The response of new cotton varieties to Pix

Greg Constable
CSIRO Cotton Research Unit, Narrabri

Pix is now in common use to manage vegetative growth of cotton in Australia. I presented a paper at the 1992 ACGRA Conference detailing how to evaluate potential responses to Pix. That procedure utilises regular measurements of plant height and node numbers. Plant growth is assessed on recent development, rather than using average node lengths. The calculation is as follows:

$$\textbf{Rate of internode increase} = \frac{\textbf{This week's height - Last week's height}}{\textbf{This week's nodes - Last week's nodes}}$$

Since it is usually too late to obtain yield responses to Pix once a crop is already too tall, this procedure allows problem situations to be diagnosed before excessive vegetative growth occurs. The results of that study are summarised in Figure 1. They show that internode increases of less than 5.5 cm lead to no response or even negative yield responses to Pix.

The data in Figure 1 were derived across a number of seasons, sowing dates and varieties. With the rapid change of varieties from the CSIRO breeding program, it was of interest to evaluate the different plant types for their response to Pix. An experiment was set up at Narrabri in the past two seasons which evaluated the Pix response of up to 18 breeding lines and varieties. Only results in commercial types are shown in this paper.

The results are summarised in Table 2. There was a greater Pix response in CS 189+ and CS 50 when compared with Siokra V-15 and CS 7S. The higher responses of CS 50 and Siokra S324 and the lower response of Siokra L23 were the most surprising results, as the Pix yield response is reverse to the plant size ranking of those varieties.

These experiments were located in a field which grows good vigorous cotton crops. Hence the average responses to Pix would be greater than average.

Table 2. The response of commercial varieties to 600 ml Pix/ha applied at first flower. Data averaged for the 1992/93 and 1993/94 seasons.

Variety	Response to Pix % yield increase
CS 189+	9.1
CS 50	8.4
Sicala V-2	5.5
Siokra S324	5.5
CS 8S	4.9
Siokra 1-4	2.7
Siokra L23	2.5
CS 7S	2.4
Siokra V-15	0.6

Conclusions

There were differences between varieties in their Pix response.

Of particular note was **CS 189+** having a consistent positive response to Pix and **Siokra V-15** having a consistent nil response.

Other varieties were intermediate. All cotton crops should be evaluated for their rate of vegetative growth in order to make an accurate decision regarding Pix response.

Acknowledgement. These experiments would not have been possible without the diligent help of Jack Kruizinga in the field.

MONITORING COTTON TO PREDICT PIX RESPONSE

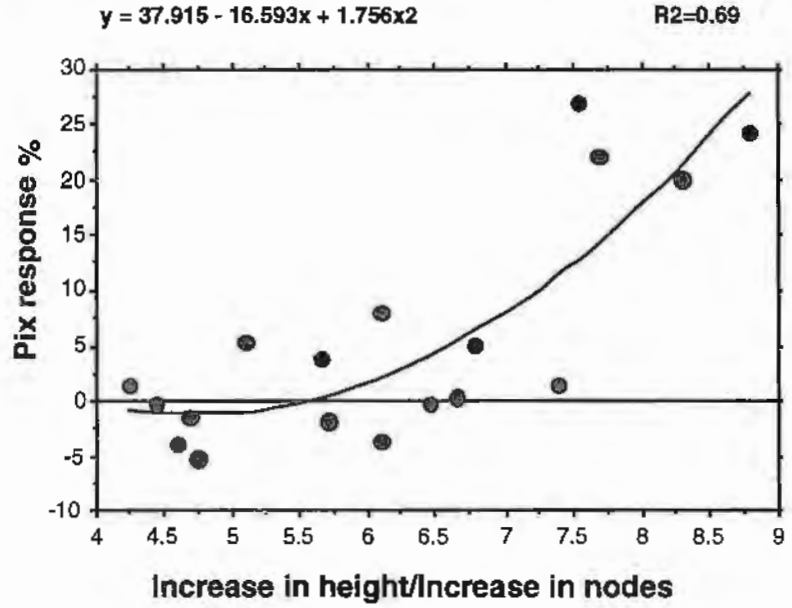

Figure 1. The relationship between rate of plant internode increase at early flowering and the subsequent yield response of that crop to Pix. Pooled data for three seasons and four varieties.

The results from Figure 1 can be used to make more informed decisions regarding the management of cotton vegetative growth. Table 1 summarises those decisions/actions.

Table 1. Using measurements of plant internode increase at early flowering to make decisions on Pix applications.

Rate of internode increase at early flowering stage.	Pix action	Other action/comments
less than 5.5 cm/node	nil	Encourage growth by judicious water and fertilizer management.
5.5 to 6.5 cm/node	200 ml/ha	Do not expect much Pix response.
6.5 to 7.5 cm/node	600 ml/ha	Continue good management.
greater than 7.5 cm/node	750 to 1200 ml/ha	Take care with water and fertilizer management.

Regular monitoring of plant size in the first half of the season is the only way to accurately determine the need to manage crop growth.