

THE EFFECT OF NITROGEN ON WEED EMERGENCE AND GROWTH. Amy E. Guza, Karen A. Renner, and Adam S. Davis, Graduate Assistant, Professor, and Research Associate, Department of Crop and Soil Science, Michigan State University, East Lansing, MI 48824.

In 2003, a field study was conducted to determine the effect of nitrogen on the emergence and growth of five weed species. Weed species included giant foxtail, redroot pigweed, velvetleaf, common lambsquarters, and ladysthumb smartweed. Weeds were seeded April 15, April 29, and May 22, 2003 in a 1 m² area. At each seeding date, 0, 56, 112, or 168 kg N/ha of was preplant incorporated to a 5-cm depth prior to weed seeding. The experiment was a split-plot design with seeding date as the main plot, nitrogen rate as the sub-plot (3 m by 9 m), and weed species as the sub-sub plot. Soil samples were taken to a depth of 7.6 cm just prior to weed seeding and at one, two, and three weeks after seeding. Soil samples were analyzed for nitrate and ammonium concentrations using an extract of 1 N KCl and were analyzed colorimetrically. Weed seedling emergence and growth stage were recorded for six weeks after planting to evaluate the effect of nitrogen on weed emergence and growth.

Initial nitrate-N and ammonium-N concentrations were 5 and 3 kg ha⁻¹, respectively, on April 15; 7 and 3 kg ha⁻¹, respectively, on April 29; and 9 and 5 kg ha⁻¹, respectively, on May 22. One week after nitrogen was applied on April 15, the amount of total inorganic N (nitrate-N + ammonium-N) was similar to the amount of nitrogen applied. However, in samples collected in the second and third week after planting, total inorganic N did not reflect the nitrogen that was applied. On April 29 and May 22 planting dates, the available N was less than expected for all sampling dates. Giant foxtail and redroot pigweed emergence and growth did not increase with the addition of N, regardless of planting date. At each planting date, emergence of common lambsquarters and ladysthumb smartweed increased with the addition of N. Common lambsquarters, ladysthumb smartweed, and velvetleaf growth increased with the addition of nitrogen, regardless of planting date.