Grain Sorghum Testing
Core Program
Grain Sorghum Testing at CSU
How Entries Work

- Seed companies decide which hybrids to plant at each location (4 replications)
- Test well-known hybrids and screen experimental lines
- We provide UNBIASED and RELIABLE data to producers and companies
Grain Sorghum Testing at CSU

2018 Participating Companies:
- Alta (Advanta)
- B-H Genetics
- Browning Seed
- Channel (Bayer)
- Dekalb (Bayer)
- Dyna-Gro (Nutrien)
- Golden Acres (AgReliant)
- S&W Seed Co
- Sorghum Partners (S&W Seed Co)

- Total of 121 entries across the 5 trials
- Up from low of 46 entries in 2015
2018 Akron Grain Sorghum

- Rainfall: 10” total
  - 4.36” May
  - 2.71” June
  - 1.86” July
  - 1.09” Aug.-Oct
- Killing freeze (<28°F) on Oct. 14
- 2804 GDDs from planting to freeze (20.2 GDUs/day)

Site Information
Collaborator: Central Great Plains Research Station
Planting Date: May 18, 2018
Harvest Date: November 6, 2018
Fertilizer: N at 53 and P at 11 lb/ac
Herbicide: Lumax EZ at 1.5 qt/ac, glyphosate at 1 qt/ac, and 2,4-D LV6 at 6 oz/ac applied May 18; Sterling Blue at 8 oz/ac and atrazine 4L at 1.5 pt/ac on June 14; Moxy 2E at 1.5 pt/ac, Sterling Blue at 8 oz/ac, and atrazine 4L at 1.5 pt/ac on July 7
Soil Type: Weld silt loam
2018 Growing Season Snapshot

Accumulated Heat Units for 2018 Growing Season

- Akron GDDs 2018: 2452
- Akron Long-Term GDDs: 2703
- Lamar GDDs 2018: 3303
- Lamar Long-Term GDDs: 3140
<table>
<thead>
<tr>
<th>Brand</th>
<th>Hybrid</th>
<th>Grain Yield&lt;sup&gt;a&lt;/sup&gt;</th>
<th>% of Test Avg</th>
<th>Test Weight</th>
<th>Harvest Plant Population</th>
<th>Plant Height</th>
<th>50% Bloom</th>
<th>Lodging Percent</th>
<th>Maturity Group&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Grain Color</th>
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<td>Dekalb</td>
<td>DKS28-05</td>
<td>106.4</td>
<td>126%</td>
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<td>55,176</td>
<td>46</td>
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<td>103.6</td>
<td>123%</td>
<td>51.8</td>
<td>51,902</td>
<td>47</td>
<td>79</td>
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<td>50.4</td>
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<td>44</td>
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<td>Channel</td>
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<td>53.7</td>
<td>56,047</td>
<td>42</td>
<td>71</td>
<td>6</td>
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<td>Bronze</td>
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<td>106</td>
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<td>ML</td>
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Average: 84.4  51.7  46,819  43  82  8

<sup>a</sup>LSD (P<0.30) 5.4

<sup>b</sup>Yields adjusted to 14% moisture and hybrids ranked by yield.
Hybrid Selection

➢ Pay attention to maturity class
  ➢ NE Colorado should be Early or Medium-
    Early only

➢ High yield

➢ Lodging scores

➢ Disease/pest ratings
  ➢ Sugarcane aphid?
Early Maturity Hybrid
Recommendations for NE Colorado
(multi-year/location data)

- Dekalb DKS28-05
  - High, long-term stable yield
  - Adapted to our region
  - Very good standability
  - Company states 57 days to bloom (69 DTB in trials)
  - Early maturity with high yield

- Dyna-Gro M59GB57
  - High, long-term stable yield
  - Adapted to our region
  - Very good standability
  - Company states 59 DTB (72 DTB in trials)
Medium-Early Maturity Hybrid Recommendations for NE Colorado (multi-year/location data)

➢ Dyna-Gro M60GB88
  ➢ Adapted to our region
  ➢ Very good standability
  ➢ Company states 60 DTB (79 DTB in trials)
  ➢ High yield

➢ Dekalb DKS29-07
  ➢ Adapted to our region
  ➢ Good standability
  ➢ Cream grain color
  ➢ Company states 59 DTB (83 DTB in trials)
Herbicide Tolerant Hybrids?! 

- Advanta (Alta Seeds brand) 
  - igrowth™ imidazoline tolerance trait (Beyond) non-GMO 
  - Launched in Argentina & Australia in 2018 

- Pioneer (Corteva) & Advanta 
  - Inzen™ acetolactate synthase tolerance trait (ALS) non-GMO developed by KSU 
    - Use with Zest herbicide (nicosulfuron) 
  - Anticipate commercial launch in 2019? 
    - TAMU tested two hybrids in 2018 trials
Herbicide Tolerant Hybrids?!

