Rolling with Bowling

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A special sugarcane aphid edition from south Texas by Robert Bowling, Stephen Biles, John Gordy, Michael Brewer, and Jason Thomas

Harvest is underway in the Texas Coastal Bend. For many, it looks like an above average to exceptional year for sorghum and corn. Sorghum yields are ranging from just under 4,000 to over 8,000 pounds per acre. Not bad for dryland sorghum! Corn harvest is underway but I have yet to hear yield reports. Both crops had very little drought or heat sress through the season. This is somewhat unusual for south Texas. For others, the rain came by the truck loads and water logged soils are never the best thing for most crops (unless you are a rice farmer!). There will certainly be areas in south Texas where production will be down as the result of excessive moisture.

South Texas corn had very little insect pressure this year. Corn earworm, *Helicoverpa zea* (CEW), was a minor issue on corn and I am unaware of corn fields sprayed for CEW with insecticides in our neck of the woods. Sorghum…well…it has been an interesting year for sorghum farmers. The most consistent insect issue on south Texas sorghum was sorghum headworm. Corn earworm was the most common species in sorghum but there was a fair number of fall armyworm in many sorghum heads. Stink bugs and sorghum midge were a real hit or miss…mainly a miss. Sugarcane aphid made a brief appearance this year but their populations declined almost as quickly as they increased in most fields. This is the second consecutive year that economic sugarcane aphid populations persisted when compared with populations on sorghum in 2013 and 2014. In 2016, populations reched or exceeded economic levels (south Texss economic threshold) but areawide collapse of sugarcane aphid occurred literally overnight. The reason for sudden collapse of sugarcane aphid populations is not well understood but we will throw out some ideas on sugarcane aphid population collapse based on observations over the past couple of seasons.

Sugacane aphid on sorghum: a 2015/2016 retrospective:

In south Texas, Johnsongrass was difficult to find early in the year, possibly the result of ditch maintenance and extremely dry conditions in the fall and winter. Consequently, sugarcane aphid was

more difficult to detect in the winter months of 2016 compared with winter monitoring efforts early in 2015. It was quite easy to find large overwintering populations of sugarcane aphid in volunteer and ratoon sorghum. The warm and dry conditions in January and February were perfect for

sugarcane aphid populations to increase and it appeared that environmental conditions early in 2016 would favor rapid population expansion of sugarcane aphid. Cool and wet conditions enveloped the Coastal Bend region by mid-March and this weather pattern continued into late-April. Overwintering sugarcane aphid populations in the Coastal Bend collapsed during this period.

Environmental conditions were drier in the Valley and sugarcane aphid near the coast reached economic populations neccesatating insecticide applications to protect sorghum from injury caused by aphid feeding. By May, much of the sorghum in the Lower Rio Grande was sprayed with an insecticide to manage the sugarcane aphid.

In early May sugarcane aphid populations increased rapidly on sorghum in Kleberg, Nueces, Jim Wells and San Patricio counties during a period of warm and dry conditions. By mid-May rain and cooler conditions returned to the lower Coastal Bend region and sugarcane aphid populations started to collapse. In late May large populations of sugarcane aphid on sorghum were reported in Refugio, Calhoun, and Victoria counties. There was a brief, although frantic, period where farmers were treating sorghum for sugarcane aphid in these counties. Rain and heavy dew hit these areas just prior to the decline of sugarcane aphid populations. Why did we see the sudden collapse of the sugarcane aphid populations in 2016? Let's look at factors that may have been responsible for their sudden collapse.

Natural Enemies: Lacewings, syrphid flies, and ladybugs were abudant in sugarcane aphid colonies across south Texas. Although they may have been responsible for limiting sugarcane aphid population growth, we are somewhat hesitant to say

they were the primary reason for the sudden sugarcane aphid population collapse across the area. There were several fields where the aphid never collapsed. For argument sake wo research fields at the Corpus Christi TAMU Agrilife Research and Extension Center will be used to explain why we have doubts about natural enemies being the sole reason for the sudden decline in sugarcane aphid populations.

On May 24 sugarcane aphid populations exceeded the south Texas economic threshold (50 to 125 aphids/leaf) in an insecticide seed treatment trial. Populations of sugarcane aphid natural enemies were quite high in this trial. It was about the time the aphid moved in that we experienced a couple of heavy rain events along with a long period of heavy morning dew across the area. There are 24 plots in the insecticide seed treatment study. The sugarcane aphid populations collapsed in 23 of the 24 plots. However, sugarcane aphid populations in the first plot of the first replication have continued to increase even in the presence of large natural enemy populations. This is very similar to a sugarcane aphid trial across the road where the aphid populations in an isolated area of the trial have never declined once they became established in mid-May.

