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Post Office Box 24680
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33416-4680
561/682-6132
mbodle@sfwmd.gov

Heidi Rhoades, Secretary
110 NE 8th St.
Delray Beach, FL 33444
561-243-1642
FLScrubj@aol.com

Kristina Kay Serbesoff-
King, Treasurer
3301 Gun Club Road
West Palm Beach, FL
33406
561/682-2864
kserbes@sfwmd.gov

Karen Brown, Editor
7922 NW 71st Street
Gainesville, FL 32653
352/392-1799
kpb@mail.ifas.ufl.edu

Ken Langeland,
Immediate Past Chair
7922 NW 71 Street
Gainesville, FL
32653-0610
352/392-9614
kal@mail.ifas.ufl.edu

Directors

Jim Burney
Aquatic Vegetation
Control, Inc.
6753 Garden Road,
Suite 109
Rivera Beach, FL 33404
561/845-5525
L1j2@aol.com

Kathy Craddock Burks
Florida Department of
Environmental
Protection
3800 Commonwealth
Blvd Ms705
Tallahassee, FL 32399
850/245-2809 Ext. 4823
Kathy.burks@dep.state.fl.us

JB Miller
Florida Park Service
1000 Favor Dykes Road
St. Augustine, FL 32086
904/794-5959
millerjb@aig.com

Tom Fucigna
R.L. Weigt Environmental
Consultants, Inc.
12063 SE Juno Crescent
Hobe Sound, FL 33455
561/545-9672

Andrea Van Loan
Division of Forestry
1911 SW 34 Street
Gainesville, FL 32608
352/372-3505 x 429
vanloaa@doacs.state.fl.us

Bill Snyder
National Park Service
Ochopee, FL 34141
941/695-4111
bill_snyder@nps.gov

John Volin
Florida Atlantic University
2912 College Ave.
Davie, FL 33314
954/236-1115
jvolin@fau.edu

Jim Cuda
University of Florida
Entomology Department
PO Box 110620
Gainesville, FL 32611
352/392-1901 x-126
jcuda@mail.ifas.ufl.edu

Committee Chairs

By-laws
Dennis Giardina
3770 19th Avenue SW
Naples, FL 34117
941/657-7637
dennis_giardina@fws.gov

CAST Representative
Dennis Giardina
Ken Langeland (alternate)

Editorial
Karen Brown

Education
Leesa Souto
Midwest Research Institute
1470 Treeland Blvd SE
Palm Bay FL 32909-2211
321/723-4547 Ext. 200
lsouto@mrresearch.org

FNGA/FLEPPC Liaison
Doria Gordon
University of Florida
P.O. Box 118526
Gainesville, FL 32611-8526
352/392-5949
dgordon@botany.ufl.edu

Legislative
Matthew King
Palm Beach County
3323 Belvedere Road,
Bldg 502
West Palm Beach, FL 33406
561/233-2400
mking@co.palm-beach.fl.us

Membership
Andrea Van Loan

Merchandise
Bill Snyder

Nominations
Tony Pernas
Everglades National Park
40001 SR 9336
Homestead, FL 33034
305/242-7846
tony_pernas@nps.gov

Plant List
Kathy Craddock Burks

Research
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Local Arrangements
Tony Pernas

Training
Jim Burney

Vendors
Brad Cochran
DowAgrosiences
1612 Parker Point Blvd
Odessa, FL 33556
813/926-4967
bdcocoran@dowagro.com

Work Groups

Australian Pines
Robert Egan
Habitat Restoration Resources
1495 Coral Point Drive
Cape Coral, FL 33990
HabitatRR@yahoo.com

Brazilian Pepper
Jim Cuda

Carrotwood
Chris Lockhart
Habitat Specialists, Inc.
P.O. Box 3116
Boynton Beach, FL 33424-3116
561/738-1179
chris@habitatspecialists.com

Dioscorea
Mike Bodle

Grasses
Greg MacDonald
University of Florida
Agronomy Department
Post Office Box 110500
Gainesville, FL 32611-0500
352/392-1811 x-214
gemac@gnv.ifas.ufl.edu

Lygodium
Amy Ferriter/Tom Fucigna
SFWMD
PO Box 24680
West Palm Beach, FL 33416
407/687-6097
aferrite@sfwmd.gov

Skunkvine
Brian Nelson
SFWMD
2379 Broad Street
Brooksville FL 34609-6899
352/796-7211
brian.nelson@sfwmd.state.fl.us

Chinese Tallow
Cheryl McCormick
Cheryl@uga.edu

Melaleuca
Francois Laroche
SFWMD
Post Office Box 24680
West Palm Beach, FL
33416-4680
561/682-6193
flaroche@sfwmd.gov

Wildland Weeds

WINTER 2002, Volume 6, Number 1

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Wildland Weeds (ISSN 1524-9786) is a quarterly publication of the Florida Exotic Pest Plant Council (FLEPPC) and the Southeast Exotic Pest Plant Council (SE-EPPC).

Wildland Weeds is published to provide a focus for the issues and concerns regarding exotic pest plant biology, distribution and control. To become a member of the Florida EPPC and receive the Council newsletter and *Wildland Weeds* Magazine, contact the Treasurer.

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Direct editorial inquiries to
Karen Brown
Editor, *Wildland Weeds*
7922 NW 71st Street
Gainesville, FL 32653
kpb@mail.ifas.ufl.edu

Editorial Board
Mike Bodle Tom Fucigna
Kathy Craddock Burks Ken Langeland
Jim Cuda

Cover: Adult male of *Megastigmus transvaalensis* on drupe of Brazilian peppertree, *Schinus terebinthifolius*. Photo by D.H. Habeck. See story on pg. 18.

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An Introduction to the St. Louis Declaration and the Codes of Conduct

By Peter White

Campus Box 3375

North Carolina Botanical Garden and
Department of Biology

University of North Carolina

Chapel Hill, North Carolina

27599-3375

Peter.White@unc.edu

Introduction

Botanical gardens, the horticultural industry, and gardeners have been responsible for some of the unwanted invaders in our natural areas and landscapes. It is estimated, for example, that 85 percent of woody plant invaders in North America were purposefully introduced for ornamental use (Reichard and Campbell 1996). Although horticulturists have become increasingly aware over the last several decades of a variety of environmental and conservation issues (e.g., integrated pest management, xeriscaping, the importance of native plants), awareness and consensus on the issue of invasive pest plants has been slower to develop. In this article I will present a brief review of this issue within botanical gardens (in part from my personal experience at the North Carolina Botanical Garden) as a way of introducing the results of the landmark meeting “Linking Ecology and Horticulture to Prevent Plant Invasions” that was held at the Missouri Botanical Garden in St. Louis in December 2001. Sarah Reichard (University of Washington), John Randall (the Nature Conservancy, Davis, California), Pat Duncan Raven (Missouri Botanical Garden), and I were the organizers and conveners of this meeting. Peter Raven and his staff at the Missouri Botanical Garden generously helped raise the support and provide the facilities

for the meeting itself. The sponsors, products, proceedings, and participants of the meeting are available at www.mobot.org/iss.

The North Carolina Botanical Garden Experience

The North Carolina Botanical Garden has always prided itself in being a pioneer among botanical gardens for adopting a conservation creed almost from its inception (the first public facilities were opened in 1966). In the early 1970s, the staff was widely active in promoting native plants and Conservation through Propagation—an ethic that called for propagation to avoid impacts to wild populations. In 1988, when the first formal mission statement was approved, conservation was presented as one of five mission elements. Today, visitors to the Garden or to its web site (www.unc.edu/depts/ncbg) will see the prominent display of the subtitle “A Conservation Garden”. The staff continues to define what it means to be a conservation garden—the support of biological diversity and environmental quality generally (White 1995).

Despite this tradition, we, like other gardens, had no formal policy on the invasive species issue in 1990. Although we specialized in native plants, we had no formal definition of “native” and we were occasionally involved in plant introduction or in receiving plants newly introduced by other gardens. Further, we, as part of the time honored tradition among gardens, participated in the exchange of seed lists that made our own North Carolina plants available anywhere else in the world. Our activities in these areas were lower key than other gardens, but they were there nonetheless.

In the early 1990s, we began to

discuss this issue as a staff. Based on these discussions, we formulated what may have been the first explicit botanical garden policy in this area (1996):

To possess plant collections that do not harm natural areas and the native plant diversity of North Carolina and the Southeast and to protect and restore the Garden's highest quality natural areas by eradicating invasive exotic species.

