

**ANNUAL PROGRESS REPORT**  
**REGIONAL PROJECT W-6**  
**CY 1997**

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*Note: PFT Federal Employees are underlined.*

## **Facilities Corner**

Dennis E. Vandever and Kim E. Hummer

A new computer based environmental control alarm system was installed to monitor the seed freezers and in vitro coolers. This system is expandable and will eventually control greenhouse irrigation. We upgraded the security alarm system in the main building, and added a new system in the headhouse and shop. We replaced the phone system with a computer driven one with voice mail. Some windows in the headhouse offices were tinted to reduce heat and glare. The parking lot was seal coated, cracks were repaired and the parking spaces were restriped.

The main building and south fence was repainted by force account. The well water was found to be acidic and was slowly destroying the copper plumbing. A neutralizer was installed to adjust the pH to 7. The east end of the headhouse was repaired. Some structural supports and siding were in need of replacement. The tissue culture growth room ceiling was replaced with a hard ceiling. The growth room was repainted and new T8 fluorescent fixtures replaced old F40 fixtures. A new lawn tractor was purchased to better maintain the landscape. A new bid was requested for the repair on the roofs of screenhouses 8 and 9 and they were completed. The rear doors on Screenhouses 8 and 9 were replaced with roll-up doors. Interior painting in Screenhouses 8 and 9 was completed. We are continuing repair work on the skylight leak problem at the front entrance to the main building. A contractor was consulted and recommended the entire roof be resealed. The North farm building restroom and office were painted and gutters were installed.

## **Staffing Changes and Training**

Kim E. Hummer

Over the course of the CY 1997, 33 employees were on the NCGR payroll, including 18 women, 2 Asians, 20 students (graduate, undergraduate, and high school levels). The Repository has 11 permanent full-time federal positions including two Scientists, a Support Scientist, five Technicians, a Program Assistant, a Facilities Maintenance Technician, and a Computer Specialist.

During calendar year 1997 we had several permanent staff changes. In February, Lisa Hunt, our Greenhouse Manager, resigned to take a position working with Biological Control Works in Jefferson, Oregon. On May 11, 1997, Liz (Elizabeth) Vella assumed responsibility as our greenhouse manager. Liz has experience working with production greenhouses in Colorado, and has an excellent eye for keeping the collections, healthy and green.

Brian Courtney completed his Computer Science Trainee position when he obtained his B.S. degree at Oregon State University. We combined the resources from this position to increase Doug Cook to a full-time position as Computer Specialist for the Repository.

Dr. John Carter, Visiting Scientist on sabbatic from the University of Minnesota, spent six months at the Repository studying *Ribes* cold hardiness. His discovery of gooseberry mite infestation in dormant black currant buds in the Repository field collection caused his research to take an unplanned turn. His study of the mite and it's effect on the cold hardiness of black currant buds will be published in several upcoming journal articles.

Dr. David McNeil, Visiting Scientist from New Zealand, worked with Dr. Barbara Reed and her staff learning *in vitro* culture techniques for *Corylus*. David alternated his six month study at the Repository and working with Dr. Shawn Mehlenbacher in the Department of Horticulture, Oregon State University.

Ms. Yuexiu Feng, Visiting Scientist from the Shaanxi Fruit Crop Research Institute, Xian, China finished her six months study of the pear collection at the Repository. She evaluated the pear

collection for several diseases including scab and pseudomonas. She also provided information on the identification of Chinese pears in the Repository collection.

Douglas Cook attended PC Troubleshooting training in Eugene, OR, March 6 and 7, 1997. Dennis Vandever took training at Washington State Plant Engineering and Maintenance Show & Conference in Tacoma, WA, October 14 -17, 1997. Ray Gekosky went to Agricultural Hazard Communication and Hearing Conservation Training in Corvallis, OR November 12-13, 1997.

### **Special Awards for 1997**

May	Kim Hummer	Received Agricultural Research Service "10-Year Service"
July	Joseph Snead	Recognition.
September	Judith Flynn	Special Service Award for coordination of the National Clonal Germplasm Repository Technical Committee and the Plant Germplasm Operations Committee.
December	Kim Hummer	Certificate of Merit for strong leadership in expanding the program of the Germplasm Repository & maintaining a highly productive Research Unit.

### **Budget and Fiscal**

By Kim E. Hummer

During 1997, The Corvallis Repository received a base fund increase of \$45K which was applied towards permanent staff promotions, step increases and pay act increases (Fig. 1). The Repository also received \$25K for in vitro culture and virus testing of hop core germplasm; a temporary \$10K for cryopreservation of *Pyrus* germplasm for back-up storage at NSSL; and a temporary \$50K from the Pacific West Area office.

The FY 1999 discretionary funds per SY are projected at \$26,700 (about \$9K less than FY 98). Staffing projections for FY 1999 have eliminated undergraduate student and temporary positions to keep salary percentage down to 77.8% of the total budget.

A CRIS Revision was submitted and accepted combining the two Repository CRISs. Beginning March 1998 the Repository will be operating under one CRIS entitled Preservation and Alternative Storage Technologies of Clonal Genetic Resources of Temperate Fruit, Nut and Specialty Crops. The *in vitro* culture and cryogenic service and research aspects of the Repository will continue to be funded at 25% of the unit budget total.

In summary, financial projections for the unit are bleak. The FY 1997 base increase was applied to salary needs and was insufficient to improve the critically low discretionary funds. The earmarked hop funding increase will support a half-time Research Assistant through our Research Support Agreement with Oregon State University. This unit desperately needs a base fund increase.

