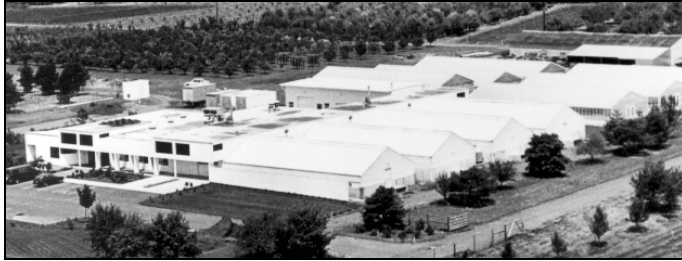


**USDA-ARS  
NATIONAL CLONAL GERMPLASM REPOSITORY  
Corvallis, Oregon**



USDA-ARS-NCGR  
33447 Peoria Road  
Corvallis, Oregon 97333-2521  
Telephone: 541/750-8712  
Fax: 541/750-8717  
hummerk@bcc.orst.edu

<http://www.ars-grin.gov/ars/PacWest/Corvallis/ncgr>

**ANNUAL PROGRESS REPORT**

**REGIONAL PROJECT W-6**

**CY 1995**

**Bruce Bartlett**, Ag. Sci. Res. Tech., Plants

**Jamie Bergen**, High School Volunteer

**Henrietta Chambers**, Collaborator

**Yongjian Chang**, Graduate Student, OSU

**Douglas Cook**, Computer Specialist

**Brian Courtney**, Computer Specialist Trainee

**Jeff Darbut**, Biological Science Aid

**Jeanine DeNoma**, Research Assistant, OSU

**Judith Flynn**, Program Assistant

**Raymond Gekosky**, Ag. Sci. Res. Tech.,

**Jorge Gerrero**, Field/Lab Work Study

**Kim Hummer**, Research Leader/Curator

**Lisa Hunt**, Ag. Sci. Res. Tech., Plants

**Mohan Kumar**, Graduate Student

**Jie Luo**, Graduate Student, OSU

**Tung Ly**, Lab Work Study, OSU

**Francis Lawrence**, Collaborator

**Wes Messinger**, Graduate Student, OSU

**Jessica Mentzer**, High School Intern

**Brian Olson**, Biological Science Aid

**Carolyn Paynter**, Bio. Sci. Lab Tech., Plants

**Derek Peacock**, Graduate Student, OSU

**Joseph Postman**, Plant Pathologist

**Leslyn Rasmussen**, Biological Science Aid

**Barbara Reed**, Plant Physiologist

**Naomi Silva**, Office Work Study, OSU

**Charlie Simon**, Office Work Study, OSU

**Joe Snead**, Ag. Sci. Res. Tech., Plants

**Piyarak Tanprasert**, Graduate Student, OSU

**Dennis Vandever**, Maintenance Technician

**Avery Wilkins**, Biological Science Aid

**CRIS Summary 1990-1995**

Corvallis NCGR maintained more than 9,489 accessions in 1995. Each accession and its corresponding information was loaded on the database in GRIN and was made available on the world wide web. More than 6,085 accessions were available for distribution. The plant pathology program eliminated viruses from 400 pears, 100 small fruits, and 12 hazelnut clones. More than 70% of the clonal accessions of the six major genera at the Repository were available as virus-tested plants. A new strawberry ilar virus from Chile was discovered, identified and intercepted. A procedure to eliminate apple scar skin viroid from quarantined Asian pears was determined. From 1991 to 1995, the Repository distributed more than 13,000 accessions to requesters from 49 countries. The most frequently requested items were in vitro cultures, seed, plant, scionwood, and cuttings. The foreign countries which requested the most germplasm during this time were Canada, Italy, China, the Russian Federation, and Australia. Over the past five years, the Repository provided training for 29 Indian scientists sponsored by OICD, and scientists from Bhutan, Brazil, Canada, China Egypt, England, Germany, Italy, Japan, Korea, Malaysia,, New Zealand, Nigeria, Pakistan, Poland, Russian Federation, Scotland, Spain, Thailand, Turkey, and the Ukraine. In 1995, about 17-20 laboratory classes visited from universities, community colleges, grade schools, and high schools. The Repository interacted with many groups, such as the Home Orchard Society, California Rare Fruit Growers, North American Fruit Explorers, Seed Saver's Exchange, the International *Ribes* Association, and Master Gardeners, by hosting annual meetings, exchanging plant material, providing information, and working with quarantine requirements for plant importation.

### **Facilities Corner**

Dennis E. Vandever and Kim E. Hummer

A windstorm swept through the Willamette Valley, Oregon, in November 1995, downing trees and causing damage from Eugene to Portland. At the Repository, the greenhouse fiberglass roofing, which was already four years beyond life expectancy, came off in spots and developed some large leaks. ARS headquarters provided \$35,000 for repairing rotted eaves, replacing the fiberglass with lexan, and replacing rotted wooden doors with steal doors.

During the year work continued on the pre-engineered building at the North Farm. Three roll-up doors were installed, (one with a window panel) as well as an exhaust fan for welding work. An exhausting-type pesticide cabinet was installed. Some of the electrical circuits and wiring were installed and the sheetrock and insulation were completed in the shop area. The office and rest room wall were roughed in and a phone line was installed. A natural gas and a forced air heating system were installed. The well was tested and certified good for drinking. The pump was rebuilt and was installed with a new pressure tank on a new pump house slab. A pump-house will be constructed this summer by force account. Interior plumbing will be installed for an eye-wash station and restroom facilities in 1996. The sewer line was also placed and reconnected to the septic tank. A fire alarm was installed through contract. About 80% of the work on the building was accomplished by our work force.

At the main building complex, the new store room was completed and the old store room was cleaned out and sheetrocked with fire-rated sheetrock and tape. The old store room will become our new seed storage area once power has been installed and the security/fire alarm systems are extended into this area some time next year. The shop building will be painted this year. A new air conditioning system was purchased for the headhouse offices and will be installed by force account. We will be busy repairing fence lines and roads in 1996 due to our recent flooding. Some exterior painting will be done on the main building by force account.

### **Staffing Changes and Training**

Our permanent staff remained stable in 1995; however, the general trend over the past three years has been a reduction in visiting scientist and student and part-time helpers. Our FY 1995 ARMPs planned 16.5 FTE, including federal and state employees.

Dr. Stan Pluta, *Ribes* geneticist from Skierniewice, Poland, studied at the Repository from May through September. His diligent effort collecting data on disease resistance, morphology, and phenology of the *Ribes* collection produced several papers in progress. Mr. Yongjian Chang, who was a visiting scientist from China, remained to begin a graduate program studying *Rubus* in vitro culture under Dr. Barbara Reed. Mohan Kumar defended his thesis on "Genetic Stability of Micropropagated and In Vitro Cold-stored Strawberries" in August, 1995.

