

# **2016 Sorghum Texas South Plains:**

**Agronomy, Hybrids,  
Fertility, Weed Control,  
and More**

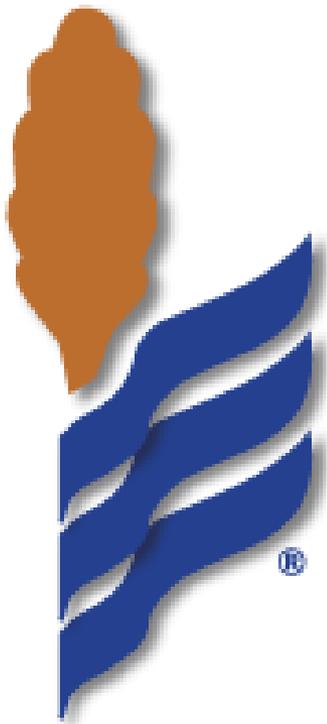
**Calvin Trostle., Ph.D.**

**Texas A&M AgriLife Extension Service--Lubbock**

**[ctrostle@ag.tamu.edu](mailto:ctrostle@ag.tamu.edu), 806-746-6101**

Sugarcane aphid tolerant hybrid on left, susceptible hybrid on right,  
Crosby Co., Texas, 2015.





**National Sorghum Producers**  
*the voice of the sorghum industry*

- ⌘ Industry representation at the national level, including policy, representation in Washington, lobbying, and international relations.
- ⌘ Annually conducts national sorghum yield contest
- ⌘ <http://www.sorghumgrowers.com>, headquartered in Lubbock, TX; (806) 749-3478, [info@sorghumgrowers.com](mailto:info@sorghumgrowers.com)

# Texas Sorghum Commodity Groups

- ⌘ **Texas Sorghum Producers.** Research, education, and promotion of Texas sorghum.



- ☑ <http://www.texassorghum.org>

- ☑ Wayne Cleveland, executive director, [wccleveland@mindspring.com](mailto:wccleveland@mindspring.com)

- ☑ Checkoff is through USCP which returns 25% of monies collect to TSP.

- ☑ View TSP's regular "Sorghum Tips" (prepared by Texas A&M AgriLife) at <http://texassorghum.org/sorghum-tips> (archive is at the bottom of the page for Tips since 2012)

- ⌘ **Texas Grain Sorghum Association.** Represents sorghum producers across Texas providing a voice in policy-making & regulatory issues at the state level; collaborate with National Sorghum Producers.

- ☑ <http://www.texasgsa.com>

- ☑ Wayne Cleveland, executive director, [wccleveland@mindspring.com](mailto:wccleveland@mindspring.com)



growing point of grain sorghum; the head is now developing, determining the number of spikelets and seeds per spikelet. (These are the important components of yield potential.)



# Management During Early Growth

- ⌘ Panicle (growing point) differentiation corresponds to 7-8 leaf growth stage (~12-15" tall), and growing point is now above soil surface
- ⌘ Herbicide labels and growth stage
  - ☒ **2,4-D, dicamba** (e.g., Banvel, Clarity, etc.), etc. should not be applied without using drop nozzles after about 5-leaf stage (~8-10" tall; some labels say up to 15")
- ⌘ Nitrogen sidedressing should be on by panicle differentiation



# Dryland Hybrid Picks (AgriLife)

- ⌘ Mostly medium & medium-early maturity, 2002-2003, 2007-2010, 2013-2015 (SHP)
  - ☒ ChannelBio—7B11?, also 6B50
  - ☒ Monsanto: DeKalb DKS 37-07\* (medium-early); non-tillering DK-44 has been dropped (replaced by DKS-44-20, which is a tillering hybrid); DKS 49-45 (medium); an “early” medium-early;
    - ☒ The old Asgrow ‘Pulsar’ \* is back in the Dekalb brand (late planting) once rated as ‘early’ but in fact is medium-early, but a good choice for a late planting.
  - ☒ Sorghum Partners KS, consider medium-early NK4420, medium NK5418 \*
  - ☒ Pioneer—several solid lines that do OK, but nothing seems to stand out (Med: 85G01, 85G03, 85G85 for caliche ground, new 85P05; medium early, 86G32)
  - ☒ Frontier 305 (medium)

\* Hybrids designated by companies as ‘tolerant’ in early screening (young seedlings) for sugarcane aphid resistance; further field confirmation is needed.

