Public Abstract
First Name:Heidi
Middle Name:Renee
Last Name:Davis
Adviser's First Name:Reid
Adviser's Last Name:Smeda
Co-Adviser's First Name:
Co-Adviser's Last Name:
Graduation Term:SS 2015
Department:Plant, Insect and Microbial Sciences
Degree:MS
Title:Emergence Pattern of Amaranthus spp. and Impact on Growth and Reproduction

Heidi R. Davis and Reid J. Smeda (Advisor)
Amaranthus species such as common waterhemp (Amaranthus rudis) and Palmer amaranth (Amaranthus palmeri) are troublesome annual weeds in cropping systems throughout the Midwest. Seedlings can emerge throughout the growing season impacting crop yields and produce prolific amounts of seed. Understanding the relationship of emergence date to plant growth and seed production is necessary to optimize management practices and minimize re-charging the soil seed bank. Natural emergence of waterhemp and Palmer amaranth was recorded over a two-year period from spring through fall. Germination was observed as soon as April 22 and as late as October 30 (252 day period). Emergence was concentrated in the spring coinciding with abundant soil moisture. The time to 90% cumulative emergence in no-till areas was 6 and 13 weeks after initial emergence in 2013 and 2014, respectively. In a separate study, seedlings of both Amaranthus species were established at five emergence timings from mid-May through mid-September. Waterhemp and Palmer amaranth plants emerging in May produced up to 803,400 seeds, while seedlings emerging in September produced up to 33 seeds. Waterhemp and Palmer amaranth plants produced viable seeds in as little as six days. Growth and reproductive data suggest that crop producers should implement management systems for common waterhemp and Palmer amaranth for the majority of the growing season to prevent additions to the soil seedbank.