Sustaining the Future of Plant Breeding

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)

Agenda

Time	Topic	Presenter
12:00 – 12:10 pm	Welcome and introductions	M. Kantar
12:10 – 12:15 pm	PBCC history, present and future	M. Kantar
12:15 – 12:25 pm	Objective 1	K. Evans
12:25 – 12:35 pm	Objective 2	P. Byrne
12:35 – 12:40 pm	Objective 3	M. Kantar
12:40 – 12:50 pm	Objective 4	T. Lübberstedt
12:50 – 1:00pm	Objective 5	M. Kantar
1:00– 1:05 pm	Discuss Renewal and new potential projects	M. Kantar and R. Pratt
1:05 – 1:30pm	Renewal discussion in breakout groups	

The **Plant Breeding Coordinating Committee** is the USDA-sponsored advisory group of reps from land grant universities

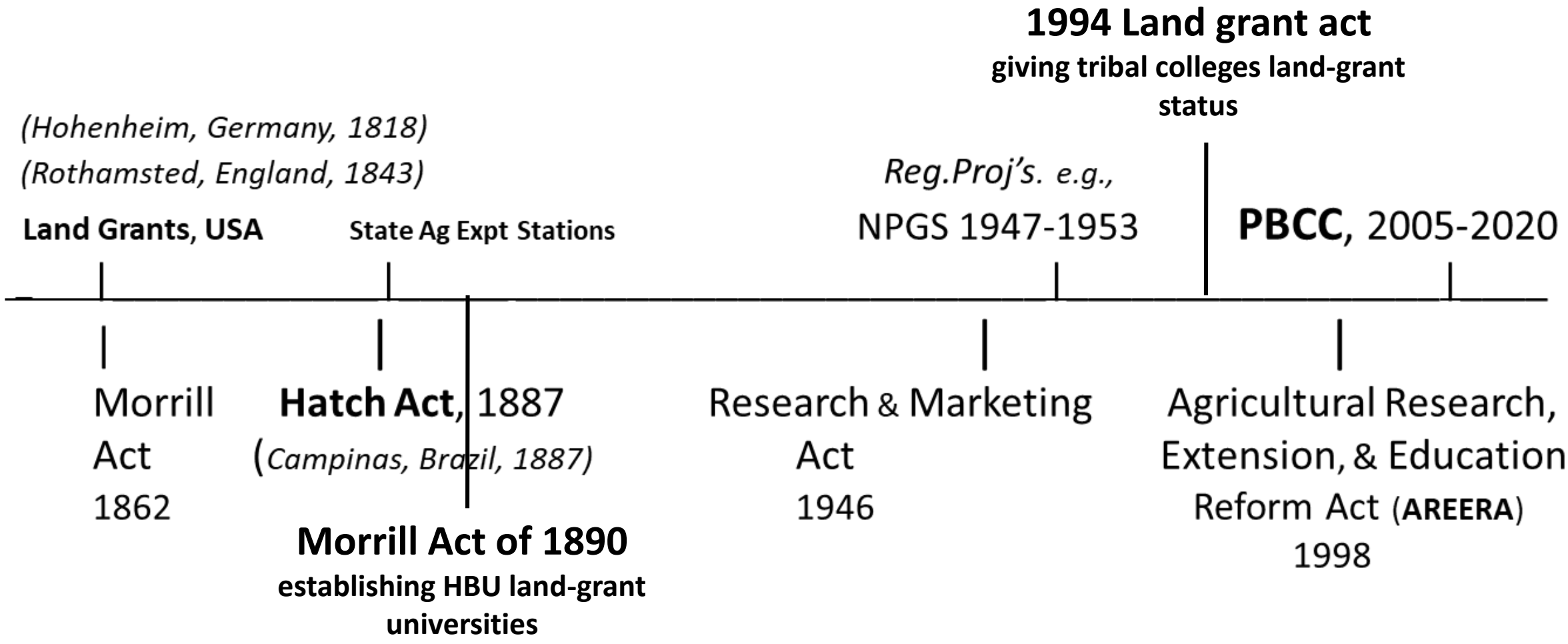
PBCC

- 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 :



