State report for

Alaska, Arizona, Hawaii and Wyoming

Compiled by Dave Stout

An Email was sent to each NPGS germplasm recipient from Alaska, Arizona, Hawaii and Wyoming. Questions asked were:

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

Alaska had 25 accepted orders, 154 order items of which 99 were filled on 10 addresses
Arizona had 75 accepted orders, 1,748 order items of which 1,665 were filled on 38 addresses
Hawaii had 33 accepted orders, 303 order items of which 233 were filled on 26 addresses
Wyoming had 18 accepted orders, 636 order items of which 571 were filled on 7 addresses.

Responses to the questionnaire are below:

(A) Masog, Gary, Northland Orchards, 7610 Old Harbor Road, Anchorage, Alaska, United States

The cuttings arrived and appeared in good condition, but I was not able to get them to root, while using two methods including a prorogation machine.

All other questions have same answer

Thanks for the material and over the years I have had very good luck with apple and cherry scion wood Including a cherry that I feel in superior to what we normally grow in our area and an apple from Kazakhstan that is proving hardy, productive, with a distinctive spicy taste. Really appreciate this service.

(B)Pearson, Roger, Fairbanks Fruit Growers, 1364 Little Fox Trail, Fairbanks, Alaska, United States

Apple seed received from openly pollinated Kazakhstan accessions arrived damaged due to improper packaging. Much of the seed accessions GMAL3625.g was crushed because it was shipped in an envelope with no padding.
A bubble wrap padded envelope would have prevented damage.

The undamaged seed was divided between 3 growers.

I had success germinating 3 accessions out of 4. Seed stratification started December 2016, planted in tree pots 3-25-17. As of 5-22-17 trees are approximately 4" tall with 10 true leaves.

PI 657002	Kaz 95 06-01
GMAL 4084.a	Kaz 96 02-01P-8
GMAL 3552.v	Kaz93-19-02

Test to determine if any of these accessions are winter hardy in interior Alaska. Location is elevation 940 feet above sea level 7 miles northeast of Fairbanks, Alaska. If any assessions survive will be used for plant breeding in future.

Received apple bud wood from Geneva August 2016. Material received in excellent condition.
Grafted using chip bud method on Malus Ranetka rootstock 8-13-201.6

Accession grafted	apple name	
588803.05	chestnut crab	apparently successful
613817.07	malinda	Failed
1485500.08	sissipuk	Failed
588872.12	northern spy	Failed

Chestnut crab apparently grafted successfully although it is very early in the growing season in Interior. Plants are just coming out of dormancy at my location.

Failures may have been due to Cold or method of grafting. According to R.M. Crasweller (Professor of Tree Fruit, Penn State Extension) "Chip budding is done in the spring before growth starts when stock and scion are still totally dormant".

Temperatures at this location reached -40 F with -30 F for extended periods during winter 2016-2017. Wind and low snow cover during Nov/Dec 2016 was also noted. After which snow cover was above normal.

Test for winter hardiness is the initial object of this experiment. Any germplasm that survives will be used for breeding purposes.

This is not published.

I grafted other material this spring from Geneva and will see results next year.

(C) Burkett, Albert, EWSY INC, 4342 East 31st Place, Yuma, Arizona, United States

The material arrived in good condition and grew well. In fact, all of the seed I have received from NPGS has grown well.

The material is useful and one line will be used as parental material after I made selections. One line will be used as a source for foliar disease resistance.

This material is useful for both research and commercial venues.

I have not made any publications.

(D) McCormick, Molly, Northern Arizona University, PO Box 5694, Flagstaff, Arizona, United States

See my responses to your questions below. I was given Asclepius subverticillata for a research project in Arizona (seeds from Utah). Thanks,

1. The material was in good condition. I cold moist stratified it for 30 days, and had 100% germination by April. It was installed at a restoration plot in July. It ended up being mixed with other accessions of Asclepius subverticillata, so specifics regarding the GRIN accession are unavailable.
2. Was this material useful to you? If yes, how? If no, why not?

The materials was useful, as we were able to boost the number of milkweed species richness and abundance of milkweed at our site.

