EFFECT OF PIX GROWTH AND YIELD OF PIMA COTTON IN THE SAN JOAQUIN VALLEY OF CALIFORNIA

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Abstract

A total on nine field tests were conducted in 1994 and 1995 in the San Joaquin Valley of California to evaluate the effects of Pix on growth and yields of Pima (*Gossypium Barbardence*) cotton. Plants were mapped at mid season and again prior to harvest to determine differences in growth characteristics due to Pix applications. Yield data were collected and lint samples sent to a laboratory for quality analyses. Significant differences existed among the means of plant height, height to node ratios, and total nodes, in various tests. A Pix treatment which included 0.5 pints applied at full bloom and 14 days later yielded significantly more than the untreated control in one test. Although there were no further significant differences, Pix treatments out yielded the control in every test.

Introduction

The growth regulator Pix (Mepaquat Chloride) has been an important tool for upland (Gossyipum hirsutum) cotton in California for the past 24 years since it was registered in 1971. Extension research has been conducted on the product, and it is generally felt that best amounts and timings of applications are known under most growing conditions. These tests were designed to gather similar rates and timings information for Pima cotton growers in the San Joaquin Valley.

Methods and Materials

Nine field tests were conducted in 1994 and 1995 in California's San Joaquin Valley to evaluate the effects of Pix on Pima cotton. Tests were conducted on three research field Stations which included norhtmost, central and southmost valley growing areas (Merced, Fresno, and Kern Counties, respectively). Other tests were conducted on land of cooperating farmers.

1994 Tests

All five tests in 1994 contained the same five treatments and were conducted in exactly the same manner. Pima S-7 was the cultivar used in all tests except the Tulare County site, which employed Oro Blanco. Treatments consisted of one application of Pix at full bloom or two applications of Pix, at full bloom and two weeks later. Various amounts of Pix were used at each of the application times, and compared to an untreated control.

1995 Tests

Four tests were conducted in 1995, two of which contained the same Pix treatments. Pima S-7 was employed in all tests. Tests were conducted on row configurations consisting of 32 inches, 38 inches, and 40 inches depending on grower equipment. All tests were plant mapped twice during the growing season to monitor growth characteristics such as plant height, height to node ratio, total bolls, percent retention, etc. Mapping occurred at mid-season, and end of season prior to harvest.

Leaf petioles were collected three times during the growing season and analyzed for nitrogen.

Finally, each test was harvested using a plot harvester or farmers conventional harvester. Yield data were collected and a seed cotton sample taken for gin turnout and moisture. A lint sample was then sent to International Textile Center for quality analysis.

Results

Table 1a and 1b show the results of the three plant growth characteristics which were monitored, including height, total nodes, and height to node ratio.

There were significant differences among the means of all three characteristics in the Merced test in 1994. There were also significant differences among the means of the height to node ratios in the Tulare County test, and the total nodes in the Madera County test. All other characteristics did not differ significantly at any of the test locations.

In the 1995 tests, there were significant differences among the means of height to nodes ratio and the average height in one test. Other plant characteristics showed trends, but no significance.

Table 2 shows lint yields for all locations in 1994 and 1995. The treatment in which 0.5 pint Pix was applied at full bloom and 14 days later, significantly outyielded all other treatments at the Fresno location in 1994. There was a tendency towards positive responses due to Pix treatments in all other tests. High C.V. % (13.5 in Merced) probably caused the lack of significance at the 0.005 level. There were no significant differences among yield means in the 1995 tests. All Pix treatments outyielded the untreated control, however.

Reprinted from the *Proceedings of the Beltwide Cotton Conference*
Volume 2:1157-1159 (1996)
National Cotton Council, Memphis TN

Table 1. Effect of treatments on three plant growth characteristics at four test sites in 1994.

	Height	Total Nodes	H/N
Fresno County Tests			
UTC	37.4		1.58
1/2 + 1/2 Pix	34.5		1.57
3/4 + 1/2 Pix	32.8		1.55
1 + 1/2 Pix	32.6		1.57
1 1/2 Pix	33.6		1.57
LSD (.05)	NS		NS
C.V. %	NS		NS
Tulare County Test			
UTC	49.1	24.7	1.99d
1/2 + 1/2 Pix	50.9	24.2	2.10b
3/4 + 1/2 Pix	53.3	24.4	2.18a
1.0 + 1/2 Pix	48.8	23.6	2.40c
1 1/2 Pix	------	------	-----
LSD (.05)	NS	NS	0.002
C.V.%	------	------	6.0
Merced County Test			
UTC	25.2b	17.1d	1.47a
1/2 +1/2 Pix	26.1a	18.0b	1.45b
3/4 + 1/2 Pix	25.1c	18.1a	1.39d
1.0 + 1/2 Pix	23.6e	17.2c	1.37e
1 1/2 Pix	24.1d	17.2c	1.40c
LSD (.05)	0.03	0.01	0.001
C.V.%	8.0	11.0	5.0
Madera County Test			
UTC	41.9	25.0A	1.67
1/2 + 1/2 Pix	36.1	18.3c	1.97
3/4 + 1/2 Pix	35.8	22.2d	1.61
1.0 + 1/2 Pix	38.6	23.5b	1.64
1 1/2 Pix	36.3	22.7c	1.60
LSD (.05)	NS	NS	NS
C.V.%	------	7.0	------

Table 1b. Effect of Pix Treatments on Some Plant Growth Characteristics at Two Test Sites in 1995.

Merced County Test

	Height	**Bolls/Plant**	**H/N**
Control	31.1	18.6	1.63
1/2 + 1/2 Pix	30.2	16.3	1.67
3/4 + 1/2 Pix	30.9	18.2	1.63
3/4 + 3/4 Pix	28.0	17.5	1.56
3/4 + 1.0 Pix	27.9	18.2	1.54
3/4 + 3/4 + 3/4 Pix	31.1	19.9	1.64
LSD (.05)	2.4	NS	0.01
C.V.%	5.3	16.8	4.1
Westside Field Station			
Control	63.9	15.5	2.00
1/2 + 1/2 Pix	59.2	17.7	1.98
3/4 + 1/2 Pix	57.3	16.5	1.97
3/4 + 3/4 Pix	58.5	15.1	1.98
3/4 + 1.0 Pix	55.5	19..3	1.90
3/4 + 3/4 + 3/4 Pix	58.2	18.7	1.89
LSD (.05)	4.7	NS	NS
C.V.%	5.3	20.8	2.70

Table 2. Effect of Pix on Lint Yields (lbs/acre) at Five Locations in 1994 And Two Locations in 1995.

1994

Treat	1	2	KERN	WSFS	TULARE	FRESNO	MERCED	MEAN
UTC	.5	.5	1290	1580	838	953	1284	1189
PIX	. 5	.5	1320	1678	902	1043	1528	1294
PIX	.75	.5	1350	1693	884	1034	1360	1264
PIX	1.0	.5	1340	1644	825	1036	1384	1246
PIX	1.5		1280	1700	----	1000	1438	1259
Variety			S-7	S-7	OROB	S-7	S-7	
Row Spacing			40”	40”	38”	40”	30”	
LSD (.05)			NS	NS	NS	85.3	NS	

1995

Treat	1	2	3	MERCED	WSFS
UTC	-----	-----	-----	943	849
PIX	.5	.5	-----	1002	924
PIX	.75	.5	-----	1022	898
PIX	.75	.75	-----	958	913
PIX	.75	1.0	-----	1066	931
PIX	.75	.75	.75	1036	896
LSD(.05)				NS	NS
C.V.%				10	8.5