

VARIATION IN MORPHOLOGY AND FATE OF GIANT RAGWEED SEED. Emilie E. Regnier, S. Kent Harrison, and Jerron T. Schmoll, Associate Professors and Research Associate, Department of Horticulture and Crop Science, Ohio State University, Columbus, OH 43210.

Experiments were conducted to quantify variation in seed (involucre) morphology among and within giant ragweed populations from different habitats and to determine if seed morphological features affected various seed fate processes. Variance component analysis of seed collected from 200 individual plants representing 8 populations indicated that 63% of the total variance in seed size and shape occurred among individual plants, 26% among populations, and only 12% within individual plants. Two-dimensional seed surface area and seed perimeter were greater, and seed perimeter:area ratio was smaller for giant ragweed populations growing in soybean fields compared to populations growing in undisturbed successional sites.

A seed burial study indicated that emergence of seedlings from large seeds (> 1.1 cm-diam) was more evenly distributed over burial depths ranging from 0 to 10 cm compared to small seed (< 0.7 cm-diam), for which seedlings emerged primarily from the 0 to 5 cm burial depth. Giant ragweed seed viability after 4 years of burial was not influenced by seed size and averaged 1, 10, 23, and 38% for seeds buried 0, 5, 10, and 20 cm below the soil surface. Predation studies showed that mice exhibited size preference for giant ragweed seed by consuming small seed at approximately twice the rate at which they consumed large seed.

Additional experiments were conducted in which small and large giant ragweed seed were placed separately on the surface of a no-till soil within enclosed plots in order to monitor their respective fates when rodent, carabid, and bird access to the seed were denied. We observed that earthworms actively gathered and stored giant ragweed seed in their burrows at differential rates according to seed size. Approximately two weeks after seed deposition in the fall, earthworms had gathered 94% of the small seed into burrows, compared to 62% of large seed. The entire significance of seed polymorphism in giant ragweed fate and survival remains unclear; but thus far it appears that seed size alone plays a significant role in seedling emergence, seed predation, and seed burial processes.