



2010 UGA Cotton Defoliant Evaluation Program Midville Location

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Field Description

This trial was conducted at the University of Georgia Southeast Research and Education Center in Midville, Ga. The site was an irrigated field planted in late May. Crop information was collected on the day of defoliation, October, 5, 2010, from 30 randomly selected plants in the trial (Figure 1). Cotton height averaged 44 inches, and ranged from 39 to 48 inches. The total number of bolls per plant ranged from 8 to 19, and averaged 13. The percentage of bolls that were open averaged 86 percent and ranged from 55 to 100 percent. Nodes above cracked boll ranged from 0 to 5, with an average of 1.9. As a reference, cotton harvested from other plots in this 3-acre field yielded 1,400 to 1,600 pounds of lint per acre.



Figure 1. Images cotton at trial site taken on October 3, 2010, two days prior to defoliation.

Defoliation applications (product selection and rate) were determined by manufacturers and were based on crop condition and weather forecast (low chance of rainfall with nighttime temperatures in the low 50s and high temperatures in the mid-80s).

Trial Description

Defoliants were applied on the morning of October 5, 2010. All treatments were applied using a CO₂-pressurized backpack sprayer, equipped with DG 11002 VS flat fan nozzles, calibrated to deliver 15 GPA at 3 mph. The trial consisted of 18 different defoliation treatments and a non-treated check. Plots consisted of four cotton rows approximately 30 feet in length; only the middle two rows of each plot were treated. Treatments were arranged in a randomized complete block design with four replications. Visual assessments of percent defoliation and percent desiccation were estimated at 7, 14 and 21 days after treatment (DAT), percent open bolls were estimated at 7 and 14 DAT, and percent regrowth was estimated at 14 and 21 DAT. Data were subjected to ANOVA using the PROC MIXED procedure of Statistical Analysis System. Means were separated with Fisher's Protected LSD at $P \leq 0.05$.

Observations and Results

Due to crop maturity and weather conditions during this trial, results should represent late season defoliant performance. Daytime high temperatures reached the low to mid-80s and nighttime lows were below 60 degrees F, except for 20 and 21 DAT (Figure 2). Although no rainfall occurred between five days before treatment and 20 DAT (Figure 3), heavy rainfall that occurred between September 25 and 29 (2.7 inches) likely initiated basal regrowth, which was visible 14 and 21 DAT (Figure 4).

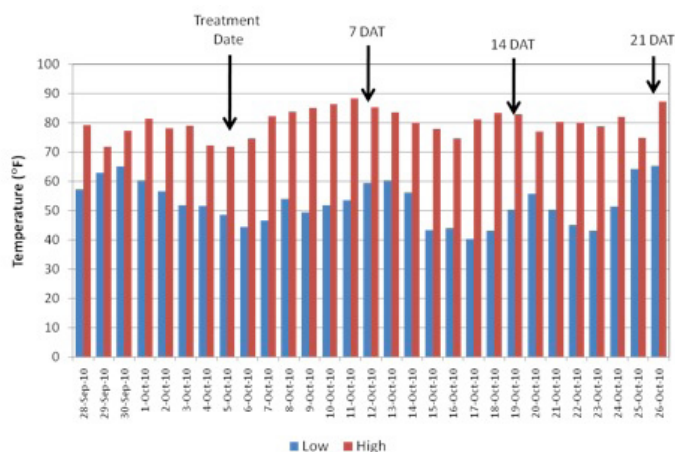


Figure 2. High and low temperatures at the Midville site during the experiment.

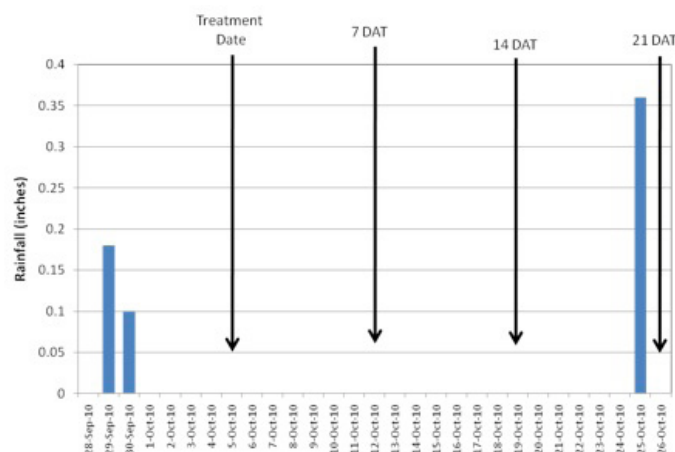


Figure 3. Rainfall events and amounts that occurred at the Midville site during the experiment.