### **New Acquisitions and Inactivation of duplicate Germplasm**

By Kim E. Hummer

During 1997 about 451 new accessions were added to the NCGR collections. New *Humulus* accessions topped the list, then *Vaccinium*, *Rubus*, *Ribes*, *Pyrus*, *Fragaria*, *Pycnanthemum*, *Corylus*, and *Mentha*. New core collections were defined for *Humulus* and *Pycnanthemum*. Core collections for *Corylus*, *Fragaria*, *Mentha*, *Pyrus*, *Ribes*, *Rubus*, and *Vaccinium* were reviewed and revised.

The Repository continues to receive several hundred new accessions each year (Fig. 2, 3). During CY 1997 we inactivated more than 1800 accessions on the GRIN data base. This inactivation

Fig. 1. USDA-ARS National Clonal Germplasm Repository  
Corvallis, Oregon

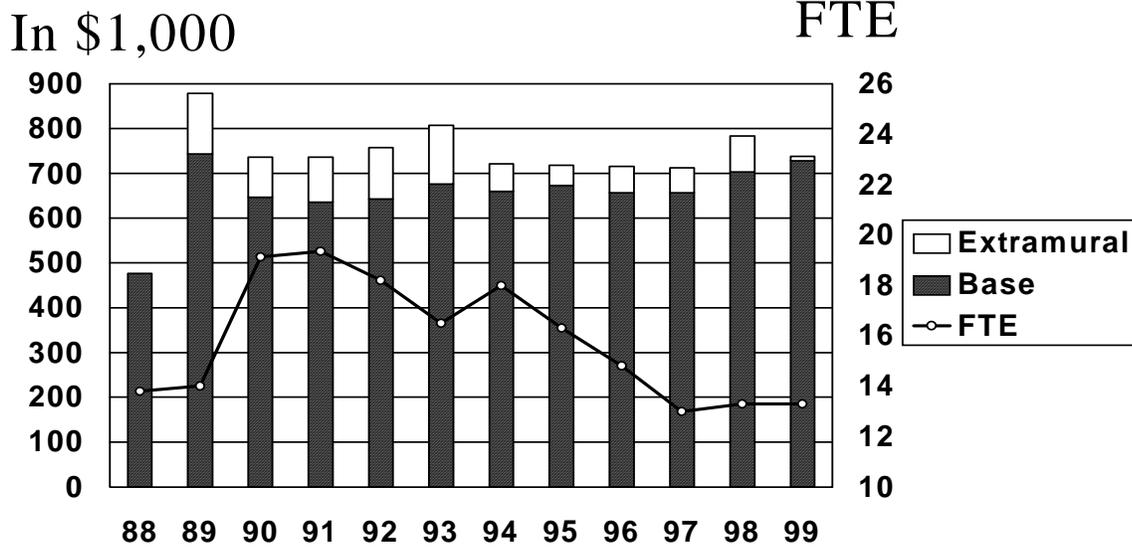
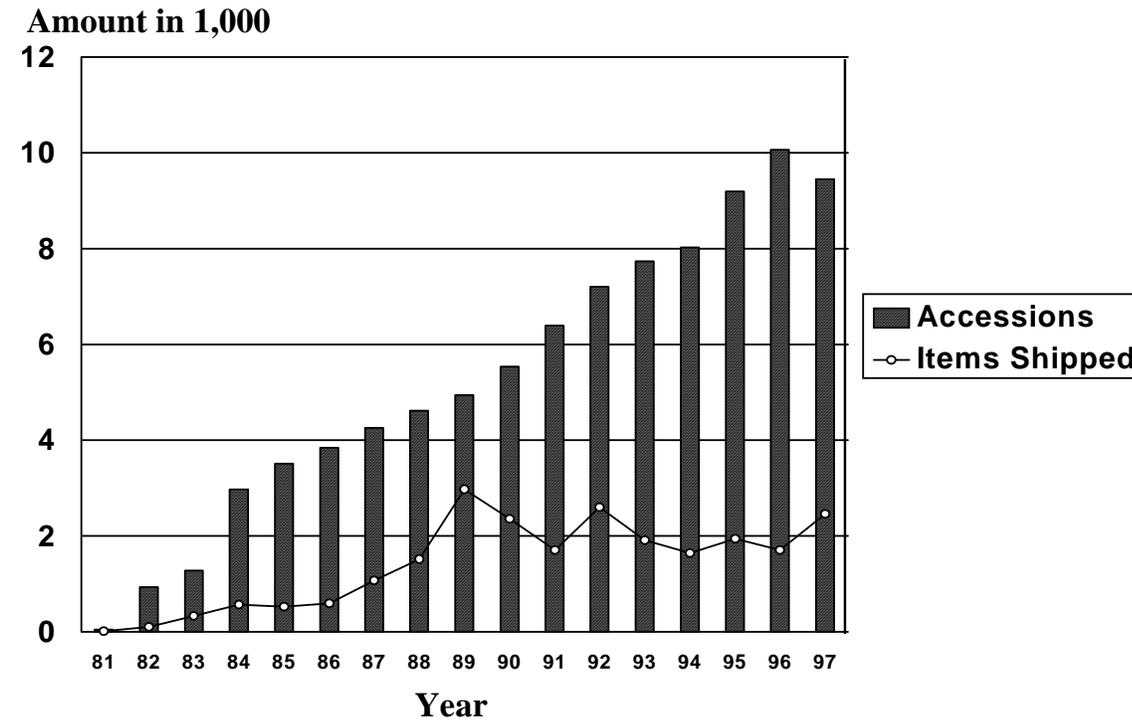
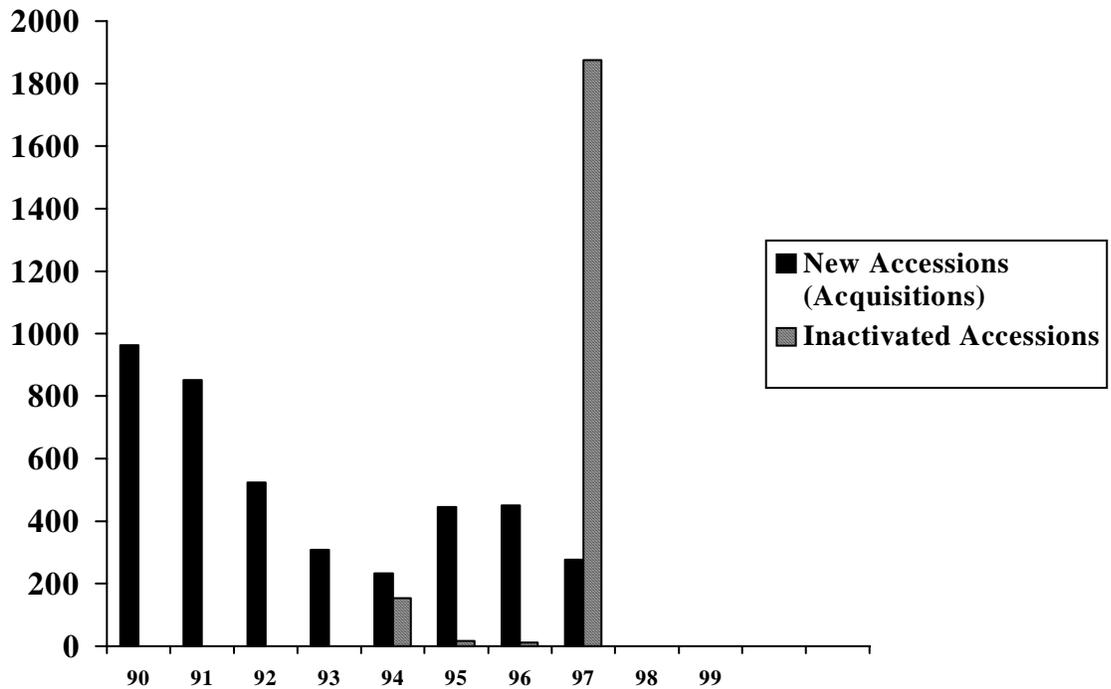


