Sustaining the Future of Plant Breeding

Plant Breeding Coordinating Committee

http://www.nimss.org/projects/17576

SCC80 PBCC State Representatives Work Session
August 14, 2020, 12-130 pm CST

Plant Breeding Coordinating Committee
Southern Coordinating Committee 80 (SCC80)
<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Presenter</th>
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<tbody>
<tr>
<td>12:00 – 12:10 pm</td>
<td>Welcome and introductions</td>
<td>M. Kantar</td>
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<tr>
<td>12:10 – 12:15 pm</td>
<td>PBCC history, present and future</td>
<td>M. Kantar</td>
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<tr>
<td>12:15 – 12:25 pm</td>
<td>Objective 1</td>
<td>K. Evans</td>
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<td>12:25 – 12:35 pm</td>
<td>Objective 2</td>
<td>P. Byrne</td>
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<tr>
<td>12:35 – 12:40 pm</td>
<td>Objective 3</td>
<td>M. Kantar</td>
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<tr>
<td>12:40 – 12:50 pm</td>
<td>Objective 4</td>
<td>T. Lübberstedt</td>
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<td>12:50 – 1:00 pm</td>
<td>Objective 5</td>
<td>M. Kantar</td>
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<tr>
<td>1:00 – 1:05 pm</td>
<td>Discuss Renewal and new potential projects</td>
<td>M. Kantar and R. Pratt</td>
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<td>1:05 – 1:30 pm</td>
<td>Renewal discussion in breakout groups</td>
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The **Plant Breeding Coordinating Committee** is the USDA-sponsored advisory group of reps from land grant universities.

**PBCC**
- Mikey Kantar – Chair
- Rich Pratt – Vice Chair
- Wayne Smith - Secretary
- Duke Pauili - Incoming 2020 Secretary
- Ksenija Gasic – Past Chair
- Kate Evans – Past Past Chair
- Thomas Lubberstedt – Executive Committee Member
- Marceline Egnin – Executive Committee Member
- Patrick Byrne – Executive Committee Member

**Representatives**
- Robert Gilbert  *Administrative advisor*
- Edward Kaleikau  *NIFA representative*
- Ann Stapleton  *USDA-ARS representative*
Time line of public agricultural research:

(Hohenheim, Germany, 1818)
(Rothamsted, England, 1843)

Land Grants, USA  State Ag Expt Stations

Morrill Act 1862

Hatch Act, 1887
(Campinas, Brazil, 1887)

Morrill Act of 1890 establishing HBU land-grant universities

1994 Land grant act giving tribal colleges land-grant status

Reg.Proj’s. e.g., NPGS 1947-1953

PBCC, 2005-2020

Agricultural Research, Extension, & Education Reform Act (AREERA) 1998

Research & Marketing Act 1946
Coordination Committees (CCs): A particular type of MSP

CCs are similar to MSPs in some aspects:
  o CCs are peer-reviewed; must be approved by SAES directors;
  o CCs address objectives of high priority among more than one SAES

CCs differ from MSPs in:
  • CC’s don’t typically receive Hatch funds for work on objectives
  • Hatch funds, if any, usually for travel of SAES rep. and/or % of SAES member salary (decision of each SAES director)

(p. 23, Guidelines for Multistate Research Activities. 2013 update. SAES Directors, NIFA, & Experiment Station Committee on Organization & Policy (ESCOP). Includes AREERA requirements. https://saaesd.org/projects/)
Origin of a coordination committee on plant breeding

- Studies & observation identified *steady decline in national plant breeding investment*
  - Exploration of resources invested 1990-94 by public/private sector workshop, Iowa State U., USDA-funded (CSREES, ERS)
  - Guner & Wehner, NCSU, 2003

- Future of Plant Breeding Education in the Public Sector
  - F. Bliss et al., UC Davis, summarized at NAPB 2015

- Together
  - Found significant *reduction in number of public* plant breeders
  - Described substantial *weakening* of university plant breeding *education*
Plant Breeding Coordinating Committee, PBCC: Approved as SCC80 in 2006

First meeting: North Carolina State, Feb 8–9, 2007 (T. Stalker; Stuber and Hancock 2007)

Initial project: 2006 –2015; “Plant Breeding “

• Describe long-term national importance of plant breeding infrastructure and education;
• Increase national awareness of plant breeding’s contributions to U.S. Economy

Current project: 2015 –2020 “Sustaining the Future of Plant Breeding”

• 1) Information/data; 2) Genetic resources; 3) IPR; 4) Education; 5) Communication

New Approved project: 2020—2025 “Imagining the Future of Plant Breeding”

