

Minutes of the Woody Landscape Plants CGC Meeting

**June 21-22, 2006
McMinnville, Tenn.**

The meeting was preceded by an optional tour led by Sandy Reed on Tuesday, June 20. The tour included the Nursery Research Center, Pleasant Cove Nursery, a visit to Dry Creek Gulf to observe native *Stewartia*, and Shadow Nursery.

The meeting was called to order at 8:10 am on Wednesday, June 21, 2006.

In attendance: Pam Allenstein (6/21), Thomas Ayala-Silva, Peter Bretting, Kevin Conrad, Richard Criley, John DeMott, Ned Garvey, Jason Griffin, Mark Krautmann, Brian Maynard, Richard Olsen, Harold Pellett, Margaret Pooler, Cecil Pounders, Sandy Reed (secretary), Tim Rinehart, Martin Scanlon, Scott Schlarbaum (6/21), Alan Whittemore, Mark Widrlechner, Susan Wiegrefe (chair), Keith Woeste

Minutes of the 2005 meeting (in Beltsville, Maryland) had been distributed and revised via e-mail following the previous meeting. Minutes were approved without discussion.

Reports

(Note that written reports were provided by these members, so the minutes reflect primarily what was not covered in the written report or what was emphasized and discussed.)

Peter Bretting, National Program Staff, Beltsville, Maryland – See written report. A workshop for NPGC curators of clonally-propagated crops was held at Corvallis in October 2005. A joint publication of clonally-propagated genetic resource management activities was prepared as a result of this meeting. Tomas Ayala-Silva offered to e-mail .pdf files of the article to everyone in our CGC as soon as it is published in HortScience.

Ned Garvey, National Germplasm Resources Laboratory (NGRL), Beltsville, Maryland – See written report. The quarantine indexing and distribution of prohibited genera germplasm duties of the Plant Germplasm Quarantine Office (PGQO) were transferred to APHIS. Three scientists from PGQO and their support staff have established the Plant Disease Research Unit within NGRL (NGRL-PDRU). The written report lists NPGS plant explorations/exchanges for 2005 and 2006. Kevin Conrad will be collecting woody ornamentals in Azerbaijan this fall. The Plant Germplasm Operations Committee (PGOC) is looking at ways to enter molecular data into GRIN. Also the Database Management Unit is planning to revamp the public interface of GRIN. If anyone has ideas for improving the GRIN interface, contact Mark Widrlechner.

Alan Whittemore, U.S. National Arboretum (USNA) herbarium, Washington, D.C. – See written report. The herbarium is concentrating on vouchering important collections of cultivated plants. Also, since the Southwest U.S. is poorly covered in the USNA, vouchers were made of plants at three locations in Arizona. Don Voss, a volunteer at the U.S. National Arboretum, has been checking and confirming the status of the type collections. Mr. Voss has done considerable work with color charts, e.g. making comparisons between different editions of the RHS color chart. If anyone has questions about color charts, he would be a good person to contact.

Kevin Conrad, Woody Landscape Plant Germplasm Repository (WLPGR), Beltsville, Maryland – See written report. The move from Glenn Dale, Maryland to the South Farm on the Beltsville campus is progressing. The new mailing address of the WLPGR is:

WLPGR FNPRU
U.S. National Arboretum
10300 Baltimore Ave
Bldg 010A Rm 233
Beltsville, Maryland 20705

The new facility at South Farm is still being set up. Polyhouses are to be installed this summer by WLPGR staff. Deer fence has been purchased and installed.

Tomas Ayala-Silva, Subtropical Horticulture Research Station, Miami, Florida – See written report. About 45 species of trees, shrubs and herbaceous perennials were collected in Puerto Rico in 2005. Approximately 80-85% of the material collected is already in the ground. There have been a lot of requests recently for ornamental sugarcane. Brazil has a good collection, but because of the CBD there are problems acquiring this germplasm. Thailand also has a good collection, and is more amenable than Brazil to exchange of germplasm.

Cecil Pounders and Tim Rinehart, Thad Cochran Southern Horticultural Laboratory, Poplarville, Mississippi – See written report. Hurricane Katrina destroyed three greenhouses and damaged several others. All buildings at the station suffered roof damage. FEMA used the facility for several months after Katrina. An article was recently published in HortScience outlining precautions that were taken to protect germplasm during the hurricane. Tim Rinehart has his molecular marker laboratory up and running. He has been working with Hydrangea and Lagerstroemia, but is open to cooperative projects focusing on additional genera.

Mark Widrechner, North Central Regional Plant Introduction Station (NCRPIS), Ames, Iowa – See written report. The NCRPIS currently has a backlog of material needing to be regenerated, so there is currently relatively little emphasis on acquiring new collections. Plants are moved from containers to the field quicker than previously, and cage-pollination is being used for seed regeneration. During the past year, images of many of the NCRPIS ornamental accessions were loaded onto the GRIN database. Software has been developed that makes it easy to mass-load image files onto GRIN. In light of the Emerald Ash Borer threat, a coordinated plan for the ex situ conservation of North American Fraxinus is being made. This involves the personnel from the NPGS, the NRCS, the U.S. Forest Service and the Canadian Genetic Resources Program. A collecting strategy is currently being drafted.

Keith Woeste, U.S. Forest Service, West Lafayette, Indiana – Hardwood Tree Improvement and Regeneration Center is a research and technology transfer unit. Work at the center involves fine hardwoods, not ornamentals, but a few species overlap. They are working on developing molecular markers for Juglans and Quercus. They also have rooting research projects involving Prunus, Juglans and Quercus.

National Clonal Germplasm Repository, Davis, California – See written report. Ed Stover was unable to attend the meeting.

USDA National Germplasm Repository, Corvallis, Oregon – See written report. Neither Kim Hummer nor Joseph Postman was able to attend the meeting.

Richard Criley, University of Hawaii, Manoa, Hawaii – There is a position in Public Horticulture at the Assistant Professor level open at the University of Hawaii. For those interested in tropical plants, “Tropical Garden Flora” by Staples and Herbst was recently published and is a great resource. ISHS will be hosting a symposium on woody landscape plants in the Czech Republic, probably in 2008.

Margaret Pooler, U.S. National Arboretum, Washington, D.C. – Breeding work is continuing with *Cercis*, *Lagerstroemia*, *Prunus*, *Syringa*, *Deutzia* and *Corylopsis*. Breeding emphasis is on increased cold tolerance and smaller plant size. Interspecific hybridization and molecular markers are being utilized in the breeding program.

Richard Olsen, U.S. National Arboretum, Washington, D.C. – Richard started work at the USNA in April 2006. He is in position previously occupied by Denny Townsend. The emphasis of his research will be to develop small trees for the urban environment.

Pam Allenstein, North American Plant Collections Consortium (NAPCC) Coordinator, American Public Gardens Association, Wilmington, Delaware – See written report. The NAPCC has a recruiter network to help expand the NAPCC program. They are also working on a project to develop a distributed database system that will allow a variety of incompatible database formats to be accessed to retrieve integrated results. The American Association of Botanical Gardens and Arboreta (AABGA) officially changed its name to the American Public Gardens Association (APGA). Pam was asked about whether there were any curatorial practices guidelines published on-line. She indicated that Tim Hohn had posted a set of guidelines on the web, but that these were most likely outdated. (Note added later by Sandy Reed -- these are posted at: <http://hort.edcc.edu/Curatorial%20Practices.pdf>)

HRI/ANLA – Mark Tefteau was unable to attend the meeting.