The permanent staff participated in a team-building exercise in January. Technical staff members were trained and recertified as consultants and pesticide applicators.

### **Special Awards for 1995**

May *Lisa Hunt* received an USDA award "For Establishing Entrance Landscaping Flower Beds, Raising, and Planting Flowers on Own Accord Creating an Attractive Entrance to the Building".

Jul *Jeffrey Darbut* received an USDA award "For Courageous, Brave, and Gallant Service in Aiding the Repository's Neighbor to Extinguish an Engine Fire in the Neighbor's Field Bean Harvester".

Sep *Dennis Vandevveer* received an USDA award "For the Detailed Coordination of Personnel, Equipment, and Contractor for the Successful Painting, Furniture Moving, and Carpet Installation at NCGR-Corvallis".

Nov *Dr. Kim Hummer* received an USDA award "For Outstanding Accomplishments in Agricultural Research".

**Budget and Fiscal**

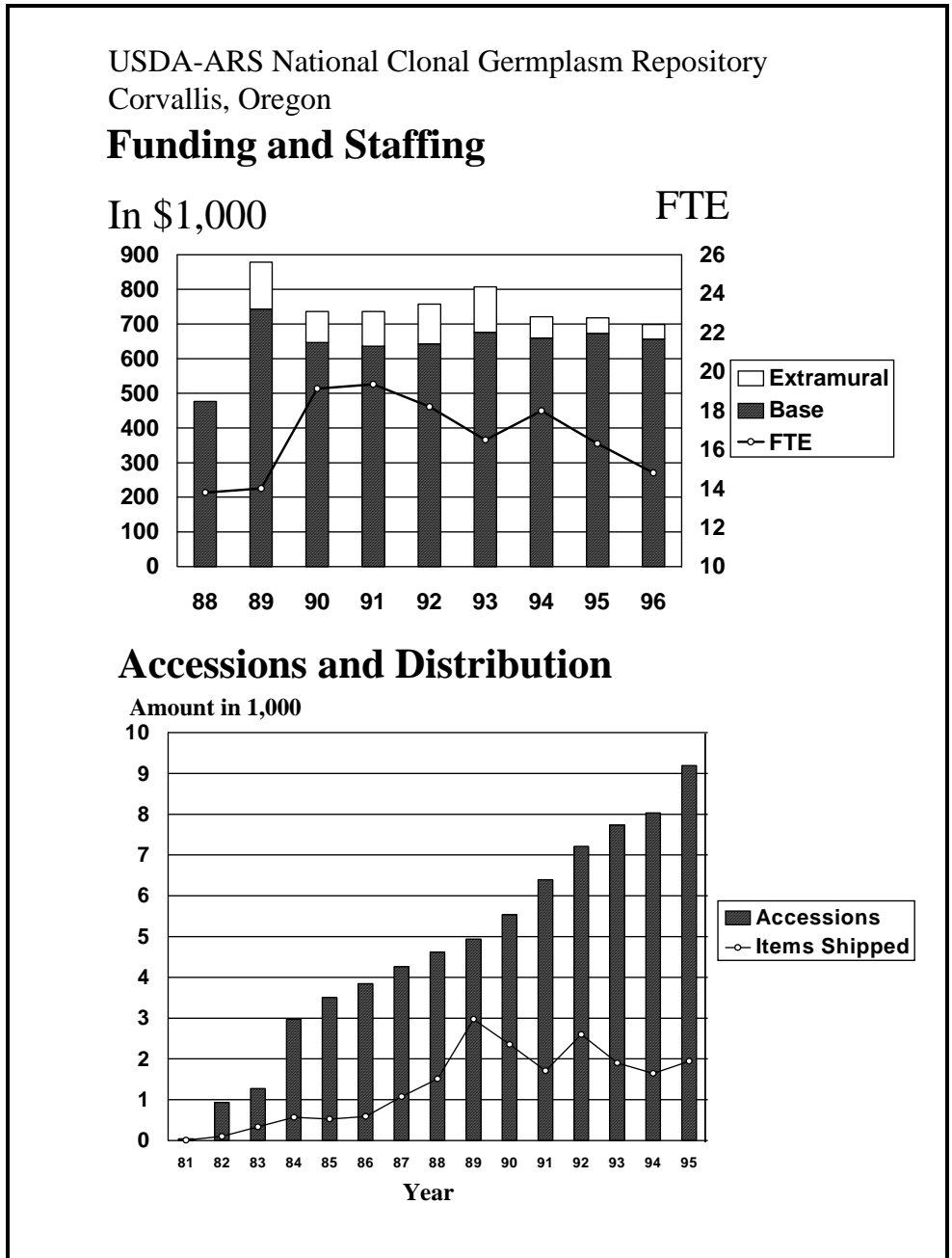
By Kim E. Hummer

The collections at the Repository have doubled since 1989. We anticipate that within ten years the collections will double again to reach the maximum capacity of 20,000 accessions. The Repository staff is reducing on-site duplication to attain more efficient germplasm storage. Distribution is leveling off between 2,000 to 3,000 accessions shipped annually.

Costs for distribution are increasing due to postage, courier rates, and APHIS charges for phytosanitary certificates. We spent roughly \$2,000 for shipping costs in FY 1995.

Our fixed costs continue to increase. Salary costs have risen several percentage points for each the past 5 years. Utility rates are increasing. Janitorial costs have doubled. More than 5% of the total budget needs to be spent annually to maintain the facilities in good order. We greatly appreciate PWA and Program staff for providing considerable financial assistance for facilities repair over the past several years.

With fixed costs increasing the total FTE is dropping to compensate. Part-time, temporary, and student helpers have been reduced to keep the



salary percentage within the 70% range and the discretionary funding at an operable amount. Extramural funding is continuing to be sought, although that directly applicable to the preservation of genetic resources is difficult to find.

### **Priority Genera**

The following genera are assigned to the Corvallis Repository. These genera are ranked according to the current value of the crop to the United States, to the world, and on anticipated value of potential new crops, and intangible values (medicinal or other properties).

