

RESIDUAL NITRATE LEVELS AS AFFECTED BY SPRING VS FALL ALFALFA CONTROL AND MANURE APPLICATION IN AN ALFALFA-CORN CROPPING SYSTEM. Bradley E. Fronning and Kurt D. Thelen, Graduate Research Assistant and Associate Professor, Department of Crop and Soils Science, Michigan State University, East Lansing, MI. 48824.

It is possible in the near future there will be a swing in crop production practices to more no-till practices and less tillage. Corn crops require large amounts of nitrogen to reach their potential yields. Under no-till practices it can be difficult to get enough nitrogen in the soil for the corn to develop and yield well. This research could help with that problem. If there is a difference among soil nitrogen levels in these treatments it could help producers get more nitrogen in the soil naturally without the use of artificial fertilizers. An added benefit of it would be that by using the no-till production practices it is possible that the producers could be sequestering carbon and helping reduce the emission of greenhouse gases.

Studies were conducted at Michigan State University near East Lansing and at Kellogg Biological Station near Hickory Corners, Michigan to determine the effect of spring vs fall control of alfalfa and manure application on soil nitrate levels available to the following corn crop. There were seven treatments: fall applied glyphosate + 2,4-D + fall manure, fall applied glyphosate + 2,4-D, spring applied glyphosate + 2,4-D + fall manure, spring applied glyphosate + 2,4-D, glyphosate applied 24 hours prior to corn planting (EARLY), glyphosate applied 24 hours prior to planting (LATE), and an untreated alfalfa check. Plots were 6 by 12.2 m and replicated 4 times at each location. This study was conducted over two years. Soil nitrate-nitrogen was measured to a depth of 0.9 m. Soil cores were collected twice a year, once in the fall and once in the spring.

Alfalfa control ranged from 83% with the LATE glyphosate treatment to 97% with the spring glyphosate +2,4-D treatment on May 9, 2003. On July 9, 2003 all treatments except the untreated provided greater than 90% control of alfalfa. There were significant differences among treatments in soil nitrate nitrogen in the spring of 2003 at the East Lansing site. Yield was significantly affected by treatment.