

CALIFORNIA ANNUAL REPORT TO THE W-6 TECHNICAL COMMITTEE FOR DISTRIBUTION YEAR 2007

by Dan E. Parfitt

June 18, 2008

344 requests for plant introductions from California users were filled by the Regional Plant Introduction Stations in 2007. Figure 1 shows the usage of germplasm in California from the National Plant Germplasm System expressed by the number of requests for California from 1993 to the present. The request level for this year was about average for recent years and a bit greater than last year. Since 1996, there has been a steady increase in the request number.

Collection of germplasm information: The collection methodology was similar to that used last year. I do not have regional research funds to use for mailing, secretarial funds, etc. Therefore, all requests were sent via e-mail. I did not attempt to query those requesters that did not have e-mail. Because the number of requesters without e-mail was so few and prior levels of response have been between 5% and 20%, a regular mailing was not done. About 10% of the e-mail addresses bounced back (either the addresses were no longer valid or the recipients filters blocked them), a similar percentage to the 8% in 2007. A total of 32 responses were received (18% of those sent) for the year 2007. A number of additional queries may have been lost in spam filters. However, the response rate for the last 2 years is similar to former mailout rates, so the recipients most likely just declined to respond.

The distributed germplasm was used in a wide variety of applications, from basic research to home gardening. No single crop or crop group was especially requested. Much of the use this year appeared to be for commercial breeding or research (University or USDA). More respondents than in the past indicated that they were using the materials for teaching or demonstration

Figure 1. Requests for NPGS Germplasm from California

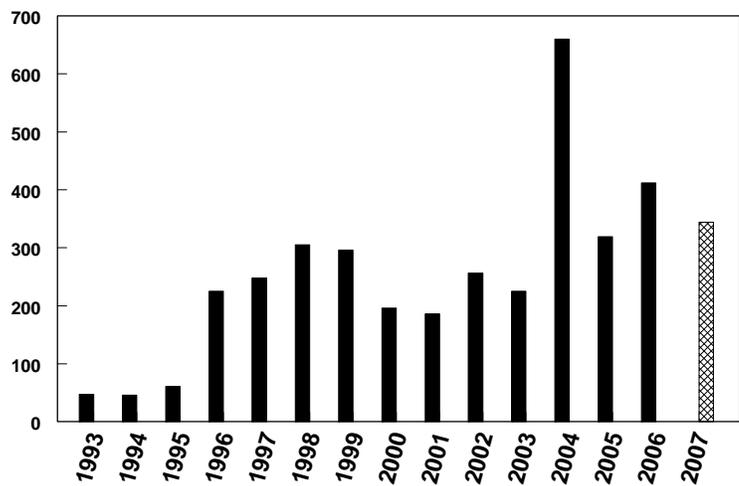
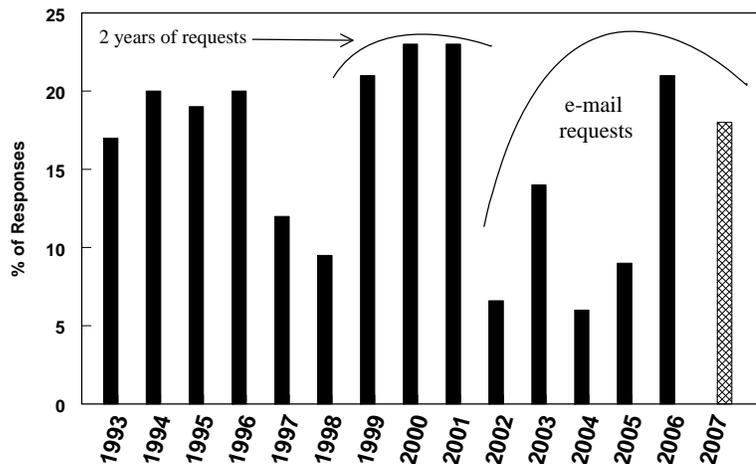


Figure 2: % of Responses



purposes. A summary of the replies is provided below to show the nature of germplasm use.

