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Weed Management Strategies in Soybeans

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Abstract

The purpose of this study was to evaluate various herbicides and application timings including preplant incorporated, preemergence, and postemergence for crop phytotoxicity, weed control, and soybean yield.

Keywords

Agronomy

Disciplines

Agricultural Science | Agriculture | Agronomy and Crop Sciences

Weed Management Strategies in Soybeans

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Introduction

The purpose of this study was to evaluate various herbicides and application timings including preplant incorporated, preemergence, and postemergence for crop phytotoxicity, weed control, and soybean yield.

Materials and Methods

The crop rotation was soybean following corn. The preplant seedbed was prepared with tandem disking and field cultivation. Crop residue was 85% at planting. A randomized complete block design with three replications was used. Herbicides were applied in 20 gallons of water/acre. Visual estimates of crop injury and percentage of weed control were made during the growing season. These observations were compared with an untreated control and were made on a 0–100% rating scale: 0% = no control or injury; 100% = complete control or crop kill.

Preplant (PPI) treatments were applied on May 20 and incorporated with one pass using a field cultivator operating 2–3 in. deep. Crow's variety 2130 R soybean was planted at 196,433 seeds/acre in 30-in. rows on May 25. Preemergence (PRE) treatments were applied on May 26. Postemergence (EPOST, POST, and SPOST) treatments were applied on June 20, July 5, and July 26, respectively. Soybean growth was V2 and 4 in. tall, V4 and 8 in. tall, and R3 to R4 and 30 in. tall on June 20, July 5, and July 26, respectively. Weeds had cotyledon to numerous leaves and were 0.25 to 4 in. tall, cotyledon to numerous leaves and 0.25 to 12 in. tall, two leaves and 0.25 to 0.5 in. tall on June 20, July 5, and

July 26, respectively. Weed species were giant foxtail, velvetleaf, common waterhemp, and common lamb's quarters, averaging a population of <1 to 1 plant/ft².

Results and Discussion

Summarized in Tables 1, 2, and 3 are the results of the study. Soybean injury from soil-applied treatments was not observed on June 15, except for 5% injury from PRE applied Gangster. Prior to postemergence applications, PRE Define, Domain, Gangster, and Boundary (1.5 pint/acre) provided 88% or less giant foxtail control on June 15, compared with 90% or more by remaining treatments. PPI Pursuit Plus treatments provided 90% or higher velvetleaf control. No other PPI or PRE treatments exceeded 83%. Define and Domain provided 77% or less common waterhemp control, compared to at least 92% control by remaining treatments. All PPI and PRE treatments demonstrated excellent common lamb's quarters control.

EPOST Raptor + Ultra Blazer, Phoenix + Select, Phoenix, FirstRate + Phoenix and Flexstar + Fusion resulted in 25 to 30% injury on June 28; Extreme resulted in 15% injury. On July 12, PRE Define followed by EPOST Phoenix provided 99% and 95% common waterhemp and common lamb's quarters control, respectively. However, this treatment provided 70% and 87% giant foxtail and velvetleaf control, respectively. Remaining treatments provided good to excellent overall weed control, except PPI Domain + Prowl H₂O + Authority for velvetleaf control. Weed control on August 24 for all of the treatments reflected the trends established on earlier observation dates. Both the above discussed treatments yielded significantly less than all other herbicide treatments.