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?
This was an experiment testing restoration design and response from the pollinator community. We collected data on Monarch eggs and larvae. We installed hundreds of milkweed plants of 3 species from various sources, and found 11 eggs, 19 larvae, and no chrysalis, which didn't end up being enough data for analysis. We weren't developing germ plasm with this project.

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.
No publications, but the project received some media coverage from NAU-TV:

https://www.facebook.com/LandscapeConservation/videos/1330063137062969/

(E) Miyasaka, Susan C., University of Hawaii, Department of Tropical Plant and Soil Sciences, Hilo, Hawaii, United States

(E) Skibicki, Samuel, Northern Arizona University, 617 S Beaver Street, Flagstaff, Arizona, United States

Recently, I requested and received 12 sweet potato accessions from Griffin, Ga.

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?
Yes, plant materials arrived in good condition. I then sent them to a commercial TC laboratory which is charging me fr multiplying the accessions further.

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

Yes, I have received 7 out of 12 accessions after they were multiplied by commercial TC laboratory. We planted them in pots in the greenhouse & will be planting them in field trials soon.

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?

No data collected yet.

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.

Earlier, we received plant materials of Medicago truncatula from Germplasm Repository in Washington State. Published article in J. Amer. Soc. Hort. Sci 14(3):249-255, 2016

Evaluation of Aluminum Sensitivity in Barrel Medic Germplasm by Yawadee Srimake and Susan C. Miyasaka

(F) Roybal, Carla, Northern Arizona University, Biology Department, 617 S Beaver St, Flagstaff, Arizona, United States

2) citations of publications, reports, presentations that include the plant germplasm you received at any time. Your information is important to USDA and NPGS as it provides justification for the continuation of this program. Data presented at 2017 Colorado Plateau Native Plant Program annual meeting in Monticello UT, will be used in Ecological Society of America and Colorado Plateau Biennial Conference presentations this summer, publication in preparation.

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? The material arrived in good condition, but material from the same warehouse was sent piecemeal and without explanation as to why the order was not shipped in full (it seemed the person filling the order was sending us accessions based on his own discretion, not what we requested). The material germinated and rooted beautifully in the greenhouse, except for all accessions of Achnetherum hymenoides and Sporobolus cryptandrus, but ACHY is notoriously tricky to grow in our greenhouse and SPCR as possibly planted too deeply...

2. Was this material useful to you? If yes, how? If no, why not? Yes! This material is the foundation of my master's thesis.

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? My thesis is examining the role of source climate in functional trait expression within species, especially in roots. Specifics about collection coordinates should be more readily available to researchers, by the way. We had trouble getting this info, which is key to our question. Research took place in a greenhouse. There isn't much residual material, but that what we have is currently being stored.

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. Have not completed publications or news items yet.

(G) Ahmad, Amjad, University of Hawaii at Manoa, 3190 Maile Way, St. John 102, Honolulu, Hawaii, United States

Q 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?

A: The materials arrived in very good condition with secured package. Thank you very much.

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

A: The overarching goal for obtaining the materials was to evaluate chickpea suitability for the micro climates/growth condition in Hawaii. However, since the materials came in a small quantity, I had to plant them at one location under controlled condition in order to increase the collection and evaluate them at different locations. So, its not yet clear if they will be useful or not.

Q 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?

A: Its a research trials lead by the University of Hawaii to evaluate chickpea crop suitability to different growth conditions in Hawaii as part of the crop diversity and self-sufficiency movement in the state.

Q 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.
A: A newsletter (extension bulletin) for a call out to local farmers to participate in the project and evaluate chickpea at different locations in Hawaii.

Extension bulletin: Ahmad A. A., T.J.K. Radovich, H.V. Nguyen, J. Uyeda, A. Arakaki, C. Nazario-Leary, J. Sugano, S. Motomura, and J. Silva. 2016. Evaluating the Suitability of Chickpea (*Cicer arietinum* L.) as a New Legume Crop to the Tropical Condition of Hawaii. HanaiAi Newsletter.
http://www.ctahr.hawaii.edu/sustainag/news

(H) Kantar, Michael, University of Hawaii, St. John Plant Science Lab, Room 102, Honolulu, Hawaii, United States

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?

