**North Central Region Technical Advisory Committee Meeting Report**

Date: June 14, 2016, 8:00 – 12:00 am

Location: Hilton Ft. Collins, CO

Attendees: Wendy Wintersteen (AA) by phone; Burton Johnson, Erik Sacks, William Tracy, Candice Gardner

Period Covered: June 4, 2016 – June 14, 2016

The meeting was hosted by the National Laboratory for Genetic Resources Preservation (NLGRP) at the Hilton Garden Inn, Ft. Collins, and held in conjunction with the joint RTACs from W6, NE9, and S9, and the Plant Germplasm Operations Committee (PGOC).

**Dean Wendy Wintersteen, Iowa State University, College of Agriculture and Life Sciences:**

* Discussed the current budget status and outlook for funding for NIFA and AFRI programs in 2017. Some discussion revolved around the challenges for the US, and in the context of global agricultural challenges, and in maintaining a leadership role in agricultural sciences. The importance of agricultural research was discussed at the 2016 AAAS meeting by Pam Johnson (Natl. Corn Growers Assoc, and member of the FFAR Board). The SoAR website (http://supportagresearch.org/) is supported by the Danforth group, and hosts publications on the importance of agricultural research. Messages focus on meeting public good needs. ASTA efforts were key to past successes.
* The Dean indicated a draft case statement is needed for funding to support the Ames genebank.
* NC-007 project reporting stresses accomplishments. The NC-007 Project renewal and revision will be submitted in 2016; information on distributions to the various US regions and internationally is important. Investments by the NCR Agricultural Experiment Stations in these efforts also provides opportunity for engagement by scientists across programs and projects, which enhances their ability to provide benefits for the public good. Scientists need to credit Hatch funding in their publications.

**Burton Johnson, North Dakota State University:**

* Provided an update on the value of and research efforts associated with white sorghum and industrial hemp. Industrial hemp genetic resources were evaluated for grain and fiber yield. Hemp seed has low vigor and a short shelf life at ambient T. Studies are needed on optimum storage regimes to preserve viability; 20% seed mortality is an optimistic goal. A thick stand is needed for fiber production. Seed yields ranged from 600-1200 pounds per acre; in contrast, 1200-1600 pounds/acre is about average for canola and sunflower in North Dakota. The value of hemp seed ranges from $0.70 - $1.00/lb; the industrial hemp business in the US is valued at about $0.5 B. The DEA and ND issued permits for small acreages for five growers in ND, with a ready market.
* White sorghum is of interest for organic production. Flowering and maturity was previously evaluated for 106 genotypes, and panicle display, plant height and seed characteristics. In 2016, 21 of the 106 were selected for further testing. This crop needs warm soil temperature for germination and establishment, and no herbicides can be used. There are no pesticides labeled for hemp here or in Canada. The crop can grow 24” in one week, and canopy closure was achieved in one month.

**Erik Sachs, University of Illinois, Champaign-Urbana:**

* Presented information on *Miscanthus* research at the UIUC. One variety of *Miscanthus x giganteus* is grown in the US, a triploid. US naturalized populations are not very cold hardy, and do not thrive well in environments such as Wisconsin or Minnesota. Cold winters reduce yields.
* *M. sacchariflorus* is of interest because it has multiple ploidy levels and is adapted farther north than *M. sinensis*. It survived the 2015/2016 winter in Saskatoon, Canada. In Eastern Russia, the interactions between *M. sacchariflorus* and livestock has been documented for more than 150 years. The first collection of this species by a western botanist was in 1855-1856 along rivers bordering Russia and China, and seeds were dispersed from St. Petersburg to European botanical gardens.
* Interspecific hybrids of *Miscanthus* and *Saccharum* were originally reported in Fiji.
* Jack Juvik’s research at UIUC focuses on anthocyanins from maize; germplasm is being screened for nutraceuticals. Brassica and arugula germplasm has been screened for glucosinolates with anti-cancer activity.
* Gary Kling evaluates black locust and Chinese wingnut woody germplasm for biomass production.