Fig. 2. Total Accessions / Distribution



# Fig. 3. New and Inactivated Accessions



prepared May 1998

**Accessions are inactivated for the following reasons:**

1. Evaluation determined that accession is a DUPLICATE.
2. Evaluation determined that accession is INCORRECT.
3. Seedlot is extinguished (CLOSED) and could not be regenerated.
4. Clone is DEAD and cannot be replaced.

was a culmination of previous years information and included eliminating duplicate or incorrectly labeled germplasm, seedlots that were extinguished and unable to be regenerated, and clones that died and could not be replaced. Duplicity was assessed by morphological and phenological observations in comparisons with taxonomic or horticultural descriptions and by molecular techniques of collaborating scientists. The total active accessions for the repository remains about 10,000.

### **Field Collections**

By Joe Snead and Ray Gekosky

Changes in the field collections have been less this year compared to previous years. Each field has increased slightly with new accessions. We continue to reduce duplicate accessions. The detection of Blueberry Scorch Carlovirus and the gooseberry mite, *Cecidophyopsis grossulariae* Collinge, in the field collections was very important news this year. The primary collections of *Ribes* and *Vaccinium* will be under screen. Once again El Nino has played a significant role in the field operations. We had flooding in the *Corylus*, *Vaccinium*, and *Pyrus* fields during the dormant season. The flooding caused increased damage to the fence line on the North farm in several locations. The wet spring weather led to increased diseases in the field.

Most of the *Pyrus* field species collections were under water for five months in the winter of 1997. This was the second winter that the tree root systems were covered for an extended period. The flooding moved drip lines and floated row markers away. No negative effects on the trees have been observed thus far. We are continuing to reduce the collection to a single tree per accession; this has been completed with the species clones. Removing the trees, and in many cases tall canopy, has allowed for more light penetration into the smaller trees. The big trees will be pruned to force new growth lower in their canopies for better scionwood production and collection. The planting is beginning to look like a specimen tree collection now.

Duplicate accessions were removed from the *Corylus* field this year. This will allow for some needed expansion room for new accessions. The flooding caused no damage in this field because the high water came and went in a short time.

Blueberry scorch carlavirus was detected in the *Vaccinium* field collection. The known infected accessions were removed. This plant collection will be closely monitored and tested for virus infection. The high water affected this field considerably. The sawdust mulch, drip irrigation parts, and labels were washed away from the lower third of the field and the plants themselves were filled with debris from the neighboring farms. New weed seeds were introduced and recognized the following growing season. Cleanup from the floods took about a week and a half to complete.

Gooseberry mites were observed in dormant buds from the *Ribes* collection. The infestation was widespread throughout the field. To control the mite, the above ground branches were cut to their crowns, removed and burned. Dormant and new growth were sprayed weekly with a low-grade mineral oil to smother the remnant mite populations as they emerged from the buds. The oil should also help reduce other diseases such as powdery mildew.

Finally, the storage building on the North Farm is nearing completion. This last year the office and bathroom areas were completed. The tractor storage part of the building was equipped with hand tools, welders, air compressor and assorted power tools. The area outside the building was landscaped. The area is now fully functional with just a few construction details to finish. Besides the germplasm farm crew, other state and federal projects use the space. At this time the North Farm is a fully functional research facility.

## **Screenhouse/Greenhouse Collections**

By Liz Vella

The greenhouse/screenhouse collections underwent several changes during CY 1997, resulting from suggestions made by the NCGR Technical Committee in September. Committee advisors suggested several operational changes to more effectively manage our collections while reducing overall costs. The first suggestion was to eliminate redundancy. The second suggestion was to reduce the number of non-core plants from two pots per accession to one. These strategies are beneficial in several ways: (1) allowing valuable space to be freed up for new accessions, (2) enabling a fine-tuning of our database inventory, and (3) reducing our overall maintenance load. These suggestions were successfully implemented by year's end in the primary collections of small fruits and mint which reside in the screenhouses.

