

## Two-pass Versus One-pass Weed Control Programs in Corn

One-pass programs can help manage input costs and labor requirements. Two-pass programs have been shown to spread out the weed management and optimize yield potential. When choosing between a one- or two-pass weed control program, it is important to consider the density and types of weeds in a field, and to carefully and accurately weigh the cost savings of a one pass program with the weed control opportunities of a two-pass program.

### One-pass Preemergence (PRE) Program

This program utilizes full labeled rates of residual herbicides like Harness® Xtra or Degree Xtra®, and tank mixtures as appropriate, applied at or near planting.

- Targets low risk fields with light weed pressure.
- Adequate and timely rainfall is essential for herbicide activation and to help protect yield potential.

Fields infested with tough broadleaf weeds such as giant ragweed, heavy grass pressure, or perennial weeds are not good candidates for this program. In a Roundup Ready® Corn 2 system, Roundup® brand agricultural herbicides can be used in-crop to control weed escapes if needed.

### One-pass Postemergence (POST) Program

In the Roundup Ready® Corn 2 system, a tank mixture of a Roundup® agricultural herbicide with a residual herbicide, like Degree Xtra®, is applied early-POST in the crop.

- Targets low risk fields with light weed pressure.
- Application timing is essential to protect yield potential.

The early-POST application needs to be made before weeds exceed 2 to 4 inches to avoid excessive crop competition. Roundup® agricultural herbicides provide control of emerged weeds, and reduction of later season weed flushes is provided by the residual herbicide component of the weed control program. This program works well in fields infested with annual weeds. However, this application is generally too early for good perennial weed control. Since timely applications are needed to minimize early-season weed competition, the number of acres committed to this program may need to be limited to allow for timely treatments.

### Two Pass (PRE followed by POST) Program

The PRE followed by (fb) POST herbicide program offers the least risk and best chance at obtaining

optimum weed control and corn yield.

- Targets high risk fields with moderate or heavy weed pressure.
- Provides better consistency and a wider window for the POST application.
- Helps minimize early-season weed competition that can rob yield potential.

Fields with heavy grass pressure and high populations of tough weeds like giant ragweed, cocklebur, velvetleaf, and annual morningglory are good candidates for this program. Fields infested with burcucumber or perennial weeds are also good candidates. This program in a Roundup Ready® Corn 2 system utilizes the labeled rate of a residual herbicides, like Harness® Xtra at or near planting, followed by a POST application of Roundup® brand agricultural herbicide. Other herbicides can be tank mixed with Roundup® brand agricultural herbicide if needed to help improve good POST weed control of certain species. All fields that are at risk from glyphosate-resistant weeds should follow this program.

### Research Results from 2010

The first of two years of testing to compare various corn herbicide programs was conducted in 2010 at five Midwestern universities. Testing was conducted at University of Nebraska,

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Untreated Check



PRE fb POST

A PRE fb POST herbicide program is often recommended, especially under heavy weed pressure. The photo on the left shows the weed pressure in the untreated check. The photo on the right shows the efficacy of a PRE fb POST program.

(Photos taken July 28, 2010, at the research trials conducted at Kansas State University.)

