EFFECTS OF HIGH HERBICIDE RATES AND TANK MIX APPLICATIONS ON GLYTOL™ + LIBERTYLINK® COTTON

Mark Rinehardt
Bayer CropScience
Sellers, SC
L. Trolinder
Bayer CropScience
Lubbock, TX
S. Baker
Bayer CropScience
Memphis, TN
G. Henniger
Bayer CropScience
Lubbock, TX
R. Humphries
Bayer CropScience
Shafter, CA
J. Holloway
Bayer CropScience
Lubbock, TX

Bayer CropScience has developed in-house GlyTol™ glyphosate tolerant technology for cotton, expressing the 2*mepsps* gene. By conventional breeding, Bayer CropScience has combined GlyTol cotton with LibertyLink® technology to produce stacked herbicide tolerant cotton varieties.

Extensive field testing of GlyTol + LibertyLink herbicide tolerant cotton has occurred across the Cotton Belt since 2007. This paper summarized three specific field trials conducted at Sellers, SC, Leland, MS, and Lubbock, TX in 2008 which shared the following objectives:

1) To determine if herbicide tolerance to glyphosate and glufosinate in GlyTol + LibertyLink cotton is affected if crop protection chemicals are tank-mixed? And,

2) To determine if GlyTol + LibertyLink cotton can tolerate glyphosate and glufosinate applications at rates that exceed full label rates?

In the tank-mix study, a tank-mix treatment of glyphosate, glufosinate, and 2-pyridinesulfonamide at the 6-8 leaf cotton stage did reduce plant height 10 days after application. However, plant heights for this treatment were not significantly different than those of the unsprayed check at harvest. Application of plant growth regulators tank-mixed with glyphosate and glufosinate did significantly reduce plant heights at harvest. Minor foliar phytotoxicity was observed with tank-mixes of glyphosate, glufosinate and both 2-pyridinesulfonamide (5%) and Pyrithiobac (1%). However, there were no significant effects with any of these or other tank-mixes on lint yield.

The high herbicide rate trials used treatments of 2X rates of both glyphosate and glufosinate, and 1X, 2X, 3X, and 4X tank -mixes of glyphosate and glufosinate. The results of these trials indicated that there was no significant effect on plant height regardless of rate or timing of application. A visual phytoxicity rating of 6% was observed with the 3X glyphosate + 3X glufosinate tank-mix applied at the 2-4 leaf growth stage; however, no damage was observed with later application timings. Additionally, there were no significant effects on lint yield.

In conclusion, these trials conducted in 2008 with GlyTol+LibertyLink cotton indicate no significant detrimental effects on plant morphology or lint yield when over-labeled or tank-mixed crop protection products as described above were applied.