WEST PLAINS IPM UPDATE

News about Integrated Pest Management in Hockley, Cochran, and Lamb Counties from
Kerry Siders

Sept. 17, 2020

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Current Situation

It has been a week now since our first significant cold front moved through. It was supposed to have brought with it, beside cold air and wind, some measurable precipitation. Unfortunately, the weatherman got the wind correct, it was about 5 degrees colder (38° F) than they anticipated, and it was not a wet front for us at all. As a result, though we are seeing many acres of cotton looking like the picture below left. Many have speculated either disease or freeze. Well it is neither. Though we can see symptoms of various diseases (verticillium wilt, bacterial blight, etc.) these are not the primarily cause of this damage to foliage. If you look in drip cotton acres you will see spots where a leak has occurred (bottom right) and this cotton is not damaged, or on center pivots look at cotton in front of the pivot is damaged versus that behind the pivot, which was last watered is not as bad, unless it was shut off back in August. So, this damage reflects how water was managed, or how much stress the plant was under when the weather event on September 7-9 moved through our area. The weather then exacerbated this stress by adding cold-dry wind at +30 mph for many hours out of the north. Therefore, you may even see east-west rows have more pronounced damage than north-south rows. The smell of injured tissue which some may have smelled, like after a freeze, was most likely from actual freeze damage 50-100 miles north of us. So, stressed plants combined with cold desiccating winds is the primary culprit of this damage, which is very widespread. Its impact will not be fully realized until harvest.

2020 Texas High Plains Cotton Harvest-Aid Guide

Murilo Maeda, Extension Specialist - Cotton, Texas A&M AgriLife Extension Service
Wayne Keeling, Systems Agronomist, Texas A&M AgriLife Research

INTRODUCTION

Cotton is cultivated as an annual crop but is inherently a deciduous perennial. Because of this, it is a flexible crop that responds well to both environmental and management factors. Harvest-aid chemicals are generally used to facilitate mechanical harvest of a mature crop by promoting leaf abscission, boll opening, and desiccating plants for stripper harvest. Premature application of these chemicals can result in loss of lint yield and quality; therefore, an understanding of what each chemical does, as well as the best timing for defoliation are important. This guide is not meant to be comprehensive, but rather focused on stripper harvested cotton in the Texas High Plains. *It covers what, when, and how much.*

HARVEST AID TYPES (*What*)

Defoliants: herbicidal types such as Ginstar, Folex, Aim, ETX, Display, Sharpen, and Paraquat (at low rates) usually cause leaf injury, which signals production of ethylene (stress hormone). The increased levels of ethylene will lead to the formation of an abscission layer at the base of the leaf petiole, causing leaf drop (Fig. 1).

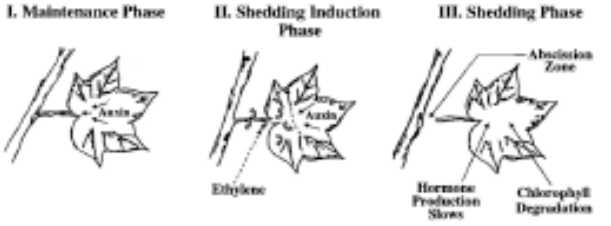

Figure 1. The three phases of the hormonal control of leaf abscission (Morgan 1984).

Defoliants and Boll Openers: hormonal-type products such as Finish 6 Pro (ethephon + cyclanilide), Ginstar and Cutout (thidiazuron + diuron), ethephon (various formulations), and thidiazuron (various formulations) create plant stress and also induce production of the stress hormone ethylene. Increased ethylene levels trigger the formation of the abscission layer at the base of the leaf petiole and in the boll walls, ultimately leading to leaf drop and boll opening.

Desiccants: have the ability to desiccate leaves and prepare the crop for stripper harvest. Gramoxone (paraquat) is an example. It destroys green tissue by disrupting photosynthesis. This process happens rapidly, and the abscission layer does not have enough time to form. When used at high rates these products can cause leaves to desiccate but remain attached to the plant (stick).

TIMING (*When*)

Timing is key. Poor defoliation timing can negatively impact lint yield and fiber quality ($$$). Generally, 4 nodes above cracked boll (NACB) is safe for defoliation while 2 NACB is safe for desiccation (Fig. 2). See figure 3 for how to determine NACB. Note that harvest aid chemicals will not accelerate fiber development, and that there is no substitute to warm weather and time when it comes to fiber maturity.

