FOCUS on South Plains Agriculture

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Cotton Insects

Cotton Aphids

Cotton aphids have been building rapidly over the past several weeks and many fields have required treatment. Physiologically and environmentally we have been setup for a bad aphid year and this seems to be coming to fruition. Cotton aphids prefer mild temperatures, and their greatest reproductive potential occurs around 68° F. Our temperatures throughout July have definitely been mild with our lows hovering right around the aphid's preferred temperature mark.

Cotton aphid colony

Cotton aphids come in a wide range of colors and sizes. Colors range from lemon yellow, to green, to almost black. Darker aphids tend to be larger and subsequently have the greatest reproductive potential. Remember that the aphids we are dealing with are not laying eggs, but reproducing asexually, giving birth to what

essentially are genetic clones. Every aphid encountered is a female and can directly contribute to the population. Cotton aphids have a huge reproductive capacity and a single female may give birth to 30 to 80 offspring. Aphid nymphs are born pregnant and will begin asexual reproduction within 4 to 7 days. A large number of green or dark colored aphids is indicative of a healthy aphid population. The smaller yellow forms are most often associated with a declining population or can indicate when the population is under some sort of environmental stress such as higher temperatures.

Temperature is not the only factor that contributes to the population potential of cotton aphids; nitrogen also plays a critical role. Research conducted by Dr. Megha Parajulee, Texas Agricultural Experiment Station, Lubbock, has demonstrated that aphid populations have a tendency to be higher in cotton subjected to higher rates of nitrogen fertilizer. Aphids suck a lot of sap and excrete large amounts of sugar-rich honeydew. Thus, one can surmise that in general, sugar is not a limiting factor for aphid nutrition. What the aphids are going for is in fact the nitrogen, primarily in the form of amino acids. Cotton plant sap from the phloem (which is the conductive tissue where aphids feed) is relatively low in amino acids and thus the aphids have to filter a large amount of phloem sap to get a sufficient quantity of amino acids. High or excessive nitrogen fertility can lead to a higher quantity of amino acids and consequently a plant more suitable for proper aphid nutrition and population development.

Fruit load will also affect the nitrogen level in cotton plants. A high fruit load, particularly larger bolls, will help draw down the nitrogen, while low fruit sets or fruit loads comprised of primarily squares and small bolls will maintain higher nitrogen levels.

Herbicide damage, namely 2, 4-D, has also shown to contribute to higher aphid reproductive potential for several other aphid species on other crops. Whether or not cotton damaged by 2, 4-D, dicamba, glyphosate, etc. results in greater aphid reproductive potential is not known, but would be a worthy research project in light of the amount of herbicide drift damage we have observed this year.

Regardless of why we have high aphid numbers, the threshold for triggering an insecticide application is 50 live aphids per leaf. Aphids directly complete with the fruit for resources, and allowing aphids to exceed this threshold can lead to yield reduction, and when open bolls are present, sticky cotton lint.

The presence or lack thereof of pathogens and predacious and parasitic arthropods will also play a key role in determining the population potential of aphids. In fact, it is not uncommon for biocontrol agents to completely regulate aphid numbers to sub-economic levels. Key biocontrol agents of cotton aphids include, predators: lady beetles, lacewing larvae, and syrphid fly larvae, the parasitoid, *Lysiphlebus testaceipes*, and the fungal pathogen *Neozygites fresenii*. If a large number of lady beetles are present and your field is approaching threshold, it distinctly possible that the lady beetles and other predators will prevent further increase or may result in a decline in the aphid population, especially if there are a good many lady beetle larvae which tend to eat more aphids than the adults. Research out of Arkansas has shown that lady beetle populations equaling or exceed 0.3 lady beetle adults or 0.2 lady beetle larvae per row-ft with an aphid population at treatment threshold will often decrease within a week to sub-threshold levels. Thus, one can see why spraying insecticides directed at other pests such as cotton fleahoppers or *Lygus* which kill off the beneficial arthropods can result in an aphid outbreak.

Parasitoids and fungi can have a similar and often more dramatic impact on aphid populations. The parasitic wasp *Lysiphlebus testaceipes* will lay eggs singly in large aphid nymphs. The parasite larvae will feed internally on the aphid and eventually the aphid will bloat and harden into a mummy which forms the cocoon for the

tiny wasp. Mummies will be stuck to the leaf and will be a light straw to brown in color depending on the color of the aphid parasitized.