Harold Pellett, Landscape Plant Development Center, Mound, Minnesota – Land in Minnesota was recently donated to the LPDC. This will be a great location for screening for cold tolerance. They started planting materials there this spring. A small polyhouse and a potting shed have been set up at the Oregon station. Work with *Buddleia* and *Weigela* is continuing in cooperation with Cornell University. The first three introductions of the LPDC have been released. They are ‘Center Glow’ ninebark, ‘Center Star’ clematis, and Silver Ball™ pear.

Jason Griffin, J.C. Pair Horticultural Research Center, Wichita, Kansas – They have a young but growing nursery industry in Kansas. They need plants adapted to high pH soils. Also this area has extreme weather conditions – hot summers and cold winters – that are a challenge to nursery producers.

Sue Wiegrefe, University of Wisconsin, River Falls, Wisconsin – METRIA will be holding its biennial meeting at University of Minnesota Landscape Arboretum in Chanhassen on June 26-28, 2006. (Note: Proceedings of this symposium are posted at <http://www.ces.ncsu.edu/fletcher/programs/nursery/metria>.) The Morton Arboretum has developed a new strategic plan which includes continuing the tree improvement program. Susan reported on the *Viburnum* evaluation grant that she received in 2005. An intern was hired to evaluate 17 populations for phenology, disease and insect tolerance, and flower and fruit characteristics. All evaluations so far have been made on single plants, but she has started cutting propagation for replicated trials.

North American China Plant Exploration Consortium (NACPEC) – Martin Scanlon recently went on a NACPEC collecting trip to China. The Director of the Beijing Arboretum coordinated the trip for them. The trip was a success and it set up good contacts for future trips. Alan Whittemore added that NACPEC has good contacts in China. For more information, contact Kevin Conrad, Martin Scanlon or Tony Aiello (Morris Arboretum).

Issues

Acquisition – Ned Garvey indicated that the NPGS has a new protocol for bringing in plants from outside the U.S. APHIS is no longer involved at ports of entry; this is now under Homeland Security. Plants are sent to the Beltsville inspection center. It was suggested that someone from APHIS be invited to attend our next meeting.

Peter Bretting provided an update on the situation with China. The main problem is that we don't yet know who the critical contact is for the CBD in China. We used to be able to get permission at the provincial level, but new legislation requires national level permission. However, we do seem to be making progress in this area.

Ned Garvey explained that regardless of who is collecting plant material, it is necessary to get National Access Permission from the country in which you want to collect. Differences between individuals, commercial interests, private institutions and the NPGS relate to what strings are attached to the material once it is brought back to the U.S. Sometimes the material comes with restrictions that do not meet the guidelines of the NPGS. For example, permission may be given to collect and use in research, but not to distribute. This would not be compatible with NPGS's mission and distribution policy.

Mark Widrlechner addressed how the CBD issue affects Index Seminum material. He said that most institutions will include a statement concerning CBD compliance. If the conditions are not acceptable for NPGS, then material should not be requested. Researchers might be able to accept material that curators could not; and, for ARS researchers, the Office of Technology Transfer should be consulted to clarify this.

Ned Garvey added that when plants come in from commercial sources, NPGS will ask how materials were collected and whether permission had been granted by the source country. Germplasm that comes in now often has a Material Transfer Agreement (MTA) attached.

Peter Bretting's report to this CGC includes the URL for the State Department site (<http://www.state.gov/g/oes/rls/or/25962.htm>) that gives information for collecting germplasm outside the U.S.

Sue Wiegrefe questioned whether NAPCC is making sure all collections are free of restrictions concerning their distribution. It was suggested that when an institution applies for membership in NAPCC would be a good time to look at this issue. NAPCC is not policing this issue; it is up to each institution as to how they implement it.

Mark Widrlechner brought up the fact that there are some collections in the NPGS that have some restrictions concerning their distribution and that this shows up in GRIN. He suggested that NAPCC organizations also enter this information into their databases.

Peter Bretting said that, at the request of some foreign governments, the NPGS will maintain some collections for safeguarding, but that we don't distribute those collections. For example, we backup Paraguay's germplasm collection at Fort Collins. Also, at the request of the Plant Variety Protection Office, we maintain PVP cultivars, but we do not distribute them until the PVP certificate expires.

Documentation/Retrieval – According to Pam Allenstein vouchering of NAPCC collections depends on the individual institution or collection. Kevin Conrad has helped some institutions with this at their request. Alan Whittemore added that the USNA Herbarium is always glad to get vouchers of important collections, but they may or may not be able to help with the vouchering. Pam Allenstein mentioned that the federated schema associated with the new database querying system includes a place for entering whether the sample has been vouchered.

Evaluation – The RFP for Evaluation of Woody Landscape Plant Germplasm was reviewed by the members in attendance. Main changes involved including links to our status report and to the full list of temperate and tropical genera with their ranks. Ned Garvey indicated that he would contact Mark Bohning about adding the full ranking list. There was discussion as to whether there should be a separate CGC for tropicals, but the consensus was that this would just “cut the pie into smaller pieces”. It was decided that the priority rankings would be reviewed every 7 years, which means that the first revision will occur in 2009.

Preservation – Kevin Conrad expressed concern about the long-term viability of the South Farm location for the WLPGR. The University of Maryland wants a spur of I-95 extended through South Farm. The property belongs to the federal government and the Beltsville Area Office is opposed to the construction of the road. However, since the position of the WLPGR in the middle of a growing urban area makes it vulnerable, Kevin plans to back up the collection at other sites. These sites will include: the main campus at the USNA in D.C.; public gardens in the D.C. area; and, the landscape at BARC. Richard Olsen emphasized that at the current time the South Farm is non-functional for his breeding purposes.

Kevin wants to move the WLPGR in the direction of using cages and insect-mediated pollination for seed regeneration. A first attempt was made but due to weather conditions it was not as successful as hoped.

The question was raised as to whether universities could be involved in woody germplasm preservation. Several people emphasized that universities are generally not interested in this work. Cooperative arrangements concerning germplasm preservation that were made in the past, such as the establishment of the four Regional Plant Introduction Stations about 55 years ago would probably not be agreed upon currently. This is especially true for universities in growing metropolitan areas.

Peter Bretting emphasized that there are several issues involved here. First, the WLPGR budget is strained. For any project working under a fixed budget, operational funds are reduced by 5 – 10%/year due to inflation and pay increases. This is what has happened with the WLPGR budget. Second, South Farm is federal land and there is a certain amount of buffering that occurs when the land is owned by the federal government. To place germplasm elsewhere, we would need to have at least a 50-year lease on the land and it is unlikely that universities would agree to that long a lease. Transfer of land requires an act of Congress, and so changes in land ownership within the federal government do not happen quickly. He also mentioned that the Floral and Nursery Plant Initiative may need to be revisited. For example, in the 1996 document, there was no mention of invasiveness, as this problem was not in the limelight. In addition, the industry needs to be made aware that without woody plant landscape germplasm banks, plants can become extinct. He suggested that we revisit our status report to include

emerging issues, such as sudden oak death and Emerald Ash Borer. However, it is not the role of this committee to provide input as to possible sources of funding for germplasm efforts.

Mark Krautmann emphasized the need for this committee to make industry aware of the importance of germplasm maintenance. He suggested articles in industry publications and talks at trade shows to increase awareness of this committee and its role. Sandy Reed and Kevin Conrad will work on getting articles written for trade magazines and industry newsletters. Mark Krautmann also suggested that private nurseries should be included in the preservation of germplasm and that the committee should consider how they would rate a company's qualifications as a site for a germplasm conservation. While there was agreement from several members of the committee that a commercial nursery might be well-suited for growing large populations, there were concerns as to long-term commitments for private companies. Mark Widrechner said he had tried growing populations at nurseries for the purpose of long-term evaluation, but that all three nurseries were forced to end the relationship before the evaluations could be completed.