The Viticulture Department at UC Davis continues to maintain grape collections for teaching and research. Plant Science fruit and nut germplasm collections continue to be maintained, but there is no formal mechanism for ensuring their continued protection. As noted in last year's report there is no one looking after departmental cherry or apricot collections. Some of the apricot materials have been removed. The Department of Botany and Plant Science at UC Riverside maintains several collections of *Citrus* germplasm for cultivar evaluation and disease related research, as well as collections of avocado, cherimoya, and persimmon.. The California Genetic Resource Conservation Program is also located at UC Davis. This unique program, supported by the State of California, has supported plant and animal germplasm conservation efforts within California. Unfortunately, the UC system has decided to close the program as part of the current budget reduction process. Information on GRCP may be found at their website at <http://www.grcp.ucdavis.edu/> as well as publications on a variety of plant and animal germplasm issues and the status of various programs.

Narratives from recipients concerning germplasm observations and the value of NPGS.

1. Anna Krones, San Diego

Prunus and Malus

My name is Anna Krones. I am a Russian who lives in Southern California and owns a 16-acre orchard in the mountains (elevation 4000 feet). Four years ago my property totally burned and we had to replant everything. I thought it was a good time to introduce some Russian varieties to my collection. To begin with, I was looking for the apple "Antonovka" It is probably the favorite type of apple in Russia. Taste and smell are exceptional, very good in storage, easy to grow. In US Antonovka sometime is used as a rootstock, but never for fruit production. The only place where I found scions was National Germplasm Repository. I've chose five out of many. The scions were shipped in a great condition – all of them took after grafting. The annual growth was so good that I was able to share with my fellow Russians and some members of Rare Fruit Growers Association, that I belong. I also requested some Ukrainian tart cherries. They are growing well too. It is early to say if there is enough chill in the Mountains of Southern California to grow these fruit, but it is definitely worth the try.

Thank you very much,

Anna Krones

2. William Glasser , Ventura

Cotton, Wheat, Oats

All seeds were planted. It is yet too early to have any serious observation. few samples did not germinate at all and few other had very poor germination.

Thank you

3. Terry Berke, Woodland

Pepper, Corn

Dan, the 300 Capsicum accessions were grown for Bob Jarrett of the Griffin, GA station, we shipped him fruit samples in August/September. Should publish something from this in the next 2-3 years. The Zea may arrived too late to plant last year, it is growing in my nursery right now.

Thanks Terry

4. Bruce Gravens, San Jose

Pepper

I received the seeds last year too late to start them. I have them started this year, with less than great germination, but OK ~40%. Plants are in the ground now. I will let you know how things progress through the year

Thanks for asking

Bruce Gravens

The greatest lies are told: before the wedding
after the hunt and during the election

5. Chester Kurowski, Davis

Cucurbits

Dan,

Indeed I did receive considerable amount of germplasm from the NPGS last year. This material is going through a screening to search for root-knot nematode resistance in the cucurbit species. We have found some materials within *Citrullus lanatus* which look good but all these materials need to be confirmed with additional testing. The search for resistance from *C. sativus* and *C. melo* has not been as productive although we are systematically going through the germplasm we obtained from the NPGS.

Thanks

Chet

6. Carol Wilson, Santa Ana Botanic Garden-Clairmont

Iris

Dr. Parfitt,

I received seed of *I. tenuifolia* from the National Plant Germplasm System in the winter of 2007. I have been using seed characters in my research on Iris and have used a portion of the seed for morphological and anatomical studies. I planted the remainder of the seed but it has not yet germinated. If it germinates I will use leaf material in DNA studies and the plants for continued research on other aspects of growth and development. I will acknowledge the center in any research that is published and will report these publications to your organization. I did not email a response because I wanted to reply after I determined their germination. Iris seed can be difficult to germinate.

Sincerely,

Carol

7. Grace Chen, Albany

Castor, Lesquerella

Dan

The PI lines I obtained from NPGS in 2007 and before were used as research materials. I enclosed the following publications that acknowledge the NPGS, hope they are strong enough to support your renewal request for your project.

Thank you

Grace

8. Chris Bruno, Stockton

Pepper

In regards to the pepper seeds that were sent to Bruno Pepper Company, I can tell you that all four varieties were successfully germinated in April 2008 and are currently growing in hopes of being evaluated (both plant & fruit) for favorable traits for possible introduction into our pepper breeding program. I will be happy to provide more information as we progress with the project. Please feel free to contact me with any questions or comments

9. Glen Cole, Woodland

Sunflower

Dan,

Eric forwarded on your request, since I am the one that is now responsible for all of our wild species integration and characterization. For all of the accessions collected over the last few years, none have been planted and assessed. I have ordered more this past Fall of 2007 and I will be assessing and introgressing a set of those materials over the next few years. So, at this time I don't have anything to report to you. Other than I have planted in the field all of the *H. niveus tephrodes*, *niveus canescens*, *anomalus*, *deserticola*, *bolanderi* and *exilis* accessions that I requested this year. All have germinated fine and I will have good stands on all of them.