We followed this in 1998 with a revision of our seed distribution policy in which we restricted our own distribution of plants to a twelve state region that lies east of the Mississippi River and south of the Ohio River, Pennsylvania, and New Jersey. This geographic region is arbitrary and subject to revision but is based on the premise that the farther a plant or gene is moved, the more likely it is to be detrimental. I believe, also, that this is the first time a garden ever restricted its own distribution of plants.

Working with Sarah Reichard, I have been involved in bringing this issue to the attention of other botanical gardens through the annual meeting of the American Association of Botanical Gardens and Arboreta (AABGA) (e.g., White 1997). An invitation from Sarah to participate in a session on conservation ethics in gardens at the 1999 annual meeting in Vancouver was the opportunity to issue a challenge to all botanical gardens through the Chapel Hill Thesis (nailed to a Paulownia tree at the Garden and now displayed on a Paulownia post cut from that tree). The Thesis was published as a challenge to botanical gardens in national and international newsletters, including the newsletter of the SEEPC (White 1999a, 1999b, 1999c).

Sarah Reichard's 2000 session on conservation ethics for botanical gardens at the AABGA annual meet-

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ing in Asheville, North Carolina (also the World Botanic Garden Congress) was a direct progenitor of the 2001 St. Louis meeting.

The evolution of the issue in the 1990s

As the discussion took place among botanical gardens, horticulturists, and the gardening public, it was initially polarized. On the one hand, some conservationists, at least to many horticulturists, seemed to be saying that all introduced plants were suspect and that risk of harm could only be eliminated by a natives-only policy. Since many plants are clearly non-invasive (even dependent on cultivation), a natives-only policy can not attain widespread acceptance. On the other hand, some horticulturists, at least to many conservationists, seemed to be saying that all plants should be permitted in horticulture and that invasiveness was a non-issue. It was clear, however, that many invasive ornamental plants had become unwanted pest species that impacted not only natural areas, but recreational boating and swimming, forestry and agriculture. A "no limits to horticulture" policy was as unlikely as a "natives-only" policy to gain acceptance. This polarization sometimes focused on the word "exotic" itself—conservationists often used this as a shorthand for "invasive" and horticulturists thus perceived a direct attack on all introduced plants. By the end of the decade, words like "pest" and "invasive" were helping to diminish the polarization occasioned by shorthand use of "exotic".

Distinguishing between "exotic" and "invasive" implies an ability to carry out risk assessment (for new introductions or newly spreading species) or measures of impact (for established species). The 1990s provided some hopeful signs in the sense that several risk assessment schemes have been shown to be able to separate invaders from non-invaders (Reichard and Hamilton 1993; but see White and Schwarz 1998 for a discussion of the uncertainties), that only a portion of introduced plants had proved to be troublesome, that an alternative to free reign horticulture could be made to work (Harty 1993), and that horti-

culturists and conservationists could work together (e.g., the experience in Florida, Regulbrugge et al. 2002). These hopeful results have allowed agreement between horticulturists and conservationists that a problem exists. The next line of discussion will take place over which species are on the "invasive" or "non-invasive" lists. It is likely that such lists will be developed through the consensus of expert opinion from all involved parties, rather than complete scientific knowledge. They will have to be reassessed on an ongoing basis. Indeed, there is a precedence for this in the formulation of endangered species lists beginning in the 1960s.

This overview of the history of the issue within the horticultural world is biased both to botanical gardens and my personal history of the issue. Other initiatives of the 1990s also were critical as backdrops to the St. Louis Meeting, including President Clinton's Executive Order 13112 in February 1999. This order established the National Invasive Species Council and called for the preparation of a National Management Plan. These efforts also have involved both horticulturists and conservationists.

The St. Louis Meeting (2001): Linking Ecology and Horticulture to Prevent Plant Invasions

Given this historical development, the organizers of the St. Louis meeting wanted to bring together all players in the invasive plant problem with the goal of issuing a joint statement on the problem and formulating draft codes of conduct that would be presented to all interested parties for voluntary adoption. Convened by the Missouri Botanical Garden and Kew Gardens and sponsored by 12 other foundations and organizations, the meeting brought together some 65 individuals representing five groups: botanical gardens, nursery professionals, landscape architects, government, and the gardening public. The Statement of Purpose was: To agree on a statement of the problem, to draft voluntary codes of conduct for each group, to discuss application of the codes, and to discuss next steps.

The products of the meeting included the St. Louis Declaration and draft codes

of conduct for each of the five groups represented at the meeting.

The five voluntary codes of conduct all address, in one way or another, eight key areas: prevention and risk assessment on a regional basis; eliminating continued distribution of invasives; removal of established invasives; development of non-invasive alternatives for various uses; raising public awareness and diminishing demand for invasives; the need to include the invasive issue in professional training; the importance of partnerships, databases, and communication; and importation and exportation rules.

One of the goals of the meeting was to disseminate the draft codes of conduct and to encourage the adoption of these codes by other parties. All of those who were involved with the St. Louis meeting are pleased by the adoption by the Southeast Exotic Pest Plant Council. In the future, the web site will include a mechanism to register and list such adoptions. For more information, link to www.mobot.org/iss.

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SOUTHEAST EXOTIC PEST PLANT COUNCIL SE-EPPC

August 30, 2002

Pat Duncan Raven
Missouri Botanical Garden
P.O. Box 299
St. Louis, Missouri 63166-0299



Dear Distinguished Organizers:

I am writing on behalf of the Southeast Exotic Pest Plant Council (SE-EPPC) to endorse the St. Louis Declaration on Invasive Plant Species (February, 2002). Specifically, this Declaration is important because it includes **Findings and Overarching Principles** that frame the invasive species problem and present the underlying basis for successful efforts to address it, and **Draft Voluntary Codes of Conduct**. As referenced in the Declaration's Statement of Purpose, the Draft Voluntary Codes of Conduct are significant because they will help govern the decisions made by commercial, professional and governmental groups whose actions affect the spread of invasive plant species.

SE-EPPC recognizes the value of these draft voluntary codes of conduct for government agencies, nursery professionals, the gardening public, landscape architects, and botanic gardens and arboreta. SE-EPPC supports the adoption of these Codes because they address significant issues that include: 1) prevention and risk assessment on a regional basis 2) eliminating continued distribution of invasives 3) removal of established invasives 4) development of non-invasive alternatives for various uses 5) raising public awareness and diminishing demand for invasives 6) the need to include the invasive issue in professional training 7) the importance of partnerships, databases, and communication, and 8) importation and exportation rules.

SE-EPPC applauds the efforts of the organizers of "The Workshop on Linking Ecology and Horticulture To Prevent Plant Invasions" held December 2001 at the Missouri Botanical Gardens that brought together shareholders and experts that gave rise to the St. Louis Declaration. This effort, which resulted in the St. Louis Declaration, provides an essential instrument to help bridge the gap between stakeholders. It provides agreement on what the basic parameters of this issue are, and how horticultural interests shall be addressed. By endorsing this Declaration, SE-EPPC supports and encourages that all necessary measures be taken to adopt and implement these voluntary codes of actions that will help prevent plant invasions.

Respectfully yours,

Brian Bowen, President
Southeast Exotic Pest Plant Council

copy: John Randall, Peter White, Sarah Reichard

Editor's note:

SE-EPPC includes state chapters in
Florida, Georgia, Kentucky, Michigan,
Mississippi, North Carolina and Tennessee.

