AGRONOMIC PERFORMANCE OF BAYERCROPSCIENCE GLYTOL GLYPHOSATE RESISTANT COTTON

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Abstract

Roundup Ready® and Roundup Ready Flex® resistant herbicide technologies from Monsanto are widely used by cotton producers across the Cotton Belt. In 2007, transgenic cotton varieties resistant to worms, herbicides or both accounted for about 93% of all upland cotton planted in the United States. Texas producers planted about 87% transgenic cotton varieties in 2007. Bayer CropScience is developing their proprietary brand glyphosate-tolerant cotton, known as GlyTol™. Glyphosate (N-phosphonomethylglycine) is a non-selective, broad spectrum herbicide. The glyphosate tolerance of GlyTol™ cotton is conferred by the introduction of a modified EPSPS gene -- the *2mEPSPS* gene. The *2mEPSPS* enzyme produced in the GlyTol™ cotton is insensitive to glyphosate inhibition, but retains its normal functions in the shikimate pathway. The purpose of these field trials was to compare plant growth, morphology, and agronomic performance of GlyTol™ cotton when treated with different commercial glyphosate products at various growth stages of cotton. Field studies were conducted at five locations in Texas, including the Brazos River Valley (College Station), Southern Blacklands (Thrall), Rolling Plains (Vernon), and Southern High Plains (Lubbock and New Deal). Treatments included four sequential foliar applications of selected glyphosate herbicide products, including Roundup Original Max®, Roundup WeatherMax®, Touchdown Total™, Glyfos-Xtra, Credit Extra, Honcho Plus, Makaze, and Glyfos-Xtra Flex, applied at different cotton growth stages – two true leaves, six to eight true leaves, lay-by, and 50% open boll. Products were similar for all locations with the exception of the High Plains, where Glyfos-Xtra Flex was used rather than Honcho-Plus. Spray treatments were applied with a hand-held boom or self propelled sprayer delivering 10 gallons/acre. All locations were planted at normal times except for the Brazos River Valley and Southern Blacklands locations where planting was about 30 days later than normal. Data collected from each plot included emergence, visual injury observations taken 10 to 14 days following each spray application, plant height taken prior to, and 10 to 14 days after each application, final plant height and lint yield. In addition, prior to harvest 25 bolls from each plot were visually inspected for deformities (parrot-beaked appearance) which may have occurred as a result of glyphosate injury. The center 2 rows of each plot were machine harvested and seed cotton samples were weighed and multiplied against a standard 34% turnout for picker-harvested locations (Brazos River Valley) and 24% for stripper-harvested locations (Southern Blacklands, Rolling

Plains, and Southern High Plains). Statistical analyses were conducted utilizing Agriculture Research Manager 7. At all locations plant height, damaged bolls, and yield were unaffected by the different glyphosate product applications. In addition, no visual phytotoxic symptomology was observed at any location. This preliminary research indicates that GlyTol™ cotton is extremely tolerant to glyphosate when applied at various cotton growth stages.