



# SOYBEAN FACTS

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## Improving Weed Control in No-till Roundup Ready Soybean

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No-till soybean production in Michigan relies almost exclusively on glyphosate for preplant and postemergence weed control. While glyphosate continues to provide excellent control of most weeds, timely applications before planting and after soybean emergence are necessary to ensure the best growing conditions for your soybean crop. The following recommendations are based on MSU research funded by the Michigan Soybean Promotion Committee (MSPC).

### Don't wait to make your burndown herbicide application

One way to give your soybean crop an early advantage is to make burndown herbicide applications before or near the time of planting. In MSU trials, preplant burndown applications of glyphosate + 2,4-D ester<sup>1</sup>, made at least 7 days prior to planting, provided excellent control of most weeds present prior to planting. Burndown applications of glyphosate that were delayed until soybeans were at the VC (unifoliate) to V2 (2 trifoliates) growth stages resulted in an average yield loss of 8.3 bushels/acre (Table 1). Waiting until soybeans were at the V3 to V5 growth stages resulted in a 9.2 bushel/acre loss. In addition to protecting yield by reducing early-season weed competition, starting the growing season with a clean field will also eliminate several winter annual weeds that may potentially serve as hosts for destructive insects and soybean cyst nematode.

<sup>1</sup> 2,4-D ester at 1 pt/A must be applied at least 7 days prior to planting soybean.

Table 1. Delaying burndown herbicide applications will reduce soybean yields. Soybean yield is averaged over 6 sites.

Application time	Yield bu/A
7 d prior to planting <sup>a</sup>	56.7
VC to V2 soybean <sup>b</sup>	48.4
V3 to V5 soybean	47.5
Untreated	36.6

<sup>a</sup> Roundup WeatherMax (22 fl oz/A) + 2,4-D ester (1 pt/A) + AMS (17 lb/100 gal) was applied.

<sup>b</sup> Roundup WeatherMax (22 fl oz/A) + AMS (17 lb/100 gal) was applied after soybean emergence.

### Residual herbicides can improve early-season and postemergence weed control

Though postemergence application timings for glyphosate are generally flexible in terms of weed height, making the application when weeds are an appropriate size remains a major factor for ensuring satisfactory control. Beyond starting the growing season with a clean field, including a herbicide with residual activity with your burndown application will reduce in-season weed growth and extend early-season weed control. Residual herbicides can improve control and reduce the growth of problematic weeds, such as horseweed (marestail), common ragweed, giant ragweed, and common lambsquarters.



As a result of reduced weed growth, the time needed between a burndown herbicide application and a postemergence glyphosate treatment may be extended. This is especially important when weather conditions may prevent timely postemergence applications. There are several different residual herbicides that can be included with a burndown application. For a complete listing of soybean herbicides with residual weed control consult Table 2D in the MSU Extension publication E-434 "*Weed Control Guide for Field Crops*".

### **Residual herbicides can pay for themselves**

There is no added application expense when a residual herbicide is included in a burndown herbicide application. Depending on market prices, weed pressure, and herbicide cost, the extra expense of adding a residual herbicide to a burndown application may pay for itself with as little as a 1 bushel/acre increase in yield. In fact, the economic returns from the addition of any of the six different residual herbicides that we examined over 2 years at 3 locations were not different from a burndown application of glyphosate + 2,4-D ester alone. This was true regardless of soybean commodity prices from \$5 to \$15/bushel. When choosing residual herbicides, the decision should be based on the types of weeds that are in the field and weed pressures to maximize economic return.

### **A pro-active approach to glyphosate-resistant weeds**

One of the most important benefits of including a residual herbicide in a weed control program is the opportunity to use herbicides with additional modes of action besides glyphosate. While glyphosate continues to provide excellent control of most weeds, the spread of glyphosate-resistant weeds throughout Michigan and the Midwest is becoming an increasing concern. In 2007, the first population of glyphosate-resistant horseweed in Michigan was confirmed in Mason County. Glyphosate-resistant horseweed populations can now be found in several counties particularly in Roundup Ready soybean fields.

In 2010 a population of Palmer amaranth has also been confirmed resistant to glyphosate. Including herbicides with other modes/sites of action to control these glyphosate-resistant weeds is increasingly important.

As glyphosate-resistant weeds become more widespread, use of residual herbicides will give growers another option for weed control in no-till soybean production to improve the stewardship of glyphosate and glyphosate-resistant cropping systems.

This fact sheet was originally produced by the Soybean 2010 project and will be updated as needed by its successor, the Soybean Management and Research Technology (SMaRT) program. The SMaRT program was developed to help Michigan growers increase soybean yields and farm profitability. Funding for SMaRT is provided by MSU Extension and the Michigan Soybean Promotion Committee. Additional information about increasing soybean yields and profitability can be found online at <http://www.michigansoybean.org>.