# Irrigated Hybrid Picks (AgriLife)

- ⌘ Perryton, Hereford, Lubbock, 2009-2013
- ⌘ Pioneer medium-long 84G62, 84P80; medium 85Y40
- ⌘ Dekalb-Monsanto: medium-long DKS 53-67; medium DKS 49-45
- ⌘ Frontier 700E (long)
  - ☒ data from older tests prior to 2009
- ⌘ Pioneer 84G62 has been a top irrigated performer for many years, but for direct head-to-head comparisons, since 2009 DKS 53-67 & 84P80 have numerically higher yields in AgriLife testing.

# South Plains--Dryland

- ⌘ Adjust to soil moisture condition
- ⌘ **Seed drop** of **30,000-35,000** seeds/A to give 21,000 to 28,000 plants/A (~2 lbs./A), this is a general maximum
  - ☑ good results under a wide range of conditions
- ⌘ High enough to not limit yield
- ⌘ Low enough to significantly reduce potential to burn up during drought
- ⌘ Adjust seed drop up only if you expect soil conditions will reduce stand establishment

# South Plains--Irrigated

⌘ Again, consider soil moisture

⌘ For limited irrigation (6-8"):

☑ Good soil moisture (5-6"), target 50-55K seeds/A

☑ Poor soil moisture (<2"), target 40-45K seeds/A

⌘ Full irrigation (12-16"):

☑ \*\*\*Up to 80,000-90,000 seeds/A

☑ Late-season, up to 100-110K seeds/A for non-tillering hybrids or ~90K seeds/A for tillering hybrids

## Production Level Factors:

# Nitrogen



- ⌘ Nitrogen: Much grain sorghum is never fertilized with N
- ⌘ Long-time rule of thumb:
  - ⌘ 2.0 lbs. of N needed per 100 lbs. of yield goal
    - ☑ All sources: soil, fertilizer, compost, even your irrigation water

# Nitrogen Fertility & Soil Testing

- ⌘ You can't get something from nothing (at least not for very long)
- ⌘ Sorghum N fertility, ~2 lbs. N per 100 lbs. of yield goal—combined source from soil **and** fertilizer N
  - ☒ Soil N value dependent upon depth of soil sample
  - ☒ Texas A&M lab calculation:
    - ☒  $N = (\text{yield goal} \times 2) - (2 \times \text{ppm N for 0-6"})$

# What to do with subsoil nitrate-N?



⌘ Question: “I have 30 lbs. of nitrate-N at 6-18” deep in my soil. Should I fully credit that N to my wheat crop requirement?”



## PROFILE SOIL SAMPLE INFORMATION FORM

Please submit this completed form and payment with samples. Mark each sample bag with your unique sample identification and ensure that it corresponds with the sample identification written on this form. \*See sampling and mailing instructions on the back of this form.

**(PLEASE DO NOT SEND CASH)**

**SUBMITTAL AND INVOICE INFORMATION:** This information will be used for all official invoicing and communication.

Name \_\_\_\_\_ County where sampled \_\_\_\_\_

Address \_\_\_\_\_ Phone \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

**CLIENT NAME:** Client name will only be included with information above on result reports.

Name \_\_\_\_\_

This form is only for paired (surface and subsurface) profile sample submittal. All subsurface samples must have a corresponding surface soil. If submitting non-profile samples, use form D-494.

Payment (DO NOT SEND CASH)

- Check
- Money Order (keep your M.O. receipt)
- Credit Card – requires additional form\*

Amount Paid \$ \_\_\_\_\_  
 Make Checks Payable to: Soil Testing Laboratory  
 \*Credit card payment forms can be downloaded at <http://soiltesting.tamu.edu>

SAMPLE INFORMATION (Required)					(See options listed below)	
Laboratory # (For Lab Use)	Your Sample I.D.	Acreage Represented	Previous lime/fertilizer	What are you growing?	Requested analyses	How is forage used?
					<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10	<input type="checkbox"/> Grazing (G) <input type="checkbox"/> G&H <input type="checkbox"/> Hay (H) <input type="checkbox"/> **Min. requirement
	This subsurface sample surface sample listed above.		Sampling Depth: <input type="checkbox"/> 6-12" <input type="checkbox"/> 6-18" <input type="checkbox"/> 6-24"		<input type="checkbox"/> 11	
					<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10	<input type="checkbox"/> Grazing (G) <input type="checkbox"/> G&H <input type="checkbox"/> Hay (H) <input type="checkbox"/> **Min. requirement

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# What to do with subsoil nitrate-N?