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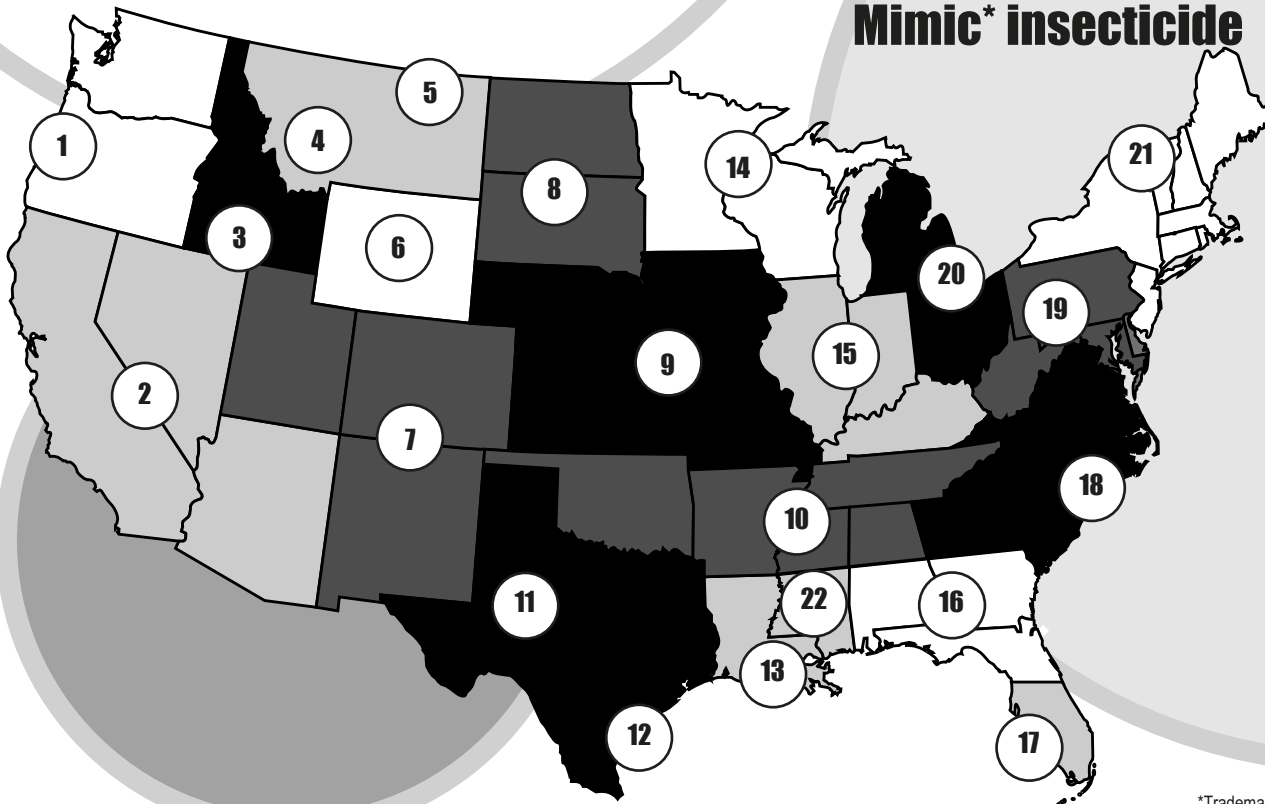
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Japanese stiltgrass (*Microstegium vimineum*)



Figure 1. Japanese stiltgrass habit

Identification and Management

Joseph C. Neal, Professor of Weed Science
Caren A. Judge, Weed Science Research Assistant
Department of Horticultural Science
North Carolina State University
Box 7609
Raleigh, NC 27695-7609
joe_neal@ncsu.edu

spreading dayflower (*Commelina* spp.). After frost, the foliage and wiry stems turn a distinctive light tan in color and persist through the winter. Vegetative identification characteristics include: rolled veneration, a very short membranous ligule, and leaf blades that are shorter and broader than most other grasses (Fig. 2).

General Description

Japanese stiltgrass is a prostrate to erect, sprawling and freely branched summer annual with spreading stems that root at the nodes. The stems are stiff and climb over other vegetation reaching more than 3 feet (~1 meter) in height but will remain prostrate if mowed. Leaves are rolled in the bud; ligules are short (~0.5 mm) and membranous with hairs on the backside;

Brief Description

Japanese stiltgrass (also known as annual jewgrass, bamboogras flexible sesagrass, Japanese grass, Mary's grass, microstegium, Nepal microstegium, or Vietnamese grass) is a summer annual commonly found in shady, moist areas (Fig. 1). It is spreading rapidly in woodlands as well as shaded landscapes and low maintenance turf throughout the southeastern U.S. and mid-Atlantic States. Japanese stiltgrass germinates in early spring, several weeks before crabgrass (*Digitaria* spp.), yet flowers and seeds much later, from mid-September through October. It has broader, shorter leaves than many other annual grasses, somewhat resembling broadleaf signalgrass (*Brachiaria platyphylla*) or



Figure 2. Japanese stiltgrass leafy shoot



Figure 3. Young seedlings have distinctively broad leaves.



Figure 4. In the winter Japanese stiltgrass vegetation covers the forest floor.

auricles are absent. Leaf blades are broader than many other grasses, particularly under shady conditions. Young seedlings are easily distinguished from other summer annual grasses by the very broad, rounded first leaf (Fig. 3). Leaves on older plants are narrowly elliptic, about 8 times longer than wide (3 to 8 cm long and 5 to 10 mm wide), sparsely hairy on the upper surface, and hairless or nearly so on the under side. The sheath has a hairy margin and hairs at the collar region but otherwise is not hairy. With age some of the hairiness of the upper leaf blade may diminish. Plants have a shallow fibrous root system. Plants tolerate mild frosts, often flowering after the first frost, but die with hard frost. Dead plant parts persist through winter and well into spring and early summer (Fig. 4).

Habitat and Distribution

Japanese stiltgrass is most commonly found in shady, moist, disturbed areas including wetlands, ditch banks, utility rights of way, mulched landscape beds, and low maintenance turf. However, infestations are common in upland for-

ests as well. Infestations typically begin in disturbed sites; once established, infestations can spread to undisturbed areas. Introduced from tropical Asia, Japanese stiltgrass has spread rapidly in public lands throughout the eastern U.S. It has been reported throughout the southeastern US, north to Ohio and New York. It is most common in the piedmont and mountains of the southeast, less common in the coastal plains. More recently it has been reported to be encroaching on shaded lawns and landscape plantings throughout its distribution.

Key Identification Characteristics:

- Rolled in the bud
- Short membranous ligule
- Auricles absent
- Upper blade sparsely hairy
- Sheath margin hairy
- Collar hairy
- Shady, moist habitats

Reproduction and Spread

A summer annual, reproduction is by seeds that germinate in early to mid-spring (early to mid-March in central NC) and sporadically throughout the growing season. Plants flower in early to mid-autumn (late September through October in central NC). Flowers are produced in a branched spike, with 1 to 3 (rarely 6) branches (rachis), each 3 to 5 cm long. (Fig. 5)

Spikelets are in pairs on the rachis, each 4.5 to 6 mm long and hairy, one sessile and the other on a short pedicel. Only one of the spikelets in each pair



Figure 5. Japanese stiltgrass seedheads form in mid to late autumn.

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is fertile; the fertile one sometimes having a slender awn 4 to 8 mm long. Japanese stiltgrass can produce large numbers of seeds — from 16,000 to 50,000 seeds per square meter. At least some of those flowers are cleistogamous (self-fertilized before the flower opens). Such an adaptation has direct implications on control measures; to prevent seed production, early removal before anthesis is imperative because some florets will produce seed before flowers have opened.

Control

Since Japanese stiltgrass infestations typically begin in disturbed areas then spread from those sites, early detection and control can prevent severe infestations. Seeds are believed to be not long-lived in the soil. Although limited information on seed bank dynamics is available, research suggests that seeds last only 3 to 5 years in the soil. Therefore, long-term management programs should emphasize prevention of seedhead formation to deplete the seed reservoir. Mulches suppress germination; however, in shady moist areas it can grow in mulch. Preemergence and postemergence herbicides used for crabgrass control generally are equally, or more effective on Japanese stiltgrass. The only herbicide specifically labeled for Japanese stiltgrass control is Plateau (imazapic). Plateau may be applied preemergence or postemergence to Japanese stiltgrass. Consult the herbicide label for details.

In research, postemergence non-selective herbicides such as Roundup-Pro (glyphosate) and Finale (glufosinate) provided excellent control with one or two applications, respectively. Selective postemergence grass herbicides were generally effective on this weed. Of the selective graminicides tested, Vantage (sethoxydim) provided the best control followed by Fusilade II (fluzafop-p), which was equal to Acclaim Extra (fenoxaprop) and better than Envoy (clethodim). Research at the University of Tennessee also suggests that sulfentrazone (Authority or Oust) is effective. Dimension (dithiopyr), MSMA and Drive (quinclorac) were not effective for postemergence control. When

using selective graminicides, young seedling weeds will be better controlled than larger plants. Several preemergence herbicides controlled Japanese stiltgrass including: Preen (trifluralin), Dimension (dithiopyr), Surflan (oryzalin), Pendulum (pendimethalin), Barricade (prodiamine), Snapshot TG (isoxaben + trifluralin), Ronstar (oxadiazon) and XL (oryzalin + benefin). Pennant (metolachlor), Team Pro (benefin + trifluralin) and Devrinol (napropamide) were less effective. If preemergence herbicides are to be used, applications must be made before the weed germinates, which occurs several weeks before crabgrass germination.

