2020 Hawaii State Annual Report
to the W-6 Technical Advisory Committee

Amjad A Ahmad, University of Hawaii (Hawaii State Representative)

SUMMARY:

In 2019, 303 items were sent to 15 recipeitns in Hawaii. We received 73.3% of total responses (11 out of 15). There was a 100% satisfaction in the packaging and germination of the received germplasms. Most of the germplasm received were ordered for reasearch purposes to increase diversity and evaluate suitability to Hawaii's condition.

In general, the overarching goal of the germplasm requests were to release them, if they appear to be useful and suitable for Hawaii. However, 10 out of 11 responds confirmed that they didn't release the germplasm yet, but 1 confirmed the release/sell of two germplasm (Roselle Hibiscus and Wing Bean) or shared with the public through Hawaii Seed Growers Network (https://www.hawaiiseedgrowersnetwork.com/). All receipts expected economical benefits (by increasing yield or reducing production cost), but on long-termbases. Since most of the lines are used in evaluation or breeding trials.

PUBLICATIONS:

Germplasm recipients reported the following publications that included materials they received from NPGS in 2018,as well as materials received earlier:

1. Anderson, J, Kantar, MB, Bock, D, Chaw Grubbs, K, Schilling, E, Rieseberg, L. 2019. Skim-Sequencing Reveals the Likely Origin of the Enigmatic Endangered Sunflower Helianthus schweinitzii. Genes, 10(12), 1040; https://doi.org/10.3390/genes10121040
2. Khoury, CK, Barchenger, DW, Carver, D, Barboza, G, van Zonneveld, M, Jarret, R, Bohs, L, Kantar, MB, Uchanski, M, Mercer, K, Nabhan, GP, Bosland, PW, Greene, SL. 2019. Crop wild relatives of chile pepper (Capsicum L.): Distributions, conservation status, and implications for adaptations to abiotic stresses Diversity and Distributions. 26(2): 209-25. doi.org/10.1111/DDI.13008

3. Ekar, JM, Betts, KJ, Herman, AC, Stupar, RM, Wyse, DL, Brandvain, Y, Kantar, MB. 2019. Domestication in real time: The curious case of a trigenomic sunflower population. Agronomy, 9(11), 704.
4. Mehrabi, Z, Pironon, S, Kantar, MB, Ramankutty, N, Rieseberg, L. 2019. Shifts in the abiotic and biotic environment of cultivated sunflower under future climate change. OCL, 26: 9. DOI: https://doi.org/10.1051/ocl/2019003
5. Love, K. and Paull, R.E. 2014 (Updated in 2019). Growing Grapes in Hawai'i. https://www.ctahr.hawaii.edu/oc/freepubs/pdf/F_N-26.pdf
6. Figs. Hawaii Fruit by Ken Love. Website publication. http://www.hawaiifruit.net/figs.html
7. Pomegranate. Hawaii Fruit by Ken Love. Website publication. http://www.hawaiifruit.net/pomgranate.html

SUMMARY OF RESPONSES:

- What were the short-term outcomes from any plant germplasm you received: Was it part of a research experiment? Did you make crosses?
- What were the long-term outcomes from any plant germplasm you received: Did you develop any new parental lines or cultivars? Did you solve a problem with the material you received?
- What do you think is the economic value of your new developments using plant material from the NPGS?

1) Michael Muszynski-University of Hawaii at Manoa.

- What were the short-term outcomes from any plant germplasm you received: Was it part of a research experiment? Did you make crosses?

Answer: I increased seed for the maize diversity accessions I ordered. My plan is to use them for research but we are still trying to obtain preliminary data in order to apply for more long-term funding to support the research.

- What were the long-term outcomes from any plant germplasm you received: Did you develop any new parental lines or cultivars? Did you solve a problem with the material you received?

Answer: None yet.

- What do you think is the economic value of your new developments using plant material from the NPGS?

Answer: The main value from this material will be (1) new knowledge of how plants can alter their phenotypes based on their local growing environment and (2) instructional material for undergraduate and graduate students.

2) Jay Boast-GoFarm Hawaii

- If you reported outcome/impact information for a grant project that included your use of NPGS germplasm, please send us this outcome/impact information.

Answer: Some of the materials I have received have become part of the offerings of the Hawaii Seed Growers Network (hawaiiseedgrowersnetwork.com) which has received two Specialty Crops Block Grants

- What were the short-term outcomes from any plant germplasm you received: Was it part of a research experiment? Did you make crosses?

Answer: I have received many maize lines, none have yet been commercialized though they have been grown out and some of them used in breeding crosses to form populations now under selection.

- What do you think is the economic value of your new developments using plant material from the NPGS?

Answer: Month of April 2020: $360 of sale of Roselle and Wing Bean originating from the NPGS received germplasm.

3) Elias Ednie-Kona, Hawaii-Individual

- If you reported outcome/impact information for a grant project that included your use of NPGS germplasm, please send us this outcome/impact information.

Answer: N/A

- What were the short-term outcomes from any plant germplasm you received: Was it part of a research experiment? Did you make crosses?

