

**Weed control with preemergence herbicides in Roundup Ready soybeans at Rosemount, MN - 2013.**

Gunsolus, Jeffrey L., Douglas W. Miller, and Bradley Kinkaid. The objective of this experiment was to evaluate weed control and crop response with several preemergence herbicides followed by postemergence Roundup applications. The experiment was conducted at Rosemount, MN on a Waukegon silt loam soil with pH 6.6 and 4.7% organic matter. Soil test P and K were 19 and 131 lbs/A respectively. Following oats, the experimental area was fall chisel plowed. In the spring, 60 lbs/A P and 60 lbs/A K were applied on May 8. The area was disked twice and field cultivated twice on June 3 and planted with Asgrow AG 1431 soybeans at a rate of 150,000 seeds/A with 30 inch row spacing. The experimental design was a randomized complete block with four replications and plot size was 10 by 30 ft. Preemergence and the postemergence-only Roundup treatments were applied with a CO<sub>2</sub> powered backpack sprayer utilizing a six nozzle boom with 20 inch nozzle spacing while Roundup applied sequentially to preemergence treatments was applied with a tractor mounted, air pressured sprayer with an eight nozzle boom with 15 inch nozzle spacing. Both systems utilized 110015VS XR Teejet flat-fan nozzles, 35 psi pressure, and a spray volume of 15 gpa. Application dates, environmental conditions, and weed data are presented below. Weed control data, soybean injury and yield data are presented in the Table.

| <b>Treatment Date</b>              | <b>June 3</b>  | <b>June 28</b>                  | <b>July 11</b>             | <b>July 19</b>                 |
|------------------------------------|----------------|---------------------------------|----------------------------|--------------------------------|
| Treatments applied                 | Preemergence   | Early Post<br>Post Roundup-only | Post<br>Roundup Sequential | Late Post<br>Post Roundup-only |
| Air Temperature (°F)               | 68             | 71                              | 86                         | 80                             |
| Relative humidity (%)              | 38             | 63                              | 32                         | 55                             |
| Dewpoint (°F)                      | 42             | 58                              | 53                         | 63                             |
| Soil Moisture                      | moist at 0.25" | dry to 0.25"                    | dry to 1.5"                | dry                            |
| Soil Temperature (°F)              | 65             | 71                              | 85                         | 93                             |
| Sky                                | 95% clouds     | 5% clouds                       | clear                      | 10% clouds                     |
| Wind (mph)                         | SE 5-7         | WNW 8-14                        | S 8-10                     | NW 8-12                        |
| Rainfall before Application        |                |                                 |                            |                                |
| Week 1 (inch)                      | 1.14           | 1.87                            | 0.78                       | 1.86                           |
| Rainfall after Application         |                |                                 |                            |                                |
| Week 1 (inch)                      | 0.90           | 0.41                            | 1.84                       | 0.48                           |
| Week 2 (inch)                      | 1.37           | 0.78                            | 0.45                       | 0.22                           |
| Soybean                            |                |                                 |                            |                                |
| Stage                              | --             | V2                              | V5                         | V9-R1                          |
| Height (inch)                      | --             | 5-6                             | 12                         | 16-18                          |
| <b><u>Weed Height (inches)</u></b> |                |                                 |                            |                                |
| Common Lambsquarters - Colq        | --             | 0.25-2 (most 1)                 | 1-2*                       | 2-4                            |
| Common Ragweed - Corw              | --             | 1-3 (most 2)                    | 1-4*                       | 2-4                            |
| Nightshade - Ebns                  | --             | 1-3 (most 2)                    | 0.75-1                     | 1-2                            |
| Pennsylvania Smartweed - Pesw      | --             | 1-4 (most 2)                    | 2-4*                       | 4                              |
| Pigweed species - Rrpw             | --             | 1-3 (most 1)                    | 0.75-1.5                   | 2-4                            |
| Grasses                            | --             | 2-4 (most 3)                    | 1-6                        | 4-8                            |

\* Refer to the results section for exceptions.

**Weed Density (plants/ft<sup>2</sup>) on June 28**

|                               |    |
|-------------------------------|----|
| Common Lambsquarters - Colq   | 11 |
| Common Ragweed - Corw         | 7  |
| Nightshade - Ebns             | 1  |
| Pennsylvania Smartweed - Pesw | 9  |
| Pigweed species - Rrpw        | 4  |
| Grasses**                     | 2  |

\*\* Grasses = Giant Foxtail, Yellow foxtail, scattered Woolly Cupgrass.

## Results

Broadleaf weed control was excellent for all preemergence treatments at the June 28 rating date with the exception of common ragweed. Prefix and all Fierce treatments had excellent common ragweed control. Valor SX had good ragweed control. Authority Elite and Authority Assist resulted in significantly less common ragweed control than the other treatments. Between June 28 and July 11 rating dates, new flushes of broadleaf weeds had emerged. New common lambsquarters were greatest in the Prefix treatment followed by the Valor SX treatment and new nightshade and pigweed were emerged in the Valor SX treatment. Broadleaf weed sizes on July 11 were generally 1 to 4 inches. The exceptions were occasional common lambsquarters and Pennsylvania smartweed (usually no more than 1 to 2 per plot) that were up to ten inches. The other exception was common ragweed in the treatments Valor SX (up to 6 inches), Authority Assist (up to 10 inches, most 3-5 inches), and Authority Elite (up to 10 inches, most 4-8 inches). Grass populations were light and variable and were not rated on June 28. At the July 11 rating, Valor SX had little or no grass control while all other preemergence treatments generally had excellent control. Grass size at the postemergence Roundup sequential ranged up to 6 inches. The Roundup sequential on the preemergence treatments controlled all weeds. Weed control ratings on October 1 represent weeds that emerged after the Roundup sequential. Those weeds were generally suppressed by the soybean canopy .

