

UNUSUAL HEAT DELAYED 1980 CROP

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Mean July air temperature at Phoenix was the highest on record during 1980 and cotton growers were disappointed by abscission of bolls in July. By mid-August temperatures moderated and the majority of cotton fields set much late August - early September fruit. September mean temperature was 3.5 degrees above normal requiring additional irrigation to mature the top crop and growers generally irrigated later than usual.

MEAN AIR TEMPERATURE - PHOENIX, ARIZONA

	<u>JULY</u>	<u>AUGUST</u>	<u>SEPTEMBER</u>
1980	95.6	87.3	87.3
1979	93.8	89.4	90.2
1978	94.6	91.4	86.3

A summary of many Maricopa County gins dealing with more than 350,000 bales found only 5.6 percent of the crop ginned by October 15. This reflects the delay in the crop maturation with only 19,858 bales ginned as compared to 44,688 bales ginned by the same date in 1979.

PERCENT OF CROP GINNED BY DATES

	<u>OCTOBER 15</u>	<u>NOVEMBER 1</u>	<u>NOVEMBER 15</u>
1980	5.6	25.1	45.5
1979	13.0	38.7	57.8
1978	9.7	25.0	46.8

THE AFFECT OF PIX ON FIVE COTTON VARIETIES DURING 1980

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A cotton variety test was planted April 20 in cooperation with Delta and Pine Land Company to evaluate the affects of PIX on yield of cotton. The treatments were replicated eight times.

PIX was applied July 7 when an average of 28 white blooms in 25 feet of row appeared (table 1). Plant height averaged 22 inches. The second application was applied to selected plots on July 29. Applications were made by ground using one nozzle per row.

Our results show small differences due to PIX applications (table 2). Considering all varieties, the 20 gram per acre rate produced an average of two percent less lint per acre than the check treatment while the 20 gram at early flower plus 10 grams three weeks later (30 grams) produced two percent greater yield.

The high yields in this test, averaging over three bales per acre, and the relatively long growing season with warm temperatures during September and October may account for the small differences. The yields in this test were excellent. The cotton was not stressed for water, insect damage was held to a minimum and a cut-out period was not observed.

The data indicate that the full season varieties, DPL-61 and DPL-120, produced more lint per acre than the short season varieties, DPL-41, ST-825 and DPL-70. Also, applications of PIX to full season varieties resulted in an average increase in yield. Plots receiving 20 grams of PIX per acre produced an average of 2 percent more lint than the check and 20 gram at early flower plus 10 gram three weeks later resulted in an 8 percent yield increase.

The early maturing varieties, DPL-41, ST-825 and DPL-70, produced an average of five percent less lint per acre when treated with the 20 gram rate of PIX. The PIX treatment of 20 grams at early flower plus 10 grams three weeks later resulted in an average of four percent less lint.

These data suggest that multiple applications of PIX may have been beneficial in this test. They also suggest that a PIX application may result in an increased yield when applied to full season varieties such as DPL-61 and DPL-120. The yield advantage was especially apparent when PIX was applied at 20 grams at early flower plus 10 grams three weeks later.

It is interesting to note that in general, the greater the number of white flowers at the date of initial application, the lower the yield. This only holds true in treatments receiving PIX applications.

The full season varieties had fewer white flowers at the initial PIX application date than the early maturing varieties. Their response to PIX was also greater.

The flower count guideline for timing PIX applications is extremely critical. It appears a two to three day delay past the optimum may result in reduced yields. Or, that PIX should be applied at an early physiological date. According to the PIX label, applications should be made when 5 to 6 white blooms per 25 feet of row appear. Our applications were applied at an average of 28 white blooms per 25 feet of row. The difference in days between these two physiological stages is minor. Additional guidelines or techniques to aid in timing PIX applications would be helpful.

Table 1. Average number of flowers and plant height on day of application.

Application date - July 7, 1980		
Variety	Flower per 25 row feet	Av. Height in inches
DPL-61	19	22.8
DPL-70	29	21.6
ST-825	49	23.4
DPL-120	20	22.5
DPL-41	25	21.0
Average	28	22.3

Table 2. Lint yield and gin turnout of five cotton varieties following PIX application.

