

## NEW PLANT GROWTH REGULATORS FOR THE COTTON INDUSTRY ?

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### Introduction

We have carried out one season of experiments on plant growth regulators that have not been used commercially in the Australian industry before (Glycinebetaine, Gibberellic acid and PGR IV) and compared these to Pix. These novel plant growth regulators may provide an important tool in improving fruit retention in cotton. Further, other important gains in efficiency may occur with the use of these regulators. These include the possible setting of fruit at lower node positions, which in turn may improve earliness, reduce late season insect control costs and reduce late season water applications.

### Methods

The experiment was carried out at Narrabri (ACRI) using the cultivar Sicot 189 and six treatments - control, gibberellic acid applied at ten leaf stage (GA<sub>3</sub> E) or at early flowering (GA<sub>3</sub> L), glycinebetaine (Gb), PGR IV and Pix (600 ml/ha at first flower). Four replicates of each treatment were used in a randomised complete block design.

### Results & Discussion

Both the late applied GA<sub>3</sub> (GA<sub>3</sub> L) and Pix increased boll weights and boll numbers, though these effects diminished by the last harvest (Figure 1). The other treatments either had no effect or more variable effects. The results indicate that at least some of these compounds have the potential to alter the fruiting dynamics of cotton.

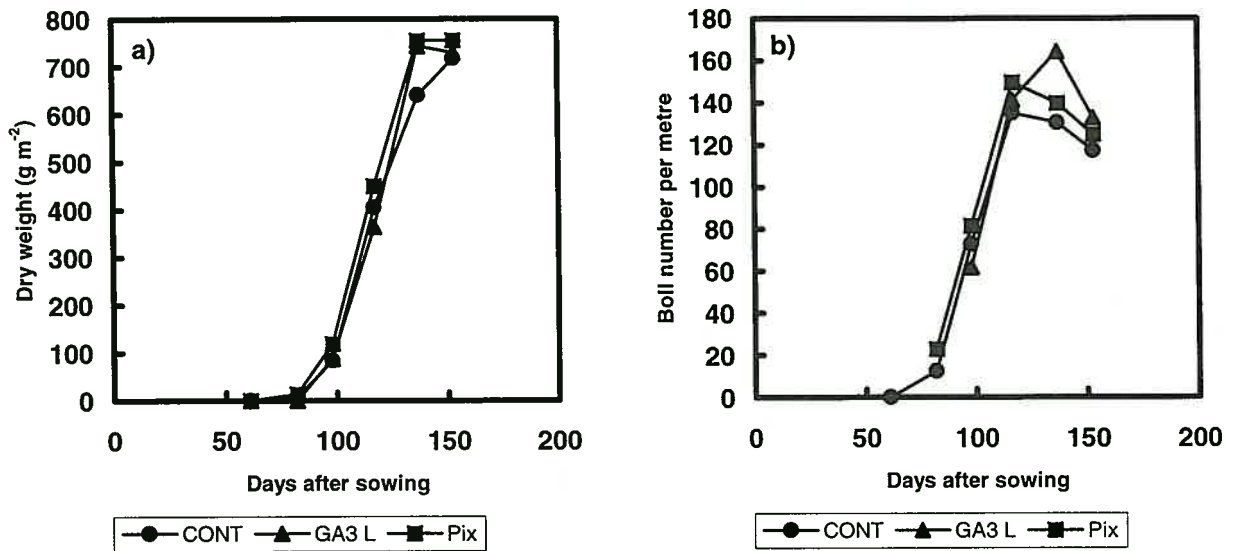


Figure 1. Both Pix and late applied GA<sub>3</sub> increased a) boll weights and b) boll numbers.

Directly after application both Pix and GA<sub>3</sub> L substantially increased the amount of dry matter partitioned into bolls. However, as the season progressed this advantage disappeared and actually lead to a significant decrease in yield for GA<sub>3</sub> L treated plants (Table 1). The lack of impact on yield may have resulted from the unusually long season that allowed a large number of late set fruit to be filled. In a more normal year the early advantage of Pix and GA<sub>3</sub> L may have been maintained through to yield. However, the finding of results do make clear that the challenge in plant growth regulator research is not so much to increase boll retention or initiation but to maintain the advantage through to yield. This will be the focus of the project in the next two seasons.

Table 1. Effect of plant growth regulators on lint % and lint yield.

Treatments	Lint %	Lint yield (kg/ha)
Control	0.42	2959
GA <sub>3</sub> E	0.42	2936
GA <sub>3</sub> L	0.42	2787†
Gb	0.42	2919
PGR IV	0.42	2787†
Pix	0.42	2854

† significantly less than control

### Conclusion

The newer growth regulators can increase boll numbers and weights, however their ability maintain this advantage through to lint yield has yet to be demonstrated. As such they are promising tools that require more work before they can become viable commercial tools.

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