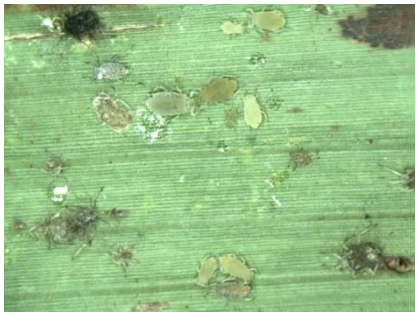
Rain: Our expereince is that rain has a minimal direct effect on sugarcane aphid populations. One example would be a sorghum field in Neuces county that had a very heavy sugarcane aphid load just ahead of a 6" rain event. Three days after the rain event we grid smapled the field. The aphid was found on all plants examined with very large aphid populations (400 to 500 aphid per leaf) along the field edge. Similar observationswere made in overwintering sugarcane aphid populations on Johnsongrass in 2015 and on a few sorghum

fields in 2016.

Recently, one farmer related a story in about two neighboring sorghum fields planted the same day to the same hybrid in 2015. One field stood in water so he used the neighboring fields to make management decisions. Once the flooded field dried enough to scout the farmer was shocked to discover heavy sugarcane aphid populations and plants covered in honeydew and sooty mold. Long and short of it, the sugarcane aphid field generally has similar production to the neighboring field but it produced less that half the grain as the uninfested field in 2015. I was in this field late on Friday afternoon evaluating a hybrid resistance trial. The sugarcane aphid susceptible hybrid and some of the less resistant hybrids were heavily infested by sugarcane aphid (many plants had heavy aphid loads in the heads). The neighboring field did not have the same pressure. The major difference in the two fields is a tree row in the infested field. Similar observations were made time and

again in 2015. Understanding the influence of vegetation surrounding fields (ecotones) may be very important in understanding sugarcane aphid establishment in sorghum.

Entomopathogenic Fungi: The literature is quite clear that sugarcane aphid reproduction is negatively effected under cool and wet conditions. Extended periods of rain and cloudy, cool conditions (similar to that in the first half of 2015 and in May of 2016) may have more of an adverse effect on sugarcane aphid populations compared with the direct effect of rain. This combination of environmental conditions may favor development of entomopathogenic fungi of sugarcane aphid pathogens. A pandemic could cause collapse of the aphid across a wide region. However, fungal pathogens of sugarcane aphid in the U.S. have not been documented although they have been identified in other countries where the sugarcane aphid occurs on sorghum.



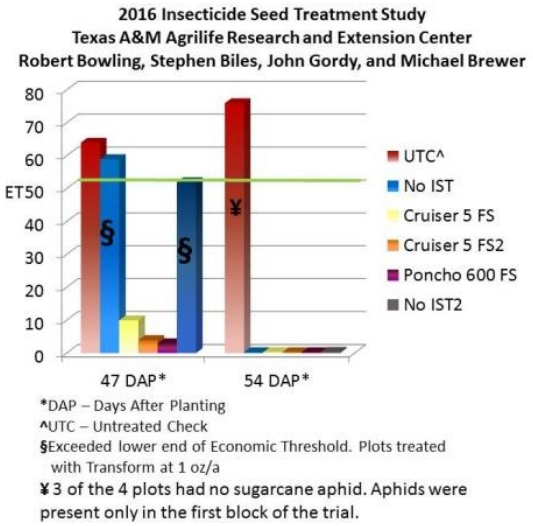
Dew: This is an interesting climatic factor that may have a big influence on collapse of sugarcane aphid colonies in south Texas. Heavy dew was a common occurrence in south Texas from mid- to late-May through early-June. There were several mornings (between 6:30 and 7:00) that I was in my sorghum trials. I observed dew in the aphid colonies and, in some instance,dew almost completely covered the aphids. This may have drowned some of the aphids and weakened the colonies exposed to extremely wet and cool conditions. Dew is something that deserves closer evaluation.

Upper leaves from two plots in the insecticide seed treatment trial. Left: only plot sustaining heavy SCA populations. Note that dew is absent from the leaf. Right: no aphids but heavy dew on this leaf. This leaf is representative of other leaves in the trial with the exceptions of the first plot (i.e. leaf on the left).