Two screenhouses were emptied to allow for construction repairs. The *Fragaria* collection was temporarily reduced to one pot per accession (both core and non-core) so that it could reside in a greenhouse during the repair. New roofs, floors, benches, and irrigation for screenhouses 8 and 9 were near completion at year's end. Core accessions will be increased to two pots per accession during 1998.

In collaboration with the *Humulus* breeding program, the hop core collection was dug and placed in pots to be held at the Repository. We now house 120 pots of *Humulus* (two per accession) and are currently in the process of virus testing and transferring the collection into tissue culture.

## **Quarantine Plants**

By Kim E. Hummer & Liz Vella

The Repository has been working with the USDA-APHIS and Oregon State regulations to import plants from foreign countries. At the close of 1997 we had 80 accessions in post-entry and other quarantines.

The plants are tested for viruses and other disease agents and are inspected at least annually by APHIS representatives. In most cases pathogen-free plants may be released after two growing seasons. This table shows the plants in quarantine at the end of 1997, listed by genus code;

**Table 1. Plants in quarantine at NCGR 1997**

<b><u>Genus</u></b>	<b><u>In Quarantine</u></b>	<b><u>Released in CY 1997</u></b>
<i>Corylus</i>	1	4
<i>Fragaria</i>	10	0
<i>Ribes</i>	50	0
<i>Rubus</i>	0	1
<i>Pyrus</i>	18	0
<i>Sorbus</i>	0	3
<i>Vaccinium</i>	1	1

## **Plant Distribution**

By Bruce R. Bartlett

The NCGR in Corvallis continues to distribute plant germplasm within the United States and at the international level. At the time of this printing, we have distributed a total of 2,489 items as seeds, cuttings, runners, scionwood, rooted plants and tissue culture from 1997 requests (Fig. 4). This number represents 83% of the total number of items requested for 1997.

The total number of plant items shipped during the 1997 calendar year was 2,632. One item from request year 1993 was shipped, 13 from 1994, 35 from 1995, 428 from 1996, and 2,155 from 1997. The total postage paid for domestic and international shipping was \$1,622.35 (Table 2). The total cost for Federal Express was \$619.73 and the total paid to the Oregon Department of Agriculture for 80 Phytosanitary Certificates was \$800.00.

**Table 2. Expenditures for Plant Distribution from 1997-1995.**

Year	Total items				Shipping cost	
	Shipped	Postage	FedEx	PC's	Total	per item
1997	2632	\$1,622.35	\$ 619.73	\$ 800.00	\$3,042.08	\$ 1.16
1996	2028	1,656.15	330.06	700.00	2,686.21	1.32
1995	1974	1,523.23	135.78	556.00	2,215.01	1.12

The total number of plant items shipped has increased over the past three years from 1,974 in 1995 to 2,632 in 1997 (Table 2). The amount spent for postage has remained stable over this period while the amount spent for Federal Express and Phytosanitary Certificates (PC's) has increased. However, the amount spent per plant item shipped has remained fairly stable.

The diverse nature of plant accessions at NCGR-Corvallis present an ongoing challenge to fill all requests in a timely manner. Items may be pending for as long as three years. The coordination of foreign import permits (IP), seasonal availability, and slow growth of some accessions all contribute to delays in plant shipment. As of May 15, 1998, 7% of the 1997 requested plants are pending, 8% are listed as not available, and 2% have been canceled. Shipment records from 1993 to 1996 show that a total of 80% to 86% of plant requests will eventually be shipped. Total plant shipments from 1997 should be 85% or slightly higher.

