DEVELOPMENT OF A CULTIVAR COMPETITIVENESS RANKING SYSTEM FOR POTATOES. Christopher M. Konieczka, Jed B. Colquhoun, and Richard A. Rittmeyer, Graduate Research Assistant, Associate Professor, and Research Associate, University of Wisconsin, Madison, WI 53706.

Potato producers rely heavily on herbicides for the majority of weed control. However, recent occurrences of herbicide resistant weeds and the lack of new herbicide registrations have stimulated interest in alternative strategies. While most alternative strategies, such as cultivation and flame weeding, rely on additional energy inputs, the most important weed control decision may be made when loading the planter. The choice of a potato cultivar that suppresses or tolerates weeds can be a component of an integrated weed management system that reduces the reliance on herbicides. The objective of this research was to develop a potato cultivar competitiveness ranking system based on emergence and canopy development, weed suppression, and ability to maintain crop yield in the presence of weeds. Ten potato cultivars ('Atlantic,' 'Bannock Russet,' 'Dark Red Norland,' 'Goldrush,' 'Rodeo,' 'Russet Burbank,' 'Russet Norkotah,' 'Snowden,' 'Superior,' and 'Villetta Rose') were evaluated in 2006 and 2007 in Hancock, Wisconsin. The study was arranged in a randomized complete block split-plot design with cultivar as the main plot factor and weed pressure as the sub-plot factor. Weed pressures included: 1) potatoes that remained weedy throughout the season; 2) potatoes that were hand-weeded for four weeks after emergence; and, 3) potatoes that were hand-weeded for the duration of the season. Early season emergence was slowest where 'Bannock Russet' and 'Rodeo' were grown. Early-season canopy development was greatest for 'Russet Burbank' and least for 'Bannock Russet.' In 2006, weed biomass in potatoes that were hand-weeded for four weeks after emergence was greatest in 'Bannock Russet' and least in 'Atlantic,' 'Dark Red Norland,' 'Snowden,' and 'Superior.' Early-season emergence, canopy development and light interception, and weed biomass were strongly related to potato yield. In 2006, 'Bannock Russet' potato yield was reduced compared to 'Russet Burbank' both when potatoes were left weedy throughout the season and when they were hand-weeded for four weeks after emergence. 'Goldrush' yield was also less than that of 'Russet Burbank' when left weedy throughout the season. In 2007, yield was lowest when 'Bannock Russet' remained weedy throughout the season.

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