Lady beetles, particularly the larvae, are voracious aphid feeders

Mummified aphids parasitized by Lysiphlebus testaceipes

Aphids killed by the fungal pathogen *Neozygites fresenii* will be covered with a dark gray fuzzy material, which is comprised of the hyphae and spores of the fungi. Research has shown that once 10-15% of the aphids within a population are mummified and/or covered with fungi, that aphid populations will significantly decline in about a week and insecticide treatment can be avoided. The only thing negative regarding parasitic wasps and fungi in regard to aphid management is that they tend to come in after the aphid population is already high. However, in situations where predators are maintaining the aphid population below but near threshold, or where hard to control populations are encountered, these biocontrol agents can be highly effective in finishing off the population and cleaning up the field.

Aphids killed by the fungus Neozygites fresenii

There are a number of insecticides to consider when treating for aphids in cotton (see Suggested Insecticides for the Management of Cotton Insects in the High Plains, Rolling Plains and Trans Pecos Areas of Texas: 2007). Some insecticides tend to be more selective towards killing the aphids and having a limited impact on the beneficial arthropods than others. The neonicotinoids fall within this group and include Centric, Trimax Pro, and Intruder. Direct exposure of the beneficial arthropods to the spray droplets may be somewhat toxic to some beneficials, but once it dries, it should be relatively safe to them. Carbine is also relatively safe to beneficial arthropods. Broad spectrum insecticides such as Bidrin, Curacron and Lorsban may also exhibit good aphid activity, but in some areas of the High Plains in previous years, some aphid populations

exhibited resistance to these products. Whether or not this resistance is still being expressed is not certain. Regardless of the insecticide you choose, it is not a good idea to make back-to-back applications of the same product or even the same class of chemistry. When choosing a rate, do not be too conservative. With the exception of Carbine, these products have been out in the field for a number of years now, and where in previous years one could get by using low rates, this does not necessarily appear to be the case any longer.

Even when dealing with a susceptible aphid population, good insecticide coverage is essential and is often key in achieving good control. When possible, apply the insecticide by ground. When going by ground, you should shoot for a spray volume of at least 10 gal per acre and include an adjuvant such as crop oil concentrate at 1% v/v spray solution. Other spray adjuvants and non-ionic surfactants can also help with coverage, but currently crop oil concentrate seems to be helping the most. If going out by air, coverage is more difficult. A spray volume of 3 to 5 gallons per acre is recommended. Lower volumes may result in less than adequate results. When spraying by air, the addition of an adjuvant is even more critical; the addition of crop oil concentrate at 1 pint per acre is a good choice.

Lygus

Lygus are still around and are relatively plentiful in weedy areas. There were quite a few acres treated for *Lygus* in July and thus far we have not noticed significant colonization in cotton as would be indicated by the presence of nymphs. As long as the weeds remain succulent we may not see much movement, but as soon as things mature and dry out we need to watch out.

Bollworms, Pinkies and Saltmarsh Caterpillars

Bollworm numbers in cotton remain low. Where corn is abundant larvae are being picked up frequently in the ears. As the corn matures it will lose its attractiveness to bollworms and we should begin seeing more eggs and larvae in cotton. Non-Bt cotton should be monitored closely and expect bollworm numbers to rapidly increase in a week or two. Pink bollworm trap catches in Gaines, Yoakum and Terry counties remains very low, averaging less than 1 moth per trap per night. The second generation of the saltmarsh caterpillars we saw in June are beginning to show up in non-Bt cotton. So far numbers have been low.

Grasshoppers

Along the southwestern edge of the Texas High Plains grasshoppers continue to be a problem, moving into cotton and peanuts from weedy areas and wheat stubble. Most of the troubled areas are on sandy soil. They are moving across the fields feeding on leaves, and for the most part damage has been moderate. Although a few adult grasshoppers have been noted most are immatures. In severe cases insecticide applications have been warranted.

