State or Territory: **Florida** Planning Cycle Start: **2000**
Reporting Year: **2004**

Current Contacts

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IPM Program Overview

This section provides an overview of major accomplishments and outcomes. It lists how the program benefits clients and explains any adjustments that had to be made to the Plan of Work.

Safeguarding Human Health and the Environment

The first coordinated, statewide integrated pest management (IPM) program in the state of Florida has been established, including IPM and biological control research, extension and education. New pest management technologies have been developed and implemented in collaboration with public and private organizations that can use them to improve Florida's agricultural productivity and profitability, protect urban environments, and preserve natural resources. Technology identification, development and delivery networks have been established among international, national, state and private sector organizations to resolve technical problems in implementing IPM and biological control.

The Florida IPM program has increased the use of IPM practices according to the following objectives: 1. Support and encourage county extension faculty and agricultural and urban clientele in planning, developing and implementing IPM and biological control programs, 2. Form collaborative partnerships composed of faculty and clientele group members to enhance the development and delivery of IPM practices, 3. Serve as the UF, IFAS contact for IPM information and coordinate this activity with pest management discipline specialists, the Pesticide Information Office, and other UF, IFAS programs, 4. Serve as a focal point for institutional IPM and biological control issues and a link between clientele and UF, IFAS, 5. Keep abreast of and support faculty IPM research, extension and teaching programs and activities, 6. Encourage the development of grant proposals by faculty teams to submit to agencies and organizations funding IPM and biological control, 7. Promote UF, IFAS IPM programs in state, regional and international settings, 8. Document and disseminate information on Florida's achievements in IPM, and 9. Maintain close working relationships with UF, IFAS Administrators, including Department Chairs, Center Directors and District Extension Directors, in advancing IPM and biological control research, extension and teaching programs.

1. Support County Extension:
• Regional pilot project on ChemSearch (all county extension offices, CDMS)
• Landscape Maintenance Training in IPM (Extension specialists and county agents)
• Woody Ornamental IPM Project (IPM Institute North America; Cherry Lake Tree Farm, Florida Nurserymen and Grower's Association; Arrow environmental Services; Extension specialists and agents)
• IPM Toolbox (Master Gardeners, statewide extension)
• IPM Florida grants (23 grants, $92,000)
• Extension meetings (regional Green Teams, 4-H Congress)

2. Foster Collaboration:

• Mole cricket nematode project in Puerto Rico (Fla. Cattlemen's Association, UPR)
• Mole cricket IPM project (T-STAR)
• Vegetable decision source book (Glades Crop Care, Pesticide Information Office)
• Florida Brevard School IPM Pilot Project (Indiana University, University of Arizona, Brevard Public Schools, IPM Institute North America)
• Fruit Fly Workshop, Grenada (CABI, USDA-APHIS)
• Strawberry Biological Control Project (Clemson University)
• IPM in IFAS environmentally related programs (Extension article).

3. Provide IPM Consultation:

• Continuous consultation on IPM and biological control to UF, IFAS and clientele groups (see consultation list).

4. Serve as IFAS's IPM Contact:

• Miami Offshore Invasive Species (USDA, APHIS; USDA, ARS; FDACS, DPI)
• USDA, APHIS regulations on hand carrying natural enemies (ANBP)
• IPM standards for Gerber carrots (Protected Harvest)
• International Butterfly Breeder's Association (invited talk at annual conference)
• Regulatory certificate for the Doctor of Plant Medicine (DPM) degree (USDA, APHIS; Florida Farm Bureau; FDACS, DPI)

5. Support Faculty:

• DPM internships in regulatory agriculture & DPM Program enhancement (Plant Medicine, USDA, APHIS; USDA, ARS; FDACS, DPI)
• Graduate students in research & extension (3 DPM, 6 Ph.D., 1 M.S.)
• Guest lectures (IPM, biological control)
• IPM and biological control outreach (Florida, Jamaica, Grenada, Puerto Rico, Colorado, North Carolina)
• Fly parasites and traps (Spalding Biological Control; USDA, ARS; Urban Entomology)

6. Assist with Grant Proposals:

• Organic agriculture research and extension priorities (UF faculty, Florida Organic Growers Association)
• SPDN project (UF faculty)
• USAID IPM CRSP (UF, IFAS International Programs, Cornell University, Ag. Education and communication)

• Grape root borer (Florida Grape Grower's Association)
• Invasive species and enhanced trade (UF, IFAS, Tropical Agriculture)
• IPM practices in landscape management (UF, IFAS, Florida Yards & Neighborhoods, statewide Extension)
• Fellowships for DPM students (NRI; UF, IFAS, International Programs)
• Mole cricket IPM (T-STAR, Florida Legislative Budget Request)

