2014 Washington State Annual Report to the W-6 Technical Advisory Committee

Carol Miles (Washington State Representative) and Jacky King, Scientific Assistant

Summary:
Every year germplasm of plant species from the National Plant Germplasm System (NPGS) is used by Washington State researchers, educators, farmers, nursery operators, and hobbyists. In 2013, 245 Washington State residents requested and received a total of 9,402 germplasm samples (1,069 taxa in the form of seeds and cuttings) from 15 NPGS repositories/stations in 315 orders (Appendix I, Table 1). These requested materials belonged to 206 genera and 1,069 species and subspecies (Appendix I, Table 2). By far the most samples requested were in the genus *Triticum*, followed by *Pisum*, *Poa*, *Eragrostis*, *Lens*, and *Cicer*. One researcher requested one sample each of 678 different taxa. The material was used in diverse scientific disciplines such as agronomy, horticulture, genetics, botany, and plant pathology, and contributed significantly to scholastic and economic activity in the State of Washington. In addition, a researcher who requested material of *Cicer arietenum* transferred the research material to Pakistan, the scientist's current research site.

A researcher working with *Triticum* species included a note that seed collection storage is a topic ripe for a new publication, stating that the previous publications are out of date. He suggested including methods pertaining to small, medium, and large collections that are intended for short, medium, and long term storage, especially low input or "passive" methods rather than high-tech systems.

Based on the addresses, 52 individuals are working at universities, 19 for USDA, 32 for commercial firms, seed companies and nurseries, 5 for non-profit organizations, 7 for private research groups, and 1 for schools and school gardens. In the list of requesters, 11 email addresses were returned as invalid, so 234 individuals received the notice to report their results. Of these, 38 (16%) provided feedback regarding the germplasm they received (Appendix II). This ratio of responses compared unfavorably with previous years (33% in 2013 and 2012, 29% in 2011, and 22% in 2010); however the total number of requesters for 2014 was more than double that of previous years, which could be a factor.

From recipient responses, we can see a wide range of plant species were requested and used. The utilization of the samples in 2013 included adaptability testing of apples, pears and other tree fruit at various Puget Sound locations (Terry Alspaugh, Carole Blakey, Charles Polance, Erick Simpson), screening of pea genotypes for resistance to Sclerotinia diseases (Lyndon Porter), screening of *Pisum* lines for resistance to root rot (Dipak Sharma-Poudyal) and powdery mildew (Clarice Coyne), germplasm evaluation for Verticillium wilt resistance in potential rootstocks for grafted watermelon (Carol Miles, Jesse Wimer), development of wheat breeding lines (Colin Curwin-McAdams), acquisition of plant material for commercial nursery propagation and distribution (Booth Canyon Orchard, Cameron Nursery, Cummins Nursery, Raintree Nursery), acquisition of native plants for beach restoration (Madrona Murphy), and *Eragrostis tef* grown out for DNA extraction (Ted Kisha).

Publications

Germplasm recipients reported the following publications that included materials they received from NPGS in 2013, as well as materials received earlier, and several articles are in progress:

1. Lyndon Porter, USDA-ARS, Pullman, WA: lyndon.porter@ars.usda.gov

Porter, L. D. 2012. Pea germplasm with partial resistance to *Sclerotinia sclerotiorum* that extends the time required by the pathogen to infect host tissue. Crop Science 52: 1044-1055.

Porter, L. D. 2012. Selection of pea genotypes with partial resistance to *Sclerotinia sclerotiorum* across a wide range of temperatures and periods of high relative humidity. Euphytica 186:671-67.

Porter, L.D. 2010. Identification of tolerance to *Fusarium* root rot in wild pea germplasm with high levels of partial resistance. Pisum Genetics 42:1-6.

Porter, L.D., Hoheisel, G., and Coffman, V.A. 2008. Resistance of peas to *Sclerotinia sclerotiorum* in the *Pisum* core collection. Plant Pathology 58: 52-60.

2. **True Confession of a Figoholic**

Charles Polance, Western Cascade Fruit Society, Lakewood, WA: charlespolance@yahoo.com, (253) 588-8288

Looking dazed and confused, I stumbled into the room and sat down in the recovery circle for the first time. I told the group I was hooked. It took a couple years before I could admit it and take this first step. There was no turning back now. I was "out." I said "my name is Chuck and I'm an addict"

In unison, they replied: HI CHUCK!!

They asked to hear my story. Well, here goes again:

I overdosed when UPD delivered a package with 15-different fig cultivars that I ordered from the National Clonal Germplasm Repository (NCGR) at University of California, Davis.

I fell off the wagon when learned that the NCGR Davis maintains over 6,600 accessions representing 15 genera and 175 species of fruit and nut crops. I perused the list for FIGS. The repository is dedicated to the conservation and management of genetic resources of Mediterranean fruit and nut crop species such as stone fruit, almond, walnut, pistachio, olive, pomegranate, persimmon, mulberry, kiwifruit, grape and FIG...YES!!! My eyes lit up like a pinball machine.

I want to share this information with members of the WCFS and encourage you to consider this FREE source of exotic and hard to find cultivars. Ordering all kinds of cuttings is easy to do. Basically, you search for the accessions you want then check for availability. If available, click "request this germplasm" and use this tool to continue filling out your request form. Or, you can simply fill out the request form. Once you've made your selections, send your order in. They make it so-o-o easy!

Presently I am conducting research on fig varieties that fall under the category of San Pedro. These have the potential of producing a good breba crop in our cool Pacific NW. Figs that thrive in places like Greece, Indonesia or Florida are unproductive here and not worth growing outside of a green house. Thus, out of over 200+ fig choices, the repository sent 15 of the 18 varieties I requested. I am hoping that Dauphine (from France), Orphan (China), or a variety with a weird name like Monstrueuse can be as productive as a Desert King.

I opened up a UPS Account to pay for the shipping cost. Failure to do this would not have hurt my chances of getting the cuttings. If you're still reading this, consider yourself hooked!! So go to the Germplasm Resources Information Network (http://www.ars-grin.gov) to get started. For more information about ordering proceed to: www.ars-grin.gov/dav. You can call the staff at (530)752-6504.
Chuck Polance,Tahoma Chapter, WCFS Newsletter, May 2014

3. Jesse Wimer, WSU Mount Vernon NWREC, Mount Vernon, WA: jesse.wimer@wsu.edu, (208) 596-9721

Wimer, J.A., C.A., Miles, and D.A. Inglis. 2014. Evaluation of watermelon rootstocks for resistance to Verticillium wilt in northwestern Washington. (Abstract) ASHS Annual Conference, Orlando, Florida.

Wimer, J.A., C.A., Miles, and D.A. Inglis. 2014. Evaluation of watermelon rootstocks for resistance to Verticillium wilt in northwestern Washington. (Abstract) ISHS International Symposium on Vegetable Grafting, Wuhan, China, p. 59.

4. **Mukai House and Garden Represents a Blend of Cultures**

Bruce Haulman and Cindy Stockett (Friends of Mukai Garden, Vashon, WA: cindystockett@gmail.com)

Vashon is home to one of the most unique landmarked sites in the nation. The Mukai House and Garden, built in 1930, is a synthesis of two cultural influences: the desire of Japanese immigrants to be American and their desire to retain their culture as well.

The Mukai House is a traditional 1920s Craftsman-style home fronted by a mowed lawn, traditional American garden plantings and a concrete sidewalk that leads to the house. B.D. Mukai wanted very much to live an American lifestyle, and his desire to be American is reflected in the Mukai House.

Immediately next to this traditional American house is the Mukai Garden, a wonderful Japanese stroll garden originally bordered by many cherry trees. The Mukai Garden design was closer to Japanese gardens for a home and family than the designs of master gardeners that adhered to strict rules of tradition. The garden was designed to share with family and friends and to provide a venue for social gatherings. The garden is historically significant because it was created by a Japanese woman, Kuni Mukai. It is a synthesis of Japanese and American influences because Kuni used Japanese elements of earth, stones and water to form her design and also used her knowledge of Northwest gardens. Kuni's desire to retain her Japanese culture is reflected in the Mukai Garden.

Together the Mukai House and Garden, along with the neighboring Mukai Cold Process Fruit Barreling Plant, became a King County Landmark in 1993. The next year the barreling plant was placed on the National Register of Historic Places.

The Mukai Garden at its peak in the 1930s and early 1940s was prominently featured in national newspapers like The Christian Science Monitor and on the front page of The Seattle Times. The garden style is probably closest to a stroll garden, but it does not strictly follow the design elements of a stroll garden. This is most likely because Kuni had to rely on her memories of Japanese gardens she may have seen near her hometown of Yokohama, Japan, and a few Japanese pamphlets and books that she brought with her when she immigrated. The term stroll garden is self-explanatory, but it rarely implies random strolling. Many are constructed in such a

way that a visitor must move carefully and slowly through the garden, taking time to appreciate the vistas that the path provides.

Cherry trees played an important part in Japanese culture. The blooming of cherry trees is still anticipated and celebrated in Japan today. Kuni placed cherry trees in her garden and hosted outdoor tea parties, serving oysters on silver platters. These tea parties celebrated the spirit of renewal that comes with spring. It must have been enchanting for visitors to come at this time of the year. Her tea parties at cherry blossom time were a major Vashon Island social event in the 1930s and 1940s.

The Mukai Garden consisted of a "hill garden" on the north end of the property. It was almost entirely surrounded by a pond with koi and even a small boat. This section of the garden is most recognizable today. The "south garden" was equally lovely with a hill landscaped with trees, azaleas and conifers. It was also next to a beautiful pond and edged with flowering cherry trees. Today the south garden has seen the most damage, as the pond has been filled in and much of the hill destroyed.

For years after the Mukais no longer lived there, the home remained a private residence. As can be seen in the 2014 Terry Donnelly photograph, the garden is in disrepair and is in need of significant restoration, though there have been numerous attempts to restore the garden in the past. For example, 1995 was Vashon Allied Arts' year of the Mukai Restoration Project. The project was funded by a King County Heritage Commission grant to do a restoration study and developed a phase one cleanup and stabilization, followed by a phase two restoration and interpretation. Although this effort got off to a good start, it ultimately floundered and was never developed. In 1999, Island Landmarks began a push to purchase the house and garden and to restore them. "The Mukai Farm and Garden: A Plan to Purchase and Operate the Facility" was developed, a Committee to Preserve the Mukai Farm and Garden was organized and a steering committee for the Mukai Farm and Garden formed. A successful campaign to raise funds to purchase the house and garden took place, and in 2000 Island Landmarks purchased the property. Unfortunately, this effort stalled as well, and little was accomplished to restore the garden. Island Landmarks did stabilize the house and garden and did attempt to develop the site, but lack of funding and internal dissention left these goals unrealized.

