

The Cost of Waiting Too Long

Weeds can grow with the crop for varying lengths of time without reducing yields. The critical period is the point in time when weeds irreversibly impact crop growth and reduce yields. Delaying weed control beyond the critical period is the primary risk associated with total post programs. Not only can yield losses begin soon after crop emergence, but the rate of yield loss can increase rapidly as control is delayed.

An experiment was conducted in north central Iowa (Northern Iowa Research and Demonstration Farm) in 2008 to quantify corn yield loss under high weed pressure. Differing periods of weed competition were created using post applications of glyphosate at either the V2, V4 or V5 corn stage (22, 36 or 43 days after planting); a weed-free treatment utilized a preemergence application of Harness followed by glyphosate.

The impact of competition on early-season corn growth was determined by harvesting corn shoots at the time of glyphosate application. Shoot biomass was reduced 10, 70 and 85% at the V2, V4 and V5 applications (Figure 1). Controlling weeds at the V2 and V4 stage allowed the corn to recover from much of the reduction in corn growth seen early in the season (5 and 12% reduction in yield compared to 10 and 85% reduction in shoot wt). Allowing the weeds to compete for an additional week (V4 to V5 stage)

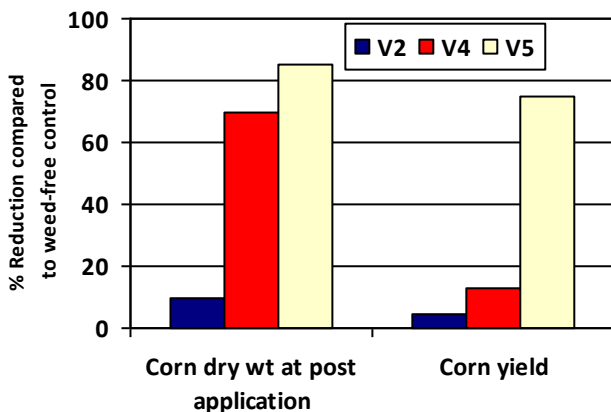


Figure 1. Effect of postemergence timing on corn growth and yield. Kanawha, IA 2008.

resulted in a 63% increase in lost yield compared to the V4 stage. This response may be due to the fact that the ear shoots are initiated near the V5 stage, thus the prolonged competition may have affected ear development.

The potential for weeds to reduce yields relatively early in the season is understood by most agronomists. However, the speed at which yield losses can accumulate may be underestimated. The number of bushels lost per day was calculated for the periods between the three post application dates (Table 1). From emergence until the V2 stage, an average of 0.5 bushel/A was lost each day glyphosate application was delayed, whereas between the V4 and V5 stages more than 17 bushels per day was lost.

Table 1. Average daily yield loss due to delay in glyphosate application.

Corn stage	Number of days	Bushel lost per day
VE to V2	16	0.5
V2 to V4	14	1.1
V4 to V5	7	17.2

This experiment illustrates the risks associated with delaying weed control beyond the critical period. The magnitude of yield loss is greater than would be found in most Iowa fields because of heavy weed pressure; however, the acceleration in yield loss as weed control is delayed is consistent regardless of weed pressure.

Diversified programs that include preemergence herbicides protect crop yields from early-season competition by reducing the number of weeds that emerge with the crop. These programs minimize risks and provide more stable economic returns than total postemergence programs.

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