DO COTTON VARIETIES RESPOND DIFFERENTLY TO PLANT GROWTH REGULATORS?

R.P. Viator, P.H. Jost and J.T. Cothren
Texas Agricultural Experiment Station
Texas A&M University
College Station, TX

Many producers across the Cotton Belt are planting genetically engineered varieties, such as herbicide-resistant Buctril® (BXN) and Roundup Ready® (RR) cotton. One unanswered question is whether these varieties respond to plant growth regulators (PGR) in the same manner as conventional varieties? Furthermore, do these varieties respond differently to PGRs when they are treated with their respective herbicides? In 1998, field studies were conducted at the Texas Agricultural Experiment Station near College Station, TX to evaluate the response of four PGR programs on a conventional/non-engineered variety (DP50) versus genetically engineered varieties (BXN47 & DP5690RR). The genetically engineered varieties were treated with two different weed management systems: one set received an application of the respective herbicide for the given variety and the other set received no herbicide. Four plant growth regulator programs were applied: untreated check; PIX program [PIX applied at 8 oz/A at match head square (MHS) and at early bloom (EB)]; PGR-IV program (PGR- IV applied at 2oz/A at 2-leaf, pinhead square, and EB); MicroFlo program (PIX 8 oz/A at MHS, PGR-IV 4 oz/A at EB, and PGR-IV 4 oz/A at 10 days after EB).

Heights were influenced similarly by PGRs in all varieties. However, the transgenic varieties tended to be 2 to 8 in. taller at harvest than the conventional variety. There was no significant interaction between varieties and PGRs in terms of yield; therefore, yield data was combined across all varieties. Yields from the PGR programs ranged from 885 to 977 lbs. lint/A and did not differ significantly from the control. Application of the labeled herbicides to the transgenic varieties did not adversely affect yields or boll distribution patterns. Also, no interactions existed in terms of boll distribution on position 1 and 2 as influenced by PGR application to transgenic varieties either sprayed or not sprayed with their respective herbicides. The lack of a negative effect on these first two fruiting positions is notable because these bolls produce the majority of the yield. Total bolls at reproductive branches 1-5 were not significantly changed by a herbicide application. Thus, spraying herbicides according to the label did not shift fruiting to higher nodes. Percent ginout was unaffected by labeled Roundup® or Buctril®applications. This is valuable information given the fact that unlabeled applications of Roundup® are known to affect cotton pollination (Mann and Bradley, 1988).

It is important to know that the use of transgenic varieties did not cause further inconsistencies of PGR responses. These data suggest that a producer can continue using the PGR program that works best for their operation even if transgenic cotton is planted. Furthermore, a producer can apply both a PGR program and a herbicide program without having interactions between the two programs. The conclusions of this study are important given the fact that some transgenic cotton varieties have faced challenges with environmental factors affecting their performance (Heering, 1998; Mann and Bradley, 1988). Additional studies over years and with other available genetically altered varieties should be conducted before conclusive statements are drawn.

Literature Cited

D.C Heering. 1998. Commercial Experience with Roundup Ready Cotton in 1997. *In* P. Dugger and D.Richter (ed.). Proc. Beltwide Cotton Conf. p.851.

Mann, J. and J, Bradley. (Monsanto representatives) 1998. Personal communication.

Reprinted from the *Proceedings of the Beltwide Cotton Conference*
Volume 1:603-603 (1999)
National Cotton Council, Memphis TN