# FOCUS on South Plains Agriculture

A newsletter from the Texas AgriLife Research and Extension Center at Lubbock

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http://texashighplainsinsects.net

http://lubbock.tamu.edu/focus

# Contents:

# Cotton Agronomy

## Crop Update

Recent storms have provided much needed moisture across much of the High Plains and parts of the Panhandle. Unfortunately, these storms also brought hail and high winds that have caused varying levels of damage to already delayed cotton crops. Some fields were completely destroyed in the areas where large amounts of hail and/or high winds were observed. Currently, there is no hard number to report in terms of lost cotton crops. Reports from Texas A&M AgriLife County Extension Ag Agents and IPM Agents indicate that some fields have already been replanted to cotton or sorghum. Rainfall amounts reported by the Texas Tech University West Texas Mesonet System (Current and Past Precipitation) vary greatly thus far for the month of June and range from a high of 5.13" to a low of 0.93" for Anton and Friona, respectively. These amounts have provided enough moisture to germinate cotton planted to dryland production fields in some areas but more is needed at timely intervals to maintain established stands. Based on data from the CottonHeatUnits.com website, heat unit accumulations at Lubbock total 699 DD60s, which is 95 above our long term average of 604. In general, the cotton stands that have been established and managed to dodge the weather bullet appear to be in fair to good condition. Growth stages of these crops range from just emerged or emerging to very early squaring. During my travels to the eastern part of the region earlier last week I determined that two dryland variety trial locations we planted had received some moisture following dry planting and were beginning to emerge. With high temperatures forecast in the 90s for the next ten days and only slight chances for additional rainfall, cotton crops that have begun squaring should be watched closely for moisture stress, especially in areas where little rainfall was experienced during the recent storm events.

## Plant Growth Regulators

Questions concerning mepiquat-based (Pix, Pix Plus, Mepex, Mepichlor, Mepiquat Chloride, Mepex GinOut, Stance, and others) plant growth regulators (PGRs) are being asked. Mepiquat chloride (MC) reduces production of gibberellic acid in plant cells that in turn reduces cell expansion, ultimately resulting in shorter internode length. MC will not help the plants compensate for earlier weather or disease damage by increasing growth rate. It may, under good growing conditions, increase fruit retention, control growth and promote earliness. MC should not be applied if crop is under any stresses including moisture; heat; severe spider mite, insect, or nematode damage; disease stress; herbicide injury; or fertility stress. Results from our replicated testing indicates that we observed from 5 to 20% reduction in plant height (compared to the control) from 16 oz of 4.2% a.i. MC material applied in up to 4 sequential 4-oz/acre applications starting at match head square (MHS) and ending at early bloom. We have been able to "shave" about 1 node from the growth of the main stem at some locations, which can result in about 3-5 days earlier cutout. **Low rate multiple applications beginning at MHS have generally provided more growth control than higher rate applications made at first bloom or later.**

Our results have shown that we usually do not get statistically significant increases in yields, but do get excellent growth control. Many times we don't see a lot of differences in performance of these products when comes to growth control.

Mepiquat chloride (MC) based products have been around for many years. Several plant growth regulators (PGRs) based on the same active ingredient are now available. Pentia is a formulation of mepiquat pentaborate - a different molecular structure than MC. Mepex Gin Out contains the same amount of MC active ingredient as others, but contains an additional PGR. Refer to the product labels or contact local representatives to ensure you understand the correct use of these products.

Mepex, Mepichlor, Mepiquat Chloride and other generics
4.2% active ingredient (a.i.)/gallon or 0.35 lb/gallon a.i.

Pentia
Mepiquat pentaborate molecule (different from MC)
9.6% a.i./gallon or 0.82 lb/gallon a.i.

Mepex Gin Out
4.2% a.i./gallon or 0.35 lb/gallon a.i. with 0.0025% Kinetin (a cytokinin).
Cytokinins are plant hormones that promote cell division and growth and delay the senescence of leaves. This product has use guidelines similar to other MC materials.

