

populations often increase in response to better plant quality, their overall impact on the plant population may be negated by profuse plant growth. The net result in many of these situations is that adequate biological control is not achieved. We are investigating the interactions between aquatic nutrient-loads, plant-tissue nutrient-storage and insect- and plant-population dynamics. Experiments carried out in large 'hydroponic' systems measure water and plant nutrient concentrations, plant growth and insect damage at nutrient levels representative of eutrophic and oligotrophic waters. Results indicate that *N. eichhorniae* has little impact on water hyacinth at high levels of N and P, while *N. bruchi* displays a reasonable level of control. At low nutrient levels both weevil species cause high levels of damage to the weed population. Further experimentation and field validation are required to confirm these results. This project should provide important information on integrating biological control with other water hyacinth control methods into an overall water-catchment management-strategy for eutrophic waters.

Combined non- or low-virulent pathogens and special formulated carriers as broad-spectrum bioherbicides

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The use of broad-spectrum bioherbicides to control weeds is proposed here. The advantages of using broad-spectrum bioherbicides include: (i) appeal to industry regarding product market-size; (ii) limited environmental pollution; (iii) safety; and (iv) ease of application by homeowners and farmers. One disadvantage is that non-specific organisms may be difficult to register for commercial use. However, such difficulty may be moot for saprophytic or low-virulent organisms that require special carriers for infection. With the use of specific carriers, organisms can be applied to target weeds with very little or no possibility of infecting nearby plants; only plants which come into contact with the organism will be damaged. Drift from oil-based sprays is extremely limited, and the small amount of spray that reaches desirable plants would cause insignificant damage. The technique is especially suited for orchards and vineyards. Results of greenhouse studies are described for the effects of saprophytic or low-virulent pathogens applied in special carriers to a broad-range of plants.