Answer: Observation purpose to determine best suitable cultivars for Hawaii's condition.

- What were the long-term outcomes from any plant germplasm you received: Did you develop any new parental lines or cultivars? Did you solve a problem with the material you received?

Answer: The potential large distribution of the plant materials for wide adoption in Hawaii will have an economic impact within few-several years (to ensure adaptability and good characteristics).

4) John Hu-University of Hawaii-Hilo.

- If you reported outcome/impact information for a grant project that included your use of NPGS germplasm, please send us this outcome/impact information.

Answer: N/A.

- What were the short-term outcomes from any plant germplasm you received: Was it part of a research experiment? Did you make crosses?

Answer: N/A.

- What do you think is the economic value of your new developmentsusing plant material from the NPGS?

Answer: Reducing the cost pf production, by reducing the use of chemical application would be the lead to higher net profit to the local growers in Hawaii.

5) Ken Love-Hawaii Tropical Fruit Growers Association, Kona, Hawaii.

- If you reported outcome/impact information for a grant project that included your use of NPGS germplasm, please send us this outcome/impact information.

Answer: N/A.

- What were the short-term outcomes from any plant germplasm you received: Was it part of a research experiment? Did you make crosses?

Answer: Research is only to determine best cultivars for Hawaii

- What do you think is the economic value of your new developmentsusing plant material from the NPGS?

Answer: Over time the plant material has assisted growers in developing marketable fruit that helps with small farm sustainability. Other growers have used the material to develop value added products.

6) Michael B. Kantar-University of Hawaii at Manoa.

- If you reported outcome/impact information for a grant project that included your use of NPGS germplasm, please send us this outcome/impact information.

Answer: I included my use of the germplasm as part of my HATCH project report. I have used the occurrence points to explore climate tolerance of different plant species and have initiated crosses with accessions from extreme populations.

- What were the short-term outcomes from any plant germplasm you received: Was it part of a research experiment? Did you make crosses?

Answer: Evaluating the germplasm charactersitics for better selection of preffered genes.

- What do you think is the economic value of your new developmentsusing plant material from the NPGS?

Answer: Right now the materials are being used for research and development, so it is difficult to assess the current value.

7) Emilie Kirk-University of Hawaii at Manoa-Kauai, Hawaii.

- If you reported outcome/impact information for a grant project that included your use of NPGS germplasm, please send us this outcome/impact information.

Answer: N/A

- What were the short-term outcomes from any plant germplasm you received: Was it part of a research experiment? Did you make crosses?

Answer: The short-term outcomes are an increase in the availability of germplasm for use in nascent research trials. No crosses have been made to date.

- What do you think is the economic value of your new developmentsusing plant material from the NPGS?

Answer: It is too soon to assess the long-term outcomes/economic value from this work.

8) Eli Isele-University of Hawaii at Manoa. Hilo, Hawaii.

- If you reported outcome/impact information for a grant project that included your use of NPGS germplasm, please send us this outcome/impact information.

Answer: Used the material to establish variety trials in Hilo and Kauai and germplasm repositorys at Komohana and UH Hilo. A few farmers also received some material. No crosses were made.

- What were the short-term and long-term outcomes from any plant germplasm you received: Was it part of a research experiment? Did you make crosses?

Answer: Long term outcomes include getting advanced cacao cultivars into Hawaii (previously unavailable), increase yield and disease tolerance in Hawaii. The problem being solved is the Hawaiian cacao industry is largely based on poor information and this will bring genetics that have been evaluated and will be again evaluated in a Hawaiian context.

- What do you think is the economic value of your new developments using plant material from the NPGS?

Answer: 1-2 million dollars per year in about 10 years.

9) Sharon Motomura-University of Hawaii at Manoa-Hilo, Hawaii.

- If you reported outcome/impact information for a grant project that included your use of NPGS germplasm, please send us this outcome/impact information.

Answer: N/A

- What were the short-term outcomes from any plant germplasm you received: Was it part of a research experiment? Did you make crosses?

Answer: Increase genotype diversity of papaya to develop crosses for better diseases resistance.

- What do you think is the economic value of your new developments using plant material from the NPGS?

Answer: Developing variety with good disease resistance will reduce the need for chemical application, which will lead to reduce production cost.

10) Noa Lincoln-University of Hawaii at Manoa-Hilo, Hawaii.

- If you reported outcome/impact information for a grant project that included your use of NPGS germplasm, please send us this outcome/impact information.

Answer: N/A

- What were the short-term outcomes from any plant germplasm you received: Was it part of a research experiment? Did you make crosses?

Answer: The short term impacts was increased propagation and availability of diverse cultivars for the emerging industry. Long term we also hope to establish tissue culture and scale up the distribution nationally and internally, providing greater impact.

- What do you think is the economic value of your new developments using plant material from the NPGS?

Answer: While it is hard to say what the economic impacts were, we have distributed over 1,500 trees, and if each tree produces 300 lbs/yr over 50 years and valued at $1 per lb then it could be said that the value is as much as 22.5 million dollars.