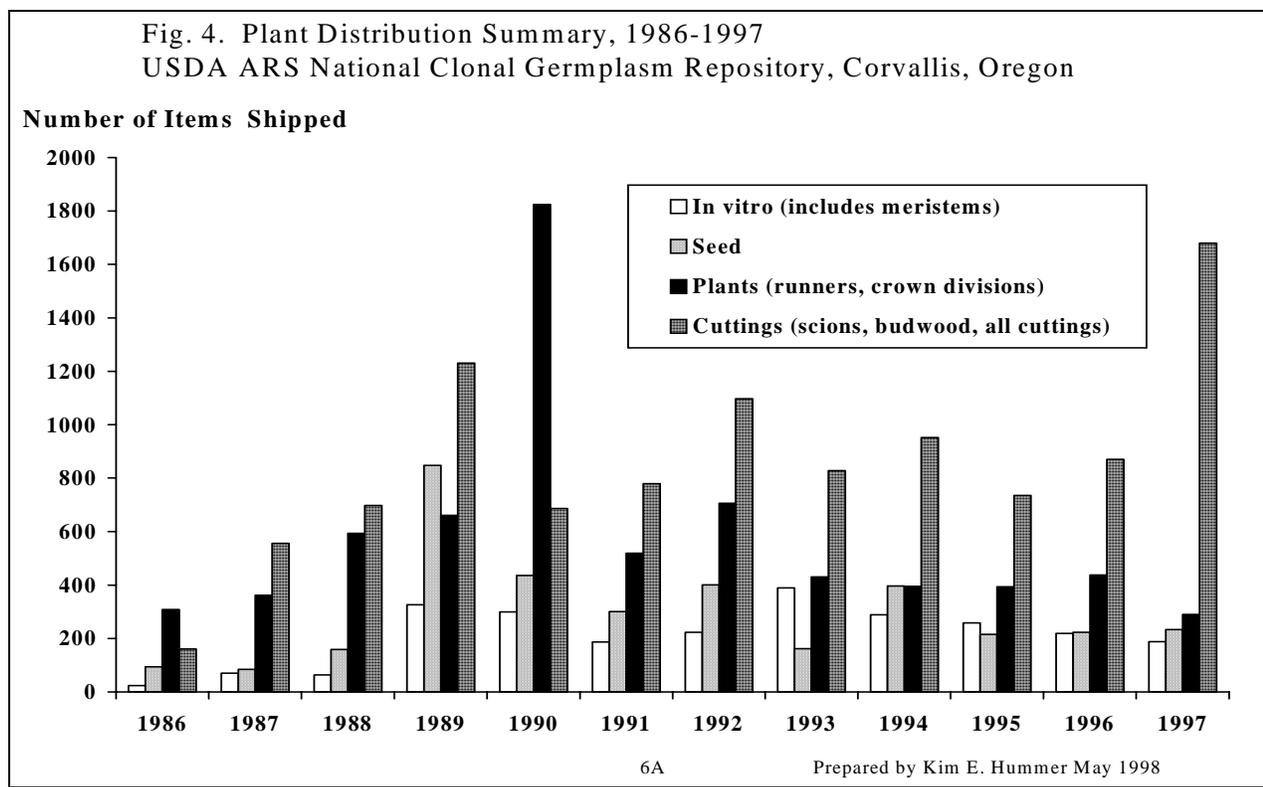
Tissue cultures represented less than 10% of the total distributed accessions, however, it was the most requested and shipped form for foreign requestors. A number of factors have contributed to the rise of tissue culture as the favored form by foreign requestors. European and South American IP restrictions are less on plants in the form of tissue culture as opposed to other forms. Situations where *Pyrus* scionwood would be prohibited to import due to the possible presence of fireblight (*Erwinia amylovora*), *Pyrus* in the form of tissue culture may be accepted. Many accessions in tissue culture are also virus tested and therefore may satisfy IP restrictions. Tissue culture accessions are durable in shipment and may be shipped most any time of the year except during periods of extreme heat and cold. Many countries will restrict the shipment of woody plants to the dormant period while these same plants if in tissue culture could be sent most any time. Some genera of seed (e.g. *Rubus*) now are prohibited from being shipped to New Zealand, France, and Germany unless the virus status of the mother plants is known. Since much of our seed collection was gathered on plant explorations, the virus status of the mother plant is unknown and we can not therefore state that the seed is virus free. All of these factors have contributed to the favor of tissue culture over other forms when shipping to foreign destinations.

A trend from 1991 to 1993 showed that about 20% of items requested in a given year would not be shipped. The unavailability of a given accession when requested and complications associated with IP's account for most of the reasons why items will not be shipped. Considerable effort was made beginning with 1994 to more closely work with requestors to select alternative accessions to those not available. Since that time, the number of items not shipped has dropped to 15% for 1994 and 95 and 16% for 1996. This trend should continue for 1997 requested items. We continue to work with all requestors in improving plant shipment.

The total number of items requested was stable during 1993 (2,513) and 1994 (2,507), dropped slightly in 1995 to 2,076, rose again to 2,291 in 1996 (domestically shipped *Humulus* have not been added to 1995 or 1996 totals and may represent an additional 150 items for each year) and rose higher yet in 1997 to 2,983. In 1996 and 1995, foreign requestors asked for approximately 40% of all items ordered. This is significantly more than the previous trend of 25% from 1992 to 94. In 1997, foreign requestors asked for 22% (643 items) of all items ordered.

A new collaboration has been established with Dr. John Henning (Hops research geneticist with USDA-Corvallis) directing *Humulus* requests, foreign and domestic, to NCGR- Corvallis for processing and shipping. *Humulus* plant requests will now be entered into the NCGR database as they are received. Year-end reporting will better reflect *Humulus* activity.

Over the past six years (1997-92) accessions from *Pyrus*, *Rubus* and *Ribes* were the most often requested based on a percentage of items requested. *Fragaria* represented 22% of all accessions requested over this six year period. This is a slight decrease from last year's report. *Pyrus* was second at 18% and *Mentha* third. Requests for *Vaccinium* accessions have been stable over the last three years but lower relative to other genera requested. Requests for our other major and combined minor genera have varied only slightly over the past six years.



## Tissue Culture

By Barbara M. Reed

Research Plant Physiologist

Screening and cryopreserving *Pyrus* accessions for shipping to the base collection at NSSL by Jeanine DeNoma (0.5 FTE) and Yongjian Chang (0.15 FTE) were a major activity this year. By year end, meristems for more than 55 *Pyrus*, 4 *Rubus*, 4 *Ribes*, and one *Cydonia* were stored at NSSL. Cryopreservation categories were added to the Foxpro database in 1997 and all data for pollen, embryonic axes, and apical meristems were entered and loaded to GRIN.

Since funds for lab assistance were low, the main activity was maintenance of the collection. From April to July French-volunteer intern Bojidar Borissov learned basic tissue culture techniques, collected over 200 *Fragaria* accessions, screened them on two bacteriological media, and multiplied them for storage.

ARS Research Apprentice Corrina Chase and Saturday Academy Intern Sara Schwanke assisted in the TC lab for eight weeks. They learned media making, sterile transfers and repropagation techniques. The interns also assisted with collecting explants for requests. Graduate student Yongjian Chang (0.35 FTE) assisted with the TC lab activities and dissected meristems for the cryopreservation program, as well as continuing his own research projects. Graduate student Valen Tsao volunteered in the lab, worked on course work, and planned his research project.

I completed a final draft of "Guidelines for the establishment, management and use of field and *in vitro* genebanks" for the International Plant Genetic Resources Institute, Rome, resulting from the Consultation on Genebank Management held in January of 1996. I was an invited speaker at the Spanish Society for Cryobiology Meeting in November, 1996. I organized and chaired a symposium on Cryopreservation of Genetic Resources at the Society for *In Vitro* Biology Meeting in June and presented a contributed paper. I am also a board member for the society. Yongjian Chang also attended with the aid of an SIVB student travel award and presented a paper on his research. I acted as an associate editor for HortScience and a reviewing editor for *In Vitro Cellular and Developmental Biology-Plant*.