Several preemergence and postemergence herbicides control Japanese stiltgrass. The goals of your site management program should influence your herbicide choices. If one wants to control Japanese stiltgrass without harming desirable vegetation, a selective grass herbicide might be most appropriate. If total herbaceous vegetation is the goal then non-selective herbicides or broad-spectrum soil residual herbicides may be a better choice.

**Before using any herbicide, read

the label and follow all label directions and restrictions.

Similar Species

Japanese stiltgrass resembles other coarse-textured summer annual grasses including smooth crabgrass and broadleaf signalgrass. In contrast, crabgrass has a tall membranous ligule (to 2 mm), longer and narrower leaf blades (15 to 20 times longer than wide), and lacks hairs on the margin of the sheath. Broadleaf signalgrass is easily distinguished from Japanese stiltgrass and crabgrass by its hairy (ciliate) ligule. Under shady conditions, Japanese stiltgrass resembles the foliage of dayflower; however, the presence of a membranous ligule readily separates Japanese stiltgrass from members of the dayflower family (Commelinaceae) which do not have ligules and are not grasses.

Links

For more information visit the following links.

<http://tncweeds.ucdavis.edu/esadocs/documnts/micrvim.html>

<http://www.nps.gov/plants/alien/fact/miv1.htm>

<http://www.amesplantation.org/ForestryWildlife/jgrass.htm>

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- Meetings with key congressional members and their staff can also be scheduled so you can let your congressional representative know how important their help can be in this effort.
- Watch for further information from your state Weed or Vegetation Management Association leadership. Additional information also will be posted on the North American Weed Management Association website at www.nawma.org/

Remember: You Can Make A Difference!

National Invasive Weed Awareness Week (NIWAW) events are sponsored by the Invasive Weed Awareness Coalition (IWAC) and its many partners.

Meeting Notes

FL-EPPC's 17th Annual Symposium

FL-EPPC's 17th annual symposium was held September 17th–19th at the historic Kenilworth Lodge in Sebring, Florida. Attended by 190 people, the meeting was a great success on all fronts.

Craig Regelbrugge, Senior Director of Government Relations for the American Nursery and Landscape Association (ANLA) in Washington, presented an illuminating keynote address on **National perspectives on the horticulture industry and invasive pest problems**. Craig represents ANLA legislatively on industry regulatory issues. He also is a member of the Invasive Species Advisory Committee that advises the Federal Invasive Species Council. ANLA (www.anla.org) is a national trade organization for nursery and landscape businesses. The organization was founded in 1875 and has approximately 2,300 members. Craig cited national horticulture industry revenues as more than \$12 billion (aggregate), which is 11% of the crop agriculture value, and \$40 billion retail. Craig unequivocally stated that "*New plants drive the market.*" He admitted that changes in industry practices are needed with regard to invasive species, but stressed that they must be at a pace the market can adapt to. He further commented that native plants and invasive species must be considered as separate issues, with both the potential harm and benefits of non-native species to be considered. Some of the goals of ANLA are to prevent new plant pest introductions (that is *plant pests*, not *pest plants*), and to maintain the ability to introduce new plants. Craig observed that the industry has moved from grower-driven to consumer-driven, making consumer education critical. As a framework for solving exotic pest plant problems, he suggested the 3 E's: *educate* (consumers), *eradicate* (pests from natural areas) and *eliminate* (invasive exotic pest plants from the

trade). He further suggests that the role and impact of plant lists should be examined. He believes in reasonable, feasible, enforceable regulation, but also thinks voluntary efforts by the industry should be pursued and encouraged now, and alternatives sought. Craig congratulated Florida groups on the progress that has been made in voluntary pest plant removal agreements. Throughout his address, Craig stressed that collaboration with those of other perspectives could be beneficial to all with an interest in invasive exotic pest plants.

Many other interesting and informative talks were given at the one and a half day presentation sessions, including news of the first known study on the economic impacts of 14 Category I ornamental plant species on nursery sales by UF/IFAS researcher Ferdinand Wirth.

Other events

Jim Duquesnel's training committee presented a one-day training session on invasive plant control in natural areas that was attended by approximately 40 participants. A test was administered that will enable those with a passing grade to apply for Restricted Use Pesticide Applicator licenses in Natural Area Weed Management (Category 21) from the Florida Department of Agricultural and Consumer Services (FDACS). Licensed applicators may purchase and apply restricted use pesticides and supervise up to fifteen unlicensed applicators under their immediate direction. (For information on other opportunities to take this test, contact the UF/IFAS Pesticide Information Office (352/392-4721).

Field trips took participants to Bok Tower Gardens, Highlands Hammock State Park, Archbold Biological Station, Lake Wales Ridge State Forest, Avon Park Air Force Range, and Kissimmee Prairie State Preserve. Sunny, breezy weather, as opposed to Tropical Storm Gabrielle's wind and rain at the 2001 symposium, allowed participants to enjoy the great outdoors in south Florida and view both natural areas, research sites and botanical gardens.

The social was a lively affair with the group well fed on catfish and boiled shrimp and dancing to the music of the

Pith Penetrators. An unexpected special guest star, **George Terry**, songwriter and former guitarist with **Eric Clapton** and a current resident of Sebring, joined the stunned members of the band for a few songs.

Annual Business Meeting

Outgoing FL-EPPC board members Alison Fox, Dennis Giardina, Christine Sutter and Phil Waller were replaced by incoming board members Jim Cuda, Bill Snyder, Andrea Van Loan and John Volin. Heidi Rhoades came on board as the new secretary.

Some of the highlights of the annual business meeting were awards of *Member of the Year* to **Jackie Smith**, FL-EPPC secretary for 5 years, *Lifetime Honorary Membership* to retiring botanist **Nancy Coile**, and *Non-Member of the Year* to UF/IFAS Extension Agent in Natural Resources **Ken Gioeli**.

Membership Committee Chair Andrea Van Loan reported that the FL-EPPC educational display was used at 12 events that were attended by over 5,000 people. Two portable displays are available on loan by contacting Andrea (see *Membership Committee*, p. 3).

Important note: the next annual symposium will return to the original schedule and will be held **June 5-6, 2003** at the Renaissance Vinoy Resort in St. Petersburg, FL. Details will be posted on the FL-EPPC web site at www.fleppc.org

Karen Brown, Editor

Stay tuned!

**The 18th Annual
Symposium**
of the
**Florida Exotic Pest
Plant Council**
will take place
June 5-6, 2003
(returning to a Spring/Summer symposium schedule.)

**at the Renaissance Vinoy
Resort in St. Petersburg, FL**

Details will be announced in the next
issue of *Wildland Weeds*, and will

Getting Private
Landowners
Involved in Invasive
Species
Management:

A Nature Conservancy Pilot Project

By Roberto Torres
Community Outreach Specialist
The Nature Conservancy
22455 E. Sunrise Blvd.,
Penthouse South
Fort Lauderdale FL 33304
rtorres@tnc.org

The Nature Conservancy has identified invasive, non-native species as one of the three most serious threats to native habitats, along with development and altered hydrology. The problem of invasive, non-native species infestations is especially severe in South Florida. The climate in South Florida is suitable for growing semi-tropical and many tropical species, allowing many non-native plants to proliferate if left unchecked. South Florida has been a center for trade with

much of Central and South America as well as the Caribbean for decades, allowing for the introduction of numerous non-native species. Furthermore, the landscaping and nursery industries are important components of the South Florida economy. Lastly, South Florida's multi-cultural population enjoys growing many species of plants that are either found in or are similar to those in their countries of origin. All these factors combine to make South Florida a "hot-spot" for invasive species introduction, and place the viability of native habitats at risk.

