Soybean Breeding

- Varieties establish the yield ceiling
- Local programs produce adapted varieties
Soybean Yields are Low in Africa

Yield kg/ha

Year
Participants

- **USA (60+ years breeding soybean, 2 years of development work)**
  - Randy Nelson – USDA-ARS and University of Illinois
  - Brian Diers – University of Illinois
  - Andrew Scaboo – Univ. of Missouri

- **Africa (<10 years breeding soybean)**
  - Nicholas Denwar – SARI, Ghana
  - Abush Tesfaye – JARC, Ethiopia
  - Godfree Chigeza– IITA breeder Malawi and Zambia
Beginning Status of Breeding Programs

- Few parental lines
- Few crosses
- Small populations
- Ineffective selection
- Small yield tests
- No mechanization
Progress in Breeding Programs in 2015

• Evaluation of germplasm provided in 2014
• U.S., Brazilian, and Chinese varieties
## Performance of US Germplasm in Ethiopia

<table>
<thead>
<tr>
<th>Variety</th>
<th>US MG</th>
<th>Days to Maturity</th>
<th>Days to Flowering</th>
<th>Plant Ht.</th>
<th>Yield (t/ha)</th>
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Relationship Between US MG and Days to Flowering and Maturity in Jimma, Ethiopia
Progress in Breeding Programs in 2015

• Evaluation of germplasm provided in 2014
  • U.S., Brazilian, and Chinese varieties
  • Rust resistance germplasm

• Planting germplasm supplied in 2015
  • F2 populations with U.S. and African parents
  • Germplasm with resistance to stink bugs
Progress in Breeding Programs in 2015

• Number of parents increased
• Number of crosses increased
• Working to increase population size
• On-site, off-season nurseries with irrigation
Progress in Breeding Programs in 2015

- Understanding thresherer capabilities
- Increase use of threshers
- Effective use of threshers
Progress in Breeding Programs in 2015

- Experience in Missouri and Illinois
- Changing perceptions
- Creating an international team
International Testing

- Collaboration with Syngenta Foundation
- Received commitments for 38 varieties from:
  - SeedCo
  - Ethiopian Institute of Agricultural Research
  - Zambia Agricultural Research Institute
  - IITA
  - Embrapa
- Pilot trials in Kenya
- Will be planted in Malawi
Bradyrhizobia survival study

• Three year study began in 2014
  • U.S and Ghanaian varieties
  • Common Ghanaian inoculum
  • Mixture of 5 strains from USDA
  • Inoculated and non-inoculated treatments
  • Cowpea variety
  • Two crop rotations

• Bradyrhizobia typed by DNA sequencing
• Not planted in 2015 but sampled in 2015
• Will be restarted in 2016
Questions?