**Table 3. *In Vitro* Storage at USDA ARS NCGR December 1, 1997**

Genus	No. of Accessions		
	<i>in vitro</i>	in storage	in propagation
<i>Corylus</i>	26	17	20
<i>Fragaria</i>	211	182	40
<i>Humulus</i>	45	36	10
<i>Mentha</i>	267	264	4
<i>Pyrus</i>	169	152	21
<i>Ribes</i>	90	58	33
<i>Rubus</i>	231	166	72
<i>Vaccinium</i>	112	96	15

## Virus Indexing

By Joseph Postman

*Corylus* is the healthiest collection at the repository in terms of virus diseases with 92% of the clones listed as virus tested. To date, 48 hazelnut clones have tested positive for apple mosaic

ilarvirus, and all but two of these have been replaced with either heat-treated clones, or with healthy plants from other sources. This virus is very easily eliminated by heat therapy. Apple mosaic is only known to be transmitted in the seeds of hazelnut, although in other crops pollen transmission is suspected. In 1997, all of the known virus-infected hazelnut trees were removed from the repository field collection to prevent the possibility of spreading this virus locally through seed or pollen.

The *Fragaria* collection has had a large influx of new accessions during the last several years. ELISA testing has been kept up to date, but the more time and labor intensive bioassays have fallen behind. This backlog will be attacked in 1998, with emphasis on the core collection. A large number of infected strawberry accessions have been detected, thanks to improved serological assays for strawberry mild yellow edge potyvirus and tobacco streak ilarvirus. Thus, there is also a backlog of infected plants awaiting therapy. At the end of 1997, 26% of the clonal collection is listed as "untested" due to the lack of bioassay results, and there are nearly 200 known virus-infected clones in our greenhouse. About two-thirds of the infected plants represent species material for which therapy is not anticipated.

*Humulus* has received little virus indexing attention in the past, since this collection was primarily maintained and curated outside our facility. This will change in 1998. With the spread of a noxious species of powdery mildew in the production areas of Washington, the hop industry is looking to Corvallis as a source of virus-tested propagation material. Antisera are on hand to begin testing a core collection of hop germplasm for six of the most important viruses, and an in vitro virus therapy program will be initiated. Fortunately, we have plants in the collection that are known to be infected with each of these viruses based on ELISA tests done in the mid 1980s by Dick Hampton. These will be important as positive controls for any future ELISA work.

A few virus infected *Mentha* clones were identified several years ago based on visual symptoms, and the viruses were successfully eliminated by heat therapy and apical meristem culture. A mint veinbanding virus was partially characterized, but information about this unreported virus have never been published. Except for tomato spotted wilt virus (TSWV), very few mint viruses have been characterized. The mint collection was tested for two isolates of TSWV in 1991 and no infected plants were found. The collection is otherwise untested. Suspicious symptoms on a handful of clones suggest the possibility of several virus-like entities lurking in these plants.

*Pyrus* is the largest collection at this repository, and has received considerable virus indexing and virus therapy attention. The pear collection is second only to *Corylus* in percent virus tested. We have over 1500 clonal *Pyrus* accessions, and 85% of these are available as virus tested plants. Virus therapy of *Pyrus* germplasm is a good investment, since there are no known vectors for nearly all pear viruses so trees will remain virus-free even when growing in the field. Virus indexing in 1996 and 1997 has focused on bioassays of new accessions and newly heat-treated clones for common latent viruses, and testing about 100 older clones each year for apple stem grooving capillovirus on the improved *Malus micromalus* indicator clone. This will continue in 1998. Comparison of virus-tested, heat-treated trees to their virus-infected counterparts to verify identities, and elimination of the older duplicates from the field collection will be a priority activity in the coming year. About 90 infected cultivars and selections await therapy. Many of these were propagated in the greenhouse in preparation for therapy. Pear blister canker viroid was detected in several clones in the collection by colleagues in Beltsville and Prosser using a new molecular probe. We will attempt in 1998 to assay a large group of our pear cultivars to determine the prevalence of this pathogen, and will also conduct a therapy trial to see how easily this pathogen is

eliminated. A permit was obtained from APHIS to bring about 30 quarantined pears to the Repository from Beltsville. These will undergo heat-therapy and apical meristem culture in Corvallis, and then be returned to the National Quarantine Center in Beltsville for follow-up indexing in an ongoing effort to help our colleagues at the NPGQC move pear germplasm through quarantine.

The *Ribes* collection is largely untested, since these plants are growing in the field and there is no way to prevent the movement of viruses by vectors. Veinbanding virus was noted in about 16% of the clones. A two to three year bioassay for reversion disease is underway for many black currant clones. A number of quarantined plants in the screenhouse are subjected to heat therapy each year in an effort to safely move these clones to the field.

Most of the *Rubus* collection was indexed by ELISA for tobacco streak ilarvirus, tomato ringspot nepovirus, and raspberry bushy dwarf virus. About 77% of this collection is listed as virus tested, although bioassays for mosaic were not completed for much of the collection. More than 50 infected cultivars and selections await virus therapy.

During routine ELISA testing of the *Vaccinium* field during the summer of 1997, a single clone was found to be infected with blueberry shock ilarvirus and about a dozen plants were found to be infected with blueberry scorch carlavirus. All infected plants were removed from the field, and all except three had virus-negative counterparts in the screenhouse. The aphid-borne carlavirus has apparently been spreading in our field, and additional testing will be required, since newly infected plants may have escaped detection. ELISA testing for at least these two viruses will be repeated in 1998. Less than half of our *Vaccinium* clonal accessions are presently maintained under screen, and we hope to increase this number during 1998.