Best regards,

Glenn Cole

Senior Research Associate

Wild Species Introgression Program

10. Danica Luca, Cal State Hayward

Alyssum, Astragalus

Alyssum murale seeds were obtained from the National Plant Germplasm System in 2007. These seeds have been used in a project designed to identify genes that are critical to the nickel hyperaccumulating mechanism observed in this species. An potential gene of interest, hypothesized to encode a fructose-1,6-bisphosphate aldolase, was previously shown to be expressed in *A. murale* in the presence, but not the absence, of nickel. The seeds obtained from NPGS were used in a study designed to determine if the expression of this gene is a nickel-specific response or part of a more general stress response. Seeds were grown under conditions known to cause stress – such as dehydration, lead, selenate, and selenite. Fresh weights and root lengths were recorded, but no significant differences from control were observed

over the concentration ranges tested. Tissue was flash-frozen on liquid nitrogen for future RNA collection. The results of further tolerance tests and RNA analysis are not yet completed.

Astragalus bisulcatus and *Astragalus cicer* seeds were obtained from the National Plant Germplasm System in 2007. Interest in these species stems from the classification of *A. bisulcatus* as a selenium hyperaccumulator and *A. cicer* as a non-accumulating relative. In our studies, some accessions of *A. cicer* appeared to grow better in selenium-containing media than the *A. bisulcatus*. Further investigation into this observation is warranted. Tissue was flash-frozen on liquid nitrogen for RNA and protein isolation experiments. RNA was examined for differentially expressed genes, under the premise that such genes could potentially be involved in the selenium hyperaccumulating mechanism of *A. bisulcatus*. Thus far, six such genes have been identified. Sequence identification of one of these genes suggests homology with an *Arabidopsis thaliana* gene encoding a cis-trans prolyl isomerase, which is likely part of a general stress response. Analysis of differentially expressed proteins will be conducted this summer.

11. Douglas Cook, UC Davis

Arachis sp.

Hi Dan,

We don't have much to report. The various *Arachis* accessions were used for allele re-sequencing to evaluate genetic variation, with the ultimate goal of constructing a SNP-based genetic map in diploid *Arachis*. We have settled on 2 *A. duranensis* parents for more detailed analysis, and we are trying to decide between deep sequencing in two additional genotypes.

The accessions we obtained from the NPGS were part of a larger number of genotypes that we have analyzed.

I hope this information is of help.

Best regards,

Doug

12. Pete Adriaenssens, Mountain View

Medlar

Dan:

Funny that you should send this request now - I was in the process of compiling my experience to date with the medlar that I received last year from NCGR, Corvallis, OR, and was going to send it to them directly. Instead, I have copied them with this email. I have a currently thriving medlar grafted to quince. Only one caveat - the quince rootstock shows signs of rot at the base (no fault of the medlar) but does not appear to be suffering at present. Any suggestions on dealing with this (please see my notes in the attached report)?

Bruce, Joseph:

Thanks for supplying the medlar scion, which is currently doing fine on a small quince. I really appreciate that you guys are out there to help and encourage amateur and professional gardeners with materials that would otherwise be difficult to get hold of. I have not yet seen a medlar for sale in any

nursery in my area although I have read a number of articles that praise the virtues of this plant and its fruit.

Progress of Grafting Medlar Scion onto Quince Rootstock, P. Adriaenssens, Mountain View, CA 94040

Notes:

I received the medlar scion (*Mespilus germanica* / Nottingham, about 20 cm long) in good condition from NCGR, Corvallis, OR, in early March. I cut it into two pieces and grafted the best piece (end section) onto a Harrow Delight pear and the remaining piece onto a quince growing in a 5-gal pot (hedging my bets, since I had only grafted apple-to-apple previously!). Both grafts were whip-and-tongue style, matching the thickness of the scionwood to that of the rootstock, binding with electrical tape and sealing with grafting paste.

The graft to the pear did not take but the one to the quince took well, though not a pretty union. The quince branches in two near the base of the plant. I left one branch to continue growth as quince and on the other branch I removed all the growth below the graft throughout last year to encourage the medlar (seems to have worked out OK).

