

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

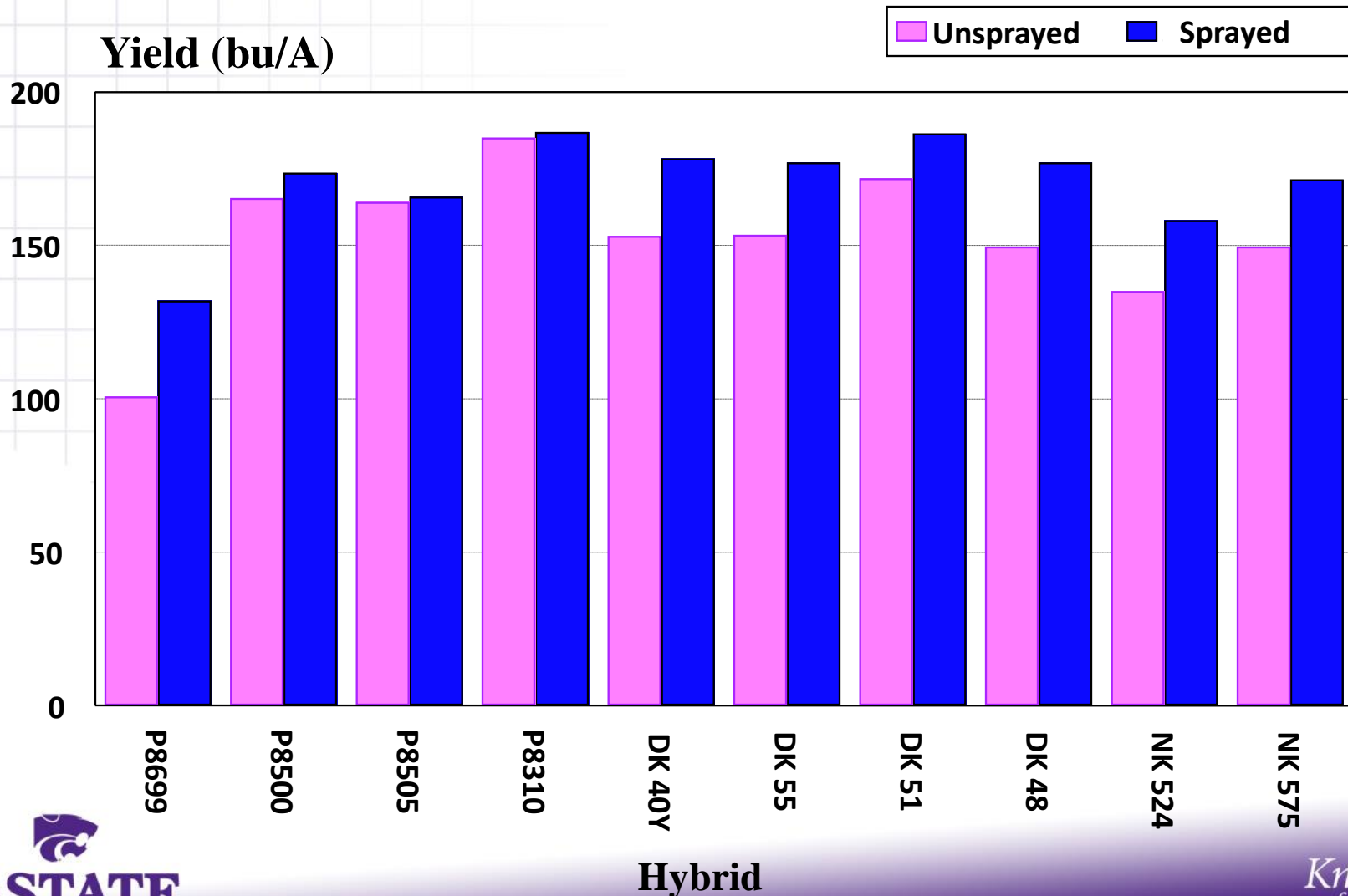


Severe case of sooty stripe

Sooty Stripe



Effect of sooty stripe on selected sorghum hybrids



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 than on corn)
 - Anthracnose
 - Ergot

Fungicide Performance on Sorghum

Treatment	Yield Bu/a
Untreated	143
Headline boot	151
Headline 50% heading	148
Headline 100% heading	156
Headline 50% flower	156

Schleicher and Jackson, UNL 2009

Treatment	Yield Bu/a
Untreated	146
Headline @ flowering	144
Quadris @ flowering	150
Quilt @ flowering	143
Quilt Xcel @ flowering	144

Schleicher and Jackson, UNL 2010

Fungicide Performance on Sorghum

Treatment	Early Planted Yield (Bu/a)	Late Planted Yield (Bu/a)
Untreated	130	138
Headline @ boot	132	137
Headline @ 100% emergence		137
Headline @ 50% flowering	126	137

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

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

*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 $< 50^{\circ}$ F if it must be stored

