



Fort Bend County - 2016 Cotton Harvest Aid Trial

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Relevance

Often, it is advisable to delay the choice of harvest-aid treatment(s) to cotton until the crop is nearly ready to terminate, which is a balance between optimizing yield and preserving quality. While the cotton variety, soil type, and cultural inputs for a given cotton crop can be selected, the weather cannot. The final decision as to when and what harvest-aid product(s) to apply is made by the prudent producer near the time of the initial harvest-aid treatment.

Cotton harvest aid chemicals are generally grouped into three categories – defoliant, desiccant, and boll opener. Defoliant remove foliage from the cotton plant by stimulating ethylene production, which promotes the formation of an abscission layer at the base of leaf petioles. Defoliant can be classed into two categories: (1) hormonal defoliant such as thiadiazuron (Dropp®, FreeFall®, etc.), and (2) herbicidal defoliant such as tribufos (Folex®) and the PPO inhibitors (Aim®, Display®, Sharpen®, etc.). For conventional cotton (non-Roundup Ready), glyphosate may be used as an herbicidal defoliant. If applied at too high a rate, herbicidal defoliant may cause excessive leaf injury, preventing the formation of the abscission layer and resulting in “stuck” leaves.

Desiccant, such as paraquat (Gramoxone®) or sodium chlorate, simply kill and dry leaf and stem tissues. At the higher rates, these products act very rapidly and do not allow an abscission layer to form at the junction of leaf petioles and the stem, resulting in “stuck” leaves. Desiccant are typically used in stripper-harvested cotton to dry plant tissues after a defoliant has been applied. Desiccant can be used at lower rates to help defoliate cotton, but selecting the appropriate rate to defoliate and not desiccate is challenging and is dependent upon environmental conditions.

Boll opener contain the active ingredient ethephon. Within the plant, ethephon is converted to ethylene, which causes bolls to open at a more rapid pace. Increased levels of ethylene within the plant also help activate abscission layers of the leaf petioles, further defoliating the plant. It is important to note that although ethephon does hasten the opening of bolls, it will not speed up the maturity of immature bolls. Additionally, boll opener tend to enhance basal and terminal leaf growth following application, thus timely harvest is more critical when using a boll opener.

Grower standards for cotton defoliation in the Upper Gulf Coast area of Texas tend to be one of two common mixtures: 1-2 oz. Dropp®, + 12-16 oz. ethephon (Prep®) + 4-6 oz. Folex®; or 4 oz. Ginstar® + 21 oz ethephon (Prep®) .

Response

Preparing cotton for harvest is not an exact science. Although there is much information on how and when to apply harvest aid chemicals, producers recognize that seasonal and crop conditions have effects on crop responses to harvest aid treatments that are not always predictable.

To demonstrate the performance of cotton harvest aides on the 2016 Upper Gulf Coast cotton crop in Fort Bend County, the Fort Bend County office of Texas A&M AgriLife Extension, working Gaylon Morgan,

Extension Cotton Agronomist, and Dale Mott, Extension Program Specialist, established a harvest aid test at Needville, Texas. The test was designed based on products and rates recommended by the industry. They also provided the products, equipment, and assistance to apply the harvest aids and evaluated each treatment. The trial plot size was 13.33 feet wide by 40 feet in length. The application volume for each treatment was 11 gallons/acre carrier volume. Deltapine® 1522B2XF was the cotton variety planted in the field where the defoliation study took place. At the time of the first application on August 2, 2016 the cotton crop was estimated to be at 60% Open Boll.

The Fort Bend County Harvest Aid Test was sprayed with the initial treatments on August 2, 2016. A total of 16 treatments were evaluated (including an untreated control), with each treatment replicated three (3) times. Treatments designed to include a second application of harvest aid were applied on August 9, 2016. Each treatment was rated on August 9, 2016 (7-DAT) for percent Defoliation, Desiccation, Green Leaf, and Green Boll; and on August 12, 2016 (10-DAT) for percent Defoliation, Desiccation, Green Leaf, Green Boll, and Regrowth.

A turn row meeting was conducted on August 12, 2016 (10 days after first application) at the site of the Fort Bend County Harvest Aid Test. Dr. Gaylon Morgan walked participants through each treatment, describing each treatment, the treatment's performance, and recommended best management practices based on the results of the Needville test. Approximate cost per acre for each treatment was provided to participants with the 7-day post-treatment results.

Results and Conclusions

Results for the Needville, Texas Cotton Harvest Aid Trial are given in the attached tables. Table 1 has the 7 DAT Evaluation of % Defoliation, % Desiccation, % Green Leaf, and % Green Boll; Table 2 has the 10 DAT evaluations of % Defoliation, % Desiccation, % Green Leaf, and % Green Boll and 10 and 16 DAT evaluation of % Regrowth. Treatments are listed by active ingredient or product name of the treatment. Some treatments required a follow-up, second application of harvest aid. This is noted by Application Timing*, Application A = 8/2/2016; Application B = 8/9/2016.

Means followed by same letter do not significantly differ $P=0.05$, LSD)

Mean comparisons performed only when AOV Treatment $P(F)$ is significant at mean comparison OSL.

Treatments with higher rates of Folex® were slightly more effective than treatments with Ginstar® at 7 DAT. Treatments that included Ethephon (Prep®) showed the most sign of regrowth at 10 DAT, with 17.3 % green leaf and 11.3% regrowth using the common treatment of 21 oz Prep® and 2.0 oz of Ginstar®. Similarly, the treatment consisting of and 2.4 oz Dropp® and 2.0 oz of Ginstar® had 11.3% regrowth 10 DAT. Ethephon did not increase the percentage of open bolls at the 7 or 10 day rating. This may be due to the mature cotton and hot, dry weather between application and the 10 DAT ratings. Subsequently, approximately 3.5 inches of rain fell in the five days after the second rating. At 16 DAT, treatments with a PPO included in the follow-up application had much lower regrowth than other treatments.. Experience gained from conducting this test resulted in increased success in reaching specific goals of boll opening, defoliation, desiccation, and regrowth suppression.

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