

EFFECT OF CARBON SEQUESTARTION PRACTICES ON WEED POPULATIONS. Bradley E. Fronning, Kurt D. Thelen, Dale R. Mutch, and Todd Martin, Graduate Research Assistant, Assistant Professor, District Extension Agent, and Technician, Department of Crop and Soil Sciences, Michigan State University, East Lansing, MI 48824.

Carbon sequestration has been a hot topic lately due to the increased awareness of greenhouse gases and the potential of global warming. Michigan State University is part of a consortium consisting of nine universities and a national laboratory investigating the potential for agricultural soils to be a sink for greenhouse gases. Potential alternatives to increase soil carbon in agricultural systems are to use no-till practices, cover crops, and/or add manure amendments. However, manure often contains weed seeds which may cause increased weed populations or population shifts resulting in higher weed control expenses.

Studies were conducted at Kellogg Biological Station near Hickory Corners, MI and at East Lansing, MI to determine the effect different carbon sequestration practices may have on weed populations. Experiments conducted at KBS investigated the influence of organic and conventional systems, and a no-till cropping system. Rye and clover cover crops were used with certain crops to try to increase soil carbon and decrease weed pressure in all three systems. Cover crop and weed biomass were harvested directly before any tillage operation or herbicide application.

The experiment at East Lansing examined the possibility of using a rye cover crop with or without either manure or compost to increase soil carbon in a silage corn/soybean cropping system. Silage corn and soybean cropping systems return low amounts of organic carbon back to the soil. Manure and compost was applied in April and December of 2002 and in April of 2003. Weed biomass and populations were determined after herbicide application at East Lansing in 2003. Glyphosate was applied on May 8 as a preplant application, and June 19 as a postemergence application. Samples were collected on May 13 and June 21.

Compost had a significant effect on weed densities and biomass with common lambsquarters being affected the most on May 13. Rye + compost had higher common lambsquarters populations and biomass than all other treatments on June 21.