**USDA Higher Education Challenge Grant Project**

**‘Enhancing Educational Outcomes for Plant Genetic Resources Conservation and Use’**

**MINUTES for April 25, 9 am MDT (via Teams)**

**The long-term goal** of this project is to expand the agricultural workforce that is well trained in subjects relevant to the acquisition, preservation, distribution, evaluation, and utilization of plant genetic resources and associated information.

**Attendees:** Dave Bubeck, Daniel Cornelius, Clare Coyne, Thomas Lubberstedt, Tara Moreau, Wayne Smith, Pat Byrne, Gayle Volk (minutes provided by G. Volk)

1. Project extension: The project has been extended by USDA for one year (until 5/31/24), but with no additional funding. Advisory Council will continue to meet every six months until May 2024.

2. Project accomplishments of last 6 months. See attached PDF of presentation.

* Kevin Falk (<https://www.linkedin.com/in/kevinfalk/>) at Corteva also filmed activities at the NAPB meetings. Perhaps video compilation efforts could be coordinated. Gayle will forward this information to Forrest Douglass and Candy Gardner because they are developing that set of videos for GRIN-U.
* Review Vivian Bernau’s crop curator video to see if she described why she wanted to be a curator.

3. National Genetic Resources Advisory Council (NGRAC) meeting occurred April 11-12, 2023 at the National Laboratory for Genetic Resources Preservation in Fort Collins, Colorado. This council advises USDA leadership about plant, animal, and microbial genetic resources. Some of the participants at the NGRAC meeting were also present at the initial PGR training planning workshop five years ago. Pat Byrne, Gayle Volk, and Geoff Morris gave presentations to NGRAC about HEC activities. The NGRAC Advisors were very complimentary of our efforts and provided some suggestions.

* Increase navigation ease in GRIN-U website. As the amount of content increases, it becomes more difficult to find items (requires browsing multiple pages).
* Increase outreach and encourage participation in the CSU Online course modules, from the National Plant Germplasm System, other genebanks, and from universities.
* Continue to pursue success stories and compile impacts for the NPGS.

HEC Advisors mentioned that both the National Association of Plant Breeders (NAPB) and the Plant Breeding Coordinating Committee (PBCC) are also very interested in developing and sharing success stories.

* Here is a link to the webpage with PBCC outputs: <https://www.nrsp10.org/PBCC_plant_breeding_outputs>
* Here’s a link to the NAPB Education page:

https://www.plantbreeding.org/education

* The HEC project will pursue improved coordination between education activities of NAPB, PBCC, and GRIN-U.

4. Fall 2023 online courses.

Gayle mentioned the busy schedules of new curators, likely making it difficult for them to sign up for a 3-credit online course. She suggested that perhaps other resources such as the soon-to-be-released NPGS Operations Manual and GRIN-U ebook content, or even a short in-person workshop could be alternative methods to train new NPGS curators. The CSU Online class seems well suited to post-docs and graduate students wanting more in-depth information about plant genetic resources conservation and use.

* Wayne Smith suggested that we email CSU Online class information to department heads of Agronomy and Horticulture Programs throughout the U.S. (as well as student clubs) to promote the CSU Online class.

5. Activities at CSU’s Spur campus (Pat)

Pat described some of his Spur campus (CSU facility in Denver) outreach activities. He has hired two CSU undergraduate students to help design content for a one-semester class (lecture materials, lab activities, and Spur campus field trip (perhaps even CSU ARDEC field trip) to be released Fall 2023.

* HEC Advisors were supportive of this outreach activity to encourage interest in plant breeding and conservation.
* Tara Moreau: This is a link to a program at UBC that engages high school students in genetics <https://www.bioteach.ubc.ca/>

6. Impact: Evaluation of online courses and GRIN-U materials.

A lengthy discussion provided a number of ideas to measure impact. Conversations started with respect to the HEC project and were then broadened to include the NPGS (or plant genetic resources) as a whole.

* Develop a communications strategy. Improve the user interface and technology to make GRIN-U relevant to a wide range of audiences (public, K-12 students, undergraduate and graduate students, genebank employees (U.S. and international), instructors, breeders and researchers. See the U.S. Botanical Garden website that was recently updated: https://www.usbg.gov/.
* Impact is measuring how people are affected by actions (could relate to current jobs and career goals). The HEC project has some plans to conduct participant surveys.
* Logic Models (Theory of Change) can be used to design roadmaps to assess impacts. Tara Moreau provided a link to a GoogleDoc of a Botanic Garden logic model that is being developed (<https://docs.google.com/spreadsheets/d/1FL0CnPet24y87pm7PKELrk6t9E9vPewm/edit#gid=1346206252>). Missouri Botanic Gardens has an example.
* Wayne Smith suggested If impact was defined as users then a cascading accounting might be considered documentation of impact. e.g. 1. how many users followed by breakdown into A. primary job users (NPGS), B. outside of primary audience, C. outside of genetics; D.  number of decision makers, e.g. expt sta directors, deans, political types. Can these data be "guessed" from the urls or web addresses of site visitors? Could be proactive and develop a list serv of Experiment Station directors, deans, dept. heads, political folks and send them notices of updates. If you could identify a person at LGUs that communicate with state ag teachers associations and science teachers associations (if there are such) and send that group updates, etc. to educate the next generations.
* Tara Moreau suggested creating soundbites for different audiences (congressional members, students, genebank staff, etc).
* Some impact information can be derived from publications (Gayle Volk mentioned an ongoing NPGS bibliometrics effort), but it won’t include industry impacts. Dave Bubeck mentioned that compilation of quantitative information and tangible sound bites about impact would be useful to the American Seed Trade Association (ASTA). He said that the private sector can calculate different types of values such as commercial values and added values. He suggested contacting Dr. Fan-Li Chou at ASTA as a follow-up. Pat Byrne will follow-up.
* Impact information has previously been compiled for the GEM project.
* New technologies (AI and others) may provide opportunities with regard to PGR management and impact that haven’t been available in the past.
* It was agreed that older impacts were also critical, especially because breeding impacts take time. There are some critical inbred lines in maize that have had high impact.
* Continue to request success stories and release them.

7. What should be our priorities for activities during the next year?

* Increasing impact and outreach are priorities.
* Other topics of interest (possibilities for future grant proposals) include:
* International. Coordinating with and providing educational resources about international programs (Convention on Biological Diversity, International Treaty on Plant Genetic Resources for Food and Agriculture, Global Biodiversity Framework—particularly relating to the 22 targets). Also review the Global Strategy for Plant Conservation to identify opportunities. <https://www.cbd.int/doc/c/e6d3/cd1d/daf663719a03902a9b116c34/cop-15-l-25-en.pdf>
* Develop curriculum for an indigenous audience. Dan Cornelius mentioned a new project with the University of Wisconsin Madison that will include indigenous crop growers perspectives from South (Mexico and Central America) and North (U.S.) regions. A seed symposium may also be included as an outreach activity.
  + Tara Moreau: This is the UBC Indigenous Strategic Plan that may be of interest <https://isp.ubc.ca/>
* Tara Moreau: This was a talk by US Botanic Garden <https://app.livestorm.co/u-s-botanic-garden/rematriating-seed-relatives-to-their-communities-of-origin-online-discussion?s=21984b63-9275-4b13-acdd-812d4ad54916>

8. How should this effort go forward without additional support from the USDA grant?

This was not directly discussed, but future project ideas are provided in 7 above.