Variety	20g./Acre		20g./A on 7/7+10g./A on 7/29		Check	
	Lint lb/A	Turnout %	Lint lb/A	Turnout %	Lint lb/A	Turnout %
DPL-61	1600	33.6	1705	33.8	1585	33.6
DPL-120	1791	35.0	1879	35.3	1747	35.3
Full season average	1696		1792		1666	
DPL-41	1544	34.4	1559	34.0	1600	34.4
ST-825	1421	31.5	1423	31.7	1490	31.9
DPL-70	1477	34.4	1544	34.3	1605	35.0
Short season average	1481		1509		1565	
Total Average	1567		1622		1605	

The Affect of PIX on DPL-70

In a separate test, four PIX rates were applied to DPL-70, on July 7. On July 29 an additional application was made to selected plots (table 3). The PIX was applied by ground rig using one nozzle per row.

Each plot treated with PIX shows a lower yield than the check treatment. The average difference between the check and all treatments was six percent. It is interesting to note that there was less difference in yield between the multiple treatment and the check than the check and any other treatment. An observation consistent with findings in an adjacent test.

We speculate that the unusually long and hot growing season may have favored multiple applications. Nevertheless, yields did not equal the nontreated check. Although the number of flowers at initial treatment date were five times greater than the label on PIX suggests, the time difference in days required to produce the extra flowers is minor. Deltapine 70, an early maturing variety, responded similarly to PIX as other short season varieties in an adjacent test.

If we rule out yearly climatic response, these findings suggest that DPL-70 and other short season varieties grown in the desert southwest may require additional guidelines or techniques to aid in timing PIX applications.

Table 3. Rate and date of PIX application to DPL-70 cotton.

Turnout %	Lint Per Acre				Check
	10g./A	20g./A	30g./A	20g./A on 7/7 +10g./A on 7/21	
34.6	1683	1763	1685	1779	1838
Average number of flowers and plant height at time of application					
	Flower per 25 row feet		Plant Height in inches		
	29		21.6		

The Affect of PIX on Petiole Nitrate Levels in Cotton

Petiole nitrate levels were measured at the initial date of PIX application and at two subsequent dates in the variety and DPL-70 rate tests (tables 1, 3 and 4).

Results suggested petiole nitrate levels of PIX treated plots were 13 percent greater than the check following an application of PIX (table 5). The petiole nitrate level in PIX treated plots remained higher following PIX application than in nontreated plots. It remained higher during the five week period petiole nitrate levels were monitored. This observation was recorded in both tests which were adjacent to each other.

In the DPL-70 PIX rate test, at each sampling date following a PIX application, the petiole nitrate levels were greater in plots receiving 20 or 30 grams PIX per acre than the 10 gram rate or check. The increase in levels ranged from an average of 14 percent on July 22 to 53 percent on August 12. Samples from the multiple PIX treatments were not analyzed. The petiole nitrate level of the 10 gram treatment was not affected to the same extent as the higher rates.

These results suggest that in the PIX treatments, a greater amount of nitrogen, a nutrient readily translocated in the plant, is in transit in the leaf petiole. Although data imply larger amounts of nitrogen are taken up by the plant following a PIX application, an important question arises concerning the criteria of proper fertilization to enhance the response of cotton to PIX applications.

Apparently, the successful use of PIX depends on the relative availability of nitrogen and the nitrogen status of the plant. This type of information may prove to be essential in determining appropriate dates of PIX applications and optimum management practices.

Table 5. Petiole nitrate levels of five cotton varieties receiving an application of PIX.

Variety	Variety Test							
	July 7	July 22		August 12				
	Total	20 gm.	Ck.	20 gm.	Ck.			
	-----NO ₃ -N ppm -----							
DPL-61	10,438	8813	9063	3063	3250			
DPL-70	10,063	8750	8688	3813	2938			
ST-825	9938	9625	6625	3625	5688			
DPL-41	10,438	10,250	8188	2563	2875			
DPL-7120	10,750	10,938	10,383	5000	2000			
Average	10,325	9675	8575	3613	3350			
DPL-70 Rate Test								
	10g	July 22		10g	August 12			
		20g	30g	Ck	20g	30g	Ck	
	-----NO ₃ -N ppm -----				-----NO ₃ -N ppm -----			
DPL-70	7250	10,563	9083	8625	4625	5063	5250	3375