Minor genera have received only limited virus testing. Some representatives of our minor pome collections including *Cydonia*, *Mespilus* and *Sorbus* were tested using the same graft-inoculated indicators as we use for *Pyrus*. A handful of plants infected with common latent viruses were detected. A mysterious virus symptom which resembles apple chlorotic leafspot was eliminated from two quarantined *Sorbus* clones several years ago using heat-therapy and apical meristem culture. These two clones, along with several other non-infected selections from Russia which are purported to have large edible fruit, were released from quarantine in 1997. Several viruses are known to be present in our *Sambucus* collection based on testing done by Dick Converse before he donated a number of elderberry cultivars, but there are no plans for therapy or for additional indexing.

Each year improvements are made to our virus indexing databases and record keeping. In 1997 nearly 23,000 virus test records were loaded to the GRIN database to provide itemized results in addition to the summary narratives which have been available for several years. The software that is used to analyze and update indexing results was modified to generate separate summaries of positive test results, and negative test results under the two major headings 'ELISA' and 'BIOASSAY.' Databases for *Humulus*, *Mentha* and Minor Genera were modified and expanded to incorporate improvements made in previous years to the major genera records. Many indexing results and observations which had not been accessible electronically were added to these databases, including historical records for *Humulus* and several minor genera. All heat-treated plants are now added to the public inventory databases as plants become established in the greenhouse, rather than waiting until a single sub-clone is selected to replace an infected clone. The collections of infected plants which are maintained as controls for virus indexing, and as

repositories of pathogen germplasm, were added to the plant inventory databases so that location data is available to the repository staff, and distributions of this material can be tracked.

### **Database Management**

By Doug Cook and Kim Hummer

During 1997 steady improvements were made to meet our needs and the needs coming in 1998. We added four new workstations with the capacity to function with the Windows version for GRIN and the new standard for Visa account book-keeping. With the addition of cabling and two new ethernet hubs all staff members now have a workstation attached to our network.

This year's hardware repairs included the repair of an HP LaserJet II and the replacement of a fusing assembly in the HP LaserJet III. Corrections and modifications of data on our database and on GRIN have dominated the activity throughout this year.

**Table 4. GRIN Records Activity during CY 1997**

<b><u>GRIN Area</u></b>	<b><u>Created</u></b>	<b><u>Modified</u></b>
Accession/Inventory/Obs	72,980	25,655
Distribution/Cooperator	3,086	1,525
Total	76,066	27,180

### **FOREIGN TRAVEL REPORTS FOR CY1997**

Kim E. Hummer

April 30, 1997 through May 13, 1997

Travel to: Shaanxi Fruit Crops Research Centre, Xi'an, Shaanxi, China

Purpose: To present an invited talk on germplasm management to a Seminar on Fruit tree Viruses sponsored by UNDP CPR/91/113

From April 28 through May 10, 1997 I visited the Shaanxi Fruit Research Center in Xi'an China and adjacent fruit producing regions within the province. I presented two seminars to the staff at the Research Center: "Plant Genetic Resources in the US National Plant Germplasm System - with special emphasis on the clonal repositories and the Corvallis Repository in particular" and "Pear Production in the US." I toured pear, apple, and peach orchards near Liqant County and Xi'an and observed the fruit cold storage cellars. I observed the horticultural practices and diseases present in the orchards. I attended the Symposium on Fruit Tree Viruses with Dr. Gaylord Mink, Prosser, Washington, Mr. Bill Howell, Prosser, Washington, Dott. Marina Barba, Rome, Italy, Dr. Tony Adams, East Malling, England, and myself as the invited foreign speakers. In addition, 40 Chinese Fruit Tree scientists and staff from six provinces were in attendance. My presentation to the symposium had three components: Plant Genetic Resource Conservation in the US National Plant Germplasm System, Operations and Cirus Testing Procedures of the Corvallis Repository, and Pear Production in the US. The panel of foreign scientists reviewed the facilities and operational procedures at the Shaanzi Fruit Research Center and made recommendations for improvements to the UNDP and to Deputy Director Shushang Ma.

### **Meetings and Presentations during CY1997**

*Joseph Postman* - 48th Annual Western Small Fruits Pest Conference, Portland, OR. 01/16-17, 1997. Presentation on Small Fruit Germplasm in Northeast China.

*Kim Hummer* - 48th Annual Western Small Fruits Pest Conference, Portland, OR. 01/16-17, 1997. Diseases of *Ribes* observed in Corvallis, Oregon.

*Kim Hummer* - Shaanxi Fruit Crops Research Centre, Xi'an, Shaanxi, China 04/30-05/13/1997. Presented invited talks: Genetic Resources in the U.S. Nat'l Plant Germplasm System; The operations & virus testing program of the Corvallis Repository; Pear Production in the U.S.

*Barbara Reed* - Society for In Vitro Biology Meeting, Washington D.C. 06/12-06/21/1997. Presented a talk on, "Cryopreservation of a World Pear Collection."

*Joseph Postman* - 17th Annual International Symposium on Virus & Virus-like Diseases of Temperate Fruit Crops, Bethesda, MD, and detailed to Beltsville Offices, 06/20-07/09/1997. He presented a paper on the temperate fruit pathogen collection maintained at the NCGR-Corvallis, and a paper on a phytoplasma he recently discovered in strawberries from Canada.

*Kim Hummer* - American Society for Horticultural Science, Salt Lake City, Utah, 07/22-07/27/1997.

Presented an annual report to Small Fruit Crops Germplasm Committee and moderated a workshop on quarantine procedures. Presented a paper on the ornamental landscape value of *Ribes* species.

*Kim Hummer* - Western Region-6 Meeting, Hilo, Hawaii 06/22-06/30/1998. Presented the CY1996 Annual Report for the National Clonal Germplasm Repository-Corvallis.

*Dennis Vandever* - Plant Engineering and Maintenance Show and Conference, Tacoma, WA, 10/15-10/16/1998.

