

IS WEED COMPETITION FOR NITROGEN IMPORTANT? Chris M. Boerboom, Professor, Department of Agronomy, University of Wisconsin, Madison, WI 53706.

Knowledge of weed crop interactions can help to guide weed management and other crop production decisions. Nitrogen is one of the three major resources that may become limiting in non-legume crops such as corn and the recent dramatic surge in the price of nitrogen fertilizers has increased the importance of optimizing nitrogen rates. Based on an experiment evaluating optimal nitrogen rates in corn with different durations of weed competition, it can be argued that weed competition for nitrogen may be more significant than competition for water or light. In the experiment, weeds were controlled preemergence or were allowed to compete until they were 10 or 30 cm tall before being controlled with glyphosate. At the economic optimum nitrogen rate, corn yield was significantly reduced when weeds were allowed to compete until they were 30 cm tall. It is reasonable to speculate that the yield loss from this duration of weed growth was caused by competition for water. However, with high nitrogen rates (100 kg/ha or more than the economic optimum nitrogen rate), corn yields with weed competition were equal to the weed-free corn. This suggests that nitrogen was no longer limiting with high rates and that early competition for water was not yield limiting. Although additional nitrogen could compensate for early-season weed competition, high nitrogen prices should preclude over application of nitrogen to manage the risk of weed competition. Partial budgets even suggest that preemergence herbicide programs that are twice as expensive as postemergence programs can have equal or greater profit at nitrogen optimizing rates. Although these results have implications for growers using inorganic nitrogen sources, growers using legumes or manure as nitrogen sources should also be aware of these relationships as nitrogen availability can be limited in these cropping systems.