Coordination Committees (CCs): A particular type of MSP

CCs are similar to MSPs in some aspects:

- CCs are peer-reviewed; must be approved by SAES directors;
- 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*
  - National Plant Breeding Study Vols. I-IV; K J Frey, 1994-2000.
  - 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
    - Symposium, Michigan State, 2005. P Gepts & J Hancock. 2006. Crop Sci. 46:4
  - 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

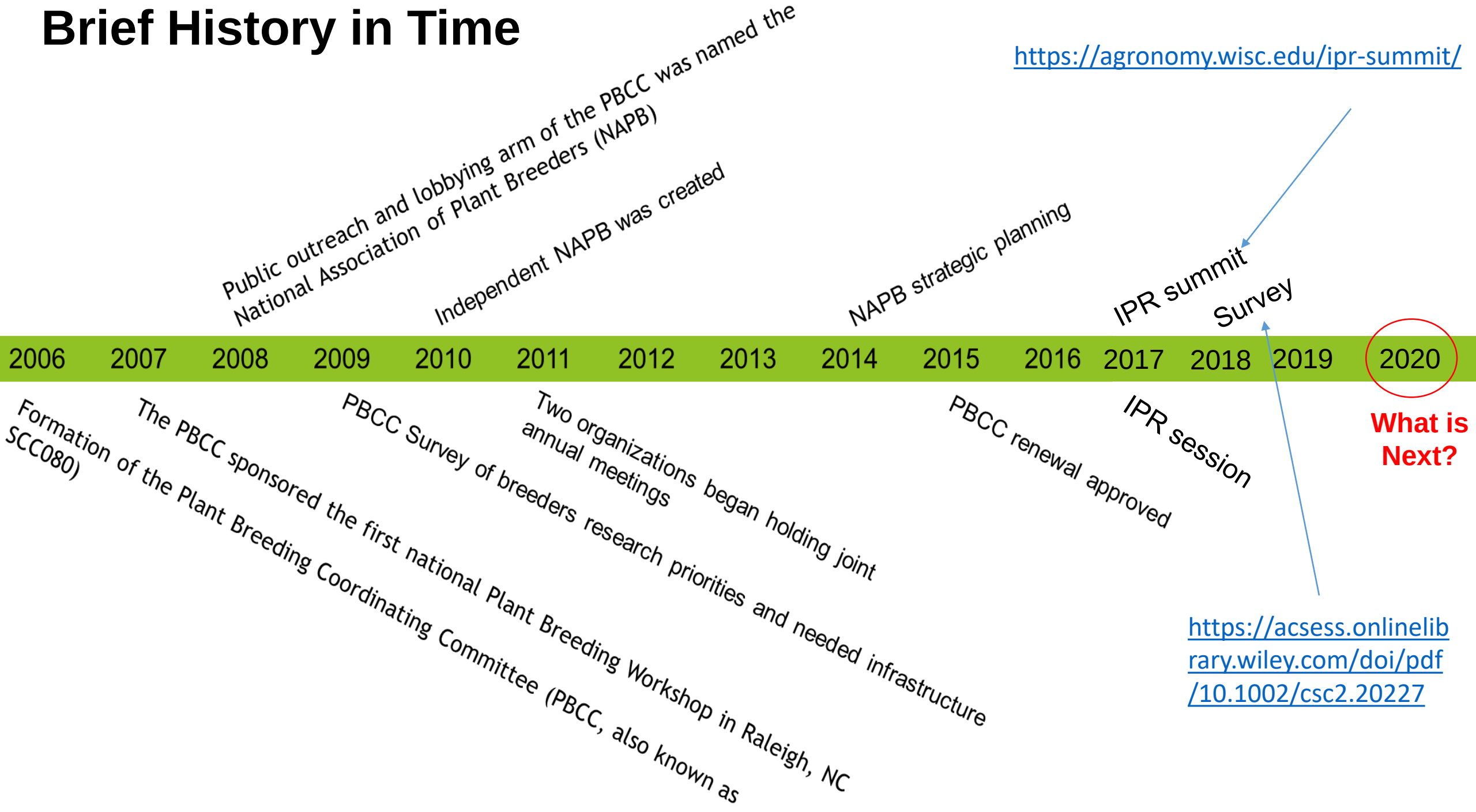
New Approved project: 2020—2025 "Imagining the Future of Plant Breeding"