Stance
Bayer CropScience's Stance product is a mepiquat chloride based PGR. It is a 4 to 1 ratio of mepiquat chloride and cyclanilide (0.736 lbs/gallon mepiquat chloride plus 0.184 lbs/gallon cyclanilide). Cyclanilide is an auxin synthesis and transport inhibitor. Auxins are generally referred to as compounds which have the capacity to induce cell elongation. The inhibition of auxins could reduce cell elongation and inhibit growth. **Producers should be aware that the mepiquat chloride concentration in Stance is about twice as high as most of the other materials we have become accustomed to applying. THEREFORE THERE IS A CORRESPONDING REDUCED RATE.** If you have specific questions concerning this product, visit with your local Bayer CropScience representative.

Consistent yield increases have not been observed from any of the MC materials we have investigated. A good fruit load will normally help control plant growth. Fields with poor early-season fruit retention, excellent soil moisture, and high nitrogen fertility status may be candidates for poor vegetative/fruiting balance and should be watched carefully. Growers who have planted varieties with vigorous growth potential and have fields with excellent growing conditions need to be concerned. For brush roll header stripper harvest, 28-32 inch tall plants optimize stripper-harvesting efficiency. If possible, target a maximum plant size of about 32 inches for cotton plants under high input irrigation (drip or high capacity pivots). If plants get larger than 36 inches, harvest efficiency and productivity drop significantly. With some spindle picker

harvesters working in the region, plant size for high yielding cotton is not as much of a harvesting consideration. **Pickers can handle higher yielding, taller plants with much greater ease than stripper harvesters, especially when the stalks are still alive (or "green"). However, if weather constraints at harvest time delay harvesting after freezing weather, the large brittle plants can still result in picker harvesting difficulties.**

Determination of application rates is generally more "art" than "science" for these products. Applications should begin when 50% of the plants have one or more matchhead squares (see specific product label for more information). It is best to get a handle on excessive growth potential early if conditions favor excessive growth for an extended period of time. Herein lies the High Plains dilemma: It is unknown at that time as to how weather will affect the crop in July and on into early August. Will we get 100+ degree temperatures, southwest winds at 30 mph at 10% relative humidity? If so, those conditions will limit plant growth in many fields with low irrigation capacity. Watch high growth potential varieties and fruit retention. If a high growth potential variety has been planted and has encountered low fruit retention, then MC rate should be increased, especially under high water, fertility, and good growth conditions. One should target applications to fields with high growth potential. Some newer varieties may need aggressive management under high irrigation capacity and/or if heavy rainfall conditions are encountered. The situation that has arisen due to the release and availability of new genetics is challenging. Visit with your seed company representative to determine which new varieties should be watched closely for MC needs under field-specific conditions. Sequential applications can be adjusted to meet subsequent crop conditions and growth potential. For any questions concerning this information, producers are welcome to contact me, Mark Kelley, at anytime. I can be reached at 806-781-6572 (mob), or 806-746-6101. MSK

# Cotton Disease Update

### Root-knot Nematode

Despite the rainfall that has been received the past few weeks, dry conditions continue to be experienced and the crop is off to a relatively slow start to this growing season. Recent travels throughout the High Plains revealed symptoms of **nematode damage** being observed in fields infested with the Southern root-knot nematode (*Meloidogyne incognita*). Symptoms consist of a general decline in plant vigor, stunting and ultimately a reduced boll load. Under extreme conditions, plants may completely die. Nematodes typically attack developing tap roots and secondary roots. These symptoms often resemble nutrient deficiencies, which arise from damage that occurs to plant roots rendering them unfit for acquiring water and/or nutrients. The feeding conducted and damage caused by root-knot nematodes, results in the appearance of galls which are key in diagnosing the problem. Nematodes hatch from eggs and locate a host during a juvenile stage via compounds that are produced by developing root systems and diffuse in the soil. Continued feeding results in the production of specialized feeding sites (giant cells), which