At the beginning of this year, I potted the plant on to a larger pot and I noticed that there is some rot at the base of the plant – the heart wood is exposed and flakes off fairly easily (see photo #4). The bark appears to be otherwise OK at present and the plant started and has maintained growth well this year. I put some peat moss mulch around the base to protect from drying out and, hopefully, encourage more growth there, since quince throws out suckers like crazy. Three fruits have set and are growing well at present and there is a fourth flower on a new branchlet. I have continued to remove growth below the graft on the medlar side and continued to maintain the quince side of the plant, with light pruning to encourage balance.

Pete Adriaenssens, May 15, 2008

13. Greg Walker, UC Riverside

Cucurbits, Cotton

Dear Dan,

Last year, I received 3 *Cucumis melo* subsp. *melo* from the National Plant Germplasm System. I am interested in screening these for resistance against whiteflies. They were chosen based on earlier literature reports that they have some degree of resistance. They are currently being field tested in Imperial Valley. The whitefly population is just starting to increase, so I do not have any results yet to share with you.

Several years back, I received seed of a wild cotton species, *Gossypium thurberi* which I tested for whitefly resistance and found very high levels of resistance. The results of four years of field studies on whitefly resistance in *G. thurberi* were published in:

G. thurberi is a diploid while the two major commercial cotton species are tetraploids; consequently, *G. thurberi* cannot be directly crossed with commercial cotton. However, by a method worked out in the 1930s, *G. thurberi* (a new world diploid *Gossypium*) can be crossed with *G. arboreum* (an old world diploid *Gossypium*), but the chromosomes don't align during meiosis, so the chromosome number is

then doubled with colchicine, thus creating a tetraploid hybrid. This tetraploid hybrid can then be crossed with commercial tetraploid cotton. I received seeds of the tetraploid hybrid from Mac Stewart (Univ. Arkansas) and I am examining them for whitefly resistance in Imperial Valley. As mentioned for the melon tests, the whitefly populations are just starting to take off, so it is too early to provide results. The goal of this year's test is to identify hybrid plants that have as much whitefly resistance as *G. thurberi* and use these plants to cross with commercial cotton. Thus our ultimate objective is to get a *G. hirsutum* breeding line that incorporates *G. thurberi* derived whitefly resistance. That would be as far as I am capable of taking it. After that, I will turn it over to plant breeders.

I hope this information is useful for your report.

Sincerely,

Greg Walker
Entomology
U.C. Riverside

14. Robert Heisey, Holister

Tomato

Hello Dan,

I received 8 extra-early maturity lines of tomato from the PI in 2007; I planted them this spring to make some crosses to examine heritability of this trait. Nothing to report yet.

Thanks.

Regards,

Bob Heisey

15. Jack Cormode

Heirloom Tomatoes

Dr. Parfitt,

I will send you the pictures that Mary Kelly of Wisconsin has sent me.

If only we all could get tomatoes like she has...

Jack Cormode

16. Jerry Hunt, Lakeside

Corn

Dan,

Currently I have approx. 20 plants of the white dent (Colorado) growing.

The sprouting was a little slow compared to the (generic) supersweet I have growing nearby. But, as the heat picked up in east county of San Diego the seed has caught up and surpassed growth of the supersweet.

The foilage is a much deeper green than the supersweet and I can't wait to see the size of the ears!

I've also planted some of the Trinidad in another isolated area and the sprouts are smaller and due to the shaded area are slow growing. The dry heat is upon us and I expect to see the full sun (Colorado) plants start telling me it is suffering in the sun no matter how much water I give it. The Trinidad should do well in partial shade with the fulltime dry heat.

My next planting will be the Chilean seed and I'm hoping to use the results from the first planting to improve on the second. I get two seasons of corn here in San Diego. I give the soil a break over the HOT Season of JUL/AUG and plant my second crop in late Aug/Sep. I've had immeasurable luck with corn on my plots in the last two years and wanted to expand with some more exotic plantings.

This initial planting is very unscientific and I would like to receive guidance in what specifics you are looking for.

I water, by hand, on a nearly daily basis and try to give it a dose of blood meal on a weekly basis. The soil preplanting soil was amended with cow manure and I don't have a PH figure because the corn says the soil is perfect. The side shoots on most of the Colorado are trimmed although a few of the plants I've allowed them to grow to see if there is an effect on plant/ear growth.

