Sorghum Disease Update

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Diseases of Concern

• Sorghum
  – Seed rots and seedling blights
  – Sooty stripe
  – Crazy top downy mildew
  – Ergot
  – Stalk rot
    • Fusarium
    • Charcoal rot
  – Grain molds
  – Environmental problems
Plants fail to emerge or die shortly after emergence

• Causes
  – Cold soil
  – Too shallow or too deep planting
  – Crusting
    – Seed rot
  – Seedling blight
• Root rots on sorghum are generally not distinguishable from each other (e.g. Fusarium vs Pythium)
Sorghum Recommendations

• Do not increase seeding rate to compensate for poor germination conditions
  – Overpopulation can lead to stalk rot problems later

• Delay planting when feasible until soil temperatures are at least 65° F at a 2” depth

• Avoid very low pH soils (<5.2) to reduce Fusarium seedling blight problems

• Supplemental seed treatments have generally not been recommended in Kansas
Severe case of sooty stripe
Sooty Stripe
Effect of sooty stripe on selected sorghum hybrids

Yield (bu/A)

Hybrid

Unsprayed
Sprayed

P8699
P8500
P8505
P8310
DK 40V
DK 55
DK 51
DK 48
NK 524
NK 575

Knowledge for Life
Sooty stripe management

• Resistant hybrids
• Crop rotation where reduced-till or no-till are practiced
• No fungicides are currently labeled for sooty stripe
Fungicide use on sorghum

- Products labeled
  - Headline
  - Quadris
  - Quilt
  - Quilt Xcel
  - Tilt (ergot only)

- Diseases labeled
  - Northern corn leaf blight
  - Zonate leaf spot
  - Gray leaf spot (different then on corn)
  - Anthracnose
  - Ergot
## Fungicide Performance on Sorghum

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Yield Bu/a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated</td>
<td>143</td>
</tr>
<tr>
<td>Headline boot</td>
<td>151</td>
</tr>
<tr>
<td>Headline 50% heading</td>
<td>148</td>
</tr>
<tr>
<td>Headline 100% heading</td>
<td>156</td>
</tr>
<tr>
<td>Headline 50% flower</td>
<td>156</td>
</tr>
</tbody>
</table>

Schleicher and Jackson, UNL 2009

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Yield Bu/a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated</td>
<td>146</td>
</tr>
<tr>
<td>Headline @ flowering</td>
<td>144</td>
</tr>
<tr>
<td>Quadris @ flowering</td>
<td>150</td>
</tr>
<tr>
<td>Quilt @ flowering</td>
<td>143</td>
</tr>
<tr>
<td>Quilt Xcel @ flowering</td>
<td>144</td>
</tr>
</tbody>
</table>

Schleicher and Jackson, UNL 2010
## Fungicide Performance on Sorghum

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Early Planted Yield (Bu/a)</th>
<th>Late Planted Yield (Bu/a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated</td>
<td>130</td>
<td>138</td>
</tr>
<tr>
<td>Headline @ boot</td>
<td>132</td>
<td>137</td>
</tr>
<tr>
<td>Headline @ 100% emergence</td>
<td>137</td>
<td></td>
</tr>
<tr>
<td>Headline @ 50% flowering</td>
<td>126</td>
<td>137</td>
</tr>
</tbody>
</table>

Duncan and Jardine, 2008
Effect of fungicides on the reaction of sorghum hybrids to anthracnose in Burleson County, Texas, 2012.

