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

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In 2016 Texas grain sorghum producers will find more information from seed companies and other sources about grain sorghum hybrids that may offer potentially increased—or better documented—tolerance/resistance to sugarcane aphid (SCA). I provide a link to a list of recent seed company designated SCA-tolerant/resistant hybrids below, but I recommend caution in evaluating information regarding sugarcane aphid tolerance/resistance. Access the full document for additional considerations. Foremost, at this time:

1) Assume all grain sorghum hybrids—even if designated tolerant/resistant to SCA—have some level of susceptibility (and all would be viewed as highly susceptible in some fields) to sugarcane aphid.
2) All grain sorghum hybrids must be scouted, and at this time the same SCA treatment thresholds apply to these hybrids as any other. *No sorghum hybrid is immune to SCA. Some Texas farmers made the mistake of assuming too much about early purported tolerant hybrids for 2015, and they failed to treat SCA in timely fashion, or even scout their fields regularly if at all.*

Dr. Ron Schnell, AgriLife cropping systems agronomist, College Station, and Dr. Bill Rooney, Texas A&M AgriLife Research sorghum breeder, College Station, both contribute further helpful comments in understanding how to properly assess the designation of specific grain sorghums as having substantial tolerance/resistance to sugarcane aphid. Together the we offer three "Bottom Lines" for potentially selecting a suitable grain sorghum hybrid for your farming conditions:

1) Texas sorghum producers should view all hybrids as susceptible at some level

and follow standard scouting and treatment thresholds for every sorghum hybrid.
2) Many field reports of SCA field activity in different hybrids are simply observations that someone has seen tolerance at some point. It certainly doesn't mean that you can ignore the SCA without implication.
3) Texas A&M AgriLife suggests producers consider planting adapted high-yielding grain sorghum hybrids then expect and plan to manage the sugarcane aphid, because even if you plant a tolerant/resistant hybrid, **you likely still have to manage it** and you may be giving up significant yield potential with an SCA-tolerant/resistant hybrid if it doesn't yield well.

Read the full document for additional information on grain sorghum hybrid tolerance/resistance to sugarcane aphid, including:

• Understand the potential caveats of designated SCA-tolerant/resistant hybrids. Here are some questions you can ask seed companies regarding their hybrids:

1) *"What hybrid(s) do you have with a proven SCA resistance gene in its parentage?"*
2) "If you do, does that genetic background transfer actual hybrid resistance to SCA in the field?"
3) "What field evidence do you have for this hybrid's substantial tolerance/resistance? Seedling tests? Field observations? Field insect counts? Yield data?"
4) "Is at least some of your field data from independent or external sources?" (If so, who?)
5) *"How does the yield of your current SCA tolerant/resistant hybrid(s) compare to your company's best grain sorghum hybrids?"* (Agronomically, you want to understand the grain yield potential of good grain sorghum hybrids even if susceptible to SCA vs. tolerant/resistant hybrids. If there are significant yield differences be sure to ask/understand if those differences may be due to likely lower-yielding shorter maturity in a hybrid.)

• Seed company initial list of designated tolerant/resistant grain sorghum hybrids (summarized by United Sorghum Checkoff Program). Dr. Brent Bean, agronomist, USCP, has compiled an initial list (Dec. 17, 2015) of grain sorghum hybrids where each seed company has confirmed their designation of individual hybrids they believe demonstrate evidence of notable tolerance/resistance to sugarcane aphid. Review his additional comments and access the link to the current list found in the full version of this publication. Dr. Bean's focus emphasizes potentially stronger SCA tolerance/resistance—the hybrids each company has the most confidence in. Hybrids that at this time are regarded as 'moderately' tolerant/susceptible are not included in the list.
• Current sugarcane aphid resources for Texas grain sorghum producers. This lists six Texas A&M AgriLife, USCP, and Texas Sorghum Association websites that maintain information different aspects of grain sorghum and sugarcane aphid.

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Nitrogen and Wheat Grain Production—Topdress N Timing is Critical

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AgriLife Extension staff across Texas often observes a common misunderstanding about N fertilizer/N top-dress timing and wheat grain production. Many producers don't realize the critical timing of top-dress N on wheat—*and are often not applying top-dress N soon enough if they are going to grain*. Thus they are losing yield potential.

