

2016 PRUNUS CGC MEETING - MINUTES
June 8, 2016
National Clonal Germplasm Repository
Davis, CA

Meeting was also accessible via teleconference at the number 888-844-9904 with the Access Code: 2604588#

- **8:00 am – Call to Order** -- Ksenija Gasic
 - **Roll Call** – Ksenija Gasic John Preece, Tom Gradziel, Terrence Frett, Ksenija Gasic, Margarita Bateman, Carolyn deBuse, on phone: Peter Bretting; Thomas Chao, Haidi Schwaning, Margaret Pooler, Gary Kinard, Cameron Peace, Jim McFerson, Andres
 - **Introductions**
 - **Formal election of Chair and new committee members** – John Preece/Ksenija Gasic
 - Need to elect the chair and the officials: KG nominated for the Chair, unanimously elected, 2 years' term,
 - All of those on call or present are members for next 3 years and those that could not make it but express interest.
 - Vulnerability statement needs to be revisited and prepared as a publication like Gayle Volk et al did for apple. Genetic Resources Crop Evolution journal.
- **Office of National Programs Report** – Peter Bretting – 18 sites in the NPGS; suggestion to devote first part of the CGC meeting(s) to briefly update the CVS (Crop Vulnerability Statement). In the provided presentation (at the end of the report) activity priorities are color coded; highest priority is in red, then orange and green; Personnel changes
- **National Germplasm Resources Laboratory Report** – Gary Kinard provided overview of the GRIN Global in addition to provided report.
- **NCGR-Davis Report** – John Preece and Carolyn DeBuse; JPreece gave an overview report on repository; huge change is that repository ships orders only to the scientific community; J.McFerson – are some of the orders available commercially? J.Preece – Yes, many are but not everything is. Those that are not might be available through CA rare fruit growers. Complementing JP for a great work and adjusting to the budgetary limitations with restricting who to ship material to G. Kinard, J. McFerson; #2 change is how repository is looking at the collection, traditionally collection was backed up in the containers, which is no longer feasible. The decision was made to only keep the plants

that are struggling in the field in containers. Using herbicides to maintain the ground in the orchards, not only strips but isles as well, the man hours for mowing. Repository is out of the land at Wolfskill. There are negotiations with UC Davis about the land that is used for viticulture to go to the repository.

- Carolyn deBuse – Many blocks in the repository are 20-30 years' age so they are in decline. CdeBuse is re-propagating collection, started with the peach and successfully re-grafted the collection to the new site which is in the 3rd leaf now 2016; apricot re-propagation was not so successful. Citation rootstock has been used, with 30% take on grafting due to the old rootstocks. This year take is 70% and the new orchard will be planted this fall; next are almonds. Discussing the report on the number of orders and items. **Acquisitions**; what is the priority for repository, heirlooms, breeding program material or wild material, which should be discussed in the vulnerability report.
- Mali Aradhaya – characterization of the collection; using molecular markers to reduce the number of seedlings, done for peach and apricot. GBS in Prunus to identify resistance for soil borne diseases.
- Mali will send K.Gasic list of the interspecific hybrids that he made for Prunus rootstock development to include into the GBS project.
- **NCGR-Geneva Report (attached)** – Thomas Chao; 130 accession of tart cherry, last year 12 requests, this year >30, significant increase of the requests 440; tart cherry cryopreservation started with M. Jenderek; most of the request are national.
- **Cryopreservation of Prunus** – Maria Jenderek; 15% success for peach. Over 1,000 accessions for peach, apricot and plums are held in repository and none backed up. Using dormant buds for cryo has drawbacks. Cryopreservation testing is time consuming, there is no way to graft material to test if cryo worked in Fort Collins, but dormant buds would work. Report provided on the success of cryo of dormant buds for peach, apricot and plums.
- **15 minute break**
- **APHIS Report (attached)** – Margarita Bateman – comments on the report that was sent to the committee and provided in hard copy at the meeting. Using NGS for pathogen detection for quarantine purposes.
- **State Reports** – Ksenija Gasic (SC), Tom Gradziel (CA), Amy Iezzoni (MI), Cameron Peace (WA), others?; K. Gasic: BARD grant, GBS apricot collection from Davis, carotenoid profiling of 90 accessions of peach from Davis and 180 from Clemson, Wells Fargo grant, update, rootstock GBS with Chile and Spain; Gradziel interest in self-compatibility in almond; Cameron; sweet cherry breeding, Nnadozie stepped down few months ago, that position will be advertised soon; no other systematic stone fruit breeding in WA; new cherry SNP array and peach; CP will genotype sweet cherry collection from Davis.