I germinated the seed in a greenhouse and when the sprouts had the tap root coming out of the 3" pot I transplanted (approx. 6 weeks ago). The plants are now chest high and tassles are starting to show. Gophers have only taken 2 of the plants. LUCKY ME! If there's any other info I can provide please let me know. I'd be happy to provide more info because these plants are very pleasant to be around and taking more data would be a pleasure. Seriously, there is something about these corn plants that is "Carlos Castenada-ish" about them. Their lush growth is a real nice addition to my plots and I'd like to thank you for providing the seed for my small "farm".

Best Regards,

Jerry Hunt

17. Jorge Dubcovsky, UC Davis

Wheat

Dear Dr. Parfit,

I received several wheat and barley lines from the National Plant Germplasm System (NPGS) in 2007. The seeds were delivered promptly and were very useful in our research. One of the studies published this year by my lab used the materials obtained from NSGC (see below). In addition, the NSGC offered an invaluable service to the USDA Wheat CAP project by archiving for the long term the 17 wheat mapping populations for the project.

18. Larry Knerr, Salinas

Lettuce Cucumber

This material is currently being evaluated in greenhouse [C melo] and field trials [L sativa]. We will have information on these lines in September.

Best regards,
Larry Knerr

19. Mallikarjuna Aradhya, NCGR, Davis

Guava

Hi Dan:

Those guava accessions were used for DNA extraction and microstellite analysis along with some other genotypes from SE Asia to identify genotypes and affinities related to a volatile produced by the guava which may repel the psyllids vectoring citrus greening in Florida.

Malli

20. Mary Durbin, UC Irvine

Sweet potato

Dear Dr. Parfitt:

The work in our laboratory has greatly benefited from materials provided by the National Plant Germplasm System over the past ten years. Specifically we have been provided with several species of Ipomoea for our research in adaptive evolution at the molecular level. Specifically we study the structural and regulatory genes of the anthocyanin pathway in Ipomoea. We currently have a paper submitted entitled “Evolutionary rate variation in the genus Ipomoea: is there evidence for adaptive molecular evolution?”

We most recently received samples of *I. saintronanensis* and *I. lacunosa*. Unfortunately *I. saintronanensis* produced only two flowers from the bud material that I received and these flowers did not set seed. I needed to collect immature embryos from the seeds. I still have the plant and am hoping that it might produce seed this spring. If it does, I'll send you some, as I know you also needed seed from this plant. With regard to the *I. lacunosa* material, I have not been able to amplify the myb regulatory gene from this species as yet. The particular myb gene that I am working on is not well conserved and is difficult to amplify from a diverse range of species. And of course that is why we needed the *I. lacunosa* and the other species we have obtained from you in the past. We need to have a broad range of the species.

Thank you again for your help in supplying the Ipomoea material needed for our research.

Sincerely,

Mary L. Durbin, Ph.D., Genetics

21. Michael Nadel, Los Angeles

Corn

The maize germplasm obtained from the USDA is being used in an ongoing maize breeding program for applications in grain production, forage, biofuels, and sweeteners. The specifics of the programs are proprietary, so we will not be disclosing more than this. We are however, extremely grateful for the work and assistance provided to us by the personnel at USDA GRIN.

Best regards,

Michael Nadel

22. J.M. Nave, Elverta**Watermelon**

It was a bad year for Citrullus. These accessions were largely wild varieties of watermelon and not commercial types. One accession did not germinate at all. The others did germinate but all plants except one fell prey to pheasants or other problems.

I'm guessing that heavy soil played a role in the failure of some of these seeds to germinate or thrive. I can't identify another cause except possibly stray litter in the form of eucalyptus leaves which can have an inhibitory effect on germination and growth of some plants. Some plants were germinated in pots and transplanted. Most of those failed to grow at all after transplant. I had the same problems with many melons growing in this same area of my property, but not with squash. I feel sure I have some problem with the soil in those areas.

The Chinese accession, PI 593349, which comes the closest to being a commercial watermelon variety, did not germinate at all. Accession PI 296332 from South Africa, a semi wild variety, developed a couple of small fruit which quickly developed blossom end rot. One plant of accession PI 482275 from Zimbabwe was growing fairly well when it was taken out by pheasants. Other plants that never grew much at all were also destroyed by pheasants. My property backs up against 40 acres of open fields and the result is occasional and unpredictable intrusions by pheasants.