The current attempt to restore the Mukai garden began in 2010 with the formation of what is now the Friends of Mukai. The group's effort to take control of Island Landmarks and the property resulted in a lawsuit which is still in King County court. The friends group has also held programs related to the house and its history, and tonight members will give a talk on the garden at the Land Trust Building.
http://www.vashonbeachcomber.com/community/256264331.html (Apr 22, 2014 at 4:43PM)

Appendix I: Summary of requests 2014.

Table 1. Number of Washington State requests, total samples, and total taxa requested from NCGR stations in 2013.

Station	No. Requests	Total samples	Total taxa
COR	44	331	57
DAV	9	56	7
GEN	19	220	8
GSOR	2	4	1
MAY	1	2	1
NC7	19	372	57
NE9	5	29	5
NR6	10	371	11
NSGC	51	3092	32
NSSL	3	11	8
OPGC	2	75	52
PARL	3	16	10
S9	22	75	27
SOY	2	3	2
W6	53	4745	791*
TOTAL	**245**	**9402**	**1069**

*678 taxa were requested by one researcher.

Table 2. Genus and species of material requested by Washington participants in 2013.

Genus	Species	Genus	Species
Achillea	filipendulina, millefolium	Kengia	serotina, songorica, squarrosa
Achnatherum	bromoides, calamagrostis, caragana, hymenoides, inebrians, lemmonii, lettermanii, nelsonii subsp. dorei, nevadense, occidentale subsp. occidentale, richardsonii, robustum, scribneri, speciosum, splendens	Kengyilia	alatavica, batalinii, grandiglumis, hirsute, laxiflora, melanthera, mutica, pulcherrima, rigidula, stenachyra, thoroldiana
Aconitum	columbianum	Kniphofia	foliosa
Actaea	asiatica, racemosa	Koeleria	atroviolacea, berythea, brevis, caucasica, caudate, glauca, grandis, litvinowii subsp. argentea, luerssenii, macrantha, nitidula, splendens, vallesiana
Actinidia	arguta, deliciosa	Lactuca	sativa
Aegilops	speltoides var. speltoides, tauschii	Lagenaria	siceraria
Aeluropus	lagopoides, littoralis, macrostachyus	Lamarckia	aurea
Agastache	foeniculum, scrophulariifolia	Lathyrus	latifolius, sativus
Agropyron	cimmericum, cristatum, cristatum subsp. brandzae, cristatum subsp. pectinatum, cristatum unranked imbricatum, cristatum var. pectinatum, dasyanthum, desertorum, fragile, Agropyron hybr., michnoi, mongolicum, pumilum	Lens	culinaris subsp. culinaris, culinaris subsp. odemensis, culinaris subsp. orientalis, ervoides, nigricans
Agrostis	canina, capillaris, castellana, clavata, gigantean, hygrometrica, keniensis, lachnantha, lyallii, mongolica, munroana, nebulosa, nervosa, pallida, rupestris, scabra, stolonifera var. palustris, stolonifera var. stolonifera, transcaspica, vinealis, vinealis subsp. trinii	Lespedeza	thunbergii
Allium	cernum, sativum, schoenoprasum, tuberosum	Leucanthemum	vulgare
Alnus	glutinosa, hirsuta, incana, rubra, viridis subsp. sinuata	Leymus	akmolinensis, alaicus, alaicus subsp. karataviensis, ambiguous, angustus, arenarius, chinensis, cinereus, condensatus, coreanus, innovatus, karelinii, mollis, multicaulis, paboanus, pseudoracemosus, racemosus,

			racemosus subsp. sabulosus, ramosus, salina, salina subsp. salina, secalinus, tianschanicus, triticoides
Alopecurus	aequalis, arundinaceus, borealis, brachystachyus, geniculatus, magellanicus, myosuroides, pratensis, textilis, utriculatus	Lolium	canariens, multiflorum, perenne, persicum, rigidum, rigidum subsp. lepturoides, subulatum, temulentum, Lolium x hybridum
Alternanthera	bettzickiana, pungens	Lonicera	caerulea, caerulea var. edulis, caerulea var. kamtschatica
Althaea	officinalis	Lupinus	littoralis, polyphyllus, polyphyllus var. burkei, rivularis, sericeus
Amaranthus	caudatus	Macrochloa	tenacissima
Ambylopyrum	muticum	Madia	exigua
Amelichloa	brachychaeta	Malus	angustifolia, domestica, floribunda, Malus hybr., sieversii, yunnanensis
Anemone	tomentosa	Marrubium	vulgare
Anethum	graveolens	Medicago	sativa nothosubsp. varia, sativa subsp. falcata, sativa subsp. sativa
Angelica	archangelica, arguta, dahurica, decursiva, gmelinii, kingii, sylvestris	Melica	altissima, argyrea, brasiliana, ciliata, cupani, decumbens, eligulata, hyalina, imperfecta, jacquemontii, macra, minuta, nitens, nutans, persica, rigida, taurica, transsilvanica, turczaninowiana, virgata
Anthosachne	Rectiseta, scabra	Melothria	pendula, scabra, sphaerocarpa, trilobata
Anthoxanthum	odoratum	Mentha	longifolia, spicata
Aquilegia	formosa	Mespilus	germanica
Arachis	glabrata, hypogaea	Microbriza	poaemorpha
Arnica	cordifolia, latifolia, montana	Mirabilis	multiflora
Aronia	melanocarpa	Moricanda	suffruitcosa
Arrhenatherum	album, elatius, elatius subsp. bulbosum, elatius subsp. elatius	Morus	alba, Morus hybr.
Astragalus	canadensis, cicer, crassicarpus, crassicarpus var. berlandieri, membranaceus, tibetanus	Myosotis	sylvatica
Atriplex	canescens	Nassella	viridula
Aurinia	corymbosa	Nepeta	cataria
Australopyrum	retrofractum	Nicotiana	tabacum

Avena	sativa	Oenothera	biennis, cespitosa, drummondii, oakesiana, rosea
Basella	alba	Oryza	sativa
Benincasa	hispida	Oryzopsis	Canadensis, pubiflora
Beta	vulgaris subsp. vulgaris	Papaver	arenarium, bracteatum, nudicaule, orientale, pseudo-orientale, rhoeas, umbonatum
Betula	lenta	Pascopyrum	smithii
Blitum	bonus-henricus	Pedicularis	groenlandica
Brachypodium	distachyon, phoenicoides, pinnatum, rupestre, rupestre subsp. rupestre, sylvaticum	Penstemon	palmeri, Penstemon spp., strictus
Brassica	nigra, rapa subsp. oleifera, rapa subsp. rapa	Petunia	axillari, exserta, integrifolia var. integrifolia
Briza	erecta, humilis, lamarckiana, lindmanii, maxima, media, media subsp. elatior, minor, subaristata, uniolae	Phalaris	amethystine, angusta, aquatic, arundinacea, brachystachys, canariensis, coerulescens, Phalaris hybr., minor, paradoxa, platensis, truncata, Phalaris x daviesii
Bromus	alopecuros, anomalus, araucanus, arvensis, auleticus, barcensis, biebersteinii, brachyanthera subsp. uruguayensis, brachystachys, briziformis, bromoideus, cappadocicus, carinatus, carinatus var. marginatus, catharticus var. catharticus, catharticus var. elatus, catharticus var. rupestris, ciliates, coloratus, commutatus, danthoniae, diandrus var. rigidus, erectus, fasciculatus, hordeaceus, inermis subsp. inermis, inermis subsp. pumpellianus, intermedius, ircutensis, japonicas, lanceolatus, leptoclados, madritensis, mango, oxyodon, parodii, pectinatus, pseudodanthoniae, racemosus, ramosus, ramosus subsp. benekenii, riparius, rubens, scoparius, secalinus, setifolius, setifolius var. brevifolius, sewerzowii, sitchensis, squarrosus, sterilis, subvelutinus, syriacus, tectorum, tectorum subsp. lucidus, tomentellus, tomentosus, variegatus	Phaseolus	acutifolius, coccineus, Phaseolus hybr., lunatus, vulgaris, vulgaris var. vulgaris

Calendula	Calendula hybr., officinalis	Phleum	alpinum, arenarium, boissieri, commutatum, exaratum, hirsutum, montanum, nodosum, paniculatum, phleoides, pratense, subulatum
Camassia	leichtlinii, quamash, quamash subsp. maxima	Physocarpus	capitatus
Camelina	hispida var. grandiflora, microcarpa, sativa	Piptatherum	aequiglume, coerulescens, gracile, holciforme, microcarpum, miliaceum, molinioides, munroi, paradoxum, purpurascens, songaricum
Campanula	medium, persicifolia, rapunculus, rotundifolia	Piptochaetium	avenaceum, napostaense
Capiscum	annuum	Pisum	abyssinicum, fulvum, sativum, sativum subsp. asiaticum, sativum subsp. elatius, sativum subsp. sativum, sativum subsp. transcaucasicum, sativum var. arvense, sativum var. elatius, sativum var. pumilio, sativum var. sativum, Pisum spp.
Caragana	arborescens	Plantago	lanceolata
Ceanothus	velutinus	Platycodon	granidflorus
Cynosurus	cristatus, echinatus, elegans		
Chenopodium	album, berlandieri, berlandieri var. bushianum, berlandieri var. sinuatum, berlandieri var. zschackei, formosanum, giganteum, quinoa, standleyanum	Poa	alpina, annua, arachnifera, arctica, arctica subsp. lanata, arida, attenuata, attenuata subsp. argunensis, attenuata subsp. botryoides, bactriana, badensis, binata, brachyanthera, bucharica, bulbosa, bulbosa subsp. nevskii, candamoana, chaixii, cita, colensoi, compressa, densa, diversifolia, dusenii, flabellata, gilgiana, glauca, glauca subsp. glauca, humilis, Poa hybr., hybrida, iberica, interior, iridifolia, lanigera, lanuginosa, ligularis, ligulata, lindsayi, lipskyi, longifolia, maniototo, nemoralis, nervosa, ochroleuca, palustris, pilcomayensis, pratensis, pratensis subsp. alpigena, pratensis subsp. angustifolia, pratensis subsp. pratensis, psilolepis, pumila, rupicola, secunda, sibirica, sieberiana, stenantha, sterilis, stiriaca, subfastigiata, supina, trivialis, trivialis subsp. sylvicola,