serve as a metabolic sink capable of supporting reproduction of the nematode and adversely affecting plant growth. Such feeding activity in conjunction with reproduction of the nematode is responsible for the development of the galls mentioned previously. Nematode populations within the soil determine potential management options, as well as determine the severity of symptoms that may be observed. Nematodes are considered stress multipliers and damage is often more severe when plants are experiencing other adverse factors such as harsh environmental conditions, water stress, etc. Promoting vigorous growth is effective at minimizing damage. With the loss of Temik 15G, chemical management options are limited. Partially resistant or tolerant varieties including Deltapine 174RF, Phytogen 367WRF, Stoneville 5458B2F, and Stoneville 4288B2F have demonstrated consistent performance in research trials focusing on nematodes. Preliminary results from studies in 2012 indicate that some newer varieties, such as Fibermax 2011GT and Stoneville 4946B2F contain genes that confer nematode resistance. These varieties along with others and several breeding lines are being evaluated in multiple locations on the High Plains. These materials were derived from breeding programs emphasizing nematode resistance or have been identified as possessing resistance genes using Marker Assisted Selection. We will be reporting results from those trials ass they become available.

In addition to varieties the seed applied nematicides, such as Acceleron-N, Aeris and Avicta can be applied to seed to help combat nematode problems. Performance of these products is dependant on soil conditions (requiring adequate moisture to “activate” them). Benefits in fields with low to moderate nematode pressure have been observed, as well as when these nematicides are used in conjunction with partially resistant varieties. Furthermore, there has been increased interest in foliar applications of Vydate, as it is the only in-season product labeled for use in cotton. In the past, Vydate was used as a supplement to early season nematode control programs comprised of Temik; however, the use pattern of Vydate has changed in the absence of Temik. Vydate is taken up through the foliage and transported to the roots, thus deposition is critical in maximizing efficacy when applied to young cotton. Hail damage received during recent thunderstorms affected cotton growth and may compromise uptake of Vydate. When making applications, a minimum of two healthy, actively growing leaves are needed to ensure that enough product is taken up by the plant. Initial application made to young cotton can be followed by a sequential application approximately 14 days later. Kerry Siders, Extension Agent-IPM in Hockley and Cochran Counties, has work extensively with Vydate and encourages producers to be mindful of applications made during the later squaring period, as this may negatively affect beneficials, thus increasing the risk of flaring aphids. It is the applicators responsibility to read, understand and adhere to all label recommendations. Refer to the following link for the complete Vydate label (http://www.cdms.net/LDat/ld264021.pdf). While there has been much research conducted to address rot-knot nematodes in High Plains cotton, there are several areas that are being and can be further be explored to limit damage and maximize profitability in areas where the pest is present. If you have any questions regarding root-knot nematodes or any other cotton diseases please contact Jason Woodward @ 806-632-0762, or via e-mail jewoodward@ag.tamu.edu. JW

*Characteristic galling caused by root-knot nematode*

*Uneven growth resulting from root-knot nematode damage*

# Sunflower Insects

### New Insecticides for Sunflower Moth Control

Our 2009 publication, Managing Insect Pests of Texas Sunflowers lists suggested insecticides for sunflower moth control that were evaluated prior to publication. There have been some developments in sunflower moth insecticides recently, and, while we do not have a complete set of experimental data on all the available options, we wish to present some limited data. **All of these data are from Roy Parker, Extension Entomologist in Corpus Christi, and we would like to thank Roy for allowing us to present his data.**

Table 1. Comparison of insecticides for effectiveness on sunflower moth larvae in sunflower, Texas A&M AgriLife Research and Extension Center, Nueces County, TX, 2012.

| Treatment[1/] (oz/acre) | Early planting date (2/16) | | Late planting date (3/15) | |
|---|---|---|---|---|
| | Larvae/ 10 heads | % infested | Larvae/ 10 heads | % infested |
| Prevathon 0.43 SC (10.0 oz/acre) | 1.5[b] | 10[c] | 1.5[b] | 15[b] |
| Prevathon 0.43 SC (14.0 oz/acre) | 1.5[b] | 15[c] | 2.0[b] | 20[b] |
| Karate Zeon 2.08 CS (1.92 oz/acre) | 20.5[b] | 60[b] | 9.0[b] | 40[b] |
| Cobalt Advanced 2.632 (31.0 oz/acre) | 21.5[b] | 75[ab] | 7.0[b] | 45[b] |
| Untreated | 99.0[a] | 100[a] | 36.5[a] | 90[a] |
| LSD (P = 0.05) | 29.34 | 33.87 | 15.80 | 33.64 |
| P > F | .0001 | .0003 | .0022 | .0030 |

Means in a column followed by the same letter are not significantly different by ANOVA.
[1/]Planting date 1 treatments were applied on April 25, 30, and May 8; and planting date 2 treatments were applied on May 16 and 23.