Insecticide seed treatments:

Sorghum insecticide seed treatments have been evaluated by numerous entomologists in Texas, the mid-south and southeastern U.S. In a trial conducted at the Corpus Christi Agrilife center, sorghum from seed treated with and insecticide had sub-economic levels of sugarcane aphid 47 days after the crop was planted (DAP) whereas plants from untreated seed exceeded the south Texas sugarcane aphid threshold (See Figure below). Plots where the sorghum did not receive and insecticide seed treatment was sprayed with an insecticide to suppress aphid activity (as defined in the protocol). The sugarcane aphid populations collapsed prior to our 54 DAP evaluations so it is not possible to determine activity of these seed

treatments beyond 47 days in this trial. However, these results are similar to resarch



trials conducted in Texas, the mid-south and southeastern parts of the U.S. and Mexico.

Our observations revealed that insecticide seed treatments were not effective against the yellow sugarcane aphid and with most of the neonicotinoid foliar insecticides. Dimethoate did provide excellent suppression of yellow sugarcane aphid.

Sugarcane Aphid Resistant sorghum: Sorghum promoted as "highly tolerant" to the sugarcane aphid have performed very well in south Texas under what could only be classified as a very brief but intense period of sugarcane aphid activity.

There are numerous SCA resistant sorghum hybrid trials around the area. It would have been preferable for all of these trials to have had heavy populations of SCA but it is the nature of the beast when working with insects. We do have some excellent strip trial evaluations and will present this information in a separate

SCA movement to the sorghum head in a SCA hybrid resistance trial near Banquete Texas.

newsletter and at fall/winter meetings.

What's happening with the sugarcane aphid in Mexico?: In 2015 Mexico sorghum farmers experienced large sugarcane aphid populations in their sorghum. Consequently, very little sorghum was harvested because of heavily damaged plants and lack of seed development caused by sugarcane aphid feeding and honeydew production.

In 2016, government programs and numerous outreach educational programs on sugarcane aphid management provided information important to Mexican farmers on IPM tactics important for sugarcane aphid management. Based on information from Jose Feregrino (seed rep in Mexico) the sugarcane aphid has not been an issue thus far in Mexico…but, he goes on to say the season is still early! However, it was about this time last year that Mexican

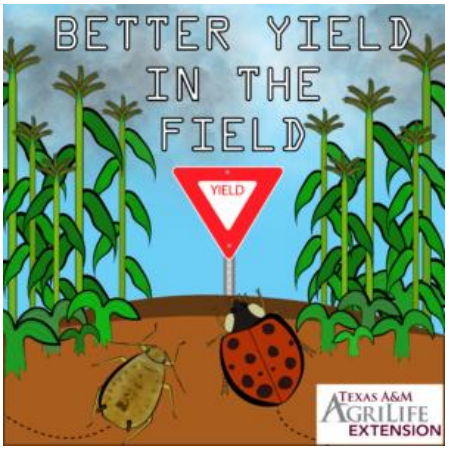
sorghum producers were experiencing large populations of SCA in their sorghum. It would be fantastic if sorghum farmers in the area surrounding Mexico City get a reprieve the aphid this year. It may also benefit sorghum producers in the U.S. by limiting sugarcane aphid flights into our sorghum production regions.

We continue to learn more about this aphid each passing year. Environmental factors such as heavy dew may play a big role in the sudden colony collapse common with this aphid. Current sorghum hybrids characterized as 'highly tolerant' to the sugarcane aphid have performed well against the sudden, rapid (but brief) increase of sugarcane aphid in south Texas. Also, natural enemies of the sugarcane aphid were abundant once again this season. We continue too explore the role natural enemies play in limiting sugarcane aphid population growth. This IPM tactic should compliment host plant resistance to supress sugarcane aphid below an economic threshold.

We would like to thank Syngenta for providing funding to evaluate the effect insecticide seed treatments have on sugarcane aphid. We also thank Jim Massey and Jason Ott for providing land and evaluating sugarcane aphid resistant sorghum hybrids.

New Fleahopper Training Video

A new training video created by Jason Thomas briefly teaches how to identify and detect flea hoppers in cotton squares. The



video will be featured on Jason's Youtube page here: (http://youtube.com/insecthunterplus).

A direct link to the video can be found here: (https://www.youtube.com/watch?v=B0ApDCtkdQk). The technique demonstrated in the video could make your job easier when trying to detect fleahoppers.

For more information on the sugarcane aphid and other field crops topics check out our new website at: (http://betteryield.agrilife.org/).

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