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TEXAS A&M AGRILIFE EXTENSION

FORT BEND COUNTY

Agriculture Newsletter

Inside this issue:

John Gordy
County Extension Agent
Agriculture and Natural Resources
1402 Band Road, Suite 100
Rosenberg, Texas 77471
Office: (281) 342-3034
John.Gordy@ag.tamu.edu
http://fortbend.agrilife.org/

Scouting Susceptible Grain Sorghum for Sugarcane Aphid – Using Aphid Counts vs. Aphid Presence and Honeydew

By John Gordy, CEA-Agriculture and Natural Resources, Fort Bend County

There has been some interest in using a combination of percent plants with aphids and presence of honeydew in deciding whether or not to apply an insecticide for management of sugarcane aphid. I would advise you to use extreme caution when considering this scouting approach. Where we have looked at this approach using percentage of plants with greater 10 aphids/leaf or greater than 25 aphids/leaf, there was no consistent yield response to those levels of infestation and I am not aware of any research that has shown that relationship. In fact, there was less yield loss with >25 aphids per leaf than with >10 aphids per leaf. By using this method, growers run the risk of treating too early (and possibly unnecessarily) or too late if they incorrectly evaluate or assess honeydew and whether aphid colonies are established or not.

I believe the most reliable decision aide is counting or estimating aphid numbers on a per leaf basis (see scout card at: http://ccag.tamu.edu/files/2016/04/NTO043.pdf). With current grain prices of around $3.80 per bushel, economic thresholds are between 50 and 100 aphids per leaf for treatment costing $10 to $15/acre for the upper and lower gulf coast regions of Texas. Scouting is still of utmost importance. Current recommendations are to scout fields at least weekly, once sugarcane aphids are detected. Checking all sides and at least 100' into the field is important to gauge whether or not the entire field, edge, or no treatment is needed.

Resistant hybrids have been discussed previously and it is believed that different hybrids have varying degrees of resistance/tolerance to sugarcane aphid damage, and thus would have different thresholds. Scouting resistant hybrids is still important although treatment decisions may currently need to be based more on experience as we are still working on threshold establishment for resistant hybrids. While we have been out in the field this week, we have seen some fields that are at or near threshold. Keep in mind that Transform WG may not be applied during bloom. Both Transform and Sivanto have a 14 day PHI. Additional information regarding Sivanto and Transform insecticides can be found at:

http://betteryield.agrilife.org/category/pesticides/

Varying Tolerances to Liberty Applications in Cotton Varieties

by Gaylon Morgan and and Josh McGinty.

There are more herbicide tolerant (HT) traits on the market than ever before and with more to come in the future. These HT traits provide new opportunities for weed management, but growers are going to have to remain diligent on the various HT traits and in which varieties these traits are included. The previous article (http://agrilife.org/texasrowcrops/2017/02/22/best-management-practices-for-auxin-tolerant-cotton-technologies-current-12017/) discussed the differences and similarities in the various dicamba products (XtendiMax®, Engenia™, and FeXapan™) and Enlist Duo®. One factor that was discussed in this article is the cotton variety tolerance to glufosinate (Liberty® by Bayer, Cheetah™ by NuFarm, or Kong by Solera) in GlyTol® LibertyLink® cotton varieties, XtendFlex® cotton varieties, and Widestrike® cotton varieties.

From trials conducted in the Southeastern CottonBelt and grower observations in Texas, there can be varying levels of crop injury from glufosinate, when applied to the different HT trait varieties. Glufosinate is the most effective for weed control when the weeds are actively growing (lush) and humidity is high. Under these same conditions, the potential for herbicide injury to cotton is also increased. This has been observed in South and East Texas, but no research has been conducted to validate the HT trait differences. However, in the Southeastern US, Dr. Stanley Culpepper and colleagues have conducted such research. Below is a summary of some of the research.

– 28 trials were conducted in the Southeastern states. Of the 28 trials, only 3 trials exceeded 15% crop injury from glufosinate. These 3 trials occurred under great cotton growing conditions and with very high humidity, and were coined “extreme environment for injury”.