In other winter wheat production regions of the U.S., farmers usually think of Spring topdressing, but in Texas—even in the Panhandle—we should view N application as 'Late Winter' topdressing. To some, Spring means calendar March 21, but that is late for almost all Texas wheat.

Properly timed top dress N for wheat is tied to a critical growth stage. What you visually see in the field is 'jointing,' that is, you begin to notice a few stems here and there coupled with erect growth. If you rub the lower stem between your thumb and forefinger you may feel a small 'bee-bee,' or node, within the stem. This means the growing point for that individual stem is differentiating, i.e., the growing point has switched over from producing another leaf to now determining potential head size (spikelet number, potential seeds per spikelet, Fig. 1). This is an important component of yield potential. Because this process for an individual head only lasts about 7 to 10 days, when you see the first few joints then most of the rest of the field has probably initiated growing point differentiation.

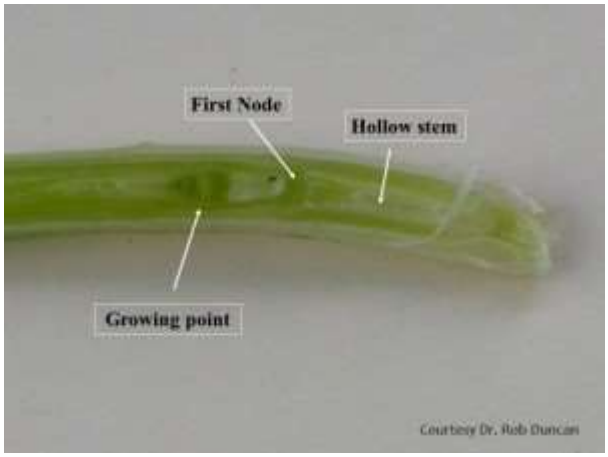

***Figure 1**. Sliced wheat stem reveals young growing point differentiation with hollow stem to the right. Growing point differentiation—spikelet number and seeds per spikelet—is likely complete. (Photo courtesy Dr. Rob Duncan.)*

To ensure that developing grain yield potential is not limited at this point, sufficient N must not only be "on the field," but it also must be **in the root zone** as a result of rain, melting snow, or irrigation. Until this happens wheat might experience inadequate N resources to drive yield potential higher. (If you grow irrigated wheat, ensuring growing conditions have adequate moisture is likewise important for yield.) Current recommendations suggest applying 1/3 of N requirement in the fall followed by 2/3 applied at top-dress.

The full guide for N topdressing with the above title, developed for the Texas High Plains, is also directly applicable for the Rolling Plains and Concho Valley. "Nitrogen and Wheat Grain Production—top-dress N Timing is Critical," contains two sections relating to N topdressing for wheat grain:

• The growth stages of growing point differentiation and jointing (Feekes 5.0) are described and why they are important;
• Using a question-and-answer format (subtitled 'Sixteen Questions about N for Wheat Grain, Texas High Plains), we explain different aspects of topdressing N on wheat and how producers can determine the target amount of N application, manage the timing, deal with exceptions including weather factors, etc. Example questions among the sixteen discussed include:

#1) What is the general N requirement for wheat grain production?
#5) Is there any benefit for N applied after jointing? What if I am late applying my N, should I still do it?
#8) There is a good chance of rain or snow in the forecast. Should I go ahead and apply my top dress N a few weeks earlier than otherwise expected?

For a copy of the High Plains report on topdressing N in wheat, consult the full edition of this document at http://lubbock.tamu.edu for the link entitled "Nitrogen Top-dress for Wheat—Sixteen Questions." Principles of this report

are applicable to South, Central, and Northeast Texas as well, though timing will move forward on the calendar to match wheat growth stage. In most years, the majority of South and Central Texas should consider top-dress timing beginning in late January and into February. This past fall was quite wet which delayed planting of many wheat fields into December and in a few cases even into January. In these cases, jointing likely will not occur until later in February and thus top-dress can also be delayed as well.