Tropical hardwood hammocks were once an extensive component of the coastal landscape in South Florida, covering approximately 12,000 acres of the Miami Rock Ridge, a rocky outcropping of limestone that extends

from Miami to Homestead and represents some of the highest elevations in the area. Today, due to extensive urban development of the coastal ridge, only about 775 acres (less than 7% of the original extent) of this community type remains in Miami-Dade County. The occurrence of these hammocks in Miami-Dade County is now limited to several large protected areas and some smaller private holdings. Although the extent of the hammocks has been seriously reduced, they are still ecologically important, and provide habitat for many rare and endangered plants and animals, some which are found

Inset: Tropical hardwood hammock understory. Sewer vine (*Paederia cruddasiana*), photo taken 100 yards from hammock pictured in inset



nowhere else in the United States. A remaining threat to these remnant maritime hammocks is invasion by invasive, non-native plant species. (Miami-Dade County Parks and Recreation Department, Natural Areas Management)

While control efforts are underway on the publicly protected lands, long-term success is compromised due to re-infestations from adjacent private lands where invasive, non-native species control is limited or non-existent. Long-term protection of the hammocks' viability could be vastly improved if invasive, non-native species were adequately controlled on these lands. To this end, The Nature Conservancy has implemented an outreach and education pilot project to inform private landowners in the vicinity of these natural areas about the importance of the natural habitat, and how they can help protect it through invasive species management on their lands. As part of its statewide invasive species initiative, The Nature Conservancy has implemented three pilot projects in South Florida to develop outreach methods that can later be applied on a larger scale. This particular project in Miami-Dade County uses education of private landowners and other stakeholders to motivate them into managing invasive, non-native species in an effort to protect important natural habitats. We hope not only to educate the homeowners, but also involve those interested homeowners and other stakeholders in a forum that would continue working after completion of the pilot project to find ways to address the issue of invasive, non-native species.

Getting Started

In preparation for the outreach phase, project staff identified the invasive, non-native plant species most responsible for impacting the tropical hardwood hammocks in the project area. These species are included in the FLEPPC Category I and II lists. The twenty-one species identified are found extensively on private lands throughout the project area, as well as on the publicly protected sites (Fig. 1).

As visual aides, we developed a slide presentation and a color handout that describes the importance of the

REQUEST FOR PROPOSALS

For Invasive Plant Research

Deadline January 31, 2003



The Florida Exotic Pest Plant Council (FLEPPC) has available funding for a small number of research grants/scholarships for students conducting studies related to invasive exotic plant management in Florida.

The deadline for proposal submission is January 31, 2003. Written proposals should be no more than three pages in length and should request funding for no more than \$2,500. The proposal should include a summary of the research project and its relationship with Florida exotic plant management problems. Particular plant species involved in the study should be one or more of the Category I or Category II exotic pest species listed by FLEPPC (see web site: www.fleppc.org). In addition, the applicant should provide complete contact information and detailed budget — with an explanation of how the funding will be used. Examples include (but are not limited to) travel funds for field work, funds for research equipment or supplies (or temporary use of specialized equipment), stipend for applicant's project work time not otherwise supported, travel funds for presentation of the research, etc. In developing the budget, funds requested are to be used for the direct costs of conducting research on the proposed project and are not to be used for indirect costs incurred by the student's university.

Proposals will be evaluated and ranked on the critical management need for scientific results in the area of study and on the clarity of the submitted request.

Basic eligibility requirements:

To be eligible for funding, applicants must be an undergraduate or graduate student enrolled at an accredited institution of higher learning anywhere within the United States. However, the research must be on a listed Florida invasive plant (www.fleppc.org/Plant_list/list.htm). An accompanying letter of recommendation from a faculty advisor is strongly encouraged.

Proposals are due by 5:00 p.m. 1/31/03. Send proposals by e-mail, fax, or mail to:

John C. Volin, Chair
Research Committee, FLEPPC
Florida Atlantic University
2912 College Ave. • Davie, FL 33314
jvolin@fau.edu

FAX - (954) 236-1099; office - (954) 236-1115

native tropical hardwood hammock, explains the impacts caused by invasive, non-native plants, identifies plants most responsible for impacting tropical hardwood hammocks in the project area, and describes how the private landowner can help in managing these species.

Outreach

To date, we have held four meetings with private landowners. A total of 115 people attended the four meetings. During the meetings, project staff collected input via questionnaires from the attendees to determine their level of awareness of the problems associated with invasive, non-native species, and their willingness to take action in managing these problems.

Involving the landscape industry in invasive, non-native plant management is crucial since many of the area's residents hire professional landscaping services. A vital component of the pilot project is the training of landscape professionals in invasive, non-native species management.

The Nature Conservancy, in partner-

ship with the University of Florida/ Miami-Dade Cooperative Extension Service, and the Miami-Dade County Parks Department and Department of Environmental Resources Management, is holding training workshops on invasive, non-native plant identification and management for landscape service professionals. The workshops include presentations on the importance of controlling invasive, non-native plant species in order to protect the native habitat, reproductive strategies of invasive plants, identification and control techniques. The workshops also include a tour of the natural areas impacted by these species. With the help of the Cooperative Extension Service, attendants of the workshops are able to receive Continuing Education Credits that are a requirement for renewal of their operational licenses, and this factored heavily into the great turnout the workshops have had.

Results of meetings with private homeowners

Of the homeowners that attended the meetings and completed the ques-

tionnaire:

- 64% said they have at least one of the plant species on their properties;
- more than 90% of those with these species claim the plants grew on their own rather than being planted by the homeowner;
- more than 50% said they have paid to have these plants removed from their properties; and
- 72% say they are willing to remove these invasive species.

When asked what would keep them from removing these species, the most prevalent response was cost to the homeowner and a lack of experience in the identification and removal of these species. Almost all the attendees stated that they would be willing to share the information gained from the meetings with their neighbors, and in several instances identified the occurrence of some of these invasive, non-native species on their neighbors' properties. When asked if they would be willing to get more involved in the management of invasive, non-native species, other than just on their own property, 44% responded they would



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Fig. 1. Species impacting the protected lands in the project area:

1. Air Potato	<i>Dioscorea bulbifera</i>
2. Australian Pine	<i>Casuarina equisetifolia</i>
3. Beach Naupaka	<i>Scaevola sericea</i>
4. Bishopwood	<i>Bischofia javanica</i>
5. Brazilian Jasmine	<i>Jasminum fluminense</i>
6. Brazilian Pepper	<i>Schinus terebinthifolius</i>
7. Burma Reed	<i>Neyraudia reynaudiana</i>
8. Castor Bean	<i>Ricinus communis</i>
9. Gold Coast Jasmine	<i>Jasminum dichotomum</i>
10. Lather Leaf	<i>Colubrina asiatica</i>
11. Lead Tree	<i>Leucaena leucocephala</i>
12. Melaleuca	<i>Melaleuca quinquenervia</i>
13. Napier Grass	<i>Pennisetum purpureum</i>
14. Orchid Tree	<i>Bauhinia variegata</i>
15. Oyster Plant	<i>Tradescantia spathacea</i>
16. Pothos	<i>Epipremnum pinnatum</i>
17. Queensland Umbrella	<i>Schefflera actinophylla</i>
18. Shoebuttton Ardisia	<i>Ardisia elliptica</i>
19. Snake Plant	<i>Sansevieria hyacinthoides</i>
20. Wedelia	<i>Wedelia trilobata</i>
21. Woman's Tongue	<i>Albizia lebbek</i>

be interested in attending volunteer work days on public lands, and 31% stated an interest in participating in a stakeholder forum that would meet regularly to address the problem of invasive, non-native species.

Some attendees expressed concerns over the costs of removing these species on their properties and of finding replacement plants. They suggested incentive programs to assist with the cost of removal and the cost of new, non-invasive plants. The attendees also stated that while they are willing to remove invasive, non-native species and understand the need to protect the natural habitat, they lacked the experience to identify and remove these plants effectively, especially since most of them hire professionals for their landscaping needs.

One problem facing the success of this project, and one that could present an impediment to similar projects in other areas, is the degree of non-native plant infestations on nearby public lands. Many of the private landowners have expressed concerns about the degree of infestations on public lands, and are reluctant to take steps to control invasives on their properties until the public lands are cleared.

Results of workshops for landscape professionals

Over 90% of the landscape professionals stated that they are aware of the environmental problems caused by invasive, non-native plants, and all of them recognized the plants in the presentation. About half have been asked by homeowners in the past to remove some of these species from their properties, and 55% are involved in the removal of invasive, non-

native species on a regular basis. Almost all of the landscape professionals said they are willing to tell homeowners about these species if they observe them in the private landscape.