DLK

Cotton Pests Around the State

Rio Grande Valley (reported by Manda Cattaneo, IPM Agent, Cameron, Hidalgo, and Willacy counties)

Boll rot, hard-lock, and strung-out cotton is becoming an increasing concern as the rain storms keep rolling into the Valley. Several fields have open cotton that has been soaked during the last couple of rain storms. The percentage cracked boll in the IPM Scouting fields ranges from 3 to 62%. Whitefly populations have continued to increase with the highest populations being found in the western and southern parts of the valley. Bollworm/budworm larvae are still being found, averaging about 5 per 100 plants, but as high as 30 per 100 plants.

Middle Coastal Bend (reported by Stephen Biles, IPM Agent, Calhoun, Refugio, and Victoria counties)

We are seeing stink bugs and leaf-footed bugs damaging cotton. Bollworms and budworms are still being picked. Some of the fields have been cut out for a while and are nearly out of the damage window for bollworms.

Central Blacklands (reported by Marty Jungman, IPM Agent, Hill and McLennan counties)

The older cotton continues to load up with bolls. Most fields of older cotton have full grown bolls. The younger cotton is loading up with squares and is a week past bloom. There have been a few fields of BollGard I treated over the past week. In most cases, the bollworm egg lay is light enough and beneficials are in sufficient numbers to where there will not be any additional problems with bollworms on BollGard I cotton. There may be exceptions-one that I can think of is some younger BollGard I that may attract more bollworm moths and have a higher egg lay. Some non-Bt cotton continues to have bollworm problems. Spider mites remain in light numbers but will need to be monitored. Stink bugs are being found in most area fields but remain threshold levels.

Northern Blacklands (reported by Glen Moore, IPM Agent, Ellis and Navarro counties)

Bollworm egg laying has declined over the past few days. Egg numbers have ranged from 4 to 8 per 100 plants. Larval numbers are highly variable ranging from 8 to 27 per 100 plants in non-Bt cotton. Bollworm larval numbers ranged from 4 to 35 per 100 plants in Bollgard cotton. A few fields of Bt cotton have been nearly eaten up by bollworms and have required over-spraying with insecticide.

Rolling Plains (reported by Ed Bynum, IPM Agent, Jones, Mitchell, Nolan, and Scurry counties)

Cotton bollworm moths continue to be active and laying eggs. Cotton aphids are present and building in practically every field. Cotton fleahoppers continue to be a concern in late planted cotton that has not started blooming. Fields across the Lower Rolling Plains region have been treated for one or more of these insects.

Southern Rolling Plains (reported by Richard Minzenmayer, IPM Agent, Runnels and Tom Green counties)

Bollworm trap catches remain very high averaging over 100 moths per night per trap. Bollworm egg counts ranged from 46 to 128 eggs per 100 plants and larval counts ranged from 0 to 8 treatable worms per 100 plants. Bollgard, Bollgard II and the Widestrike cotton varieties seem to be holding up. The tobacco budworm trap in Tom Green County caught an average of 19 moths per night. This is much higher than in recent history. Cotton aphids seem to be increasing across the area. Beneficial numbers are high and should be considered when making treatment decisions.

St. Lawrence Valley (reported by Warren Multer, IPM Agent, Glasscock, Reagan, and Upton Counties)

We are seeing more egg-lay scattered across area fields, but not very high numbers except for a field or two. Eggs have ranged from 0-75 per 100 plants, small worms for 0-25 and large worms from 0-2 per 100 plants. Aphids seem to be increasing slightly, but conditions are right for more rapid increases. We are continuing to see a few stink bugs in scattered fields.

Cotton Agronomy

Crop Progress Update

Conditions have been favorable for crop growth over the last week, with some badly needed rainfall obtained in some areas. The month of July ended up with only about four days with up to 94 degrees for highs. We have yet to hit 100 at Lubbock. Temperatures for July were below normal, following the overall trend we encountered in May and June. Heat unit accumulation for July was about 541 at Lubbock, which is about 12% below normal. For the entire growing season (from May 1 through July 31), Lubbock is about 16% below normal (Click here for LTA vs 2006 comparison), and well below the last several years (Click here for 2004, 2005, 2006, and 2007 vs LTA). Where we are headed in the fall is anyone's guess. Many producers have been irrigating for anywhere from 2-3 weeks, depending upon their local moisture conditions.

