

Effect of Foliar Applications of PGRIV on Yield of Pima and Upland Cotton

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Abstract

The commercial product PGRIV was tested in small plots on cotton at the Maricopa Agricultural Center. Multiple foliar applications of this product had no significant effect on lint yield of Pima S-7 and DPL 90 cotton.

Introduction

The product PGRIV is a solution of various biologically active compounds including the plant growth regulators gibberellic acid and indolebutyric acid. PGRIV has been reported to increase cotton yields by increasing the number of bolls retained by plants (Urwiler and Stutte, 1988). However, little research information is available on the use of this product under central Arizona conditions. The objective of this study was to determine the effect of foliar applications of PGRIV on yield of Pima and upland cotton.

Materials and Methods

Pima S-7 and DPL 90 seed was planted in dry soil and irrigated up 17 April, 1992. Rainfall in March prevented this field from being worked and preirrigated and eventually delayed planting. Additional irrigations were on 29 April, 29 May, 20 June, 2 July, 13 July, 29 July, 10 August and 21 August. The plantings received 39 lbs of N/acre preplant and 81 lbs of N/acre during the growing season.

The plantings were divided into plots 43 ft. long by 4, 40 inch rows wide. Plots were separated by 7 ft. alleys. Both the Pima and upland tests were arranged in randomized complete block designs replicated 4 times. A description of the treatments is shown in Table 1. The treatments were applied by a tractor mounted sprayer boom that sprayed 4 rows at a time. When foliar treatments were applied in a band, nozzles were spaced 40 inches apart and when treatments were applied broadcast, nozzles were spaced 20 inches apart. The application rate for band applications was 8 GPA for cotton in the seedling stages and 15 GPA for cotton at the match head square stage. Broadcast applications at early bloom and mid bloom were at a rate of 20 GPA. To measure the effect of treatments on earliness, cumulative yield data were collected from all plots in both Pima and upland tests. Open cotton was picked in subplots in each treatment plot on 19 August, 28 August, 3 September, 10 September, 17 September, 24 September, 1 October, 8 October and 10 November.

The tests were defoliated on 9 and 21 October. Defoliants used each time were Dropp at 0.15 lb. a.i./acre and Def at 0.75 lb. a.i./acre. On 26 October, a 25 boll sample was collected from each plot to determine boll weights and lint percent. The center 2 rows of each plot were machine harvested on 10 November. Heat units for the growing season (17 April-9 October) were 4128.

Results and Discussion

Cumulative seedcotton yields for PGRIV treatments for Pima and upland cotton are shown in Tables 2 and 3. There were no significant differences among treatments in cumulative yields on any of the harvest dates. Lint yields, boll size and lint percent for the various treatments for Pima and upland cotton are shown in Table 4. PGRIV treatments had no significant effect on lint yields or other yield factors. These treatments need to be tested for several years before recommendations can be made.

Reference

Urwiler, M.J. and C.A. Stutte. 1988. Influence of PPG-1721 and PGRIV on field-grown cotton (Gossypium hirsutum). In Proc. Beltwide Cotton Conf., Nashville, Tenn. National Cotton Council, Memphis, Tenn. Abstract, p. 68.

Table 1. Description of PGRIV foliar treatments on Pima and upland cotton.

Treatments	Rate and Application Information*
1	1 oz/A in band at 1-2 TLS, May 7 1 oz/A in band at 5 TLS, May 19 2 oz/A in band at MHS, June 4 4 oz/A broadcast at EB, June 26
2	1 oz/A in band at 2-4 TLS, May 12 2 oz/A in band at MHS, June 4 4 oz/A broadcast at EB, June 26
3	2 oz/A in band at MHS, June 4 4 oz/A broadcast at EB, June 26
4	1 oz/A in band at 1-2 TLS, May 7 1 oz/A in band at 5 TLS, May 19 2 oz/A in band at MHS, June 4 4 oz/A broadcast at EB, June 26 3 oz/A broadcast at MB, July 9
5	Untreated check

*TLS = true leaf stage, MHS = match head square stage,
EB = early bloom stage, MB = mid bloom stage.

Table 2. Cumulative seedcotton yields for PGRIV treatments on Pima Cotton.

Treatment*	Harvest date				
	28 Aug.	10 Sept.	24 Sept.	8 Oct.	10 Nov.
	(lbs/acre)				
1	362 a	1480 a	2619 a	3080 a	3383 a
2	292 a	1434 a	2632 a	3139 a	3439 a
3	275 a	1377 a	2559 a	3112 a	3588 a
4	441 a	1705 a	2722 a	3160 a	3372 a
5	271 a	1467 a	2611 a	3198 a	3581 a

*See Table 1 for description of treatments. Means followed by the same letter are not significantly different at the 0.05 probability level.

Table 3. Cumulative seedcotton yields for PGRIV treatments on DPL 90 Cotton.

Treatment*	Harvest date				
	28 Aug.	10 Sept.	24 Sept.	8 Oct.	10 Nov.
	(lbs./acre)				
1	1236 a	2346 a	3235 a	3623 a	4040 a
2	1365 a	2431 a	3472 a	3861 a	4255 a
3	1235 a	2394 a	3224 a	3740 a	4124 a
4	1271 a	2406 a	3300 a	3654 a	4003 a
5	1348 a	2446 a	3443 a	3857 a	4247 a

*See Table 1 for description of treatments. Means followed by the same letter are not significantly different at the 0.05 probability level.

Table 4. Effect of PGRIV treatments on lint yield, boll size and lint percent of Pima and upland cotton.

Treatment ¹	DPL 90			Pima S-7		
	Lint yield (lb/acre)	Boll Size (g/boll)	Lint Percent	Lint Yield (lb/acre)	Boll Size (g/boll)	Lint Percent
1	2067 a ²	4.33 a	40.4 a	1368 a	3.05 a	38.1 a
2	1957 a	4.57 a	38.3 a	1432 a	3.12 a	38.6 a
3	1889 a	4.47 a	38.7 a	1338 a	2.95 a	39.0 a
4	1816 a	4.70 a	37.0 a	1436 a	3.13 a	38.9 a
5	2029 a	4.76 a	39.4 a	1352 a	2.96 a	38.5 a

¹See table 1 for description of treatments.

²Means in columns followed by the same letter are not significantly different at the 0.05 probability level.