seen no sign of it the spring where it was planted. This could have been from the later planting date Sept or Oct.
 - We used the Germplasm for display in Botanic Garden with both scientific and display goals.
 - We did not release any material that were derived or partially derived from these two plants.

- No publication resulted from the above Germplasm.

2. Mr. Saleh Al-Turki, Dep. Of Horticulture and Landscape Architecture, Colorado State University, Fort Collins provided the following report on date fruit accessions received.

Date fruits were received in a good condition without any pests or diseases. Each cultivar was put in sealed plastic bag where they placed in a cork box.

This is the Information about what was received:

Cultivar	Binomial	Accession No	Quantity	Inventory Item
Hayany	Phoenix dactylifera	RPHO 13	50 CT	CVARS 4D-22-01
Deglet Noor	Phoenix dactylifera	PI 4611	50 CT	CVARS 4D-31-02
Zahidi	Phoenix dactylifera	PI 8743	50 CT	CVARS 4D-20-02
Barhee	Phoenix dactylifera	PI 8746	50 CT	CVARS 4D-04-08
Halawy	Phoenix dactylifera	PI 8750	50 CT	CVARS 4D-03-02
Khadrawy	Phoenix dactylifera	PI 8751	50 CT	CVARS 4D-08-02
Khalasa	Phoenix dactylifera	PI 8753	50 CT	CVARS 4D-10-08
Hilali	Phoenix dactylifera	PI 8760	50 CT	CVARS 4D-30-03
Medjool	Phoenix dactylifera	PI 74204	50 CT	CVARS 4D-26-09
Amir Hajj	Phoenix dactylifera	PI 80781	50 CT	CVARS 4D-02-06

Date fruit and pits cultivars are used to compare antioxidant activities (free-radical-scavenging activity) and total phenolics among them by more than one method.

There are no publications resulted to these cultivars yet.

3, Dr. Les Wright, Busch Agricultural Resources, Inc, Ft. Collins, CO. 80524 provided the following on Hordeum accessions they received.

The germplasm was used in a crossing block as an early line. Our barley lines are generally mid to late maturity and I used this line to cross in earliness. The resulting early generation will be sent to our malting barley research collaborators in China for them to select best adapted plants from the segregating material. No releases to date. No publications to date.

4. Dr. Walter Messier, Chief Technical Officer at Evolutionary Genomics, LLC, Aurora, CO ordered the following species;

Aegilops speltoides

Aegilops tauschii

Triticum aestivum compactum

Triticum aestivum aestivum

Triticum monococcum aegilopoides

Triticum monococcum monococcum

Triticum turgidum durum

Triticum urartu

Zea mays mays

Sorghum propinquum

The seeds and germplasm we used to extract nucleic acids (a destructive process that consumed all available material during extraction of nucleic acids). The nucleic acids were then analyzed for subsequent sequencing of genes-of-interest in our genomics project. No plant material was released to the public that was derived from any NPGS germplasm we received. To date, no publications have resulted that present information about the germplasm received (although we anticipate several publications in the next 12-18 months).

5. Personell at the USDA, ARS National Center for Genetic Resources Preservation, Fort Collins, Colorado ordered numerous accessions. Their work is reported elsewhere in the NPGS system and is not repeated herein.
6. Russell D. Rasmussen, STA Laboratories, Inc. Longmont, CO ordered several watermelon accessions: The accessions were ordered to conduct mapping work but have not started
7. Albert Pisciotta, 1006 Lynn Dr., Pueblo CO received cutting of grape from Geneva, NY. He filed the following report:

My problem was finding the right grape for our climate in Pueblo and one that produces a lot of sugar, large clusters and one that is basically hardy. I have been propagating plants unsuccessfully for the past few years, and after finding

Cornell's web sight and reading about them I decided to request some cuttings that might be ideal for my purpose.

Mr. Philip Forsline answered my request and sent me 20 cuttings. Five Canada Muscat of witch one survived. Five Cayuga White of which one survived. Five Niagara of which one survived. And five Niagara Rosada of which three survived. The cutting I lost were either due to not rooting or winter kill. None were injured by pests (insects). I think my problem was that the plants were placed in saw dust during their dormant period and were injured by the pitch or other impurities in the saw dust. Those plants that made it are starting out fine this spring.

I again requested more cuttings and again am going to try. This year the plants were paced in sand and kept from freezing from Jan to May. They were set in around the 15th of May. This year I received 12 cuttings. The cuttings are starting to bud.