The WLPGR has not sent any material yet to Fort Collins for cryostorage, but Mark Widrechner has been working on cryostorage of willows. Gayle Volk at Fort Collins is looking for people to collaborate with on the cryostorage of vegetative materials.

Multi-site options for storage of germplasm were discussed. The group was in consensus that back-up storage of woody landscape plant germplasm is critical. According to Kevin Conrad, only 10% of the WLPGR material is currently backed up at Fort Collins.

Use/Support/Awareness – Ned Garvey circulated a draft of the Associate Germplasm Collection policy for the NPGS. Discussion centered on: the eventual need to include private collections; documentation that CBD guidelines had been followed; and, the ability of institutions to distribute germplasm.

Status Report Revisitation – The 2002 status report was circulated. Mark Widrechner and Margaret Pooler agreed to coordinate the revision of this report, with help from other committee members for particular sections. Main changes suggested by the committee involved updating statistical data, adding in new threats to germplasm, updating status of WLPGR, and including information about project to link databases. A target date of Sept. 1, 2006 for the draft revision was accepted.

Future

Membership – Sandy Reed will send letter to all members of the WLPCGC asking if they wish to remain on the committee. Based on replies, she will submit the revised membership list to Mark Bohning. Kevin Conrad will approach Michael Melendrez (New Mexico nurseryman) about joining the committee. Mark Krautmann will contact Bill Hendrix (Klehm Nursery) and Richard Criley will speak with Loren Oki (Univ. of California).

Election of Secretary – Jason Griffin was elected Secretary.

2007 Meeting – Tentative plans are to meet in conjunction with the FarWest Trade Show in Portland, Oregon. The pre-meeting tour would be on Wednesday, August 22. On Thursday, Aug. 23, the committee would meet in the morning to mainly consider "house-keeping items" (reports, etc.) On Friday morning, the committee would meet to discuss substantive issues. Industry leaders would be invited to attend and participate in the Friday morning session. Afternoons would be left free for visiting

the trade show floor. Mark Krautmann will check with the Oregon Association of Nurserymen to see if this is suitable with them and if a meeting room can be arranged.

The meeting was adjourned at 11:10 am on Thursday, June 22.

Report from the U. S. National Arboretum herbarium, 2006

Alan T. Whittemore

Collecting: We continue to concentrate on voucher important collections of cultivated plants that include material used in important breeding projects, well-named cultivars and recently introduced germplasm. So far this year, we have made considerable collections from the National Arboretum. We continued to voucher significant specimens in the Lagerstroemia breeding collection, and we reviewed our living and herbarium collections of Glenn Dale azaleas and pressed 31 specimens that had never been vouchered. We also collected several significant collections of cultivated plants, including Camellia species and cultivars from the American Camellia Society, and plants cultivated at the Boyce Thompson Arboretum (Superior AZ), the USDA Desert Legume Project (DELEP) (Tucson AZ), the University of Arizona Campus Arboretum (Tucson AZ), and the National Aquarium (Baltimore MD). I also made collections related to my research, primarily North American Celtis species.

We continue to look for important living collections to voucher, especially unvouchered collections that are in danger because of the retirement of curators or other reasons. We also want to broaden our geographical representation of ornamentals; currently we're strong in eastern United States, weakest in the Rocky Mountains and the interior southwest. We're glad to have input from the committee on collections that we should consider working on.

Significant collections received: We have labelled and databased 117 Cirsium specimens vouchering research by Tracey Slotta (USDA-Fargo ND), and we have labelled the vouchers from the 2004 Republic of Georgia germplasm trip by Paul Meyer (Morris Arboretum) and Joseph Postman (USDA-Corvallis).

Type and standard collections: Volunteer Don Voss continues the arduous job of checking and confirming the status of all of our type collection (currently we have 1906 specimens that are confirmed valid types). We verified, labeled, and mounted all our backlog of cultivar Nomenclatural Standards (48 cultivars). We currently hold standards for 830 cultivars.

Databasing: We have added 1567 records to our specimen database in BGBase, about a third of these being vouchers from east Asian germplasm trips. There are currently 45,233 herbarium specimens in the database. We hope the database will be accessible via the Web in the not-too-distant future, but we have no target date for this.

**Report to Woody Landscape Plant CGC 2006
NCGR Corvallis - Major Accomplishments for 2005**

Prepared by Kim Hummer & Joseph Postman

(Our unabridged, 30 page report complete with glossy colour pictures and circles and arrows and paragraphs can be found at: <http://www.ars-grin.gov/cor/news/AnnualReport2005.pdf>)
Service

1. The Repository received 145 new accessions during 2005. The total inventory increased by 989, which included new on-site back-up forms for primary inventory items. We loaded 4,401 images for Actinidia, Fragaria, Rubus, Ribes, Vaccinium, Pyrus and Juglans plants, flowers or fruits.
2. For the third year in a row, Bruce Bartlett, Plant Distribution Manager, broke records for distribution, shipping 4,640 items for 503 requests around the world. This is the largest number of accessions distributed in one year from the Corvallis Repository since establishment in 1981.
3. The Repository hosted two meetings this past year: the 56th annual Western Pest and Disease Conference on 11 and 12 January 2005, at Timberline Lodge, Government Camp, Oregon; and a workshop for clonal curators in the National Plant Germplasm System held at the Corvallis Repository on 2-3 October. More than 40 individuals attended from NPGS gene banks in Brownwood (2 people), Corvallis (17), Davis (5), Hilo (4), Geneva (6), Fort Collins (2), and Riverside (4). We had productive discussions and hands-on technology exchanges on computer and database issues, screenhouse and field collection management, in vitro and cryogenic methods, and molecular evaluations. A joint publication of clonal activities to was prepared for submission to HortScience as a result of this meeting.
4. Joseph Postman and his staff evaluated and documented information concerning the pear field collection. A long, rainy spring season resulted in very high fungal disease incidence and provided an opportunity to add useful data to ongoing evaluations for pear leaf scab, fruit scab and Fabraea leaf spot. A large number of accessions were identified as either highly resistant or highly susceptible to these diseases. In September and October, more than 1000 fruit photographs were taken and loaded to GRIN as image vouchers.
5. The tissue culture lab provided in vitro materials for core collection cryopreservation to NCGRP - Ft. Collins. These materials will provide a cryogenic backup for our collections. At present the mint core is cryostored as are parts of the Pyrus, Ribes, Humulus, Fragaria, and Rubus core collections. We are collaborating with NCGRP on the cryostorage of these collections.

Research

1. Barbara Reed and graduate student Hailu Aynalem developed a computer analysis technique to screen in vitro-stored cultures. The results correlated well with our standard visual screening method but is not practical for direct use at this time. Dr. Reed and visiting scientist Dr. Sandhya Gupta optimized vitrification and encapsulation cryopreservation protocols for several accessions of Rubus. These protocols, in addition to the slow-cooling protocol already in place, provide several options for cryostorage of the Rubus collection.

2. Nahla Bassil and her laboratory team developed 51 additional EST-SSR markers in *Fragaria*: 37 from 'Strawberry Festival', in collaboration with Kevin Folta and Kim Lewers, and 14 from 'Yellow Wonder' in collaboration with Janet Slovin. In blueberry, Nahla Bassil and Peter Boches, her graduate student, developed SSR fingerprints for 69 important blueberry cultivars using 31 SSR loci, and uploaded the results for 54 cultivars using 25 SSRs to GRIN at <http://www.ars-grin.gov/cgi-bin/npgs/html/eval.pl?492824>

3. Kim Hummer and Nahla Bassil collaborated with Ing. Jose Mota, Isabel Arnas and other scientists in the Azores, under an Azores Cooperative Initiatives Grant. Samples of unknown apple and pear cultivars growing in the Azores were sent for molecular marker analysis to compare to known, standard Portuguese and American cultivars. The Repository laboratory identified eight sets of synonyms in 18 apple and 9 pear genotypes grown in the Azores using 11 microsatellite markers from both genera.

