Nitrogen Rates And Growth Regulators: Cotton Being Observed

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Dr. Wayne Ebelhar, Mississippi State University researcher at the Delta Research and Extension Center, has been working on nitrogen rates and plant growth regulators (PGR's) for cotton.

"We have specifically been working with Pentia which is a mepiquat pentaborate from BASF. According to Ebelhar, Pentia is the trade name of the product and the compound is mepiquat pentaborate. The product contains boron instead of the original plant growth regulator mepiquat chloride commonly known as Pix that contains no boron. In his earlier work evaluating mepiquat chloride, lint yield response to the additions of PGR was often variable and usually not statistically significant.

"In the first two years of research of the current study, I looked at this product along with my colleagues with applications initiated at first bloom," said Ebelhar, "we used fairly high rates of 12 to 16 ounces per acre per application. We got no significant response to the product the first year but in the second year, we measured a significant decrease in lint yield which not good and also not expected."

Dr. Wayne Ebelhar, Mississippi State University Researcher at the Delta Research and Extension Center, discusses his work on nitrogen rates and plant growth regulators (PGR's) for cotton.

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"That same year, my colleague Dr. Nichols had some other work underway where he was looking at Pentia with much earlier applications and lower rates than in our study. In those studies, initiating Pentia applications at pinhead square and lower rates, positive responses to the PGR were observed," said Ebelhar.

The next year, Ebelhar shifted his focus to looking at six to eight ounces of Pentia initially applied at pinhead square followed by another six to eight ounces applied about three weeks later about the time that they are beginning to bloom.

"That third year, we got a significant increase in yield. In the last two years, we have continued that same work and have gotten significant yield increases three years in a row. It ranges from about 60 to 90 pounds of lint per acre each year," said Ebelhar. This type of response pays for the PGR material plus application costs.

This study specifically looks at plant growth regulators and nitrogen rates for cotton following corn in rotation. Ebelhar says that he can get a lot of excess growth in cotton following corn and with the shift to more corn acres and less cotton acres we will be seeing more and more cotton following corn. This probably means that most of the cotton lands are going to be rotated with corn at some point in time.

"We have been seeing anywhere from 10 to 15 percent yield increase for cotton following corn," said Ebelhar, " I think we can continue to see that kind of response based on research that has been underway in the Delta since 2000."

"We have been doing a lot of work in rotation looking predominantly at nitrogen and potassium management in cotton and in corn," said Ebelhar, "The biggest response to rotation occurs the first year following corn. Plant cotton a second year following corn does not have the same magnitude of benefit but does fair well compared to continuous cotton."

"In the plant growth regulator study we do have some direct comparisons of nitrogen rates with and without the plant growth regulator. We have been looking at nitrogen rates from 60-150lbs of N per acre," said Ebelhar.

According to Ebelhar, in most years of the study they have only seen a yield response up to 120lbs of N rate once during hurricane Katrina. "That gave us a little bit of an advantage late in the season as we tried to produce a top crop," said Ebelhar, "but we have not seen that in any other year."

"Nitrogen rates above 120lbs N per acre, are not getting us a significant yield increase and with nitrogen costs of 75 to 80 cents a pound there is definitely no need to put additional nitrogen on cotton above 120lbs," said Ebelhar.

"Putting out more nitrogen has been shown to delay maturity. The plant growth regulators tend to hasten maturity, but if you are moving in one direction with more N and then move back with a PGR then you gain nothing," said Ebelhar.

"While we have seen significant response to PGR's in the last few years, the best plant growth regulator is fruit. Keeping the fruit protected and on the plant provides the for the best plant growth regulation," said Ebelhar. Δ