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# Sequential Weed Control Programs in Liberty Link Soybeans

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# Sequential Weed Control Programs in Liberty Link Soybeans

## Abstract

The development of glyphosate-resistant weeds has greatly complicated weed control in soybeans. Liberty Link soybeans provide growers an alternative herbicide option for postemergence weed control in soybeans. Liberty Link programs can provide effective weed control in a sequential weed-control program that includes effective preemergence residual herbicides at planting time followed by timely applications of Liberty.

## Keywords

Liberty Link soybeans, henbit, giant ragweed, Palmer amaranth, large crabgrass

# Sequential Weed Control Programs in Liberty Link Soybeans

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## Summary

The development of glyphosate-resistant weeds has greatly complicated weed control in soybeans. Liberty Link soybeans provide growers an alternative herbicide option for postemergence weed control in soybeans. Liberty Link programs can provide effective weed control in a sequential weed-control program that includes effective preemergence residual herbicides at planting time followed by timely applications of Liberty.

## Introduction

Weeds are a major production problem in soybeans, especially with the development of glyphosate-resistant weeds. Liberty Link soybeans provide growers an alternative herbicide option for postemergence weed control in soybeans.

## Procedures

A field experiment was established near Manhattan, KS, on a Reading silt loam soil with 2.7% organic matter and a pH of 5.8. The plot area had a natural infestation of Palmer amaranth (mixed population of glyphosate-susceptible and resistant biotypes), velvetleaf, and ivyleaf morning glory. Credenz CZ3841 Liberty Link soybeans were planted at 120,000 seeds/a in 30-inch rows on May 12, 2016, into a recently tilled seedbed. Preemergence (PRE) treatments were applied on May 13. A good, activating rain was received within 4 days after planting, and more than 5 inches of rain was received during a 4-day period 12 to 15 days after planting. Early postemergence (EP) treatments were applied to 2-trifoliate-leaf soybeans (6 inch), 1- to 2-inch Palmer amaranth, 1- to 3-inch velvetleaf, and 1- to 2-inch morning glory on June 3 at 83°F, 45% relative humidity, and mostly clear skies. Postemergence (P) treatments were applied to 5 trifoliate leaf soybeans (12 inch), 1- to 12-inch Palmer amaranth, 6- to 10-inch velvetleaf, and 1- to 4-inch morning glory on June 15, with 94°F, 45% relative humidity, and clear skies. Treatments were applied with a compressed-air tractor sprayer, delivering 15 GPA at 26 psi through AIXR110025 flat fan spray tips to the center 6.7 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, and soybeans were harvested from the center 2 rows of the plots on October 24.

## Results

Good early rainfall resulted in good herbicide activity. Preemergence Valor XLT and Fierce caused some early-season soybean stunting, but soybeans recovered over time. Early postemergence (EP) treatments that included Anthem Maxx caused foliar burn to soybeans, but new growth was unaffected. No soybean injury was evident at the July 14 evaluation (data not presented). All PRE herbicide treatments provided excellent early-season Palmer amaranth control. All sequential herbicide treatments gave very good late-season Palmer amaranth control, which was better than single applications of Liberty, especially the postemergence (P) timing. All PRE treatments except Prefix provided good early-season velvetleaf control. All treatments except Liberty P gave 95% or better control of velvetleaf at the July 14 evaluation. All PRE treatments except Prefix and Boundary provided 85% or better morning glory control prior to EP applications. All treatments except Boundary followed by Liberty or single applications of Liberty provided 90% or better morning glory control by the final evaluation. Soybean yields were very high as a result of good precipitation through the growing season. Soybean yields generally corresponded to the level of weed control.

**Table 1. Weed control in Liberty Link soybeans on May 31, 2016, Manhattan, KS**

| Treatment* | Application timing | Application rate | Palmer amaranth | Velvetleaf | Morning glory |
|---|---|---|---|---|---|
| | | oz/a | % control | | |
| Authority First/Liberty 280+AMS | PRE/EP | 6.4/29 | 100 | 96 | 96 |
| Authority Maxx/Liberty 280+AMS | PRE/EP | 6.4/29 | 100 | 89 | 93 |
| Valor XLT/Liberty 280+AMS | PRE/EP | 4/29 | 100 | 97 | 85 |
| Fierce/Liberty 280+AMS | PRE/EP | 3.75/29 | 100 | 100 | 87 |
| Prefix/Liberty 280+AMS | PRE/EP | 32/29 | 100 | 53 | 49 |
| Boundary/Liberty 280+AMS | PRE/EP | 32/29 | 100 | 95 | 17 |
| Authority Elite/Liberty 280+AMS | PRE/EP | 32/29 | 100 | 88 | 88 |
| Authority First/ Anthem Maxx+Liberty 280+AMS | PRE/ EP | 5/ 3+29 | 99 | 98 | 92 |
| Authority MTZ/Liberty 280+AMS | PRE/EP | 14/29 | 99 | 94 | 90 |
| Authority MTZ/ Anthem Maxx+Liberty 280+AMS | PRE/ EP | 14/ 3+29 | 99 | 92 | 88 |
| Liberty 280+AMS | EP | 29 | --- | --- | --- |
| Liberty 280+AMS | P | 29 | --- | --- | --- |
| Liberty 280+AMS/Liberty 280+AMS | EP/P | 29/29 | --- | --- | --- |
| Least significant difference ($P < 0.05$) | | | NS | 9 | 14 |