Roy's 2012 results indicate that there was a strong numerical advantage to Prevathon, but it should be noted that Prevathon was not statistically different from Karate with Zeon or Cobalt Advanced. Karate with Zeon was included as a "standard" against which the newer products could be compared.

Roy conducted several more sunflower moth trials this year (2013) and, while the data are not yet published, he sent us a sneak peak.

Table 2. Sunflower moth control study 2013, Victoria County, Texas. There were two treatments, the first at 2% bloom (May 17) and the second at 98% bloom (May 22). Roy Parker, Extension Entomologist, Corpus Christi.

| Trt No. | Treatment Name | Product Rate | Product Rate Unit | Larvae/5 Heads | Pct. Heads Infested |
|---|---|---|---|---|---|
| 1 | PREVATHON 0.43 SC | 10.0 | OZ/ACRE | 4.3c | 45.0cde |
| 2 | PREVATHON 0.43 SC | 14.0 | OZ/ACRE | 1.5c | 15.0e |
| 3 | BELT 4 SC | 2.5 | OZ/ACRE | 2.5c | 30.0de |
| 4 | BELT 4 SC | 3.0 | OZ/ACRE | 9.5c | 65.0a-d |
| 5 | BLACKHAWK 36% AI | 2.8 | OZ/ACRE | 5.5c | 55.0bcd |
| | DYNE-AMIC 0.25%V/V | 0.25% | V/V | | |
| 6 | RADIANT 1.0 LB AI/GAL | 4.0 | OZ/ACRE | 17.8bc | 95.0a |
| | DYNE-AMIC 0.25% V/V | 0.25% | V/V | | |
| 7 | BESIEGE 1.25 ZC | 6.0 | OZ/ACRE | 4.3c | 40.0cde |
| 8 | BESIEGE 1.25 ZC | 9.0 | OZ/ACRE | 4.0c | 45.0cde |
| 9 | KARATE 1.0 EC | 3.8 | OZ/ACRE | 37.8ab | 75.0abc |
| 10 | UNTREATED | | | 58.3a | 90.0ab |
| LSD (P=.05) | | | | 24.30 | 37.87 |
| Standard Deviation | | | | 16.74 | 26.10 |
| CV | | | | 115.28 | 47.02 |
| Replicate F | | | | 1.490 | 1.033 |
| Replicate Prob(F) | | | | 0.2395 | 0.3938 |
| Treatment F | | | | 5.080 | 3.897 |
| Treatment Prob(F) | | | | 0.0005 | 0.0029 |

The 2013 study found no significant difference in head moth control (as determined by the number of larvae per 5 heads) provided by Prevathon, Belt, Blackhawk+Dyne-amic, Radiant +Dyne-amic, and Besiege at the rates listed in the table. Control with Karate not as good as with the products listed above (except Radiant + Dyne-amic) and was not different from the untreated check.

It is important to note that some of the insecticides in the table above, with the exception of Besiege and Karate, are not pyrethroids and will not provide knockdown and control of adults. Do not be alarmed if you use one of these new non-pyrethroid insecticides and still see adults in the field; that is expected and the insecticides are controlling the egg (in some cases) and larval stages. Radiant is spinetoram, Blackhawk is spinosad, Belt is flubendiamide, Prevathon is rynaxypyr, Besiege is a mixture of the pyrethroid lambda-cyhalothrin and rynaxypyr (but a different formulation of rynaxypyr than is in Prevathon), and Karate is lambda-cyhalothrin. RPP