The only modest success I had was with PI 254623 from the Sudan. This plant grew very slowly but did eventually set two fruit, one of which did mature somewhat. I'm not sure whether it matured completely because the flavor and sweetness were minimal but I have no way to know what a fully mature fruit tastes like. I did however get a number of seed which I will be using in the future. I first want to try to resolve the apparent issue I have with my soil. I brought in some new topsoil this year which I will use for planting next year. I only used 15 of the 25 seed that were sent so I still have 10 seed left of each of these accessions.

If there's anything else you would like to know, please ask. I just don't have much to report.

Mike

P.S. Every year I have some kind of interesting story about a failure. A few years ago someone stole my rice. I had planted 6 different hybrids in 6 small wading pools and they were doing quite well. When I came back from a short vacation the rice plants were all gone. I understand people occasionally pilfering fruit (pomegranates are becoming more popular) or squash or watermelons, but rice ?

23. Michael Canady, Acampo**Pepper**

Hi Dan,

We are planning to screen these Capsicum accessions for traits of interest (disease resistance, agronomic/horticultural traits, etc.) to our various pepper breeding programs. At this point, I don't really have any more information to offer, so hopefully this is helpful.

Best regards,

Mike Canady

24. Niu Dong, USDA-ARS Albany

Safflower

Dear Dan:

The Safflower seeds (*Carthamus tinctorius*) were used for tissue culture followed protocol of Radhika et al. (2006). Calli were produced from different explants. However, regeneration of shoots from the calli was not successful. Most shoots produced were vitreous. I am now busy working on other plant species and do not have time to work on Safflower.

Niu Dong

25. Paul Jackson, Lawrence Livermore National Laboratory Castor

Dan,

We are using the *R. communis* isolates sent in 2007 along with other isolates sent in I think 2003 and some commercial isolates to build a library of SNP's that can be used to analyze populations of seeds - as would be present if someone were to prepare ricin from these. The work is being done for the Department of Homeland Security and the FBI and involves development of quantitative SNP assays because the ratio of SNP provides sufficient information to allow comparison of different ricin or castor bean populations (a bag of beans from multiple plants would likely be used to prepare ricin). The same assays could easily be used to characterize individual *R. communis* isolates if someone has a need for that.

What would be very useful from our perspective would be information about how the different accessions were obtained and grown - did someone at USDA grow these out to produce more seed? Was there any attempt to keep plants from one accession from cross-pollenating plants from another? The reason these are interesting questions is that, often, seeds from the same accession have quite a variety of different SNP combinations. All of them are consistent with coming from a single plant heterozygous at multiple alleles - or this could have occurred because of cross-pollination. Also, some isolates are listed to be from countries where this species is not native so any information about the original source would be useful from our perspective.

I hope this helps - and I'm sorry this is late. I just got to this e-mail a short time ago.

Paul

26. Prakash Pradhanang, Stockton

Tomato

Dear Dan,

The germplasms that I received so far from TGRC and NPGS were screened against verticillium wilt (*Verticillium dahliae* race 2) and bacterial speck (*Pseudomonas syringae* pv. tomato race 1). I was looking for immunity type of host reaction, which I could not find among hundreds of accessions from different wild species,very frustrating experience!!

I am thinking to resume screening again with the view of finding moderate resistance. It is tough to make use of this kind of resistance without a marker, but finding a source is the first step, I think.

From this fall season, I shall be working on to optimize the bacterial density and inoculation techniques.

With regards,

Prakash

27. Raymond Sheehy, Sacramento

Linseed, Rice, Barley

Dear Dr Parfitt,

Two of the Camelina sativa did well here in the sacramento valley and will be replanted on a larger scale to see how well they will do as a cover crop. Of the Oryza sativa one has been introduced into my breeding program, neither Hordeum vulgare grew well and were dropped from my breeding program.

I have also received scion wood from NPGS for the Northern CA chapters of the California Rare Fruit Growers which is distributed to its members and to the Public in its January scion exchanges held through out Northern CA. We do this as a public service to promote fruit growing and to educate the public on propagation techniques and to promote the vast number of varieties not generally available to the public.

Thank you

Ray Sheehy

28. Richard Jeske, Willits

Grape

Dear Sir,

I am writing in support of the National Plant Germplasm System. I have been the recipient of germplasm from your system for the last few years, including 2007/08.

I am a private collector of table grape varieties. I grow these grapes in Mendocino County and share my observations with others who are interested in growing table grapes. I've written and had published articles about these grapes for the POMONA magazine of the North American Fruit Explorers and also for the California Rare Fruit Growers Association magazine. Last year I hosted a blind tasting of about 40 table grape varieties and I will publish the results. Some of the varieties that I've grown are superior to cultivars that I could obtain commercially. These deserve wider distribution.