- ⌘ Question: “I have 30 lbs. of nitrate-N at 6-18” deep in my soil. Should I fully credit that N to my wheat crop requirement?
- ⌘ **YES.** *Texas A&M AgriLife data across many soil types and different crops across the state shows that for all practical purposes we **CAN** credit that N to crop requirement.*
  - ☑ *When soil fertilizer tests have been conducted and the soil profile N below 6” is deducted from the applied N there is essentially no difference in yield due to the N fertilizer reduction.*

# Nitrogen Fertility & Soil Testing

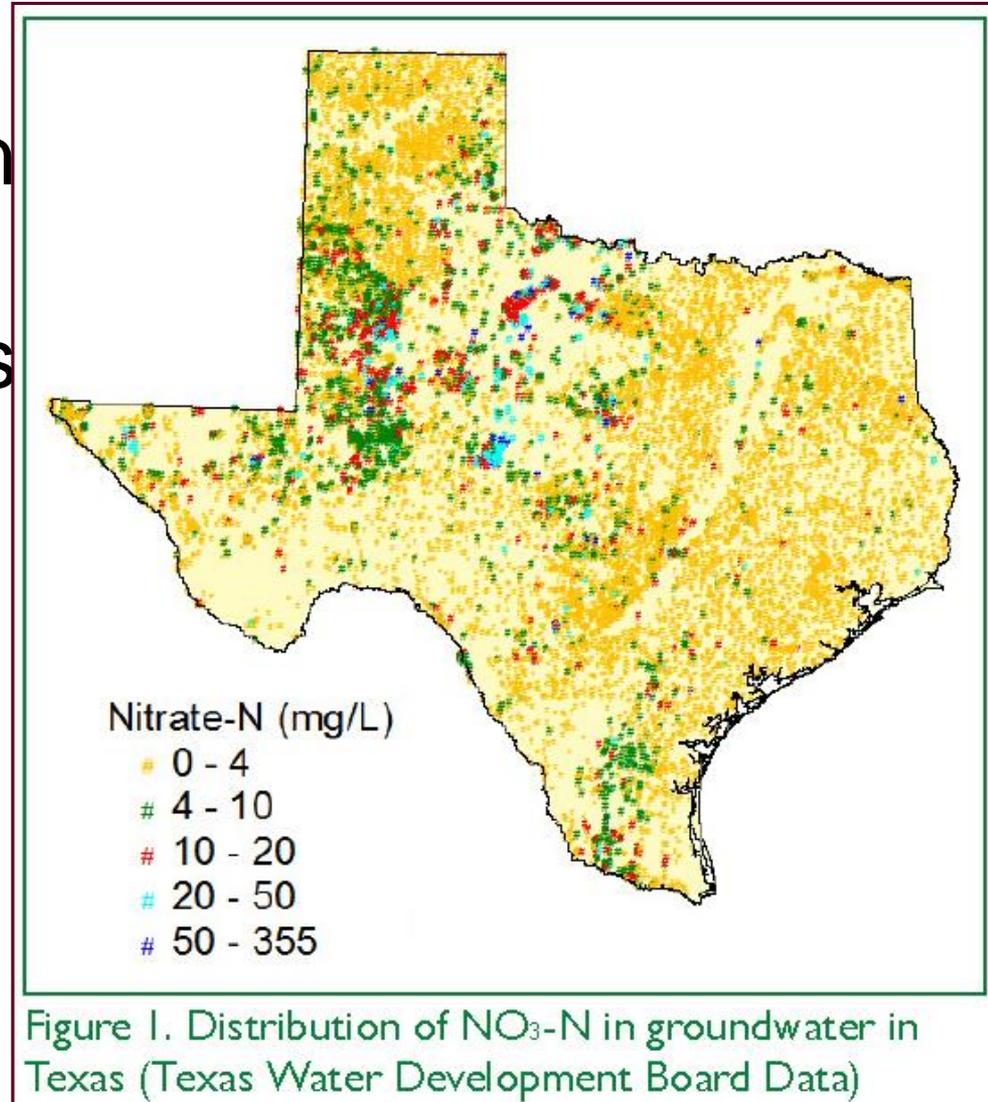
- ⌘ You can't get something from nothing (at least not for very long)
- ⌘ Sorghum N fertility, ~2 lbs. N per 100 lbs. of yield goal—combined source from soil **and** fertilizer N
  - ☒ Soil N value dependent upon depth of soil sample
  - ☒ Texas A&M lab calculation:
    - ☒  $N = (\text{yield goal} \times 2) - (2 \times \text{ppm N for 0-6"})$
    - ☒  **$N = (\text{yield goal} \times 2) - (\text{all profile N, 24+"}\text{deep})$**

