
Different Strategies for Different Weeds: Biological Control of Nutsedges, Pigweeds, Tropical Soda Apple, and Grasses with Plant Pathogens

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Dactylaria higginsii and *Phomopsis amaranthicola* are effective bioherbicides for nutsedge (*Cyperus rotundus* and *C. esculentus*) and pigweed (*Amaranthus* spp.) species. These fungi are highly host-specific at the generic level respectively to *Cyperus* spp. and *Amaranthus* spp. They readily produce spores on commonly used laboratory agar media and natural media such as milled white rice. We are pursuing the EPA biopesticide model to develop and register *D. higginsii* and *P. amaranthicola* as commercial bioherbicides. Certain strains of *Ralstonia* (= *Pseudomonas*) *solanacearum* kill tropical soda apple (*Solanum viarum*) when they are injected into the plant stem. For field use, a cut-and-swab or cut-and-spray method of inoculum application has been developed, and this method provides nearly 100% weed control within a week. For practical use of this bacterium in Florida, we are developing a system of 'in-time production' and application of fresh, unformulated inoculum. Two bioherbicide systems, based on the use of two or three pathogens in a 'multiple-pathogen strategy', are effective for the control of guineagrass (*Panicum maximum*) with *Drechslera gigantea*, *Exserohilum longirostratum*, and *E. rostratum*, cogongrass (*Imperia cylindrica*) with *Bipolaris socchari* and *D. gigantea*, and several other grasses. We anticipate further progress in the development and registration of all of these bioherbicide agents. A detailed discussion of these biological control systems will be presented.

Ice Nucleating Active Agents: Interaction with the Overwintering Success of Insects

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The strategy of using exotic phytophagous insects in a sustained effort to control plant pest populations has had many unequivocal successes, partial successes and unexplained failures. Where success has been less than complete, an inability of the insects to over-

winter in numbers sufficient to maintain control of the plant pest can be a cause of the program failure. This presentation examines the relationships of ice nucleating agents (INA) with overwintering insects and earmarks areas where INAs can cause problems for non-native insect species. Approaches for assessment of INA barriers and their possible remedies will also be discussed.