

Tame Invasives Portal: A Solution for Your Life

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Local, state, and federal governments in Florida spend an estimated \$12,500,000 annually to manage four invasive plants: old world climbing fern (*Lygodium microphyllum*), tropical soda apple (*Solanum viarum* Dunal), Brazilian pepper-tree (*Schinus terebinthifolius*), and melaleuca (*Melaleuca quinquenervia*). Often times, these invasive plants can not be adequately managed utilizing traditional mechanical, chemical, and cultural practices. Biological control is another proven, yet under utilized, strategy that can be used to manage invasive plants. Unfortunately, there is a lack of understanding of the role of biological control as an effective tool in our efforts to control invasive plants. A web portal entitled “TAME Invasives: A Solution for Your Life” is made available by the University of Florida at <http://pesticide.ifas.ufl.edu>. This portal features research-based information, multimedia products and online coursework that focus on the management of these four invasive pest plants. Online courses have been developed to teach course participants how to 1) manage these invasive plants; 2) use herbicides in the most effective manner that is safe for people and the environment; and 3) understand the role of biological control as an essential Integrated Pest Management (IPM) tool for the management of these invasive plant species.

Brazilian pepper-tree (*Schinus terebinthifolius*), old world climbing fern (*Lygodium microphyllum*), melaleuca (*Melaleuca quinquenervia*), and tropical soda apple (*Solanum viarum* Dunal) are four invasive exotic pest plants designated as Category I Invasives by the Florida Exotic Pest Plant Council. This designation indicates that these plants are among the worst invasive pest plants in South Florida causing significant damage to the environment and economy of the state. Data provided by the University of Florida, IFAS Center for Aquatic and Invasive plants indicated that in 2005, government agencies in Florida spent \$2.9 million on Brazilian pepper-tree management, \$1.1 million on old world climbing fern, \$8.1 million on melaleuca, and \$416,983 on tropical soda apple. Management of these four invasive exotic pest plants accounts for a significant portion of the billion dollar annual price tag the government spends on invasive species management.

Often times, invasive exotic pest plants can not be adequately managed utilizing traditional mechanical, chemical and cultural practices. Biological control is another proven, yet under utilized, strategy that can be used as part of an integrated pest management (IPM) plan to manage invasive plants. Biological control involves the use of host-specific pathogens, insects or other agents to reduce pest levels or inhibit the well-being of pest species. Unfortunately, there is a lack of understanding of the role of biological control as part of an IPM plan. A web portal entitled “TAME Invasives: A Solution for Your Life” is being made available by the University of Florida at <http://pesticide.ifas.ufl.edu>. This portal features research-based information, multimedia products and online coursework that focuses on IPM plans for these four high priority invasive pest plants in South Florida with an emphasis on biological control.

Materials and Methods

Online courses have been developed to teach course participants how to 1) manage these high priority invasive plants; 2) use herbicides in the most effective manner that is safe for people and the environment; and 3) understand the role of biological control as an essential Integrated Pest Management (IPM) tool for the management of these invasive exotic pest plant species. In addition, this portal features information about the University of Florida/IFAS research and extension biological control program initiatives for these four high-priority South Florida invasive plant species.

Several biological control agents are currently in use as part of an IPM plan for invasive plant management:

TROPICAL SODA APPLE. Tropical soda apple, *Solanum viarum* Dunal (Fig. 1), is a FL EPPC Category I invasive plant found



Fig. 1. A close-up of tropical soda apple (*Solanum viarum*) fruit.

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primarily in pastures and woody areas throughout Florida and the southeastern United States (Medal et al, 2006). This prickly plant features small gumball sized fruits that look like tiny watermelons in immature form and then turn yellow when mature. The tropical soda apple leaf beetle, *Gratiana boliviana*, is a biological control agent from South America that has a high degree of host specificity to tropical soda apple. *Gratiana* feed on tropical soda leaves, reducing the vigor, growth rate, and fruit production of the plant.

MELALEUCA. *Melaleuca quinquenervia* (Fig. 2) is a FL EPPC Category I invasive plant originally from Australia that now infests approximately 500,000 acres in South Florida (Cuda et al., 2006). The United States government and the State of Florida list melaleuca as a noxious weed and prohibit the sale, possession, or transportation of the plant. The two biological agents have been released: the *Melaleuca* weevil (*Oxyops vitosa*) and the *Melaleuca* psyllid (*Boreioglycaspis melaleucae*). Both insects are particularly fond of young melaleuca seedlings and new leaves. Feeding damage from these two insects is reducing *Melaleuca* reproduction, seedling establishment, and growth.

OLD WORLD CLIMBING FERN. Old world climbing fern (*Lygodium microphyllum*) (Fig. 3) is listed as a Category I invasive species by FLEPPC and it is listed by the Florida Department of Agriculture and Consumer Services on the Florida Noxious Weed List (5B-57.007 FAC) (Hutchinson and Langeland, 2005). This fast-growing invasive vine is found throughout South Florida and has the ability to smother shrubby and herbaceous brush. In addition, this vine reproduces by spores which are wind-dispersed. A moth (*Austromusotima camptonozale*) was released in southeastern Florida as a biological control agent for old world climbing fern.