• 1) Resource Analyses; 2) Genetic resources Conservation and Utilization; 3) Education; 4) Communication
Brief History in Time

2006: Formation of the Plant Breeding Coordinating Committee (PBCC, also known as SCC080)

2007: PBCC sponsored the first national Plant Breeding Workshop in Raleigh, NC

2008: PBCC Survey of breeders research priorities and needed infrastructure

2009: Two organizations began holding joint annual meetings

2010: Independent NAPB was created

2011: NAPB strategic planning

2012: IPR summit

2013: IPR session

2014: PBCC renewal approved

2015:

2016:

2017:

2018:

2019:

2020: http://agronomy.wisc.edu/ipr-summit/

What is Next?

Current objectives

1. Collect, analyze, and disseminate information about the U.S. plant breeding effort in both public and private sectors (Kate Evans)

2. Promote the conservation, characterization, and utilization of plant genetic resources and access to them (Pat Byrne)

3. Identify Best Management Practices for public sector IP protection to encourage the creation/distribution of crops (Bill Tracy) - completed

4. Optimize opportunities for public-private collaboration in plant breeding research and education, including continuing education for plant breeders (Thomas Lübberstedt)

5. Foster communication among public plant breeders and federal agencies on policy issues, including alerts to threats to agricultural security that are relevant to plant breeding (Mikey Kantar)
2020 Updates
Objective 1: Collect, analyze, and disseminate information about the U.S. plant breeding effort in both public and private sectors

Subcommittee lead: Kate Evans

- Initial focus on public programs
- Survey committee: Kate Evans, Ksenija Gasic, Mikey Kantar, David Francis & Sarah Kostick
- Teamed up with Dorrie Main’s NIFA NRSP10 and NSF PGRP projects
  - Long term database support (for future regular surveys)
  - Funding for Michael Coe, Cedar Lake Research Group LLC, for survey design and analysis
Highlights:

• Significant reduction in personnel over last 5 years
  • aging demographic of program leaders
• Budget shortfalls/uncertainty endanger/constrain support of key personnel, maintain core infrastructure & operations, make use of current technology
• Reduced/sporadic funding → focus on sustaining core operations
  • reduced graduate student/postgrad training
Objective 2: Promote the conservation, characterization, and utilization of plant genetic resources and access to those resources for plant breeding.

Subcommittee lead: Pat Byrne

Sustaining the Future of Plant Breeding: The Critical Role of the USDA-ARS National Plant Germplasm System

P. Byrne, G. Volk, C. Gardner, M. Gore, P. Simon, S. Smith

Crop Science 58:451–468, 2018
Two infographics on Plant Genetic Resources were funded by PBCC/NAPB, targeted to the public.
Ebook on crop wild relatives published April, 2020

https://colostate.pressbooks.pub/cropwildrelatives/

8 chapters released, 10 in development.
Each chapter contains text, embedded videos, and references.

The ebook was inspired by PBCC and made possible in part by funding from USDA-ARS, Colorado State University, IICA-PROCINORTE, and USAID.
Higher Education Challenge Grant Awarded June, 2020

“Enhancing Educational Outcomes For Plant Genetic Resources Conservation and Use”

OBJECTIVES

- Develop an organized series of learning resources (videos, ebook chapters, images, etc.) covering PGR topics;
- Establish an online repository to host, organize, and track usage of the developed content;
- Develop and offer three 1-credit graduate-level courses on PGR conservation and use in plant breeding and genetics;
- Disseminate the developed materials broadly, including through the Plant Breeding eLearning for Africa Program.
The grant stems from discussions at the 2015 PBCC meeting in Pullman, … which led to a Crop Science review article in 2018, … and the HEC proposal in 2019.

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<th>Participants</th>
<th>University</th>
<th>Name</th>
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<tr>
<td><strong>Colorado State Univ.:</strong></td>
<td>Pat Byrne (PI)</td>
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<td></td>
<td>Maria Munoz-Amatriain</td>
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<td>Jill Zarestky</td>
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<td><strong>Iowa State Univ.:</strong></td>
<td>Walter Suza</td>
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<td><strong>USDA-ARS:</strong></td>
<td>Gayle Volk, Fort Collins, CO</td>
<td>Candy Gardner, Ames, IA</td>
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<td>Gary Kinard, Beltsville, MD</td>
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<td><strong>Consultant:</strong></td>
<td>Deana Namuth-Covert, Lincoln, NE</td>
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Objective 3: Identify Best Management Practices for public sector IP protection to encourage the creation/distribution of crops

Subcommittee lead: Bill Tracy

https://agronomy.wisc.edu/ipr-summit/

- Continuing to educate
- Recently tech transfer professionals
- Share Document with Offices of Technology Transfer
Objective 4: Optimize opportunities for public-private collaboration in plant breeding research and education, including continuing education for plant breeders.

