TRIBENURON-TOLERANT SUNFLOWER PRODUCTION: SEED AND HERBICIDE SYSTEM UPDATE. Lawrence S. Tapia, James D. Harbour and Craig Alford, Product Development Manager and Field Development Representatives, DuPont Ag & Nutrition, Denver, CO, 80228.

Tribenuron-tolerant sunflowers were developed by Pioneer in the early 1990's by traditional plant breeding methods. A single, dominant gene confers resistance to tribenuron, and this gene has been incorporated into key elite germplasm. Field research was conducted in KS, TX, SD, ND, NE, CO, and IL from 2002 to 2006 to determine efficacy, crop response and yield comparisons when tribenuron was applied to 2-leaf (V2), 8-leaf (V8), and post-bud (R1) tribenuron-tolerant sunflower. Standard small-plot research techniques were used at all the research locations each year. Tribenuron was applied, at 0.125, 0.1875, 0.25, 0.5 or 1.0 oz ai/a to either V2, V8 or R1 tribenuron-toltrant sunflowers; and in some tests, each herbicide rate was applied sequentially to V2 then V8, growth-stage sunflower.

Phytotoxicity at 7 DAT ranged from 0 to 22% and decreased to less than 5% at 40+ DAT. Phytotoxicity was generally greater when tribenuron was applied to V2 or V2 then V8 sunflower (2 – 22%) than V8 or R1 sunflower (<1%). However, tribenuron-tolerant sunflower injury decreased to 4% or less by 40+ DAT. Tribenuron controlled common lambsquarters and marshelder regardless of herbicide rate, herbicide program or application timing; however, common purslane was not controlled by tribenuron. Kochia, palmer amaranth, redroot pigweed, Russian thistle, and puncturevine were controlled best with tribenuron applied sequentially to V2 then V8 sunflowers.

Field research was conducted to determine efficacy and tribenuron-tolerant sunflower response to various weed control programs currently used in the US. Pendimethalin, sonalan, and sulfentrazone were applied pre-emergence to tribenuron-tolerant sunflower, after which tribenuron (0.125 oz ai/a) was applied post-emergence to approximately V8 sunflower. Further, tribenuron (post-emergence) was applied without a pre-emergent herbicide for a POST-only herbicide treatment program. Phytotoxicity was less than 4% (14 DAA) regardless of herbicide treatment program. Weed control programs provided good-to-excellent control of Kochia, Russian thistle, and puncturevine.

Yield comparisons of improved tribenuron-tolerant sunflower lines were conducted in 2006 with tribenuron at 1X, 2X and 4X use rates. There were no sunflower yield differences with tribenuron applied at 1X and 2X rates compared to a comparable sunflower herbicide and seed program. Tribenuron applied at 4X tribenuron use rates resulted in unacceptable yield loss for several lines tested.

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