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Abstract

The purpose of this study was to evaluate two-pass and single-pass corn herbicide programs for crop phytotoxicity, weed control, and yield.

Keywords

Agronomy

Disciplines

Agricultural Science | Agriculture | Agronomy and Crop Sciences

Weed Management in Corn with Preemergence and Postemergence Applied Herbicides

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Introduction

The purpose of this study was to evaluate two-pass and single-pass corn herbicide programs for crop phytotoxicity, weed control, and yield.

Materials and Methods

The crop rotation was corn following soybean. Fertilization included 140 lb/acre actual N applied as anhydrous ammonia. The pre-plant seedbed was prepared in the spring with a field cultivator. Crop residue was 35% at planting. A randomized complete block design with three replications was used. Herbicides were applied in 20 gallons of water/acre. Visual estimates of percentage crop injury and weed control were made during the growing season. These observations are compared with an untreated control and made on a 0 to 100 rating scale (0%=no control or injury; 100%=complete control or crop kill). Herbicide treatment corn yields were taken and adjusted to 15.5% moisture.

Laser hybrid L8H71 corn was planted at 35,077 seeds/acre in 30-in. rows on May 8. Preemergence (PRE) treatments were applied on May 9. Postemergence (POST) and midpost-emergence (MPOST) treatments were applied on May 31 and June 9, respectively. Corn growth stage was V2 to V3 and 4.5 in. tall and V4 to V5 and 12 inches tall on May 31 and June 9, respectively. Weeds had cotyledon to numerous leaves and were 0.25 to 3 in. tall on May 31. On June 9, weeds had cotyledon to

numerous leaves and were 5 in. tall. Weed species were giant foxtail, velvetleaf, common waterhemp, common lamb's quarters, and Pennsylvania smartweed, averaging a population of <1 to 2 plants/ft².

Results and Discussion

Summarized in Tables 1, 2, and 3 are the data on corn injury, weed control, and yield as affected by herbicide treatment. No differences occurred in corn stand between treatments. PRE applied treatments did not result in corn injury and POST and MPOST treatments did not cause more than 10% injury. PRE treatments as part of two-pass programs provided a broad range of giant foxtail, velvetleaf, common waterhemp, common lamb's quarters, and Pennsylvania smartweed control when observed on May 31. Overall, the level of control of the species was dependant on whether the reduced rate herbicide(s) was solely a grass, broadleaf, or broad spectrum product. On May 31, single-pass programs of G-Max Lite plus Balance Pro, Radius plus Atrazine, and Lumax applied PRE at 1× rates, afforded good to excellent overall weed control. Following POST and MPOST application timings, two-pass treatment programs demonstrated good to excellent weed control overall when observed on June 19 and July 28. Variable velvetleaf control with several treatments and fair giant foxtail control by Lumax was observed on July 28. Herbicide treatment corn yields ranged from 147 to 184 bushels/acre, excluding the untreated control. Generally, there were few yield differences between the herbicide treatments, and almost all of them out yielded the untreated control.