

COMPARISON OF FIVE COMMON WATERHEMP (*AMARANTHUS RUDIS*) COHORTS: PLANT POPULATION DENSITY, FLOWERING DATE, AND CONTRIBUTION TO THE SOIL SEEDBANK. Chenxi Wu and Micheal D. K. Owen, Graduate Research Assistant and Professor, Department of Agronomy, Iowa State University, Ames, IA, 50011.

Common waterhemp is an increasingly problematic weed of agronomic systems throughout the Midwest United States. Common waterhemp seeds have a discontinuous emergence pattern and are able to germinate later in the season than many summer annual weed species, which makes common waterhemp difficult to manage, particularly in glyphosate-based crop systems. Our 2009 field study identified five cohorts of common waterhemp. Cohorts were established by counting and marking all seedlings emerged at a certain day in a 5m*5m quadrat at emergence intervals (May 22, May29, June 6, June22 and July 8) which were influenced by rainfall events. Seedling emergence was defined as full expansion of two cotyledons, and seedlings that emerged later within an established cohort area were removed. The population density, especially female plant density, of each cohort decreased as emergence occurred later in the summer with 4, 2, 2, 2 and 1 plants/m² in cohorts 1 through 5, respectively. Later-emerging cohorts transitioned from vegetative growth to reproductive growth faster and the time interval between emergence and flowering for each cohort varied from 27 to 54 days. However, there was no difference in reproductive time with all cohorts similar in time requirement of generating viable seeds. Common waterhemp was able to produce up to $5.6 (\pm 1.3) \times 10^5$ seeds/m². Later cohorts had reproductive outputs almost as high as earlier cohorts although later cohorts had a significantly smaller plant size. Knowledge of life history traits of cohorts, such as growth and reproduction would help in understanding the biology of common waterhemp and consequently help to develop guidelines for its control.