			trivialis var. glabra, urssulensis, versicolor, versicolor subsp. araratica, versicolor subsp. ochotensis, versicolor subsp. relaxa, versicolor subsp. stepposa
Chimaphila	umbellata	Polemonium	pulcherrimum
Chrysanthemum	Chrysanthemum x morifolium	Prunus	Prunus spp., triloba
Cicer	arietinum, bijugum, reticulatum	Psathyrostachys	fragilis, juncea
Coreopsis	delphinifolia, gladiata, grandiflora, lanceolata, leavenworthii, major, palmata, pubescens, pulchra, Coreopsis spp., tinctoria, verticillata	Pseudoroegneria	geniculata, geniculata subsp. pruinifera, geniculata subsp. scythica, gracillima, kosaninii, libanotica, spicata, stipifolia, strigosa, strigosa subsp. aegilopoides, tauri
Cornus	mas, officinalis	Psilurus	incurvus
Corylus	americana, avellana, californica, Corylus hybr., Corylus spp.	Psoralea	Psoralea spp.
Cosmos	bipinnatus, sulphureus	Puccinellia	distans, distans subsp. borealis, distans subsp. limosa, distans subsp. sevangensis, gigantea, glauca, hauptiana, intermedia, maritima, stricta, tenuiflora, tianschanica
Cucumis	sativus var. sativus	Pyrus	communis, communis subsp. caucasica, communis subsp. pyraster, Pyrus hybr., pyrifolia, salicifolia, Pyrus spp., ussuriensis, Pyrus x bretschneideri
Cucurbita	maxima, moschata	Raphanus	sativus
Cyamopsis	tetragonoloba	Ratibida	columnifera, pinnata
Cydonia	oblonga	Ribes	aureum, aureum var. aureum, aureum var. gracillimum, aureum var. villosum, hirtellum, malvaceum, sanguineum, spicatum, uva-crispa
Cymbopogon	commutatus	Rostraria	cristata
Cytisus	commutatus	Rubus	corianus, Rubus hybr., idaeus subsp. idaeus, leucodermis, loganobaccus, neomexicanus, occidentalis, parviflorus, strigosus, ursinus, Rubus x neglectus
Dactylis	glomerata, glomerata subsp. lobata	Rudbeckia	fulgida, fulgida var. speciosa, hirta
Danthonia	alpina, californica	Rytidosperma	unarede

Daucus	carota, carota subsp. carota, carota subsp. commutatus, carota var. sativus	Salicornia	bigelovii
Dasypyrum	breviaristatum, villosum	Sanguisorba	minor subsp. balearica
Delphinium	elatum, laxiflorum	Scabiosa	ochroleuca, Scabiosa spp.
Deschampsia	cespitosa, cespitosa subsp. beringensis, danthonioides, elongata	Schmidtia	pappophoroides
Dianthus	deltoides	Scrophularia	nudata
Dichanthelium	scoparium	Scutellaria	brittonii
Dinebra	panicea subsp. brachiata	Secale	cereale
Dysphania	ambrosioides	Sicana	odorifera
Echinacea	angustifolia, purpurea	Solanum	acaule, ajanhuiri, bulbocastanum, commersonii, curtilobum, demissum, juzepczukii, lycopersicum, okadae, palustre, scabrum, sisymbriifolium, Solanum spp., suaveolens, tuberosum, tuberosum subsp. andigenum
Echinops	ritro	Sorbus	alnifolia, Sorbus spp.
Elymus	abolinii, alienus, angulatus, antiquus, aristiglumis, arizonicus, atratus, austromontanus, bakeri, barbicallus, breviaristatus, burchan-buddae, canadensis, caninus, caucasicus, ciliaris, ciliaris subsp. amurensis, ciliaris subsp. japonicas, confuses, curvatus, dahuricus subsp. dahuricus, dahuricus subsp. excelsus, dentatus, donianus, drobovii, elymoides subsp. brevifolius, elymoides subsp. californicus, elymoides subsp. elymoides, fedtschenkoi, fibrosus, glaucissimus, glaucus, glaucus subsp. glaucus, gmelinii, hoffmannii, Elymus hybr., hystrix, interruptus, lanceolatus subsp. lanceolatus, lanceolatus subsp. psammophilus, macrochaetus, macrourus, magellanicus, multisetus, mutabilis, mutabilis subsp. mutabilis, mutabilis subsp. praecaespitosus, mutabilis var. oschensis, nevskii, nipponicus, nutans, panormitanus, patagonicus, pendulinus subsp.	Sorghum	bicolor subsp. bicolor

	brachypodioides, pendulinus subsp. pendulinus, praeruptus, purpuraristatus, repens subsp. elongatiformis, repens subsp. repens, scabrifolius, scabriglumis, schrenkianus, schugnanicus, semicostatus, sibiricus, sierra, sinosubmuticus, stenostachyus, strictus, tibeticus, tilcarensis, trachycaulus subsp. subsecundus, trachycaulus subsp. trachycaulus, transbaicalensis, transhyrcanus, tschimganicus, tsukushiensis, tsukushiensis var. transiens, uralensis, uralensis subsp. komarovii, villosus, violaceus, virginicus, wawawaiensis, wiegandii		
Elytrigia	lolioides	Spirea	douglasii
Ephedra	californica, torreyana	Sporobolus	contractus, filipes, fimbriatus, giganteus, helvolus, indicus, indicus var. capensis, indicus var. pyramidalis, marginatus, nitens, phyllotrichus, texanus, usitatus, wrightii
Eragrostis	acutiflora, acutiglumis, aethiopica, airoides, aspera, bahiensis, barbinodis, bergiana, bicolor, capensis, cilianensis, cilianensis subsp. starosselskyi, congesta, curvula, cylindriflora, dielsii, echinochloidea, eriopoda, ferruginea, gangetica, gummiflua, heteromera, humidicola, intermedia, lappula, lehmanniana, leptocarpa, lugens, macilenta, mexicana, mexicana subsp. virescens, minor, neesii, nigra, nutans, obtuse, pallens, papposa, patens, patentipilosa, patentissima, pectinacea, pilosa, plana, planiculmis, polytricha, porosa, racemosa, retinens, rigidior, rotifer, rufescens, sarmentosa, secundiflora, secundiflora subsp. oxylepis, superba, tef, tenella, tenuifolia, tremula, trichodes, trichophora, truncate, unioloides, variabilis, viscosa		

Eremopoa	altaica subsp. songorica, persica	Stipa	arabica, baicalensis, Stipa barbata, brandisii, bungeana, capensis, capillacea, capillata, caucasica subsp. desertorum, dasyphylla, dregeana, glareosa, kirghisorum, lagascae, lessingiana, offneri, orientalis, parviflora, pennata, przewalskyi, pulcherrima, richteriana, sareptana, sibirica, tirsa, ucrainica
Eremopyrum	bonaepartis, orientale, triticeum	Taeniatherum	caput-medusae, caput-medusae subsp. asperum, caput-medusae subsp. caput-medusae, caput-medusae subsp. crinitum
Erodium	laciniatum subsp. pulverulentum	Tagetes	lucida
Eschscholzia	californica	Tetragonia	arbuscula, tetragonoides
Festuca	abyssinica, altaica, altissima, ampla, arizonica, arundinacea subsp. arundinacea, arundinacea subsp. atlantigena, arundinacea subsp. fenas, arundinacea subsp. orientalis, arundinacea subsp. uechtritziana, beckeri, brachyphylla, callieri, cretacea, dolichophylla, filiformis, gigantea, gracillima, heterophylla, hystrix, idahoensis, karatavica, kingii, kronenbergii, laxa, lemanii, lenensis, longifolia, magellanica, mairei, matthewsii, novae-zelandiae, occidentalis, orthophylla, ovina, pallens, pallescens var. pallescens, pallescens var. scabra, pratensis subsp. apennina, pratensis subsp. pratensis, pseudodalmatica subsp. asperrima, pseudodalmatica subsp. pseudodalmatica, pseudovina, pulchella, pungens, purpurascens, roemeri, rubra, rubra subsp. arctica, rubra subsp. commutata, rubra subsp. rubra, rupicaprina, rupicola, sclerophylla, sibirica, spectabilis, thurberi, trachyphylla, valesiaca subsp. valesiaca, varia, venusta, violacea, vivipara		
Ficus	carica	Theobroma	cacao

Fragaria	chiloensis subsp. pacifica, vesca subsp. bracteata, virginiana subsp. glauca, virginiana subsp. platypetala, x ananassa	Thinopyrum	bessarabicum, caespitosum, elongatum, Thinopyrum hybr. , intermedium, intermedium subsp. intermedium, junceum, podperae, ponticum, pungens, pycnanthum, sartorii, scirpeum
Gaillardia	aristata, pulchella	Thymus	kotschyanus var. kotschyanus, Thymus spp.
Glycine	max, tabacina	Trifolium	pratense, repens, wormskioldii
Glycyrrhiza	glabra, uralensis	Trisetum	flavescens, spicatum
Helenium	amarum	Triticum	aestivum subsp. aestivum, aestivum subsp. compactum, aestivum subsp. macha, aestivum subsp. phaerococcum, monococcum subsp. aegilopoides, monococcum subsp. monococcum, Triticum spp., timopheevii subsp. timopheevii, turgidum subsp. dicoccoides, turgidum subsp. dicoccon, turgidum subsp. durum, turgidum subsp. polonicum, turgidum subsp. turanicum, turgidum subsp. turgidum, urartu, vavilovii, zhukovskyi
Helianthus	annuus	Urtica	dioica
Henrardia	persica	Vaccinium	angustifolium, corymbosum, Vaccinium hybr., parvifolium, uglinosum, vitis-idaea
Hesperostipa	neomexicana	Valeriana	officinalis
Heteranthelium	piliferum	Verbascum	pyramidatum
Holcus	lanatus	Verbena	halei, hastata, officinalis, urticifolia,
Hordelymus	europaeus	Vicia	americana, articulata, disperma, faba, faba var. minuta, pannonica, sativa, sativa subsp. sativa, villosa
Hordeum	vulgare subsp. vulgare	Vigna	unguiculata subsp. sesquipedali, unguiculata subsp. unguiculata
Humulus	lupulus var. lupulus	Vulpia	alopecuros, myuros, persica, unilateralis
Impatiens	balsamina		X Aegilotriticum spp.
Jarava	ichu, plumosa		X Elymotriticum spp.