7. Promote UF, IFAS IPM Programs:

• Extension meetings (Green Teams, 4-H, Master Gardener, counties)
• CSREES Regional IPM Center (Vice Chair, newsletter articles)
• National IPM Symposium (publicity committee)
• Association of Natural Bio-control Producers (annual conference, consultation)
• Scientific societies (ESA- Editorial Board, FES-committees, APS and MSA)
• IOBC-AMRQC (co-chair, report- Global IOBC Newsletter)
• IPM Institute of North America (newsletter article)
• Insect Rearing Workshop, Mississippi State University (lectures, book chapter)
• International scientific visitors (Iraq, Peru, Colombia, Brazil)

8. Document and Deliver IPM Information:

• IPM Florida report to CSREES
• Film Florida IPM success stories (UF, IFAS, ICS; statewide Extension)
• IPM Florida website (http://ipm.ifas.ufl.edu)
• Florida Entomological Society (Associate Editor, Pioneer Lecture articles, committees)
• Publications (see list)

9. Work with the UF, IFAS Administration:

• Entomology and Nematology Department (Entomology & Nematology Student Organization faculty advisor, Florida State Fair, mentor new faculty, Social Committee, Administrative Committee, IAEA Short Course, Courtesy Faculty appointments)
• Caribbean Initiative on Invasive Species (Caribbean Food Crops Society; UF, IFAS, Tropical Agriculture)
• UF, IFAS Goals and Focus Areas (Co-chairman, statewide Extension)
• UF, IFAS Tenure, Promotion and Permanent Status Committee
• Search & Screen Committees

Benefits achieved through IPM Technologies or Strategies

Research and extension efforts by UF/IFAS faculty are increasingly leading to reductions in the use of high-risk pesticides, thereby protecting human health and the environment. Florida's IPM program report for FY2004 includes examples of state Extension specialists/researchers' and Extension agents' efforts to develop and promote IPM systems in a variety of commodities and areas of emphasis:

ChemSearch Pilot Test- ChemSearch is the industry's premier searchable database for agricultural chemicals and contains product label information for over 1,600 crop protection and special products including 24Cs, Section 18s and Supplemental Labels. ChemSearch allows the user to search by crop or site, pest (up to four at a time), state/county, manufacturer, product name, type of product (herbicide,

insecticide, etc.), application time or label type (24C, etc.). As a result of searches, use rates, pests controlled, re-entry options, crop rotations and safety information as well as other facts are displayed or printed in a one to two page format. In addition to the label summary, full-text versions of all product labels are available, as are over 4,200 MSDSs for agricultural and specialty products. After a successful pilot program, the University of Florida and Southern Region IPM Center expanded the ChemSearch program into each of the 12 states in the Southern Region for evaluation of its use and content by Extension faculty. These states will work with CDMS staff to improve the database as necessary for Extension and research purposes. Based on the IPM Florida projects, CDMS has extended the trial program to all Land Grant Universities and government agencies in the U.S. (http://www.sripmc.org/newsalerts/newsletter/September04.pdf)

Woody Ornamental IPM Project- The two-year project achieved the goal of significantly increasing the number of woody ornamental plant producers who can use an IPM assessment program to encourage reduced risk practices and products. A diverse workgroup comprised of producers, buyers, researchers, extension specialists and agents, and other stakeholders have created a reduced-risk practice assessment. This assessment will be available on the web for any producer to use in evaluating their operations. In addition, an IPM certification program for woody ornamental plant production is being made available to producers by the IPM Institute of North America, with the woody ornamental plant industry, consumers, IPM Florida, and University of Florida Extension in advisory roles. This “IPM Star Certification” will provide credible recognition in the marketplace for Florida woody ornamentals produced using IPM practices. Individual growers will be able to undergo certification for their woody ornamental products to meet the demands of developing niche markets. Currently, these markets primarily involve environmentally oriented consumers, real estate developments, and public agencies. IPM practices can in some cases be less expensive than non-IPM practices, providing a financial incentive for adoption. IPM certification can provide one or more additional incentives, including price premiums, access to new markets, preservation of existing markets, enhanced neighbor and community relations, and reduced liability from pesticide risks.