– Under the extreme environment for injury, the table below shows differences in tolerances to Liberty applications.

The level of herbicide tolerance to glufosinate can vary between the different herbicide tolerant traits and varieties with the LibertyLink trait. Why the differences in tolerance in varieties with the LibertyLink traits? LibertyLink is a Bayer Crop Science patented trait. It is our understanding that the LibertyLink trait is the same for GlyTol LibertyLink varieties and the XtendFlex varieties. The XtendFlex varieties use a different trait introgression process which may occasionally result in less tolerance to Liberty; however, the XtendFlex varieties must still exhibit a very high tolerance to Liberty in order to be approved as LibertyLink by

Percent Visual Cotton Injury at 3 Days After Treatment in TyTy, GA in 2015. Data provided by Dr. Stanley Culpepper, University of Georgia.

	Stoneville 6448GLB2	DeltaPine 1553B2XF	Phytogen 499WRF
Liberty	11	19	26
Liberty + Roundup Pow ermax	11	21	27
Liberty + Roundup Pow ermax + Warrant	23	35	41

* Liberty = 32 oz/a; Roundup Powermax = 32 oz/a; Warrant = 48 oz/a

** Herbicides were applied at 15 gpa and no adjuvants were added

Bayer Crop Science.

Cotton varieties with the Widestrike insect protection trait (WRF) have two copies of the pat gene, which provides partial tolerance to field rates of glufosinate, though less than varieties with the LibertyLink trait. Varieties with the WideStrike 3 traits, including Enlist traits (W3FE), express three copies of the pat gene

and provide even greater tolerance to glufosinate. Data from Dr. Culpepper indicates glufosinate tolerance is slightly less that GlyTol LibertyLink varieties, but slightly better tolerance than the XtendFlex varieties tested.

When crop injury is observed on cotton plants, the response to glufosinate usually manifests itself as small necrotic spots on the leaves. In Figure 1 below, this response can be seen on several varieties with varying trait packages. Glufosinate is not translocated in the plant and thus the necrotic injury will only be observed on the leaves present at application and subsequent leaves will be healthy. With low levels of glufosinate injury (<15%), cotton plants easily grow through the injury and little (if any) yield loss would be expected to occur.

In summary, under the extreme environmental conditions of lush growing conditions and high humidity, some differences may be observed among trait packages in their tolerance to glufosinate. Additionally, as the number of tankmix partners with Liberty increase, the potential for crop injury increases for all varieties and traits. Occasionally, greater injury may be observed on WideStrike and XtendFlex varieties, but is unlikely to affect yield.

Figure 1. Crop response of several varieties to a postemergence application of 29 fl oz of Liberty 280 SL in the Coastal Bend of Texas, 2017. Pictures provided by Josh McGinty.

Have you noticed any flowering pigweed recently?

by Muthu Bagavathiannan, Josh McGinty, Vijay Singh, Peter Dotray and Gaylon Morgan

Palmer amaranth and waterhemp are two pigweed species that have become problematic in row crop production fields in Texas. Palmer amaranth is widespread in the High Plains, Rio Grande Valley, Coastal Bend and Central Texas regions, whereas waterhemp is predominantly found in the Upper Gulf Coast as well as the Blacklands regions. Herbicide resistance in these two species is an emerging issue and extension specialists have emphasized the need for diversifying weed management tactics to prevent/delay resistance. Because pigweeds produce enormous amounts of seeds, preventing seed production from the escapes is a critical component of sustainable resistance management. Research has shown that a single Palmer pigweed plant can produce in excess of 1.5 million seeds under good growing conditions. Recent research conducted at College Station and Lubbock by Texas A&M AgriLife scientists has shown that Palmer pigweed plants can emerge

Flowering Pigweed, continued from page 3

and produce seed as late as early October at these locations. This means that pigweeds can emerge even after the harvest of row crops in Aug/Sep in South Texas and manage to produce significant amounts of seeds in the fall. The issue is likely of even greater importance in the southern most regions of the state, where winter frosts may not always occur. In a previous row-crops newsletter, we have emphasized the importance of managing these late-season emerging pigweeds to minimize future weed issues.