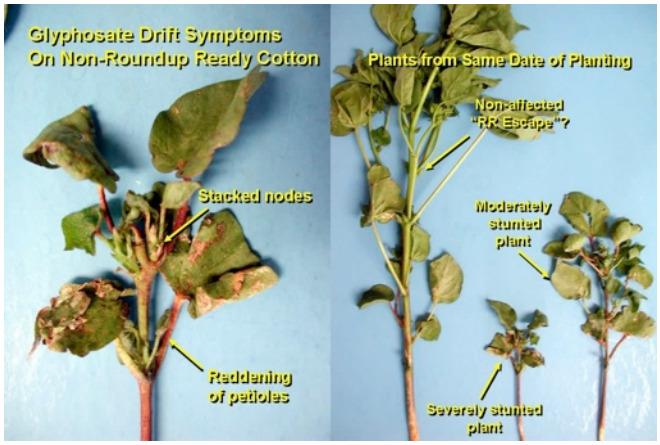
Observations of planted variety trials and other locations were made this week. Our Muleshoe trial is blooming well, and has about 16-18 mainstem nodes, and is about 8 nodes above white flower (NAWF) at this time. However, it was planted on May 15 and it took about 70-75 days to reach bloom. The Plains location, planted May 23 has 16-18 mainstem nodes, is 8-9 NAWF, and has been blooming for about a week or so. This location took about 65 days to reach bloom. This location has received excellent rainfall and some irrigation. One trial that we lost due to hail and replanted at Lubbock on June 7 is now blooming. That location hit bloom in about 53 days, which indicates that in spite of the cool conditions in June and July, it is really making excellent progress. The overall picture out there is a mixed bag, due to local weather events. Some environmentally damaged cotton is still lagging in terms of development; however, we still have a good crop out there in many fields in spite of the overall "lateness." Many dryland fields are still holding up well. We just need to pickup some rainfall and we could be in great shape. If we have a great August, September, and October, there is no telling where this crop can go.

I have seen some Verticillium wilt symptomology showing up in some fields. (link to vert photo). I know that Dr. Terry Wheeler (research plant pathologist) and Dr. Jason Woodward (Extension plant pathologist) have been getting phone calls about this. Only time will tell what happens in some of these fields.

Verticillium wilt

Glyphosate Drift Problems on Non-Roundup Ready Cotton Varieties

Glyphosate (Roundup) herbicide drift onto conventional cotton has resulted in a considerable number of calls and reports across the area. Cotton with “stacked nodes” and reddening of leaf petioles is generally an indication.



Glyphosate damage
Click a photo to get a larger image

Plants exhibiting these symptoms will generally not grow well and sometimes have no visible squares. The probability of obtaining any reasonable yield from these type plants is very low, based on the calendar date and normal fall temperatures. Many times, only a few "normal escapes" are visible in these fields. These "normal escapes" may not have obtained enough drift to cause problems, or may be a result of contamination of Roundup Ready/Roundup Ready Flex seed into the conventional variety during harvesting and/or processing or planter box cleanout.

Dicamba Drift Symptomology

I have recently observed dicamba (such products as Banvel, Clarity, and some generics) drift symptomology in cotton. This appeared to be minor, but many plants exhibited "cupped" leaves and some flaring of small squares. Based on research trials conducted at Halfway by Dr. Wayne Keeling, symptomology such as I observed generally did not result in much yield loss. For photos of dicamba drift damage, click here. To compare dicamba symptoms with phenoxy (2,4-D) click here. Generally, phenoxy damage will not exhibit "cupping" symptoms. Also, the phenoxy damage results in leaves with a more "strapped" appearance. Many times, this level of phenoxy damage during blooming can result in substantially lower yields.

Precision Agriculture Expo Set for September 6th at Plainview

There will be a Texas Plant Protection Association sponsored Precision Agriculture Expo at Plainview on September 6th. This will provide producers and industry personnel an excellent opportunity to learn about the latest technology and applications. For a copy of the agenda, click here. For a copy of the pre-registration forms, click here. For more information, visit the TPPA Web site (http://tppa.tamu.edu/). RKB

Cotton Plant Pathology

Fusarium wilt variety data available

Fusarium wilt, caused by the soilborne fungus *Fusarium oxysporum f. sp. vasinfectum*, is an increasingly important disease throughout production regions across the Southern High Plains. The disease is more prevalent in lighter textured soils which also favor the root-knot nematode. Fusarium wilt can initially be characterized by yellow zones on the margin of leaves.(Photo of Fusarium wilt on a leaf.)