4. Joseph Postman, in collaboration with Nahla Bassil, implemented phytoplasma testing protocols for repository genera. They evaluated two sets of primers for nested PCR and examined suspected phytoplasma infected clones in *Corylus*, *Fragaria*, *Pyrus*, and *Vaccinium* to verify their usefulness as positive controls. They conducted trials for appropriate sampling date, tissue source and effectiveness of universal primers. Universal primers P1/P7 for initial PCR and R16F2n/R16R2 for the nested reaction worked well for all samples except *Vaccinium*. They obtained good results with appropriate size bands for hazelnut stunt, strawberry multiplier, strawberry greenpetal, strawberry fruit phylloidy, pear decline, and cranberry falseblossom). Sampling dates after mid-September were best. Leaf petioles were the tissue of choice. Super-core strawberry collection was assayed (48 clones) and nearly half tested positive for phytoplasmas.

Report of the USDA National Clonal Germplasm Repository (NCGR), Davis, CA

Ed Stover, Research Leader and Curator

Funding and Staffing update

Davis-NCGR funding has been essentially unchanged for FY 05-06, despite significant “salary creep”. Clay Weeks, the Prunus Horticulturist, has been on extended medical leave since August 2005 and is expected to be out until at least August 2006. During the second quarter of FY 06, we lost a biological science technician (Joe Wehrheim), and this salary permits us to maintain a sound fiscal basis. Loss of these two people has slowed progress in characterizing our collections.

Funding of \$106,000 has been obtained through five grants in 2006, with expectation of at least one additional year of funding of similar amounts from each source. \$56,600 was received from Viticulture Consortium West for development of a National Grape Registry, which will be a user friendly on-line database of all grape genetic resources in the US and was listed as an industry priority in recent ARS Grape Industry workshops. \$20,000 was obtained through the Nursery Industry Advisory Board for molecular fingerprinting of Prunus cultivars. \$10,050 in 2006 was provided by the California Fig Advisory Board for assessing phenology and fruit quality characteristics of many fig accessions (\$10,800 was awarded in 2005). \$2,140 was received from the Missouri Botanical Garden to assess genetic diversity in Eastern Himalayan walnuts. Unofficial notice has been received that we will also be funded \$18,000 by the Walnut Marketing Board, to assess resistance to crown gall across the entire NCGR Juglans collection, in collaboration with Davis ARS Plant Pathologist Dan Kluepfel.

Maintenance of Collections- The Davis NCGR has assigned a “Crop Point Person” to each collection so that each crop genus (and its relatives) has one person to focus on it. Detailed cultural management plans were developed and both fruit and budwood quality were widely praised as being the best in Davis NCGR history. With considerable help from National Program funding, micro-irrigation is now in place across most of the nursery/greenhouse/screenhouse area.

Vitis- 93% of the Vitis collection now resides in screenhouses to protect against Pierce’s Disease. Equipment for virus screening was purchased using National Program funds, and will be used to assess 400 accessions in 2006.

Juglans- With input from the Juglans CGC we have stabilized some accessions which were in decline and have developed a management plan that provides fairly normal cropping on part of each tree for nut evaluation, while producing excellent budwood for distribution, and maintaining tight spacing for land use efficiency.

Actinidia- Plants in our Actinidia collection have performed very poorly. Investigations and discussions confirm that site selection was inappropriate for plants in this genus. As appropriate and possible, plants have been repropagated, recollected, or dug up. They will be transferred to a new, better drained site in 2006.

Acquisition of new accessions

From January 2005 through May 2006, Davis NCGR accepted 628 new accessions. Several species are new to the NPGS, and likely were never previously grown in the US.

Distribution of material

In 2005 Davis NCGR had the largest germplasm distribution in its history. A total of 3027 accession orders were delivered to customers. Already, 2781 accessions have been distributed in 2006, suggesting a new record for distributions is likely this year.

Research

Vitis phylogeny project – Cluster and principal component analyses of both microsatellite (18 loci) and AFLP (6 primer combinations containing 791 polymorphic characters) data have been completed. A manuscript on genetic diversity and differentiation within and between different species, series, and sub-genera will be completed in 2006. Microsatellite data across 18 loci and 351 accessions comprising 52 taxa of Vitis are ready for uploading on to GRIN.

Plum and apricot SSRs - Sixteen microsatellite loci have been used to fingerprint 500 plum and apricot accessions.

Ficus SSRs- Twelve microsatellite loci have been used to fingerprint 122 fig accessions. The entire collection will be completed in 2006. It is likely that a number of accessions will be found to be duplicates. Olea SSRs- Sixteen microsatellite loci have been used to fingerprint 60 olive accessions. The entire collection will be completed soon. In collaboration with UC Santa Barbara, the National Park Service, and UC Davis his work is being extended to evaluating identities of early olive introductions into California.

Punica AFLPs- AFLP analysis has been used to assess genetic diversity within our pomegranate collection. Despite the diverse origins of our individual accessions, diversity was found to be very low.

Iberian grape SSRs- SSR fingerprints were taken on ~100 purported Iberian grape accessions and data are being shared with our Spanish and Portuguese counterparts to verify identities.

Vitis characterization-Conducted the first year of a study to characterize phenology, fruit quality and yield in 50 Iberian Vitis accessions.

Olea characterization-Detailed data in phenology and morphology were collected on our entire Olea collection in 2005-06. Data collection will be repeated in 2006-07.

Ficus characterization-Detailed data on phenology and fruit quality were collected on a significant subset of the fig collection.

Publications:

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evolution, and conservation of crops. Motley, T.J., Zerega, N., and Cross, H. (eds.). Columbia University Press, New York, 143-170.

Aradhya, M.K. Potter, D., and Simon, C.J. 2006. Molecular Phylogeny and biogeography of the walnut genus *Juglans* (Juglandaceae). *Botanical Journal of the Linnean Society* (in review).

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Bhat, R. G., Colowit, P. M., Tai, T. H., Aradhya, M. K., and Browne, G. T. 2006. Genetic and pathogenic variability in *Phytophthora cactorum* affecting fruit and nut crops in California. *Plant Disease* (in press)

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Report of the SHRS Miami to the WLPCGC for 2005-6

Prepared by Alan Meerow and Tomás Ayala-Silva

From May 2-13, 2005, horticulturist Tomas Ayala-Silva and Geneticist Alan W. Meerow visited Puerto Rico as part of a two man team plant exploration. The main focus of this collection trip was *Tabebuia haemantha*, a rare Puerto Rican endemic that has many features of interest to horticulture. Sixty-two collections including 45 species of trees, shrubs and herbaceous perennials were obtained. The team, sponsored by the Plant Exploration Office (PEO) and assisted by Dr. Ricardo Goenaga and Dr. Brian Irish (TARS, Mayaguez), assessed many new subtropical/tropical species for evaluation and possible introduction.

New field plantings were established for three populations each of *Tabebuia haemantha* and *T. heterophylla*, one of *T. chrysotricha* and 4 populations of *Thespesia grandiflora*, all material collected in Puerto Rico by Tomas Ayala-Silva and Alan Meerow.

Three hurricanes in succession caused a great of damage to the collections at the SHRS. We lost approximately 10% of accessions, and several evaluation fields of ornamentals were severely damaged. The Repository hosted two meetings this past year: the annual Friends of Chapman Field meeting on 11 February 2005, at the repository in Miami, Florida; and the Tropical Flowering Tree Society meeting held at the Miami Repository on March 12, 2005.