# Timing of N for Grain Sorghum

- ⌘ Older guidelines: Pre-plant/at-plant + 30-35 day sidedress (initiation of growing point differentiation), about 75% of needed N in the plant by heading
- ⌘ Today's pivot or drip irrigation application: may consider delaying last 20% until after growing point differentiation
- ⌘ Medium-early: last N 50 days after planting
- ⌘ Medium-long: last N 60 days after planting

# Nitrate-N in Irrigation Water

⌘ Nitrogen in the form of nitrate in irrigation water helps meet crop N requirements and reduces fertilizer cost for crop production



# Nitrate-N in Irrigation Water

⌘ Credits for NO<sub>3</sub>-N  
from irrigation water

⏏ Subtract from  
recommended N rate

Lbs. N/A added with water =  $m$   
ppm NO<sub>3</sub>-N in water x 0.23 x inches of water applied



Water Applied (inches)	NO <sub>3</sub> -N in Irrigation Water (ppm)			
	10	20	30	40
	lbs N added/acre			
9	20	41	61	82
12	27	55	83	110
15	34	68	102	136

Source: AgriLife Extension SCS-2009-1, Nitrogen Management in Cotton

# Nitrate-N in Irrigation Water

Once residual soil N and possible irrigation water N credits have been determined, an effective fertilization strategy can be developed

## Cotton Example

Residual soil N: 15 lb/A

Irrigation water added N: 27 lb N/A

Recommended N: 125 lb N/A (2.5 bale/A yield goal)

125 lb N/A – 15 lb N/A – 27 lb N/A = 83 lb N/A needed

**SAVE \$\$\$**

# Crop N (Sorghum) & Phosphorus

⌘ Observation, if soil test P is:

☑ 'Very Low', 0-10 ppm, then P is 50% of N requirement

☑ 'Low', 10-20 ppm, then P is 40% of N requirement

☑ 'Medium', 20-50 ppm, then P is ~25% of N requirement (in range of 30-40 soil P)

# Sorghum & Phosphorus

- ⌘ No simple rules of thumb. Texas A&M soil test for Mehlich-III has broad range of 'Medium' at 20-50 ppm
- ⌘ West Texas research suggests crop response 'transition zone' at 30-40 ppm P
  - ☑ Inconsistent yield response in this range to added P
  - ☑ West Texas soil research suggests P fertilizer additions at this level of soil test P does not demonstrate measurable yield differences.
- ⌘ What is your soil test recommendation philosophy?
  - ☑ 'Crop requirement' vs. 'Build and Maintain'

# Other Ions

## ⌘ Sulfate ( $\text{SO}_4$ )

☑ In large amounts, sulfates can result in bitter, medicinal tastes, laxative effects or “rotten egg” odor from hydrogen sulfide gas formation