Environmental/Cultural Problems





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



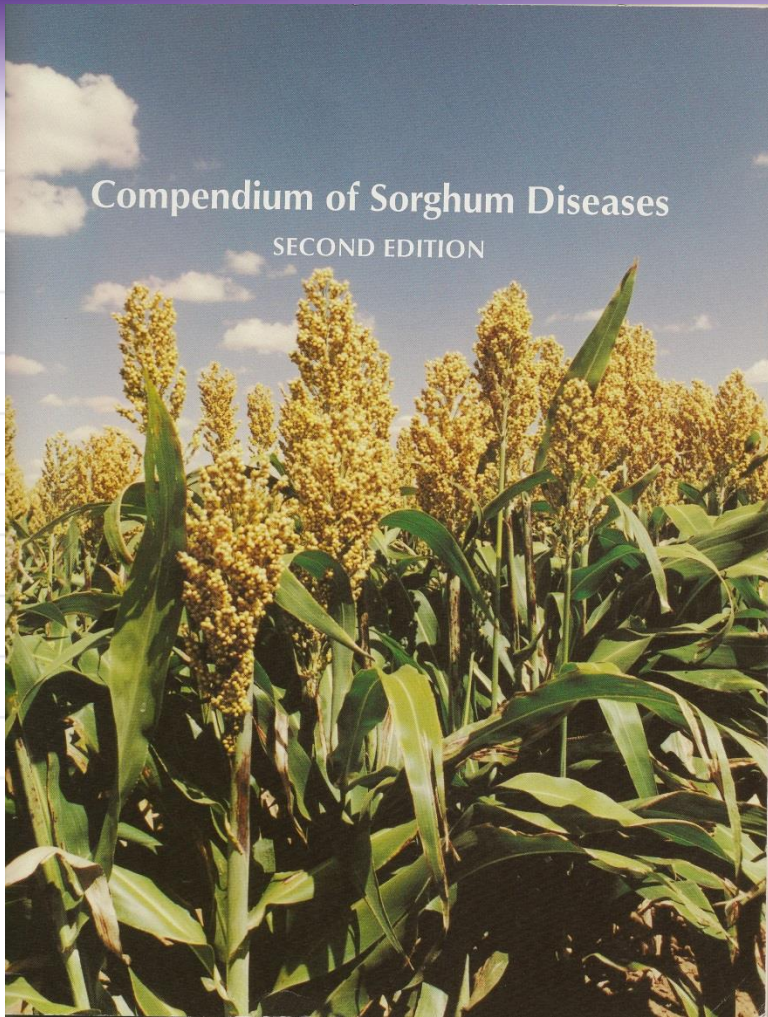
Iron Chlorosis

- Symptoms appear on the newest emerging leaves first
- An alternating green and yellow striping is noticeable (veins remain green)

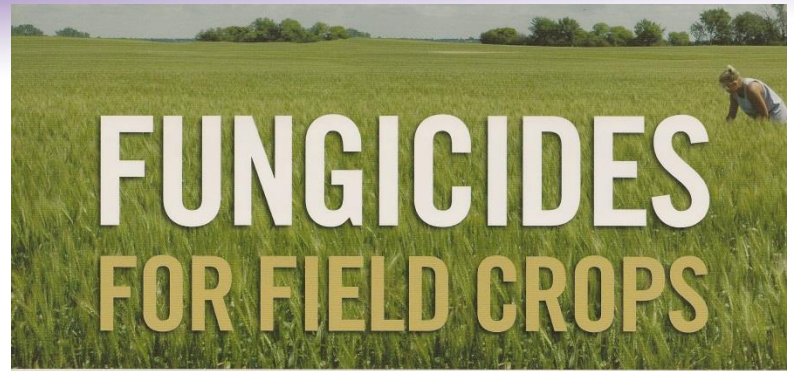


Chlorosis management

- 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



Compendium of Sorghum Diseases
SECOND EDITION



FUNGICIDES
FOR FIELD CROPS



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facebook.com/kstate.cropdiseases

The screenshot shows the Facebook profile for 'K-State Crop Diseases'. The page header includes the Facebook logo, a search bar, and the page name 'K-State Crop Diseases' with a 'Timeline' dropdown and an 'Admin Panel' link. The profile picture is a large image of harvested corn. Below the profile picture, the page name 'K-State Crop Diseases' is displayed with '315 likes' and '3 talking about this'. The page is categorized as a 'Local Business' with the address '4024 Throckmorton Plant Sciences Center, Kansas Stat...' and phone number '(785) 532-5180'. There are tabs for 'About', 'Photos', 'Notes 129', 'Map', and 'Likes 315'. The main content area shows a 'Status' update with the text 'What have you been up to?' and a 'Photo / Video' icon. Below this is a post from 'K-State Crop Diseases' dated 'January 16' with the text 'Are seed treatments worth the investment? The global seed treatment market was valued at \$2.43 billion in 2011.' To the right, there is a 'Highlights' section and a 'Recent Posts by Others on K-State Crop Diseases' section with three posts by 'Doug Jardine'.

Twitter: Doug1954@KSU_CropDoc

The screenshot shows a Twitter post from 'Doug1954 @KSU_CropDoc' dated 'Aug 27'. The text of the tweet is 'We are not without Aspergillus ear mold in 2013. Near Lawrence, KS.' followed by a link to a photo on Twitter: 'pic.twitter.com/ydlosj9Wq3'. Below the text is a photograph of a corn cob with a significant portion of the kernels covered in a white, fuzzy mold. The tweet has an 'Expand' button and a menu with 'Reply', 'Delete', 'Favorite', and 'More' options.

Questions?