Approximately 100 woody ornamental distributions were made from the National Germplasm Repository.

An outstanding subtropical ornamental shrub, *Polygala myrtifolia* 'Chapman Field' was released this past year, and we have received numerous requests for material. Unfortunately, severe hurricane damage to the stock planting delayed distribution of cuttings until this summer.

Post-doc Margarita Mauro Herrera isolated 13 WRKY gene loci from *Cocos nucifera* and is using them to characterize ornamental coconut germplasm. She is also in the process of isolating resistance gene homologs (RGHs) from coconut as well. We hope that to be able to identify alleles associated with varieties that are resistant to the lethal yellowing phytoplasma..

We established replicated field evaluations of several seedling selections of the ornamental shrub *Tecoma guarume* for possible cultivar release.

Alan Meerow completed analysis of 83 *Plumeria* cultivars using 21 microsatellite DNA loci, and numerous *Halesia tetraptera* accessions at the Woody Ornamentals Germplasm Collection in Glen Dale, MD (a collaborative project with Mark Roh). Analysis of Puerto Rican *Zamia* populations with 20 SSR loci is ongoing.

Scientists associated with the ornamentals CRIS project at the Miami NCGR authored or co-authored 4 abstracts, 6 non-refereed proceedings or trade journal, and 13 refereed publications.

USDA/ARS
National Germplasm Resources Laboratory
Report to PGOC, RTACs and CGCs
2006

The National Germplasm Resources Laboratory (NGRL), located in the Plant Sciences Institute at the Henry A. Wallace Agricultural Research Center in Beltsville, MD, supports the acquisition, introduction, documentation, evaluation, and distribution of germplasm by the National Plant Germplasm System (NPGS) and other components of the U.S. National Genetic Resources Program (NGRP). The Laboratory is comprised of the Germplasm Resources Information Network/Database Management Unit (GRIN/DBMU), the Plant Exchange Office (PEO) and the Plant Disease Research Unit (PDRU) whose functions and procedures are provided below. The Laboratory also facilitates the activities of the Crop Germplasm Committees that advise components of the NPGS on a variety of matters.

Plant Exploration and Exchange Program

The PEO supports the collection of germplasm for the NPGS through the management of a Plant Exploration and Exchange Grant Program. Plant explorations involve field collection of germplasm not available in any germplasm collections, while plant exchanges are expeditions to arrange exchange of germplasm already conserved in foreign genebanks. Annual guidelines for developing plant exploration and exchange proposals are prepared by the PEO and distributed to researchers.

An extensive review procedure is used to assess the relevance of the proposals to the NPGS needs and the likelihood that the proposed explorations or exchanges will accomplish their stated objectives. Before submission, proposals are reviewed by the appropriate CGC or other crop experts. After submission to the PEO, proposals are reviewed by a subcommittee of the NPGS Plant Germplasm Operations Committee (PGOC). The PEO then evaluates the proposals and the PGOC reviews and makes recommendations on funding to the ARS National Program Staff (NPS).

All foreign explorations supported by PEO comply with the provisions of the Convention on Biological Diversity on access and benefit sharing related to genetic resources. Prior informed consent to collect genetic resources is obtained from the appropriate host country authorities before the exploration takes place. The permission includes agreement on the benefits to the host country associated with access to genetic resources. The PEO is involved in most requests to foreign governments for permission for collecting and negotiates the terms of agreements when necessary. Foreign explorations are always conducted in cooperation with scientists from the host country and cooperation with the national genetic resources programs is strongly encouraged. Germplasm obtained on explorations is shared by the NPGS and the host country.

(Attachments: FY 05 and 06 Plant Explorations and Exchanges)

Facilitation of Germplasm Exchange

The PEO assists NPGS personnel and other scientists in acquiring germplasm from scientists and private citizens, foreign national and international genebanks, domestic and foreign explorations, and special projects and agreements. The PEO also helps to expedite the distribution of germplasm from the NPGS to scientists and other genebanks.

In FY 05, PEO assisted with the distribution of 35,590 items to 60 countries. PEO also assisted with importing 81 shipments containing 3,105 items from 34 countries.

PI Documentation

Since 1898, Plant Introduction (PI) numbers have been used as unique identifiers for accessions incorporated into the NPGS. In earlier times, PI numbers were automatically assigned to all material received by the Plant Introduction Office, a predecessor of the PEO. Currently, before PI numbers are assigned, NPGS curators first evaluate the passport data, and grow and observe new accessions to verify uniqueness and rationale for preservation in the NPGS. For this reason, curators usually assign a local identifying number to an accession until a decision is made to assign a PI number. When a decision is reached to assign a PI number to an accession, the curators are now requested to contact Mark Bohning for assignment of the next sequential number(s).

In addition, ARS and the Crop Science Society of America (CSSA) have an agreement that all released cultivars, germplasm, parental lines, genetic stocks, and genetic mapping populations registered by the CSSA be preserved in the NPGS and assigned a PI number.

The NGRL also assigns PI numbers to plants that have received Plant Variety Protection (PVP) from the Plant Variety Protection Office.

International Collaboration to support conservation and exchange of plant genetic resources

PEO works with other US and international programs to support plant germplasm conservation and exchange worldwide.

During the past year, PEO continued to collaborate with the National Department of Genetic Resources and Biotechnology (DENAREF) of the National Institute of Agricultural Research (INIAP) in Ecuador, the Organization of Farmers and Indigenous Peoples of Cotacachi (UNORCAC), and the USDA/FAS on a P.L. 480 – funded project to support complementary (ex situ and on-farm) conservation and increased utilization of agro-biodiversity in native farming communities in Cotacachi, Ecuador.

The PEO also collaborated with USDA/FAS and USDA/ARS/OIRP to develop joint germplasm collection, conservation and maintenance programs in Jordan, Morocco, Tunisia, Peru, Bangladesh, Sri Lanka, Uzbekistan, Pakistan, Kazakhstan, Guyana, Georgia and Azerbaijan using US Food for Peace and other programs.

Since 2002, PEO has been collaborating with the plant genetic resources programs of the eight Central Asia and the Caucasus countries: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan, Armenia, Georgia and Azerbaijan. This program is organized by ICARDA (International Center for Research in the Dry Areas) and the focus is on development of national plant inventories, staff training, and plant exploration.

PEO is collaborating with the International Center for Tropical Agriculture (CIAT) to develop Geographical Information System (GIS) technology to guide the collection of germplasm on plant explorations. Projects are planned in Guatemala and Paraguay.

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The Germplasm Resources Information Network

The mission of the Database Management Unit (DBMU) is to develop and maintain information systems for the National Genetics Resources Program comprised of plants, animals, microbes, and invertebrates. We have completed the development of a new interface for the plant database and will continue to enhance that system when specific needs arise. The first version of the National Animal Germplasm Program system has been completed and is currently being used in a production mode. The DBMU has now begun developing a requirements document for version two.

Recent statistics for data in the plant database include:

- Over 80,000 taxonomic names (including synonyms)
- 470,946 accessions representing 11,839 species and 1,916 genera
- 1,543,563 inventory records
- 1,235,671 germination records
- 6,313,140 characteristics/evaluation records
- Over 106,000 Images

Germplasm accessions acquired by the National Plant Germplasm System (NPGS) since the effective date of the Convention on Biological Diversity continue to be flagged in the database with appropriate disclaimers and MTA's. These agreements are displayed with accession passport data and automatically printed on GRIN generated packing slips when accessions are distributed. During the past year, the DBMU continued to provide support to NPGS site personnel and assisted NPGS sites in loading passport data, evaluation data, distribution information and images into the database

GRIN was demonstrated at several Crop Germplasm Committees and commodity meetings along with scientists visiting NGRl throughout the year. The Directory of NPGS Personnel and Crop Germplasm Committees continues to be maintained on the GRIN Web page in a PDF format.

