

# Weed control in soybean as influenced by residual herbicide use and glyphosate application timing following different planting dates

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## Introduction

- Soybean growers are planting earlier in the spring to maximize yield potential.
- Earlier planting dates may reduce the ability of soybean to compete with weeds, because colder soil and air temperatures in early spring conditions may favor weed growth.

## Objective

- Evaluate weed control and soybean yield as influenced by residual herbicide use and postemergence (POST) glyphosate application timing following three different planting dates.

## Materials and Methods

- A field study was conducted near Arlington, WI in 2012.
- Plots were 3 m wide by 15 m long, and treatments were replicated four times.
- Trial area was cultivated on April 5, 0.87 kg a.e. ha<sup>-1</sup> glyphosate was applied prior to each planting date.
- Soybeans were planted at 296,400 seeds ha<sup>-1</sup> in rows 76 cm wide.
- Main Plots were blocked by the Planting Date (PD)
  - Early – April 24
  - Mid – May 10
  - Late – June 4
- Subplots were a 2x4 Factorial arranged as a RCB:
  - [2] With or without PRE residual herbicide (RH) application
    - RH = 0.26 + 0.03 kg a.i. ha<sup>-1</sup> sulfentrazone + cloransulam-methyl
  - [4] POST glyphosate timing (GT): V1, V2, V4, R1
    - Glyphosate = 0.87 kg a.e. ha<sup>-1</sup>
- Weeds were counted prior to each POST GT
- Soybean yield was adjusted to 13% moisture

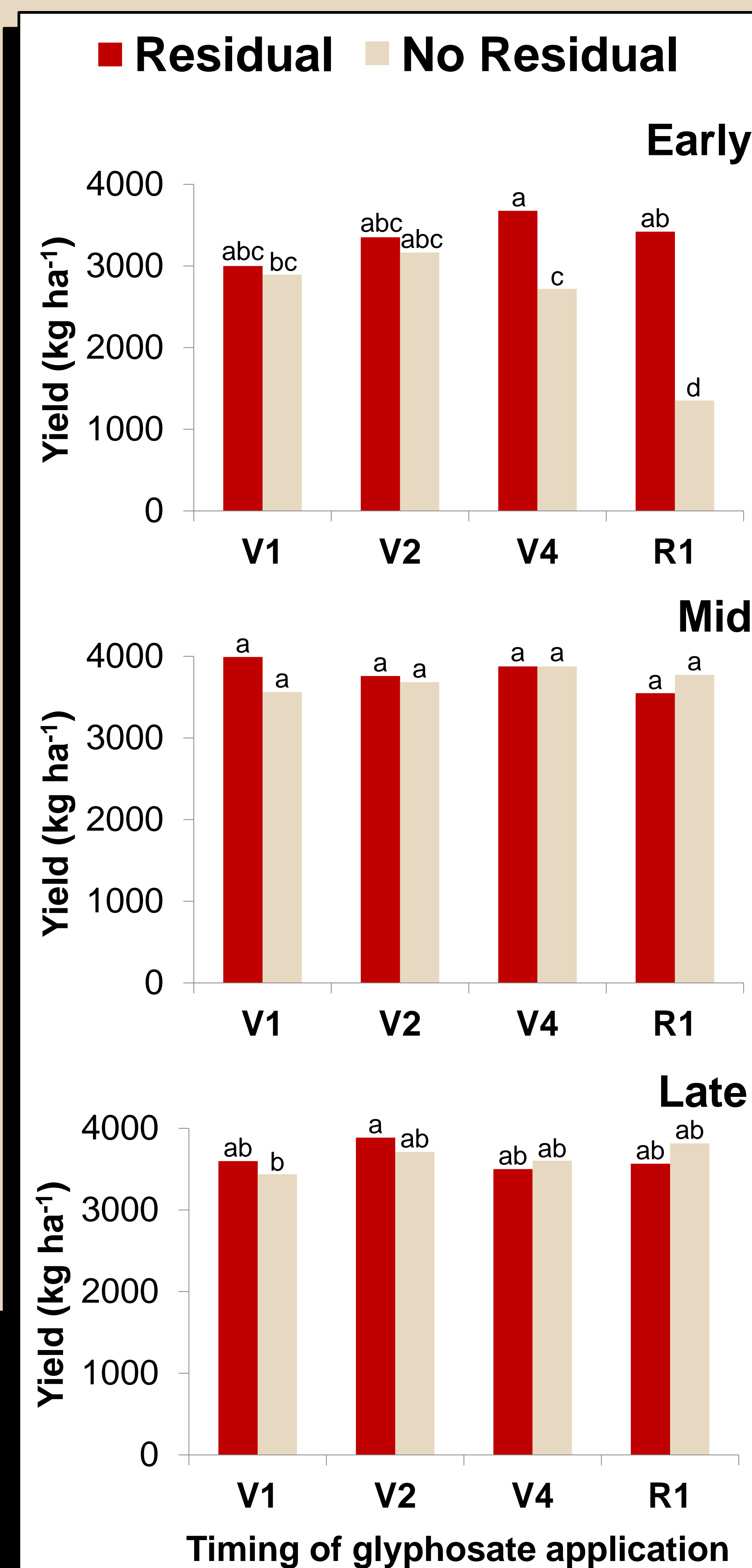
**Table 1.** Total weed density at POST glyphosate timing as influenced by planting date (PD), residual herbicide (RH) and glyphosate application timing (GT). The highest order interaction of PD x RH x GT was not significant (P=0.6044). The PD x RH and PD x GT interactions were significant at P < 0.0001 and P = 0.0187, respectively. Densities with the same letters are not significantly different (P ≤ 0.05).

Factors	Planting date		
	24 April	10 May	4 June
<b>Residual herbicide</b>	Total weed density <sup>a</sup> (plants m <sup>-2</sup> )		
sulfentrazone + cloransulam	15.6 c	16.4 c	1.9 d
No PRE residual	66.9 a	31.6 b	2.9 d
<b>Glyphosate timing</b>			
V1	46.0 a	20.9 cd	2.5 e
V2	40.0 ab	31.0 bc	1.5 e
V4	30.9 bc	25.3 cd	2.6 e
R1	48.1 a	18.9 d	2.9 e

<sup>a</sup>Predominant weed species in the trial were common ragweed (*Ambrosia artemisiifolia* L.), common lambsquarters (*Chenopodium album* L.), and giant foxtail (*Setaria faberi* Herrm.)

**Figure 1.** Influence of residual herbicide use and glyphosate application timing on soybean yield. Yield means with the same letters within planting date are not significantly different (P < 0.05).

## Results



**Figure 2.** Pictures were taken at the R1 glyphosate application timing.

## Conclusions

- Planting Date:**
  - Total in-crop weed density declined as planting was delayed.
  - Mid and late planting dates yielded more than the early planting date.
- PRE Residual Herbicide:**
  - Total weed density was significantly less at the early and mid planting dates in plots with a residual herbicide.
  - A significant reduction in yield occurred in plots without a residual herbicide at the early planting date only.
- Glyphosate Timing:**
  - When a residual herbicide was used, there was no significant difference in soybean yield among the different glyphosate application timings regardless of planting date.
  - At the early planting date when no residual herbicide was used, soybean yield was maximized when glyphosate was applied at the V1 or V2 soybean growth stages.
  - There were no significant differences in yield observed between application timings in the absence of a residual at the mid and late planting dates.