### ☑ Limits

☒ Domestic water: > 250 ppm can cause diarrhea

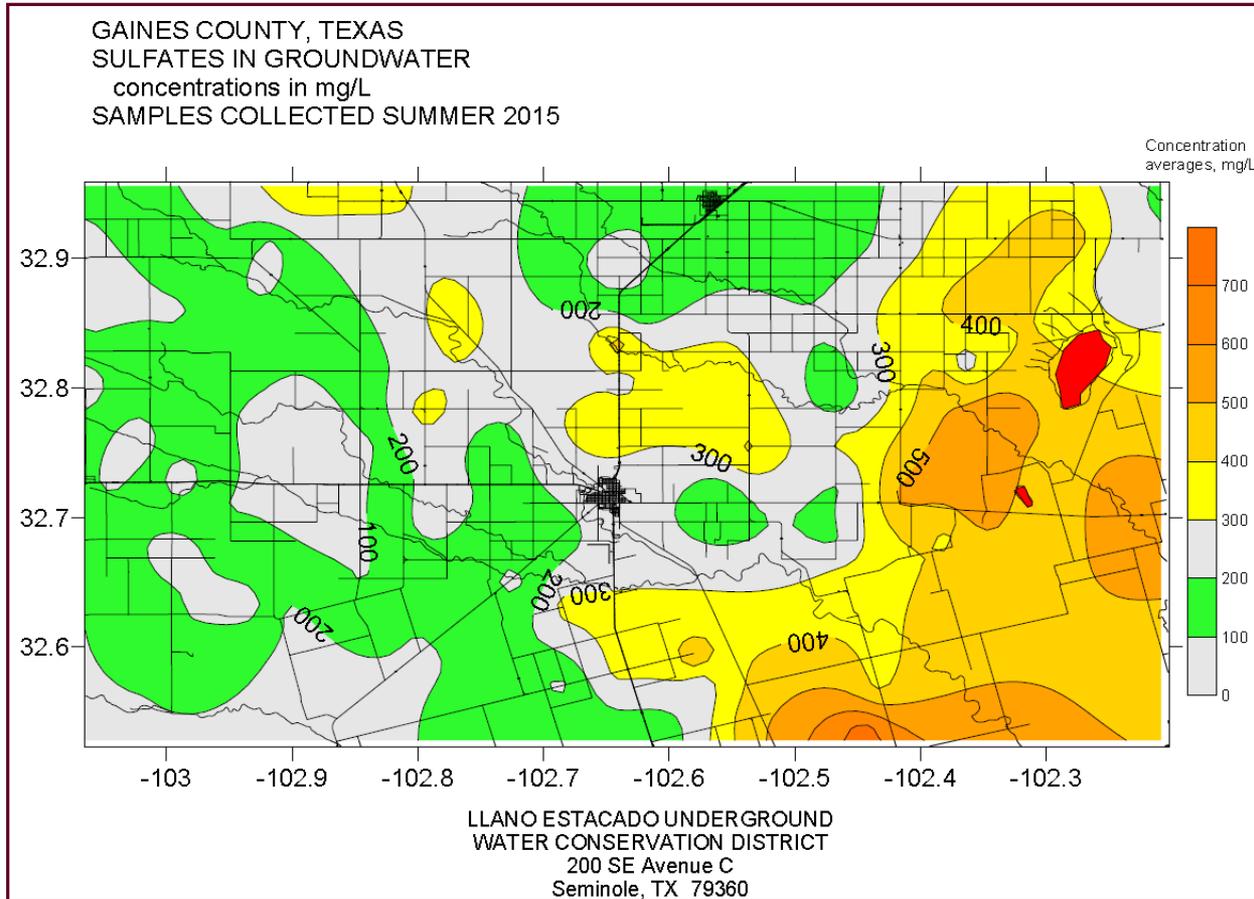
☒ Irrigation water: Moderate concentration of sulfate can reduce growth or cause specific injury

☒ Livestock water: > 2000 ppm can cause diarrhea in most livestock

# Sulfate in Irrigation Water

- ⌘ Sulfur is a secondary macronutrient essential to plants
- ⌘ Taken up as sulfate-S
- ⌘ Possible to reduce inputs of S fertilizer by accounting for S in irrigation water

# Sulfate-S in Irrigation Water



# Sulfate-S in Irrigation Water

- ⌘ If groundwater is 100 ppm  $\text{SO}_4$ 
  - ☒ Convert from  $\text{SO}_4$  to  $\text{SO}_4\text{-S}$  (multiply by 0.33)
    - ☒  $100 \text{ ppm } \text{SO}_4 \times 0.33 = 33 \text{ ppm } \text{SO}_4\text{-S}$
    - ☒  $33 \text{ ppm } \text{SO}_4\text{-S in water} \times 0.23 \times 10 \text{ inches of water} = 76 \text{ lbs. S/A added with water}$
  - ☒ Calculate lbs. S/A added with water
  - ☒ It is a credit to any crop S requirement