A GRIN site meeting will be held in September in Geneva, NY. Many issues will be discussed about the GRIN site software and the public system. Recommendations from that meeting will be incorporated into the system.

In September of 2005 the NP301 began its second cycle and a stake holders meeting was held near Baltimore. Two major issues regarding GRIN were identified including:

- 1.) GRIN needs to handle molecular data being generated on NPGS accessions and needs to interact better with the plant genome databases
- 2.) The GRIN public web interface and software need to be rewritten in order to meet users needs

To address these issues a sub-committee of NPGS curators has been developed to advise us on how to incorporate molecular data into GRIN. They have already laid out the structures that need to be added

to GRIN and the DBMU has begun to create the new tables and software to manage and display the data to the user community.

A public interface committee has also been established and will consist of NPGS personnel to advise the DBMU on improving the public interface to GRIN. The committee will solicit input from the CGCs and other stakeholders of the system.

The DBMU is also working with the international community to make the GRIN data available through a biodiversity portal which will allow users to search multiple databases at the same time.

The GRIN system was available 98% of the time on a 24 hour a day and 7 day a week schedule. Access to the database through the web pages continues at a brisk pace. Over the last year, there were 154,570 unique host computers that accessed the GRIN database. This accounted for 544,043 visits to the data. We always encourage users to send any comments on the public interface by email to dbmu@ars-grin.gov.

The current version of pcGRIN will continue to be supported by the DBMU. Any new pcGRIN software will be a version of the national GRIN system that can operate on a personal computer utilizing the same Database Management System and development tools to reduce maintenance costs.

Two Sun Microsystem computers were replaced in 2001, one that supports the web server and site users and one that is used specifically for the databases. The databases reside on a separate computer to provide additional security. We also purchased two additional small Sun Microsystems workstations that are used for database development and for testing new operating systems prior to release to the user community. Additionally, one terabyte of disk space was purchased to ensure adequate space is available for increases in characteristic, evaluation, and image data.

Security for the computer and databases are always being reviewed and monitored for intrusion by those who may attempt to corrupt web pages or to destroy data. The system is protected by a firewall and all data are backed up at onsite and offsite locations. We keep backups at several local offsite locations and one at Ft. Collins, CO, for long term storage. The computer system has an Uninterruptible Power Supply for short term power outages and a diesel generator for long term power outages. The building is now locked with access permitted by either a building security person or a card key. The computers are in a locked room that is monitored for temperature on a 24 hour, 7 days a week schedule.

Crop Germplasm Committee Facilitation

Since January 1, 2005, over thirty of the 40 Crop Germplasm Committees (CGC) have met. An NGRL representative was present at most of the meetings to help facilitate their activities. Summaries of each meeting are prepared and distributed to appropriate National Program Leaders, NGRL staff and other NPGS personnel. The committees continue to provide advice on all aspects of the NPGS including identifying gaps and duplications in the collections, germplasm maintenance and evaluation, quarantine issues and maintaining updated versions of the crop vulnerability reports. The 10th biennial meeting of the CGC Chairs will be held in Ames, IA June 6-7, 2006. This will be in conjunction with the Regional Technical Advisory Committees and the Plant Germplasm Operations Committee. This meeting provides an opportunity for Chairs to hear presentations on the status of NPGS sites, plant germplasm exchange, international issues, preservation and utilization, the molecular characterization of accessions,

interactions between curators and CGCs and plant quarantine issues. It also allows the Chairs to meet and interact with each other, NPGS managers and curators, and invited guests from ARS, other government agencies, and non-government organizations.

Plant Disease Research Unit

Effective October 1, 2005, the responsibilities for the quarantine indexing and distribution of prohibited genera germplasm that were performed by the USDA-ARS, Plant Germplasm Quarantine Office (PGQO) in Beltsville MD were transferred to the USDA Animal and Plant Health Inspection Service-Plant Health Programs (APHIS-PHP). Three scientists from PGQO and their support staff have established the Plant Disease Research Unit within NGRL (NGRL-PDRU). The mission of NGRL-PDRU is to investigate pathogens and diseases of quarantine significance that occur in clonal plant germplasm that must enter the US through federal quarantine programs. The objectives are focused on determining the causal agents responsible for diseases that prevent germplasm from entering the country, and developing tools to effectively detect and eliminate them. These research efforts provide support to the APHIS quarantine program and help facilitate the safe introduction and international exchange of valuable plant germplasm.

NGRL-PDRU is glad to discuss potential collaborations with pathologists and stakeholders who have interest in clonally propagated, prohibited genera crops that are handled by the USDA quarantine program.

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NPGS Plant Explorations/Exchanges during FY 2005<\caption>		
Target Crop	Country	Principal Contacts
Butternut	United States (MN, WI, OH, IN, KY)	M. Ostry, K. Woeste
Saltgrass	United States (CA, OR, NV)	J. Harrington, S. Reid
Woody landscape plants	United States (PR)	T. Ayala-Silva, A. Meerow
Sunflower	United States (CO, WY)	T. Gulya, G. Seiler, L. Marek
Sunflower	United States (CA)	T. Gulya, G. Seiler, L. Marek
Tomato	Chile	R. Chelelat, R. Pertuzé, L. Faundez
Herbaceous ornamentals	Republic of Georgia	M. Mosulishvili
Cotton	Mexico	M. Ulloa, J. Stewart, S. Acosta Nunez
Beet	Greece	R. Hannan, B. Hellier, L. Frese, S. Samaras
Breadfruit (exchange)	Tahiti	D. Ragone, D. Lorence
Wheat and barley	Turkey	B. Steffenson, H. Bilgic, T. Akar
Cereals and legumes	Armenia	N. Rukhkyan, C. Francis, I. Arevshatyan, K. Street
Potato	United States (AZ)	J. Bamberg, C. Fernandez, A. del Rio
Lesquerella	United States (TX)	A. Salywon

NPGS Plant Explorations/Exchanges Planned for FY 2006

NPGS Plant Explorations/Exchanges planned for FY 2006<\caption>		
Target Crop	Country	Principal Contacts
Walnut	Guatemala	D. Stone, P. Manos, A. de MacVean
Guayule	United States (AZ, NM, TX)	D. Stout, T. Coffelt, M. Foster
Sunflower	United States (AL, FL, GA, MS, LA, SC)	T. Gulya, G. Seiler, L. Marek
<i>Poa</i> spp.	Italy, Germany, Czech Republic	R. Johnson, D. Huff, M. Romani, L. Pecetti, R. Paoletti, M. Sarno, E. Willner, M. Ševčíková
Soybean	South Korea	G. Chung, T. Shin
Fruits and nuts	Armenia and Republic of Georgia	J. Postman, E. Stover, A. Charchoghlian, N. Rukhkyan, S. Gasparyan, M. Mosulishvili
Grapes	United States (AL, TX, LA, OK, AR)	L. Goertzen, J. Kamas, H. Schwaninger
Grasses	Kyrgyzstan	D. Johnson, R. Soreng, K. Samsaliev, V. Chapurin, S. Shuvalov
<i>Vaccinium</i> spp.	United States (FL)	K. Hummer, P. Lyrene
Woody ornamentals	Azerbaijan	K. Conrad, M. Byrne, I. Shahmardan
Cereals, legumes, and grasses	Tajikistan	B. Hellier, K. Street
Turfgrass	China (Inner Mongolia)	D. Johnson, M. Majerus, G. Anlin
Potato	United States (AZ)	J. Bamberg, C. Fernandez, A. del Rio

**North American Plant Collections Consortium (NAPCC)
2006 Annual Report**

Prepared by Pam Allenstein, NAPCC Coordinator, American Public Gardens Association
WLP-CGC Meeting
June 8, 2006

PROGRESS REPORT

GOAL 1 – Increase the number of NAPCC Collections to represent the major genera of ornamental plants found in AABGA member gardens

New Collections

Polly Hill Arboretum - *Stewartia* -19 taxa
Fairchild Tropical Botanic Garden – *Arecaceae* – 625 taxa, 2000+ accessions
Tyler Arboretum – *Rhododendron* – 529 taxa

Pending Applications

Arnold Arboretum of Harvard University – *Stewartia* - awaiting report from June review
Atlanta Botanical Garden – *Sarracenia* - September site review scheduled

Recruiter Network

30 individuals in six regions throughout the US and Canada form a network of recruiters and mentors actively expanding the NAPCC program. Since the recruitment campaign launched in October 2005, over 150 queries have been made, numerous presentations given to targeted collections holders, and a number of new applications in development. A re-organized NAPCC Committee now includes six regional organizers, and is focusing currently on recruitment.

