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2011 BeanCAP Activities

- Conducted 4 replicated BeanCAP trials:
  - Middle America
  - Jalisco/Durango
  - Andean
  - Drought

- Trained 3 undergraduate and 4 high school students

Students were involved

Dry Bean Breeding Activities:

- Seed preparation
- Field design and maps
- Planting
- Planting in growers' fields
- Field staking
- Note taking
- Disease screening (CBB, BBS, BW, and BCMV)
- Experiments on drought (greenhouse/field)
- Hybrid formation
- Oral presentations






Students were involved

Dry Bean Breeding Activities:

- Lab experiments
  - Cooking time
  - DNA work with a graduate student
- Drought physiological parameters (NDSU PhD student)
  - leaf temperature
  - soil moisture content
  - stomata conductance

Events where BeanCAP was discussed

Event	Date	Attendants
LEAD Tour	April 5	29
Western Nebraska Community College	April 21	50
University of Nebraska Expo Field Day	July 26	150
Crop Management Workshop	August 16 to 18	132
Nebraska Dry Bean Growers Association	August 23	150
Scotts Bluff Youth Day Leadership	September 25	60
Leadership Scotts Bluff, Inc	October 21	20

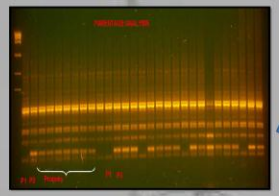
DNA Extraction (Scotts Bluff Youth Day, September 15, 2011)

University of Nebraska Expo on July 26, 2011

UNL Dry Bean Breeding Program

University of Nebraska Lincoln

IANR

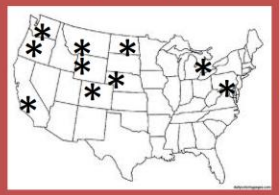


Hybrid Verification

Chickpea Research

Regional Trials

WRBT, CDBN, MRPN



Winter Nursery

Puerto Rico
New Zealand

On Station Trials

- P1 x P2 Greenhouse
- F1 Greenhouse
- F2 Scottsbluff/Mitchell
- F3 Individual Selections, Puerto Rico
- F4 Very Early Yield Trial
- F5 Early Yield Trial
- F6 Intermediate Yield Trial
- F7 Advanced Yield Trial
- F8 Advanced Yield Trial

Parents are originated from Exotic Germplasm (Colombia, Mexico, and USA), USA and CIAT's Core Collections, and Interspecific crosses. Advance UNL lines are recycled through Recurrent Selection

These trials are evaluated for Bean Common Rust at Beltsville, MD and Lincoln, NE

On Farm Trials

'Mother & Baby' Trials → Variety/Germplasm Release

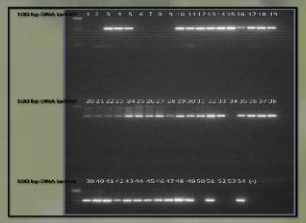
Carlos Urrea at CIAT, 2010

Multiple Disease Evaluation:

- Common Bacterial Blight (CBB), North Platte
- Bacterial Brown Spot, Bacterial Wilt, CBB, and Bean Common Mosaic Virus, Greenhouse, SB
- White Mold, SB and Greenhouse, at Lincoln, NE

Multiple Traits Evaluation:

From F4 to F8, the lines are evaluated for yield and its components, disease resistance, earliness, drought tolerance, seed quality and nutrition (UNL Food Science) , and plant architecture. MAS is used in the process of selection.



Marker Assisted Selection (MAS)

BeanCAP

The Common Bean Coordinated Agricultural Project (Bean CAP) is a national program to initiate a modern plant breeding training. BeanCAP focuses primarily on early career recruitment and practical breeding/genomic training.

That training helps illustrate, for example, how the integration of genomic and phenotypic data, can be used to improve nutritional traits in plants.

Conversion of high throughput markers into low cost markers for day-to-day use in breeding programs helps support US bean breeding programs such as this one.

The nutrition, genetic, and genomic scientists will coordinate the development of an eXtension Community of Practice that will utilize high-quality animations and other multimedia to educate the general public and educational communities about the biology of nutrition and how genetics/genomics technology assists with the improvement of nutritional traits.

Empower Students

Presented the UNL Dry Bean Breeding Program during the University of Nebraska Expo on July 26, 2011.

Planted two of the ‘Mother and Baby’ trials at Gering Valley and Bayard, NE (Growers’ fields)

BeanCAP Related Articles

- Hansen, S. 2011. *Bean counting isn't all that boring*. StarHerald, Scottsbluff, NE April 13, pages 1 & 3.
- Hansen, S. 2011. *Panhandle is latest stop on international guest for excellence*. StarHerald, Scottsbluff, NE. May 29, page 3 & 4.
- Hansen, S. 2011. Program: *BeanCAP gives students a chance to learn about dry edible bean breeding*. StarHerald, Scottsbluff, NE. June 26, pages 1 & 2.
- Hansen, S. 2011. *Learning leaf language*. StarHerald, Scottsbluff, NE. August 14, pages 1 & 2.
- Otsdiek. D. 2011. *UNL bean plots part of worldwide effort to improve crops*. StarHerald, Scottsbluff, NE. September 18, page 1.
- Otsdiek. D. 2011. *UNL bean plots part of worldwide effort to improve crops*. The Business Farmer. September 30, pages 6 & 7.
- Urrea, C.A. 2011. *UNL dry bean breeding program*. The Bean Bag. 29(4):2.

Challenges

Physical distance from main campus

Challenges

- Housing
- Recruit one more undergraduate student

David Nash, WNCC professor

- ‘Nice to hear from you. I will be on the lookout for a student with the interests you need. I had all four of the students, and now Scout, in my classes here at WNCC. I was/am always anxious, and a little envious, to hear about what they were doing. I have lost track of Misty but the other three are doing well in their next level of studies’

Nicole N. Schnittger

- ‘I am currently full time at University of Nebraska at Omaha majoring in Biology focusing in pre-medicine. Due to the highly competitive nature of this field I have considered plant breeding as a field I would pursue. Had it not been for the amazing opportunity granted me by your program I would never have known about this field, let alone thought to consider making a career of it.’

Misty L. Griffits

- ‘I am not back in school yet. I am actually working in Phlebotomy at the medical clinic in Gering. I actually applied for ALOT of jobs in agronomy! So now I am not sure what I want to do when I grow up, but I am still seriously considering molecular biology as a means into DNA and studying plants, I'm just not sure which ones. I hope everything is going great for you!’

Emily Hoehn

- ‘I'm currently attending the C.W. Post campus of Long Island University in Brookville, New York. I am a year away from receiving my bachelors in Environmental Science. From there, I'm hoping to extend my studies into Hydrolysis or Meteorology. I found your efforts to make a drought resistant plant that is sustainable in Nebraska very fascinating. I hope to study efficient ways to use the most valuable resource we have: water.’

- ‘Thank you very much for allowing me to participate in your bean breeding program. It has been a great value to me.’

Other BeanCAP Students

- Tania Torres, majoring in Biology, Barry University, Miami, Shores Florida
- Charity Burkey, University of Wyoming, 2nd semester Ag Business and plan to take classes in Horticultural Sciences
- Scout Wilson, WNCC, 2nd semester in Biology. Planning to be a breeder. Summer 2012 internship at DSU (Undergraduate Research Molecular Genetics & Genomics)
- Danni Becker, majoring in Biology, Univ. of Missouri, Kansas City, MO. Plan to continue in Vetenerary Medicine.

Positive things about BeanCAP

- Public awareness
- Invited to set up experiments in Genetics (Biology Class, Scottsbluff High School)