- 1) Resource Analyses; 2) Genetic resources Conservation and Utilization; 3) Education; 4) Communication

Plant Breeding Coordinating Committee State Reps

Brief History in Time

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



https://acsess.onlinelibrary.wiley.com/doi/pdf/10.1002/csc2.20227

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

Crop Science

ORIGINAL RESEARCH ARTICLE | Open Access

Plant Breeding Capacity in U.S. Public Institutions

Michael T. Coe, Katherine M. Evans, Ksenija Gasic, Dorrie Main

First published: 24 May 2020 | https://doi.org/10.1002/csc2.20227

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.

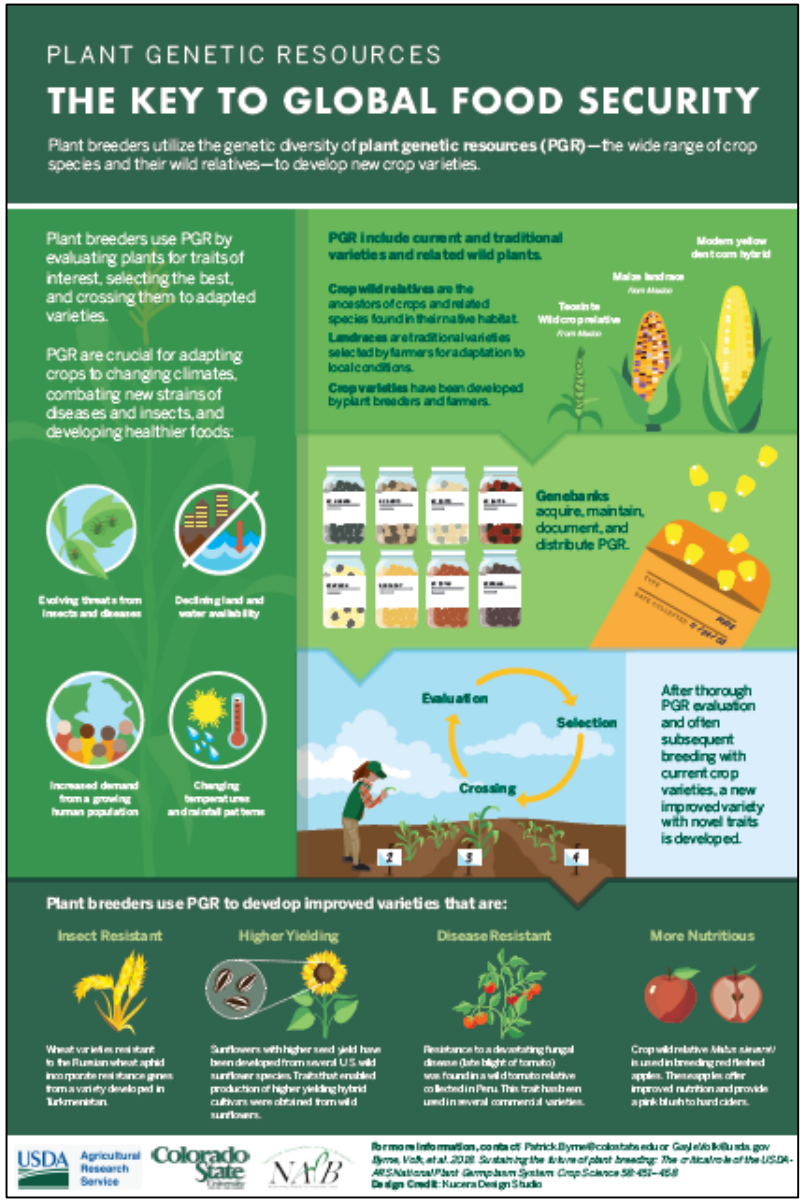
Subcommittee lead: Pat Byrne

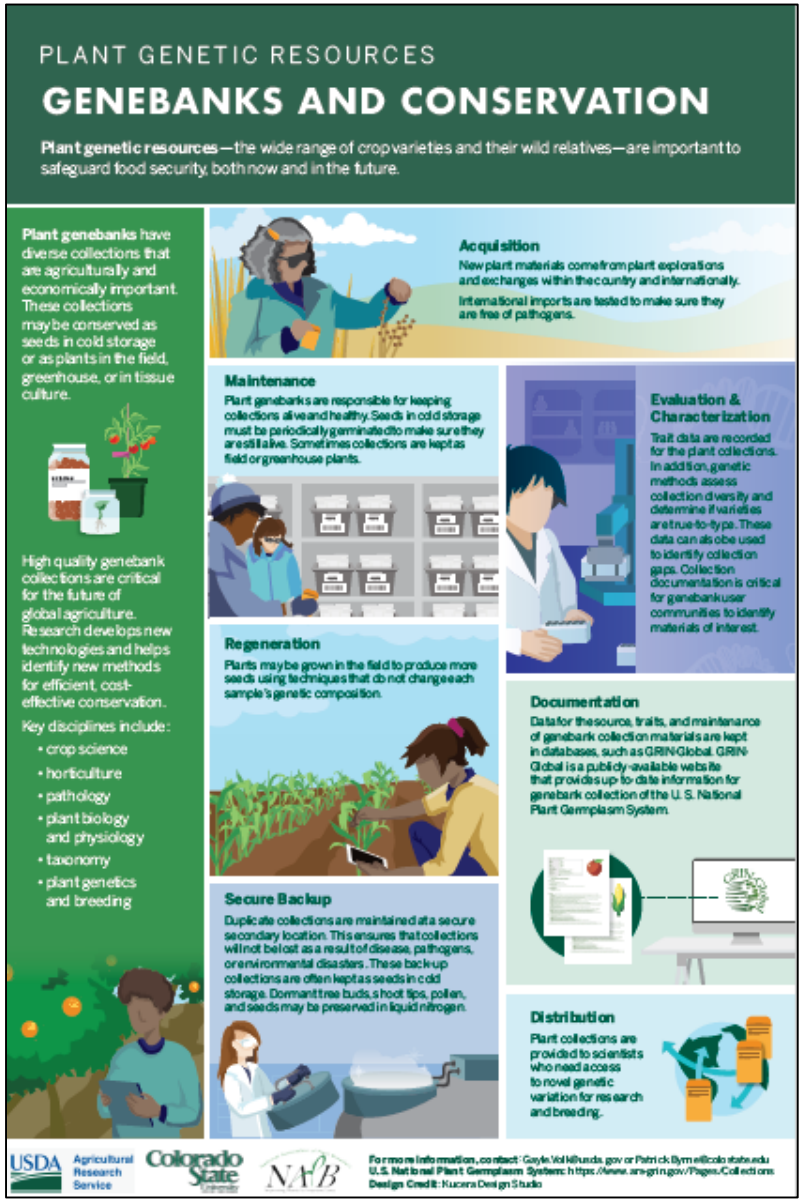
Sustaining the Future of Plant Breeding: The Critical Role of the USDA-ARS National Plant Germplasm System