I am also working with cuttings that I have gotten from area farmers and friends. at the present time the following are the names of the cuttings I am propagating, Niagara , Niagara Rosada, Chancellor Seibl, Cayuga White, Mario Muscat, Sovereign Noir, Interlaken, Another Chancellor, Concord,

8. Mr. Steve Parr, Upper Colorado Environmental Plant Center, Meeker, CO ordered 3 *Elymus glaucus* and 48 *Festuca idahoensis*. He filed the following report:
The forb germplasm will be utilized for propagation trials and increase for a project with sage grouse. The blue wildrye will be added to some 30 other collections for inclusion in an Initial Evaluation Planting (IEP). A separate IEP will be conducted with the Idaho fescue. So, in short, nothing is yet in the ground, but project plans are being developed. We will keep you posted.
9. Bettina Deavours, Department of Biology, Colorado State University, Fort Collins, CO received 1 *Solanum tuberosum*. She filed the following report:

I received potato cultivar Desiree from the NPGS in 2006. I am using this cultivar to generate transgenic potato plants expressing a sucrose transporter. This work is currently in progress and I have no other information for your report.
10. Dr. Jungua Peng, Dep. Soil and Crop Sciences, Colorado State University received 2 *Triticum aestivum* subsp. *aestivum* accessions, to evaluate for resistance genes for Russian wheat aphid. The material will be used to identify and transfer useful genes to commercial wheat cultivars and molecular mapping.
11. Dr. Linda Hansen and Lee Panella, USDA/ARS, Fort Collins CO ordered *Beta* accessions from W6. They filed the following report:

Rhizoctonia root rot resistance of *Beta* PIs from the USDA-ARS NPGS, 2006.

Thirty plant introductions (PI) from the USDA-ARS National Plant Germplasm System (NPGS) (including garden beet, sugar beet, leaf beet, fodder beet, and wild beet) were evaluated for resistance to *Rhizoctonia* root rot. Inoculation with dry, ground, barley grain inoculum of *Rhizoctonia solani* isolate R-9 (AG-2-2) was performed on 13 Jul at a rate of 2.2 g/m row with inoculum applied on the crown of the plant. Immediately after inoculation, plots were cultivated (using an in-row duck-foot cultivator) to place soil onto the plant crowns. Beets were harvested 8 Sep, with a single row lifter (pulled and cleaned by hand) and each root was rated for rot on a scale of 0 (no damage) to 7 (dead plant with root completely rotted). Average disease severity was

determined to create a disease index for each PI. The PIs were tested in a disease nursery that included eight additional tests, involving experimental breeding material and commercial cultivated varieties. Controls were included in all nine tests. *Rhizoctonia* root rot reached moderate severity

levels in early Sep for the entire nursery. Average DI across all nine tests in the 2006 nursery for highly resistant FC705-1, resistant FC703, and susceptible FC901/C817 controls were 1.7, 1.8, and 3.5, respectively. The results of the data are published in a separate report by Hansen and Panella.

12. Dr. Linneau Skoglund, Busch Agricultural Resources Inc. received 1 *Hordeum vulgare* subsp. *vulgare* accession. She reported the following:

We requested this line due to reports of resistance to *Fusarium* head blight. The line was tested in an inoculated/irrigated nursery in Crookston, MN where it did well for FHB. However, DON levels in the grain were unacceptable (6.98 ppm). We made crosses to Brier in our Fall 2006 crossing block and are now F2s. Due to the high levels of DON in Brier and its very tall stature, I doubt the crosses will go any further.

13. Dr. James Quick., Fort Collins, CO received 87 *Triticum turgidum* subsp. *durum* accessions, to evaluate for resistance to foliar head blight. All were planted in the field and lost due to drought. No germplasms or releases were made.

14. Dr. Scott Haley, Dep. Soil and Crop Sciences, Colorado State University received accessions of *Triticum aestivum* subsp. *aestivum* and *Triticum turgidum* subsp. *durum* to screen for resistance to a new biotype of Russian wheat aphid that was found in Colorado and neighboring states in May 2003. He reported the following:

We submitted all of our data on RWA screening to Harold Bockelman for inclusion into GRIN. We have used this germplasm in a search for RWA resistance in wheat. We released Ripper (PI 644222) in fall 2006. Ripper was derived from a cross with a sister selection of KS94WGRC29 (PI 586954). Two publications, for cultivar releases was reported.