On April 6, 2017, we noticed flower heads in Palmer pigweed that emerged early spring in College Station. By April 17, mature seed could be found on the flower heads of the group of seedlings that emerged first. These plants were of considerable size and produced ample seeds (at least several thousand seeds per plant) (Figures 1 to 3). This is the first time we ever noticed mature seed production in Palmer pigweed prior to summer in College Station, especially within the planting window for grain sorghum, cotton and soybean.

Figure 1. View of a field with flowering Palmer pigweed in College Station (mid-April 2017)

Figure 2. Growth of individual Palmer pigweed plants in College Station (mid-April 2017)

Figure 3. Presence of mature seed (black color) in Palmer pigweed plants by mid-April in College Station

At Corpus Christi, McGinty observed Palmer pigweed seed maturity by mid-March this year.
This observation highlights the likelihood that Palmer pigweed can add seed to the soil even prior to planting the summer crops in some areas of Texas, and these mature weeds have caused many challenges for obtaining adequate control with the preplant burndown herbicides. It is likely that pigweed seed production has occurred prior to row-crop planting in areas south of College Station in the Upper Gulf Coast, Coastal Bend and Rio Grande Valley regions due to much warmer temperatures. We could not rule out the possibility for pigweed seed production in areas north of College Station as crop planting is usually delayed by few weeks.

This observation points to the need for robust early-season weed management practices implemented prior to planting. Application of effective burn-down or pre-plant incorporated residual herbicides is critical even if plans are there to disk the field prior to crop planting. If herbicide resistance is suspected, the burndown herbicides must include herbicides for which the pigweeds are still susceptible and must be applied prior to pigweeds reaching the 4 to 6 inch growth stage. Continuous wet weather conditions can complicate herbicide application timings. Thus, applications must be made at the earliest possible window to achieve effective control of the pigweeds. If burndown applications did not provide sufficient pigweed control due to resistance, larger growth stages, or other reasons, consider disking the field prior to mature seed production if tillage is an option. Keep in mind that pigweeds only need about two weeks from flowering to mature seed production. Pigweed flowers mature from the bottom of the seedhead upward, so look for dark brown to black seeds at the base of the flower head (see Figure 3). It is imperative to be vigilant in preventing seed production in pigweeds, and the importance of monitoring and managing early-season pigweeds should not be overlooked.

It is unclear whether we are finding biotypes (or portion of a biotype) that have developed the ability to germinate and produce seed early in the season. Further, we are not sure what portion of these seeds can germinate immediately and produce seed again during late summer. Research will be conducted to answer these and other practically relevant questions.

Foliar Injury Symptoms from Auxin Herbicides are NOT a Good Indicator of Cotton Yield Loss

by Seth Byrd – Extension Cotton Specialist – Lubbock, TX; Peter Dotray – Extension Weed Scientist – Lubbock, TX; Wayne Keeling – Research Cropping Systems and Weed Science – Lubbock, TX; Misha Manuchehri – Extension Weed Scientist (OSU) – Stillwater, OK; Josh McGinty – Extension Agronomist – Corpus Christi, TX; Gaylon Morgan – State Extension Cotton Specialist – College Station, TX

Cotton injury from herbicide drift and potential yield loss has been a hot topic recently, both among producers and in the popular press. It is important to note that this is a complex issue and a definite answer to "How much yield will I lose?" is difficult if not impossible to accurately predict. Previous studies evaluating sub-lethal (drift or tank contamination) rates of dicamba and 2,4-D have illustrated the complex relationship between visual injury and yield loss. Often, there is a poor relationship between the two (i.e. severe visual foliar injury results in minor to no yield loss, or vice versa) and many factors play a role in cotton's yield response after exposure to these herbicides. Important factors include growth stage at time of exposure, rate/concentration of herbicide, degree of exposure, and environmental conditions after exposure.

