

WEED SEEDBANK COMMUNITIES AFTER 35 YEARS OF TILLAGE AND ROTATION. Lynn M. Sosnoskie, John Cardina, and Catherine P. Herms. Department of Horticulture and Crop Science, The Ohio State University, Wooster, OH 44691.

Weed species diversity and community composition of the soil seedbank were characterized 35 years after the implementation of a long-term study involving cropping sequences (continuous corn, corn-soybean, corn-oat-hay) and tillage systems (conventional-, minimum- and no-tillage). Germinable seeds within the top 10 cm of soil in early spring were identified and enumerated in 1997-1999. Canonical discriminant analysis and cluster analysis were used to examine differences in weed community composition with respect to management system. The first canonical function explained 40 to 60% of the within-subjects variation for species composition, for all 3 years. The first canonical function was strongly associated with crop sequence. The canonical scores for the plots planted to corn-oat-hay clustered separately from the continuous corn and corn-soybean plots, and were statistically distinct from them according to Mahalanobis squared distances. There was no similar degree of separation in response to tillage, implying that crop rotation was more important in influencing community composition. Results suggest that weed management and other cultural practices in the corn-oat-hay system favor species with life-history characteristics that differ from species more commonly associated with corn and soybean systems. Crop sequence and tillage system are important non-chemical methods of shifting weed species number and diversity, and therefore, community structure. Manipulation of these factors could help to reduce the negative impact of weeds on crop production.