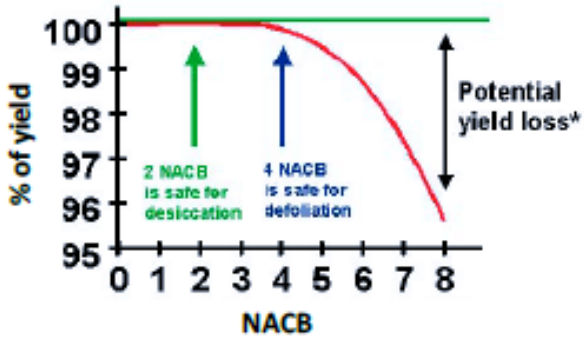

Figure 2. Potential yield loss when determining harvest aid application timing based on nodes above cracked boll (NACB). Kerby et al. 1992.

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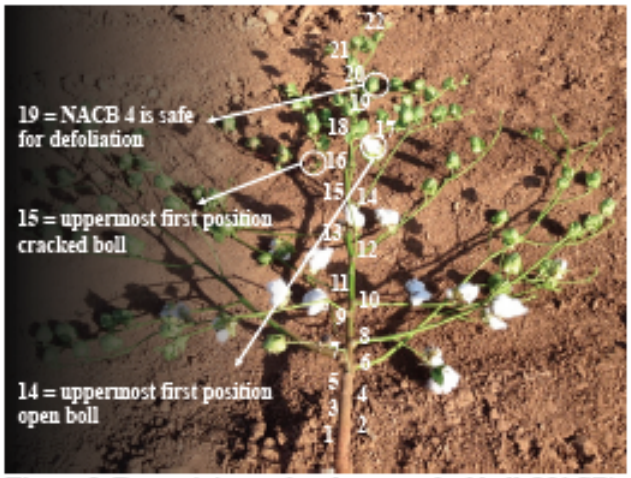

Figure 3. Determining nodes above cracked boll (NACB).

When trying to determine the appropriate timing of harvest aid application, there are several methods to assess crop readiness. The most commonly used are:

1. 40-60% open bolls
2. Nodes above cracked boll (NACB) ≤ 4
3. Knife method

Methods one and two are well correlated, with 60% open boll representing approximately 4 NACB (Fig. 4).

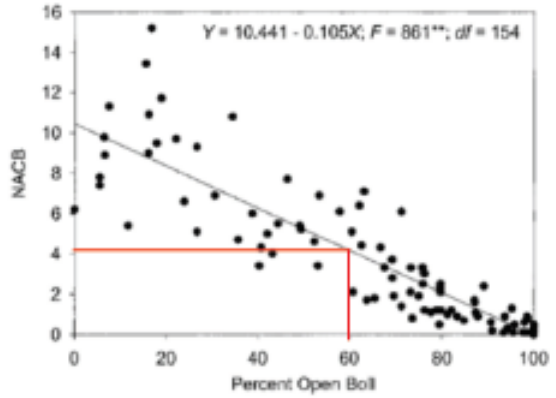

Figure 4. Nodes from uppermost first sympodial position cracked boll to the uppermost harvestable boll (NACB) vs. percent open boll. Red line indicate 60% open boll equals 4.1 NACB. Modified from Bednarz et al. 2002.

Method 3 consists of inspecting the uppermost boll you believe will contribute to yield by slicing it in a cross section. Mature bolls safe for defoliation will have a fully developed darkened seedcoat, be absent of any "jelly" like material, and be hard to cut (Fig. 5).

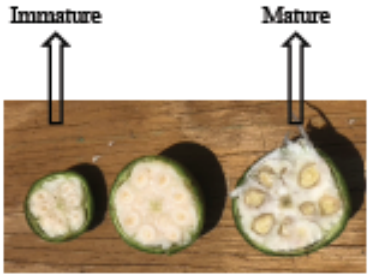

Figure 5. The knife method relies on slicing a cross section of the boll to determine maturity. Note the darkened seedcoat on the mature boll.

After applying harvest aids, it may take 7-14 days for the full effect, depending on weather conditions. Usually, defoliants and desiccants will take approximately 7 days, with hormonal products containing active ingredients such as ethephon and thidiazuron taking longer.

EXPECTATIONS & RATES (*How Much*)

Expected Harvest Aid Activity						
Expected Activity on →			Juvenile Growth	Mature Leaves	Re-Growth Suppression	Boll Opening
Using Active Ingredient ↓	Trade Names[1]	Common Use Rate (oz/A)[2]				
Ethephon	BollBuster, Ethephon 6, Prep, Super Boll, Boll'd	32	Poor	Fair	Poor	Good
Ethephon + Cyclanilide	Finish 6 Pro	32	Poor	Good	Fair	Good
Ethephon + Urea Sulfate	First Pick, Cotton Quick	50 - 60	Poor	Good	Fair	Good
Thidiazuron + Diuron	Ginstar, Cutout, Adios, Dropp Ultra	6.0 - 8.0	Good	Good	Good	None
Thidiazuron	Thidiazuron SC, Dropp, FreeFall, Daze	5.0 - 6.0	Good	Good	Good	None
Tribufos	Folex, Def	12 - 16	Fair	Good	Poor	None
Carfentrazone	Aim	2.0	Good	Good	Poor	None
Pyraflufen Ethyl	ETX	1.25	Good	Good	Poor	None
Carfentrazone-Ethyl + Fluthiacet-Methyl	Display	1.5 - 2.0	Good	Good	Poor	None
Sulfentrazone	Sharpen	0.75 - 1.0	Good	Good	Poor	None
Paraquat[3]	Gramoxone, Firestorm, Parazone	8 - 32 (2lb) 6 - 24 (3lb)	Poor	Fair	Poor	Fair

