A USDA/NIFA Supported Project

BeanCAP Project
2011 Advisory Board Meeting
2010-2011 Field Experiments

James D. Kelly, Michigan State University
Philip Miklas, USDA-ARS, Prosser, WA
Ken Kmiecik, Seminis Seeds, ID

United States Department of Agriculture
National Institute of Food and Agriculture

Light Red Kidney

Navy

Pink

Soldier

Dark Red Kidney

Great Northern

Pinto

Black

Small Red

White Kidney

Cranberry

Yellow Eye

Dry Bean Genotypes ~ 406 entries

- Genotype Selection Criteria
- USDA-ARS Programs (3): Prosser, Beltsville, Mayaguez
- Universities (8):

  CSU, CU, MSU, NDSU, UCD, UI, UNL, UPR
- Private Sector (7): Seminis, ADM, Gentec, Hyland, Kelley Bean, Idaho Seed Bean, (Ameriseed, Seed Grow)
- Canada (2): Univ. Guelph, Univ. Saskatchewan
- AG-Canada (2): Manitoba, Alberta
- International (1): Zamorano – Honduras (CRSP)
- All entries listed on BeanCAP web site along with garden beans

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2010 Activities

- Assemblage of seed at NDSU – cataloguing & distribution
- Distribution to Seminis Seed, Filer ID – Spring GH increase
- Distribution to MSU, East Lansing – GH increase (backup)
- Sample sent to UCD for DNA extraction >>>> Beltsville
- Field Increase @ Filer, ID - 378 Lines – future field studies
- Field Increase @ Othello, WA – 250 lines - backup
- Field Increase @ E. Lansing, MI – 375 lines - backup
- Sent subset of 248 lines to Houston (NDSU, MSU) for nutritional analysis – seed produced in field in WA, MI
- Smaller subset 165 sent to CSU for fiber analysis (30)
- Identified subset 172-entries for 192-Genotyping Panel
- Identified subset 100 genotypes -testing under drought

BeanCAP Varieties – Seed Production in Idaho, 2010

378 lines total increased
356 lines 1- 6 kg seed

Harvest BeanCAP Varieties – East Lansing MI - 375 single rows – limited seed amounts

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Plans for 2011

- Two Major Field Trials – Association Mapping Studies
- Phenotyping 300 Genotypes at 4 Locations
- Evaluation of 100 Genotypes for Testing under drought stress at 4 Locations
- Choose 300 genotypes – include 100 in drought trial
- Traits being measured – under discussion
- Locations Listed

2011 Field Trials – Association Mapping

Participant	Location	Phenotype - 300 Lines	Drought Trial -100	Comments- Drought
Mark Brick	CSU	Y	N	Plot size
Phil Miklas	Prosser	N	Y	Terminal
Juan Osorno	NDSU	Y	Y	Intermittent
Carlos Urrea	UNL	Y	Y	Terminal
Jim Kelly	MSU	Y	Y	Intermittent
Tim Porch	Mayaguez	N	Y	Intermittent Planted 12/27/10
ADM Seedwest	New Plymouth ID	N	Y	Terminal