The postemergence-only Roundup treatments resulted in 100% weed control at each application (June 28 and July 19). By the July 19 date, most late weed emergence had occurred (except for a few common lambsquarters) resulting in 100% control of those weeds at the October rating date.

Soybean injury was observed on June 28 in all Fierce treatments. Symptoms were temporary and no injury was observed on July 11. No yield differences were noted between treatments. Untreated check plots were not harvested due to high weed populations. Soybean yields in the untreated plots were estimated to be less than 5 bu/A.

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**Table.**

| Herbicide Treatment <sup>1</sup>                                      | Rate<br>(product/A)               | Weed Control |      |      |      |      |      |      |      |      |      |      |      |      |      |      |       | Soybean |               |                 |    |
|---|-----------------------------------|--------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|---------|---------------|-----------------|----|
|   |                                   | Colq         |      |      | Corw |      |      | Ebns |      |      | Pesw |      |      | Rrpw |      |      | Grass |         | Injury<br>(%) | Yield<br>(bu/A) |    |
|   |                                   | 6/28         | 7/11 | 10/1 | 6/28 | 7/11 | 10/1 | 6/28 | 7/11 | 10/1 | 6/28 | 7/11 | 10/1 | 6/28 | 7/11 | 10/1 | 7/11  | 10/1    |               |                 |    |
|   |                                   |              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |       | (%)     |               |                 |    |
| <b>(Preemergence June 3) / (Postemergence July 11)</b>                |                                   |              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |       |         |               |                 |    |
| (Valor SX <sup>2</sup> ) / (Roundup <sup>3</sup> + AMS <sup>4</sup> ) | (2 oz) / (32 oz + 3 qt)           | 99           | 98   | 97   | 94   | 93   | 100  | 99   | 96   | 100  | 97   | 97   | 99   | 100  | 98   | 100  | 45    | 99      | 0             | 42              |    |
| (Fierce <sup>5</sup> + Classic <sup>6</sup> ) / (Roundup + AMS)       | (3 oz + 0.33 oz) / (32 oz + 3 qt) | 100          | 100  | 98   | 99   | 98   | 100  | 100  | 100  | 100  | 99   | 100  | 100  | 100  | 100  | 99   | 99    | 99      | 99            | 5               | 42 |
| (Fierce) / (Roundup + AMS)  | (3 oz) / (32 oz + 3 qt)           | 99           | 99   | 97   | 99   | 98   | 99   | 100  | 99   | 100  | 99   | 99   | 100  | 100  | 100  | 99   | 99    | 99      | 99            | 8               | 42 |
| (Fierce) / (Roundup + AMS)  | (3.75 oz) / (32 oz + 3 qt)        | 99           | 99   | 99   | 99   | 97   | 99   | 100  | 100  | 100  | 99   | 99   | 99   | 100  | 100  | 99   | 96    | 99      | 5             | 41              |    |
| (Authority Assist <sup>7</sup> ) / (Roundup + AMS)                    | (5 oz + 5 oz) / (32 oz + 3 qt)    | 99           | 100  | 100  | 79   | 74   | 100  | 100  | 100  | 99   | 100  | 99   | 100  | 100  | 100  | 99   | 98    | 99      | 0             | 43              |    |
| (Prefix <sup>8</sup> ) / (Roundup + AMS)                              | (2 pts + 5 oz) / (32 oz + 3 qt)   | 99           | 96   | 98   | 99   | 98   | 100  | 99   | 99   | 99   | 99   | 98   | 99   | 100  | 100  | 100  | 99    | 100     | 0             | 42              |    |
| (Authority Elite <sup>9</sup> ) / (Roundup + AMS)                     | (25 oz + 5 oz) / (32 oz + 3 qt)   | 100          | 99   | 100  | 61   | 55   | 99   | 100  | 100  | 100  | 96   | 98   | 99   | 100  | 100  | 99   | 99    | 100     | 0             | 42              |    |
| <b>(Early Postemergence June 28) / (Late Postemergence July 19)</b>   |                                   |              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |       |         |               |                 |    |
| (Roundup + AMS) / (Roundup + AMS)                                     | (32 oz + 3 qt) / (32 oz + 3 qt)   | --           | 98   | 99   | --   | 99   | 100  | --   | 100  | 100  | --   | 98   | 100  | --   | 100  | 100  | 100   | 100     | --            | 40              |    |
| LSD (P=.05)   |                                   | ns           | 2    | ns   | 13   | 12   | ns   | ns   | ns   | ns   | ns   | ns   | ns   | ns   | 1    | ns   | 21    | ns      | 3             | ns              |    |

<sup>1</sup> Treatments and rates in parenthesis represent a single application.

<sup>2</sup> Valor SX 51WDG = flumioxazin.

<sup>3</sup> Roundup PowerMax 4.5L = glyphosate.

<sup>4</sup> AMS = N-Pak ammonium sulfate solution (3.4 lbs/gal).

<sup>5</sup> Fierce 76WDG = 33.5% flumioxazin & 42.5% pyroxasulfone.

<sup>6</sup> Classic 25WG = chlorimuron.

<sup>7</sup> Authority Assist 4SC = 3.33 lbs ai/gal sulfentrazone & 0.67 lbs ai/gal imazethapyr.

<sup>8</sup> Prefix 5.29EC = 4.34 lbs ai/gal s-metolachlor & 0.95 lbs ai/gal fomesafen.

<sup>9</sup> Authority Elite 7SC = 0.7 lbs ai/gal sulfentrazone & 6.3 lbs ai/gal metolachlor.