

EFFECT OF CRITICAL PERIOD OF COMPETITION AND NO SEED THRESHOLD WEED MANAGEMENT STRATEGIES IN A TRANSITIONAL VEGETABLE ORGANIC SYSTEM. Karen J. Amisi *, Douglas J. Doohan, Matthew D. Kleinhenz and Sally Miller, Graduate Research Assistant and Associate Professors, The Ohio State University/OARDC, Wooster, OH 44691.

Weed management is one of the biggest challenges faced by organic farmers. Frequently used weed management practices include tillage, crop rotation, living and plastic mulches, cover crops, smother crops, and slashing. To provide a more rationale approach, we investigated the use of two weed control strategies, Critical Period of Competition (CP) and No Seed Threshold (NST) for farmers transitioning from conventional to organic production. Field experiments were conducted in 2001, 2002, and 2003 at the Ohio Agricultural Research and Development Center in Wooster, OH. In 2001, a 4-year transitional organic rotation of wheat, clover, cabbage, and processing tomato was established in soil previously in a conventional corn/soybean/forage agronomic rotation. The experimental design was a split plot in a Randomized Complete Block Design with 4 replications. Main plots were soil amendments (none, raw dairy manure, composted dairy manure). Amendments were applied in spring at the rate of 101 kg N/ha and incorporated prior to planting. Subplots were weed control strategies; NST, where seedling weeds were removed weekly for the whole season and no weeds permitted to mature seeds in the field, and CP, where plots were kept weed-free only for the first 5-6 weeks of crop growth. Each crop had 6 main plots of 222 m² each and 24 subplots with an area of 56 m² each. The impact of weed management strategies was evaluated by counting emerged weed seedlings in tomato and cabbage plots, and by exhaustive germination in the greenhouse of weed seeds in soil samples taken from plots in early spring of each year. In 2001, emerged weed seedlings in cabbage and tomato plots and soil seed bank weed counts for broadleaf and total weeds indicated adequate homogeneity between plots. In 2002 and to a greater extent in 2003, there were more emerged weeds present in CP than in NST plots. The seeds in the soil seed bank decreased from 2002 to 2003 and the decline was greater in samples from NST plots than from CP plots. Specific conclusions about the effect of amendments on weed communities cannot be determined at this time.