#### Priority 1 - Major genera

<b>GENUS</b>	<b>CROP</b>	<b>US VALUE \$ million</b>	<b>US Production Trend</b>	<b>1993 World Production (MT)</b>	<b>World Production Trend</b>
1. <i>Fragaria</i>	strawberries	519	increasing	2,305,165	increasing
2. <i>Vaccinium</i>	blueberries cranberries	290	increasing	-----	increasing
3. <i>Pyrus</i>	European pears Asian pears	251	increasing	1,033,000	increasing
4. <i>Rubus</i>	raspberries blackberries	155	increasing	286,759	increasing
5. <i>Humulus</i>	hops	150	stable	123,498	stable
6. <i>Mentha</i>	mint	122	stable	-----	stable
7. <i>Corylus</i>	hazelnuts	21	stable	565,156	stable
8. <i>Ribes</i>	black currants gooseberries	2	increasing	573,718	increasing

#### Priority 2 - Minor Genera

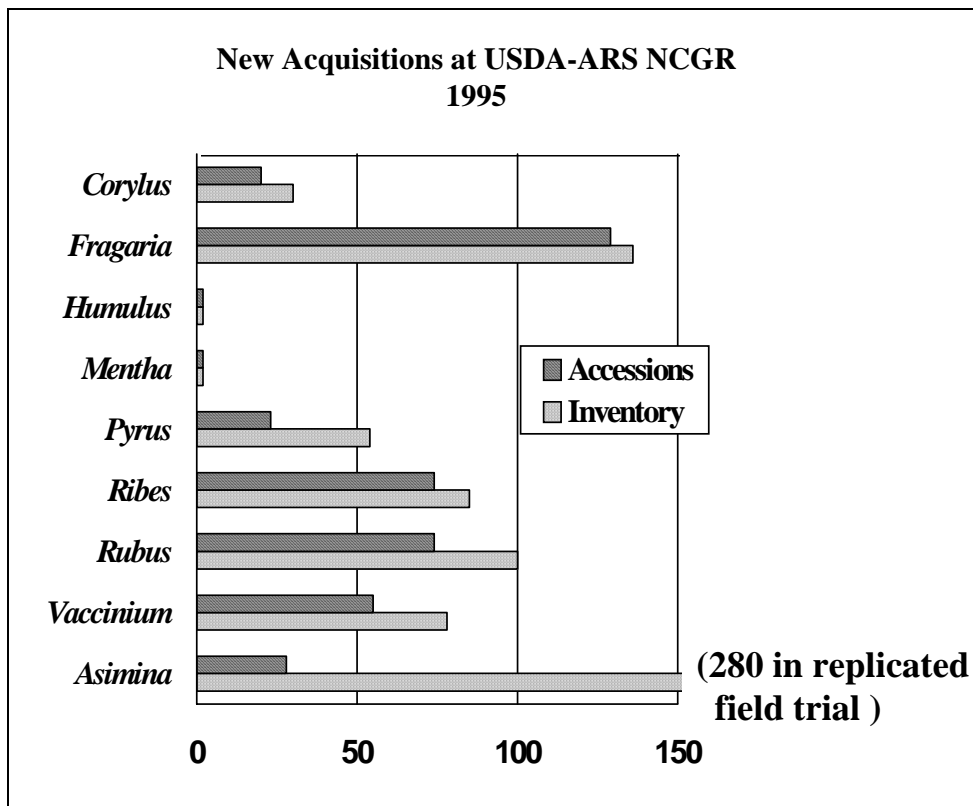
<b>GENUS</b>	<b>CROP</b>	<b>REASON FOR NCGR-CORVALLIS PLACEMENT</b>
9. <i>Juglans cinerea</i>	butternuts	Davis, CA cannot hold these because of canker quarantine
10. <i>Asimina</i>	pawpaws	new crop potential, medicinals, natural pesticides, US native
11. <i>Cydonia</i>	quince	dwarfing rootstocks for pear
12. <i>Sorbus</i>	mountain ash	rootstock for pear, ornamentals
13. Intergeneric Crosses		horticultural novelties, rootstocks, genetic studies
14. <i>Amelanchier</i>	shadbush	crop in Northern US, Canada, rootstock for pear
15. <i>Mespilis</i>	medlar	crop in Italy, rootstock for pear, ornamental
16. <i>Sambucus</i>	elderberry	home owner crop in US, juice and wine production Europe
17. <i>Pycnanthemum</i>	mint relative	potential medicinal, US natives
18. <i>Peraphyllum</i>	peraphyllum	rootstock for pear, US native
19. <i>Gaylussacia</i>	huckleberry	blueberry relative, US natives
20. <i>Galtheria</i>	salal, others	blueberry relative, US natives
21. Others	miscellaneous	<i>Arbutus, Ceanothus, Eriobotrya, Escalonia, Holodiscus</i>

		US natives - ornamentals, in GRIN, grow well in Oregon
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## New Acquisitions

During 1995, 407 new accessions were received (including hazelnut cultivars from the Ukraine) and 767 new inventory items were added to the NCGR collections. More than 120 *Fragaria* accessions were collected in the United States and elsewhere. Approximately 72 of the *Fragaria* were different genotypes of *F. virginiana* Duchesne collected from the southeastern United States. New accessions of *Mentha satureioides* were received from Australia. Pears were collected from the wild in Yugoslavia, China, Kazakhstan, and Morocco. About 49 new pear accessions were propagated for the field.

More than 25 currants and gooseberry cultivars were received from Dr. Margie Luffman, Curator for the Canadian Clonal Genebank. These accessions have become part of the US collection and will act as a back-up for the Canadian collection. These, and other back-up accessions, are documented in the accession group table of GRIN, under: agname = "Canadian CGB." USDA small fruit exploration expeditions to Bolivia and within the southeastern United States provided wild species of *Fragaria*, *Ribes*, *Rubus*, and *Vaccinium*. The Repository is participating with 15 other sites across the country in an *Asimina* variety trial. For this trial, 28 new cultivars and selections were received, budded, and planted at the North Farm in the fall of 1995. This project is in collaboration with Dr. Anita Azarenko, Department of Horticulture, Oregon State University, Dr. Des Layne, Kentucky State University, and Neil Peterson, Head of the Pawpaw Foundation. In addition six seedlots of other *Asimina* species were planted.



## Plant Collections Management 1995

By Joe Snead and Kim Hummer

The Corvallis Repository holds the primary collections for *Fragaria*, *Mentha*, *Rubus* and *Vaccinium* cultivars in the screenhouses; *Corylus*, *Humulus*, *Pyrus* and *Ribes* are preserved as field collections. The minor genera collections were moved from land on the Oregon State University, Lewis Brown Farm to the Repository's North Farm. The North Farm contains the *Rubus* species, the *Ribes* species and cultivars, *Humulus*, and a variety trial for *Asimina*.

