

EFFECTS OF NITROGEN RATE AND WEED REMOVAL TIMING ON CORN YIELD.  
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Timely weed control and adequate nitrogen supply are both necessary to maximize corn grain yield and economic return. A field study was established in 2009 at the Michigan State University Agronomy Farm in East Lansing to investigate the effect of nitrogen rate and weed control timing on corn grain yield. A split-plot, randomized complete block design consisted of four preplant nitrogen application rates (0, 67, 134, and 202 kg N/ha) as main plots and six weed removal timings as subplots. Weed removal timings were defined by weed height to include control when weeds were 5, 10, 15, and 20 cm tall. Plots were maintained weed free after each weed removal timing. Two additional treatments included weed free and weedy (no weed removal) plots. At each weed removal timing, biomass samples were collected from a 0.25 m<sup>2</sup> area by species and fresh and dry weights recorded. Additionally, chlorophyll measurements were collected from corn ear leaves during pollination. Chlorophyll content increased with nitrogen rate and decreased with later weed removal timings. Biomass data indicated that number of weeds present at each weed removal timing was not affected by nitrogen application rate. Grain yield increased with N application rates and decreased, compared to the weed-free control, when weed control was delayed to 10 cm. Nitrogen use efficiency by corn decreased as weed removal timing increased. At the highest N rate, grain yield was the same among 0, 5, 10, 15, and 20 cm weed removal timings, indicating that grain yield loss due to delayed weed removal can be reduced with larger N application rates.