Juglans	cinerea		X Triticosecale spp.
		Yucca	angustissima, glauca, harrimaniae
		Zea	mays subsp. mays

Appendix II: Original responses from 38 NPGS germplasm recipients in 2013

1. Did the material arrive in good condition? Did the material germinate and/or root well? Did the material grow well? Any observations you may have on general growth and development?

2. Was this material useful to you? If yes, how? If no, why not?

3. What were the outcomes from any plant germplasm you received: Was it part of a research experiment? Did you make crosses? Are you developing any new plant offerings? What are your future plans with this material?

4. Have you completed any publications or news items related to the material you received at any time? If yes, please include a list of your publications and news items.

1. <u>Terry Alspaugh, Olympic Orchard Society, Sequim , WA</u>

Order # 221375

3 Corylus avellana
8 Cydonia oblonga
3 Mespilus germanica
16 Pyrus communis
2 Pyrus hybr.
8 Pyrus pyrifolia
1 Pyrus spp.
1 Pyrus ussuriensis
1 Pyrus x bretschneideri

I received the following scionwood in February and March of 2011 from NPGS (Order number: 2011003).

NPGS #	Taxon	Cultivar
557029	***Corylus avellana***	Gem (=Fitzgerald 18)
637885		Zeta
654983		Santiam
502332	***Cydonia oblonga***	Tashkent AR-232 seedling 2
559892		Pineapple
25931		Portugiesische Birquitta (Portugal)
35979		Ekmek
25981		Tekes (Tekkes)
655046		Van Deman
655052		Karp's Sweet Quince - Majes Valley
655057		Meech's Prolific (= Le Borgeot?)
660787	***Mespilus germanica***	Nottingham
660797		Macrocarpa
660802		Monstreuse d'Evreinoff
541303	***Pyrus communis***	Duchesse d'Angouleme
541119		Aurora

279334		Epargne (= English Jargonelle)
541207		Highland
541322		Luscious
295096		Sucre de Montlucon
541273		Thorn
541287		Yellow Huffcap
105193		Clara Frijs (Comtesse Clara Frijs)
541335		Doyenne Gris
541345		Merricourt
541285		Winter Nelis
300691		Beurre Hardy
541444		Stuttgarter-Geishirtle (= Zuckerbirne)
617532		Colette
541320		Honeysweet
654927	***Pyrus communis hybrid?***	Gompapa
541711	***Pyrus hybrid***	Garber
541903		Monterrey
97347	***Pyrus pyrifolia***	Chojuro
392317		Niitaka (= Singo)
352638		Shinseiho
224087		Shinseiki
352636		Shinsui
541904		Seuri Li
638012		Choju (=Ichiban Nashi tm)
312509	***Pyrus ussuriensis***	Tse Li
506362	***Pyrus x bretschneideri***	Ya Li

Did the material arrive in good condition?

The scionwood arrived in excellent dormant condition on three separate dates: Cydonia oblonga arrived 2/8/11, all Pyrus arrived on 2/14/11 and Mespilus arrived on 3/15/11. My records are unclear as to when Corylus arrived but I believe it also arrived on 3/15/11. The scions were various lengths which I did not measure or record. Upon arrival, I put the scions in an ice chest that I attempted to maintain at about 36 degrees Farenheight. Extra scions were brought to the Olympic Orchard Society scionwood exchange in March of 2011 to share with members.

How did this material grow?

I bench grafted the Pyrus scions to three (3) different rootstocks: OHxF 97, OHxF333 and Quince BA29C. Two of the Mespilus were grafted to OHxF97 and the "Nottingham" cultivar was grafted to Quince BA29C rootstock. I also did top-grafting of the Corylus to a "Santiam" filbert tree in my orchard. The Cydonia scions were all top-grafted to an "Aromatnaya" quince also in my orchard. I also tried a "jelly roll" technique with the Cydonia scions to see if they would produce roots if rolled up in a damp paper towel and placed in a warm, dark location. My notes show that experiment was unsuccessful and I did not end up with any quince scions that were rooting.

To do the bench and top-grafting, I used a modified whip graft technique called the "Owens Box Cut" as taught by Erik Simpson, then president of the Olympic Orchard Society. The grafts were

done using an anvil pruner. The grafts were held together with rubber grafting band and then wrapped with Parafilm. I did not use any sealant wax on any grafts. The grafts were completed at various times beginning in March of 2011 and completed in May and June of 2011. The bench grafted trees were potted in 1 gallon containers and grown in a protected area on the north side of our house.

Did the material germinate and/or root well? Did the material grow well?

The grafted trees grew well during the months immediately following grafting. As you can imagine, I had a lot of trees in 1-gallon containers that I was caring for and they did well. I also grafted several of the Asian pear cultivars onto existing trees at the Master Gardener's Woodcock Demonstration garden in Sequim. The following varieties were grafted:
Chojuro, Shinseiho, Hosui were all grafted to our "Unknown variety" Asian pear tree on 5/12/11. On the 20th Century Asian pear I grafted Ya Li, Seuri Li, Shinseiki, Tse Li and Choju (Ichiban Nashi).

Any unique observations you may have on general growth and development?

The trees grafted at the Master Gardener's Woodcock Demonstration garden have been interesting to monitor since 2011. On 5/16/12, after a year of growth, I noted the following:

Grafted to "Unknown"	**Observation 5/16/12**	**Observations 10/4/12**
Chojuro	3 flower clusters, 2 new branches 1" long	one 12" branch, 20 leaves, 1 fruit ~ 2" in size
Shinseiko	1 new branch with 7 leaves	one 12" branch, 14 leaves
Hosui	1 new branch with 5 leaves	graft broken off
Grafted to "20th Century Asian Pear		
Ya Li	1 new branch 1" long with 10 leaves	one 12" branch, 30 leaves
Seuri Li	1 new branch 1" long with 6 leaves	can't find graft or scion due to heavy leaf cover
Shinseiki	1 branch 12" long with 12 leaves	couldn't find in 2012 but 24-1/2" branch 2/14/14
Tse Li	1 branch 18" long with 20 leaves	two branches 12" long, 15 leaves & 6 leaves
Choju (Ichiban Nashi)	1 branch 18" long with 16 leaves	one 24" long branch with 19 leaves

I was notified in January 2014, by the Master Gardener's president, that the "20th Century" Asian pear was going to be cut down at the Woodcock Garden to make some additional parking space. On 2/4/14, I removed the branches of the Seuri Li, Shinseiki and Tse Li grafts. I currently have these in cold storage and will be grafting them to new rootstock and also to a neighbor's Bartlett Pear with the next month (~June, 2014). In this way I will be able to keep these three varieties growing.

Removed from '20th Century' Asian Pear 2/4/14	
Ya Li	can't find graft or scion
Seuri Li	1 branch 53" long (no leaves, it is February)
Shinseiki	1 branch 24-1/2" long (no leaves)
Tse Li	1 branch with a 26" offshoot, a 10" offshoot, a 28" offshoot and a 27" offshoot
Choju (Ichiban Nashi)	can't find graft or scion

Was this material useful to you? If yes, how? If no, why not?
Yes, this material was very useful. I have had the opportunity to successfully graft many new trees and have found that experience absolutely magical. I am very thankful to have received scions of all these wonderful trees.
What were the outcomes from this material in 2011? Was it part of a research experiment?
I have been grafting the last three years as a personal experiment to research what fruit cultivars do well in our maritime climate. I have learned a lot about different varieties of apple, pear, medlar, quince and filbert thanks to the scions so generously shared by NPGS. I have found that with careful choice of rootstock, simple grafting techniques and proper care of the newly grafted tree that a high percentage of success can be realized.
Did you make crosses?
No, I have not made any crosses.
Are you developing any new plant offerings?
No, I am not developing any new plant offerings.
Have you completed any publications or news items?
No, I have not completed any publications or news items.
What are your future plans with this material?
All of the surviving trees that I had grafted in 2010 and 2011 (57 trees) were given to a young man to begin an orchard on 5 acres in Sequim. His name is Sam Konovalov and has a business called Stone Farms. I have tried to contact him via email and telephone to find out if I may visit his orchard and document what trees are surviving. I have not received a reply from him at the time of writing this report. I hope to hear from him in 2014 and if possible, take scions this winter from the trees I gave him in October 2011.
Also, the trees in my orchard at Sundial Loop, Sequim, WA. belong to a new owner as we sold that house in August, 2011. I have asked the new owner for permission to visit the orchard and document what grafts are surviving. I hope to visit the orchard in 2014.
I hope to get organized in my new home soon and begin my new orchard. I plan on starting with the Asian Pear scionwood gathered from the Woodcock Demonstration Garden.

2. Jacqueline Baker, Western Cascade Fruit Society, Sequim , WA
Order # 240434
24 Malus domestica
1. The scion wood arrived in excellent condition. It was so exciting to open the package and anticipate the grafting and farming of so many varieties! Thank you so very much for this opportunity. I am so happy to be able to help preserve these historic varieties by growing them and being able to share my experience.
The scion wood was grafted onto EMLA 111 root stock and appears to be doing very well this year. Almost all have leafed out to date. They were potted in fresh potting soil in root pouches (biodegradable fabric pots) and that seems to be working much better for me than the regular plastic pots used in previous years.
2. This scion wood is being used to establish an orchard of more than 200 trees of mostly heirloom varieties in the Sequim, Washington area, north Olympic Peninsula. I am working with Olympic Orchard Society (which is part of the larger Western Cascade Fruit Society) to see which varieties will do well in this climate, to learn cultivation methods and circumstances that will help these trees to thrive and to experience and share the great variety of flavors, textures,

and characteristics of historic fruit. The goal of the society is to foster interest in fruit trees and their propagation within the society and the surrounding community. What I experience and learn from the trees on my farm will add to that effort.
3/4. I have not done any published research or attempted any crosses. I have been talking and showing my fruit tree work to people in my community, on my own, and by way of orchard society activities.

Trees grafted in 2009 are doing well, producing fruit. I have been hosting mason bees on the farm each spring but apparently there are plenty of other pollinators available to help out. I have been surprised with the staking still needed to support a few of these trees, with my reference being some trees on the farm my Dad planted 40 years ago and some my great-grandfather planted 100+ years ago which need no staking.