As part of a regular cycle, the *Fragaria* collection was rejuvenated and repotted this year. A new winterizing system for the screenhouses was constructed with plastic roll down curtains for extreme freezing weather conditions. In the planning stages for next year are repairing and replacing the roofs on screenhouses 8 and 9. The roof in screenhouse 9 leaks badly and waterlogs the pots in the winter rains. This is very hard on the *Fragaria* in the winter.

The *Pyrus* field is being reduced to a single tree per accession. This will allow the trees that were squeezed into double spacing a chance to grow to full potential. Some of the cultivars are backed-up in the shade-tube; some are backed-up as in vitro cultures. The cultivar collection was evaluated and the duplicate plants were removed. This process is about one-third finished in the species and rootstock blocks. The *Corylus* and *Vaccinium* fields were enlarged to accommodate space for additional new accessions.

GENUS	NUMBER OF ACCESSIONS IN CORE	<u>Core Subsets</u>
<i>Corylus</i>	163	Initial core subsets have been designated for the listed crops. The core representatives have been flagged on the GRIN accession record. We will work with the new <i>Humulus</i> curator in 1996 to determine a <i>Humulus</i> core, and with the Small Fruit and the Pear Crop Germplasm Committees to annually review the core collection for additions or deletions.
<i>Fragaria</i>	389	
<i>Humulus</i>	-----	
<i>Mentha</i>	45	
<i>Pyrus</i>	196	
<i>Ribes</i>	156	
<i>Rubus</i>	278	
<i>Vaccinium</i>	230	

### Characterization

The Repository staff has entered evaluation and characterization data to the GRIN database annually. Because of limited staff and resources we are emphasizing the data collection and entry for one or two genera each year, while rotating through our assigned list.



#### Phenotype data:

The Repository staff collects phenotypic and morphological data and has entered 72,668 observation records to the GRIN database thus far. In addition, the Repository is collecting flowering and fruiting images for assigned crops. We have loaded 300 images that are linked to accession numbers. These can be accessed through the Repository homepage. An additional 200 historical fruit images are present also on the homepage.

#### Molecular data:

Generally, the Corvallis Repository has chosen to evaluate assigned genera through phenotypic and morphological means. The Repository has not attempted to measure diversity of the collections by molecular means, nor has the Repository developed DNA fingerprinting techniques for identification of cultivars. The Repository has maintained communications with researchers working on DNA analyses for assigned crops.

During the 1980s, allozyme studies were performed on *Pyrus* and *Fragaria*. Interpretations of these studies were unclear and these data were not loaded into the GRIN database. A master's thesis was jointly sponsored by the Corvallis Repository and the Department of Botany and Plant Pathology at Oregon State University examining the sectional differences in *Ribes* through inter-generic spacers in the chloroplast and ribosomal genomes. The results pertained to the supra-species taxonomy and phenetics of the genus and were not able to be loaded to GRIN as observation data.

### **Quarantine Plants**

By Lisa Hunt

The Repository has been working with USDA-APHIS and the Oregon State Department of Agriculture to import plants from foreign countries. At the close of 1995 we had 152 accessions (a total of 377 plants) in post-entry and other quarantines. The plants are tested for viruses and other disease agents and are inspected annually by APHIS representatives. Pathogen negative-plants may be released after two growing seasons. This table shows the number of plants in quarantine at the end of 1994 listed by genus code:

<u>Number of:</u>	<u>Cor</u>	<u>Fra</u>	<u>Rib</u>	<u>Rub</u>	<u>Pyr</u>	<u>Sor</u>	<u>Vac</u>	<u>Cas</u>	<u>IGC</u>
Accessions	11	41	61	1	18	12	2	5	1
Plants	63	174	111	29	37	12	7	5	3

### **Plant Distribution**

By Bruce R. Bartlett

The NCGR in Corvallis continues with its mission to distribute plant germplasm for research within the United States and internationally. At the time of this printing, for 1995 we have distributed a total of 1,618 items as seeds, cuttings, runners, scionwood,

rooted plants and tissue culture. This number represents 78% of the total number of items requested (2,076) for 1995.

The diverse nature of plant accessions at NCGR-Corvallis presents an ongoing challenge to fill all requests in a timely manner. Therefore, 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. Seven percent of the plants requested in 1995 are still pending and 12% are listed as not available. Shipment records from 1991 to 1995 show that a total of 75% to 86% of plant requests will eventually be shipped.

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 requesters to select alternative accessions to those not available. Since then, the number of unavailable items has dropped to 15% for 1994 and 1995. We continue to work with all requesters to improve plant shipment.

The total number of items requested was stable during 1993 (2,513) and 1994 (2,507) and dropped slightly in 1995 to 2,076 (domestically shipped *Humulus* have not been added to 1995 totals and may represent an additional 150 items). In 1995 foreign requesters asked for approximately 40 % of all items ordered. This is significantly more than the previous trend of 25% from 1992 to 1994. As of this printing, 206 requests and approximately 1,500 total items have been ordered for 1996. This pace represents a substantial increase over the previous three years and more closely resembles 1992 when there were 351 requests for a total of 3,554 items.

Over the past four years (1992-1995) accessions of *Fragaria* followed by *Pyrus*, *Rubus* and *Ribes* were the most often requested. However, in 1994 *Ribes* was the most often sought genus and *Fragaria* was fourth. The number of *Vaccinium* accessions requested has dropped from 314 in 1992 to 77 in 1995 while the number of *Corylus* accessions requested increased from 141 to 203 during the same period. Requests for our other major and combined minor genera have varied only slightly over the past four years.

**Collection Locations**

Location of primary and back-up collections established or maintained during 1995.

Crop		Primary Collection		NPGS Back-up preservation				
		Location	Type	Location	Type	Plant Material		
<i>Corylus</i>	cultivars	33447 Peoria Rd	field	NCGR cooler	TC	plantlets (core)		
	species			NSSL	LN2	embryonic axes		
				NCGR dewar	LN2	embryonic axes, pollen		
<i>Fragaria</i>	cultivars	33447 Peoria Rd	screenhouse 8, 9	NCGR cooler	TC	plantlets		
	species			NCGR	LN2	meristems (core)		
				NSSL	-20	seed		
<i>Humulus</i>	male cultivars	33707 Peoria Rd	field					
	female cultivars			Rt 34 Botany Farm	field	NCGR cooler	TC	plantlets
	species			33447 Peoria Rd	seed freezer	NSSL	-20	seed
<i>Mentha</i>	cultivars	33447 Peoria Rd	screenhouse 8	NCGR cooler	TC	plantlets		
	species			NSSL	LN2	meristems		
				NCGR	TC	plantlets (core)		
<i>Pyrus</i>	cultivars	33447 Peoria Rd	field	NCGR	TC	plantlets (core)		
	species			NCGR	tubehouse	grafted, potted		
				NSSL	-20	seed		
<i>Ribes</i>	cultivars	33707 Peoria Rd	field	NCGR	TC	plantlets (core)		
	species			NCGR	LN2	meristems		
				NSSL	-20	seed		
<i>Rubus</i>	cultivars	33447 Peoria Rd	screenhouse 5, 6	NCGR	TC	plantlets (core)		
	species			NCGR	LN2	meristems		
				NSSL	LN2	meristems		
<i>Vaccinium</i>	cultivars	33447 Peoria Rd	screenhouse 10	NCGR	TC	plantlets (core)		
	species			NCGR	TC	plantlets (core)		
				NSSL	-20	seed		
Minor Genera	cultivars	33707 Peoria Rd	field					
	species							