# Non-cotton Agronomy

### Mobile Resources for Chemical Labels and Sorghum Information

Do you need easy access to chemical labels for planning purposes, wish to 'shop' for herbicide specifics or for names of generics vs. brand name chemicals? Texas A&M AgriLife staff rely on http://www.cdms.net to readily obtain label information from their computer. Accessing individual labels works fairly well from a smart phone, too. Access is free. To use Chemical Data Management Systems' database, log in to the website then: 1) click 'Services' then 'Labels/MSDS,' 2) enter the desired product name in the search box (keep the name simple, for example 'Dual' rather than 'Dual Magnum' to ensure you return all labels for Dual products), 3) select the label of your choice, then 4) choose the main label or any supplemental labels you might need.

You may also search for chemicals based on active ingredient, target crop, or other criteria: 1) click 'Services' then on the left choose 'Other Search Options,' 2) register with CDMS (free), 3) enter the common name (e.g., *s*-metolachlor, the a.i. in Dual), product type (herbicide, insecticide, etc.), and 'crop/site' which is your target crop (e.g., sorghum), and 'Texas' at the bottom. You will then receive a summary of active ingredients, possibly in combination (there are several for *s*-metolachlor)—make your choice, then 'Next' then choose the particular sorghum crop (e.g., grain sorghum, sorghum/sudan, etc.), then you receive the final results—labels comparable to Dual (nine in this example).

### On-the-Go Mobile Access to USCP Sorghum Guides

United Sorghum Checkoff Program's pocket grain sorghum production guides are also available at http://www.sorghum.mobi with your smart phone. For the South Plains, Concho Valley, and Rolling Plains, click on the West Texas guide, and if you are in Deaf Smith to Armstrong Counties, then use the High Plains edition, which also covers north into Kansas. CT

# Cotton Insects

### Early season cotton insect pest: Cotton fleahopper

Cotton which is at the 5 to 7 true leaf stage has passed the window of economic loss due to thrips injury and plants are now entering into the squaring stage. After the region finally started receiving desperately needed precipitation in recent days, cotton plants across most of the area are starting to grow well and should compensate for some of the earlier thrips injury. During this early squaring stage of cotton, we must protect small squares (pinhead to match-head sized

fruiting buds) from any insect injury, as these first-position squares will eventually contribute to a majority of the lint produced by a cotton plant. Considering our relatively short growing season, protection of these early season squares and small bolls is particularly true when a cotton crop gets a late start or grows slowly in the seedling stage. Therefore the main objective at this point of time (during early season) should be to protect the crop and have maximum square retention. One of the major pests during this early growth stage of cotton is a small but destructive insect, the cotton fleahopper. Texas in general and specifically south-Texas experience the highest pressure and associated damage from this insect compared to other cotton belt states. The good news for our High Plains producers is that cotton fleahopper pressure in this area is typically very low and not consistent, but insect populations are unpredictable like our weather and therefore we must keep an eye on this insect by scouting our crop for this and other threatening pests.

**Biology:** Cotton fleahopper is a small, pale, dusty, green colored insect. Adults are about 1/8 of an inch in length. Cotton fleahoppers belong to the so called "plant bug" family, which includes other cotton insect pests such as *Lygus*, verde plant bug and clouded plant bug. However, the cotton fleahopper is much smaller than the other plant bugs mentioned here. Both immatures and adults are capable of causing injury to the plant. Upon close inspection, several black dots can be seen on the antenna and legs of an adult cotton fleahopper. Immatures are also pale green in color and feed on small squares and tender parts of a cotton plant by sucking plant juice (phloem sap). Cotton fleahoppers overwinter as eggs laid into the tissues of a limited number of host plant species. Eggs hatch during early spring, after receiving some rain showers and warm weather. Later the insect goes through five different immature stages, called instars. Immatures do not have wings and grow bigger in each successive developmental stage. It takes cotton fleahoppers about 25 days from the egg to adult stage. Adults live approximately 2-3 weeks and reproduction occurs during this adult period.

