

IMPACT OF WEED REMOVAL TIMING ON GLYPHOSATE-RESISTANT CORN (*Zea mays*).  
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Weed removal timing in corn is critical to minimize competition for available resources such as nitrogen. The objective of this experiment was to compare weed removal timing to in-season corn leaf nitrogen and resultant grain yield. Field studies were conducted in 2003 and 2004 in central and northeast Missouri. Corn 'Asgrow RX730' was planted in late April in 76 cm rows at a population of 69,500 seeds/ha. Weed removal treatments were timed for different sizes of grasses only (4), broadleaves only (4), and a mixed population of grasses and broadleaves (6). Grass only plots were established with early POST applications of 2,4-D, and grasses were removed at heights ranging 12 to 32 cm. Broadleaf competition was achieved by a PRE application of *s*-metolachlor; broadleaves were removed at heights ranging from 8 to 23 cm. POST glyphosate applications were used to remove weeds and additional applications were made to maintain weed-free conditions. This study was established as a randomized complete block design with four replications. A chlorophyll meter (Minolta® SPAD 502) was used to record corn leaf nitrogen at 10-day intervals in selected treatments from the initial timing of weed removal until plant senescence. For each site-year, SPAD meter readings were lowest for the untreated control, and readings were highest for the weed-free control. SPAD meter readings declined generally following 90 to 100 days after planting, reflecting leaf and plant senescence. Early season SPAD meter readings were similar between the 25 cm grass, 32 cm grass, and 20 to 25 cm broadleaf treatments, indicating few differences in the competition for available nitrogen. SPAD meter readings were up to 29 % lower for the weed removal treatments versus the weed-free control. Grain yield was reduced up to 92 % for the untreated control versus the weed-free control. In all 4 site-years, grain yield was similar for treatments with single and sequential applications of glyphosate, compared to the weed-free control, provided applications were made before weeds reached 15 cm in height. Also, grain yield reductions due to competition from the largest broadleaves (20 to 25 cm) were minimal. However, grain yield was 4 to 16% greater when broadleaves were removed initially at 5 to 10 cm compared to 20 to 25 cm in height. Grass pressure reduced yield up to 17% when glyphosate application was delayed until grasses reached 30 cm compared to the weed-free control. Grain yield was optimal when grasses were removed at 12 cm compared to delaying the removal until 30 cm. Reductions in corn leaf nitrogen reflected reduced grain yield from competition with weeds, but the availability of other factors, such as water, were also important.