<b>GENUS</b>	<b>In Vitro</b>	<b>LN2</b>	<b>Other Locations</b>
<i>Corylus</i>	28	50 pollen 2 species embryonic	Oregon State University Department of Horticulture, Corvallis, OR
<i>Fragaria</i>	296	some experimental	CCG, Harrow, Ontario Canada
<i>Humulus</i>	54	-----	OSU Hops Farm, Corvallis, OR
<i>Mentha</i>	310	10 at NSSL	Delaware State College
<i>Pyrus</i>	164	39 meristems COR 15 meristems NSSL some pollen	Oregon State University, Medford, OR USDA-ARS, Kearneysville, MD Seed Saver's Exchange, Decorah, IA
<i>Ribes</i>	101	some experimental	CCG, Harrow, Ontario Canada
<i>Rubus</i>	259	14 meristems COR	CCG, Harrow, Ontario Canada
<i>Vaccinium</i>	97	some experimental	Rutgers University, Chatsworth, NJ
Subtotal	1300		
Minor Genera	0	-----	
<b>TOTAL</b>	1300		

With additional resources and personnel we could backup more materials in LN2 at NSSL. The techniques are worked out for cryogenic preservation for representatives of almost all of our genera. MORE MONEY IS NEEDED FOR THIS EFFORT!

### **Tissue Culture**

By Barbara Reed

Strawberries were a major focus in 1995. Barbara Reed completed a cold storage study on "Factors affecting the *in vitro* storage of strawberry". *Fragaria* germplasm, stored at 4°C as cold-hardened *in vitro* plantlets, was rated for condition on a 0-5 scale at 9, 12 and 19 months. Plants with ratings  $\geq 2$  were healthy enough to remain in storage. Benzyladenine (BA) at 0, 1, 2.5 and 5  $\mu\text{M}$  and storage in darkness or with a 12 hour photoperiod were examined for a group of four genotypes. Means of plant condition ratings over all treatments and genotypes were best (3.4) at 9 and 12 months and declined to 2.2 at 19 months. Increasing concentrations of BA were correlated with higher condition ratings compared to those without BA, and plants stored with a 12 hour photoperiod had higher ratings than those stored in the dark. At 9 and 12 months, plants grown with BA and a 12 hour photoperiod had the highest ratings. Five different *Fragaria* genotypes were used to study the effect of photoperiod and cold hardening on condition ratings of stored plantlets.

Cold-hardened plants had higher condition ratings (2.1) than those stored without cold hardening (1.8). Plants stored with a 12 hour photoperiod had higher mean condition ratings (2.2) than those stored in the dark (1.7). Storage with cold hardening and a 12 hour photoperiod resulted in improved plant condition. The extent of improvement was genotype dependent.

Graduate student Mohan B. Kumar completed his M.S. thesis on "Genetic Stability of Micropropagated and *In Vitro* Cold-stored Strawberries". The genetic stability of micropropagated and cold-stored *Fragaria x anannasa* cultivar 'Pocahontas' was evaluated by RAPD assay. Plantlets grown for eight months on MS medium with 5µM or 15µM benzyladenine were analyzed. No evidence of mutations was seen in over 200 loci that were PCR amplified with 29 of the 30 operon primers used. 'Pocahontas' *in vitro* plantlets stored for over four years at 4°C also showed no evidence of mutations. One primer generated polymorphic profiles for all plants analyzed, but it was not reproducible and no pattern matching any treatment was seen. Morphological characteristics of field-grown plants did not differ for the BA treatments, but cold-stored plants differed from BA-treated plants.

### **Cryopreservation**

By Barbara Reed

Barbara Reed traveled to Scotland in April on a NATO Collaborative Research Grant to develop cryopreservation protocols for *Ribes* germplasm, and hosted Scottish scientists in Corvallis during August to complete and analyze the project. Comparison of freezing techniques was completed at both facilities and plans are underway for future collaboration.

Technician Jeanine DeNoma, graduate student Jie Luo, visiting scientist Yongjian Chang and Barbara Reed initiated a long-term liquid nitrogen stored pear collection at NSSL with the cooperation of Leigh Towill. Accessions are tested and those with greater than 50% regrowth are sent to NSSL in a travel dewar as time permits.

### **Virus Indexing**

By Joseph Postman

As of 1 December, 1995, more than 80% of the clonal accessions for *Corylus*, *Pyrus*, and *Rubus* were available as virus negative plants. "Virus negative" includes plants that have tested negative for several important viruses and plants that have been produced by heat therapy. The following virus tests were conducted during 1995, with new accessions and heat-treated sub-clones as the highest priority:

<b>Genus</b>	<b>Bioassay</b>	<b>ELISA</b>
<i>Corylus</i>	-	13
<i>Fragaria</i>	78	307
<i>Pyrus</i>	246	-
<i>Ribes</i>	11	-
<i>Rubus</i>	385	192
<i>Vaccinium</i>	-	34

### **1995 Virus Status Summary Clonal Accessions**

<b>Genus</b>	<b>Percent Virus Negative</b>	<b>Percent Infected with Known Viruses</b>
<i>Corylus</i>	90.3	3.5
<i>Fragaria</i>	67.8	20.2
<i>Pyrus</i>	82.4	12.9
<i>Ribes</i>	28.7	19.5
<i>Rubus</i>	85.3	10.8
<i>Vaccinium</i>	64.0	0.8

Heat therapy followed by apical meristem culture is used to eliminate viruses from infected clonal accessions. One to five meristems are typically dissected for each heat-treated clone. *Fragaria* is heat treated *in vitro*, and other genera are heat treated as potted plants.