A transverse cross section of the stem will reveal blackening of the vascular system. This can sometimes be confused with Verticillium wilt. (Photo of Fusarium wilt on a root.)

Management strategies used to control Fusarium wilt differ from those available for Verticillium; however, they are limited. Currently, the most beneficial management approach for Fusarium wilt is to adequately control nematodes. In the past, Dr. Terry Wheeler has compared the use of Temik 15G (5 lbs/acre) and AVICTA Complete Pak to a no nematicide treatment control. The use of Temik 15G provides improved yields over that of AVICTA Complete Pak and the non-treated control. Although the performance of AVICTA Complete Pak is more sporadic than that of Temik 15G, it consistently yields better than the non-treated control. While Dr. Wheeler continues to test the use of at-plant and seed treatment nematicides for controlling root-knot nematode, additional studies are currently underway evaluating the performance of developing seed treatments and varieties in fields with a history of Fusarium wilt. Preliminary results from two locations (Dawson and Terry counties) indicate there are significant differences among varieties when it comes to Fusarium wilt susceptibility, (Click here to view trial results). The varieties Phytogen 485WF and Fiber Max 1740B2F have a higher percentage of wilt at both locations. Whereas, the All-Tex varieties Apex B2RF, Arid B2RF and Titan B2RF, Fiber Max 1840 B2F, and the AFD varieties 5065B2F and 5064F consistently have a lower percentage of wilt. Although not present in both locations, PayMaster 2326RR has done well in the past; whereas, varieties from the Fiber Max 960 series appear to be more susceptible to the disease. In addition to resistant varieties, much interest is being expressed in the development of seed treatments containing a nematicide with combinations of fungicides to provide improved control of the disease.

Preliminary data from trials conducted this year show trends in reductions in Fusarium wilt compared to non-treated controls; however, it is still too early to say whether or not these products will have a fit in production systems in the region. We will to continue to study the aspects of Fusarium wilt and pass along any information that may alleviate losses incurred by the disease. If you have any questions regarding cotton or peanut diseases or their management please contact Jason Woodward at the Lubbock Center (806) 746-6101. JW

Corn Insects

Southwestern corn borer flight underway, spider mites building

Second generation southwestern corn borer egg laying is underway, but so far the populations are below economic levels. The other threat is from spider mites, and it is not hard to find mites in many of our area fields. Some fields have been treated, and depending on the weather and levels of beneficial species, more fields might need treatment soon. As mentioned in previous editions of FOCUS, I am not seeing as many beneficial insects and beneficial mites in fields this year, and biological control is not proving to be as effective as we have come to expect. The spider mite chapter from our recent publication,

"Texas Corn Production Emphasizing Pest Management and Irrigation" is attached. It discusses economic thresholds and control options with available miticides. It must also be reiterated that if a miticide needs to be used in post-tassel corn, Oberon would seem to be the product of choice, in part because it kills adults as well as immature life stages. RPP

Sorghum Insects

Comments on the 24(c) for Oberon

Texas Department of Agriculture has issued a Section 24(c) for use of Oberon on sorghum grown for seed. Complete details were provided in the June 20 issue of FOCUS. I want to emphasize that it is a violation of the label to use Oberon on sorghum grown for grain. This is not a trivial matter, and it could result in grain from treated fields being rejected at the elevator, and it could result in regulatory action. The other thing I need to mention is that TDA does not have to stick its neck out to get Section 24(c) registrations for us, and by abusing the process we put them at risk with EPA. TDA is being a friend to the sorghum industry, and we should not repay that friendship by jeopardizing their standing with EPA.

Greenbug control on sorghum for silage

Greenbugs are nearing threshold on some sorghum fields. For those fields that will be cut for silage, the question becomes which insecticides have a short enough pre-harvest interval to allow them to be used. It should be noted that Lorsban 4E has a pre-harvest interval of 30 days when it is used at 1 pint per acre or less, and a pre-harvest interval of 60 days when used at rates over 1 pint per acre.

A complete list of suggested insecticides is provided in "Managing Insect and Mite Pests of Texas Sorghum"

Other sorghum pests

Headworms are light in most areas. It is time to start watching for headworms, spider mites and sorghum midge. Spider mites are present at low numbers in many fields. RPP

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