BRAZILIAN PEPPER-TREE. Brazilian pepper-tree, *Schinus terebinthifolius* (Fig. 4), is an invasive pest plant from South America (Gioeli and Langeland, 2006). Nearly all terrestrial ecosystems in central and southern Florida are being encroached upon by the Brazilian pepper-tree. It is often inaccurately described as the Florida holly because of its red berries that ripen in winter months. As of June 2008, no biological control agents have been released in Florida for Brazilian pepper-tree. Two potential agents have been under scientific review: Brazilian pepper-tree sawflies (*Heteroperreyia hubrichi*) and Brazilian pepper-tree thrips (*Pseudophilothrips ichini*). Unfortunately, the sawfly was shelved because it is a close relative of another insect known to have toxic compounds stored in its biochemistry. Fortunately, there is a high degree of likelihood that the thrips will be released in the near future.

Results and Discussion

In conclusion, the TAME Invasives Portal has proved to be an effective way to provide public access to Extension and research products. An examination of the cost-savings associated with the adoption of one of the biological control agents featured on this portal can serve as a case study on the overall benefits of the adoption of the use of biological control in an invasive plant management IPM plan. The St. Lucie County Natural Resources Extension Agent and the 4-H/Livestock Extension Agent, often in conjunction with agents from the Division of Plant Industry and UF/IFAS Indian River REC, distributed *Gratiana boliviana* to local property owners with tropical soda apple infestations. According to a recent article in *The Florida Cattleman and Livestock Journal*, the average rancher spends \$25/acre on chemicals

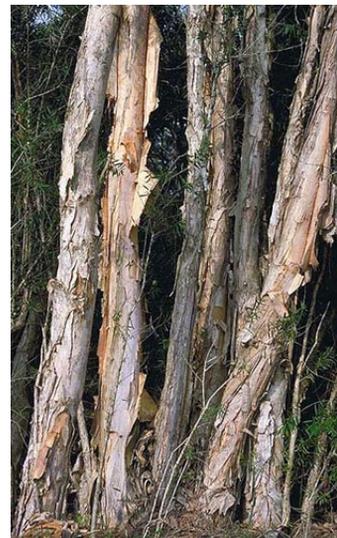


Fig. 2. Melaleuca (*Melaleuca quinquenervia*) originated from Australia and is known for its paper-like bark.



Fig. 3. Old world climbing fern (*Lygodium microphyllum*) leaf close-up, nearing readiness to disperse fertile spores.



Fig. 4. Brazilian pepper-tree (*Schinus terebinthifolius*) originated from South America and can now be found on right-of-ways through much of central and southern Florida.

to control tropical soda apple and \$19/acre on mechanical control (mowing) (Thomas, 2007). In 2007, St. Lucie County Extension Agents provided *Gratiana* to ranchers with 5603 acres under management. Tropical soda apple densities were examined during site visits to determine levels of tropical soda apple infestations. Approximately 2865.5 acres were infested with moderate to high density levels of tropical soda apple. Without the use of *Gratiana*, ranchers would have spent an estimated \$71,637.50 on chemical control of tropical soda apple and \$54,444.50 on mechanical control. When *Gratiana* is used to control tropical soda apple, infestations of this invasive plant should no longer need chemical and mechanical control. Estimated savings for ranchers participating in the *Gratiana* release program through the St. Lucie County Cooperative Extension is \$126,082.

In addition, there are cost-savings associated with the use of the online training courses made available through the TAME Invasives Portal. Pesticide applicators licensed under Ch. 487, 482, and 388 must renew their licenses either through reexamination or earning continuing education units (CEUs). In 2007, 184 people participated in license recertification continuing education programs offered via the Portal. A survey of these course participants indicates the following savings by having taken these courses online rather than in-person:

I. Participants were asked how much would have been spent on hourly wages attending these courses in-person if these courses were not available online. Respondents indicate an average of \$34 would have been spent on hourly wages for participants to take courses in-person. This results in a savings of \$6,256 in hourly wages.

II. Participants were asked how much would have been spent on travel costs to attend these courses in-person rather than online. These travel costs include mileage, per diem, hourly wages during travel, etc. Respondents indicate an average of \$94.29 per course would have been spent traveling to these courses if they were offered in-person. This results in a savings of \$17,349.36 in travel-related costs.

III. Participants were asked how much cost was incurred in lost productivity had the participants attended these courses in-person rather than online. Respondents indicate an average of \$156.92 per course in lost productivity. This results in a savings of \$28,873.28.

IV. In total, course participants indicated they saved a total of \$52,478.64 by participating in online CEU recertification courses rather than attending courses in-person.

Overall, the TAME Invasives Portal has been a successful way to educate the residents of Florida about the need to manage these four high priority invasive plants through the implementation of an IPM strategy with an emphasis on the use of biological control agents. Cattle ranchers in St. Lucie County have reported a significant savings in herbicide use to manage tropical soda apple. Additionally, licensed pesticide applicators were able to reduce costs significantly through the use of the online training programs offered via this portal. Should additional future funding be obtained, this portal will be expanded to include Extension and research products for other high-priority invasive pests.

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