

NET INFLUENCE OF EARTHWORMS (*LUMBRICUS TERRESTRIS*) ON GIANT RAGWEED (*AMBROSIA TRIFIDA*) SEEDLING RECRUITMENT. J. Liu, E. Regnier, K. Harrison, C. Holloman, J. Schmoll, F. Diekman, and D. Barker. The Ohio State University, Columbus, OH.

*Lumbricus terrestris*, the common nightcrawler, buries large numbers of giant ragweed seeds over a range of depths inside its vertical burrows. Seed burial by *L. terrestris* can protect seeds by removing them from the soil surface where they are easily detected and consumed by seed predators, but it can also reduce seedling recruitment when seeds are buried inside burrows below optimum depths for emergence. Field experiments were conducted in 2005 and 2006 in Columbus, OH to determine the net effects of *L. terrestris* on giant ragweed seedling establishment in the presence and absence of seed predators. A hierarchical Bayesian model indicated that the probability of emergence was highest when neither predators nor earthworms were present. Adding predators decreased the probability of emergence more than adding *L. terrestris*. To determine if *L. terrestris* had a protective effect on giant ragweed in the presence of seed predators, we calculated a protectiveness ratio as the ratio of the observed emergence probability when predators and *L. terrestris* were both present to the expected emergence probability based on individual effects of *L. terrestris* and predators. The ratio ranged from 1.33 to 1.57 in 2005, suggesting that *L. terrestris* protected seeds from predation. There was no protective effect in 2006, possibly due to low predation intensity. A separate study of seed burial by earthworms and seed predation was conducted in sites with varying degrees of vegetative cover. The proportion of seeds buried by earthworms and consumed by predators varied widely among sites. The results indicate that the interaction of earthworms and seed predators is complex and depends on habitat and the relative activity-density of seed predators and *L. terrestris*. It is likely that *L. terrestris* increases giant ragweed seedling recruitment when the probability of recruitment losses due to seed predation exceeds the probability of recruitment losses due to deep burial by the earthworms. *Lumbricus terrestris* may facilitate giant ragweed establishment in no-tillage fields and successional sites with vegetative cover that provides a suitable habitat for vertebrate seed predators and few opportunities for seed burial.