**Damage symptoms:** Upon feeding by cotton fleahopper on pinhead size squares, the small fruit (square) turn pale yellow and eventually dry out. Later, the dried out squares fall off the plant (referred to as a "blasted" square) and a scar forms at the point of square attachment to the plant. Following severe cotton fleahopper injury to the terminals of young cotton plants, plants do not grow normally and irregular branching patterns can be seen, which is often referred to as "crazy cotton".

**Habitat:** Cotton is not the primary host of cotton fleahopper. Rather, this insect prefers other host plants such as horsemint, woolly croton, silverleaf nightshade, and evening primrose. While horsemint and woolly croton are the two most preferred and abundant host plant species for cotton fleahoppers in south and south-east Texas, these plants are rare in the High Plains area. That may well explain why we see fewer cotton fleahoppers in High Plains compared to south

Texas. However, silverleaf nightshade and evening primrose are two prevalent weeds or volunteered plants seen across the High Plains and these two plants support cotton fleahopper populations to some extent. If a cotton field is surrounded by lots of silverleaf nightshade and/or evening primrose, they may act as a source of cotton fleahoppers. In that situation, if it is feasible, I suggest not to disturb the patches of those weeds present near the cotton field when your crop is in the early squaring stage. By doing so, you may be able to restrict some movement of cotton fleahoppers to cotton from these weed host plants.

**Scouting and thresholds:** Depending on the crop growth stage and plant vigor, scouting methods for cotton fleahopper could be different. When plants are in the early squaring stage, non-destructive, whole plant visual sampling is recommended. Whole plant visual inspections will not only help in finding cotton fleahoppers, but also will help you calculate an estimate of square retention. However, once the crop attains the flowering stage and beyond, the use of beat-bucket or drop-cloth methods of sampling will be more efficient for detecting presence of cotton fleahopper. The current economic threshold for cotton fleahoppers in our High Plains region is 25-30 insects per 100 plants inspected. Another method of determining the threshold for cotton fleahoppers is through an estimation of square retention on the plants. The recommended threshold for percent square set in cotton is 90% during 1$^{st}$, 85% during 2$^{nd}$ and 75% during the 3$^{rd}$ week of squaring to the time of 1$^{st}$ bloom. If percent square set drops below the specified number corresponding to the week of squaring, insecticide intervention is justified. I suggest not to solely relying on the square set percentage for threshold, but also finding cotton fleahoppers on the plants. Because there are other environmental factors which can result loss of squares in cotton plants.

**Management:** For our region, it is rare for cotton fleahopper populations to reach and go beyond the economic threshold level, at which level chemical intervention is warranted. There are several natural enemies (beneficials) which have the potential to suppress the cotton fleahopper populations to some extent. Among those, spiders, big-eyed bug, assassin bug, and damsel bugs are the most common predators of fleahoppers in cotton. Removal of weeds such as silverleaf nightshade should significantly lower potential fleahopper population in cotton. For chemical control options, there are several effective insecticides available for cotton fleahoppers such as Centric® 40WG @1.25 oz/acre, Intruder® WSP @ 0.6 oz/acre, Belay® @ 4 oz/acre, Orthene® 97 @ 8 oz/acre, Carbine™ 50WG @ 1.7 oz/acre, Bidrin® 1.6-3.2 oz/acre and Transform® WG 0.75 oz/acre.


*Adult cotton fleahopper* (placed near a dime for comparison)

*Immatures of cotton fleahopper*

| Different plant bugs found in cotton | |
|---|---|
|  |  |
| *cotton fleahopper* | *verde plant bug (not in Texas High Plains region)* |
|  |  |
| *clouded plant bug (not in High Plains)* | *Lygus bug* |
| Photographs from Bugguide.net | |



*Representation of a healthy and a damaged square in cotton plant*

*Weed host of cotton fleahoopper in High Plains: Evening primrose*

*Weed host of cotton fleahoopper in High Plains: Silverleaf nightshade*

# FOCUS on South Plains Agriculture

## Fair use policy



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## Useful Web Links

Water Management Website, TAMU, Irrigation at Lubbock, IPM How-To Videos, Lubbock Center Homepage, Texas AgriLife Research Home , Texas AgriLife Extension Home, Plains Cotton Growers

## County IPM Newsletters

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