15. Shawn Carney, Blossomwood Orchards, Cedaredge, CO received 18 *Malus domestica* accessions. He filed the following report:

We are not plant scientists, but the following is the information requested in case it can be of use.

1. Some varieties suffered heavy damage after grafting due to two stripe grasshoppers.
2. Test for good cider varieties.

2006 *Humulus lupulus*-COR

1. Cuttings have died due to poor location for planting.
2. Test for hop growth in western Colorado.

2005 *Pyrus*- COR 12 varieties, Req #2005380

1. Some varieties suffered heavy damage after grafting due to two stripe grasshoppers.
2. Test for good perry varieties.

No publications or releases were reported.

16. Jean-Patrick Dideir, Cargill, Inc., Fort Collins, CO received 1 *Brassica juncea* and 7 *Brassica napus* accessions. He filed the following report:

The germplasm received from NPGS is currently been increase in greenhouse here in Fort Collins with the exception of PI431572 and PI458921. They germinate quite well. Phenotypic evaluation will be done later in 2007. We did not publish and we did not release plant material to the public.

17. Joe Lohnes, Greeley City Forester, Greeley, CO received 2 *Afraegle paniculata*, 4 *Citrus unshiu*, 2 *Afraegle paniculata*, 2 *Citrus aurantium*, 2 *Citrus limettioides*, 2 *Citrus limonia*, 2 *Citrus medica*, 2 *Citrus sinensis*, 2 *Microcitrus australis*, 2

Microcitrus inodora, 2 Severinia buxifolia, 2 Citrus deliciosa, 2 Citrus reticulata, 4 Citrus sinensis, 2 Citrus unshiu, 2 Citrus x tangelo, and 2 X Citrofortunella swinglei. He filed the following report:

I am a hobby (greenhouse) citrus grower/collector. All of the budwood and seeds that Dr. Krueger has arranged for me to obtain has been for my own, personal collection. *Afraegle paniculata* (Nigerian Powder Flask) has never germinated despite several tries/seed batches. I wound up with is mostly 1's and 2's of this and that from the germplasm repository stock. None of the plants have left my property. You can view a few of my citrus' (60 various) photos by going to Google, type in "Citrus Joe's photo album"...from there....'click around' and you'll see some citrus photos...plus the recent visit (March) to see Dr. Krueger. Dr. Krueger has mentioned visiting Fort Collins and says he may do that again. No publications or releases were reported.

8. Dr. Mark Brick did not receive any germplasm in 2006, however, he is utilizing germplasm for introgression of white mold resistance into pinto bean germplasm. Genetic resistance to white mold has been reported in both common (*Phaseolus vulgaris* L.) and scarlet runner (*P. coccineus* L.) beans. The project was able to (1) develop a RIL population derived from a cross between CO72548, an elite Colorado State University pinto line, and resistant common bean line G122; (2) evaluate the utility of a previously reported QTL for white mold resistance derived from G122; (3) identify additional QTL for resistance via genome-wide composite interval mapping of the RIL population; and (4) develop an interspecific backcross inbred line (BIL) population derived from a cross between our most resistant RIL (RIL67) and *P. coccineus* accession PI 255956. Ongoing activities for 2006-07 will allow us to make further progress toward our long term goal of pyramiding resistance genes found in common bean with those in *P. coccineus*. Results from screening the Phaseolus core collection to three races of *Fusarium* wilt were published.

Germplasm registrations and publications:

Brick, M.A., P.F. Byrne, H.F. Schwartz, J.B. Ogg, K. Otto, A.L. Fall, and J Gilbert. 2006. Reaction to three races of *Fusarium* wilt in the *Phaseolus vulgaris* core collection. *Crop Sci.* 46:1245-1252.

Haley, S.D., J.J. Johnson, F.B. Peairs, J.S. Quick, P.H. Westra, J.A. Stromberger, S.R. Clayshulte, B.L. Clifford, J.B. Rudolph, A. Giura, B.W. Seabourn, O.K. Chung, Y. Jin, and J. Kolmer. 2006. Registration of 'Bond CL' wheat. *Crop Sci.* 46:993-994.

Haley, S.D., J.J. Johnson, F.B. Peairs, J.S. Quick, P.H. Westra, J.A. Stromberger, S.R. Clayshulte, B.L. Clifford, J.B. Rudolph, B.W. Seabourn, O.K. Chung, Y. Jin, and J. Kolmer. 2006. Registration of 'Protection' wheat. *Crop Sci.* 46:995-996