**William Tracy, University of Wisconsin-Madison:**

* Phil Simon is sequencing *Daucus* (carrot) germplasm, and collecting germplasm with David Spooner.
* Shawn Kaeppler and Natalia deLeon have screened 500 lines from a 1000 maize line diversity panel for SCMV and MDM; about 10% of the 500 lines were completely resistant.
* A sweet corn diversity panel was established; about 50% of the lines included are from the NCRPIS collection. 50% of the lines in the panel are derived from historic IL inbred lines; a subset of these lines will ultimately be deposited to the NCRPIS collection. Wisconsin will add about 150 sweet corn lines. Michael Gore is examining the panel for carotenoids, using HPLC.
* The source of the sugary enhancer gene was determined. This gene contributes to water-soluble polysaccharide content, a major factor in ‘mouth feel’ of sweet corn, and important for commercial quality.
* The sweet corn breeding effort is working to combine improved husk cover and tightness with high maysin-content silks, to enhance resistance to corn earworm.
* A culinary corn project works to breed non-sweet corn for vegetable use. Choclero germplasm from Chile has no known sweet genes. A long, shoe-peg type kernel, it is useful in soups.

**Pablo Jourdan, Ornamental Plant Germplasm Center, The Ohio State University:**

* Major efforts are devoted to collection and maintenance of *Phlox* germplasm. These are maintained as plants until seed production can be obtained, which is challenging. In the US, 65 species of phlox are found, about 40 western and 20-23 eastern. Taxonomy and phlogeny are being developed.
* Peter Zales has developed a research herbarium of species collected across the eastern US from 2010-2013.
* A graduate student’s research focuses on resistance to powdery mildew, an obligate pathogen, and other diseases.
* Polyploidy is common among phlox species, and cryptic variation is more common on the fringes of its native distribution.
* The relationship between flower color forms and patterning has been surveyed; multiple colors can have the same anthocyanin chromatographic pattern. The influence of pH on color expression is suspected.
* Seed quality factor studies are being conducted, and germination requirements are usually unknown. Twelve week stratifications are involved. Seeds are not a problem for the annual phlox, but perennial phlox are rhizomatous and seed viability is a problem, as well as self-incompatibility. Polyploids commonly have seed viability issues.
* Lepidopteran pollinator insects are utilized for pollination; clear-wing moths seem most effective.
* Five or six new cultivars can be released as a result of interspecific hybridization efforts. Companies help with virus cleaning of phlox stocks, in appreciation for access to the collection.

**Candice Gardner, North Central Regional Plant Introduction Station:**

* Reported on status of collection availability, backup, and infrastructure improvements. The three backup generators are now operational at the NCPRIS, and cover providing power for all essential functions, including seed storage, greenhouses, server rooms, etc. The roofs of the headquarters building and the GEM seed storage building were coated with a polymer that will extend their life.
* Since our last meeting, the following individuals have (or will soon) retire: Dan Barney, USDA-ARS Horticulturist; Lloyd Crim, ISU Farm Equipment Operator III; Irvin Larsen, USDA-ARS Agri. Research Science Technician; Larry Lockhart, ISU Program Manager III – July 1; Charles Block, USDA-ARS Plant Pathologist. It is a time of great change at the station. Fred Engstrom will assume Larry Lockhart’s position, having 10 years of experience at the station serving the GEM Project. Other departures: Susan Siev, Term Germplasm Program Asst; Robert Stebbins, Germplasm Program Asst.

**Resolutions:**

* Be it resolved that the NC-007 RTAC and the nation owe sincere appreciation to Larry Lockhart (ISU Program Manager II) and Charles Block (USDA Plant Pathologist) upon their retirement for their long-term public service to the North Central Regional Plant Introduction Station, the NC-007 Project, and for the many positive impacts of their work.
* The NC-007 RTAC thanks Lloyd Crim (ISU Farm Equipment Operator III) and Irvin Larsen (USDA Agri. Science Research Tech) for their many years of service at the North Central Regional Plant Introduction Station, supporting station operations and oilseeds curation.
* The NC-007 RTAC thanks our hosts at the National Laboratory for Genetic Resources Preservation, Ft. Collins, for the excellent hospitality and meeting organization provided. The opportunity to engage with other Hatch project researchers, curatorial staff, and international genebank staff is greatly appreciated.

**Other discussion:**

* There is a need to train new plant genetic resource conservation professionals. Development of a certification type program was discussed. The CGIAR system could play a role. A workshop symposium on the structure/mechanics of a program to train these professionals should be developed, and curricula.

**2017 and future meetings:**

* Will be hosted by Bill Tracy in Madison, Wisconsin during the 3rd or 4th weeks of August.
* Bill Tracy will serve as chair in 2017; Erik Sachs as secretary.
* Future meeting schedule: 2018 – Illinois; 2019 – Iowa; 2020 – Ohio