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Sequential Weed Control Programs in No-Tillage Xtend Soybeans

D.E. Peterson, C.R. Thompson, and C.L. Minihan

Summary

The development of glyphosate resistant weeds has greatly complicated weed control in soybeans. Roundup Ready 2 Xtend (dicamba tolerant) soybeans provide growers an alternative herbicide option for preplant and postemergence weed control in soybeans. Preplant programs that included dicamba provided excellent control of giant ragweed. Sequential programs consisting of Envive or Enlite plus glyphosate and dicamba pre-plant followed by postemergence treatments that included glyphosate and dicamba provided excellent control of henbit, giant ragweed, Palmer amaranth, and large crabgrass.

Introduction

Weeds are a major production problem in soybeans, especially with the development of glyphosate resistant weeds. Roundup Ready 2 Xtend (RR2X) soybeans provide a new herbicide option for preplant and postemergence weed control in soybeans.

Procedures

A field experiment was established near Manhattan, KS, on a Reading silt loam soil with 3.3% organic matter and a pH of 6.7. The plot area had a natural infestation of henbit, giant ragweed (moderate level of glyphosate resistance), Palmer amaranth, and large crabgrass. Preplant (PP) treatments were applied to blooming henbit, and 1- to 12-inch giant ragweed on May 3, 2016, at 72°F, 35% relative humidity, and mostly clear skies. Pioneer P31T52X RR2X soybeans were planted at 120,000 seeds/a in 30-inch rows on May 23, 2016. Postemergence (P) treatments were applied to 2-trifoliolate-leaf soybeans (6 inch), 3- to 6-inch Palmer amaranth, and 1- to 6-inch large crabgrass on June 13, 2016, with 82°F, 35% relative humidity, and partly cloudy skies. Treatments were applied with a CO₂ back-pack sprayer, delivering 15 gpa at 35 psi through TTI110015 flat fan spray tips to the center 6.3 ft of 10 by 25 ft plots. The experiment had a randomized complete block design with three replications. Crop injury and weed control were visually evaluated throughout the growing season.

Results

All treatments eventually provided excellent control of all broadleaf weeds evaluated and very good control of large crabgrass. Postemergence Roundup PowerMax plus dicamba (Fexapan) and Cinch treatments caused minor leaf spotting, and postemergence treatments with Cobra caused more severe foliar burn to soybeans, but new growth was unaffected.

Table 1. Weed control in RR2X soybeans on May 31, 2016, Manhattan, KS

| Treatment* | Application timing | Application rate oz/a | Henbit ----- | Giant ragweed % control | Palmer amaranth ----- |
|--|--------------------|--------------------------|-----------------|----------------------------|--------------------------|
| Envive+RU PowerMax+Fexapan#/ RU PowerMax+Fexapan | PP/ P | 2.5+22+22/ 22+22 | 100 | 99 | 100 |
| Envive+RU PowerMax+Fexapan/ RU PowerMax+Cinch+Fexapan | PP/ P | 2.5+22+22/ 22+16+22 | 100 | 99 | 100 |
| Envive+RU PowerMax+Fexapan/ RU PowerMax+Cobra+Cinch | PP/ P | 2.5+22+22/ 22+10+16 | 100 | 99 | 100 |
| Enlite+RU PowerMax+Fexapan/ RU PowerMax+Fexapan | PP/ P | 3.5+22+22/ 22+22 | 100 | 100 | 100 |
| Enlite+RU PowerMax+Fexapan/ RU PowerMax+Cinch+Fexapan | PP/ P | 3.5+22+22/ 22+16+22 | 100 | 99 | 100 |
| Envive+RU PowerMax+Fexapan/ RU PowerMax+Cobra+Cinch | PP/ P | 3.5+22+22/ 22+10+16 | 100 | 100 | 100 |
| Least significant difference ($P < 0.05$) | | | NS | NS | NS |

* / indicates sequential application; PP = preplant; and P = postemergence.

Non-labelled dicamba product actually applied, but equivalent Fexapan rates presented.

Table 2. Weed control in RR2X soybeans on July 26, 2016, Manhattan, KS

| Treatment* | Application timing | Application rate oz/a | Large crabgrass ----- | Giant ragweed % control | Palmer amaranth ----- |
|--|--------------------|--------------------------|--------------------------|----------------------------|--------------------------|
| Envive+RU PowerMax+Fexapan#/ RU PowerMax+Fexapan | PP/ P | 2.5+22+22/ 22+22 | 94 | 100 | 100 |
| Envive+RU PowerMax+Fexapan/ RU PowerMax+Cinch+Fexapan | PP/ P | 2.5+22+22/ 22+16+22 | 97 | 100 | 100 |
| Envive+RU PowerMax+Fexapan/ RU PowerMax+Cobra+Cinch | PP/ P | 2.5+22+22/ 22+10+16 | 97 | 100 | 100 |
| Enlite+RU PowerMax+Fexapan/ RU PowerMax+Fexapan | PP/ P | 3.5+22+22/ 22+22 | 94 | 100 | 100 |
| Enlite+RU PowerMax+Fexapan/ RU PowerMax+Cinch+Fexapan | PP/ P | 3.5+22+22/ 22+16+22 | 97 | 100 | 100 |
| Envive+RU PowerMax+Fexapan/ RU PowerMax+Cobra+Cinch | PP/ P | 3.5+22+22/ 22+10+16 | 96 | 100 | 100 |
| Least significant difference ($P < 0.05$) | | | 3 | NS | NS |

* / indicates sequential application; PP = preplant; and P = postemergence.

Non-labelled dicamba product actually applied, but equivalent Fexapan rates presented.

Table 3. Soybean injury to RR2X soybeans on May 31, 2016, Manhattan, KS

| Treatment* | Application timing | Application rate oz/a | Soybean injury | | |
|--|--------------------|--------------------------|-----------------------|--------|---------|
| | | | June 20 | July 8 | July 26 |
| | | | ----- % control ----- | | |
| Envive+RU PowerMax+Fexapan#/ RU PowerMax+Fexapan | PP/ P | 2.5+22+22/ 22+22 | 2 | 0 | 0 |
| Envive+RU PowerMax+Fexapan/ RU PowerMax+Cinch+Fexapan | PP/ P | 2.5+22+22/ 22+16+22 | 5 | 0 | 0 |
| Envive+RU PowerMax+Fexapan/ RU PowerMax+Cobra+Cinch | PP/ P | 2.5+22+22/ 22+10+16 | 20 | 7 | 0 |
| Enlite+RU PowerMax+Fexapan/ RU PowerMax+Fexapan | PP/ P | 3.5+22+22/ 22+22 | 3 | 0 | 0 |
| Enlite+RU PowerMax+Fexapan/ RU PowerMax+Cinch+Fexapan | PP/ P | 3.5+22+22/ 22+16+22 | 5 | 0 | 0 |
| Envive+RU PowerMax+Fexapan/ RU PowerMax+Cobra+Cinch | PP/ P | 3.5+22+22/ 22+10+16 | 25 | 10 | 5 |
| Least significant difference ($P < 0.05$) | | | 4 | 2 | 2 |

* / indicates sequential application; PP = preplant; and P = postemergence.

Non-labelled dicamba product actually applied, but equivalent Fexapan rates presented.



Figure 1. Application of Envive + Roundup Power Max + dicamba preplant followed by Roundup Power Max + dicamba postemergence.