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Tips For Remaining Profitable When Commodity Prices are Low

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Low commodity prices often results in a shift in acreage from one crop to another. However, when crop prices are low across the board, growers must look for alternative ways to remain profitable. Crop inputs are naturally the first place many will look. Will reducing input costs increase net returns? The wrong cuts could result in yield reductions and/or detrimental impacts over the next several years, such as with poor weed management. Increasing efficiency may be a more viable option. Below are several tips for becoming more efficient.

Pest Control

Pest control inputs for cotton, corn and grain sorghum may include weed, insect and disease control. Weed control is one area that should not be sacrificed. Most herbicide programs are designed to address very specific weed issues, including herbicide resistant weeds. Starting the season weed free, using residual herbicides, and post emergence herbicides with different modes/sites of action will be essential for managing resistant weeds now and moving forward. Allowing resistant weeds to produce seed could drastically increase cost of weed control and reduce yields of future crops. Also remember that early season weed competition can reduce yield significantly. For example, cotton needs to remain weed free for 6 weeks after planting to minimize yield loss from weed competition. The bottom line, weed

management programs should not be adjusted to compensate for lower crop prices.

Insect and disease control will remain important to maintain yield. Economic thresholds have been established for major crops and pests in Texas. Take advantage of the tools, apps and calculators that are available. For example, sorghum head worm, stinkbug and midge calculators are available through the Department of Entomology at: http://entomology.tamu.edu/extension/apps/. These calculators take into consideration grain value and the cost of application to determine when insecticide applications are economical. Economic injury levels should also be applied for management of crop diseases. Preemptive fungicide applications that may contribute to improved plant health but may not contribute to higher yields or a positive return on investment. Additional sources of information for pest control:

Seed

Seed costs differ proportionally by crop depending on production cost and technologies contained within the seed. The first decision for planting is which variety or hybrid to select. Consistent yield performance should always be the first criteria. Selecting the wrong variety or hybrid can result in yield losses greater than 10%. Information on statewide yield performance for cotton, corn and grain sorghum can be found at http://varietytesting.tamu.edu/. Following yield, other characteristics should be considered, such as herbicide tolerance and insect protectants.

After the seed is selected, the next decision is seeding rate. Some crops can compensate for changes in population by adjusting yield components. Grain sorghum can compensate by adjusting head size and tiller number per plant to maintain grain yield per acre. Cotton can compensate by adjusting the boll size and number of fruit per plant. Therefore, minor reductions of seeding rates could be implemented with minimal impact on yield. Uniform stands (no long skips) may be just as important as final plant populations. Additionally, with lower seeding rates, seed quality becomes more important, and more attention should be paid to germination rates and varieties or hybrids with better seedling vigor.

Corn can compensate for changes in plant population to some degree. This is often referred to as “flex” versus “fixed” hybrids. All corn hybrids will respond to changes in plant population by adjusting the number of kernel rows and/or the kernels per row. The larger issue when deciding if corn-seeding rates can be reduced is the yield potential of your environment. In high yielding environments (irrigated corn), reduction of seeding rates may not be justified. Yield reduction from small changes in seeding rate would likely exceed savings on seed costs. In low yield environments, small reductions to seeding rates may be economically justified.

Planter maintenance and setting is critical for efficiency with seed. It is necessary for achieving the target population with uniform spacing. Maintenance goes beyond routine cleaning and lubrication. Ensure that all row cleaners, coulters, opening disks, seed meters, closing wheels, etc. are properly adjusted and replaced if worn as

recommended by the manufacture. Next, calibrate seed drop using seed that you will be planting. Check again if changing to seed of a different size. Look for doubles or triples and within row spacing and make adjustments if necessary to achieve uniformity. Always dig and ensure proper seed depth as well and repeat when moving to new fields. Uniformity and precision will save seed cost and optimize yield.

Fertilizer

There are many options for becoming more efficient with fertilizer. This includes subsurface banding, variable rate applications, etc. Yet, the basics are the best place to start. Fertilizer applications should always be based on soil test results. Soil nutrient levels could be higher than you expect which may enable you to reduce or eliminate unneeded applications. Soil submittal forms and nutrient recommendations can be found at the links below.
In addition to routine 6-inch depth soil samples, soil sampled to a depth of 12", 18" or 24" can be submitted and credit given for residual nitrate-nitrogen (NO3-N). Use the form and the instruction found on the link below. Studies across Texas have demonstrated the ability of crops to recover NO3-N to depths of 2 ft and 100% credit can be given to nitrate-nitrogen found in the soil samples. The amount of residual N found in soils is uncertain but the economic value could be substantial.