# Soil Sampling, Yield Goal, and Your Recommendations

- ⌘ Does someone collect your soil samples, and provide your recommendations?
- ⌘ If so, and you receive fertilizer recs. without having given a yield goal, you need to ask how the recs. were derived
- ⌘ Do you know the soil test philosophy behind your recommendations?
- ⌘ Did you receive a copy of the soil tests?

# Sources of Label Information

## & **AgriLife** Extension Weed Scientists

- ⌘ Labels for herbicides, insecticides, fungicides, seed treatments, growth regulators, etc.—access through <http://www.cdms.net>, click 'Label Database' then 'Search' then conduct either of two searches:
  - ⌘ **A)** Enter product name then choose the specific product then its label or supplemental label (most common use)
  - ⌘ **B)** Click "Other Search Options" (register for a free password) to search by active ingredient (looking for a generic?), find a class of chemicals (herbicides, fungicides, insecticides) labeled for a particular crop, etc.
- ⌘ **Texas High Plains**—Dr. Pete Dotray, Lubbock, (806) 746-6101, [pdotray@ag.tamu.edu](mailto:pdotray@ag.tamu.edu)
- ⌘ **Central & South Texas**—Dr. Paul Baumann, College Station, (979) 845-3041, [pbaumann@ag.tamu.edu](mailto:pbaumann@ag.tamu.edu)
- ⌘ **South Texas**—Dr. Josh McGinty, Corpus Christi, (361) 265-9203, [joshua.mcginty@ag.tamu.edu](mailto:joshua.mcginty@ag.tamu.edu)

# What About Furrow Diking?



- ⌘ An “Old” technique
- ⌘ Benefits are well documented in research
- ⌘ Practice may be considered a nuisance, but it is still recommended

# Sorghum Irrig. on Split Pivot

- ⌘ **Two-crop**/two planting date/**split pivot** scenarios
  - ☑ Early cotton, late June sorghum
  - ☑ Early sorghum, delayed cotton
  - ☑ Early sorghum, late sorghum same pivot
- ⌘ The goal is to minimize or even eliminate the overlap of peak irrigation
  - ☑ Much if not most of the time you are only watering a half circle
- ⌘ Check with Extension (Trostle) for an explanation of possible scenarios for your farm

# Grain Sorghum & the 500-lb. Gorilla...





## **“Evaluating if Grain Sorghum Hybrids with Seed Company Designation of Tolerance/Resistance to Sugarcane Aphid Are Right for You in 2016”**



⌘ Read at <http://lubbock.tamu.edu>

⌘ All grain sorghum hybrids, even if rated tolerant/resistant, are susceptible at some level and must be scouted like any other grain sorghum hybrid

⌘ See all SCA resources for the Texas High Plains at <http://www.texasinsects.org/sorghum.html>

# **Sorghum Hybrid Selection:**

## **5 Questions to Ask Companies**



⌘ “What hybrid(s) do you have with a proven SCA resistance gene in its parentage?”

# **Sorghum Hybrid Selection:**

## **5 Questions to Ask Companies**



⌘ “If you do, does that genetic background transfer actual hybrid resistance to SCA in the field?”

# Sorghum Hybrid Selection:

## 5 Questions to Ask Companies



⌘ “What evidence do you have for this hybrid’s substantial tolerance/resistance? Seedling tests? Field observations? Field insect counts? Yield data?”

# **Sorghum Hybrid Selection:**

## **5 Questions to Ask Companies**



⌘ “Is at least some of your field data from independent or external sources?”

⌘ If so, who?

# Sorghum Hybrid Selection:

## 5 Questions to Ask Companies



- ⌘ “How does the yield of your current SCA tolerant/resistant hybrid(s) compare to your company’s best grain sorghum hybrids for a given production area?”
- ⌘ *We don’t think it is worth sacrificing yield potential, in part because we don’t know to what extent SCA will be an issue in 2016.*