I now have over 150 varieties of table grapes that I am observing and assessing. More than half of these were obtained through the Germplasm System, from UC Davis and from Geneva. I had exhausted all of the suitable varieties that I could purchase locally or through the mail.

I think it is important to maintain as much biological diversity as possible, and the National Plant Germplasm System seems to do a great job of it. The material I've ordered has arrived in great shape and the service has been very efficient.

We may face some problems with our food supply in the future. It may be important to have these repositories where there we could find varieties that resist various insects or diseases. Diversity is important.

Please continue this important program. Use this letter in any way to advocate for the program. Please contact me if you need any further information.

Sincerely,

Richard Jeske

29. Shifeng Pan, Gilroy

Dianthus species

Dr. Pan provided a germination percentage list for a variety of selections and species, below.

Species	Accession#	Origin Country	Germination (out of 25)	Flower Date
D. armeria	PI326374	Ukraine	22	
D. barbatus	PI371882	Russian federation, Yakuti	16	
D. campestris	PI629098	Ukraine, Poltava	7	
D. capitatus	PI326375	Ukraine	16	
D. carthusianorum	PI618695	Hungary, Pest	12	
D. caryophyllus	PI170353	Turkey, Balikesir	0	
D. chinensis	Ames22262	China, Beijing	14	
D. chinensis	Ames24132	Russian Federation, Primor	12	
D. chinensis	Ames24133	Russian Federation, Primor	14	
D. chinensis	NSSL15527	United States, California	20	5/18/08
D. chinensis	PI371886	Russian federation, Yakuti	16	5/20/08
D. chinensis	PI371887	Russian federation, Yakuti	8	
D. chinensis	PI371892	Russian federation, Yakuti	8	
D. chinensis	PI371893	Russian federation, Yakuti	6	
D. chinensis	PI613023	Korea, North, Hwanghae Puk	20	5/18/08
D. giganteifs subsp	PI586606	Canada, Alberta	16	
D. hybrida	PI607423	Germany, Saxony	20	
D. hybrida	PI607424	Germany, Saxony	10	
D. hybrida	PI607425	Germany, Saxony	16	
D. hybrida	PI618700	Hungary, Pest	20	
D. hybrida	PI618701	Hungary, Pest	21	
D. hybrida	PI618702	Hungary, Pest	15	
D. hybrida	PI618703	Hungary, Pest	19	
D. hybrida	PI618704	Hungary, Pest	19	
D. longicalyx	PI597600	Korea, South	21	
D. iumnitzeri	PI618705	Canada, Alberta	16	
D. orientalis	PI380827	Iran	18	5/18/08
D. pancicii	PI618709	Hungary, Pest	18	
D. petraeus	PI618706	Canada, Alberta	16	
D. plumarius	PI371884	Russian Federation, Yakuti	6	
D. plumarius	PI371890	Russian Federation, Yakuti	7	
D. plumarius	PI586605	Czechoslovakia	4	
D. sp(Ipswich pinks)	OPGC308	United Staes, Ohio	11	
D.sp(Allwood's Fragrant villa)	OPGC309	United Staes, Ohio	12	
D. sp(Microchip Mix).	OPGC310	United Staes, Ohio	20	
D. sp(Arctic Fire)	OPGC312	United Staes, Ohio	16	5/20/08
D. sp(Extra Dwf Mix)	OPGC313	United Staes, Ohio	16	
D. sp (B-42)	PI323970	Russian federation	5	
D. sp 301	PI380826	Iron	2	
D. sp(index Seminum 108)	PI586607	Finland, Turku ja Pori	2	
D. superbus	PI229517	Japan, Hokkaido	0	
D. superbus	PI371889	Russian federation, Yakuri	1	
D. superbus	PI371891	Russian federation, Yakuri	4	
D. superbus	PI479370	Japan, Hokkaido	4	
D. superbus	PI618708	Russian federation, Sakhal	12	

30. Doug Yamaguchi

Citrus

Hello,

I used the satsuma mandarin scionwood to graft onto my existing satsuma mandarin tree. My satsumas are not sweet, so I grafted on the Miho wase, Okitsu wase, and Miyagawa and am hoping these will produce much sweeter fruit. The majority of the scions are growing nicely and I am hoping for some fruit next season. I have also received scionwood last year for the same reason as described above. I have ordered numerous plums, asian pear, pawpaws, and fig scionwood in the past. I have also ordered many blueberry cuttings but not a single one made it or even grew any roots. Like the mandarins, I graft the plums, pears and pawpaws to existing trees in my backyard, just to increase the variety without planting new trees. The majority of the scionwood samples have taken and are growing nicely. I use the fig cuttings to start plants which I grow in pots. I do this only as a hobby because I love fruit. I don't know if this is the information you wanted or not, but I thought I'd send it anyway just in case.