Building Awareness

New NAPCC Web Pages

As part of the Association's total website re-design, new NAPCC web pages feature newest members, list participants by institution and by collection name with links to their websites, answer frequently asked questions, explain the steps in applying, and include collection profiles. The new website www.publicgardens.org will be launched the end of June.

Presentations and Site Meetings

APGA Mid Atlantic Regional Meeting, Oct 2005, Mt. Cuba Center
Montreal Botanical Garden, Nov 2005 site meeting
Fairchild Tropical Botanic Garden, Nov 2005 site meeting
Montgomery Botanical Center, Nov 2005 presentation & site meeting
Flamingo Gardens, Nov 2005 site meeting
Plant Breeders Conference, Nov 2005 presentation, Gainesville, FL
US National Arboretum, Feb 2006 meeting with staff, WA DC
Jenkins Arboretum, March 2006, Devon, PA
APGA Annual Conference, June 2006, San Francisco, CA

Reviewer Training Workshop

Held at UC Davis Arboretum in conjunction with the APGA Annual Conference. 33 participants, including representatives from Pacific and Interior West targeted institutions. Sponsored by UC Davis Arboretum and APGA, partnering with Mt. Cuba Center, Scott Arboretum, Huntington Botanical Gardens, and Ganna Walska Lotusland. Brings NAPCC pool of reviewers up to 90 individuals.

GOAL 2 – Facilitate coordination of NAPCC plant collections

Distributive Database Querying System

Year 1 of “PlantCollections – A Community Solution” three-year project will develop a distributed database system for Web-based querying utilizing DiGIR protocol, open-source data-sharing software. This will allow information from multiple institutions currently using a variety of incompatible database formats to be accessed to retrieve integrated results. An Institute of Museum and Library Services National Leadership Grant awarded to Chicago Botanic Garden in partnership with APGA and University of Kansas, and fifteen participating NAPCC institutions. Federated schema has been developed and first three institutions’ data are being mapped. Search portal currently being developed and due to launch initially on new APGA website.

Multi-Institutional Initiatives & Curatorial Groups

Three multi-institutional initiatives are currently in active development: Oaks – coordinated by Mount Auburn Cemetery, Maples – coordinated by Arnold Arboretum, and Palms – coordinated by Fairchild Tropical Botanic Garden. Pilot of new multi-institutional NAPCC application will test this new process. Communication among specialized curatorial groups will be facilitated through enhanced eCommunities capabilities on new APGA website.

1st NAPCC Members Forum

Scheduled as a pre-conference activity in San Francisco, this first-time event is anticipated to attract 20-25 representatives from institutions holding NAPCC collections. They will hear the latest program updates and exchange information about their collection activities. This is planned to be an annual networking opportunity going forward.

Strengthening USDA/APGA Collaboration

Meetings of WLPGR, USNA, and NAPCC representatives held in February and March to begin developing a joint initiative to strengthen both programs. APGA Board of Directors formally endorsed a resolution in April 2006 supporting NAPCC as a core program and the ongoing collaboration with USDA through a joint ornamental germplasm preservation initiative. NAPCC Coordinator participated in USNA Stakeholder Meeting and its USNA Research Program Review.

USDA/APGA Specific Cooperative Agreement

Current SCA is due to expire August 31, 2006. New multi-year agreement will focus on developing strategic distribution plan of target woody and herbaceous genera among NPGS repositories and NAPCC participating institutions; strengthening information exchange through distributive database querying system; recruitment campaign drive.

GOAL 3 – Raise professional plant curation standards in public gardens

APGA 2006 Annual Conference

To be held June 26 – July 1 in San Francisco with the theme “Sustainability: Walking the Talk”, sessions include case studies of ex situ conservation at botanical gardens, integrating collections and research,

sustaining ornamental plant collections, latest IPM practices, and developing invasive plant policies. Joint meeting of NAPCC members and those interested in plant collections will focus on organizing future professional development programs for plant collections managers and curators.

APGA 2nd Conservatory Symposium

Professional development training hands-on workshop held February 2006 hosted by New York Botanical Garden attended by nearly 60 public garden staff focused on maintenance practices and collections management.

APGA Plant Collections Listserve

Active listserv serving over 400 subscribers is moderated by Frank Telewski and hosted by Michigan State University. It provides a discussion forum on wide range of topics, including plant labeling and mapping, exchange and location of hard-to-find taxa, job postings, invasive plants policies, and debate of collections/conservation-related issues.

MISCELLANEOUS

AABGA becomes APGA

In March 2006, the American Association of Botanical Gardens and Arboreta officially changed its name to American Public Gardens Association (APGA). It was felt that this new name is more inclusive of the diverse types of institutions the Association represents. The name change coincided with a rollout of new benefits and dues structure for individual members. The Association's new web address is www.publicgardens.org, and staff email addresses now are firstinitiallastname@publicgardens.org with other contact information remaining the same.

**Report to the Woody Landscape Plant Crop Germplasm Committee
from the North Central Regional Plant Introduction Station (NCRPIS), Ames, Iowa**

Mark P. Widrechner, Horticulturist
US Department of Agriculture - Agricultural Research Service
Email: isumw@iastate.edu
June 2006

Since our last meeting in July 2005, the NCRPIS has acquired 21 new accessions of woody landscape plants and 18 new accessions of herbaceous ornamentals. The two largest groups of new acquisitions resulted from collections made in the Republic of Georgia and an NPGS exchange project with Palestinian Territories. Jeff Carstens and I have also been acquiring wild collections of *Cornus alternifolia* from throughout its native range.

In 2005, we produced 41 control-pollinated or isolated seed lots of woody-landscape plants, grew out another 56 accessions from seed, and vegetatively re-propagated 63 accessions. The 2005 field season resulted in the successful cage regeneration of 38 accessions of herbaceous ornamentals. In March, we stored the ornamental seeds harvested in 2005 and will soon begin proofing passport data so PI numbers can be assigned to many of the newly available accessions. At the end of 2005, 43% of 1980 ornamental accessions were available for distribution and 32% were backed-up at the National Center for Genetic Resources Preservation (NCGRP) in Fort Collins. Past research with Leigh Towill at NCGRP to develop a cryogenic-storage protocol for dormant vegetative buds of *Salix* is being tested by Gayle Volk to determine whether it can be adopted as a routine back-up method.

Starting last fall, we attempted to germinate 71 accessions of woody plants, focusing on *Aronia*, *Euonymus*, *Ligustrum*, *Physocarpus*, and *Rhus* (most of which can be regenerated in large field cages), with 42 accessions successfully germinated. The 2006 field season has generally been pleasant, but with below-normal precipitation, which may lead to a droughty summer. On the plus side, transplanting and other field work progressed quite quickly this spring.