When asked the best way to motivate the private landowners to remove invasive, non-native species from their properties, 48% of the landscape professionals suggested increased education and public awareness, while 20% suggested an incentive program and 10% suggested more regulation. On the usefulness of the workshop, 73% found the quality of the presentations excellent, 71% found the information gained useful, 83% said the knowledge gained was substantial, and 27% said they would change much of their practices, while 39% would change some.

Strategy for Success

The most effective way to meet with private landowners is to be placed on the agenda of their regularly scheduled homeowner association meetings. Not only is the attendance much higher, but the audience seems to be more interested in the subject matter if they feel this is part of the association's agenda. One particularly successful part of the project involved a homeowner

association that invited project staff to present at their annual meeting. After the meeting, the president of the association requested copies of the project handout to use as part of a package that will be given to residents buying homes in the area so they understand the importance of habitat protection and invasive species management. Additionally, project staff members have been contacted by several residents who attended the meetings and who wish to remove the invasive, non-native species present on their properties.

The most successful part of the project so far has been the workshops for the landscape industry representatives. Not only did attendance exceed expectations, but participants' input indicated that the workshop was very informative. Furthermore, many of the participants stated the need for similar workshops on a regular basis.

An ongoing effort

Project staff continues to contact homeowner associations and other groups in the project area in an effort to schedule additional meetings with private landowners. Further project assessment will encompass contacting the private landowners that participated in the meetings to see if they have taken steps to remove and/or manage these invasive, non-native species on their properties. Project staff members are currently exploring methods for holding a workshop for private landowners similar to the ones for landscape professionals, and also are working on a strategy for engaging the nurseries within or near the project area.

As this project goes forward, we not only are taking an important message to private landowners and landscapers, but also are learning strategies that could be applied in similar projects on a larger scale. As many of the attendees of our workshops and meetings have stated, the first and most important step in managing invasive species is educating the public. The Nature Conservancy is excited about the results of this pilot project so far, and we look forward to taking these results to a new level, one that will help address the problem of invasive, non-native species throughout the entire state.

Brazilian Peppertree Seed Chalcid: Wasp Wages War on Widespread Weed

J. P. Cuda¹, G.S. Wheeler², and D. H. Habeck¹

Introduction

Brazilian peppertree, *Schinus terebinthifolius* Raddi (Anacardiaceae), is an evergreen shrub or small tree native to Argentina, Paraguay and Brazil (Ewel et al. 1982). Introduced into Florida as a landscape ornamental in the late 19th century, the popularity of Brazilian peppertree as an ornamental plant was attributed to the numerous bright red drupes produced during the holiday season in Florida. Brazilian peppertree is now recognized as a highly invasive species that quickly dominates disturbed sites as well as natural communities where it forms dense thickets that completely shade out and displace native vegetation. Brazilian peppertree is the most widespread of Florida's invasive weed species (Schmitz 1994), and is considered one of the most important threats to biodiversity because it disrupts native plant and animal communities. Birds occasionally become intoxicated following ingestion of the drupes (or fruits) that remain on the trees for several months (Campello and Marsaioli 1974). Furthermore, volatiles produced by the flowers can cause sinus and nasal congestion in sensitive humans, and direct contact with the plant's sap can irritate the skin and cause allergic reactions similar to poison ivy. The distribution of Brazilian peppertree extends from the Keys to Duval County on the east coast and to Levy County on the west coast of Florida (Fig. 1) (Wunderlin and Hansen 2000).

In the 1980s, surveys of the arthropods associated with Brazilian peppertree were conducted in Florida as a first step towards developing a classical (or importation) biological control program

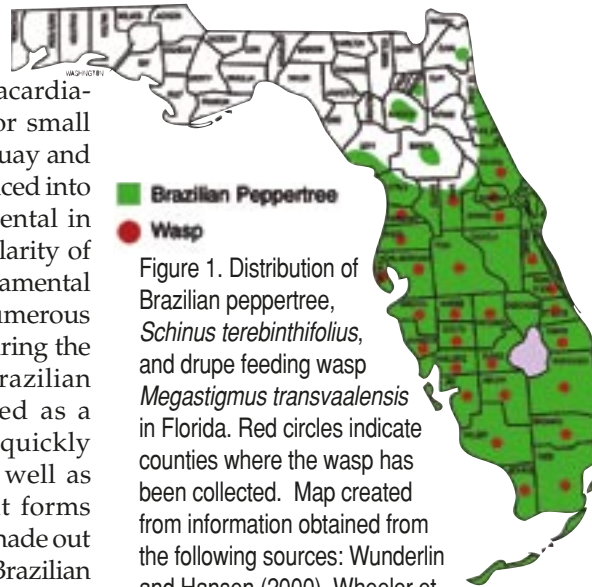


Figure 1. Distribution of Brazilian peppertree, *Schinus terebinthifolius*, and drupe feeding wasp *Megastigmus transvaalensis* in Florida. Red circles indicate counties where the wasp has been collected. Map created from information obtained from the following sources: Wunderlin and Hansen (2000), Wheeler et al. (2001) and D. H. Habeck, unpublished data.

against this highly invasive weed (Casani 1986, Cassani et al. 1989). One of the reasons for conducting these domestic surveys was to conserve limited resources and valuable time that would otherwise be wasted surveying for natural enemies in Brazil that might already be established in Florida. Although an extensive list of insects associated with Brazilian peppertree was compiled during these surveys, none of the insects identified severely damaged the drupes of the plant. Because Brazilian peppertree reproduces and spreads mostly by seeds (Langeland and Burks 1998, Tobe et al. 1998), the introduction of a natural enemy that preferentially attacks the drupes would contribute to the biological control of this invasive weed by limiting the production and dispersal of the seeds. The importance of seed predation was recognized in an earlier biological control program against Brazilian peppertree in Hawaii, and eventually led to the introduction of the seed-feeding beetle *Lithraeus atronotatus* (Pic) (Coleoptera: Bruchidae) into the islands in the 1950s (Julien and Griffiths 1998).

In 1988, an insect previously unknown to Florida was reared from the drupes of Brazilian peppertree collected in Palm Beach County (Habeck et al. 1989). The insect was subsequently identified as *Megastigmus transvaalensis* (Hussey) (Hymenoptera: Torymidae), a phytophagous seed chalcid wasp (see cover). The Brazilian peppertree seed chalcid *M. transvaalensis*, also known as the Brazilian peppertree drupe feeding wasp, is an adventive species that probably arrived in Florida as a contaminant of the fruits sold as pink peppercorns in gourmet food stores (Habeck et al. 1989). Other possible modes of arrival in Florida include wasp-infested drupes of Brazilian peppertrees imported as ornamental plants (Grissell and Hobbs 2000), or infested drupes sold at craft stores for holiday decorations (Wheeler et al. 2001).

Distribution

Worldwide, the Brazilian peppertree seed chalcid has been reared from drupes of *Schinus* spp. collected in Argentina (Wheeler et al. 2001), Brazil (Grissell and Hobbs 2000), the Canary Islands (Grissell 1979), Réunion, Mauritius (Habeck et al. 1989) and South Africa, where it is considered a native species (Grissell 1979). In the United States, the wasp has been reported from California (Harper and Lockwood 1961), Hawaii (Beardsley 1971), and Florida (Habeck et al. 1989). In Florida, the insect has been recovered from Brazilian peppertree drupes collected in the following counties: Brevard, Broward, Charlotte, Collier, Dade, DeSoto, Glades, Hardee, Hendry, Hernando, Highlands, Hillsborough, Lake, Lee, Martin, Orange, Palm Beach, Pasco, Pinellas, Polk, Sarasota, Seminole, St. Lucie, and Volusia (Fig. 1) (Wheeler et al. 2001, D. H. Habeck, unpublished data).

Description

Adult. Adults of the Brazilian peppertree seed chalcid are pale yellow-brown

¹Assistant Professor and Professor Emeritus, respectively, Entomology and Nematology Department, University of Florida, PO Box 110620, Gainesville, FL 32611-0620 jcuda@mail.ifas.ufl.edu.

²Research Entomologist, USDA, ARS Invasive Plant Research Laboratory, 3205 College Avenue, Ft. Lauderdale, FL 33314 wheelerg@eemail.com.

