

Entom

U.S. Department of Agriculture <b>Accomplishments Report AD-421</b> U.S. Dept. of Agriculture, State Agricultural Experiment Stations and Other Institutions			Date (Month, Day, Year)  01/10/2013		
1. Accession  0213667	Agency Identification No.  2. CSREES 3. LAB		5. Work Unit/Project No.  LAB93899		6. Status  Final Report
7. Title  Biological Control of Arthropod Pests and Weeds					
12. Investigator Name(s) (Last Name and Initials)  Johnson, S. J.					
20. Termination Date 09/30/2012			40. Period Covered (mo/da/year): 10/01/2007 TO 09/30/2012		
Outputs:  Results of the salvinia and red imported fire ant (RIFA) biological control research were presented at the S.E. Branch (8 submitted talks and 1 invited) and national Entomological Society of America meeting (8 talks), Rocky Mountain Conference of Entomology (5 talks) and once each at National Pest World 2011 (invited), Imported Fire Ant Conference (2010), Florida Entomological Society (2012), North American Benthological Society (2011), and the Southern Division of the American Fisheries Society (2010). Six articles on fire ant and 3 articles on salvinia biological were published in high impact journals. Four articles on fire ant and salvinia biological control were published in the Louisiana Agriculture magazine and a chapter on rearing the salvinia weevil in the greenhouse was included in the "Guide to Mass Rearing the Salvinia Weevil for Biological Control of Giant Salvinia" published by Texas A&M AgriLife Extension Service. Patent applications for "Floating Pitfall Trap" were filed with the U.S. Patent Office (Serial No. 61/420,906) and International Patent Office (PCT/US 2011/063666).					
Outcomes/Impacts:  Establishment of <i>Pseudacteon cultellatus</i> from the October 2011 release near Clinton was not confirmed at the release site in May or September. There were no additional releases of any <i>Pseudacteon</i> species in Louisiana in 2012. <i>P. tricuspis</i> was collected for the first time over the 4 year study in both May and September in the phorid free area. <i>P. tricuspis</i> numbers finally rebounded from the harsh winter of 2010 in phorid areas in September and was only 39% below 2009 levels and increased 3.04 fold from spring to fall. <i>P. curvatus</i> numbers were significantly different among years ( $p < 0.002$ ) but not between seasons or the two areas. Overall, a significant decrease (23%) was detected in fire ant population index at both locations between 2009 and 2012 ( $p < 0.05$ ). The populations rebounded in 2012 but the overall decline was still probably associated with the long cold winter of 2010 and not specifically phorid fly impacts. Classical biological control efforts against red imported fire ant (RIFA), if successful, will result in lower populations of this pest and reduced pesticide use for its control. The colony of the plant hopper, <i>Megamelus scutellaris</i> , a new biological control agent of water hyacinth, was lost in fall 2011, but reestablished during spring 2012. <i>M. scutellaris</i> releases were made in 1.086 cubic meter screen cages at three locations, Gramercy and Baton Rouge (2 cages each) and Luling (1 cage). Approximately 600 hoppers were released in each cage in early June. Hoppers were observed in the Gramercy and Baton Rouge cages until August 1; but were never recovered at Luling. There were no hoppers observed after August 15 at any of release sites. A new biological control project was initiated against water lettuce, <i>Pistia stratiotes</i> with the water lettuce weevil, <i>Neohydronomus affinis</i> . Weevils were obtained from the Corps of Engineers, Water Ways Experiment Station in Vicksburg, MS. Several releases were made in a 1.5 acre pond in Baton Rouge and a lake in Luling over the spring. The Baton Rouge site had no weevils present in April samples, but the Luling site had a natural infestation of 0.8 weevils/kg of water lettuce. August sampling found an average of 5.68 weevils/kg at Luling and 1.25 weevils/kg at Baton Rouge. By early November the Luling population had increased to 15.68 weevils/kg (312 per sq m) and 1.31/kg at Baton Rouge. Water lettuce plants at Luling were heavily damaged and plant density reduced in isolated spots on the lake. Classical biological control efforts against common and giant salvinia, water hyacinth and water lettuce will reduce the amount of surface area infested with these invasive aquatic weeds and reopen many areas in Louisiana to duck hunting, normal fishing and other recreation activities.					
Publications:  Parys, K.A. and S.J. Johnson. 2012. Impact of the red imported fire ant, <i>Solenopsis invicta</i> (Hymenoptera: Formicidae), on biological control of salvinia minima (Hydropteridales: Salviniaceae) by <i>Cyrtobagous salviniae</i> (Coleoptera:					



Curculionidae). Florida Entomologist 95: 136-142.

Eisenberg, L.J. and S.J. Johnson. 2012. Rearing the salvinia weevil in the greenhouse. In: A. Knuston and J. Nachtrieb, eds. A guide to mass rearing the giant salvinia weevil for biological control of giant salvinia. ESP-475 Texas A&M AgriLife Extension Service.

Participants:

Seth Johnson (PI), Anna Meszaros, Lee Eisenberg, Katherine Parys, Dearl Sanders, Mike Ferro, LSU AgCenter. Partner Organizations: Anne-Marie Callcott (USDA-APHIS), Mike Grodowitz (Corps of Engineers, Water Ways Experiment Station), Phil Tippins (USDA-ARS).

Target Audiences:

Land owners, property owners around recreational lakes and hunting clubs impacted by salvinia, water lettuce and water hyacinth infestations and cattlemen with fire ant infestations.

Project Modifications:

Not relevant to this project.

Approved (Signature)	Title	Date
		