Competition Between a Glyphosate-resistant and Susceptible Biotype of junglerice (*Echinochloa colona*).

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Junglerice (*Echinochloa colona*) is a problematic weed in annual and perennial cropping systems as well as non-crop areas of California. This problem has been further aggravated by the discovery of glyphosate-resistant (GR) biotypes in the Central Valley. Development of effective management strategies for herbicide-resistant weeds requires an understanding of population dynamics and potential impacts of the resistant biotype. For example, some herbicide-resistant biotypes carry a fitness penalty and can have reduced competitive ability than the herbicide-susceptible biotypes. Therefore, study of the competitive ability of resistant and susceptible biotypes of weeds is of ecological significance and can impact weed management decisions. Some studies have found that the GR horseweed (*Conyza canadensis*) was more competitive than the glyphosate-susceptible (GS) biotype. However, it is not known if it is the same case with junglerice. This needs to be determined as the findings may have ecological significance to the population dynamics of these two biotypes of junglerice in the Central Valley. Therefore, a study was conducted in summer 2015 in Fresno to compare the competitive ability of GR and GS junglerice.

Two- to 3-leaf seedlings of a confirmed GR and a GS junglerice biotype were obtained from University of California, Davis and were transplanted into 15.1 l (4 gal) plastic pots containing field soil. In each pot, the GR and GS plants were planted at different ratios in a replacement series experiment style. The ratios were 4:0, 3:1, 2:2, 1:3, and 0:4 of GR and GS plants, respectively. Each plant was labelled with a small plastic stake for identification. Each treatment was replicated four times and the experiment was arranged as a randomized complete block. All the pots were irrigated with 1.1 l/pot (0.3 gal/pot) of water every two days. Each pot was also fertilized with 100 ml (0.1 qt) of a solution containing 4 g (0.14 oz) of commercial fertilizer (Miracle-Gro) twice during the growing season. The plants were grown for six weeks. At the early flowering stage, the plants from each pot were individually harvested at the soil surface. After harvest, the plants were individually stored in paper bags, oven dried at 60° C for 3 days and shoot dry weights was recorded. Data were analyzed using analysis of variance procedures in SAS at a 0.05 level of significance and graphs were prepared using SigmaPlot.

The total average aboveground biomass and total dry weight of the inflorescence was greater in the GS than in the GR type. However, the number of flower heads was greater in the GR than in the GS type. This indicated that the biomass allocation patterns to the reproductive structures and total seed production could be different in the GS and the GR junglerice. However, this cannot be ascertained as the experiment was terminated before seed set. The replacement series data showed that the GS junglerice was more competitive than the GR biotypes and produced more biomass at all densities. Therefore, this study indicated that the GS was more competitive than the GR junglerice biotypes tested. However, it cannot be generalized if this is the case with all GR and GS biotypes of junglerice in California. The study will be repeated in 2016.