

Examining the response of cotton to Pix (mepiquat chloride) applied at first flower in the Macquarie Valley.

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BACKGROUND & METHOD:

The overall aim of the project is to examine the response of cotton to Pix (mepiquat chloride) under different growth rates in the Macquarie Valley. The plan is to target a variety of cotton crops over two to three seasons that have dissimilar growth rates and fruit retention. The work will evaluate whether research completed at Myall Vale Research Station (near Narrabri), is pertinent to the shorter season growing conditions of the Macquarie Valley or otherwise. The work conducted by Dr Greg Constable found that a Pix response did not occur at internode growth rates of less than 5.5 cm in the pre-flower period. Similar findings have come out of California from work by Dr Tom Kerby. Approximately 10 percent of cotton is grown on narrow row spacings (75cm), therefore sites will also be chosen to represent this type of cotton growing. In the first year of the project (1993/94 season), four trial sites were selected in the Macquarie Valley. The location of the trials was chosen to represent the valley's climatic differences (Table 1). Four rates of mepiquat chloride were used on all four sites, namely 0, 300, 600 & 1000 ml/ha, applied at first flower.

TABLE 1.

Site	Location	Row Spacing	Variety	Planting Date
Jedburgh	Warren	100 cm	CS50	10-Oct-93
Toobaroo West	Trangie	100 cm	Sicala V1	12-Oct-93
Waitara	Tottenham	75 cm	CS50	12-Oct-93
Willow Bend	Mt Foster	100 cm	Siokra 1-4	14-Oct-93

Sites were sampled throughout the season every two weeks until cutout. Sampling included simple plant mapping of height, number of vegetative and fruiting nodes and retention of fruit in first positions. From flowering onwards, nodes above and below the white flower were counted as well as the previous data. After cutout, a full plant map took place at each site, in each treatment. This included mapping every fruiting position on the plant in addition to the data collected from the in-season mapping.

RESULTS & DISCUSSION:

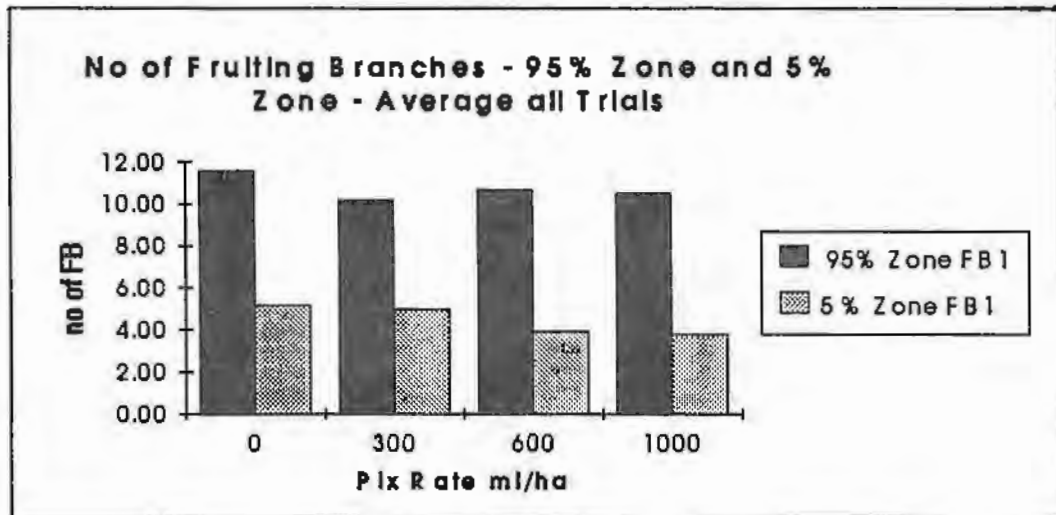
TABLE 2.

Property	Growth Rate cm/node*	% Retention FP1	
		1st 5 FB	Total
Toobaroo West	4.1	70%	77%
Willow Bend	6.1	67%	78%
Jedburgh	4.0	77%	71%
Waitara	5.7	76%	74%
MEAN	4.98	73%	75%

*average cm/node values between 12 & 16 main stem nodes (pre-bloom).

