

FIELD COMPETITION BETWEEN GIANT CHICKWEED (*MYOSOTAN AQUATICUM*) AND ALFALFA. Joseph D. Bollman and Michael P. Crotser, Department of Plant and Earth Science, Undergraduate Research Assistant and Assistant Professor of Agronomy, University of Wisconsin at River Falls, River Falls, WI 54022.

A field replacement series study was conducted in River Falls, WI in 2004 to investigate competitive interactions between alfalfa and giant chickweed plants grown at different proportions. The experiment was a randomized complete block design with three replications. Four-leaf giant chickweed transplants were planted on June 18 into direct seeded alfalfa within 1.2 m² plots. Plots were then thinned to proportions of 0:100, 25:75, 50:50, 75:25, and 100:0 of alfalfa to giant chickweed plants, respectively. Each plot totaled of 100 plants and areas surrounding the plots were kept weed-free by hand removal.

The relative growth and performance of alfalfa and giant chickweed was determined by calculating plant relative yield (PRY); the per plant mass in monoculture divided by the per plant mass in mixed species stands. A PRY value greater than one indicates greater intraspecific vs. interspecific competition, whereas a PRY value less than one indicates greater interspecific vs. intraspecific competition. In addition, the relative per-unit area productivity for a particular proportion of two species can be predicted by calculating the relative yield total (RYT). A RYT greater than one suggest annidation or avoidance of competition (greater biomass productivity per unit area in mixed stands vs. monoculture), while RYT less that one suggest antagonism (less biomass productivity per unit area in mixed stands vs. monoculture).

The study was harvested on July 29 and shoot dry weights were determined and expressed on a per-plant basis. Sub-samples of dry matter were analyzed for forage quality, including ash content, neutral detergent fiber, and crude protein. PRY and RYT were calculated and these data with plant weights, and forage quality values were analyzed using analysis of variance. If means were significantly different, they were separated using Fisher's protected LSD test.

Giant chickweed shoot biomass and PRY were not influenced by the different alfalfa to giant chickweed proportions, suggesting giant chickweed is equally competitive in mixed stands and monoculture. Greatest alfalfa shoot biomass was observed at the 100:0 alfalfa to giant chickweed proportion, while lowest biomass was observed at the 75:25 alfalfa to giant chickweed proportion. Alfalfa PRY was negatively influenced by interspecific competition with giant chickweed. Proportions of 50:50 and 75:25 of alfalfa to giant chickweed noted PRY values significantly lower than 1.0, indicating alfalfa is less competitive in mixed species stands than when grown alone. RYT values for the majority of the mixed species proportions suggested neither greater nor less biomass productivity per-unit area. Giant chickweed present in any of the forage samples significantly increased ash content. Greatest crude protein and lowest neutral detergent fiber levels were observed in pure stands of alfalfa. This data suggests forage quality increases as the proportion of alfalfa increases.