IPM Toolbox- Homeowners need training in Integrated Pest Management (IPM) to reduce pesticide use by adopting less toxic pest management practices. An “IPM Toolbox” containing hands-on activities that improve the pest management decision-making skills of Master Gardeners and the public has been developed and evaluated in the northeastern counties of Florida. The proposed project aims to assemble and distribute toolboxes for the remaining 50 counties in the state and train extension agents to use the toolboxes to educate Master Gardeners and the public. Pre- and post-training questionnaires will be used to evaluate effectiveness of the training sessions that extension agents conduct using the toolbox. The project will result in greater understanding of alternative pest management practices by Master Gardeners and other homeowner clientele.

Florida School IPM Pilot Project- The School IPM team has been visiting the Brevard IPM pilot schools for nearly a year now achieving long term, environmentally sound pest suppression through the use of a wide variety of technological and management practices. Control strategies in an IPM program extend beyond the application of pesticides to include structural and procedural modifications that reduce the food, water, harborage, and access used by pests. IPM practices include 1. Monitoring and identification of pest populations, 2. Education about pests and pest conducive areas,

3. Reducing pest conducive conditions by eliminating food, water, and harborage, and 4. Targeting the least hazardous pesticides on an “as needed” basis to areas not contacted or accessible to children, faculty, or staff (http://schoolipm.ifas.ufl.edu).

Sarasota County IPM Program- Sarasota County is dedicated to implementing IPM and has one of the most active programs in Florida. Sarasota is the first county to hire an IPM Coordinator who, along with other County Staff and input from the County’s citizen IPM Advisory Board, has completed a new IPM Policy. A list of approved products for use in the County’s IPM program is being developed (this has not been completed but organochlorines and organophosphates will be prohibited). The County’s longstanding IPM resolution adopting the practice of IPM for pest management in the County and establishing the citizen IPM Advisory Board is being updated and strengthened, and the membership and charges of the Board expanded. The Sarasota IPM Coordinator continues to chair an IPM Working Group, which is now in its eleventh year. The Working Group was established in Sarasota County and serves as a monthly forum for pest management personnel in County government; this is a meeting where issues and questions are discussed, pests highlighted, and new methods and materials are presented. The School Board, local municipalities and the Sarasota Memorial Hospital also participate with the IPM Working Group. Sarasota North and South County Athletics have an Environmental Pest Management Technician (EPMT) who has the responsibility to scout for pest problems instead of spraying by date and season. An athletic field IPM team was established to control the use of pesticides on athletic fields and restrict any purchases without approval from the IPM Coordinator or EPMT’s. Entomopathogenic nematodes are used as tools for the control of mole crickets instead of solely relying on chemical approaches. IPM Florida collaborators introduced Larra bicolor, an ectoparasitic wasp of mole crickets into the County along with its preferred nectar plant. A parasitic phorid fly also was released in the county as a part of the its IPM plan. Sarasota County's IPM Coordinator attends monthly meetings of the Chemical Sensitive Community to maintain a dialog and work out accommodations where possible. As a result of these meetings, Mosquito Management Services provides notification before aerial and ground spraying by telephone, county TV programming, and its website. The Environmental Landscape Management (ELM) contract for grounds maintenance around County buildings does not use synthetic chemical pesticides (Scythe is used instead of Roundup for Weed Control). This is an accommodation to the Chemical Sensitive Community. Synthetic chemical pesticides are used in other outdoor contracts and in various in-house programs (athletic fields, parks, roadsides and aquatic weed control). The ELM contract is being converted into a model contract and landscape maintenance guide for distribution in our Builder-Developer, Community Associations, and Florida Yards and Neighborhood Programs, and for homeowners. The indoor pest management contract of county buildings uses only baits, gels, and boric acid dusts.

Dissemination of IPM Knowledge

In Florida, IPM information is disseminated by UF/IFAS primarily through the individual and collaborative efforts of numerous state Extension specialists and county Extension agents. IPM Florida provides support to groups and individuals involved in providing IPM information. Other clientele are involved in collaborative efforts, and ultimately the citizens of Florida are the benefactors. The objective is to shift pest management practices from relatively high to low health and environmental risk by providing information and training on the use of pest management alternatives, including the acceptance of pests when their damage is

minimal.

One of the main avenues of support to individuals disseminating IPM information in Florida is the IPM Florida Web site (http://ipm.ifas.ufl.edu), which was reorganized and enhanced in 2003. It is divided into categories of IPM information and contains sections for agriculture, community IPM, and natural areas, where information is given by commodity or clientele type. A section about the IPM Florida program provides contact information, an explanation of IPM concepts, and a description of current projects. Another section on applying IPM includes information on planning IPM programs, scouting, pest identification, IPM tactics (biological, cultural, chemical, mechanical), measuring IPM, invasive species, genetically modified organisms, and soil and water quality. There are success stories for melaleuca, mole crickets, ornamentals, and tomato IPM. Extension resources are offered, including IPM questions and answers, links to county extension offices and IPM programs in other states, demonstrations, diagnostic clinics, glossaries, newsletters, news releases, pesticide information, photo galleries, presentations, proceedings, publications and additional related links. Finally, there is a search engine for locating information on the site. The total number of visits to the IPM Florida website during 2004 was 51,816. Information is being gathered and redistributed to about 300 listserv members, including announcements from the USDA, CSREES and Southern Region IPM Center.