### 1995 Virus Elimination Efforts

<b>Genus</b>	<b>1995 Meristems</b>
<i>Fragaria</i>	37
<i>Pyrus</i>	89*
<i>Ribes</i>	75
<i>Rubus</i>	121

\* Primarily Quarantine Accessions for NPGQC

### Database Management

By Doug Cook and Kim Hummer

Corvallis data is stored on GRIN and in a network server at Corvallis. This server is electronically backed up by a tape-drive system each week. Tapes are stored in a fire-proof cabinet on site. Each winter we send copies of our database as hardcopy and in magnetic media to NSSL for archiving and as a data security backup. In 1995 we installed a 28.8 baud modem workstation to increase speed. We now have three independent phone lines with modems. The Repository computer work stations required a number of repairs throughout the year including re-installing corrupted software and replacing hard drives, video cards, keyboards and network interface cards. We installed a Power Macintosh PC 7100/80 with high quality graphics to supplement our PC clones.

Each workstation now has at least eight megabytes of RAM and is using Foxpro and Microsoft Office software. We have installed three uninterruptable power-supply units which now allows six workstations to continue operating though our occasional power outages.

Corvallis Report of Records on GRIN - 31 January 1996

GENUS	ACCESSION RECORDS	INVENTORY**	OBSERVATION
<i>Corylus</i>	579	190	3727
<i>Fragaria</i>	1361	2008	15874
<i>Humulus</i>	809	868	0
<i>Mentha</i>	513	881	62
<i>Pyrus</i>	1940	2956	42500
<i>Ribes</i>	1090	1375	4806
<i>Rubus</i>	1758	2361	5020
<i>Vaccinium</i>	1114	1279	679
Subtotal	9164	12024	72668
Minor Genera	935	1038	0
<b>TOTAL</b>	10099	13062	72668

Total cooperator records	= 1534	Total source member records	= 9152
Total source history Records	= 8889	Total IPR records	= 167

## **FOREIGN TRAVEL REPORTS FOR 1995**

### **A. Kim E. Hummer**

Research Leader/Curator

Travel Report for October 1995

Purpose: To visit Canadian Clonal Genebank, Trenton, Ontario and to attend NCR-22 Small Fruit Meeting, Simcoe, Ontario

Summary: The Smithfield Experiment Station, where the Canadian Clonal Genebank is located, is scheduled to be closed by October, 1996. The Canadian Clonal Genebank will be moving to Harrow, Ontario approximately 400 miles away. The plant collections will have to be repropagated and moved to Harrow. I visited with Dr. Margie Luffman, Curator of the CCG, regarding obtaining plant material for our collection and made arrangements to backup items in our collection during their move, to ensure the safety of the germplasm. Dr. Luffman will be sending us about ten pears and about twenty *Ribes*. Additional plant material may also be shipped.

The North Central Region - 22 Small Fruits meeting was hosted by the Horticultural Research Institute at Simcoe, Ontario. Small fruit representatives from about 25 states and provinces attended the meetings from 19-22 October and reported on research and breeding activities in their region. I presented a report to NCR-22 concerning activities at NCGR during 1994-1995.

I also met with Small Fruit Crop Germplasm Committee on 20 October 1995 to discuss priorities of genera and plant evaluation. The committee suggested new individuals for rotation of membership.

### **B. Barbara M. Reed**

Research Plant Physiologist

Travel report for March-April, 1995

University of Abertay Dundee and Scottish Crop Research Institute, Dundee, Scotland

Purpose: Collaborative research on *Ribes* cryopreservation supported by a NATO travel grant.

Experiments were conducted with three freezing methods and four genotypes. Data was collected later and analyzed on the reciprocal visit to NCGR in August.

Travel Plan: April 2: Portland to Glasgow

April 3-20 Collaborative research with UAD and SCRI

April 23: Glasgow to Portland

C. **Barbara M. Reed**

Research Plant Physiologist

Travel Report for June-July 1995

Kajang, Bangi and Kuala Lumpur, Malaysia

Purpose: To collaborate with Dr. Normah Mohd. Noor on cryopreservation research, teach a one-week class on cryopreservation of apical meristems to her students and research assistants and attend and present an invited talk at the International Workshop on “*In Vitro* Conservation of Plant Genetic Resources.” All expenses were covered by the Universiti Kebangsaan Malaysia.

Summary: Dr. Normah works with recalcitrant seeds of tropical fruit trees. She is interested in using apical meristem cryopreservation for those species which can not be preserved as seed or embryonic axes. We discussed possible lines of research and collaboration. The class involved nine students and technicians from Universiti Kebangsaan, Malaysia and one faculty member from another university. Lectures and laboratory experiences covered three methods of cryopreservation of meristems and some basic research on cryobiology. The conference was mainly discussions to develop recommendations for improved storage of germplasm using *in vitro* and cryopreservation techniques.

Travel Plan: June 19: Travel to Kajang

June 21-24: Consult with Dr. Normah and set up for class

June 25-30: Teach class on cryopreservation methods for apical meristems

July 1-7: Attend International Workshop on *In Vitro* Conservation of Plant Genetic Resources.

July 8: Travel to Corvallis



D. **Barbara M. Reed**

Research Plant Physiologist

Travel Report for November 1995

Spain, November 1995

Purpose: Invited speaker at the Spanish Society for Cryobiology Meeting, present a talk on cryopreservation.

Summary: Dr. Erica Benson (Dundee Institute of Technology, Dundee, Scotland), Dr. M.R. Ahuja (Institute of Forest Genetics, Grosshansdorf, Germany) and I spoke on plant related topics to a mostly medical audience. The talks were well received and probably were a valuable educational tool for the plant germplasm community. While at the meetings Dr. Benson, Dr. Keith Harding and I were able to have some in Depth conversations about cryopreservation and complete a renewal for collaborative grant application.