[1] List is not comprehensive. Mention/omission does not imply endorsement/declination.
[2] Make sure to check and follow labels for restrictions, appropriate tank-mix partners, and need for adjuvants.
[3] Lower paraquat rates can initiate defoliation; use higher rates for desiccation.

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THINGS TO CONSIDER

- Delaying harvest aid application can increase weathering losses
- Harvest aid chemicals are not very mobile (good coverage is important)
- When determining maturity, avoid relying on a single method
- Cooler weather reduces plant metabolism and harvest aid activity (higher rates may be required)
- For most irrigated cotton a two-shot program is required (boll opener + defoliant followed by a desiccant 7-10 days later)
- Match harvest aid application to harvesting capacity
- High rates of defoliants or desiccants, especially in warm weather can cause leaves to "stick"
- Avoid excessive late season fertilization and irrigation
- Drought stressed cotton is more difficult to defoliate
- Desiccants will interrupt development of immature bolls
- Remember restrictions on planting small grains following harvest aid application (thidiazuron, thidiazuron + diuron, ethephon, and ethephon + cyclanilide)

REFERENCES

Bednarz, C.W., W.D. Shurley, and W.S. Anthony. 2002. Losses in yield, quality, and profitability of cotton from improper harvest timing. Agron. J. 94:1004–1011.

Kerby, T.A., J. Supak, J.C. Banks, and C. Snipes. 1992. Timing defoliation using nodes above cracked boll. In D.J. Herber and D.A. Richter (Eds.) Proceedings of the Beltwide Cotton Conference. Nashville, TN. 6-10 Jan. 1992. National Cotton Council of America, Memphis, TN.

Morgan, P. W. 1984. Is ethylene the natural regulator of abscission? In Y. Fuchs, & E. Chaultz (Eds.), Ethylene: Biochemical, physiological, and applied aspects (pp. 231-240).

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Tighter Regulations Around Bt Corn Are Pending, by Dr. Pat Porter

This week the EPA released a draft plan that essentially overhauls many of the regulations around insect resistance management (IRM) in Bt crops grown in the "cotton belt".

There are many major changes proposed, one of which is that field failures are presumed to be cases of "practical resistance" if certain criteria are met. (Like 6% boll damage in third generation (Vip) cotton and second instar bollworm larvae are present, which is basically the treatment threshold we use now.) Seed companies can then make collections and do the insect rearing and testing to refute the determination of resistance, if they want to do so. This is totally opposite of the way things have been done for 25 years. In the past, field failures were presumed to be from susceptible insects, and only laboratory testing could determine whether the insects were resistant.

Seed blend corn refuge will be approved for southern planting. However, a 20% structured (block) refuge will also be required with fields planted to seed blends. This block refuge is basically insurance until we can figure out whether seed blends are a good thing or a bad thing, as some of the data say they might accelerate resistance. In the last four years there has been an all-out effort by the seed industry and Land Grant Universities to answer this question, and if it turns out that seed blends are safe then the requirement for a block refuge could be dropped in the future. ABSTC (the Agricultural and Biological Stewardship Technical Committee, a consortium funded by Bayer, Corteva (Pioneer) and Syngenta), sponsored a very expensive and detailed seed blend trial that Dr. Suhas Vyavhare and I conducted near Olton this year. Bayer sent a large crew of people to help on the days we could not possibly have done all of the work ourselves. I am grateful that Bayer and their excellent people stepped in at their own expense to help us answer this important question; we could not have done it without them. We are all trying to answer the seed blend questions as quickly as possible.

The new rules, if enacted as currently proposed, will change things at the farm level. I am quoting from the document directly.

- **"Sales of Bt corn products requiring block refuges must be followed up with on-farm visit by the seed industry for compliance monitoring by ABSTC during the growing season.** This will be conveyed to growers at the point of sale and be included in the grower agreement. Visits will be reported to the Agency [EPA].
- **For farmers out of compliance with block refuge standards in the cotton belt for one year, the registrant [seed company] will withhold all the company's Bt corn products, including RIB and block refuge for two years.**
- Registrants must ensure that seed dealers obtain signed grower agreements that set forth the terms of the IRM program. **If a seed dealer fails to ensure that at least 95% of the customers sign grower agreements, registrants will restrict the availability of the Bt seed to that dealer.** Registrants must ensure that seed dealers keep a record of signed grower agreements for a period of at least three years from sale.
- Industry must ensure availability of non-Bt elite corn hybrids for refuge."