Doug Yamaguchi

31. Zeger van Herwijnen, La Selva Beach

Various crop species

Dear Dan,

I made a list of things you sent, but we did not do tests with all of them. Some we had to multiply before being put in a test. We will have these results later. Some part of the material did not germinate. Herewith I send you a list with comments.

Kind regards,

Zeger

<u>Species</u>	<u>Observations</u>
Brassica spineseens	Delia resistant
Cucumis metuifer	no results yet
13 Citrullus colocynthis	no results yet
5 Citrullus lanatus var citroides	no results yet
4 Citrullus lanatus var lanatus	no results yet
10 Cucumis melo	no results yet
105 Cucumis melo subsp. agrestis	no results yet
197 Cucumis melo subsp. melo	no results yet
1 Cucumis melo var. chito	no results yet
2 Cucumis melo var. conomon	no results yet
20 Cucumis melo var. flexuosus	no results yet
1 Cucumis melo var. inodorus	no results yet
1 Lycopersicon esculentum	PepMV susceptible
1 Lycopersicon peruvianum "	PepMV susceptible
2 Lycopersicon pimpinellifolium "	PepMV susceptible
1 Heuchera pardolia	no germination
1 Heuchera piosissima	no germination
1 Heuchera rubescens	no germination
1 Lithophragma glabrum	no germination
1 Saxifraga oregana	no germination
9 Phaseolus coccineus	no results yet
9 Phaseolus dumalis	no results yet
3 Phaseolus glabellus	no results yet
2 Phaseolus parvifolius	no results yet
17 Phaseolus vulgaris	no results

Publications using PI Germplasm:

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3. He, X., Chen, G. Q., Lin, J. T. and McKeon, T. A. Regulation of diacylglycerol acyltransferase in developing seeds of castor. *Lipids* 39:865-871. 2004.
4. Chen, G. Q., He, X. and McKeon, T. A. A simple and sensitive assay for distinguishing the expression of ricin and *Ricinus communis* agglutinin genes in developing castor seed (*Ricinus communis* L.) *J. Agric. Food Chem.* 53:2358-2361. 2005.
5. Chen, G. Q., He, X., Ahn, Y. J., Vang, L. and McKeon, T. A. Toward the development of a safe castor crop: expression pattern comparison of ricin and 2S albumin genes and phylogeny analysis of 2S albumin. *Recent Progress in Medicinal Plants.* 15:453-463. 2006.
6. He, X., Chen, G. Q., Lin, J.-T., and McKeon, T. A. Diacylglycerol acyltransferase activity and triacylglycerol synthesis in germinating castor seed cotyledons. *Lipids* 41:381-385. 2006.
7. Ahn, Y. J., Vang, L., McKeon, T. A. and Chen, G. Q. High-frequency plant regeneration through adventitious shoot formation in castor (*Ricinus communis* L.) *In Vitro Cell Dev. Bio-Plant* 43:1. 2007.
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11. Ahn, Y.J., and Chen, G.Q. (2007). Temporal and spatial expression of 2S albumin in castor (*Ricinus communis* L.). *Journal of Agricultural and Food Chemistry* 55, 10043-10049.
12. Ahn, Y.J., and Chen, G.Q. (2008). In vitro regeneration of castor (*Ricinus Communis* L.) using cotyledon explants. *HortScience* 43, 215-219.
13. Walker, G. P. & E. T. Natwick. 2006. Resistance to silverleaf whitefly, *Bemisia argentifolii* (Hem., Aleyrodidae), in *Gossypium thurberi*, a wild cotton species. *Journal of Applied Entomology* 130: 429-436.
14. Zhang, W. and J. Dubcovsky. Association between allelic variation at the *Phytoene synthase 1* gene and yellow pigment content in the wheat grain. 2008. *Theoretical and Applied Genetics.* 116:635-645.