*Judith Flynn* - USDA ARS Pacific West Area offices, Albany, California, 12/07-12/12/1997. Detailed to the Area offices on work assignment.

### **Visitors, Technology Transfer and Community Outreach**

By Judith Flynn

Fourteen countries of the world were represented within the total 560 visitors to the Repository. We welcomed people from Asia (China, India, Japan, Taiwan, and Thailand), Europe (France, Hungary, Italy, Norway, Russia, Turkey), New Zealand, South America, South Africa, and the United States. Twelve folks from our sister city, Uzghorod, Ukraine, found the Repository fascinating. It was interesting to note that we had 100 local individuals visit the Repository. Most heard about us through word-of-mouth.

Several industries sent representatives to NCGR to gain information on our programs. Driscoll Strawberry Associates, The Mint Industry Research Council, and Procter & Gamble, Inc. toured the facility. Linfield College's Plants and Society Class, Willamette University's Biology Class, Oregon State University's Plant Breeding and Biotechnology for Teachers classes, Linn-

Benton Community College's pesticide class, Philomath and Crescent Valley High School classes and Hawthorne Manor made up the educational institutes which toured the facilities. Four employees assisted at the Linn-Benton Community College Job Fair for the third consecutive year.

David McNeil, Visiting Scientist and Senior Lecturer in Crop Physiology at Lincoln University, New Zealand, gave a speech on, "RAPD and Morphological Relationships in Determining Graft Compatibility in Chestnuts: A Comparison of Upgma cluster and PCA Analysis."

Tatiana Eremeeva, Stone Fruit Breeder from Russia, presented a seminar titled, "Fruit Production of the Baikal Region with Special Emphasis on the Stone Fruits."

The Repository hosted the NPGS Plant Germplasm Operations Committee Meeting in July and the NCGR Technical Committee Meeting in September.

### **NCGR 1997 PUBLICATIONS**

Huck, R.B. and **H.L. Chambers**, 1997. Polyploidy: A Factor in the Evolution of *Decerandra* Benth. (Labiatae), *Edinburgh Journal of Botany* 54(2):217-229.

**Hummer, Kim E.**, 1997. Diamonds in the Rust: *Ribes* Resistance to White Pine Blister Rust. *Fruit Varieties Journal* 51(2): 112-117.

**Luo, J.** and **B.M. Reed**, 1997. Abscisic acid-responsive protein, bovine serum albumin, and proline pretreatments improve recovery of *in vitro* currant shoot-tip meristems and callus cryopreserved by vitrification. *Cryobiology* 34:240-250.

**Postman, J.D.**, 1997. Blueberry Scorch Carlavirus Eliminated from Infected Blueberry (*Vaccinium corymbosum*) by heat therapy and apical meristem culture. *Plant Disease* 81:111.

**Postman, J.D.**, and **K. E. Hummer**, 1997. Pear; Asian Pear; Quince. in *The Brooks and Olmo Register of Fruit & Nut Varieties*, third edition. ASHS Press, Alexandria, Virginia, 744 pp.

**Postman, J.D.** and **K. E. Hummer**, 1997. Pears - Asian; Pears - European. in W.R. Okie (ed.). *Register of New Fruit and Nut Varieties - Brooks and Olmo List 38*. *HortScience* 32(5):792-793.

**Postman, J.D.** and **K. E. Hummer**. 1997. Quince. in W.R. Okie (ed.). *Register of New Fruit and Nut Varieties - Brooks and Olmo List 38*. *HortScience* 32(5):796-797.

**Postman, J.D.**, 1997. Unusual flower symptoms of blueberry shoestring disease caused by blueberry shoestring virus. *Plant Disease* 81(10):Cover Photograph.

**Reed, B.M.**, and **Y. Chang**, 1997. Medium- and long-term storage of *in vitro* cultures of temperate fruit and nut crops. In: *Conservation of Plant Genetic Resources In Vitro*. vol. 1. (eds. M.K. Razdan and E.C. Cocking) pp. 67-105. Science Publishers, Inc., Enfield, NH, USA.

**Reed, B.M., J. Mentzer, P. Tanprasert, and X. Yu, 1997.** Internal bacterial contamination of micropropagated hazelnut: Identification and antibiotic treatment. In: Pathogen and Microbial Contamination Management in Micropropagation. (ed. A.C. Cassells) pp. 171-176. Kluwer Academic Press.

**Tanprasert, P. and B.M. Reed, 1997a.** Detection and identification of bacterial contaminants from strawberry runner explants. *In Vitro Cell. Dev. Biol. - Plant* 33:221-226.

**Tanprasert, P. and B.M. Reed, 1997b.** Detection and identification of bacterial contaminants of strawberry runner plants. In: Pathogen and Microbial Contamination Management in Micropropagation. (ed. A.C. Cassells) pp. 141-145. Kluwer Academic Press.

**Tanprasert, P. and B.M. Reed, 1997c.** Determination of minimal bactericidal and effective antibiotic treatment concentrations for bacterial contaminants from micropropagated strawberries. *In Vitro Cell. Dev. Biol. - Plant.* 33:227-230.

#### **Abstracts:**

**Chang, Y. and B.M. Reed, 1997.** The effects of *in vitro* growth condition on the cryopreservation of *Pyrus* meristems. *In Vitro Cellular and Developmental Biology* 33:50A.

**Hummer, K, 1997.** Ornamental landscape potential of several *Ribes* species. *HortScience* 32(3):508.

Rom, C. and **K. E. Hummer, 1997.** Maintaining a healthy fruit crop industry. (Quarantine concerns.) *HortScience* 32(2):423.

**Reed, B.M., Towill, L., J. Luo, Y. Chang, and J. DeNoma, 1997.** Cryopreserved storage of a world pear collection. *In Vitro Cellular and Developmental Biology* 33:51A.