In this trial, only minor differences in percent open boll were observed, likely due to the high percentage of open bolls present at time of defoliation. Cotton in all treated plots was at least 96 percent open by 7 DAT. As expected, treatment differences regarding percent defoliation were most apparent 7 DAT, but were also visible 14 and 21 DAT. The rate of defoliation between treatments also was observed; some treatments appeared to be superior at 7 and 14 DAT and some were among the best only at 21 DAT. Some desiccation was observed at 7 DAT with particular treatments, but in most cases leaves that appeared to be desiccated were defoliated by 14 and 21 DAT. Due to rainfall that occurred prior to initiation of the trial, regrowth was visible by 14 DAT and widespread by 21 DAT. In general, most treatments that contained thidiazuron were least susceptible to regrowth.



Figure 4. Illustration of basal regrowth observed at 21 DAT.

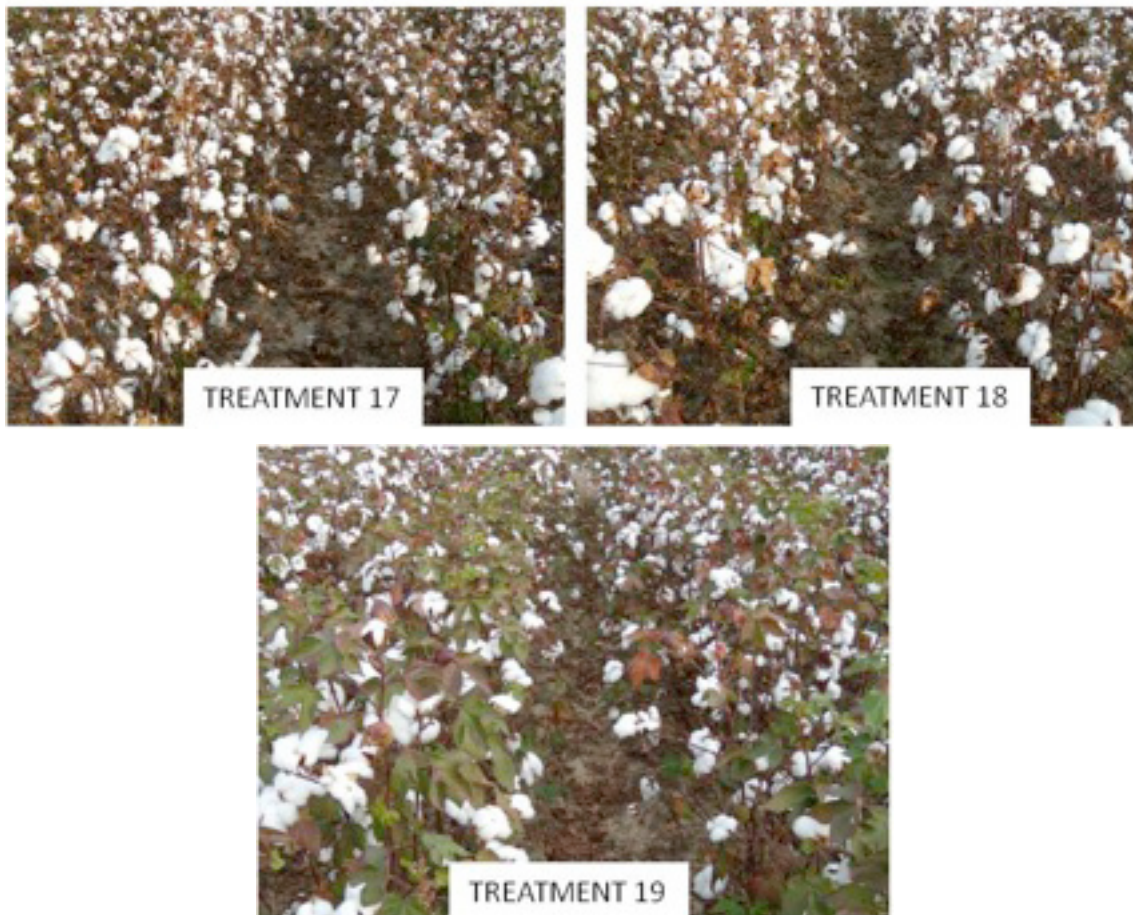
Defoliation decisions are often difficult due to the tremendous amount of product and rate combinations. This trial demonstrated the effectiveness of the 18 defoliation treatments that were tested at this location in these conditions; therefore, it is important to recognize that defoliant performance can vary and is often difficult to predict. Additionally, it is always advised to consult the label of any harvest aid product regarding directions for use, rates and safety information.