SILENT INVADERS:

Plants Out of Place



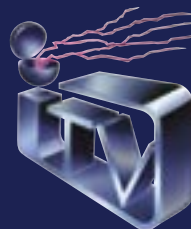
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This 30 minute TV special will help raise public awareness of the ecological and economical impact invasive plants are having on our country, and will reflect the need for ongoing scientific research and cooperation between agencies and related industries.

SPECIAL THANKS: This program is made possible by educational grants from BASF Vegetation Management Group, Bureau of Land Management, Gulf of Mexico Program, Syngenta Professional Products, U.S. Geological Survey, and U.S. Fish & Wildlife Service, (National Wildlife Refuge System and Fisheries and Habitat Conservation.)



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in color (see cover photo). Males range in size from 2.3 to 2.9 mm whereas females tend to be larger. Body length for female wasps ranges from 3.1 to 3.4 mm; the length of the abdomen and ovipositor range in size from 1.2 to 1.4 and 1.5 to 1.9 mm, respectively. Almost half of the overall body length in females is attributed to the ovipositor (Hussey 1956). Gravid females of *M. nigrovariegatus*, another *Megastigmus* wasp for which there is more published descriptive information, normally contain 10 to 25 eggs (Milliron 1949). Presumably, females of *M. transvaalensis* are capable of producing the same number of eggs.

Egg. The egg stage of *M. nigrovariegatus* is composed of three parts: a long narrow anterior stalk, an elongate-oval body, and a short spur-like posterior stalk (Fig. 3) (Milliron 1949). Individual eggs range in size from 0.99 to 1.5 mm in length, are grayish white in color, and the entire surface is glossy and smooth, lacking ornamentation. The eggs of *M. transvaalensis* probably are similar in shape, size and texture.

Larva. The Brazilian peppertree seed chalcid presumably has five instars, the same number of instars reported for *M. nigrovariegatus* (Milliron 1949). Although more than one egg may be deposited inside a drupe, the larvae are cannibalistic and usually only one larva (Fig. 4) is capable of completing its development. Occasionally, a single drupe will support complete development of two larvae.

Pupa. After the larvae of the Brazilian peppertree seed chalcid attain their maximum size, they transform into the pupal stage (Fig. 5) and remain in a prolonged diapause (or resting) period for several months. Adult emergence seems to be photoperiod-induced and occurs when the drupes containing viable pupae are exposed to short daylength (12-hr photoperiod), which coincides with the flowering phase of Brazilian peppertree during the fall of the year (Wheeler et al. 2001).

Life Cycle

The complete life history of *M. transvaalensis* has not been investigated but a generalized biology of seed-attacking *Megastigmus* wasps was described by (Milliron 1949). After mating, the female deposits an egg

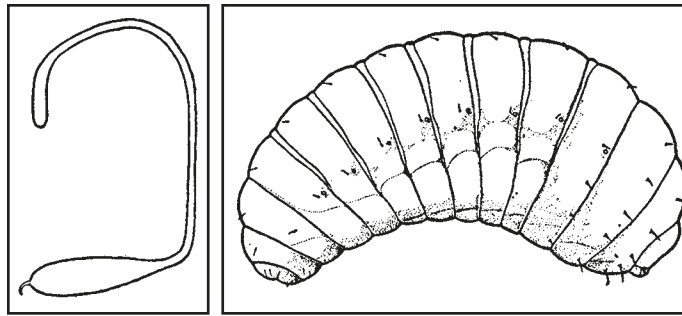


Figure 3. Line drawing of egg stage of *Megastigmus* wasp. Source: H. E. Milliron (1949).

inside the developing drupe where all life stages of the wasp are passed. The egg incubation period is short, and larvae probably hatch in 4 to 5 days. After several months, a single adult emerges from the drupe. However, this period may be shorter in *M. transvaalensis* as adults emerged a few weeks after flower initiation (G. S. Wheeler, unpublished data). Prior to emergence of the adult wasp, it is difficult to distinguish between attacked and unattacked drupes because there apparently is no external evidence of the insect developing inside until the adult chews a circular emergence hole in the wall of the drupe.

The Brazilian peppertree seed chalcid apparently has two generations per year that are synchronized with the winter and spring drupe production periods of its host plant. The sex ratio of wasps emerging from drupes of Brazilian peppertree averaged over a two-year period was 2:1 (females: males) (Wheeler et al. 2001).

Host Plants

The Brazilian peppertree seed chalcid is capable of developing and reproducing on plants in the genera *Rhus* and *Schinus*. The host range of the insect includes at least three *Rhus* spp. native to South Africa, including *Rhus laevis* L. and *R. angustifolia* L. (Hussey 1956, Grissell 1979, Yoshioka and Markin 1991). *Schinus molle* L. and *S. terebinthifolius*, both native to South America, are considered novel host plants (Hussey 1956, Habeck et al. 1989). No native members of the Anacardiaceae, or cashew family, found within the Florida distribution of Brazilian peppertree are attacked by the wasp despite numerous attempts to rear the insect from the drupes of high-risk species such as winged sumac, *Rhus copallina* L. (Wheeler et al. 2001).

Importance

Megastigmus transvaalensis inhibits

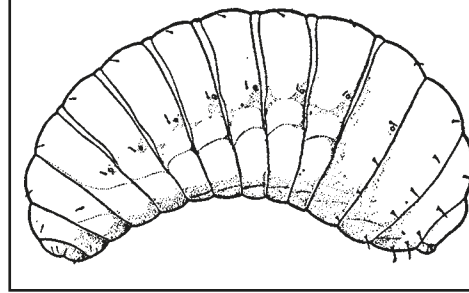


Figure 4. Line drawing of mature larva of *Megastigmus* wasp. Source: H. E. Milliron (1949).

Figure 5. Female pupa of *Megastigmus* wasp prior to adult emergence. Note ovipositor curved over the back of the abdomen. Source: H. E. Milliron (1949).



seed production and may reduce the spread of Brazilian peppertree into natural areas where this invasive weed is displacing native species. In a two-year study, up to 31% and 76% of the Brazilian peppertree drupes were damaged by the wasp during the winter and spring fruit production periods, respectively (Wheeler et al. 2001). The single seed developing inside the drupe also fails to germinate when damaged by the wasp.

An augmentation program is currently underway in the Everglades National Park (G. S. Wheeler, personal communication). Wasps are being reared and released in remote areas infested with Brazilian peppertree where the insect is not established. Further research is needed to determine why a higher incidence of wasp-damaged drupes was observed in Brazilian peppertree plants occurring north of Lake Okeechobee and in more inland rather than coastal sites (Wheeler et al. 2001).

Acknowledgements

We thank Howard Frank and Marjorie Hoy for reviewing the manuscript and Mike Sanford, Department of Entomology and Nematology, University of Florida, for assistance in preparing the illustrations. Florida Agricultural Experiment Station Journal Series No. N-02258.

Note: References are available by request from the senior author.

Southeast EPPC Update

New Board Structure, Roles Defined, and
Provisional State Chapter Status Created

By Brian Bowen, SE-EPPC President, Brian.Bowen@state.tn.us

Changes to improve our ability to make decisions and complete tasks emerged from our July 22 SE-EPPC Board meeting in Birmingham. Particularly, a change in bylaws resulted in a smaller and more productive Board of Directors that now has 4 officers, a previous past president, and one representative from each state chapter as voting members. It also includes as non-voting members, one representative from provisional state chapters, affiliate members, and liaisons that represent agencies or major non-governmental organizations. An example of an affiliate member is the South Carolina Native Plant Society. Current liaisons include the US Forest Service and SAMAB (Southern Appalachian Man and the Biosphere)

Another change in bylaws created provisional status for newly forming state chapters, giving them one year to get up and running before they receive state chapter status. A provisional state chapter must first submit bylaws to the SE-EPPC Board for approval. After one year of operating under these bylaws, the chapter will receive IRS non-profit status under group exemption through SE-EPPC. Also, all provisional state chapters are required to have at least 2 face-to-face board meetings per year, and are strongly encouraged to have quarterly meetings. Provisional state chapters, as well as all other state chapters, will be required to post their board meeting minutes on the SE-EPPC web page.

Another outcome of the past Board meetings was to define roles of officers. This was timely with the elimination of the coordinator position, and it now provides officers with an understanding of what they are expected to do.

