

# THE UTILITY OF PREEMERGENCE HERBICIDES WITHOUT ADEQUATE RAINFALL IN SPRING 2012

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## Introduction

Herbicide resistance in weeds, especially glyphosate resistance, has generated many recommendations from University Extension over the last several years to include more preemergence herbicides with residual weed control activity as a greater part of an Integrated Weed Management approach. Unfortunately, over the last many years the economics have favored the sole reliance on a postemergence glyphosate system. It is apparent that constantly ‘beating the drum’ to include residual herbicides as a way to prevent resistance falls on deaf ears unless economics favor the approach. Moreover, residual herbicides applied at the preemergence timing do not come without potential drawbacks. These drawbacks can include injury on young crop seedlings under adverse weather conditions, poor performance when rainfall does not occur to ‘activate’ the herbicide into soil-water solution, and potential carryover under prolonged dry soil conditions adversely affecting a sensitive rotational crop. Unfortunately, we experienced both of the latter of those three statements in 2012, even though the extent to the problems of carryover will not be clear until we’re into the 2013 season. So, in a dry year like 2012, it may easily leave some to question whether the risk of preemergence herbicides is worth the reward. With this background in mind, it is important to constantly evaluate the value of using preemergence herbicides with residual weed control activity for protecting crop yield, and ultimately producing greater economic returns. At the UW-Madison Arlington Agriculture Research station, we annually conduct several herbicide evaluation trials. This year we also conducted several trials that evaluated the impact of several other pest management treatments on the yield of corn and soybean. Several trials revealed the impact of early-season weed control through the use of residual herbicides this year, but to stay concise, I will summarize one corn trial and one soybean trial which demonstrated the effect of early-season weed control in a dry year (2012).

## Materials and Methods

These trials were grown at the University of Wisconsin-Madison Arlington Agriculture Research Station near Arlington, WI in 2012. The corn trial was planted on 5/11/2012, and the soybean trial was planted on 5/14/2012. At the farm there were 2.4 inches of rainfall between May 1 and May 10, 2012 (before planting). Rainfall during the remaining May and June timeframe was 0.2 inches on May 24<sup>th</sup>, 0.4 inches on May 26<sup>th</sup>, and 0.2 inches on May 28<sup>th</sup>, 0.1 inches on June 12<sup>th</sup>, and 0.1 inches on June 21<sup>st</sup>. This equated to only 1 inch of rainfall during the first 48 to 51 days of crop growth. Moreover, rainfall did not occur for 10 to 13 days after the preemergence herbicide applications, which limited efficacy.

Because these trials focused on yield, plot dimensions were larger than normal efficacy plots. The corn trial plots were 10’ wide by 65’ long, and they were replicated six times. Corn was planted at 32,000 seeds/a. The trial design was a split-plot with nitrogen as a main plot effect

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where N was applied at either 135 or 185 lb/a. There were six subplot treatments based on increasing pest control inputs. The first three subplot treatments were increases in herbicide program 'intensity'. Those three treatments included 1) No PRE 2) Outlook® at 20 fl oz/a PRE 3) Verdict® at 15 fl oz/a PRE. All three treatments were followed by 0.77 lb ae/a glyphosate at V7.

The soybean study was planted at 143,000 seeds/a. Plots in the soybean study were 10' wide by 100' long and replicated four times. The soybean study was also a split-plot where main plots were split with a PRE herbicide treatment of 1.5 pt/a Boundary®, or no PRE herbicide treatment. The six subplots were treatments of increasing pest management intensity. In this trial the residual herbicide was followed by one pass of glyphosate (Touchdown Total at 24 fl oz/a) at the V3 soybean stage, and the NO PRE plots were followed by two passes of glyphosate at the same rate; the first pass at V2, and the second at V7.

#### Summary of 2012 results

Corn study: In brevity, averaged over the main plot effect of N rate, the NO PRE treatment yielded 175 bu/a, the Outlook treatment yield 182 bu/a, and the Verdict treatment yielded 191 bu/a.

Soybean study: In brevity, the whole plot effect of the PRE Boundary treatment, averaged over all six subplot treatments, was 4.1 bu/a where the NO PRE yielded an average of 45.3 bu/a and the PRE Boundary yielded 49.4 bu/a.

Given the yield difference in both corn and soybean trials at Arlington, WI this year, the return on investment (ROI) for preemergence residual herbicides was very favorable despite low rainfall. Reduced efficacy was observed from these soil-applied residual herbicides compared to expectations in a 'normal' year because of low rainfall for activation, however, the disadvantage of weed competition on corn and soybean from the loss of early-season soil moisture was equally more important than in a 'normal' year. However, the advantage of a weed control system with a diverse approach to controlling weeds, versus reliance on glyphosate alone, is a very valuable benefit for protecting against the development of glyphosate resistance.

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