AGRONOMIC TRAITS

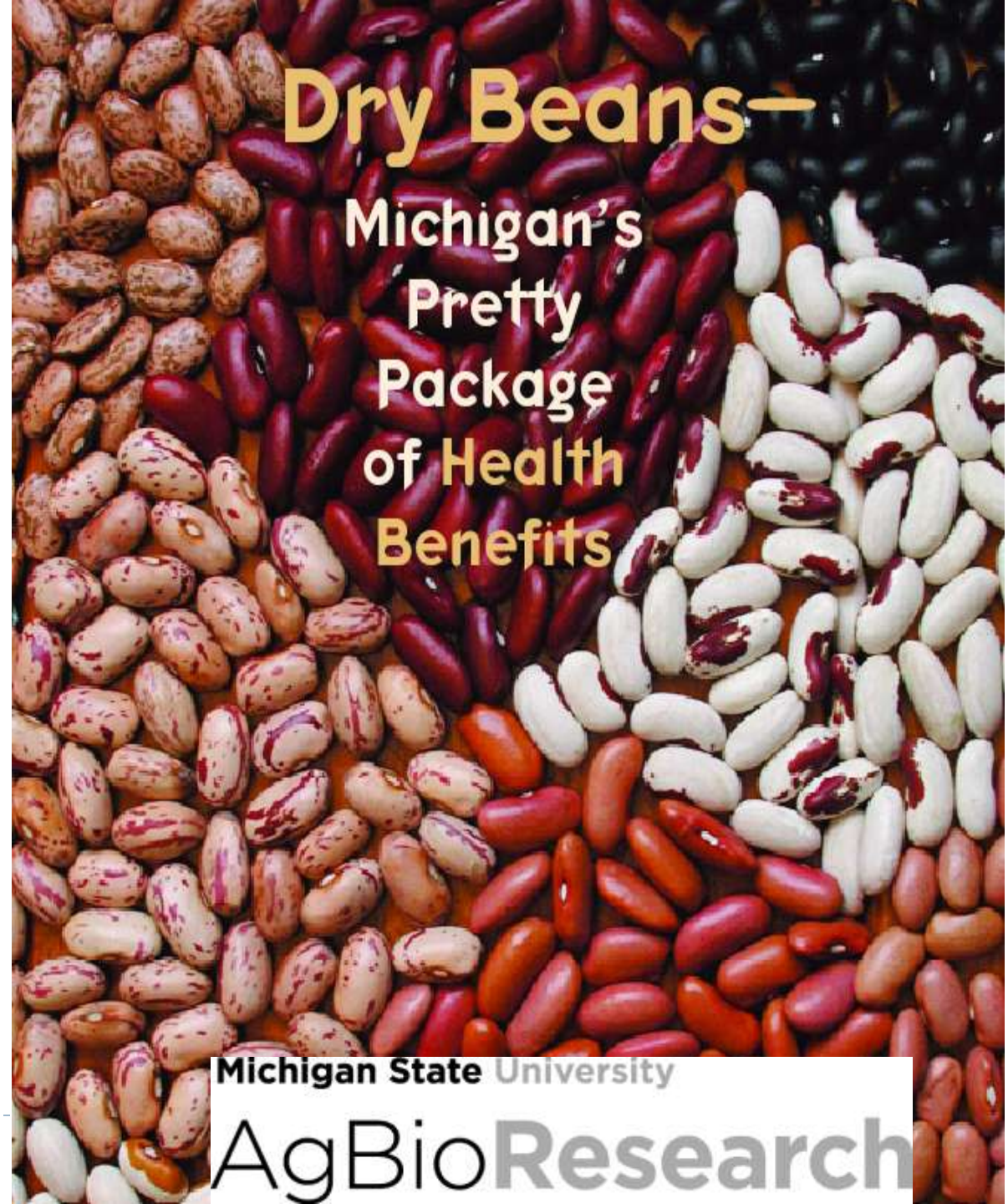
- **Early Vigor (EV):** Scored on a 1 to 9 scale, where 1=excellent and 9= very poor, within the first three weeks after emergence.
- **Days to Flower (DF):** Actual number of days from planting to when approximately 50% plants in a plot have at least one opened flower.
- **Days to Maturity (DF):** Actual number of days from planting to harvest maturity.
- **Plant Height (PH):** Recorded in cm from the base of the plant (soil surface) to the canopy, measured at harvest.
- **Growth Habit (GH):** Recorded during flowering and verified when crop is senescing as type I= determinate erect or upright, II= indeterminate erect, and III= indeterminate prostrate.
- **Lodging (LG):** Scored at harvest on a 1 to 5 scale, where 1 =100% plants standing erect, and 5= 100% plants flat on the ground.
- **Pod Clearance (PC):** Recorded at harvest as % pods on plants not touching the ground or in contact with the soil surface.
- **Seed Yield (SY):** Recorded in Kg/ha at 16% moisture and rounded up to the nearest whole number.
- **Weight of 100 Seeds (SW):** Weight of 100 randomly taken undamaged seeds recorded in grams at 16% moisture.
- **Desirability Score (DS):** Overall rating of agronomic suitability, 1=excellent, 5=unfavorable
- **Appearance Desirability (AD):** An aggregate value for seed size, shape, color, and brilliance for the respective market class scored on a 1 to 9 scale, where 1= excellent and 9= commercially unacceptable.

AGRONOMIC DATA- DROUGHT EXPTS

- **Based on Replicated Stress and Non stress treatments**
- **Drought Intensity Index (DII):** Index for Experiment - Ratio of mean yield loss/ mean NS yield. Index is comparable between experiments.
- **Percent Reduction (%R):** Percent Reduction in yield due to drought stress for each entry.
- **Geometric Mean (GM):** Geometric mean yield of each entry across two treatments.
- **Drought Susceptibility Index (DSI):** Ratio of yield loss of each entry/ NS yield divided by DII for the experiment.
- **Chlorophyll Content (CC):** SPAD. – few locations
- **Canopy Temperature (CT):** IR Directional Thermometer – canopy temp
- Other Traits unique to drought – under discussion

ADDITIONAL AGRONOMIC DISEASE DATA

- **Disease Incidence or Severity (DI):** Scored on a 1 to 9 scale, where 1=none and 9= extreme susceptibility, based on natural occurrence or inoculated trials in field or GH. Include many of pathogens listed below:
- **Rust (Rust):** Natural or artificial inoculation– specify race(s).
- **White Mold(WM):** Natural inoculum.
- **Common Bacterial Blight (CBB):** Natural or artificial inoculation – specify strain(s).
- **Anthracnose (Ant):** Artificial GH inoculum – specify race(s).
- **Halo Blight (HB):** Natural or artificial inoculation – specify strain(s).
- **Root Rots (RRR):** Natural occurrence – specify pathogen(s).
- **Virus (BCMV):** Natural occurrence – specify pathogen(s).
- **Other Pathogens or Pests:** Natural local infections



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Michigan State University
AgBioResearch

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