AN INITIAL TEST INTO THE SELECTIVITY OF EIGHT HERBICIDES FOR MANAGEMENT OF HYDRILLA IN THE PRESENCE OF EIGHT CO-OCCURING NATIVE PLANT SPECIES

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The effects four systemic and four contact herbicides on hydrilla and eight native aquatic plant species was observed over a 12 week period at the mesocosm facility located on the R.R. Foil Plant Science Research Center, Mississippi State University, Starkville, Mississippi. A series of treatments were applied to a set of emergent and floating plant species, as well as, a treatment for submersed plant species. Emergent and floating species consisted of American Lotus (*Nelumbo lutea* Willd.), white water lily (*Nymphaea odorata* Aiton), water primrose (*Ludwigia peploides* (Kunth) P.H. Raven) and American pondweed (*Potamogeton nodosus* Poir.). Submersed species consisted of coontail (*Ceratophyllum demersum* L.), elodea (*Elodea canadensis* Michx), bladderwort (*Utricularia* L.), sago pondweed (*Stuckenia pectinata* (L.) Börner), and hydrilla (*Hydrilla verticillata* L.f Royle*)*. Each plant species was planted in 10 x 12 centimeter (cm) pots or 25 x 30 cm submersible cages and was grown for 4 weeks prior to treatment. Plants were treated with four contact herbicides (diquat, endothall, flumioxazin, and copper) and four systemic herbicides (fluridone, imazamox, penoxsulam and bispyribac sodium). All herbicides were applied to the water at typical recommended treatment rates for hydrilla. Contact herbicides were allowed a 12 hour contact time, after which the tanks were drained and replaced with pond water. Harvests for both systemic and contact herbicide treatments were conducted at 4, 8, and 12 weeks post treatment to assess plant biomass and re-growth. Treatments were compared using a two-way analysis of variance with a Fisher's protected LSD test, using time as a variable and species as a variable. The systemic herbicide bispyribac sodium and the contact herbicide copper significantly reduced hydrilla biomass when compared to all other treatments after the 12 week period. Copper also significantly reduced the biomass of all submersed plants used in the study. In contrast, bispyribac sodium selectively controlled for hydrilla, and all other submersed and emergent/floating species treated with bispyribac sodium were not significantly reduced when compared to the reference over the 12 week study period. Research into herbicide selectivity allows for the development of herbicide use patterns that maximize the control of hydrilla and minimize the effects on native aquatic plant species.