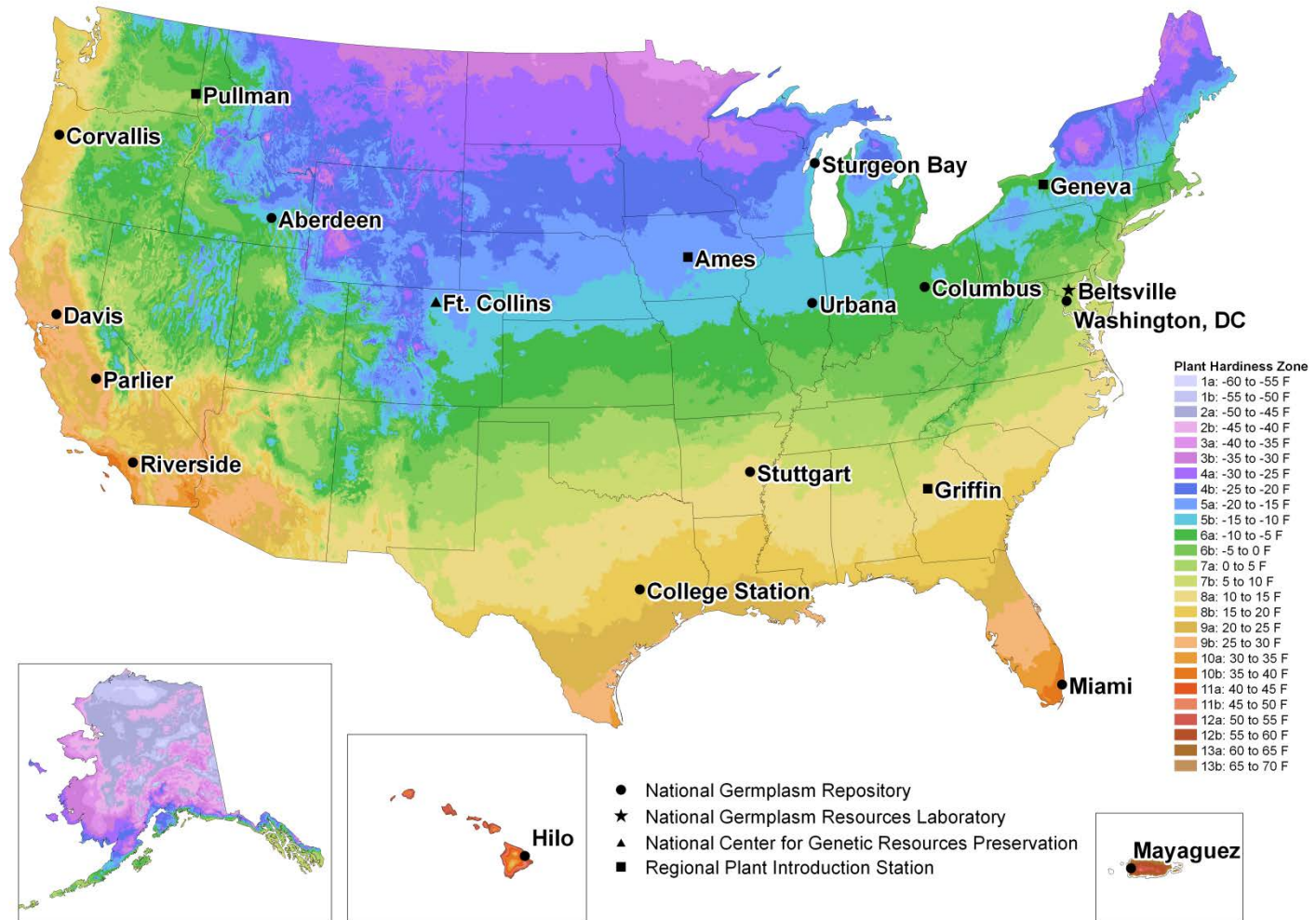
- **Evaluation Funding Report** – Cameron Peace
- **Prunus Vulnerability Statement** – Ksenija Gasic and John Preece will work on the vulnerability statement send it to the committee for edits. Make it up to date for posting on the NCGR web site and look how the material can be reformatted for publication similar to apple
- **Additional Items;** Thomas Chao is preparing collection trip to Taiwan. No wild material from Prunus can leave China. J. McFerson; recruitment is going on at Prosser for new virologist, and other staff members; J. Preece had a visiting scientist from Vietnam, she put few interspecific rootstock in vitro, did refrigerated studies with shoots in vitro, as a way to back up the collection for few years in cold. Master students will continue that work. For now Prunus is the species that is used for refrigerated storage experiment. Training on heat therapy and cleaning by Richard Slocum in Margarita's group is a possibility for a new person in Clemson to start making clean plants.
- **Discussion of time and location of next meeting;** Suggestion was to schedule it at approximately the same time and place for 2017, also to make it at the same time as RB2 visits to growers/breeders. It was decided that Prunus CGC meeting for 2017 will be in August 10-11, after NAPB meeting at Davis repository.
- Morning session adjourned at 12:15pm and after lunch travel to Wolfskill Experimental Orchards for tour of the Prunus collections

Minutes taken by K. Gasic

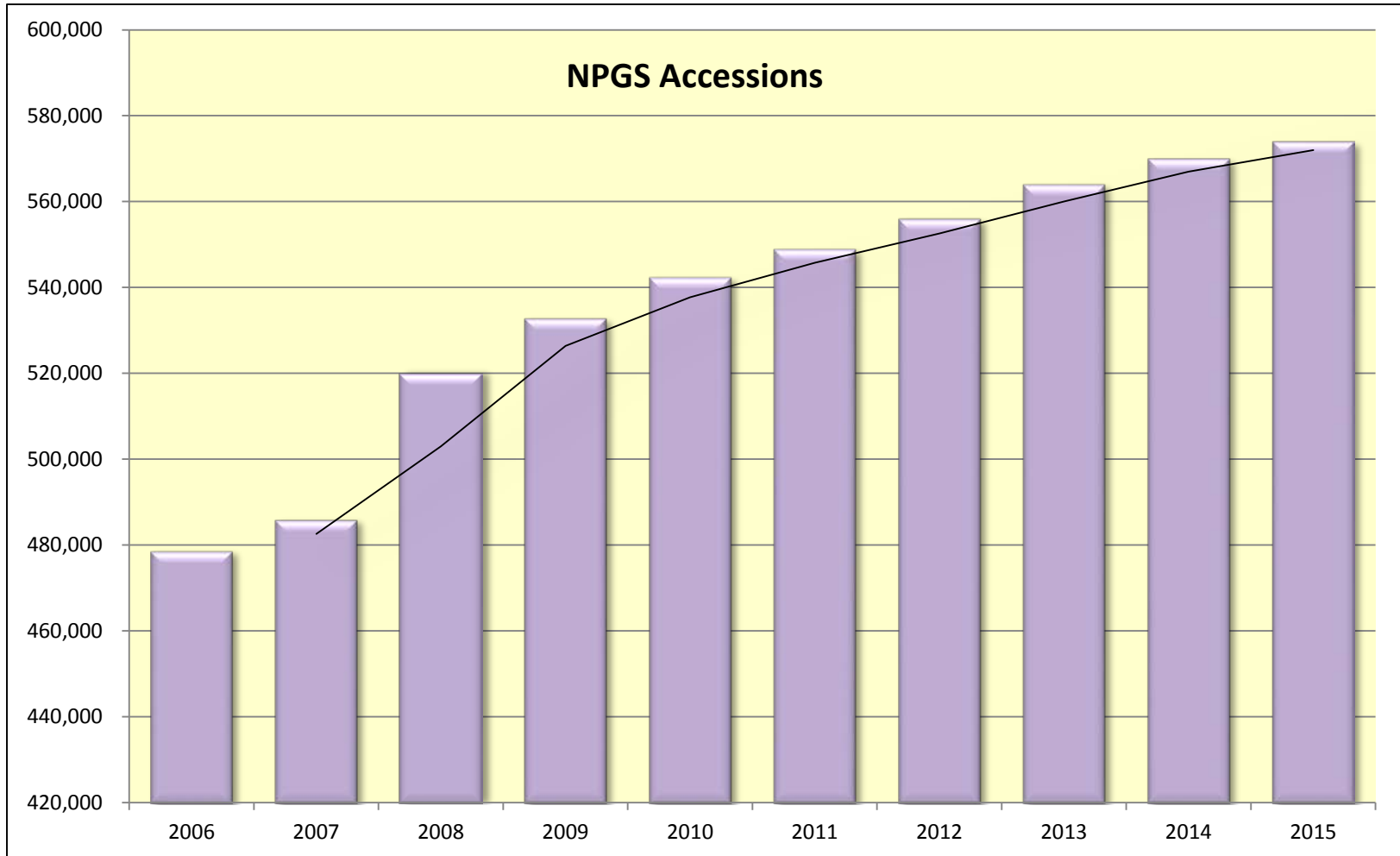
The National Plant Germplasm System: 2016 Status, Prospects, and Challenges