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

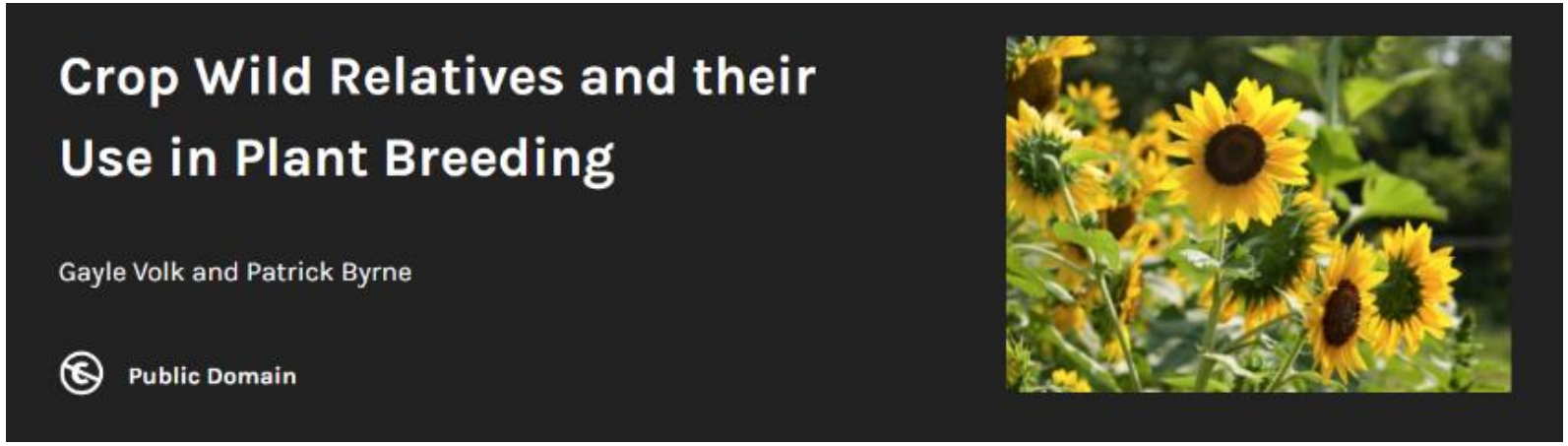
Crop Science 58:451–468, 2018

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.

Participants

Colorado State Univ.:	Pat Byrne (PI) Maria Munoz-Amatriain Jill Zarestky
Iowa State Univ.:	Walter Suza
USDA-ARS:	Gayle Volk, Fort Collins, CO Candy Gardner, Ames, IA Gary Kinard, Beltsville, MD
Consultant:	Deana Namuth-Covert, Lincoln, NE