Why is EPA doing this? Basically, it is because corn earworm/cotton bollworm is now resistant to all but one Bt toxin, Vip3a. Refuge rules were not well followed in the past, and now resistance has come home to roost. If we are to prevent resistance to Vip3a, the last effective toxin for bollworm, things need to change. Prior to this we were operating under the set of rules mostly set forth in 1996, and there were some major problems with them. The new guidelines correct several of the mistakes made in the past.

The EPA document is not final, and in several places, it goes out of the way to ask for input from producers and consultants. I know the woman who wrote the document and is in charge of changing it, and she sincerely wants to hear from you on how these proposed changes will affect you, and whether there is a better way to accomplish the objectives. I trust her to listen to you. You can be assured that the anti-Bt crop lobby will be submitting comments, so here is your chance.

The 24-page draft document is here: https://beta.regulations.gov/document/EPA-HQ-OPP-2019-0682-0007. The docket where you can submit your comments is here: https://beta.regulations.gov/search?filter=EPA-HQ-OPP-2019-0682. I would be glad to answer any question about the proposed changes, and you can write me at p-porter@tamu.edu.

UPCOMING EVENTS:

HOCKLEY COUNTY R.A.C.E. TRIAL FIELD DAY

September 22nd, 2p.m.

Hockley County Texas A&M AgriLife Extension will once again be hosting the Hockley County R.A.C.E trial field day. This field day will highlight multiple cotton varieties from several companies. Seed reps and AgriLife Extension Specialists will be on hand to discuss each variety and answer any questions you many have.

The field day will be on the farm of Seth Howard, which is ¼ mile north on FM 303, 6 miles west of Levelland COOP elevator.

If you have any questions about this field day, please call the extension office at 806-894-3159.

TEXAS A&M AGRILIFE EXTENSION

LEVELLAND
Chamber of Commerce

HOCKLEY COUNTY
Ag Producers
SHRIMP BOIL APPRECIATION LUNCH

Wednesday, September 23rd

MALLET EVENT CENTER BANQUET HALL

11:30 AM-1:00 PM

Guest speaker *Kody Bessent*

Vice President of Operations and Legislative Affairs, Plains Cotton Growers

hosted by the Levelland Chamber of Commerce

kindly RSVP to 806.894.3157

AGRICULTURAL PESTICIDE WASTE COLLECTION

Wednesday, October 21, 2020 8a.m. - 2p.m.

UNWANTED AGRICULTURAL SURPLUS PESTICIDES?

DISPOSE OF THEM PROPERLY AND STAY IN YOUR VEHICLE

South Plains Fairgrounds • 105 E. Broadway • Lubbock, TX 79403

ACCEPTED ITEMS INCLUDE:

- Outdated, discontinued or unwanted agricultural pesticides
- Insecticides
- Herbicides
- Fungicides
- Rodenticides
- Nematicides
- Growth Regulators
- Empty, Triple-Rinsed Plastic Pesticide Containers
- Empty or Partial Metal Drums

PESTICIDES MUST BE KEPT IN ORIGINAL CONTAINERS, EVEN IF THE LABEL IS NOT PRESENT.

Unknown pesticides will be sampled and identified on site.

MATERIALS NOT ACCEPTED:

- Explosive ordinances and ammunition
- Petroleum-Based Products
- Paints
- Medical Wastes
- Radioactive Substances
- Household Pesticides, Chemicals, and Waste
- Tires
- Fertilizers, Propane or Butane Cylinders
- Chlorinated Hydrocarbons
- Fumigant Canisters
- Used motor oil and other automobile fluids
- Auto Batteries
- Empty Totes
- Methyl-Bromide Cylinders
- Dioxins (2,4-5T, Silvex, TCDD, etc.)

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For questions or additional information contact the Lubbock County Office at (806) 775-1740, Danny Nusser, Regional Program Leader at (806) 376-0051, or the Texas Department of Agriculture at (806) 799-8555.

West Plains IPM Update is a publication of the Texas A&M AgriLife Extension Service IPM Program in Hockley, Cochran, and Lamb Counties.

Editor: Kerry Siders, Extension Agent-IPM
Contact information: 1212 Houston St., Suite 2 Levelland, TX 79336
(806) 894-3150 (office),
638-5635 (mobile), or 897-3104 (Fax)
ksiders@tamu.edu (E-mail),

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