Peter Bretting
USDA/ARS Office of National Programs
Peter.bretting@ars.usda.gov
1.301.504.5541

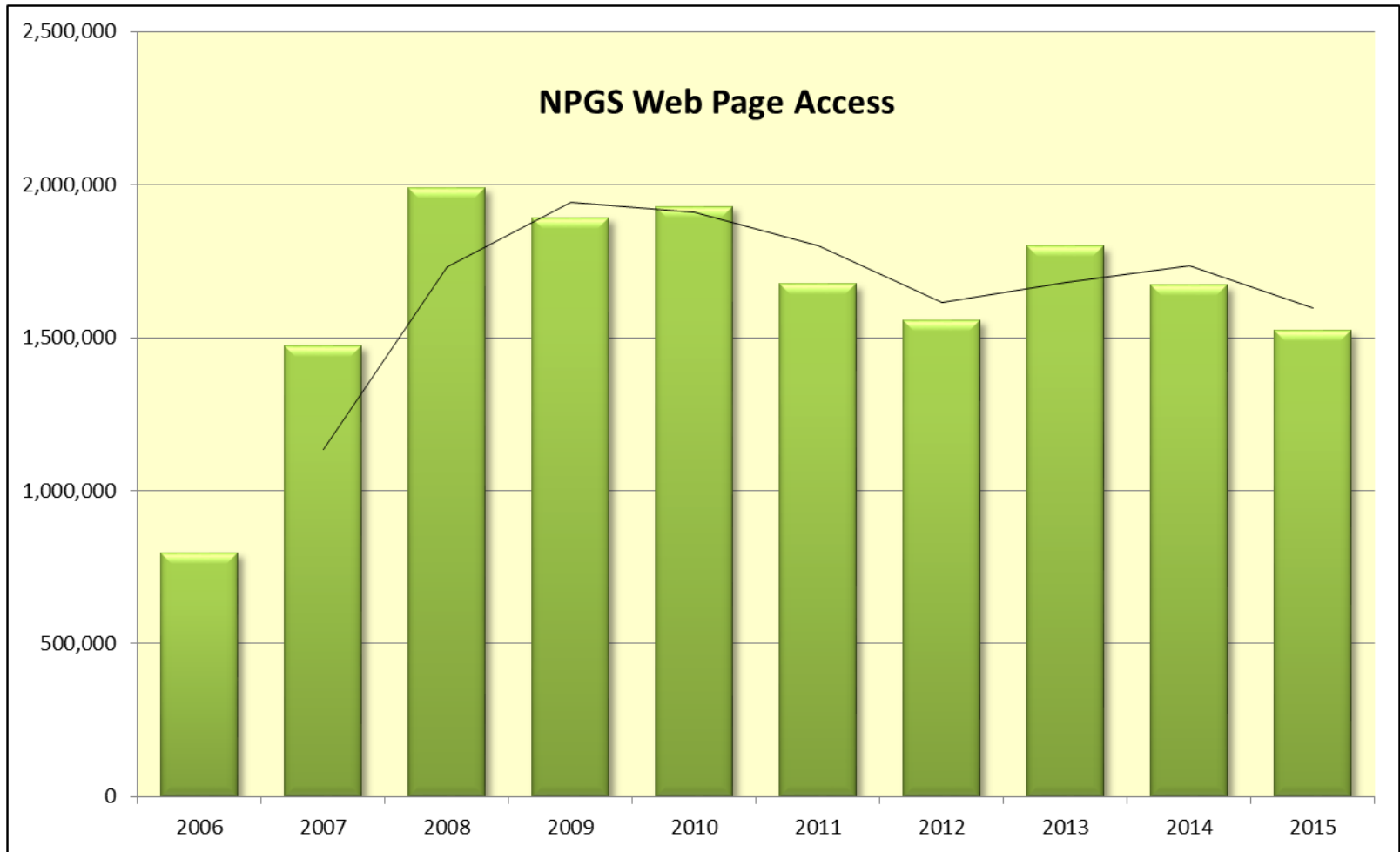
USDA National Plant Germplasm System (NPGS)