Subcommittee lead: Thomas Lübberstedt

Expected Outcomes and Impacts: Public-private collaboration
• Number and quality of plant breeding graduate students maintained or improved
• White paper or journal publication produced on core competencies for plant breeding students
• Public-private collaborative research proposals funded
Core Concepts in Plant Breeding: Current Status 2019

- Core outcome/concept/learning objective lists generated for all 8 ISU MS PLBR courses (S18)

- “Course pairing” to identify gaps and redundancies; comply with Bloom (F18)

- Hierarchical Web-tool for MS PLBR core concept/outcomes/learning objectives (F18)

- Feedback from ISU PLBR faculty (F18)

- Feedback from stakeholders / other universities outside ISU (S19)

- Public availability of Web-tool (F19)
Core Concepts in Plant Breeding: Current Status 2020

- No feedback from other universities outside ISU (S19) after sending hierarchical web-tool

- Public availability of Web-tool (F19): Dorrie Maine agreed to help developing a web-tool starting in 2020

- White paper initiated with Assibi Mahama, Mike Retallick, Dorrie Main, Martin Bohn

- Planned submission to USDA HEC in 2021
Objective 5: Foster communication among public plant breeders and federal agencies on policy issues, including alerts to threats to agricultural security that are relevant to plant breeding

Subcommittee lead: Mike Gore, Mikey Kantar
Science–graphic art partnerships to increase research impact


Communications Biology 2, Article number: 295 (2019) | Download Citation
Best Practices Worksheets Available


**Science Communication for Plant Breeding Tips**

**How to write a blog on your research?**

1. Keep things short. A good length for a blog post is 500 to 800 words.

2. The primary audience for this blog is the general public. So:
   - Start with the question (the one assigned), and make sure your conclusion addresses the question again
   - Keep your explanations simple
   - Don’t worry about being an absolute subject-matter expert. Being relatable is the most important factor in blogging
   - Avoid technical terms and jargon
   - Use a conversational, informal tone
   - Write with examples for your points whenever you can
   - Use concrete, specific language in your post
   - The goal is for the post to read at the 8th grade level

3. Identify photos to go along with your post, whenever possible, these are more memorable than the text

4. A good way to check the reading level is the Hemingway application [http://www.hemingwayapp.com/](http://www.hemingwayapp.com/)
New PBCC project 2020-2025

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<tr>
<th>When?</th>
<th>What?</th>
<th>Implications for PBCC?</th>
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<tbody>
<tr>
<td>Sept 2020</td>
<td>Existing project expires, new PBCC project Oct 1, 2020 -2025</td>
<td>Opportunities for building on PBCC’s experience &amp; accomplishments</td>
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**Writing Committee:** Michael Kantar(Chair), Ksenija Gasic, Kate Evans, Patrick Byrne, Wayne Smith, and Richard Pratt

**Administrative Advisor:** Robert Gilbert

**NIFA Rep:** Edward Kaleikau
New objectives

1. **Resource Analyses:** Collect, analyze, and disseminate data about U.S. public and private plant breeding efforts, including human capacity and access to enabling knowledge, technologies, germplasm, and infrastructure.

2. **Genetic Resources Conservation and Utilization:** Promote the conservation, characterization, and utilization of plant genetic resources and access to those resources for plant breeding purposes.

3. **Education:** Explore the U.S. plant breeding education capacity across universities and identify potential gaps and ways of achieving more uniform teaching capacity.

4. **Communication:** Improve communication [1] among public plant breeders and federal-state-local agencies on plant breeding policy issues, including alerts to existing and emerging threats to agricultural security that are relevant to plant breeding; [2] among public plant breeding programs and university administrators through enhancing the mission and impact of PBCC state representatives; and [3] between the plant breeding community and public audiences.
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<tr>
<th>Date</th>
<th>Activity</th>
<th>Who</th>
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<tr>
<td>August, 2020</td>
<td>Decide about new discrete projects for the renewal</td>
<td>Decided by PBCC leadership and membership</td>
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<tr>
<td>Oct, 2020</td>
<td>Decide on projects for the 2020-21 year</td>
<td>PBCC leadership</td>
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<tr>
<td>Jan. 2021</td>
<td>Finalize working groups for different projects</td>
<td>PBCC leadership</td>
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<tr>
<td>Feb. 2021 - onward</td>
<td>Start work on the new projects</td>
<td>PBCC membership</td>
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