Trees grafted in the years between 2009 and present suffered from probable contaminants in the potting soil and the pots themselves and an outbreak of root rot. A few survived each year, tough little trees, and they still seem to be doing well out in the orchard now. I am beginning to see definite differences in growth rates and eagerness to fruit between the different varieties. Thank you very much for sending me the scion wood to work with.
Jackie Baker

3. <u>Anna Berim, Washington State University, Pullman, WA</u>

Orders # 251814, 251988

1 Scrophularia nudata
1 Verbascum pyramidatum

1. The material arrived in good condition. A total of 6 seeds were planted for each species. *Verbascum pyramidatum* germinated and rooted well, but began turning black (younger leaves) and red (older leaves) after growing for about two months. One plant became completely dried out and black. It is currently unclear whether this was due to overwatering, over fertilization, or something else. Only two seeds of *Scruphularia nudata* germinated. They rooted well.
2. The material is very useful for the graduate student (Korey Brownstein) who works on distribution and biosynthesis of iridoids in Scrophularia and Verbascum. Korey is analyzing the metabolic profiles of different plant parts using high-resolution mass spectrometry. He was able to collect the necessary samples from *Verbascum pyramidatum*, and will collect the tissue of *Scrophularia nudata* later this year when our greenhouse staff re-grows a necessary number of replicates.
3. This is part of a research project funded by NSF (graduate research fellowship to Korey Brownstein) and aimed at elucidation of iriroid biosynthesis. It is currently not planned to make crosses. After selecting the species exhibiting the most promising metabolic profiles, the project foresees generation of next-generation sequencing data (using RNA isolated from plant tissue) and identification of genes and proteins that are important for accumulation of pharmacologically active iridoids.
4. No publications yet.

4. <u>Kristina Booth, Booth Canyon Orchard, Carlton, WA</u>

Order # 242763

1 Pyrus communis

1. The material was in good shape. I got dormant scion wood, and all the grafts took. Growth was slow on one sample, but good on the other.

2. This material was unavailable anywhere in the US that I could find. Thank you for having this great resource available to us.
3. We plan on testing this variety for market acceptance. It will be a few years still till we get a crop.
4. No publications. We are a commercial orchard, not a research setting.

5. <u>Dan Borman, Eastsound, WA</u>

Order # 249475

2 Avena sativa
1 Elymus violaceus
2 Hordeum vulgare subsp. vulgare
40 Triticum aestivum subsp. aestivum
1 Triticum aestivum subsp. sphaerococcum
1 Triticum spp.
21 Triticum turgidum subsp. durum
2 Triticum turgidum subsp. turanicum
2 Triticum turgidum subsp. turgidum
1 Triticum vavilovii
4 Triticum zhukovskyi
3 X Elymotriticum spp.
1 X Triticosecale spp

All winter and spring accessions except the spring Hordeum have been planted and are growing. The winter materials are either heading or about to. There were some that did not germinate well. I say that as there was good germination on rows either side. I try never to plant all seed so I do re-plant, sometimes in spring for winter materials in case that that they are weak and need warmer temperatures to germinate well. That is a pain because then they are hanging out for a whole season before wintering over, and I often need to transplant them to the new winter nursery, but I am always glad to get the opportunity to see how new types do here.

I do not differentiate between germination and survival because in many accessions I obtain 100% (both). When I do further increases on poorly growing accessions, sometimes I find it never does well, or rarely find that the material is selected for survival in these conditions and does well thereafter. There are some accessions that I have babied year after year but never does well and eventually I lose them. Most of the time, the issue is severe Stripe Rust. Sometimes I guess it is poor climate match, but that is more difficult to gauge. A few I have lost through poor storage and I remedied that situation.

Seed collection storage is a hot topic ripe for a publication as the previous publications are out of date. Needed are methods pertaining to small, medium, and large collections that are intended for short, medium, and long term storage. Especially needed are low input methods or "passive", not high tech methods.

To specifically answer your questions:

1. I am happy that the material does arrive in good condition. Germination/survival is noted beside each accession # below. I am curious why some accessions have such low germination/survival. In this case/year it was poor germination. It is too early to determine how well these materials grow here. I begin to see patterns after a few years. I try to apply what I have learned to make better choices for future requests.

2. After initial trials and increase, these materials are crucial to provide planting stocks for local gardeners and farmers who wish to localize their production. In addition, they are being used to demonstrate differential disease resistance, climate tolerance, and simply taxonomic types.
3. (See 2)The accessions that do well (so far about 10%) in initial trials are increased, then passed on to the Orcas Island Seed Bank for further increase, then offered to gardeners and farmers. Previously obtained material has gone out to about 30 requesters. The entire collection of this list and previous lists are being grown in small amounts to maintain the stock. In the future, it is hoped that crosses of the more interesting material is done. However, no actual breeding work has been needed so far.
4. No publications as yet.

I do believe I neither ordered nor received *Elymus violaceus* from W6. Your list seems to have 81 items. Since they are not listed by PI # etc, then I cannot say what might have happened to create the discrepancy with the NSGC packing inventory list of 78 items.

I can report on the following list of what I have/received:

ID	Germ/Survival	Taxon	ID	Germ/Survival	Taxon
PI 504848	Avena planted not germinated yet		**Triticum and Intergeneric, Cont.**		
PI 573755	Avena planted not germinated yet		PI 428640	75%	Taa
PI 636079	Hordeum - plant soon		PI 436206	100%	Taa
Triticum and Intergeneric			PI 442573	0%	XEly...
CITR 6480	80%	Taa	PI 447382	100%	Taa
CLTR 14091	50%	Ttd	PI 47417	30%	Taa
PI 37159	0%	Ttd	PI 461515	50%	Taa
PI 70711	100%	Tas	PI 486350	60%	Taa
PI 133185	90%	Ttd	PI 496260	0%	Ttd
PI 149809	70%	Taa	PI 499365	100%	Ttd
PI 166450	100%	Ttt	PI 499366	50%	Ttd
PI 167436	100%	Ttd	PI 502644	100%	Taa
PI 170918	100%	Taa	PI 525339	70%	Ttd
PI 174657	100%	Taa	PI 525445	100%	Ttd
PI 178095	100%	Ttd	PI 532913	100%	Taa
PI 178113	70%	Ttd	PI 547164	100%	XTrit...
PI 185720	90%	Taa	PI 557014	30%	Taa
PI 192148	100%	Ttd	PI 559605	100%	Taa
PI 210946	70%	Ttd	PI 560611	100%	Taa
PI 229563	100%	Taa	PI 560816	100%	Taa
PI 260897	100%	Taa	PI 560885	40%	Ttd
PI 264982	20%	Ttd	PI 560896	100%	Ttt
PI 274659	100%	Taa	PI 564820	100%	Taa
PI 274662	30%	Taa	PI 587026	100%	Taa
PI 274664	70%	Taa	PI 592111	100%	Taa
PI 283891	100%	Ttd	PI 592121	100%	Taa
PI 290498	100%	Ttd	PI 592122	100%	Taa
PI 296968	50%	Tz	PI 592123	100%	Taa
PI 298401	70%	Taa	PI 592124	100%	Taa
PI 298542	30%	Ttd	PI 592125	100%	Taa
PI 320097	100%	Ttd	PI 592126	75%	Taa
PI 320119	10%	Ttd	PI 592140	25%	Taa
PI 326319	2%	Tv	PI 592149	20%	Taa
PI 331258	10%	Ttt	PI 592151	10%	Taa
PI 341805	100%	Tz	PI 604956	10%	XEly...

PI 347004	40%	Taa	PI 605216	50%	XEly...
PI 347008	50%	Taa	PI 615324	5%W 0%S	Taa
PI 352541	25%	Ttt	PI 631447	100%	Taa
PI 355706	80%	Tz	PI 648392	100%	Taa
PI 428344	30%W 25%S	Tz	PI 654182	100%	Ttd

6. <u>Todd Cameron, Cameron Nursery LLC, Eltopia, WA</u>

Orders # 241072, 247052, 247979

5 Malus domestica
1 Malus hybr.
1 Malus x robusta
1 Malus domestica
2 Malus hybr.
9 Malus domestica
2 Malus hybr.
1 Malus x robusta

1. The material arrived in good condition; it has not been propagated yet.
2. The material was useful; it was identified by research as having superior winter hardiness and thus worthy of testing for colder growing districts.
3. The material is part of a research experiment. No crosses have been made, and any new plant offerings will depend on the results after test propagation and field trials.
4. No publications.

We did not order the material by genus and species and only know them by the common names. The material is still in storage. In each case NPGS was critical in that these varieties are difficult to find and have superior characteristics growers may profit from. We are so pleased you were able to supply us with this valuable material.

7. <u>Clayton Campbell, McKay Seed Co., Moses Lake, WA</u>

Order # 251111

1 Chenopodium berlandieri
3 Chenopodium berlandieri var. sinuatum
1 Chenopodium giganteum
114 Chenopodium quinoa

Received the seed late last year and have seeded it this spring. Arrived in good condition. Will be able to answer your other questions this fall.

8. <u>Mark Clark, Bush Prairie Farm, Olympia, WA</u>

Order # 241051

1 Triticum aestivum subsp. aestivum

1. The material arrived in good condition. I put in soil blocks in my germination room but nothing came up. I believe they either needed a chilling period or I just didn't get conditions right.
2. This material was not useful only because it did not germinate.
3. Future plans with this material – may try again next year.
4. No publications.

9. Clarice Coyne, USDA-ARS, Washington State University, Pullman, WA

Orders # 244411, 246042, 249386

30 Pisum fulvum
10 Lens culinaris subsp. culinaris
1 Cicer reticulatum

1. The material arrived promptly and in good condition (High germination).
2. Yes, it was useful. We screened the *Pisum fulvum* for resistance to powdery mildew caused by *Erisyphe trifoli*, all were susceptible.
3. I plan to enter this information into the GRIN database.
4. No plan to publish, other than on GRIN.

10. Colin Curwin-McAdams, WSU Mount Vernon NWREC, Mount Vernon, WA

Orders # 249738, 249799, 250122, 250196, 250539

4 Triticum aestivum subsp. aestivum
1 Triticum turgidum subsp. dicoccon
19 Triticum turgidum subsp. durum
4 Triticum turgidum subsp. turgidum
1 Triticum aestivum subsp. aestivum
1 Triticum turgidum subsp. durum
2 Thinopyrum elongatum
1 Thinopyrum hybr.
1 Thinopyrum intermedium
2 Thinopyrum junceum
2 Agropyron cristatum
12 Triticum aestivum subsp. aestivum
3 Triticum turgidum subsp. durum
1 Triticum turgidum subsp. turgidum

1. All accessions ordered had good germination and have been successfully grown in the greenhouse and those varieties identified as being useful are being increased in the field.
2. The material I have obtained from the USDA is invaluable to my research as a graduate student and the service they provide is critical. I have diverse breeding projects working to introduce novel seed colors in locally adapted varieties of wheat and the USDA genebank is by far the most comprehensive collection of interesting material. They have always been incredibly helpful and professional and orders have been sent out promptly. Without this resource I would not be able to access the range of varieties I need.
3. The germplasm I received is part of several breeding projects for my PhD research. I have made crosses with many of the varieties and am looking to develop varieties well adapted to the Coastal Northwest with good baking quality and novel seed coats. The *Thinopyrum* accessions are being used to advance the perennial wheat project through wide hybridization.
4. No publications as of yet, but I hope to in the future.