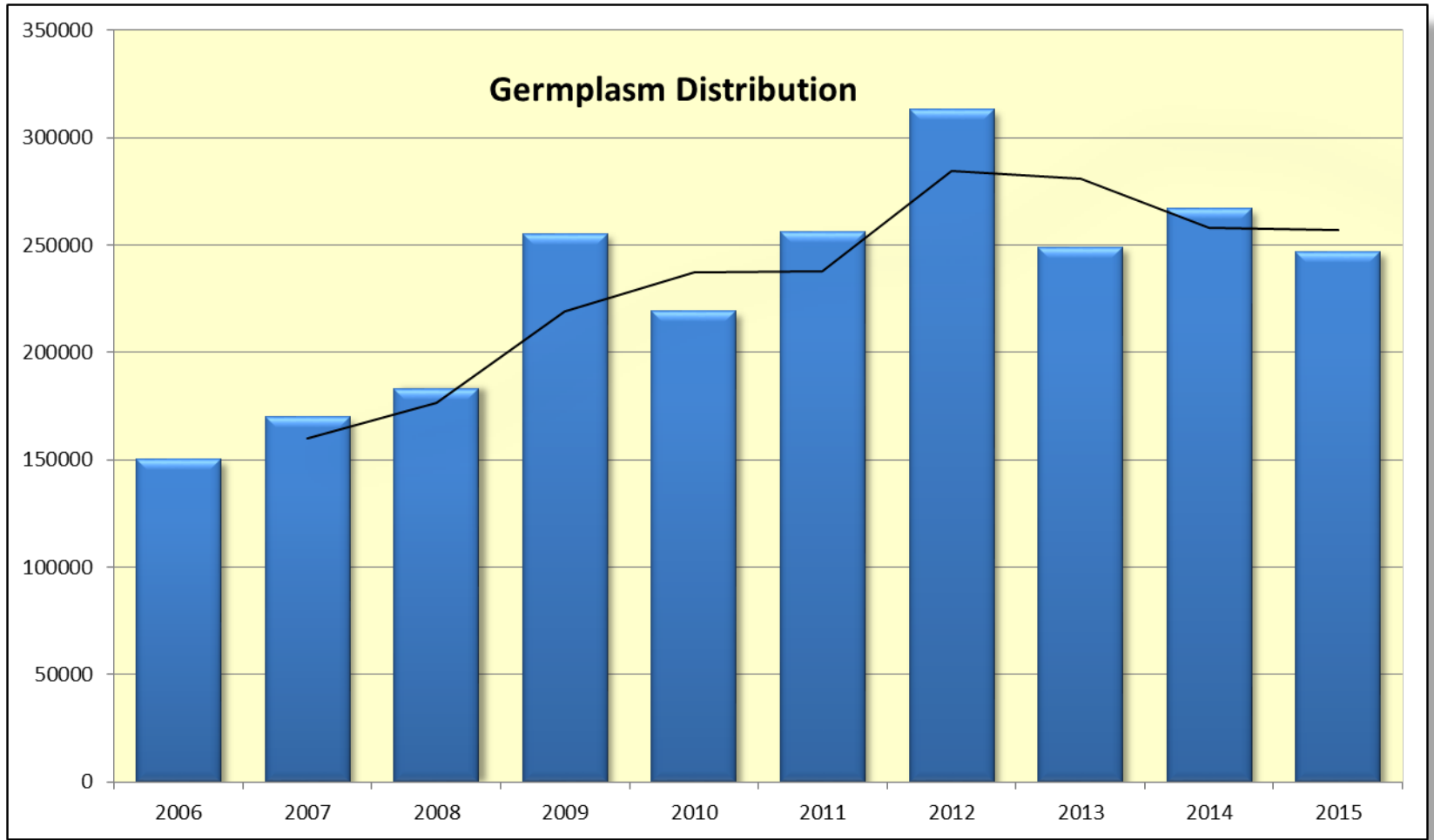
NUMBER OF NPGS ACCESSIONS 2006-2015



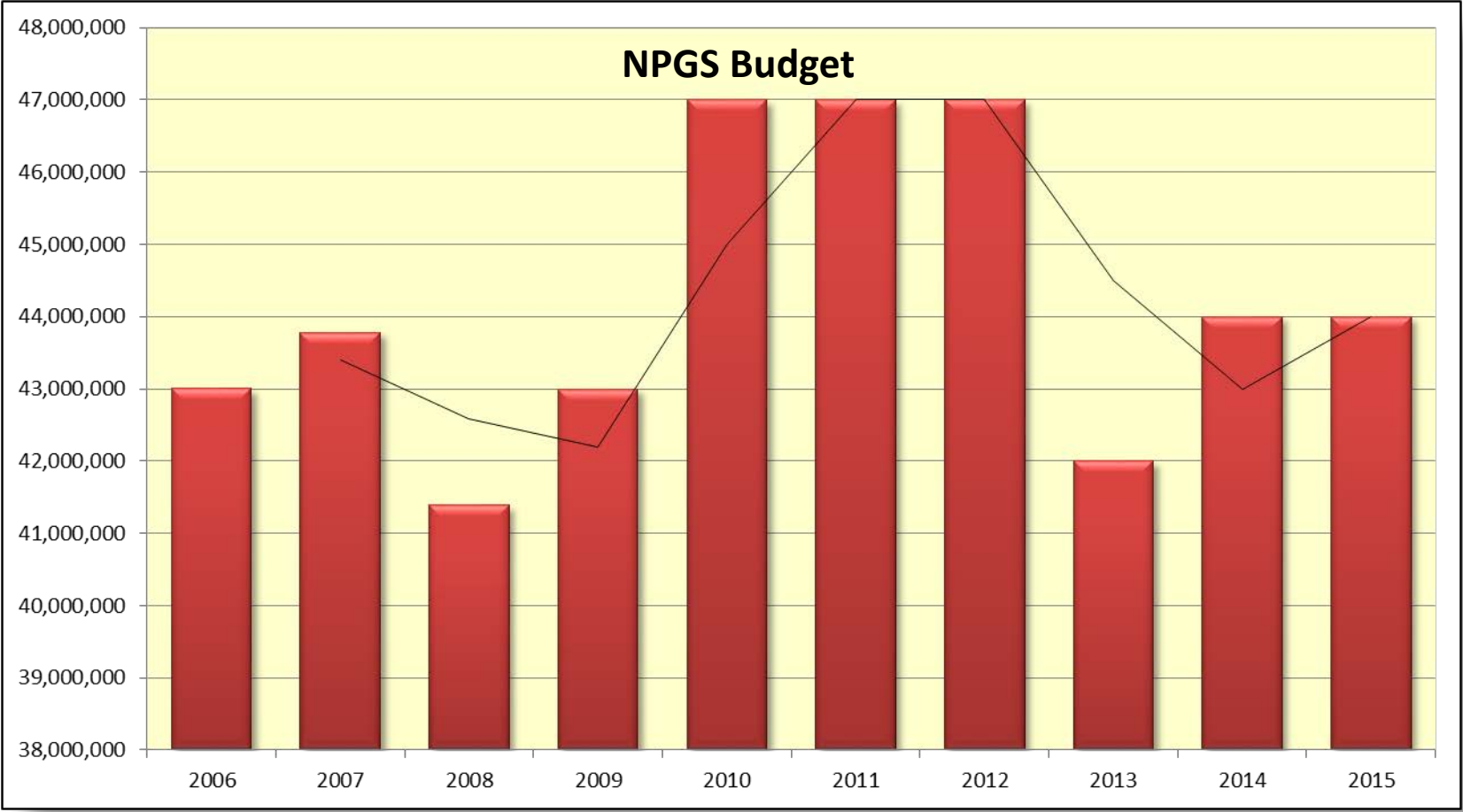
DEMAND FOR NPGS INFORMATION 2006-2015



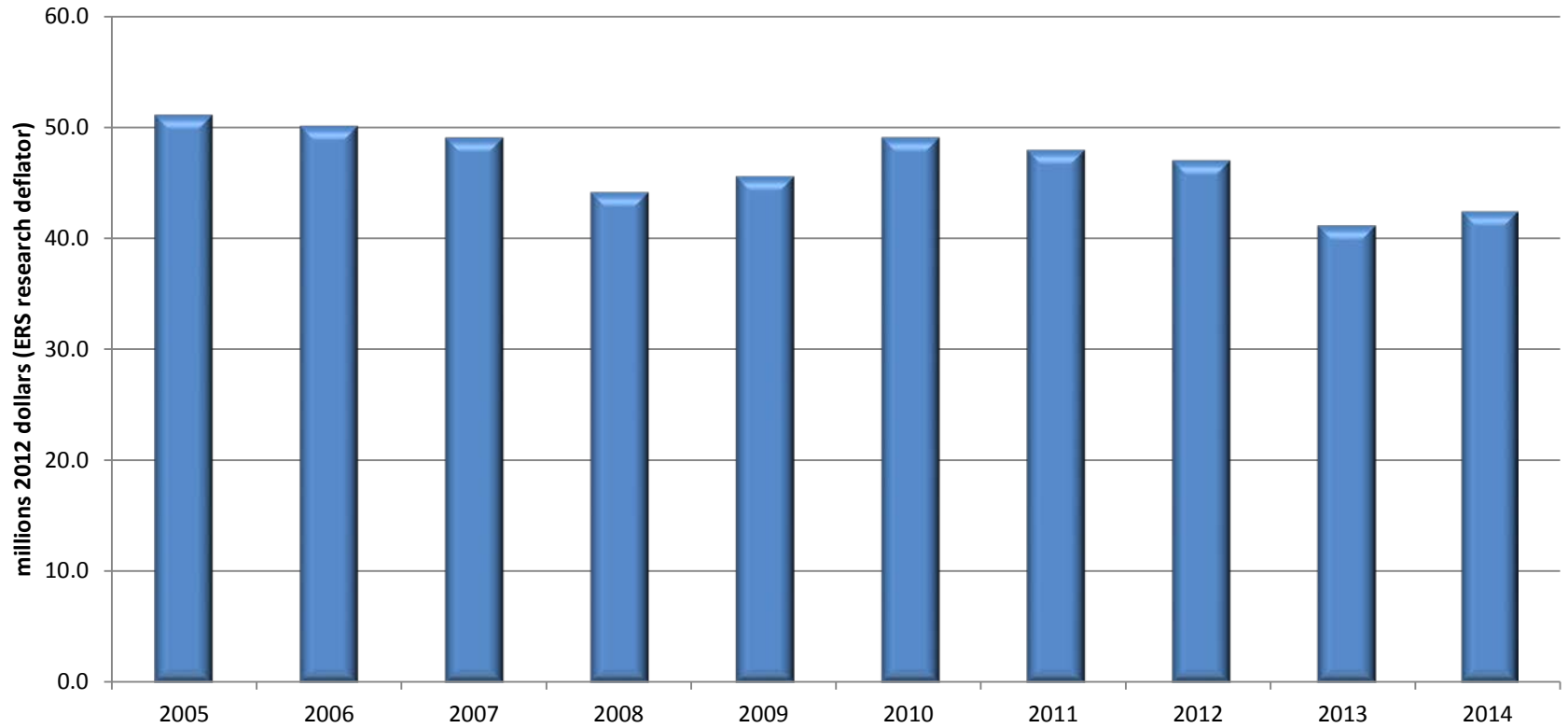
DEMAND FOR NPGS GERMPLASM 2006-2015



ARS NATIONAL PLANT GERMPLASM SYSTEM BUDGET 2006-2015



Real ARS National Plant Germplasm System Budget, 2005-2014 converted to 2012 dollars with ERS research deflator



