GIANT RAGWEED INTERFERENCE AMONG CROPPING SYSTEMS. Jerron T. Schmoll, Emilie E. Regnier, and S. Kent Harrison, Research Associate, Associate Professor, and Professor, The Ohio State University, Columbus, OH 43210.

Studies were conducted to determine the potential of cropping systems to minimize giant ragweed establishment and competition. Cropping systems were established in 2000 in a field with a heavy giant ragweed population and consisted of a factorial combination of tillage (no-tillage vs. chisel plow), crop species (corn, soybean, fallow), and giant ragweed management (weedy, weed-free for 3-5 weeks after crop planting, and weed-free during the entire season). Giant ragweed cumulative seedling emergence was determined in the fifth year of the study (2004) as an indication of the relative seed bank size resulting from the previous four years of continuous cropping for each of the 18 different cropping systems. As expected, giant ragweed emergence in 2004 was reduced most (over 88%) in the weed-free treatment compared to the weedy treatment regardless of crop (corn, soybean, or fallow). Maintaining the field free of giant ragweed for 3-5 weeks reduced emergence in 2004 about a third (27 to 34%) in corn and soybean compared to the weedy treatment but had no effect in the fallow treatment, indicating that in the absence of competition, seed return by giant ragweed populations was not affected by a delay in emergence of up to five weeks. Giant ragweed emergence was 33 to 52% lower in soybean than in corn, averaged over giant ragweed management treatments, and the reductions were greater in no-tillage than in chisel-plow. The difference between the two crops may have been the result of faster canopy cover by soybean, and the stimulatory effect of N on giant ragweed growth in the corn crop. Giant ragweed populations were especially high in continuous no-tillage corn, due to reduced crop stand and vigor associated with accumulation of insect pests, particularly the common corn borer, and the addition of N. Although giant ragweed produces relatively few seed in comparison to other broadleaf annual weeds, and seeds are short-lived (approximately six years) and severely predated by rodents, severe and sustained control measures are required to reduce seed return and significantly impact emergence in subsequent years. There was no evidence that no-tillage reduced giant ragweed populations, despite the greater vulnerability of seeds to predation when left on the soil surface. Four years of continuous prevention of seed return reduced emergence by 90% in conventional tillage and 84% in no-tillage compared to emergence in the first year of the study. In the 3-5 weeks weed-free treatment, giant ragweed emergence in 2004 was reduced 18% in conventional tillage compared to emergence in 2000, while in no-tillage emergence increased 248%.

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