Yes the material arrived in excellent condition, the material grew well, We did not take detailed notes, as we were mostly concerned with crossability.

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

The material was very useful, we have crossed both the teosinte and wild sunflower with domestic material, we are looking at potential segregation for perennial habit and drought resistance.

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?

It was for both research purposes, crossing, and prebreeding. We will be evaluating crosses in future material for further use in our breeding program.

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.

We have not completed any publication yet, but hopefully will soon.

(I) Love, Ken, 81-6393 Keopuka Makai, , Captain Cook, Hawaii, United States

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?

Still waiting for the material to germinate, so far less than 10% which is common for dormant figs coming to Hawaii.

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

Very much so in terms of building the Hawaii Tropical Fruit Grower 5 island repositories.

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?

Plants will be grown out in 5 areas of Hawaii where cuttings will be made available to our 750 growers.

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. *Not recently but past publications are found on the University of Hawaii web sites. http://www.hawaiifruit.net/figs.htm is one of the older extension publications.*

(J) Rau, Edward, Sustainable Bioresources, LLC, PO Box 350, Naalehu, Hawaii, United States

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?

Because of pick-up and shipping delays the seeds were not in optimal condition on arrival in Hawaii. The seeds of *Brosimum alicastrum* (Maya Nut) are of a recalcitrant species and these delays may have affected their viability. On arrival they were all immediately planted in an experimental array of various soil mediums and fungicide treatments. Only about 26% of the seeds germinated. According to the Maya Nut Institute, this is an abnormally low rate for this species. Soil types, growing conditions and fungicide treatments did not appear to affect the germination rate but the seed condition did (presence or absence of radicles). Most of those without intact radicles did not germinate.

The seedlings from the germination experiments in September 2016 are free of pests and diseases but growing very slowly. We are now beginning to distribute these to others for field trails.

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

It would be very difficult to obtain these perishable seeds from foreign sources and import them into Hawaii. Without having a domestic source for them (USDA Miami) we would not have been able to conduct this research. The material would have been more useful if the origin of the trees grown by USDA in Florida was provided. The species may be locally adapted to soil and climatic conditions present in the areas where the trees were endemic. We suspect the trees may have been from an area that does not have volcanic soils as we do here in Hawaii.

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?

Refer to my responses to previous questions. We are a research company and this part of an ongoing series of experiments.

We plan to use most of the seedlings produced from germination testing in small field trails with volunteer farmers and have donated some seedlings to the University of Hawaii.

The remainder of the seedlings will be advertised as new product offerings through our online store, currently closed.

If there are favorable outcomes from field trails, including production of viable seeds from local plantings, we will promote our long term goal of establishing this species as a new agroforestry crop in Hawaii.

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.

Yes, we have published preliminary results from the germination experiments in the news section of our website: sustainablebioresources.com Photos are available.

We have also shared information on the germination tests with the Maya Nut Institute.

In keeping with our policy regarding the introduction of new species in Hawaii and our Plant Pono Nursery endorsement, a HPWRA invasiveness risk assessment was obtained, confirming low risk.

We do not introduce plants that have not been assessed or determined to present high risk. See: http://www.plantpono.org/hpwra-plant.php?id=1340

(K) Reyes, Victor, Akahele Energy, 46 Kalihi Place, Kula, Hawaii, United States

Thanks for touching base... Received the material in good shape. However, they were not planted due to traveling conflict but will do so this summer. Will advise of results accordingly.

(L) Harper, Mary, Pepperitaville, P.O. Box 166, Cowley, Wyoming, United States

All my seed germinated and plants have now gone to the garden. I am trialing varieties for my high desert location in Wyoming. We get temps as high as 110 in the summer. Locally, there is little variety of pepper plants available. I am hoping to be able to offer more choice to local growers. I currently grow 325+ varieties from more than 60 countries. I am very excited to see how the USDA Germplasm plants produce in our shorter season, high altitude location. My seed was started February 1st and moved to heated greenhouse February 15th. I very much appreciate the chance to start these mostly unknown varieties.