Travel Plan: October 30 leave from Portland, OR

October 31 arrive Oviedo, Spain, Consult with Drs. Benson and Harding

November 1-4 attend Cryobiology Meeting

November 5-12 Personal Time

November 13 Return to Portland, OR

**Meetings and Presentations during 1995**

Feb 6 *Joseph Postman* attended 46th Annual Western Small Fruits Pest Conference, Vancouver, B.C., Canada; Feb. 6-7, 1995

Feb 11 *Kim Hummer* invited to speak at International *Ribes* Association Meeting, Feb 12 and invited speaker at North American Strawberry Conference, Orlando, FL; Feb 15-17, 1995

Feb 15 *Francis (Whitey) Lawrence*, Collaborator, to attend North American Strawberry Conference, Orlando, FL; Feb 15-17, 1995

Feb 20 *Joseph Postman* and *Joseph Snead* to attend *Pyrus* Crop Advisory Committee Meeting in Hood River, OR; Feb. 21, 1995

Feb 22 *Judith Flynn* invited to temporarily fill vacant PWA-Area Director's Secretary position, Albany, CA; Feb 22-Mar 3, 1995

Mar 30 *Barbara Reed* invited on behalf of NATO Grant, administered by University of Abertay, Dundee to do collaborative research with the University of Abertay Dundee and The Scottish Crop Research Institute (SCRI), Dundee, Scotland; Mar 30-Apr 24, 1995

May 19 *Barbara Reed* (presented poster & organized workshop) and *Mohan Kumar* (presented talk) and *Piyarak Tanprasert* (presented poster) to annual meeting of the Society for *In Vitro* Biology; Denver, CO; May 19-25, 1995

Jun 7 *Kim Hummer* to Woody Ornamentals Germplasm Committee meeting and visited program & administrative staff and a safety meeting; Jun 7-14, 1995

Jun 19 *Barbara Reed* invited by University of Kebangsaan, Malaysia and IPGRI under cooperative agreement to lecture on methods for the cryopreservation of *in vitro* grown apical meristems, Kuala Lumpur, Malaysia; Jun 19-Jul 8, 1995

Jun 25 *Kim Hummer* to 1995 W-6 Annual Meeting, Logan, Utah; Jun 26-27, 1995

Jul 6 *Jie Luo* and *Yongjian Chang* attended the Cryobiology Meeting, Madison, WI; July 6-12

Jul 13 *Kim Hummer* invited by California Rare Fruit Growers, Inc. to present talk and to visit CA Repository, Davis. Also visited Luther Burbank's House and Gardens, Santa Rosa, CA, and Andy Mariani's Orchards and CT Kennedy's collection, Jul 13-17, 1995

Jul 16 *Judith Flynn* invited to be Co-Facilitator Chairperson for the 26th National Training Program for the Federally Employed Women, Inc., Tacoma, WA; Jul 16-22, 1995

Jul 24 *Bruce Bartlett*, *Douglas Cook* and *Brian Courtney*, site visit, Davis Repository, Davis, CA; Jul 24-Jul 28, 1995

Jul 28 *Barbara Reed* presented a poster at the 92nd ASHS, Montreal, Canada; Jul 28-Aug 6, 1995

Jul 28 *Maxine Thompson*, Collaborator, to 92nd American Society of Horticultural Science (ASHS), Montreal, Canada; Jul 28-Aug 6, 1995.

Jul 29 *Derek Peacock*, graduate student, to make a presentation at the 92nd ASHA, Montreal, Canada; Jul 29-Aug 5, 1995

Aug 2 *Andrew Grzeskowiak* to Pacific West Area Office for site visit with Elizabeth Ferguson, EEO Officer, Albany, CA; Aug 2-7, 1995

Aug 20 *Kim Hummer* and *Joseph Postman* to attend Plant Germplasm Organization Committee Meeting and the GRIN Meeting in Ames, IA; Aug 20-26, 1995

Oct 17 *Kim Hummer* to visit Canadian Clonal Genebank, Trenton, Ontario, and to attend NCR-22 Small Fruit Meeting, Simcoe, Ontario, Canada; Oct 17-23, 1995

Oct 29 *Barbara Reed* invited speaker on cryopreservation at the Fourth Annual meeting of the Spanish Society for Cryobiology, Oviedo, Spain; Oct 29-Nov 8, 1995

Nov 27 *Bruce Bartlett* & *Douglas Cook* to GRIN site visit, Beltsville, MD; Nov 27-Dec 1, 1995

## Visitors, Technology, Transfer and Community Outreach

By Judy Flynn

The NCGR hosted over 542 visitors representing countries around the world. Guests hailed from Asia (China, India), Africa (Nigeria, Egypt), Europe (Poland, Spain, Germany, Turkey, Ukraine, ), United Kingdom (Scotland, England), Australia, Central America (West Indies) and South America (Brazil). North American visitors came from many provinces of Canada and throughout the United States.

The Repository staff were active in supporting programs of horticulture, plant physiology, plant pathology, and nursery management. Groups visiting the NCGR included: Oregon State University's (OSU) botany, horticulture, plant breeding, forestry and reading/conference classes, the OSU seed school; Western Oregon State College honors botany students; and many local elementary, middle school and high school classes. Members of the Corvallis Home Orchard Society and members of Dick Post's Reno, Nevada Agriculture Tour participated in a Repository site visit and question/answer period during 1995. Also, guests from private industry (Microplant Nurseries) scheduled tours of the facilities. Repository personnel had a display booth with literature at the Linn-Benton Community College job fair and the Oregon State University career day events.

### NCGR 1995 PUBLICATIONS

**Buckley, P.M., T.N. DeWilde, and B.M. Reed.** 1995. Characterization and identification of bacteria isolated from micropropagated mint plants. *In Vitro - Plant* 31:58-64.

Chang, Y and B.M. **Reed.** 1995. Shoot formation of *Rubus* meristems following cryopreservation. Northwest Center for Small Fruits Research Annual Conference, Corvallis, OR. Abst.

Chang, Y. and B.M. **Reed.** 1995. Improved shoot formation of blackberry and raspberry meristems following cryopreservation. *Cryobiology* 32: 581. Abst.

Grauke, L.J., T.E. Thompson, P. Forsline, and K. **Hummer.** Use of core subsets in developing germplasm collections of clonally propagated crops. *HortScience* 30(4):907. Abst.

Hadidi, A., I. Davis, A. Minafra, D. Boscia and J.D. **Postman.** 1995. A virus affecting apples and pears is related to grapevine virus A as revealed by IC-RT-PCR. *Acta Horticulturae* 386:37-44.

**Hummer, K.E.** ed. 1995. NCGR-Corvallis Operations Manual, NCGR-Corvallis, Ore., Sta. Rep. 150 pp.

**Hummer, K.E.** and B.R. **Bartlett.** 1995. Update on interstate restrictions of *Ribes*. USDA-ARS NCGR Station Pub. 4 pp.