11. McKenzie Ellison, Dow AgroSciences, Pullman, WA

Orders # 244149, 245167, 248527, 248615, 250446

Order 10231:

11 Triticum aestivum subsp. aestivum
1 Triticum aestivum subsp. compactum

1. Material arrived in good condition, germinated and grew well under greenhouse conditions.
2. Material will likely be useful for the creation of mapping populations for hessian fly resistance.
3. Material was used to create crosses for a mapping populations. Results are pending.
4. No publications.

Order 9053:
10 Triticum aestivum subsp. aestivum
3 Triticum aestivum subsp. macha
3 Triticum aestivum subsp. spelta
3 Triticum aestivum subsp. sphaerococcum
2 Triticum vavilovii

1. Material arrived in good condition and germinated and is growing well. Material is in the field this year and so is early in development yet.
2. Unknown at this time.
3. The material will be evaluated for potential use in crosses with more adapted PNW material. This is still in early stages.
4. No publications.

Order 26780:
311 Triticum aestivum subsp. aestivum

1. Material arrived in good condition and germinated and is growing well. Material is in the field this year and so is early in development yet.
2. Unknown at this time.
3. This is Rio Blanco x IDO444, we hope to use this for mapping stripe rust markers. Phenotypic screening will be done later in the year.
4. No publications.

Order 14825:
166 Triticum aestivum subsp. Aestivum

1. Material arrived in good condition and germinated and is growing well. Material is in the field this year and so is early in development yet.
2. Unknown at this time
3. This is the O9XQ36-003 RIL. We plan on using it to map quality traits. This is still in early stages.
4. No publications.

Order 21520:
354 Triticum aestivum subsp. aestivum

1. Material arrived in good condition. Poor germination/emergence of:
   CItr 12385
   CItr 17274
   CItr 17606

PI 447348
PI 562528
PI 610260
PI 608358 through PI 608373
PI 612560 did not grow at all

2. Unknown at this time.
3. Plants are in the field for evaluation, all material are soft red winter wheat, crosses with soft white winter wheat are planned to widen genetic base of PNW wheat.
4. No publications.

12. <u>Katherine Evans, WSU TFRC, Wenatchee, WA</u>

Orders # 243019, 247615, 247978

1 Pyrus communis subsp. caucasica
1 Pyrus hybr.
1 Pyrus salicifolia
39 Malus domestica
1 Malus floribunda
7 Malus hybr.
3 Malus sieversii
1 Malus sieversii

1. The material arrived in good condition and grafted without many problems. Improvements seen with the pear material following the hard-pruning of the collection.
2. This material was useful, adding to existing germplasm collection at WSU for future evaluation and possible breeding
3. No outcomes yet. Some will be included for genome scanning – all will eventually be phenotyped.
4. No publications etc yet.

13. <u>E. Patrick Fuerst, USDA-ARS, Western Wheat Quality Lab, Pullman, WA</u>

Order # 242647

2 Hordeum vulgare subsp. vulgare

1. The material arrived in good condition, and germinated and grew well. No observations on general growth and development.
2. The material was not useful to me. Literature suggested these were dormant barley lines. I needed something with very high levels of seed dormancy and these particular lines weren't dormant enough.
3. I grew them out and tested dormancy of fresh seeds and there was too little dormancy for my needs. No future plans.
4. No publications.

14. <u>Nathan Grant, WSU Crop and Soil Sciences, Pullman, WA</u>

Order # 251604

17 Triticum aestivum subsp. aestivum
10 Triticum turgidum subsp. durum

1. The material arrived in good condition. Some of the seeds did not germinate in our initial experiment but most of the germinated seeds grew well in greenhouse conditions.
2. The material was useful for our experiment on emergence from deep planting depths.

3. The material is being used for research purposes. We are evaluating these lines for their emergence capabilities.
4. No publications have been completed at this time; the material is still under evaluation.

15. <u>Jinguo Hu, WSU Regional Plant Introduction Station, Pullman, WA</u>

Order # 243274

1 Vicia faba

1. The seeds came in good condition and germinated well after I planted them in the field. This accession was listed as the largest seed in the collection (1.58 grams/seed). I observed visually the seed size varies greatly among the plants within the accession. I only harvested seeds from one plant with largest seed. The seeds were weighed in the lab and the value was very close to that in the database (1.55 g/seed).
2. This accession will be used in a breeding project for developing vegetable type faba bean lines.
3. I plan to cross this accession to a winter-hardy line to combine winter-hardy and large seed size through breeding.
4. No publications yet.

16. <u>Grasa Barbosa Juliani, Seattle, WA</u>

Orders # 237594, 250176, 251119

25 Ficus carica
2 Morus alba
1 Morus hybr.
1 Prunus spp.
1 Ribes aureum
1 Rubus parviflorus
1 Ribes spicatum
1 Rubus occidentalis

1. The material arrived in good condition. Some of the items germinated and/or rooted well, some did not. Some grew well, others did not. I believe the quality of the cuttings were excellent, however, these varieties are not easy to root in the Pacific NW without the proper propagation equipment, grow room, etc. I don't have them. I just have a heating coil and a small grow light. Also during the winter, the new plants are vulnerable to gnats. Without their predators, they munch on the young roots, thus killing the plants. Some of the fig cuttings seem to be doing better. Although they are very young, it is possible to determine that some varieties are going to survive for us in the NW, especially those I grafted onto other varieties that I know to grow well in this area. Many are in gallon or 3 gallon pots, several grafts were made onto my established 24 y.o., but only one survived the winter, only those in small pots that I had protected during the winter have survived. As to the *Morus* cuttings, I only have one that survived the gnat ordeal, it is doing quite well. The seeds of the *Ribes aureum* and *Rubus parviflorus* germinated well, but the survival rate is very small. I baby the plants, but only have a few survivors. The *R. occidentalis* (I received 2, not 1 as listed), they came as tip rooted, and very small; they are doing excellent and I am very pleased with them. I am hoping to be able to share and continue to propagate them. The *Ribes spicatum* never rooted.

2. This material was useful. Some were totally unknown to me. I have learned new techniques. How some of these varieties grow, and am able to share my experiments with others. I hope others can also benefit from my experiments.
3. This work was my own personal experimentation. I did not make any crosses; although I have grafted the ficus carica onto my own root stock and those seem to be doing better. Only the future will tell if the new plants/fruits are actually new or just improved from the root stock used. I really hope to be able to continuing sharing knowledge and spark other youngsters to feel interested in the area of producing fruits in a home orchard setting. Fruits that are delicious, nutritious and easy to grow.
4. I have not yet completed any publications.

Please let me know if you wish to have pictures of the survivors. I am working (volunteering) with the local Boys and Girls club helping them put up a garden from the children, it is a setting where the children are part of it. I am hoping to bring the plants in when they are more established. Not in your list, but this year, I also received several kiwi cuttings. They are in refrigeration still. I have a few out in rooting process. I will test a few kinds to see which one works for us.

Perhaps my boldest move was to dig a large hole next to my 24 y.o. fig tree, find a good flexible ½" thick root, I dug enough of a hole so I could work in it. I grafted a little piece of my Black Madeira (rare and difficult to root variety) onto the root I uncovered. With the entire root still in the soil, the graft was covered with a clear 5 gallon bottle (comes with water) without bottom, covered with wood chips, under the soil line, and another larger plastic container was put over to keep the warmth in. I could monitor the growth through the bottle neck. It did a little growth last summer and it was time to go to sleep.

Because it was sitting under the other tree, in not a sunny spot, I waited until last week to unearth it. I dug further and cut the root long enough to be able to plant it in a large pot, in a sunnier location. I had it covered under a plastic shelter not to get too soggy; it is waking up with glory. This variety has the most beautiful leaves. My one cutting straight to root grafting worked! This is worth noting for other rare varieties.

17. <u>Jacqueline King, WSU Mount Vernon NWREC, Mount Vernon, WA</u>

Order # 250202

2 Phaseolus vulgaris

1. Accessions arrived in good condition and in a timely manner.
2. The accessions were intended for a bean field trial but the investigators decided not to include them.
3. See #2.
4. No.

18. <u>Ted Kisha, USDA-ARS, Washington State University, Pullman, WA</u>

Orders # 242865, 247555

4 Eragrostis tef

337 Eragrostis tef

1 Festuca arundinacea

All the tef was grown out for DNA extraction. We began analysis with TRAP (Target Region Amplification Polymorphism) markers designed after genes in the Gibberellic Acid pathway hoping to separate the accessions into groups by potential for straw strength. Ran 4 plants each of the first 48 accessions (and then ran out of $$$) with excellent results. While

AFLP separated them into 3 admixed groups, the TRAP markers found 14 distinct groups. Hoping to continue the research until all 400+ are complete. Maybe thought of bulking accessions. We're hoping to correlate groups with straw strength and try recurrent selection to produce tef that will stand up. Working with Kevin Murphy in CSS to find funding.
1. The material arrived in good condition, and germinated well.
2. The material was useful (see notes above).
3. For future plans with this material, see above.
4. No publications as yet.

19. <u>Thomas Koehler, Dow Agroscience, Pullman, WA</u>
Orders # 249400, 250437
24 Triticum aestivum subsp. aestivum
1 Triticum aestivum subsp. aestivum

24 Triticum aestivum subsp. aestivum
1. The material arrived in good condition and germinated well. It is growing in the field.
2. We have not been able to evaluate the material to date.
3. The material may be used to map traits of interest and/or used in crossing.
4. No publications to date.

1 Triticum aestivum subsp. aestivum
1. The material arrived in good condition and germinated well. It is growing in the field.
2. We have not been able to evaluate the material to date.
3. The material may be used to map traits of interest and/or used in crossing.
4. No publications to date.

20. <u>Erik Landry, Washington State University, Pullman, WA</u>
Orders # 241605, 241980, 248956, 249516
12 Corylus avellana
1 Corylus hybr.
1 Corylus spp.
15 Vicia faba
2 Vicia faba var. minuta
1 Hordeum vulgare subsp. vulgare
13 Secale cereale subsp. cereale
16 Triticum aestivum subsp. aestivum
5 Triticum aestivum subsp. spelta
2 Triticum turgidum subsp. dicoccon
2 Triticum turgidum subsp. durum
1 X Triticosecale spp.
1. Corylus didn't root
2. The Vicia was sown last year and I sampled for sugars.
3,4. I'll be publishing a paper on sugar profiles hopefully this fall, and probably upload the raw data to GRIN at some point as well.