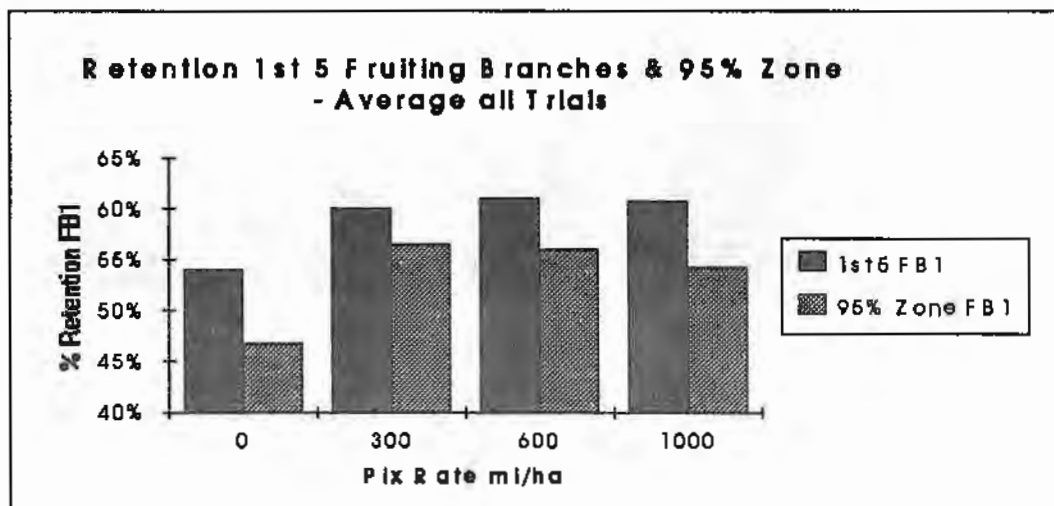
Table 2 shows the early season growth rates in the four trial areas. It can be seen that the cm/node values were fairly low, the highest being just over 6. First Position Retention (FP1) for both the first 5 fruiting branches (1st 5 FB) and overall first positions (Total), was fairly high. The work by Constable & Kerby suggests that these two factors will mean no yield response to applications of Pix at first bloom to this type of cotton. The yield results are discussed in full later. This season's work also suggests that even though mepiquat chloride reduced the number of nodes on the plant, the reduction is primarily from the 5 percent zone (Figure 1). As this reduction was mainly from unproductive fruiting branches on top of the plant, a reduction in final lint yield has not occurred at the chemical rates or timing of application described previously.

FIGURE 1.



Applications of mepiquat at first flower also generally increased retention of fruit to first positions (Figure 2). This was not the case in for all the sites, but certainly emerged as a trend.

FIGURE 2.



As previous work has shown, the reduction in both the height of the plant (Figure 3) and in total number of nodes produced (Figure 4), was directly proportional to the rate of mepiquat chloride at first flower. Figure 5 shows the nodes above white

flower (NAWF) slopes for the four treatments at the Jedburgh trial. From the graph it can be seen that there were no significant differences between treatments.

FIGURE 3.

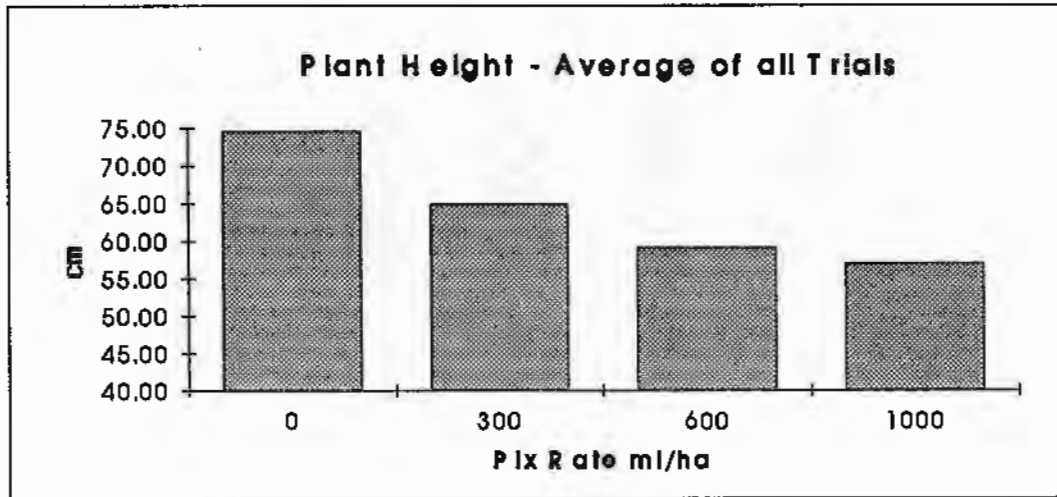
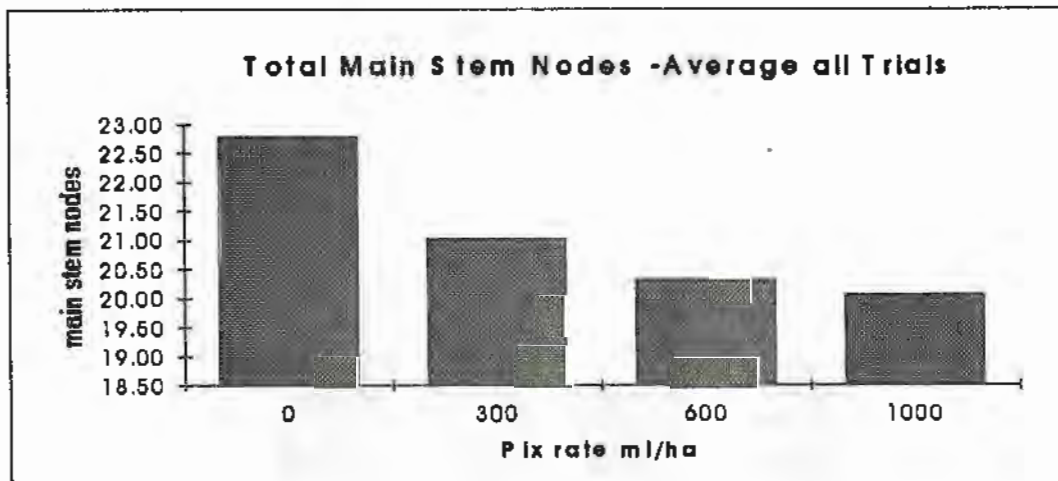
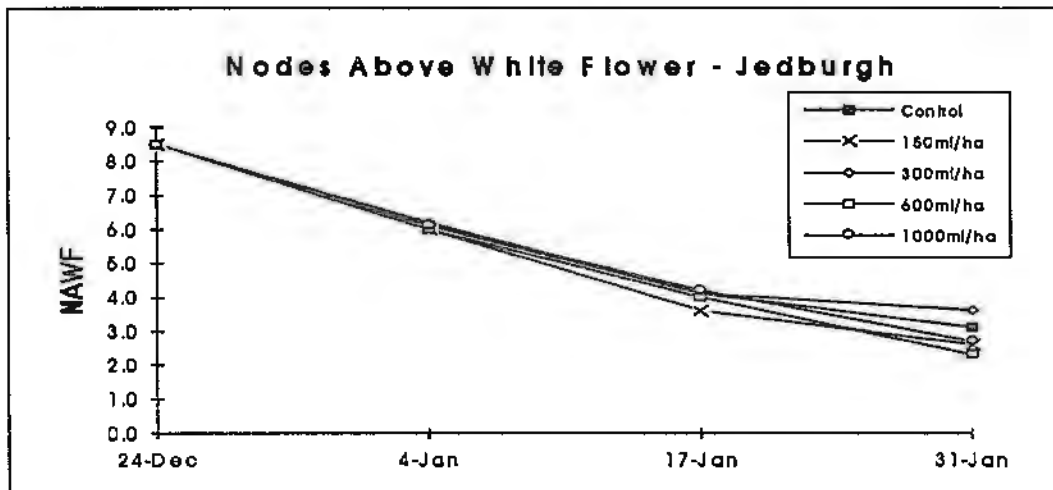