• Colorado State University Research
  – Dr. Todd Gaines
    • PhD student, Olivia Todd, working on finding ACCase inhibitor resistant sorghum mutants
    • Currently screening sorghum lines that were planted in greenhouse last summer/fall
Field Selection and Planting

• Plant as soon as soil temps reach mid-upper 50s
  – Ideally, plant into moisture
  – Need warm weather in forecast after planting
• Avoid calcareous and/or high pH soils
  – Will have issues with Fe deficiency
• Plant 1-2” deep and avoid crusting
Seeding Rates

• Dryland
  – Anywhere from 30-45,000 seeds/acre
  – Yield trials planted at 43,600
  – The lower the seeding rate, the more tillering you will have
  • Tillers are good and bad
  • Variety and weather dependent
Iron Chlorosis

• Usually associated with high pH and calcareous soil
• Slows growth, reduces yield
• Iron required to supply chlorophyll for new leaf growth
Treating Iron Chlorosis

• No tolerant hybrids on the market
• Mild Fe chlorosis not worth treating
  – Condition usually improves throughout season
• If treating, do it early in season
  – 10-14 days after emergence
  – 7-10 day intervals
• Iron chelate
  – Split application more effective than single application in-furrow at planting (Obour et al., 2019)
Cold Tolerance in Sorghum

• If soil temps are below 59° germination and emergence can be inhibited

• Stand establishment and early-season vigor adversely affected by air and soil temps below 59 degrees

• We are collaborating with K-State to screen sorghum lines for tolerance by planting early
## Grain Sorghum Maturity

<table>
<thead>
<tr>
<th>Hybrid</th>
<th>2015 (Akron)</th>
<th>2017 (Sheridan Lake)</th>
<th>2018 (Akron)</th>
<th>Company Est. Days to Bloom</th>
<th>Difference (days)</th>
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<td>BH 3400</td>
<td>-</td>
<td>-</td>
<td>70</td>
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<td>-</td>
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<td>16</td>
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<td>M71GB01</td>
<td>-</td>
<td>59</td>
<td>73</td>
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<td>-</td>
<td>79</td>
<td>92</td>
<td>60</td>
<td>19-32</td>
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</table>

2018 at Akron temps were still above long-term (118 year) avg.
Grain Sorghum Maturity in Northeast CO

-Plant an early hybrid...especially if planting in June

-Add at least 10 days to the mid-bloom date provided by company to get a better idea of actual days to bloom

-Need additional 30-45 days after bloom for grain-fill to reach physiological maturity

-Consider avg. frost dates for your location and importance of maintaining grain quality (TW)
Weed Control Options Pre-Emerge

➢ Grassy Weeds
  ➢ Metolachlor (Dual)
  ➢ Dimethenamid-P (Outlook)
  ➢ Acetochlor (Degree)
  ➢ Mesotrione (Callisto)

➢ Must use Concep treated seed!

➢ Broadleaf and Grass
  ➢ Any of the above as pre-mixes with atrazine
    (Bicep II Mag, Lumax EZ, Cinch ATZ, etc.)

Starting with a clean field is critical!
Weed Control Options Post-Emerge

- **Grassy Weeds**
  - None for non-traited sorghum

- **Broadleaf Weeds**
  - Multiple chemicals available
    - Puncturevine
      - Starane NXT
      - 2,4-D
    - Kochia
      - Dicamba
      - Kochiavore
      - Starane NXT
      - Huskie + atrazine (can cause leaf burn and yellowing)

Follow label directions!
Fertilizing Grain Sorghum

➢ Nitrogen Requirements
  ➢ Soil test your fields every year
  ➢ Cheap way to avoid over-fertilization or detect deficiencies
  ➢ No blanket recommendation (not 1.2, not 2.0, just soil test!)

