

## NCGR Corvallis Major Accomplishments for 2005

### 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 56<sup>th</sup> 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, greenhouse 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. In strawberry, 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 4 genera (*Corylus*, *Fragaria*, *Pyrus*, *Vaccinium*) to verify their usefulness as positive controls. They conducted trials for appropriate sampling date, best tissue to extract, effectiveness of universal primers. Assayed all super-core strawberries (48 clones). The universal primers P1/P7 for initial PCR and R16F2n/R16R2 for the nested reaction worked well for all samples except *Vaccinium*. They obtained very good results with appropriate size bands for positive controls (hazelnut stunt, strawberry multiplier, strawberry green petal, strawberry fruit phylloidy, pear decline, cranberry falseblossom). Sampling dates after mid-September were best. Leaf petioles were the tissue of choice. Nearly half of our super-core strawberries tested positive for phytoplasmas. The testing results will now allow us to distribute some of the strawberry collection to countries in the European Union.