Some key challenges that stretch the NPGS's resources

- **Managing and expanding the NPGS operational capacity and infrastructure to meet the increased demand for germplasm and associated information**
- **Fulfilling the demand for additional germplasm characterizations/evaluations**
- **Acquiring and conserving germplasm of crop wild relatives**
- **BMPs and procedures for managing accessions (and breeding stocks) with GE traits and the occurrence of adventitious presence (AP)**

A key priority: Crop Vulnerability Statements (CVS)

- **Assessing crop genetic vulnerability and setting NPGS priorities accordingly.**
 - **Template for constructing crop vulnerability statements**
 - **Some CGC have published, or plan to publish, their CVS— e.g., Volk et al. 2014 The vulnerability of US apple (Malus) genetic resources. Genet. Resour. Crop Evol. DOI 10.1007/s10722-014-0194-2.**
 - **But, CVS need not be as formal as that. Web-style content is fine.**
 - **It's more important that the CVS be updated frequently; perhaps devote the first part of each CGC meeting to briefly reviewing and updating the CVS.**

Genetic Resource Management Priorities

- **Acquisition**
- **Maintenance**
- **Regeneration**
- **Documentation and Data Management**
- **Distribution**
- **Characterization**
- **Evaluation**
- **Enhancement**
- **Research in support of the preceding priorities**

Personnel Changes

- Farewell and best wishes to Barbara Reed (NCGR-Corvallis), RC Johnson (WRPIS-Pullman) and Dan Barney (NCRPIS-Ames) for their retirements.
- Congratulations and best wishes to Richard Olsen, formerly lead scientist for the USNA-Washington, DC genebank project, on becoming the new Director, USNA.
- Best wishes to Brian Irish who moved from TARS-Mayagüez to WRPIS-Pullman/Prosser to be the new alfalfa and clover curator.
- Welcome and best wishes to Shyam Tallury, new peanut curator at SRPIS-Griffin; Claire Heinitz, new curator at NALPGR–Parlier; and Mary Lou Polek, the new RL for the NCGR-Riverside.

**USDA-ARS National Germplasm Resources Laboratory
Beltsville, Maryland
2016 Report to PGO, RTACs and CGCs**

The National Germplasm Resources Laboratory (NGRL) supports the acquisition, introduction, documentation, evaluation, and distribution of germplasm by the National Plant Germplasm System (NPGS) and other components of the U.S. National Genetic Resources Program (NGRP). The Laboratory is comprised of the Plant Exchange Office (PEO), the Database Management Unit (DBMU), and the Plant Disease Research Unit (PDRU).

Plant Exchange Office

Plant Exploration and Exchange Program:

- The PEO supports the collection of germplasm for the NPGS through the management of a Plant Exploration and Exchange Program. Guidelines for developing plant exploration and exchange proposals will be distributed to CGC chairs in January 2016. Proposals must be endorsed by the appropriate CGC or other crop experts.
- The deadline for submitting proposals for explorations or exchanges to be conducted in FY 2017 is July 22, 2016.
- All foreign explorations supported by PEO comply with the Convention on Biological Diversity on access and benefit sharing related to genetic resources. Prior informed consent to collect genetic resources is obtained from the host country before the exploration. The PEO is involved in most requests to foreign governments for permission to collect, and negotiates the terms of agreements when necessary.

FY 2015 NPGS Plant Explorations:

<u>Target Crop</u>	<u>Country</u>	<u>Principal Contacts</u>
Woody landscape plants	Armenia	G. Fayvush, A. Lexanyan, H. Hovhannesian
Woody landscape plants	Georgia	M. Eristavi, G. Tedoradze, T. Kurdadze
Wild sunflower	United States (AZ, UT)	L. Marek, G. Seiler
Kentucky coffeetree	United States (AR, KS, MO, OK)	J. Carstens, A. Schmitz
Switchgrass	United States (CT, MA, ME, NH, RI, VT)	M. Harrison, G. Pederson, R. Brown
American smoketree	United States (AR, MO, OK)	J. Carstens, C. Hopkins, J. Graf
Wild apple	United States (AL, AR, MI)	T. Chao
Wild potato	United States (AZ)	J. Bamberg, C. Fernandez, A. del Rio

Wild beet	United States (CA)	B. Hellier, L. Panella, K. Richardson
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Conservation of Cranberry Genetic Resources in the U.S.:

- A pilot project under the US Forest Service - ARS framework on complementary conservation of crop wild relatives is continuing (<http://www.fs.fed.us/wildflowers/ethnobotany/documents/cwr/FrameworkNativeCropWildRelativesOct2014.pdf>). The project involves the conservation of the genetic resources of wild cranberry (*Vaccinium macrocarpon* and *V. oxycoccos*) on U.S. National Forests.
- Leaf tissue samples from 21 populations of *V. macrocarpon* and 17 populations of *V. oxycoccos* have been collected from nine National Forests and sent to the ARS Cranberry Genetics and Genomics Laboratory in Madison, WI (Juan Zalapa, Lorraine Rodriguez-Bonilla), for genetic analysis. Germplasm has been sent to the National Clonal Germplasm Repository in Corvallis, OR (Kim Hummer). Herbarium vouchers have been sent to the U.S. National Arboretum in D.C. (Alan Whittmore). Results from the genetic analysis and other data will be used to identify cranberry populations that are the highest priority for designation as *In Situ* Genetic Resource Reserves (IGRRs). Long-term management plans will be implemented by the USFS to monitor, manage, and safeguard the security of the populations. The evaluation will be extended to populations on land under ownership of other public or private entities in the future.

Discovery and Documentation of Historical Plant Introductions:

- A project to identify historical plant introductions that are not in the NPGS was initiated in 2015. The project focuses on several plant introduction gardens that were established by USDA soon after the initiation of a formal USDA program for foreign plant introduction in 1898. The gardens (located in Chico, CA, Cheyenne, WY, Savannah, GA, and Brownsville, TX) propagated and evaluated the new plant material for its economic value. The locations were not intended to provide long-term conservation of these materials and the properties were eventually redirected to other uses within the USDA, or sold. Some original plants, especially long-lived tree species, survive on these properties. Many of these plants were never incorporated into the NPGS collections when they were established to provide long-term conservation of genetic diversity. In 2015, study of the former plant introduction garden in Chico, CA identified numerous accessions that will be considered for incorporation into the NPGS.

