

# APCRP: Applied Use of Insect Biocontrol Agents

## Capability

Many introduced aquatic plant species have become serious problems in areas of the U.S. where the environment is conducive for growth. These species impede navigation and flood control, hinder recreation, and increase human health risks by providing breeding areas for disease vectors such as mosquitos. Biological control has been undertaken for several of these species; however, only limited applied research has been conducted to improve the release, establishment, and monitoring of these agents in an effort to increase their efficacy.

This research focuses primarily on improving procedures for using insect agents effectively within existing aquatic plant management programs. This entails evaluating agent impact through laboratory, greenhouse, and in-field experimentation, implementing cost-effective release and establishment procedures, and developing mass-rearing strategies. This research is performed in collaboration with United States Army Corps of Engineers (USACE) Districts and federal and state agencies, including the United States Department of Agriculture- Agricultural Research Service (USDA-ARS) and the United States Department of the Interior (DOI). To date, this work has primarily focused on biological control of giant salvinia (*Salvinia molesta* Mitchell,) and waterhyacinth (*Eichhornia crassipes* (Mart.) Solms).

The major objective of this work is to develop procedures to cost-effectively apply and use insect biocontrol agents for introduced aquatic plants. Primary objectives include: 1) development of appropriate release and establishment procedures, 2) develop suitable evaluation tools to determine impact and efficacy of specific agents, 3) implement research to develop cost-effective mass-rearing procedures, allowing releases of high numbers of high-quality agents for use by operational personnel, and 4) ensure agent use is compatible with existing management strategies.



**Figure 1: Releasing the waterhyacinth plant hopper in a large waterhyacinth infestation in Louisiana.**

## Applications

The release and establishment of insect biocontrol agents can have a significant impact on management operations. The introduction of natural insect enemies of target plants has caused the reduction of plants such as alligator weed, keeping them below problem levels on an annual basis for over 40 years. This type of technology significantly reduces cost and time needed for aquatic plant management and leads to more sustainable management practices.

## Status

This work is ongoing through FY16.

## Documentation and References

- Grodowitz, MJ, NE Harms. In press. Use of an inexpensive chlorophyll meter to predict nitrogen levels in leaf tissues of waterhyacinth (*Eichhornia crassipes* (Mart.) Solms). *Journal of Aquatic Plant Management*.
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- Grodowitz, MJ, S. Johnson, J. Woodard, N. Harms, G. Dick, J. Freedman. In press. Update on the progress of rearing and establishing the waterhyacinth planthopper (*Megamelus scutellaris* Berg; Hemiptera: Delphacidae) APCRP Technical Note. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

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# Article Sources and Contributors

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