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

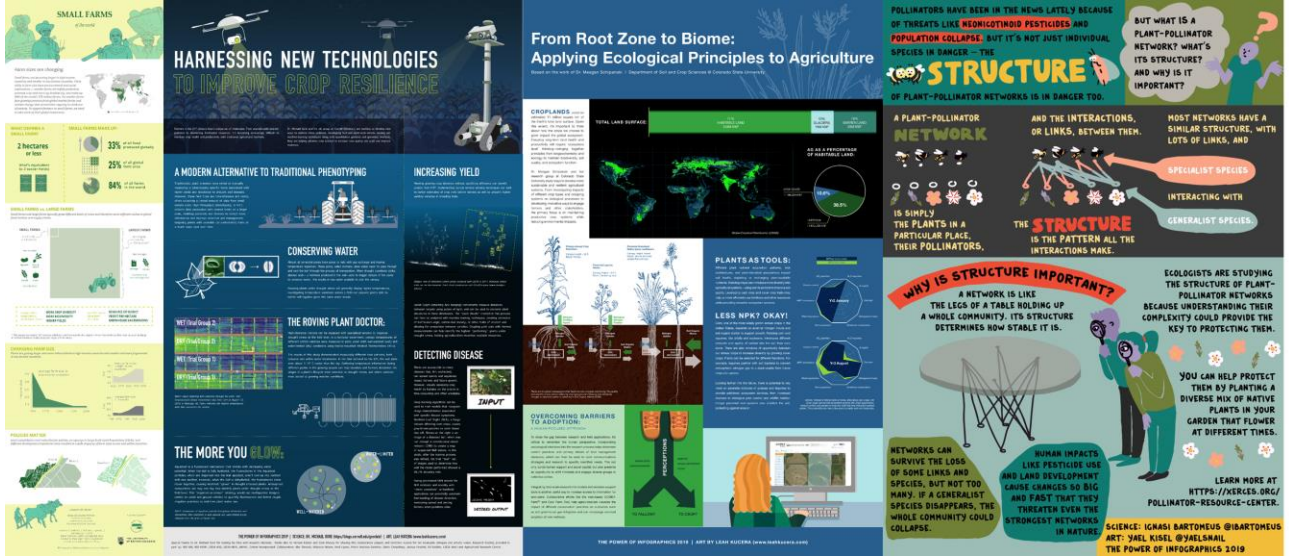
- **Core outcome/concept/learning objective lists generated for all 8 ISU MS PLBR courses (S18)**
- **“Course pairing” to identify gaps and redundancies; comply with Bloom (F18)**
- **Hierarchical Web-tool for MS PLBR core concept/outcomes/learning objectives (F18)**
- **Feedback from ISU PLBR faculty (F18)**
- **Feedback from stakeholders / other universities outside ISU (S19)**
- **Public availability of Web-tool (F19)**

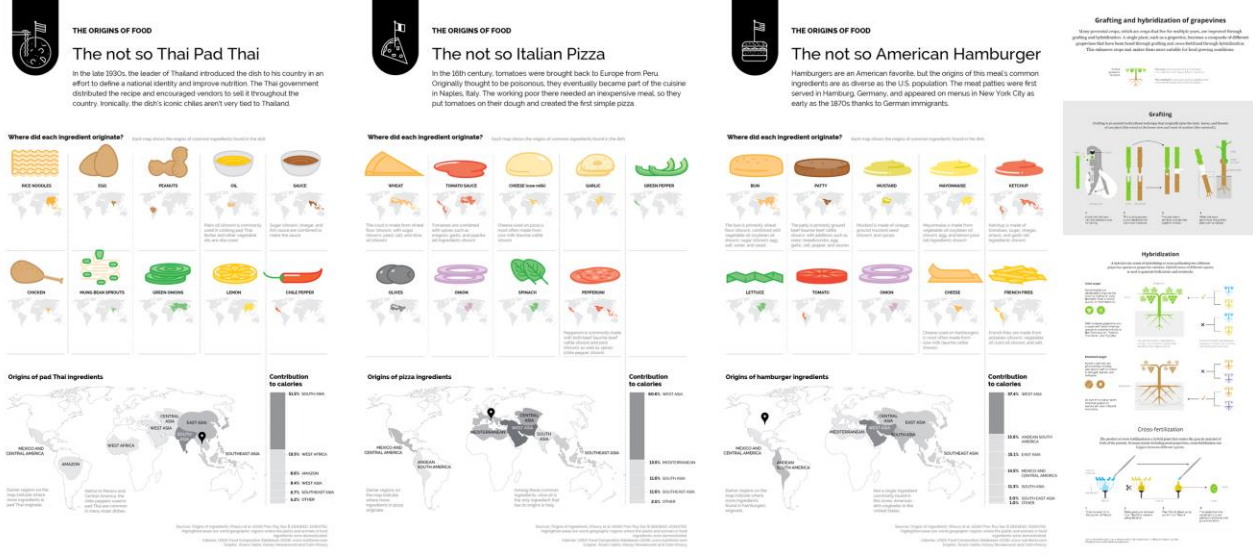
Core Concepts in Plant Breeding: Current Status 2020