* / indicates sequential application; AMS = ammonium sulfate applied at 1.5 lb/a; PRE = preemergence; EP = early postemergence; and P = postemergence.

**Table 2. Weed control in Liberty Link soybeans on July 14, 2016, Manhattan, KS**

| Treatment* | Application timing | Application rate | Palmer amaranth | Velvet-leaf | Morning glory |
|---|---|---|---|---|---|
| | | oz/a | ---------- % control ---------- | | |
| Authority First/Liberty 280+AMS | PRE/EP | 6.4/29 | 98 | 100 | 97 |
| Authority Maxx/Liberty 280+AMS | PRE/EP | 6.4/29 | 100 | 98 | 96 |
| Valor XLT/Liberty 280+AMS | PRE/EP | 4/29 | 100 | 97 | 90 |
| Fierce/Liberty 280+AMS | PRE/EP | 3.75/29 | 99 | 97 | 95 |
| Prefix/Liberty 280+AMS | PRE/EP | 32/29 | 100 | 95 | 90 |
| Boundary/Liberty 280+AMS | PRE/EP | 32/29 | 100 | 100 | 83 |
| Authority Elite/Liberty 280+AMS | PRE/EP | 32/29 | 100 | 100 | 95 |
| Authority First/ Anthem Maxx+Liberty 280+AMS | PRE/ EP | 5/ 3+29 | 98 | 100 | 97 |
| Authority MTZ/Liberty 280+AMS | PRE/EP | 14/29 | 97 | 95 | 97 |
| Authority MTZ/ Anthem Maxx+Liberty 280+AMS | PRE/ EP | 14/ 3+29 | 98 | 97 | 94 |
| Liberty 280+AMS | EP | 29 | 92 | 95 | 83 |
| Liberty 280+AMS | P | 29 | 63 | 77 | 60 |
| Liberty 280+AMS/Liberty 280+AMS | EP/P | 29/29 | 97 | 100 | 92 |
| Least significant difference ($P < 0.05$) | | | 4 | 7 | 7 |

* / indicates sequential application; AMS = ammonium sulfate applied at 1.5 lb/a; PRE = preemergence; EP = early postemergence; and P = postemergence.

**Table 3. Soybean injury and yield of Liberty Link soybeans, Manhattan, KS, 2016**

| Treatment* | Application timing | Application rate | Soybean injury 5-31-16 | Soybean injury 6-15-16 | Soybean yield |
|---|---|---|---|---|---|
| | | oz/a | % control | | |
| Authority First/Liberty 280+AMS | PRE/EP | 6.4/29 | 0 | 0 | 78 |
| Authority Maxx/Liberty 280+AMS | PRE/EP | 6.4/29 | 0 | 2 | 81 |
| Valor XLT/Liberty 280+AMS | PRE/EP | 4/29 | 12 | 0 | 77 |
| Fierce/Liberty 280+AMS | PRE/EP | 3.75/29 | 15 | 5 | 76 |
| Prefix/Liberty 280+AMS | PRE/EP | 32/29 | 0 | 0 | 80 |
| Boundary/Liberty 280+AMS | PRE/EP | 32/29 | 0 | 0 | 74 |
| Authority Elite/Liberty 280+AMS | PRE/EP | 32/29 | 0 | 0 | 82 |
| Authority First/ Anthem Maxx+Liberty 280+AMS | PRE/ EP | 5/ 3+29 | 0 | 8 | 79 |
| Authority MTZ/Liberty 280+AMS | PRE/EP | 14/29 | 0 | 0 | 78 |
| Authority MTZ/ Anthem Maxx+Liberty 280+AMS | PRE/ EP | 14/ 3+29 | 0 | 6 | 77 |
| Liberty 280+AMS | EP | 29 | - | 0 | 70 |
| Liberty 280+AMS | P | 29 | - | - | 50 |
| Liberty 280+AMS/Liberty 280+AMS | EP/P | 29/29 | - | 0 | 77 |
| Least significant difference ($P < 0.05$) | | | 2 | 3 | 7 |

* / indicates sequential application; AMS = ammonium sulfate applied at 1.5 lb/a; PRE = preemergence; EP = early postemergence; and P = postemergence.

**Figure 1. Authority First PRE followed by Liberty postemergence.**