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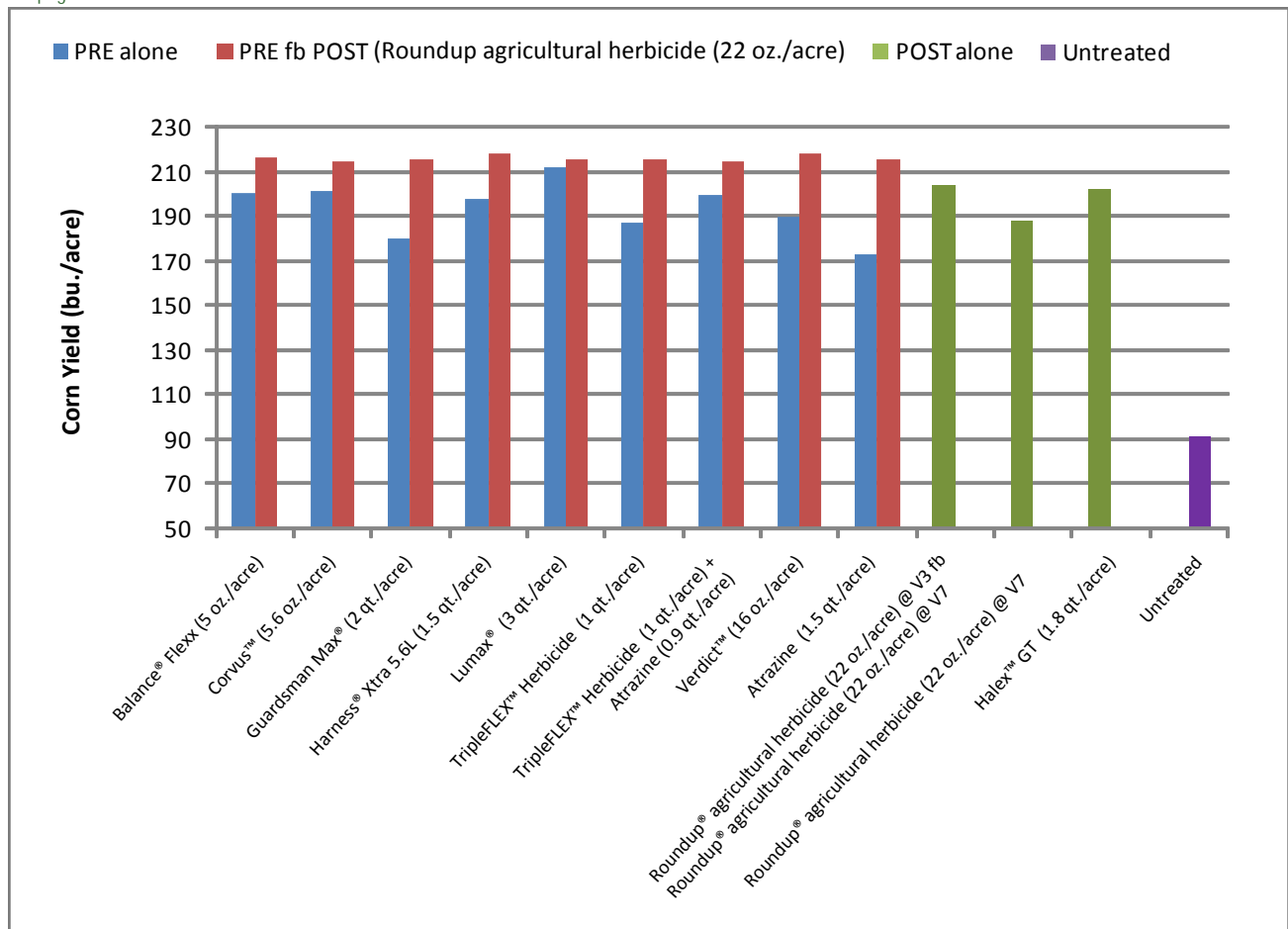


Figure 1. Yield results of various treatments averaged across five locations. Monsanto data 2010.

Kansas State University, Purdue University, The Ohio State University, and Michigan State University.

Several herbicide programs were evaluated for weed control and their effect on grain yield. Nine PRE programs were evaluated as a PRE only. These nine programs were also evaluated as PRE fb POST, with the POST treatment of a Roundup® agricultural herbicide (22 oz./acre) applied at V7 (Figure 1). Other herbicide programs included a POST treatment of Hallex™ GT herbicide and a two-pass POST only program of a Roundup® agricultural herbicide at V3 fb V7.

PRE fb POST treatments had an advantage over PRE alone treatments in end of the season weed control efficacy (Figure 2) and grain yield.

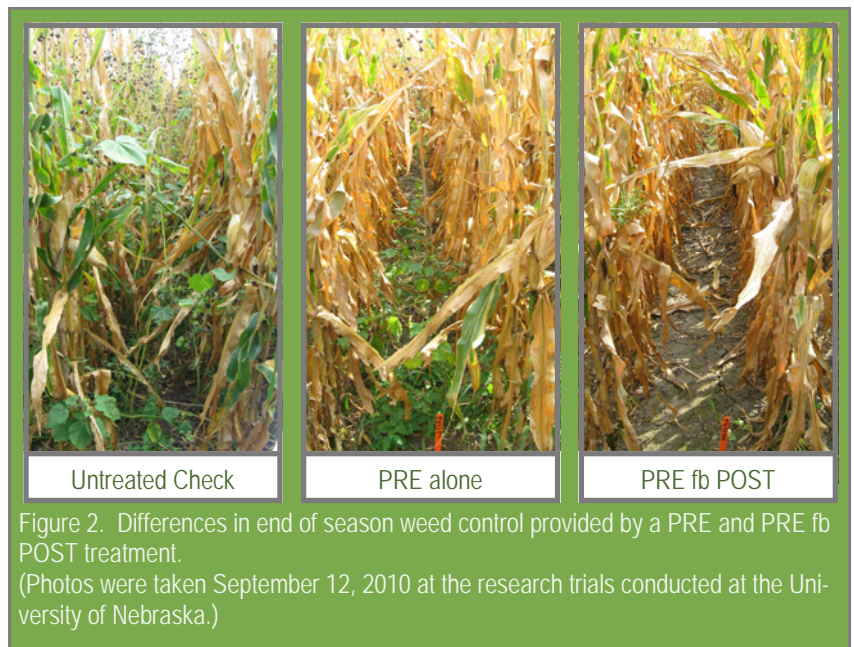


Figure 2. Differences in end of season weed control provided by a PRE and PRE fb POST treatment. (Photos were taken September 12, 2010 at the research trials conducted at the University of Nebraska.)