A summary of previous research indicates that much is still unknown regarding the effects of sub-lethal rates of auxinic herbicides in cotton. Tables are included illustrating the range of injury estimates and yield loss results of studies evaluating drift rates of dicamba and 2,4-D on cotton in South Texas and the Texas High Plains. Pictures illustrate examples of visual injury symptoms from sub-lethal applications of 2,4-D and dicamba at various growth stages, the corresponding range of injury ratings from some of these studies also are included.

What is Known:

- Cotton is more sensitive to 2,4-D than dicamba across a wide range of rates.
- Primary factors contributing to yield response are 1) rate or dose of the herbicide and 2) growth stage of cotton at the time of exposure; however, environmental conditions after exposure which may allow plants to recover also are important.
- Typical epinasty and strapping leaf injury symptoms are more prevalent and severe when cotton is exposed at vegetative growth stages (prior to 1st square), with less severe vegetative symptoms being present at the later stages (after 1st flower and further into the flowering period).
- There are differences in visual injury symptoms between dicamba and 2,4-D, particularly at higher rates. Leaf strapping is the more pronounced symptom resulting from 2,4-D while leaf cupping generally results from dicamba. However, at very low rates these differences are less obvious.
- Greater yield loss typically occurs from exposure during the first square to early bloom period; however,

Foliar Injury Symptoms from Auxin Herbicides are NOT a Good Indicator of Cotton Yield Loss, continued from page 5

What is Unknown:

- Interactions with other crop stress (drought, disease, insect pests, etc.). Previous studies have managed cotton for high yield (adequate to optimal irrigation, timely planting, and intensive pest control) before, during, and after exposure to sub-lethal rates of auxinic herbicides. There is little information regarding the response of cotton in non-irrigated conditions or late-planting dates. Is the stress magnified or mitigated under sub-optimal conditions?
- Impact of varieties and maturity classes. Differences between early and late maturing varieties to sub-lethal rates of 2,4-D or dicamba may differ slightly or greatly at different growth stages due to differences in fruiting patterns. The magnitude or lack of differences between maturity classes is unknown.
- Indirect impact on fiber quality, whether yield is impacted or not. Previous research has shown no direct impact on fiber quality. However, insufficient data is available to draw conclusions about how fiber quality could be indirectly impacted as a result of delayed maturation or other factors. Again, a limited set of growing and management conditions has been evaluated, which represent a small proportion of potential production scenarios.
- A method to accurately predict yield loss prior to harvest. While the relationship between symptomology and yield loss has been extensively studied, there has been virtually no success in predicting yield loss or management recommendations that could be used to make management decisions for the remainder of the season.

The most important take away message is that there is no definitive answer to the "How much yield will I lose?" question. While previous research has identified some range of expected yield loss, the interaction between the herbicide, the rate, the timing of injury, and environmental conditions are very complex. It may not be as bad as it looks, or a bad situation may not exhibit any symptoms. The best option is to manage the crop like the unaffected portion of the field so that potentially productive acres are not neglected. If a yield loss estimate needs to be determined, divide the affected portion of the field up based on expected severity or level of yield loss (mild, moderate, severe for example) and compare the yield from these areas to the non-

1/10 – 1/50 rate of dicamba at cotyledon – 2 leaf

1/10 – 1/50 rate of 2,4-D at cotyledon – 2 leaf

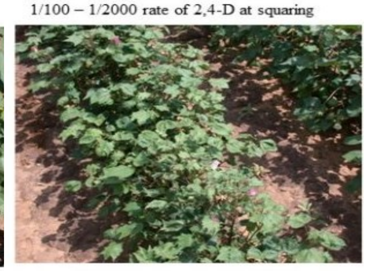
1/100 – 1/2000 rate of dicamba at squaring

1/100 – 1/2000 rate of 2,4-D at squaring

1/10 – 1/50 rate of dicamba at cotyledon – 4-5 leaf

1/10 – 1/50 rate of 2,4-D at cotyledon – 4-5 leaf

1/10 – 1/50 rate of dicamba at first bloom



1/10 – 1/250 rate of 2,4-D at first bloom

Table 1. Injury ratings and yield loss from sub-lethal rates ranging from 1/100 – 1/2000 of the full rate of dicamba and 2,4-D from South Texas and the Texas High Plains.