GRIN Taxonomy for Plants:

- GRIN Taxonomy provides online current and accurate scientific names and other taxonomic data for the NPGS and other worldwide users. This standard set of plant names is essential for effective management of ARS plant germplasm collections, which now represent ca. 15,091 taxa. A broad range of economically important plants are supported by GRIN nomenclature, including food or spice, timber, fiber, drug, forage,

soil-building or erosion-control, genetic resource, poisonous, weedy, and ornamental plants.

- GRIN Taxonomy includes scientific names for 27,175 genera (14,180 accepted) and 1,399 infra-genera and 106,734 species or infra-species (62,089 accepted) with over 64,000 common names, geographical distributions for 54,756 taxa, 457,913 literature references, and 31,404 economic impacts.
- GRIN Taxonomy includes federal and state regulated noxious weeds and federally and internationally listed threatened and endangered plants, with links to information on noxious weed and conservation regulations to ensure unimpeded interstate and international exchange of plant genetic resources.
- Since 2008 a project to provide thorough coverage in GRIN-Taxonomy of wild relatives of all major and minor crops has been underway. We have completed our initial work on 165 major and minor crops, and an interface to query these data in various ways has been developed (<https://npgsweb.ars-grin.gov/gringlobal/taxon/taxonomysearchcwr.aspx>) and is now placed on the GRIN Taxonomy public site. We invite feedback from NPGS curators and CGC members for those CWR classifications already developed.

Facilitation of Germplasm Exchange:

- The PEO also helps to expedite the distribution of germplasm from the NPGS to foreign scientists and other international genebanks through a long standing collaboration with USDA-APHIS at Building 580, BARC-East. In 2014, germplasm for 644 public orders containing a total of 40,214 samples of NPGS accessions were shipped from Beltsville to individuals in 68 countries throughout the world for research and education. In addition, PEO facilitated the agricultural inspection of arriving germplasm shipments containing accessions from numerous different foreign countries to researchers and curators at NPGS sites.

Crop Germplasm Committees:

- The CGC section in GRIN (<http://www.ars-grin.gov/npgs/cgcweb.html>) was given a minor facelift in the transition to GRIN-Global.
- Please send updates to the individual crop CGC sections to Gary Kinard.
- Most committees continue to meet regularly and are active. Committees are particularly urged to update their Crop Vulnerability Statements.
- A virtual meeting/web conference was held for CGC Chairs on December 3, 2015 with about 30 committees represented. Updates were provided on the activities of ARS and the NPGS, international issues related to plant genetic resource exploration and exchange, GRIN-Global, and the activities of the CGCs.
- NGRL also has a conferencing account that is available to the CGCs to host virtual meetings (teleconference and/or webinar).

Database Management Unit

GRIN and GRIN-Global:

- At the beginning of 2015, the plant database included:
568,900 accessions representing 14,895 species and 2,383 genera
2,011,410 inventory records
1,848,225 germination records
8,882,171 characteristic/evaluation records
325,134 images
1,672,037 distinct visits to the NPGS pages of GRIN in 2014, a 7% decline from 2013
- The U.S. NPGS made the transition from GRIN for plants to GRIN-Global on November 30, 2015. The GRIN-Global Development Team will spend the early part of 2016 fixing bugs as they are reported and then initiate improvements and enhancements to both the Curator Tool and Public Website.
- Comments, ideas and suggestions on GRIN-Global can be sent to the entire development team at feedback@ars-grin.gov.

Plant Disease Research Unit

- The PDRU conducts research on pathogens that infect clonally propagated prohibited genus (i.e. quarantine) plant germplasm, including their etiology, detection, and elimination by therapeutic procedures. This project also provides direct support to the APHIS Plant Germplasm Quarantine Program and helps facilitate the safe introduction, conservation, and international exchange of valuable plant germplasm. Additional updates will be provided for those committees whose crops are within the scope this project's research.

Key NGRL Contacts

Research Leader

Gary Kinard (Gary.Kinard@ars.usda.gov, 301-504-5951)

Plant Exchange Office

Karen Williams (Karen.Williams@ars.usda.gov, 301-504-5421)

John Wiersema (John.Wiersema@ars.usda.gov, 301-504-9181)

GRIN-Database Management Unit Technical Issues

Quinn Sinnott (Quinn.Sinnott@ars.usda.gov, 301-504-6072)

Crop Germplasm Committees

Gary Kinard (Gary.Kinard@ars.usda.gov, 301-504-5951)

Plant Disease Research Unit

Ruhui Li (Ruhui.Li@ars.usda.gov, 301-504-7653)

Dimitre Mollov (Dimitre.Mollov@ars.usda.gov, 301-504-8624)

Dr. Margarita Licha Bateman
Lead Plant Pathologist/Program Manager
Pome/*Prunus* Fruit Trees Quarantine Programs
USDA-APHIS-PPQ-Field Operations
Bldg 580, BARC-E, Beltsville, MD 20705

2016 USDA-APHIS QUARANTINE REPORT

Bldg 580

Beltsville, MD

INTRODUCTION

The Plant Germplasm Quarantine Program (PGQP) imports fruit introductions, propagates them, tests them for pathogens, and releases them to importers and repositories. In 2016 the Pome quarantine program issued the following types of releases: final releases for 14 *Malus*; provisional releases for 7 *Malus* and 3 *Pyrus* for the Pomes program. The *Prunus* quarantine program had 14 final releases as well as 14 provisional releases; the seedling program had 155 final releases. We are pleased to state that the total amount of releases for 2016 is 207. In addition, our program has ongoing collaboration with the Pomes and *Prunus* Repositories, Crop Germplasm Committees, with scientists of the National Clean Plant Network, commercial nurseries, and private growers.

