

LONG-TERM EFFECTS OF SEEDBANK MANAGEMENT ON YIELDS IN VEGETABLE CROPS. David E. Hillger, Kevin D. Gibson and Stephen C. Weller, Graduate Research Assistant, Assistant Professor, and Professor, Purdue University, West Lafayette, IN 47907.

Controlling the amount of weed seed returning to the seedbank is a major component of an integrated weed management system. Field plots were established in 2000 that investigated the weed communities of three different soil management practices (rye cover, stale seedbed and conventional tillage) with two different weed seed management levels (critical threshold and zero seed threshold) within a two crop rotation (soybean and tomato) system. Radish, leaf lettuce, and succulent pea were planted into tilled strips within each treatment and allowed to grow without any additional weed control practices for the duration of the experiment (43 days for radish, 56 days for lettuce and 65 days for peas). Weed density in the plots and yields were collected for each crop and analyzed. The level of weed seed management previously practiced significantly influenced yield for all three crops. Yields for radish, leaf lettuce and pea were 29%, 31% and 39% higher, respectively, in the zero seed threshold treatments than in the critical period threshold plots regardless of soil management effect. In the case of pea, yields were 69% higher following a previous year soybean crop than a tomato crop. Radish and lettuce did not differ based on the previous year's crop. Our results provide strong evidence that successful management of the weed seed production and soil seedbank can drastically reduce weed pressure in the follow year's crop which in this case allowed early season vegetable production with no need for supplemental weed management.