

Impacts of weed competition on plant characters and the critical period of weed control in rice under saline environment

ABSTRACT

An experiment was conducted in pots at the glasshouse of the Universiti Putra Malaysia during June to November 2011 to determine the critical period of weed-crop competition in transplanted rice under saline condition. One salt tolerant rice variety (MR232) and three salt tolerant weed species (*Echinochloa colona*, *Cyperus iria* and *Jussia linifolia*) were studied under three salinity levels. Different durations of weed interference and weed-free period were imposed to understand the impact of time on crop characteristics of rice. Critical periods of weed competition under 5% and 10% loss were determined through Logistic and Gompertz equations. Results revealed that the critical period of crop-weed competition were different under different salinity levels. The rice and weed dry matter, rice plant height, chlorophyll content, leaf area, number of tillers, filled grain, 1000 grain weight and grain yield were reduced with increased crop-weed competition period. Weed dry weight was also increased with prolonged weed competition period. The critical period of crop-weed competition increased with the elevated salinity levels. The critical period for weed competition under 5% yield loss at 0, 4 and 8 dS m⁻¹ were 14 to 55, 12 to 64 and 7 to 80 days, respectively. The estimated critical period for rice at 10% yield loss level were 36 to 45, 32 to 48 and 23 to 64 days at 0, 4 and 8 dS m⁻¹, respectively. The present study concludes that more intensive weed management operations in rice are needed under saline than at non-saline environments.

Keyword: Critical period of weed competition; Logistic and Gompertz equations; Rice; Weed management