Treatment	Application Rate	7 DAT			14 DAT			21 DAT		
		% Open	% Defoliation	% Dessication	% Open	% Defoliation	% Dessication	% Defoliation	% Dessication	% Regrowth
1 Adios Ethephon 6	6.4 oz/a 24 oz/a	96.8 bc	72.5 efg	12.0 cd	96.8 b	84.5 cd	3.8 c-f	89.8 cd	1.3 ef	17.0 f
2 Adios Ethephon 6	8 oz/a 32 oz/a	98.3 abc	82.5 abc	8.3 ef	99.8 ab	89.3 abc	4.5 bcd	95.5 ab	2.5 cde	18.3 ef
3 FirstPick FreeFall 4 SC	56 oz/a 1.6 oz/a	97.8 abc	70.0 g	10.0 cde	99.3 ab	74.0 e	3.5 c-f	87.0 de	3.5 a-d	22.8 ef
4 FirstPick thidiazuron (1 lb ai/gal) + diuron (0.5 lb ai/gal)	56 oz/a 6.4 oz/a	97.8 abc	78.8 b-e	16.3 ab	100.0 a	82.8 d	6.3 ab	87.0 de	4.5 ab	28.5 cde
5 Sharpen ethephon (6 lb ai/gal) COC	0.75 oz/a 21 oz/a 1 % v/v	97.0 bc	71.3 fg	8.3 ef	99.5 ab	88.8 abc	4.3 b-e	92.5 bc	2.3 cde	43.8 ab
6 Sharpen tribufos (6 lb ai/gal) ethephon (6 lb ai/gal) COC	0.5 oz/a 8 oz/a 21 oz/a 1 % v/v	96.5 c	82.5 abc	18.3 a	99.5 ab	89.5 abc	8.0 a	93.8 ab	4.8 a	42.5 ab
7 Folex ethephon (6 lb ai/gal) thidiazuron (4 lb ai/gal)	4 oz/a 21 oz/a 1.6 oz/a	98.5 ab	77.0 c-f	7.0 ef	99.8 ab	85.0 bcd	3.3 def	86.0 e	2.5 cde	38.3 bc
8 Folex ethephon (6 lb ai/gal)	6 oz/a 21 oz/a	97.3 abc	72.5 efg	5.0 f	99.3 ab	82.5 d	1.8 fg	86.5 de	1.5 ef	50.0 a
9 Aim ethephon (6 lb ai/gal) NUS	1 oz/a 24 oz/a 0.25 % v/v	98.0 abc	80.8 a-d	7.0 ef	99.3 ab	87.3 a-d	2.0 efg	93.5 ab	1.8 def	28.8 cde
10 tribufos (6 lb ai/gal) ethephon (6 lb ai/gal) NUS	16 oz/a 24 oz/a 0.25 % v/v	96.5 c	78.8 b-e	8.8 de	96.8 b	87.0 a-d	3.0 def	89.5 cde	1.5 ef	51.3 a
11 Aim thidiazuron (4 lb ai/gal) ethephon (6 lb ai/gal) NUS	0.5 oz/a 1.6 oz/a 24 oz/a 0.25 % v/v	96.5 c	80.0 a-d	9.0 de	99.3 ab	88.8 abc	3.0 def	94.5 ab	3.0 a-e	26.3 def
12 tribufos (6 lb ai/gal) thidiazuron (4 lb ai/gal) ethephon (6 lb ai/gal) NUS	8 oz/a 1.6 oz/a 24 oz/a 0.25 % v/v	97.3 abc	75.0 d-g	8.8 de	96.8 b	84.3 cd	4.5 bcd	86.8 de	2.3 cde	49.5 a
13 Ginstar Finish 6 Pro	6.4 oz/a 32 oz/a	98.3 abc	82.8 abc	8.5 e	100.0 a	90.3 ab	5.8 abc	96.8 a	3.0 a-e	16.3 f
14 Ginstar Finish 6 Pro	8 oz/a 21 oz/a	98.3 abc	85.5 a	7.0 ef	99.8 ab	91.3 a	3.0 def	93.5 ab	4.0 abc	23.3 ef
15 ET Ethephon (6 lb ai/gal) COC	1.5 oz/a 32 oz/a 1 % v/v	98.5 ab	79.5 a-d	9.3 de	99.5 ab	84.3 cd	6.3 ab	89.5 cde	2.5 cde	44.5 ab
16 ET ethephon (6 lb ai/gal) thidiazuron (4 lb ai/gal) COC	1.5 oz/a 32 oz/a 2 oz/a 1 % v/v	99.0 a	78.8 b-e	13.0 bc	99.8 ab	89.5 abc	4.3 b-e	94.3 ab	2.8 b-e	34.5 bcd
17 Blizzard ethephon (6 lb ai/gal) COC	0.5 oz/a 32 oz/a 1 % v/v	98.5 ab	84.3 ab	13.0 bc	99.8 ab	90.5 a	6.5 ab	95.5 ab	4.8 a	42.5 ab
18 Blizzard ethephon (6 lb ai/gal) thidiazuron (4 lb ai/gal) COC	0.5 oz/a 32 oz/a 3.2 oz/a 1 % v/v	99.0 a	82.5 abc	15.5 ab	99.8 ab	90.0 ab	8.0 a	94.3 ab	4.8 a	24.0 def
19 Non-Treated Control		92.3 d	0.0 h	0.0 g	95.3 c	0.0 f	0.0 g	0.0 f	0.0 f	0.0 g
LSD (P<0.05)		1.81	6.29	3.34	1.18	5.33	2.30	3.66	1.82	10.95

The following photographs were taken 14 days after treatment. Treatment number represents the particular defoliation applications made in the table above.







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