*1/100 – 1/2000 of the full rate**		South Texas		Texas High Plains	
Cotton Growth Stage	Herbicide	Injury Range	Yield Loss	Injury Range	Yield Loss
Cotledon-2 leaf	Dicamba	–	–	0-15%	0%
Cotyledon-2 leaf	2,4-D	–	–	2-50%	1-3%
4-5 leaf	Dicamba	–	–	0-13%	0%
4- leaf	2,4-D	6-70%	6-8%	1-35%	0-6%
Squaring	Dicamba	0-96%	0-39%	1-35%	0-6%
Squaring	2,4-D	5-48%	1-15%	0-44%	0-5%
First bloom	Dicamba	0-20%	0-23%	0-4%	0-3%
First bloom	2,4-D	0-34%	0-1%	0-3%	0-5%
First bloom + 2 weeks	Dicamba	0-15%	0-17%	0-1%	7-14%
First bloom + 2 weeks	2,4-D	0-4%	0%	0-8%	0%
First bloom + 4 weeks	Dicamba	–	–	–	–
First bloom + 4 weeks	2,4-D	0-3%	0%	0-8%	0%
First bloom + 6 weeks	Dicamba	–	–	–	–
First bloom +6 weeks	2,4-D	0%	0%	0-1%	0%

Data compiled from studies performed in Texas (Everitt and Keeling, 2009; Byrd et al., 2016; Dotray, unpublished data, McGinty, unpublished data, and Morgan, unpublished data). *All applications were made with a minimum carrier volume of 10 GPA.

Table 2. Injury ratings and yield loss from sub-lethal rates ranging from 1/10 – 1/50 of the full rate of dicamba and 2,4-D from South Texas and the Texas High Plains.

*1/100 – 1/50 of the full rate**		South Texas		Texas High Plains	
Cotton Growth Stage	Herbicide	Injury Range	Yield Loss	Injury Range	Yield Loss
Cotledon-2 leaf	Dicamba	–	–	3-57%	10%**
Cotyledon-2 leaf	2,4-D	–	–	18-66%	50%**
4-5 leaf	Dicamba	–	–	4-39%	8%
4- leaf	2,4-D	26-84%	47-76%	1-35%	0-6%
Squaring	Dicamba	1-99%	0-91%	8-43%	5-70%
Squaring	2,4-D	9-69%	50-63%	21-57%	50-68%
First bloom	Dicamba	0-54%	3-82%	6-37%	0-54%
First bloom	2,4-D	0-45%	57-82%	2-32%	0-15%
First bloom + 2 weeks	Dicamba	0-27%	1-65%	4-8%	30-40%
First bloom + 2 weeks	2,4-D	0-23%	3-45%	0-15%	2-23%
First bloom + 4 weeks	Dicamba	–	–	–	–
First bloom + 4 weeks	2,4-D	0-11%	0-15%	0-10%	0%
First bloom + 6 weeks	Dicamba	–	–	–	–
First bloom +6 weeks	2,4-D	0-9%	3-15%	0-1%	0%

Data compiled from studies performed in Texas (Everitt and Keeling, 2009; Byrd et al., 2016; Dotray, unpublished data, McGinty, unpublished data, and Morgan, unpublished data). *All applications were made with a minimum carrier volume of 10 GPA.
**Only one ite year available.

Texas A & M AgriLife Extension Service — Fort Bend County
John Gordy, County Extension Agent– Ag/NR
1402 Band Road, Suite 100
Rosenberg, Texas 77471

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DATES TO REMEMBER

June 7
Sugarcane Aphid Turn-Row Meeting

June 22
Row Crops Tour—Fort Bend, Brazoria, and Waller Counties

John Gordy, CEA- Ag/NR
John.gordy@ag.tamu.edu
(281) 342-3034
Fort Bend County Extension
1402 Band Road, Suite 100
Rosenberg, Texas 77471

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http://fortbend.agrilife.org