- **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





COMMUNICATIONS BIOLOGY

Comment | OPEN ACCESS | Published: 06 August 2019

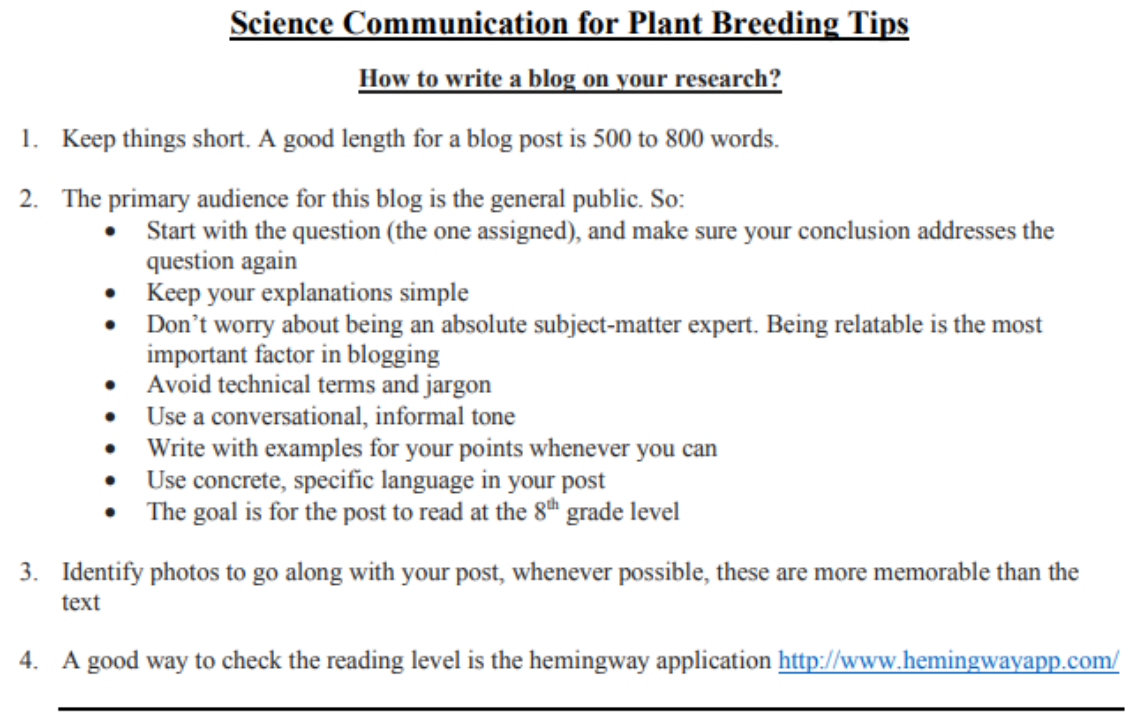
Science–graphic art partnerships to increase research impact

Colin K. Khoury ✉, Yael Kisel, Michael Kantar, Ellie Barber, Vincent Ricciardi, Carni Klirs, Leah Kucera, Zia Mehrabi, Nathanael Johnson, Simone Klabin, Álvaro Valiño, Kelsey Nowakowski, Ignasi Bartomeus, Navin Ramankutty, Allison Miller, Meagan Schipanski, Michael A. Gore & Ari Novy

Communications Biology **2**, Article number: 295 (2019) | Download Citation ⬇

Best Practices Worksheets Available

- https://www.plantbreeding.org/files/napb/science-communication-for-plant-breeding-tips-combined.pdf



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/

New PBCC project 2020-2025

When?	What?	Implications for PBCC?
Sept 2020	**Existing project expires, new PBCC project Oct 1, 2020 -2025**	**Opportunities for building on PBCC's experience & accomplishments**

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.

New Project Timeline

Date	Activity	Who
August, 2020	Decide about new discrete projects for the renewal	Decided by PBCC leadership and membership
Oct, 2020	Decide on projects for the 2020-21 year	PBCC leadership
Jan. 2021	Finalize working groups for different projects	PBCC leadership
Feb. 2021 - onward	Start work on the new projects	PBCC membership