

## Corn Weed Management Studies

Brent A. Pringnitz, extension program specialist,  
Robert G. Hartzler, professor,  
Department of Agronomy

### Introduction

Several studies were conducted in corn to evaluate commercially available herbicides for weed control, crop phytotoxicity, and crop yield. Various herbicide treatment combinations and application methods were evaluated.

### Materials and Methods

The studies were established using a randomized complete block design with three or four replications. Herbicide evaluation plot size was 10 ft by 25 ft. For studies that included yield evaluation the plot size was 15 ft by 25 ft. Herbicides were applied in 20 gallons of water per acre. Visual estimates of percentage weed control and crop injury data were made throughout June and July. Weed control observations are compared with an untreated control and are made on a zero to 100 rating scale with zero percent equaling no weed control. Crop injury ratings are on a 0 to 100 rating scale, with 0 representing no crop injury. Weed species and populations evaluated included: 50 to 100 foxtail, 30 to 75 waterhemp, and two to ten lambsquarters, Pennsylvania smartweed, and velvetleaf/ft<sup>2</sup>.

The soil was a Canisteo clay loam with a pH of 6.9 and 7.5% organic matter. The experimental design was a randomized complete block with three replications. The 1999 crop was soybeans. Tillage included spring field cultivation. Fertilization included 287 lbs/A 82-0-0 and 416 lbs/A of 10-25-27. Crop residue on the soil surface was 14% at planting. 'DeKalb hybrid DK545RR' glyphosate-tolerant corn was planted 2.0 inches deep on April 26 at 29,900 seeds/A in 30-inch rows. Herbicide application dates and

crops stages are presented in Table 1. Precipitation data are presented in Table 2.

### Results and Discussion

*KC-POST (Table 3)* – Callisto provided the most consistent broadleaf control. Control of waterhemp and Pennsylvania smartweed was poor with AE F130360 (experimental, Aventis). However, AE F130360, an ALS-inhibitor, would not be expected to control ALS-resistant waterhemp. No significant injury was noted from the treatments.

*KC-RRYD (Table 4)* – The sequential treatments (Dual followed by Roundup Ultra or two Roundup applications) and the late postemergence application of Roundup Ultra provided the most consistent control. However, the late postemergence treatments (alone and with Dual) showed lower crop yield due to early season weed competition. The early and middle postemergence treatments of Roundup Ultra provided less control due to weeds emerging after the treatments.

*KC-SYST (Table 5)* – Treatments that included both a preemergence and postemergence herbicide provided the most consistent weed control. Outlook applied early-postemergence provided poor grass control due to foxtail emerging before the treatment. AE F130360 failed to control ALS-resistant waterhemp and Pennsylvania smartweed.

*KC-PRE (Table 6)* – Single-product preemergence applications generally provided less effective foxtail control than applications of two or more active ingredients. The highest level of foxtail and broadleaf control was provided by Balance Pro + Surpass + atrazine. Treatments including Balance Pro or Callisto provided the most consistent control of broadleaves.

**Acknowledgments**

Aventis, BASF, Bayer, Monsanto, and Novartis provided support for these studies. The authors

also acknowledge Dave Rueber and Tom Hartwig for their assistance with these studies.

**Table 1. Herbicide application dates and crop stages.**

Treatment	Corn	
	Date	Crop stage
Preemergence (PRE)	April 26	--
Early postemergence (EPOST)	May 25	8 in.
Postemergence/mid postemergence (POST/MPOST)	June 2	12 in.
Late postemergence (LPOST)	June 9	18 in.

**Table 2. Weekly rainfall totals and largest single rainfall following planting.**

Weeks after planting	Total rainfall (inches)	Largest single rainfall event (inches)
1	0.12	0.07
2	0.40	0.40
3	0.70	0.25
4	0.79	0.50
5	0.02	0.01

**Table 3. Evaluation of postemergence broadleaf herbicides in corn. (KC-POST)**

Treatment	Rate	Unit	Timing	Crop	P.	Lambs-	Water-	Velvetleaf	
				Injury	Foxtail	Smartweed	quarters		hemp
				(% injury)		(% weed control)			
1 DUAL II MAGNUM	1.5	pt	PRE	2	78	92	99	99	99
CALLISTO (4SC)	3	fl oz	MPOS						
CROP OIL CONC.	1	% v/v	T						
FERTILIZER - 28%UAN	2.5	% v/v							
2 DUAL II MAGNUM	1.5	pt	PRE	0	92	33	99	47	99
AE F130360 (70WG)	1.25	oz	EPOST						
METH SEED OIL	1.5	pt							
FERTILIZER - 28%UAN	2	qt							
3 DUAL II MAGNUM	1.5	pt	PRE	0	83	83	99	93	89
AIM (40DF)	0.33	oz	EPOST						
ATRAZINE(90WG)	1	lb a.i.							
NONIONIC SURFACTANT	0.25	% v/v							
4 DUAL II MAGNUM	1.5	pt	PRE	0	85	93	99	83	86
BUCTRIL (2EC)	1.5	pt	POST						
5 UNTREATED CHECK (DUAL II MAGNUM, NO POST)			CHEC K	0	0	0	0	0	0
LSD (0.05)				2.43	8.33	21.88	0	11.6	14