21. <u>JoAnn Mahaffey, Olympia, WA</u>
Order # 241831
2 Triticum monococcum subsp. monococcum

1. Yes, the sample arrived in good condition and quickly. It germinated easily and grew well. I suspected it would be small and grass like which it is.
2. I am on the board of South Sound Seed Stewards. We have a demonstration booth at the Washington State Fair. I made an herbariun sample of the Einkorn and used it in the booth along with other wheats to show the evolution of wheat and the variety of wheat from different parts of the world. Most people don't know the difference between wheat and oats or barley so the display was interesting to lots of people. I also used the Einkorn sample in a talk I gave to Lewis County Master Gardeners on growing grain in your back yard. Much to my surprise they really ran with it and had a harvest festival in the fall.
3. I will keep this seed going but have no plans to do any breeding with it. Wouldn't that be reinventing the wheel? Jim Myers warned me about that in a long discussion we had about creating an op small headed cabbage. Then I found Copenhagen Market and saved myself a lot of work.
4. No publications, live presentations.

Hope this is helpful. Would really hate to see GRIN go away due to lack of funding Thanks.

22. <u>Rebecca McGee, USDA-ARS, Washington State University, Pullman, WA</u>

Orders # 241169, 242038, 243847, 244343, 244410, 244889, 244890, 245237, 245238, 245240, 245268, 247345, 248619

10 Phaseolus acutifolius
7 Lens culinaris subsp. culinaris
509 Cicer arietinum
3 Cicer reticulatum
6 Lathyrus sativus
29 Pisum fulvum
260 Lens culinaris subsp. culinaris
2 Pisum abyssinicum
301 Pisum sativum
2 Pisum sativum subsp. asiaticum
9 Pisum sativum subsp. elatius
10 Pisum sativum subsp. sativum
1 Pisum sativum subsp. transcaucasicum
13 Pisum sativum var. arvense
3 Pisum sativum var. pumilio
1 Pisum sativum var. sativum
14 Cicer arietinum
1 Cicer bijugum
10 Lens culinaris subsp. culinaris
3 Lens culinaris subsp. odemensis
28 Lens culinaris subsp. orientalis
29 Lens ervoides
12 Lens nigricans
1 Pisum sativum
4 Lens culinaris subsp. culinaris
1 Pisum sativum

1. Yes, materials arrived in good condition.
2. Yes, as materials used for many experiments and in breeding.

3. GBS, GWAS, Phenotypic Evaluation, Breeding, etc. Developing offerings to the plants? Don't know what they want yet… Future plans include phenotyping, identifying MTA, mapping, etc.
4. 2013-2014 reports in preparation and/or submitted, not yet accepted.

23. <u>Carol Miles, WSU Mount Vernon NWREC, Mount Vernon, WA</u>

Order # 248780

106 Lactuca sativa

1. Seed arrived in good condition and had a high germination percentage. Seed was not grown past the cotyledon stage so growth beyond that point cannot be commented on. Significant differences in germination rate at 5^{o} C were observed between accessions.
2. This seed was useful in gaining knowledge about the genetic component of lettuce germination rate at cold temperatures. The seed germinated well and the method of seed production used by the USDA Germplasm Repository made the seed very useful for observing the genetic component of germination due to the environmental conditions during seed production being kept the same.
3. The seed received was used in a germination screening performed at 5^{o} C to collect data on the germination rate of each accession at low temperatures.
4. The results of this screening will be published and potentially be made available on the USDA Germplasm Repository's GRIN Network to make it accessible to the public. Oral presentations and posters listed below:

<u>Presentations</u>

27 March 2014 Evaluating baby-leaf salad greens for spring and fall production in Northwest Washington. Poster presentation, Washington State University Academic Showcase. Pullman, WA.

29 July 2014 Screening the USDA lettuce germplasm collection for rapid germination rate under cold conditions. Oral presentation, 2014 ASHS Annual Conference. Orlando, FL.

Reported by Charlene Grahn, WSU Mount Vernon NWREC.

24. <u>Amita Mohan, Crop and Soil Science, Washington State University, Pullman, WA</u>

Orders # 243555, 249202, 249270, 251371

1 Sorghum bicolor subsp. bicolor
1 Oryza sativa
1 Triticum aestivum subsp. aestivum
1 Triticum turgidum subsp. durum
1 Raphanus sativus
1 Solanum lycopersicum
3 Oryza sativa

1. We have not received Raphanus and Solanum seeds. The other material arrived in good condition. Some of the seeds did not germinate in our initial experiment but most of the germinated seeds grew well in greenhouse conditions.
2. The material was useful for our experiment and most of the lines were used as a check.
3. The material is being used for research purposes. We are evaluating these lines and compiling the data that will be published.
4. No publications at this time; the material is still under evaluation.

25. Paula M. Moore, Washington State University, Pullman, WA

Order # 242884

2 Elymus elymoides subsp. brevifolius
1 Elymus macrourus
2 Elymus wawawaiensis

1. The material arrived in good condition and germinated well. It was used for a viability study and was not grown into plants. The seed did have a lot of fungus growth on the seed coat.
2. This material was useful to me since is not available commercially.
3. Material was used for a Master's program research and thesis work. No crosses, new plant offerings, or future use of material.
4. Publications: in the future the research will be published with AOSA Handbook for Testing Seed. The intended journal publication at this time will be Seed Technology, published by AOSA. The thesis will not be published until December 2016.

26. Rhonda and Dave Moulton, Port Angeles, WA

Order # 251876

1 Beta vulgaris subsp. vulgaris
5 Lactuca sativa

The materials arrived in very good condition. The seeds were planted about 1 ½ weeks ago and are sprouting well. They appear to be thriving and healthy. We home school and the seeds were used for educational purposes that are ongoing.

27. Madrona Murphy, KWIAHT: Center for the Historical Ecology of the Salish Sea, Lopez Island, WA

Orders # 244879

1 Trifolium wormskioldii

1. The material arrived in good condition and germinated well (we used sandpaper for scarification and it germinated in less than a week at room temperature). It is growing well. The material from the Nooksack Delta showed some red coloration in the new leaves, which we did not find in the material from Pacific County.
2. This material was very useful to us. *T. wormskioldii* used to be a component of estuarine plant communities in the San Juan archipelago, but has been extirpated since at least the 30s--we would like to include it in living shoreline projects and this is our first opportunity to observe material from our eco-region.
3. We intend to use this material for both research and restoration; we have not made any crosses and will be keeping the accessions separate. The material from Pacific County will be used for research only, whereas the material from the Nooksack Delta will be used as seed and cutting sources for both research and out planting.
4. We have no publications or news items related to the material at this time.

Thanks!

28. Linda Mustard, Crestview Farms, Montesano, WA

Order # 221115

1 Fragaria vesca subsp. bracteata
1 Fragaria virginiana subsp. platypetala
1 Lonicera caerulea var. kamtschatica
1 Pyrus communis

1 Pyrus pyrifolia
1 Pyrus spp.
1 Rubus hybr.
1 Rubus loganobaccus
1 Rubus strigosus
1 Vaccinium uliginosum

All received in good condition. Nothing survived apparently due to the weather conditions in my area. Very helpful in determining what not to plant.

29. <u>Steve Noffsinger, Seneca Foods Corporation, Dayton, WA</u>

Orders # 241569, 242073, 242232, 243273, 245641, 246521

8 Phaseolus vulgaris
1 Phaseolus vulgaris
1 Phaseolus vulgaris
4 Phaseolus lunatus
3 Phaseolus vulgaris
2 Phaseolus vulgaris

1. All material arrived in good condition and did well.
2. This material was useful. Primarily, we're looking at virus tolerance in the Upper Midwest and Great Lakes Region, like all the other companies are doing right now for that area. The virus issue in snap beans isn't going away soon, as good to excellent tolerance is very difficult to achieve and very quantitative.
3. Some of the plant germplasm we received will continue to be used as checks, and others will/have gone into crossing to develop new breeding material and varieties. It will be 10-20 years before any progeny will be used as processing varieties. The *Phaseolus lunatus* accessions were a very long shot for increasing genetic diversity and developing improved varieties, as there appears to be almost no diversity in the green baby lima gene pool for varieties that have been released in the last several decades. There are only 2-4 very part-time lima bean breeders in North America, and most have gone outside to wilder *Phaseolus lunatus* material for breeding green baby limas.
4. These materials were mentioned in monthly and annual Seneca publications, which are for internal use only.

30. <u>Charles Polance, Western Cascade Fruit Society, Lakewood, WA</u>

Order # 242279

3 Ficus carica

1. Material arrived in good condition and grew well.
2. This material was very useful.
3. I am conducting research on fig varieties that fall under the category of San Pedro. These have the potential of producing a good breba crop in our cool Pacific NW.
4. Published article in WCFS Newsletter May 2014 (see above).

31. <u>Lyndon Porter, USDA-ARS, Pullman, WA</u>

Order # 243116

3 Pisum abyssinicum
3 Pisum fulvum

345 Pisum sativum
3 Pisum sativum subsp. asiaticum
30 Pisum sativum subsp. elatius
11 Pisum sativum subsp. sativum
1 Pisum sativum subsp. transcaucasicum
18 Pisum sativum var. arvense
2 Pisum sativum var. elatius
5 Pisum sativum var. pumilio
1 Pisum sativum var. sativum
3 Pisum spp.

1. The material arrived in good condition and we did not have any problems with the material germinating and establishing healthy plants. We did not have any problems with general growth and development of the plants.
2. This material was extremely useful for us. We have been using this material to screen for resistance in pea to two major viral pathogens, Bean Leaf Roll Virus and Pea Enation Mosaic Virus. We have identified some material with resistance to these pathogens that can be used in future breeding programs to develop resistant cultivars.
3. The material received has been used in research experiments to identify germplasm with resistance to major viruses (Bean Leaf Roll Virus and Pea Enation Mosaic Virus) impacting the pea industry. Crosses have not been made using this material. I have not yet developed any new plant offspring. My future plans for this material are to finish identifying virus-resistant material and develop mapping populations from this material to identify genes associated with the resistance.
4. Publications:

Porter, L. D. 2012. Pea germplasm with partial resistance to *Sclerotinia sclerotiorum* that extends the time required by the pathogen to infect host tissue. Crop Science 52: 1044-1055.