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Yield results indicated that the PRE fb POST treatments out-yielded the corresponding PRE alone treatments by 22.6 bu./acre, and the Halex™ GT POST alone treatment by 13.4 bu./acre, when averaged across five locations (Figure 3). The yield advantage of the PRE fb POST programs was related to early-season and late-season weed control, especially of giant ragweed and waterhemp.

A PRE fb POST herbicide program is the most consistent way to minimize weed competition throughout the growing season, thereby protecting yield potential. An examination of commonly recommended PRE only and POST only herbicide programs also indicated a yield advantage for the PRE fb POST herbicide program (Figure 4). The need for timely weed control to reduce early season weed competition is illustrated by comparing the Roundup® agricultural herbicide at V7 treatment to the other herbicide programs in yield (Figure 4) and effect on crop growth (Figure 5).

### Manage Weed Resistance

The use of residual herbicides can help minimize the risk of developing glyphosate-resistant weed populations in a Roundup Ready® Corn 2 system. Programs utilizing herbicides or tank mixtures with multiple modes of action, timely POST applications, and maintaining clean fields can reduce the risk of weed shifts and resistance.

### Summary

When selecting a herbicide program, five key concepts to consider are yield potential, profitability, feasibility, weed pressure and weed resistance. A PRE fb POST herbicide program has benefits relative to all of those factors. There are certain situations where a PRE alone or a POST alone may be feasible. However, carefully consider the risks and benefits of each type of herbicide program prior to making a decision.

Sources: Weed Control Guide for Ohio and Indiana 2010, The Ohio State University and Purdue University Extension, WS-16, <http://www.btny.purdue.edu> (last visited 8/11/10).



Figure 5. The left plot received two applications of Roundup PowerMAX®, one at Mid-POST (V3) and the other at Late-POST (V7). The right plot received only one application of Roundup PowerMAX® herbicide when weeds were 6-12" tall. Photo is from research trials conducted at Michigan State University, 2010.

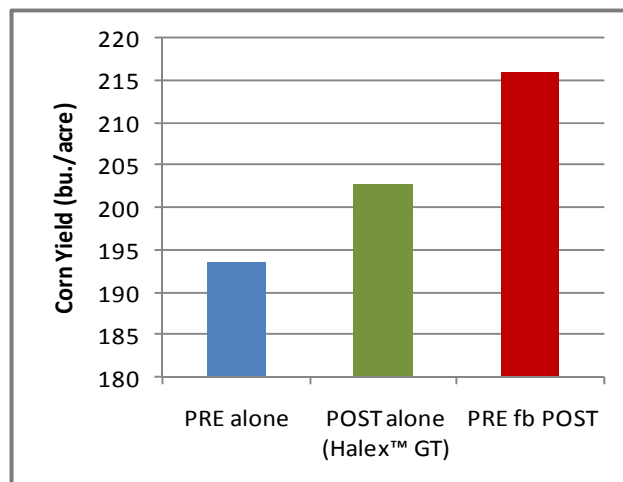


Figure 3. Yield results averaged across five locations comparing PRE, POST (Halex™ GT), and PRE fb POST treatments. The PRE value represents the average the first 9 herbicides in Figure 1. The PRE fb POST value represents those same 9 treatments fb a POST application of Roundup® agricultural herbicide at V7. Monsanto data 2010.

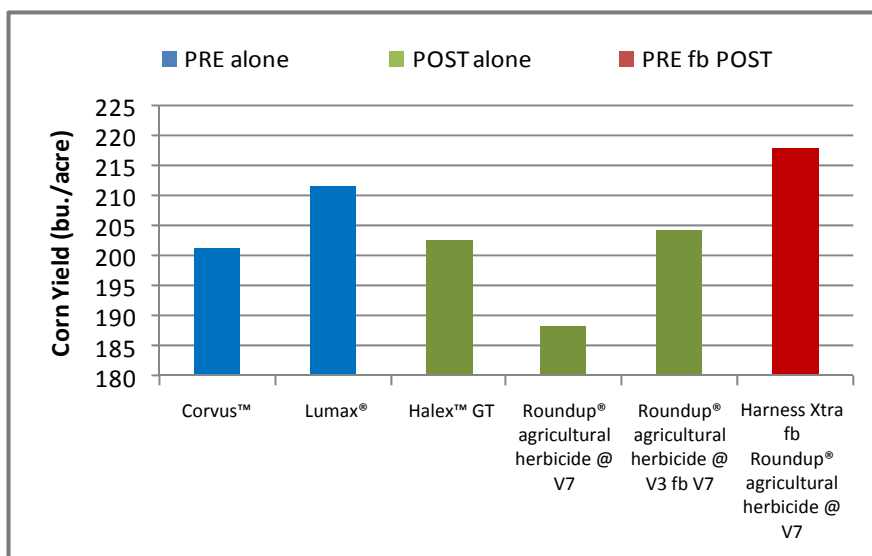


Figure 4. Yield results of common PRE, POST, and PRE fb POST programs averaged across five locations. Monsanto data 2010.

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