This spring, we are in the final year of a three-year cage field for about 50 accessions of woody landscape plants (primarily *Physocarpus*, *Spiraea*, *Diervilla*, and *Ligustrum*), supplemented by accessions of tall, perennial Malvaceae (*Alcea*, *Althaea*, and *Lavatera*) (most of which successfully overwintered from 2005). And we are in the second year of a three-year field for herbaceous perennials, emphasizing *Potentilla*, *Tanacetum*, and *Lamiaceae*. Spaces in field cages were filled this spring through the addition of annuals, primarily *Matricaria* and *Calendula*.

Two new nursery fields have been established on our farm during the last year, as we are shifting a significant proportion of the growing-on process from containers to the field. This should help us produce better root systems and reduce our reliance on limited "cave" space for overwintering. Many of the seedlings that were transplanted to the field last fall and this spring will be moved to cages for control-pollinated seed increase, after our existing three-year cage fields are "finished." We acquired a new mulching wagon similar to the one we saw at Beltsville last year. It's a great labor-saving device.

Jeff Carstens has completed the process of updating our field books for 2006. Inventories of plants in containers were updated last year, and inventories of field plantings will be updated during the summer, along with the capture of additional images.

Last year, demand for seed samples of woody and herbaceous ornamental germplasm from NCRPIS decreased. In 2005, 14 plants, 123 cuttings, 83 budwood sticks, and 207 seed packets were distributed to meet outside requests for woody and herbaceous ornamental germplasm. This diverse group encompassed 54 genera; those most in demand were *Salix* (103 cuttings), *Fraxinus* (80 budwood sticks and 1 seed packet), *Cornus* (15 packets and 2 plants), *Alcea* (14 packets), and *Malva* (14 packets). So far this year, we have filled ornamental germplasm requests for 447 cuttings, 1 root sample, 20 plants, and 102 seed packets.

For 2006, five tree and shrub accessions were chosen for evaluation in the NC-7 Trials, resulting in the distribution of 286 plants for testing (plus 25 replacement plants) at 22 sites and an additional 79 plants to 10 botanic gardens and arboreta. The number of trial sites is the highest since 2002. This year's shipping process was simplified and less expensive, because four of the five accessions were shipped dormant and bare-root. Typically, about 90% of the trial plants have been grown in containers and shipped shortly after they had begun to leaf out in a cool greenhouse. In addition, last April, Jeff Carstens took a productive trip to deliver these plants and meet with our cooperators and nursery professionals in Missouri, Kansas, Colorado, and Nebraska.

Research on the development of models to predict the likelihood of naturalization of non-native woody plants continues in collaboration with Peter Bristol and Kristen Kordecki at the Chicago Botanic Garden. Data sets are being completed for the Chicago region that are being used to help validate models based on life-history and geographic characteristics that were developed from data collected in Iowa. The ultimate goal of this project is to produce powerful and accurate risk-assessment methods that function on a regional basis. Preliminary results indicate that geographic-risk factors play very similar roles in both Iowa and the Chicago region.

I continue to help oversee the management of the Ornamental Plant Germplasm Center (OPGC), at the Ohio State University (OSU) and work closely with David Tay, Susan Stieve, Jennifer Ehrenberger, and OSU faculty and administrators to facilitate OPGC's full integration within the NPGS. I helped organize an external planning team last March that has drafted a report with recommendations on future directions for the OPGC. This report is undergoing final review and should be released shortly. The Herbaceous Ornamental CGC, now under Neil Anderson's leadership, will be holding a two-day session in Illinois in August to assist OPGC staff with implementation and better mobilize professional resources within the research community.

During the past year, we loaded images of many of our ornamental accessions onto the GRIN database, along with summaries of NC7 Trial performance. Pete Cyr, our IT specialist, recently designed easy-to-use software to mass-load image files, and Jeff Carstens is now proficient in using the system. Jeff is also learning about pollination-control techniques for wind-pollinated tree genera, such as *Alnus*, *Betula*, and *Fraxinus*, which hopefully will allow us to increase our throughput for their seed regeneration.

One last project that I'd like to report on is the development of a coordinated plan for the ex situ conservation of North American *Fraxinus* in the face of Emerald Ash Borer. Earlier this month, Kevin Conrad, Ned Garvey, Candy Gardner, and Dave Ellis from NPGS met with Bob Karrfelt from the US Forest Service and Ken Richards from the Canadian Genetic Resources Program to discuss this topic. Bob is now drafting a collecting strategy that will be distributed to the group for refinement later this summer. In support of these plans, I've been assembling a bibliography of published research on the genetic diversity and reproductive biology of North American ash.

WLPGR, FNPRU, Beltsville, Maryland Accomplishments for 2005

Research (Dr. Mark Roh)

It was suggested using the hybrid formula, *P. densiflora* × *P. sylvestris* for *Pinus sylvestris* var. *sylvestriformis* rather than an infraspecific taxon of either parental species based on the study of chloroplast DNA simple sequence repeats (cpDNA SSR). The origin of *A. crenata* seedlings with non-variegated foliage from a progeny of a mother plant with variegated foliage and red berries (VM) resulted from cross-pollination between VM as a maternal source and *A. crenata* with regular foliage as a paternal source as verified utilizing sequence-characterized amplified region (SCAR) markers.

Service

The Woody Landscape Plant Germplasm Repository (WLPGR)

1) We continued forward with the planned move from our former home of 10 years at the former Plant Introduction Facility in Glenn Dale Maryland to South Farm in Beltsville, Maryland. Our new mailing address is:

WLPGR FNPRU

U.S. National Arboretum

10300 Baltimore Ave

Bldg O10A Rm 233

Beltsville, Maryland 20705

The repository is in the final stages of moving the existing field collection at Glenn Dale to South Farm however it is just beginning the process of setting up a production facility. We finished grading for the polyhouses and the houses will hopefully be installed this summer by us between meetings and other travel. We will also install the required deer fence. The facility will include: a propagation greenhouse (or polyhouse) suitable for cutting and seed production, 2 production polyhouses 30' X 100' a Pot-in-Pot production facility capable of handling 500 trees and supply and equipment storage.

2) We continued to actively seek and collect new germplasm with a focus on the Russian Far East including additional collections around Vladivostok and the Primorye Region as well as the Sakhalin and Kurile Islands and the Republics of Georgia and Azerbaijan. We also have established and are beginning and aggressive U.S. collections program.

3) We continued collaborating with the American Public Garden Association (APGA) on the development of the North American Plants Collections Collaborative (NAPCC). This on going project is meant to establish a network of North American botanical gardens and arboreta to coordinate and improve the collective living plant collections of North America and enhance the conservation and availability of plant germplasm for current and future use.

4) We hosted a two day meeting by the Woody Landscape Plant Crop Germplasm sub committee (WOODY CGC) to review the overall program of the Woody Landscape Plant Germplasm Repository as well as the Woody CGC full committee in June.

5) At the encouragement of the Woody CGC I submitted a proposal to fund a 1 year curatorial assistant (\$20,200) to help review the remaining as well as the historic germplasm at the Glenn Dale Station. The proposal was accepted

(notification was made on May 2 2006) and funded for \$17,000. Alan Koontz was hired and is currently working on the project.

6) We organized and hosted a week long conference between the botanical communities of the United States and Russia in Chambersburg, Pennsylvania from September 19 to 23. The attendance included 35 Russian scientists from all regions of their country and 42 American Scientist.

7) We integrated all WLPGR data into the data base used by the National Arboretum (BGBASE) for better access and inclusion of the NA D.C. campus germplasm records as well as better use of support staff for records management. We plan to continue to work on merging GRIN with BGBASE in order to make all our records accessible.