➢ Phosphorus
  ➢ Soil test!
  ➢ Yield response has been shown for P

➢ Iron, Zinc, & Sulfur
  ➢ Might be a good idea on high pH soil
  ➢ Depends on soil test results
Objectives:
1) Response of yield to applied N
2) Specific N-rates for each hybrid!
3) Use in-season crop optical sensing to improve N recommendations (CHL and Greenseeker)
   a) Determine N rates for maximum economic return
Grain Sorghum N Fertilizer Study

2018 & 2019 trial years:

3 Locations, 4 hybrids, 3 nitrogen rate treatments

-Akron, Burlington, Sheridan Lake
-Alta 1203, Dekalb 28-05,
Dyna-Gro M59GB57, and M60GB31
-0, 80, 160 lb/N target per acre applied
(additional N)
Grain Sorghum N Fertilizer Study
Sheridan Lake 2017 Results

Hybrid Yield Response to N-fertilization:

We applied 0, 36, 57, and 124 lb/ac additional N and started with 40 lb/ac in soil.
Grain Sorghum N Fertilizer Study
Sheridan Lake 2017 Results

CHL and Yield Correlation:
-Significant and fairly-strong positive correlation

\[ R^2 = 0.4173 \]
Grain Sorghum N Fertilizer Study
Akron **2018** Results

- Started with 99 lb/ac of N in top 2 feet
  - Didn’t see yield response to N
  - DKS28-05 and M59GB57 were significantly higher yielding than the others in 2018
  - Did see positive response of TW to N in medium early hybrids (not shown)
Resources for Sorghum Production

➢ CSU Crops Testing Website

Welcome to the Official Colorado Variety Testing Program!

Crop Variety Performance Trials are conducted by Colorado State University’s Crops Testing Program to provide unbiased and reliable information to Colorado crop producers to help them make better variety decisions. Each crop in our program has a page where the most recent trial information can be found. Technical reports are available for each crop page. Use the navigation menu above to reach all information about a specific crop.

Recent Trial Results & Site Updates

Colorado Sorghum Meetings (March 26 & 27)

Wheat Field Days Flyer (June 2019)

2019 Trial Entry Information: (On respective corn, sunflower, dry bean, forage and grain sorghum crop pages)
Resources for Sorghum Production

➢ CSU Crops Testing Website - Sorghum Page Resources

Making Better Decisions: Annual Colorado Sorghum Hybrid Performance Trial Technical Reports by Year (PDF)

- 2018
- 2017
- 2016
- 2015
- 2014
- 2013
- 2012
- 2011
- 2010
- 2009
- 2008
- 2007
- 2006
- 2005
- 2004
- 2003
- 2002
- 2001
- 2000
- 1999

Spring Crop Reports (2018-2007)

Resources
- Grain Sorghum Production Handbook
- Sorghum Checkoff
- New Mexico Sorghum Forage Production Guide
- Western Forage Sorghum Production Guide
- High Plains Grain Sorghum Production Guide
- Defense Against the Sugarcane Aphid Herbicides for Grain Sorghum (K-State, 2019)
- Sorghum Results from Nearby States
  - Kansas State University
  - New Mexico State University
  - Texas A&M University (grain)
  - Texas A&M University (forage)
  - University of Nebraska-Lincoln
Resources for Sorghum Production

Coming soon!!

➢ Grain sorghum CSU Extension Factsheet for producing sorghum in Colorado

Collaborative effort of Sally, Jerry J., and Kevin L.
FERTILIZING GRAIN SORGHUM

The cost of planting grain sorghum is much less expensive than other crops, primarily because of seed price. As a result, many growers assume they can save on other input costs as well. The best example of this involves the use of fertilizer.

Find out more
Choosing a Sorghum Hybrid
By Brent Bean, Ph.D., Sorghum Checkoff Agronomist During...

Planning for Next Season
By Brent Bean, Ph.D., Sorghum Checkoff Agronomist Way back...

Adding Sorghum to the Crop Mix...
By Brent Bean, Ph.D., Sorghum Checkoff Agronomist With...

Read More

Sorghum is a Good Rescue Option...
Brent Bean, Sorghum Checkoff Agronomist There is still...

Double Cropping and Late-Planted...
Double Cropping and Late-Planted Grain Sorghum MAPS May...

Effective Post-Emergence Weed Control
A successful pre-emergence weed control program is important...

Read More

Pre-Emergence Weed Control
Weed control is critical for the success of any crop, and...

Read More

Grain Sorghum and Early Fall Freeze
By Brent Bean, Ph.D., Sorghum Checkoff Agronomist Late-planted...

Harvesting Quality Grain Sorghum
By Brent Bean, Ph.D., Sorghum Checkoff Agronomist Harvesting...

Late Season Grain Sorghum Management
By Brent Bean, Ph.D., Sorghum Checkoff Agronomist As a...

Late Planted Sorghum Considerations...
Downloadable PDF >>

Early Season Grain Sorghum Growth...
In the life of any crop, certain growth stages negatively...

Read More

Read More

Read More

Read More
2019 Sorghum Field Days in September at Akron, Sheridan Lake, Seibert, Walsh
Resources for Sorghum Production

Call or email us with questions!

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