T. Isakeit, Texas A&M

<table>
<thead>
<tr>
<th>Treatment, rate/A</th>
<th>Anthracnose rating*</th>
<th>Grain mold/weathering rating**</th>
<th>Test weight (lb/bu)</th>
<th>Yield (lb/A)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fungicide</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-treated control</td>
<td>2.1</td>
<td>2.6</td>
<td>60.49</td>
<td>7307</td>
</tr>
<tr>
<td>Headline 2.09 12 fl oz/A</td>
<td>1.4</td>
<td>2.5</td>
<td>60.63</td>
<td>7094</td>
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<tr>
<td>Quilt Xcel 2.2 14 fl oz/A</td>
<td>2.1</td>
<td>2.6</td>
<td>60.42</td>
<td>7386</td>
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<td>Topguard 1.08 14 fl oz/A</td>
<td>2.0</td>
<td>2.8</td>
<td>60.53</td>
<td>7364</td>
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<tr>
<td>LSD (P=0.01)</td>
<td>0.6</td>
<td>NS</td>
<td>NS</td>
<td>NS</td>
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</tbody>
</table>

*Rating scale of 1-5, where 1=no disease and 5=death of plants.
**Rating scale of 1-5, where 1=no disease and 5=deteriorated seed.

*Yields = 126 – 132 bu/A
Crazy Top Downy Mildew
Crazy top management

- The disease only occurs in low wet areas of fields where soils are saturated for 24-48 hours 1-3 weeks after emergence.

- No management is necessary except to perhaps improve drainage where feasible in affected areas.
Ergot

- A sticky honeydew exudes from the head 1-2 weeks after flowering

- only sterile florets can be infected
Honeydew

- A white cottony growth may appear on the leaves or soil below infected heads

- While looking similar to bird droppings, it is actually the sporulating fungus
Ergot management

- Avoid late planting (nearly all cases of ergot in production fields in Kansas have been in fields blooming after September 1st)

- Fungicides are only recommended in hybrid seed production fields
  - Tilt, Quadris, Quilt
Stalk Rot

- Significant lodging may or may not occur
- Reduced head size and stalk deterioration are typical symptoms
Fusarium Stalk Rot

- Shredded inner stalk
- Tissue color may be red, purple, or tan
- Cool, wet conditions following a period of stress, particularly drought, favor disease development
Charcoal rot

• The same shredded appearance as with Fusarium occurs but there is a black dusty discoloration present

• Charcoal rot is most severe when it is wet early in the season, and then very hot and dry during grain fill
Stalk rot management

- Choose hybrids with good root and stalk strength, stay green characteristics and post-freeze lodging resistance

- Reduce seeding rates, especially for charcoal rot
  - Too thick stands promote thinner stalks that are more susceptible to lodging

- Use no-till to increase soil moisture availability
  - Nebraska data showed a 28% reduction in stalk lodging under no-till
Stalk rot management (con’t)

- Balance fertility, especially potassium and chloride
  - Avoid excessive nitrogen
  - Use seed treatment insecticides or over the top sprays as necessary to control chinch bugs and aphids
- Manage stress factors such as compaction, plant population, weeds, herbicide stress, etc
  - Avoid brace root damage from 2,4-D or dicamba
- Timely harvest
- Rotate with non-host crops, especially wheat
Grain Mold

• This tends to be a problem in falls with cool, wet weather that delays harvest

• Sorghum molds are not dangerous to livestock

• Moldy grain should not be stored

• Aflatoxin is not an issue in sorghum
Grain mold management

• Plant resistant hybrids
  – Bronze and reds are generally more resistant due to higher tannin levels

• Timely harvest
  – Grain will continue to weather as long as it is in the field

• Keep grain moisture at < 10% and grain temperature at < 50° F if it must be stored
Environmental/Cultural Problems
Roots have tended to grow down the furrow and not penetrate the sidewalls.

Sidewall compaction
Rootless sorghum/corn
Poor brace root development
Lodged sorghum due to poor brace root development
(environment, not 2,4-D)
Iron Chlorosis

- Iron chlorosis generally occurs in high pH, calcareous soils

- Sorghum is one of the more susceptible crops
Iron Chlorosis

• Symptoms appear on the newest emerging leaves first

• An alternating green and yellow striping is noticeable (veins remain green)
Chlorosis management

• Avoid planting sorghum in problem fields

• Use of iron chelates in-furrow is currently being evaluated

• Like soybeans, there are likely hybrid differences in tolerance
facebook.com/kstate.cropdiseases

Twitter: Doug1954@KSU_CropDoc
Questions?