ACCESSIONS IN TESTING

Prunus

As of May 2016 Tom C. Kim, Horticulturist for *Prunus* has received and established 36 accessions itemized as follows: 3 *P. salicina* accessions from South Africa; 4 *P. armeniaca* from France; 9 *P. persica* accessions from Valencia, Spain; 10 *Prunus avium* (cherry) accessions, including 1 *P. campanulata*, 1 *P. cyclamina*, 1 *P. pendula*, 1 *P. sargentii* from The United Kingdom; 6 *P. armeniaca* from France; 4 *P. domestica* from Germany. During 2016 we have a total of 340 *Prunus* accessions in Bldg 580.

Pomes

As of May 2016, Robert Jones, Pomes Crop Specialist for Pomes has received and established a total of 34 accessions itemized as follows: 21 cider apple accessions and 4 cider pears from The United Kingdom, 1 *Malus trilobata* from Scotland, UK; 2 accessions (rootstocks) from Brazil and 6 new positive controls from

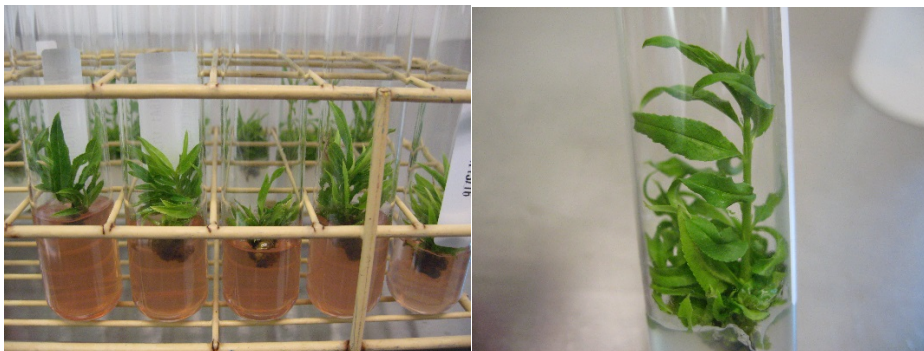
the Canadian Food Inspection Agency, Canada. During 2016 we have the following pome accessions: 207 Apples, 178 Pears, 34 Quinces in Bldg 580.

Pathogen interceptions

Every year we intercept a series of pathogens of quarantine significance in fruit trees of Pomes and *Prunus*. These ones mentioned below were discovered last year as part of the routine testing for pathogens. Testing was done using indicators, molecular tests and immunological tests. The trees that tested positive were sent to thermotherapy through *in vitro* culture. Enclosed below are some of the pathogens intercepted in incoming material: **Prunus program** Viruses: *Marafivirus*, *Nectarine stem pitting associated virus*, *Cherry virus A*, *Plum bark necrosis stem pitting associated virus*, *Little cherry virus 1*, *Little cherry virus 2*, *Prunus necrotic ringspot virus*, *Prune dwarf virus*; Viroids: *Hop stunt viroid*, *Peach latent mosaic viroid*; *Phytoplasma*; **Pomes program**: Viruses: *Apple stem pitting virus*, *Apple stem grooving virus*, *Apple chlorotic leafspot virus*, Viroids: *Apple fruit crinckle viroid*, *Pear blister canker viroid*.

Therapy-Tissue Culture

Richard Slocum, Tissue Culture Scientist, continues to establish accessions in tissue culture in order to put them through therapy. These accessions are undergoing therapy and testing at different levels within the program. His latest accomplishment has been to be able to do tissue culture of almonds and keep them for several growing seasons in tissue culture. At this time he will continue working on the survival of the material post therapy, which has proven to be challenging.



Prunus dulcis

Releases approved by Dr. J. Foster in 2016

Crop Type	Final Release	Provisional Release	Total Released 2016
Pomes accessions by B. Jones	<i>Malus</i> - 14 <i>Pyrus</i> -0 <i>Cydonia</i> -0 Total: 14	<i>Malus</i> -7 <i>Pyrus</i> -3 <i>Cydonia</i> -0 Total: 10	<i>Malus</i> -21 <i>Pyrus</i> -3 <i>Cydonia</i> -0 Total: 24
<i>Prunus</i> accessions by Tom C. Kim	<i>Prunus</i> -14	<i>Prunus</i> -14	<i>Prunus</i> -28
<i>Prunus</i>- *seedlings *by J.Foster/D. Johnson	155	0	155
Total	Final	Provisional	Total 207

Crop	FY207	FY 08	FY 09	FY 10	FY 11	FY 12	FY 13	FY 14	FY15	FY16
Pome Fruits	2	0	23	57	48	100	72	32	59	24
<i>Prunus</i> clones	6	17	33	16	50	41	35	20	23	28
<i>Prunus</i> *seedlings	31	70	138	196	111	107	332	247	204	155
Total per year	39	87	194	269	209	248	439	351	286	207

Release Summary: 2007-2016

Pathogen detection procedures submitted in 2016

- A. One step multiplex for the detection of four *Nepoviruses*: ToRSV, BBLMV, BCRV, CLRV (Nepovirus 3 Group)
- B. Nepovirus tests for ArMV, TBRV, RpRSV, SLRSV

2016 Relevant Collaboration

Dr. Ruhui Li, Dr. Gary Kinard- USDA-ARS: NGS for Quarantine Program
Visit to Foundation Plant Services, Davis, CA, Topic: NGS. Hosts: Dr. Maher Al-Rwahnih and Dr. Deborah Golino.

Dr. Mike Rott, Agriculture Canada-Topic: NGS protocols in use in Canada-
Conference call

New Personnel at PGQP

Martha Malapi-Wight, Ph.D. is the new Lead Plant Pathologist for the Poaceae Quarantine Program. Dr. Malapi-Wight joined the PGQP program in December 2015. She will be working on the quarantine of her assigned crops, as well as assisting PGQP in moving forward on the implementation of NGS for diagnostics for quarantine purposes.