Plant Breeding Coordinating Committee

A multi-state coordinating committee that provides a forum for leadership on issues and opportunities of strategic importance to national core competency in plant breeding research and education

Allen Van Deynze
USDA Listening Session

http://passel.unl.edu/communities/pbcc
http://lgu.umd.edu/lgu_v2
Plant Breeding

a **product-oriented discipline of sciences** rooted in breeding, quantitative genetics and statistics for crop improvement that encompasses an increasing number of support technologies to sustain society.

**Plant breeding has Measurable and Tangible Outcomes and Impacts.**
Recruiting, Training and Communication

“Career decisions are made from hands-on experiences” David Douches, MSU

**USDA/NIFA Plant Breeding and Education program UC Davis**

- 2000 students from K-6 introduced to plant breeding
- 100 High School students and >100 freshman undergraduates introduced to plant breeding in the field
- 40 videos (sbc.ucdavis.edu) and National Association of Plant Breeders (plantbreeding.org)
- 5 Graduate students and interns

**USDA/NIFA Coordinated Agricultural Projects**

- Education and Extension components (1/3rd budget)
- Triticeae CAP – Plant Breeding Training Network
  - 85 graduate students (65 at TCAP institutions, 20 outside grant)
  - 73 undergraduates (38 at TCAP institutions, 35 at MSIs)
  - 4 films ([http://passel.unl.edu/communities/pbtn](http://passel.unl.edu/communities/pbtn))
Funding mechanisms

- Competitive grants
- **Long-term** operational funds - Capacity funds
- Infrastructure and equipment funds
- Emergency funds
Emergency funds must be timely

**Citrus Greening**
Florida industry- $1.54 B
US - $2.34 B
2005 - industry begins research
2008 USDA funding
Priorities: Fund the Whole Plate
Goals and priorities

2008 Summit 40 experts, Miller et al. 2010

- Decipher the genetic basis of plant environmental responses – G x E
- Conserve, characterize and utilize novel germplasm.
- Manage complex traits, including quantitative traits
- Develop efficient, high-throughput analysis systems
- Create knowledge from information
- Understand basic genetic mechanisms.
- Increase plant efficiency and quality
- Improve seed health, quality and performance
- Develop cost-efficient risk analysis systems for products of new technologies

Surveys-2009 NAPB, ASTA Seed Summit, 2011
Public and Private Funding

• Public funding is essential for *basic research and long-term research* in plant breeding in all crops
• Public funding and infrastructure are essential to *train* field-based plant breeding and agriculture
• Although private invests heavily in major commodity and vegetable crops, *not all regions or crops are addressed* for variety development and germplasm release

Private partnerships: Survey of 210 researchers and administrators, 9 Univ., 30 Companies.

Stripe Rust: 40-100% yield loss in 25% of wheat in NW USA in 2008
UC Davis Wheat Program

Common Wheat
Lassik (HRS): introgression of strong gluten (GluD1 5+10), high grain protein content (GPC-B1), nematode resistance (Rkn3) and stripe rust resistance Yr17
Patwin (HWS): Resistance to new races of stripe rust.
   Introgression of Yr17
Patwin 515: HWS. Resistance to new races of stripe rust. Two stripe rust resistance gene Yr5 and Yr15 on top of Yr17

Impact: Wheat epidemic currently controlled, Adding UG99

Funding: Hatch, UC Davis, USDA/IFAS, USDA/NIFA, Growers, Private

http://passel.unl.edu/communities/pbcc
Tracking Outcomes: USDA/ARS Carrot breeding program
Phillip Simon, Madison, WI

Carrot Nutritional Value

<table>
<thead>
<tr>
<th>Year</th>
<th>Carotene content</th>
<th>Per capita availability</th>
<th>Est. % of total vitamin A available</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>90</td>
<td>3.7 kg</td>
<td>14 %</td>
</tr>
<tr>
<td>2005</td>
<td>130</td>
<td>5.6 kg</td>
<td>21 %</td>
</tr>
</tbody>
</table>

One square meter of U.S. carrot production (one crop) is adequate to fulfill vitamin A needs for one adult for one year.

**Funding:** USDA/ARS, USDA-IFAFS, USDA/NIFA, USDA-SCRI, USDA_OREI, Commodity Board, Grower support, Private

See [http://passel.unl.edu/communities/pbcc](http://passel.unl.edu/communities/pbcc)
References


References