Will the 2015 Rust Levels Repeat in the 2016 Wheat Crop?

by Dr. Clark Neely, Small Grains/Oilseeds Extension Specialist – College Station, TX; Dr. Ron French, Grain and Vegetable Extension Plant pathologist – Amarillo, TX

It is now February and we are once again seeing significant rust levels in wheat in areas of Southern and Southeast Texas. The elevated levels of rust this early in the season is eerily similar to 2015; however, leaf rust appears to be more prevalent at this time than stripe rust, unlike 2015. Currently, wheat planted prior to December 1 seems to be most affected with more foliage available for infection. Wheat observed in Hill and Williamson Counties was planted late (mid-December) and seed was slow to germinate and therefore little or no rust was present. Leaf rust appears to be heaviest in the College Station area and south. Though stripe rust is not widespread, one "hot spot" was identified in plots near College Station (*Figures 3 and 4*) on susceptible wheat. Other reports indicate active stripe rust on the Gulf Coast, Uvalde, and Northeast Texas on susceptible varieties.

Mild temperatures and wet conditions have led to the build-up of this disease and levels are high enough that wheat leaves are yellowing and plants are stressed (*Figures 1 and 2*). Without a significant cold snap to knock the disease back, inoculum levels are primed to spread to other regions of the state once

temperatures begin to warm up and the crop advances further north. Another key factor that will influence the development and spread of rust this spring will be moisture conditions across the state. The most recent long term forecast from the National Weather Service indicates a continuing El Niño through the spring, which brings with it an elevated chance of above normal rainfall for the state of Texas and conducive conditions for rust development.

Although fungicide applications are generally not warranted this time of year, producers in Central Texas and south should be scouting fields regularly now for disease. If rust is detected and mild, wet conditions are expected in the near future for your area, a fungicide application may be warranted. Even if weather conditions do favor disease development, other northern regions of the state should not expect to see any rust for another one to two months. Keep in mind that hot temperatures and dry conditions can halt disease progression quickly, although leaf rust will tolerate warmer temperatures (85 degree F and slightly higher) compared to stripe rust which may lose viability. Freezing temperatures may render leaf rust spores unviable but that is not the case with stripe rust spores.

When considering an early season fungicide application, producers should consider whether they have planted a leaf or stripe rust susceptible variety. If rust is detected on a resistant variety, the progression of the disease may be slow and reduce the need for a fungicide application. The most current resistance ratings for wheat varieties can be found in the 2015 Texas Wheat Variety Trial Results publication (http://varietytesting.tamu.edu/wheat/index.htm). Other factors to take into account are yield potential, type of irrigation (which can increase moisture levels), other fungal diseases present, age of the plant, and where pustules can be found in the canopy in relationship to the flag. Regardless of the fungicide used, producers should not expect an early season application to last the rest of the season. Under the right conditions, a subsequent fungicide application may be needed around flag leaf emergence to protect the plant through grain fill. It is important to scout a field and observe rust infection in both the lower and upper canopy, as humidity may favor rust increase in lower leaves which can later move up into the canopy once humidity levels increase due to higher moisture levels in the upper leaves. For proper disease identification refer to Texas A&M AgriLife Extension publication titled “Identifying Rust Diseases of Wheat and Barley”

In summary, further development and spread of rust in wheat on a statewide or regional scale depends heavily on weather conditions. If dry conditions prevail, statewide impact will be substantially lower, but the prospect of a continuing El Niño means rust could be a real concern once again this spring and producers need to be attentive to their wheat fields as the season progresses.

Figure 1. Leaf rust causing obvious yellowing and leaf desiccation in susceptible winter wheat in College Station, TX on February 2, 2016

Figure 2. Leaf rust pustules on winter wheat leaves in College Station, TX on February 2, 2016.

Figure 3. Strip rust pustules on winter wheat leaf in College Station, TX on February 2, 2016

Figure 4. Strip rust causing lesions and yellowing of leaves in susceptible winter wheat in College Station, TX on February 2, 2016