FIGURE 4.



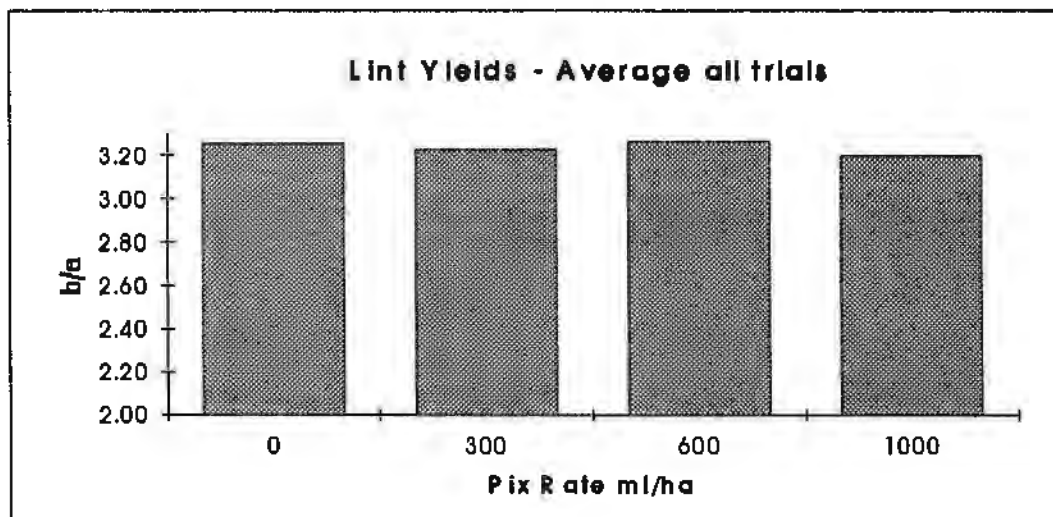
There was a trend in the Willow Bend trial which showed higher rates of Pix having marginally steeper slopes (and so faster cutouts than the lowest rate of 300 ml/ha and the control. The Willow Bend trial was the fastest growing crop early season, and this response is perhaps because of the more vigorous crop having a greater reaction

FIGURE 5



to Pix. Plots were picked separately using picker weigh scales. For the 1993/94 season, there was neither a yield reduction or a yield increase in any treatment, at any trial site (Figure 6). The lack of yield increase is probably due to the cool start to the season (October 1993 was 7 percent cooler than the 33 year mean, and 13 percent cooler than October 1992), and the generally higher retention of fruit

FIGURE 6



in lower positions on the plant compared with the 1992/93 season. Pre-flower plant monitoring (between 12 and 16 nodes), gave for all trials results of between 4 and 6 cm per node (Table 2). As mentioned previously, work by Constable and Kerby states that a pre-flower cm per node value of more than 5.5 is needed before yield responses with Pix occur. Data collected from these trials support these research findings.