These changes should help us build a stronger organization and identify and develop more meaningful goals. As president, I am grateful to have an opportunity to make SE-EPPC a better organization. We need everyone's support in this effort so that we can make a difference in preventing new exotic pest plant introductions while getting rid of those that are already here. Visit our web site at: www.se-eppc.org

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Internodes

MARK YOUR CALENDAR

Ecosystem Restoration and Stewardship in Florida, hosted by the Florida Center for Environmental Studies, **January 15-17, 2003**, Renaissance Resort, St. Augustine, FL. Contact: <https://secure.ces.fau.edu/rsc/program.ihtml> or e-mail jjolley@ces.fau.edu

The 2003 Annual Meeting of the *Weed Science Society of America (WSSA)*, **February 10-13, 2003**, Adams Mark, Jacksonville, FL. Contact: jlancaster@allenpress.com or www.wssa.net/

Detecting & Assessing Invasive Exotic Plants: Approaches for the Florida Landscape, A Conference and Workshop, **February 12-14, 2003**. Florida International University, Koven's Conference Center, Miami, FL. Contact: R. Monchek, rmonchek@sfrestore.org, www.sfrestore.org/issuetteams/exotic/iepda/IEPDAindex.htm

NIWAW IV, the National Invasive Weeds Awareness Week in Washington, DC, will take place **February 24 - 28, 2003**. Contact: North American Weed Management Association (NAWMA), www.nawma.org/index.html

The 64th Annual Meeting of the *Association of Southeastern Biologists (ASB)*, **April 9-12, 2003**, Washington, DC. Contact: http://www.biology.howard.edu/ASB/ASBstart_here.html

The Florida Native Plant Society, 23rd Annual State Conference, *Symbiosis: The Power of Partnerships*, **May 8-11, 2003**, Fort Myers, FL. Contact: www.fnps.org/

The *Southeast Exotic Pest Plant Council 2003 Annual Symposium*, **May 15-17, 2003**, Lexington, KY. Contact: mwilliams@mail.state.ky.us

The *Aquatic Weed Control Short Course*, **May 19-23, 2003**, UF/IFAS Fort Lauderdale Research and Education Center. Contact: conference.ifas.ufl.edu/

The *Florida Exotic Pest Plant Council 2003 Annual Symposium*, **June 5-6, 2003** at the Renaissance Vinoy Resort in St. Petersburg, FL. (Note: FLEPPC is returning to a Spring/Summer schedule for the annual symposium.) Contact: www.fleppc.org

The 7th *International Conference on Ecology and Management of Alien Plant Invasions (EMAPI)*, **November 3-8, 2003**, Miami, FL. Contact: www.bio.miami.edu/iirm/emapi7/

Graduating Students:

Congratulations to the following students who recently completed their graduate studies on exotic pest plants:

Dorothy Brazis, 2002, Master's Degree, University of Florida, Agronomy, "Factors influencing the distribution of *Paederia foetida* (skunk vine): an invasive vine of natural areas of Florida." Major Professor: Randall Stocker.

Kristina Serbesoff-King, 2002, Master's Degree, Florida International University, Environmental Studies, "*Melaleuca quinquenervia* – A review of the taxonomy, biology, harmful and beneficial values, distribution and control of *Melaleuca quinquenervia* in Florida." Major Professor: "Jay" Jayachandran.

New Books:

A Plague of Rats and Rubber-Vines – the Growing Threat of Species Invasions, by Yvonne Baskin, 2002. Island Press: www.islandpress.org

Rare Plants of South Florida: Their History, Conservation and Restoration, by G.D. Gann, K.A. Bradley, and S.W. Woodmansee, 2002. The Institute for Regional Conservation: www.regionalconservation.org

Invasive Aquatic and Wetland Plants Field Guide, by Stratford Kay, 2002. North Carolina State University/ North Carolina Sea Grant: Barbara_doll@ncsu.edu

A Global Compendium of Weeds, by R.P. Randall, 2002. (More than 20,000 entries!) RG and FJ Richardson, Australia: www.weedinfo.com.au/

Education/Extension:

The **Florida Master Naturalist Program** (FMNP) is an adult education extension program developed by the University of Florida and taught in many counties throughout the state. FMNP is for persons interested in learning more about Florida's environment and conservation issues and is appropriate for people of all knowledge levels. The program includes courses in 3 subject areas: *Freshwater Wetlands*, *Coastal Systems*, and *Upland Habitats*. Each subject is taught independently and costs \$200. For more information, go to www.MasterNaturalist.org

NOTES FROM THE DISTURBED EDGE

Chapter 6

This was crazy - she'd been a hostage long enough. She spent her days battling vicious alien intruders, the Sigourney Weaver of the floral kingdom, but now she was cowering in her own home, peeking out through the curtains, hoping that frightening thing out there would just go away. Her faithful and ever-so-patient canine companion alternately peered up at her and stared at the doorknob, leash in mouth and legs crossed - watching her behave like some paranoid freak, fearing she'd finally thrown a rod. She felt like she was teetering on the brink of insanity, and her dog was about to explode.

She knew this would happen, and had spent all afternoon obsessing about it, hoping that he would concoct some magical cure in response to her endless diatribe about the inevitable confrontation that was now unfolding, but she had been left to blaze her own path, flatly refusing to take the low road. "No," she'd told him, "this is someone I've got to see every day. I can't just give her the old 'Oh yeah, they tend to drop some leaves when they're first transplanted, especially in, uh, whatever season this is . . .' line and hope she finds the will to go on after her tragic loss. She'll know I'm lying, or at least I will. No — I just have to talk to her." She knew she did, but certainly did not want to right now.

He'd thought that maybe she could introduce the topic from an obtuse angle, steer the conversation to talk about their work perhaps, but she'd disagreed. "She knows what I do — kind of, I think. I've heard her yelling 'that nice girl next door is an environmental guardian' into the phone," and she'd pre-empted the supposedly witty retort she knew would follow, "and yes, I'm pretty sure she's talking about me because the other person next door to her is an old man..."

In her head she repeated "That which does not kill me makes me stronger," while another part of her mind inquired, "How can I drop this kind of bomb on my neighbor, especially such a nice little lady, without coming off as a self-righteous know-it-all or, worse yet, a blue-booted thug, casting judgment on her neighbor, the legendary tree police?" How do you tell the little lady who waves to you each morning and sends you off with a 'Go save our environment sweetie!' each day, how do you tell her, when you come back at the end of the day, that you just spent 8 hours killing the plants she's

cultivating? How do you tell her that her newly acquired botanical additions are anathema in this climate?

She understood - her neighbor had purchased most of her plants from the local Big Tropical Illusion Garden Center, or whatever that place was called. She'd talked with the friendly garden department folks in their matching aprons and their pruners in substantial leather holsters. They'd sold her hearty, fast growing plants that would add texture, color, and beauty to her garden. She'd planted and coddled and watered and fed them, and they would grow and grow and grow, and then go to seed and set about their work of uncontested dispersal, until the day when that nice girl next door would come face to face with their healthy little progeny, and lay them all to waste, ripping them from the face of the earth, tearing them limb from limb. "Yes, this was quite unexpected, she was always such a quiet girl . . ." How would she explain?

The best way to deal with your fears is to confront them. She was awash in bumper sticker psychology. Winners set realistic goals and achieve them. Losers, well losers sometimes cowered in their own homes. She opened the door; the dog bounded gleefully forth and romped around the yard once, quickly, before heading for a favorite territorial signpost. "Oh hello deary" the little lady smiled, and waved as she looked up from some intense gardening activity, "isn't it a lovely day for a walk? I just love it when..." her polite attention to the friendly conversation was distracted by the realization that her dog was still busy adding new meaning to the term basal bark application — wow that was really a patient pooch. "Just talk to her," he'd said.

She interrupted the continuing stream of good cheer: "Ma'am — can we talk?" and was genuinely surprised by the response. "Oh good, yes I'd like that — it seems you're always in such a hurry. Come on in out of the heat, you've been out working in the sweaty environment all day. I made some cookies this afternoon, and I've wanted to ask you about that other tree — it never did get those new leaves you talked about..." She rolled her eyes and stepped inside, praying that the truth, or at least most of it, would set her free. She'd been a hostage in her own home long enough.

- J.A.

An excerpt from "*The Adventures of Hack Garlon and his buxom sidekick Squirt.*"