**Hummer, K.E.** and B.R. **Bartlett.** 1995. Safe movement of *Ribes* germplasm. *The International Ribes Association Newsletter.*

- Hummer, K.E.** 1995. What's new in strawberry genetic resources: raw materials for a better berry. 4TH North American Strawberry Conference Proceedings. (In Press).
- Hummer, K.E.** 1995. Your Government Cares! California Rare Fruit Growers Meeting Proceedings.
- Hummer, K.E.** 1995. The mystical powers and culinary delights of the hazelnut: a globally important Mediterranean crop. *Diversity* 11 (1 & 1):130.
- Hummer, K., L. Fuchigani, V. Peters, N. Bell.** 1995. Survey of *Rubus* cold hardiness. *Fruit Variety Journal* 49(1):52-58.
- Hummer, K.E.** 1995. The dollars and sense of collecting germplasm. Proceedings of the Northwest Center for Small Fruits Annual Conference, November 29, 1995. Abst.
- Kumar, M. B., R.E. Barker, and B.M. **Reed.** 1995. Genetic stability of micropropagated strawberries. 1995 Congress on *In Vitro* Biology, Denver, CO, May 20-24, 1995.
- Kumar, M.B., R. Barker, and B.M. **Reed.** 1995. Genetic stability of micropropagated strawberries. *In Vitro* 31:52. Abst.
- Luo, J. J. DeNorma, and B.M. **Reed.** 1995. Cryopreservation screening of *Pyrus* germplasm. *Cryobiology* 32: 558. Abst.
- Nee, Cheng-Chu, Wen-Ben Lin and K. **Hummer.** 1995. The recovery of Taiwan native pear (*Pyrus koehnei* Schneider)- III Growth Characteristics. *J. of the Chinese Soc. for Horticultural Science.* 41(2):107-115.
- Peacock, D.** and K.E. **Hummer.** 1995. The effect of liquid nitrogen and sulfuric acid on the germination of several *Rubus* species. *HortScience* 30(4):869. Abst.
- Piyarak, Tanprasert, P.M. Buckley, and B.M. Reed.** 1995. Detection and characterization of bacterial contaminants of micropropagated strawberry. 1995 Congress on *In Vitro* Biology, Denver, CO, May 20-24, 1995. Abst.
- Pluta, S.** and K.E. **Hummer.** 1995. Gooseberry and currant evaluation at the USDA-ARS NCGR-Corvallis, OR. Proceedings of the Northwest Center for Small Fruits Annual Conference, November 29, 1995. Abst.
- Postman, J.D.** and A. Hadidi. 1995. Elimination of apple scar skin viroid from pears by in vitro thermo-therapy and apical meristem culture. *Acta Horticulturae* 386:536-543.
- Postman, J.D.** 1995. A novel method for layering hazelnut trees. *Pome News* 20(1):59-60.
- Postman, J. D.** and K. E. **Hummer.** 1995. Descriptions of new fruit and nut varieties - Brooks and Olmo List 37 - Asian Pears, Pears, Pear Rootstocks. *HortScience* 30(6):1135-1150.

- Postman, J.D., K.E. Hummer, and A. Wilkins.** 1995. The National Clonal Germplasm Repository home page. <http://www.ars-grin.gov/ars/PacWest/Corvallis/ncgr>.
- Postman, J.D.** 1995. Why are they keeping 2000 pear varieties in Corvallis? Plant genetic resources at the National Clonal Germplasm Repository. Valley Orchardist, October 1995. Willamette Valley Tree Fruit Growers Assoc.
- Postman, J.D.** 1995. Why are they keeping 2000 pear varieties in Corvallis? Plant genetic resources at the National Clonal Germplasm Repository. Seed Savers 1995 Harvest Edition. Seed Savers Exchange, Decorah, Iowa.
- Postman, J.D.** 1995. Blueberry Scorch Carlavirus eliminated from infected blueberry. Northwest Center for Small Fruits Research Annual Report (Abstract).
- Postman, J.D.** 1995. Necrotic ring spots on leaves of mountain laurel caused by rhododendron necrotic ringspot virus. Plant Disease 79(5): Cover Photograph.
- Postman, J. and K. Hummer.** 1995. Pears. In: Register of New Fruit and Nut Varieties Brooks and Olmo List 37. J.N. Cummins, ed. Hort Science 30(7): 1141-1142.
- Reed, B.M., P.M. Buckley, and T.N. DeWilde.** 1995. Detection and eradication of endophytic bacteria from micropropagated mint plants. *In Vitro - Plant* 31P:53-57.
- Reed, B.M. and X. Yu.** 1995. Cryopreservation of *in vitro*-grown gooseberry and currant meristems. Cryo-Letters 16:131-136.
- Reed, B.M.** 1995. Pretreatment strategies for the cryopreservation of plant tissues. Proceedings of the International Workshop on *in vitro* conservation of plant genetic resources. July 4-6, 1995, Kuala Lumpur, Malaysia.
- Reed, B.M.** 1995. *In vitro* rooting response of *Pyrus* germplasm. HortScience 30: 1392-1294.
- Reed, B.M. and P. Tanprasert.** 1995. Detection and control of bacterial contaminants of plant tissue cultures. Plant Tissue Culture and Biotechnology. 1:137-142.
- Reed, B.M. and K. E. Hummer.** 1995. Conservation of germplasm of strawberry (*Fragaria* Species) In: Y.P.S. Bajaj (ed.) Biotechnology in Agriculture and Forestry Vol. 32.pp. 354-370.
- Reed, B.M., J. Mentzer, P. Tanprasert, X. Yu, and P. Buckley.** 1995. Bacterial contaminants of *Corylus in vitro* cultures. In Vitro 31:59 Abst.
- Reed, B.M.** 1995. Effects of BA concentration and photoperiod on 4°C *in vitro* storage of strawberry. HortScience 30:871. Abst.
- Reed, B.M.** 1995. Factors affecting the *in vitro* storage of strawberry. Northwest Center for

Small Fruits Research Annual Conference, Corvallis, OR. Abst.

Tanprasert, P., P.M. Buckley, and B.M. **Reed**. 1995. Detection and characterization of bacterial contaminants of micropropagated strawberry. *In Vitro* 31:58A. Abst.

**Thompson**, Maxine M. 1995. Chromosome numbers of *Rubus* cultivars at the USDA-ARS National Clonal Germplasm Repository- Corvallis, OR. *HortScience* 30(7):1453-1456.

**Thompson**, Maxine M. 1995. Chromosome numbers of *Rubus* species at the USDA-ARS National Clonal Germplasm Repository- Corvallis, OR. *HortScience* 30(7):1447-1452.

**Thompson**, Maxine M. K.E. **Hummer**. 1995. Chromosome numbers of *Rubus* accessions in the USDA/ARS National Clonal Germplasm Repository, Corvallis, OR. *HortScience* 30(4), 833.

Yeo, D. Y. and B.M. **Reed**. 1995. Micropropagation of *Pyrus* rootstocks. *HortScience* 30:620-623.

Yu, X. and B.M. **Reed**. 1995. A micropropagation system for hazelnuts (*Corylus spp*). *HortScience* 30:120-123.