Porter, L. D. 2012. Selection of pea genotypes with partial resistance to *Sclerotinia sclerotiorum* across a wide range of temperatures and periods of high relative humidity. Euphytica 186:671-67.

Porter, L.D. 2010. Identification of tolerance to *Fusarium* root rot in wild pea germplasm with high levels of partial resistance. Pisum Genetics 42:1-6.

Porter, L.D., Hoheisel, G., and Coffman, V.A. 2008. Resistance of peas to *Sclerotinia sclerotiorum* in the *Pisum* core collection. Plant Pathology 58: 52-60.

32. <u>Casey Sauls, Cummins Nursery, Battle Ground, WA</u>

Order # 239399
2 Malus domestica

In 2013 I received *Malus domestica* cultivars 'Rosemary Russet' and 'Grenadier'

1. The scions arrived in excellent condition and took easily. The growth of Rosemary Russet was stronger than that of Grenadier. Growth from Rosemary Russet on G41 and Bud-9 each topped three feet, while Grenadier grew less than a foot on G41 and G202. I looked for varieties that showed resistance to bacterial canker induced by *Pseudomonas syringae*. I have noticed no infection on Grenadier (either on G202 or G41). Damage from canker was seen on Rosemary Russet on the apical buds of trees on Bud-9 and G41. No further canker was observed.

2. The scionwood was very useful to me because I am trying to find cultivars that will respond better to the wet growing conditions in my area.
3. I plan to grow out Rosemary Russet and Grenadier. I may top graft Hudson's Golden Gem onto one of the Grenadier G202 trees as Hudson's Golden Gem is more susceptible to Pseudomonas infection.
4. I have not completed any publications or news items. Thank you for providing this scionwood.

33. <u>Dipak Sharma-Poudyal, Washington State University, Pullman, WA</u>

Order # 244129

41 Pisum sativum
2 Pisum sativum subsp. sativum
1 Pisum sativum var. arvense

1. I received materials in good condition. I used these *Pisum* lines to find out the resistance sources to pea root rot caused by *Rhizoctonia solani* AG 8. Experiments were conducted in green house condition. Most of the lines germinated well but PI175226, PI197450, and PI226561 did not germinate well. I took measurement on plant height, dry weight of shoot and root, and root rot severity caused by the pathogen on pea seedling after 4 week of planting.
2. These materials were useful to search for the sources of resistance for root rot caused by *Rhizoctonia solani* AG 8. Although most of the pea lines are susceptible to pea root rot, a few pea lines performed well in inoculated condition. However, there was great variation among these promising lines within experiment and between experiments.
3. Screening of *Pisum* lines was a part of a research project "Epidemiology and management of stunting of onion and pea in the Columbia Basin of Oregon and Washington". I did not make any crosses. The project was finished last year. And we do not have any further plans to proceed.
4. I do not have any publication to date from this study. I am working on the data and going to write a manuscript.

34. <u>Michael Pumphrey, Washington State University, Pullman, WA</u>

Order # 248567

319 Triticum aestivum subsp. aestivum
1 Triticum aestivum subsp. spelta
3 Triticum monococcum subsp. monococcum
1 Triticum turgidum subsp. dicoccon
2 Triticum turgidum subsp. durum
1 Triticum turgidum subsp. turgidum

1. The material arrived in good condition. Germination and growth were excellent. There are variations in morphological and physiological traits, and response to stripe rust and both seedling and adult growth stages.
2. The material was useful because it is part of the NSGC winter wheat core collection for the Washington State University TCAP stripe rust project.
3. The materials are part of the winter wheat TCAP association mapping panel. Future plans are to develop mapping populations that will enable us target stripe rust resistance loci with greater precision and higher resolution. In addition, the stripe rust resistance in the

materials will be used for diversification of stripe rust resistance in the Washington State University wheat breeding program.

4. No publications yet. However, we have started drafting manuscripts for publication.

Reported by Victor Louis Demacon (vdemacon@wsu.edu)

35. Lucinda Stockett, Friends of Mukai Gardens, Vashon, WA

Order # 249441

1 Fragaria x ananassa

With regard to the *Fragaria x ananassa* I requested: It arrived last October in good condition, two plants have survived and are thriving. The plants were very useful as they will be a wonderful addition to the Mukai Farm and Garden, located on Vashon. B.D Mukai was a Japanese immigrant to Vashon in the 1920's and grew 60 acres of Marshall strawberries. He was very successful and created a thriving industry built around the Marshalls. Our group, "Friends of Mukai Gardens," are in the process of restoring the Mukai Farm and the Garden which was a unique example of a Japanese garden designed by a Japanese woman in the 1930's. I have been in the process of reintroducing them also to the community of Vashon Island. Several articles have been written by me, in our local paper, "The Beachcomber."

Cindy Stockett (A recent article is included above).

36. Bill Whitson, Cultivariable Seeds, Moclips, WA

Order #249559

3 Solanum ajanhuiri

1. All tubes of 1 accession (599279) arrived contaminated, but I was able to save one of them. The rest were in good condition and have grown very well in culture.
2. They have been useful, but won't be ready to use in breeding work until 2015.
3. I intend to use these varieties in breeding, but they're still being multiplied in culture at this point.
4. No publications as yet.

37. Jesse Wimer, WSU Mount Vernon NWREC, Mount Vernon, WA

Orders # 245862, 245901, 250576

13 Benincasa hispida

10 Cucurbita moschata

10 Lagenaria siceraria

All of the material arrived in good condition. The material was useful as it was included in a screen for Verticillium wilt resistance among watermelon rootstocks. None of the accessions were found to be completely resistant to Verticillium wilt, but all demonstrated varying levels of tolerance (and all had greater tolerance than watermelon).

Although it was very interesting to grow the *B. hispida* accessions, these plants did not thrive in our climate due to the cool summer weather in northwestern Washington. Thus, while some of the *B. hispida* accessions demonstrated high levels of tolerance to Verticillium wilt, they would be of little practical importance in our area.

Germination for all accessions was fairly high (>75%), but it was also somewhat sporadic (especially for *B. hispida*). Rooting was good for all accessions except for *B. hispida*. Vigor in

the greenhouse was relatively high for all accessions except for *B. hispida*, however, the variability in germination led to a lack of uniformity among the seedlings of any given accession.

No crosses were made and no new plant offerings will be made available directly from my efforts. However, new information regarding Verticillium wilt resistance will be made available, which could be used in future breeding programs. My plan with this material is to use it as rootstock for watermelon in a 2014 observational trial at WSU Mount Vernon NWREC.

Publications:

Wimer, J.A., C.A., Miles, and D.A. Inglis. 2014. Evaluation of watermelon rootstocks for resistance to Verticillium wilt in northwestern Washington. (Abstract) ASHS Annual Conference, Orlando, Florida.

Wimer, J.A., C.A., Miles, and D.A. Inglis. 2014. Evaluation of watermelon rootstocks for resistance to Verticillium wilt in northwestern Washington. (Abstract) ISHS International Symposium on Vegetable Grafting, Wuhan, China, p. 59.

38. <u>Louisa Winkler, WSU Mount Vernon NWREC, Mount Vernon, WA</u>

Order # 249424

20 Avena sativa

1. All the material arrived in good condition with no seed discolouration. All accessions have been observed for at least part of one cycle under greenhouse conditions (Kuromi and Marvelous were requested later and are now heading). Germination has been close to 100% and development normal. Disease symptoms have arisen on plants leading up to anthesis and *Fusarium poae* has been isolated from plant samples, but this is unlikely to be related to the seed; similar symptoms have been observed on plants from other seed sources. We think that the problem may be due to greenhouse sanitation and thrip pressure. Disease symptoms include white, necrotic lesions with pink tinges, blasted florets and white fungal mycelium on some emerging heads in the worst cases. Accessions MF9424-66, MF9521-79, MF9521-461 and MF9620-64 appeared to be particularly badly affected. Photographs can be provided if desired. All accessions except Kuromi and Marvelous have now been planted in the field for harvest of seed in August 2014.
2. My work with these accessions only began in Fall 2013, but progress to date is good and much of the material will be actively used in research and breeding work (please see Question 3 for details).
3. I have harvested seed from those accessions which have already completed a generation in the greenhouse. Kuromi is intended for use as a source of genetic resistance against *Microdochium nivale* in the oat breeding program, and Marvelous for use as a crown-rust susceptible disease check (there are no reports of crown rust, *Puccinia coronata*, having been observed in western Washington, so it will be interesting to see if Marvelous picks it up). Brooks, Norline, Wintok, and Black Winter oat seeds were planted in the field in fall 2013 and survived several hard frosts and prolonged periods of cold (several degrees to either side of freezing) temperatures. They appear to have potential as a source of cold-tolerance genes and will be used as breeding parents.They are also being used in an experimental programme of spring-by-winter crosses which is hoped to form the basis of a genetic study to better understand genetic control of winter tolerance and its effects on grain quality characteristics. Pringle's Progress, Swan, Suwannee, Brighton, Welcome and Marion have been a fascinating example of the oat phenotypes which cultivators and

breeders were dealing with in the late 18th and early 20th centuries. They will be grown in the field over the next few seasons for historical interest and to observe their disease resistance and other characteristics related to yield potential, to see if they could be interesting as breeding parents. All of the hulless oat lines will be observed for their potential as hulless breeding parents. The MF accessions were planted in fall but did not survive the winter.

4. No publications to date.

	Cultivar	Avena species	Hulled (H) / Hulless (N)	Spring (S) / Winter (W)
1	Black Winter Oat	sativa	H	W
2	Brighton	sativa	N	S
3	Brooks	sativa	H	W
4	Jostrain	sativa	H	S
5	Marion	sativa	H	S
6	Marvelous	sativa	H	S
7	MF9424-66	sativa	N	F
8	MF9521-462	sativa	N	F
9	MF9521-79	sativa	N	F
10	MF9620-64	sativa	N	F
11	NC Hulless	sativa	N	S
12	Norline	sativa	H	W
13	Otana	sativa	H	W
14	Pennlan	sativa	H	W
15	PI 62090	sativa	N	S
16	PI 629080	sativa	N	S
17	PI 629091	sativa	N	S
18	PI 620083	sativa	N	F
19	Pringle's Progress	sativa	H	S
20	Provena	sativa	N	S
21	Suwanee	byzantina	H	W
22	Swan	sativa	H	S
23	Terra	sativa	N	S
24	Welcome	sativa	H	F
25	Wintok	sativa	H	W
26	Kuromi	sativa	H	S