Collaborative efforts in IPM involving a range of stakeholders have helped to reduce the use of high-risk pest management practices, such as the application of broad-spectrum pesticides, in vegetable and ornamental plant production, public schools, and other contexts. Additional organizational linkages, including stakeholder collaboration in IPM implementation in Florida, include involvement with the following groups: NY Times- Article; American Farmland Trust- Producer; CABI- Workshop; Elsevier- MS review; USDA, ARS-Insect diet, grants, ms review, Phyllophaga, tech. transfer, fruit flies, insect rearing, SBIR review, Biocontrol, MS review; UF, IFAS-Specimen ID, climbing fern, grants, employment, lobate lac scale, MS review, recommendation letters, IPM, butterflies, biocontrol permits, plant nutrition, tenure & promotion; Ball Publishing- Article; Dow Chemical- Insect Rearing; CDFA- Biocontrol; Clearwater Butterfly- Insect Rearing; Univ Guayaquil- Insect Rearing; ANLA-Cactoblastis; FAO, IAEA- Course instructor; MSU- Workshop, Cactoblastis, book chapter, recommendation letter; Cornell Univ- Article, grants; Venezuela-Consult.Chrysoperla; Ent. Exp. & App.- MS review; Canada- Biocontrol; Agbio Phyllophaga; UF Health Sciences- Grants; Protected Harvest-MS review; North 1 Television- Mantids; Eurofresh Farms- Tomato mite; USDA, APHIS- Employment; USDA, CSREES- Collab. Australia; ANBP- Greenhouses; FSU- Employment, CABI Workshop; UF, IFAS- Tenure; DEP- Nominations; U of Arizona- Recommendation letter, Gershon Feder; EPA- Ornamentals; DOI- actoblastis; Ag. Canada- Velvetbean Caterp.; FDACS, DPI- IAEA Course; Wake Forest U.- Oleander Caterp.;Ventura Co.-News IPM; India- IPM; IPM Institute NA- IPM Certification, Spalding Labs.- Fly Parasites, Traps; FAO, IAEA- Tse Tse Fly; Ag. Canada- Spruce Budworm.

Publications in 2004:

Larson, B. C. and N. C. Leppla. 2004. New Tomato and Pepper Extension Resources. Citrus & Vegetable Magazine. 68:18-20.

Leppla, N. C., J. H. Frank, N. Vicente and A. Pantoja. 2004. A Commercial Nematode for Mole Cricket Control. Proc. Caribbean Food Crops Society, 2004. (in press).

Leppla, N. C. and B. C. Larson. 2004. Quality Control Methods for the Production of Natural Enemies. Encyclopedia of Pest Management. Marcel Dekker, NY. 4 p.

Frank, J. H., N. C. Leppla and N. Vicente. History of Turf's Nastiest Pest Mole Crickets to the South. Florida Turf Digest. 21:20-2.

Osborne, L.S., N.C. Leppla, and R.S. Osborne. 2004. Biological Control of Foliage Pests, pp. 385-394. In K. M. Heinz, R. G. Van Driesche, and M. P. Parrella [eds.], Biological Control of Arthropod Pests in Protected Culture. Ball Publishing, Batavia, IL. 552 p.

Leppla, N. C. 2004. Rearing of Insects, pp. 1862-1868. In J. L. Capinera, (Ed.), Encyclopedia of Entomol., Vol. 3. Kluwer, Boston. 2580 p.

Sonke, D. J. and N. C. Leppla. 2004. IFAS's IPM, BMPs, FYN and More: An Alphabet Soup of Good Environmental Programs for Florida. University of Florida, IFAS, EDIS (http://edis.ifas.ufl.edu).

Enhanced Stakeholder Collaboration

Coordination is essential to mobilize and focus Florida's research and extension talent to manage pests of agriculture, communities and natural areas in ways that are effective but cause minimal non-target effects in the environment. IPM Florida helps to identify and communicate research needs for new, more biologically based pest management technologies.

IPM Florida stimulated and accelerated action responsive to the needs of the Extension community and collaborated widely with growers, crop consultants, Extension agents, educators, and researchers. One of the highest priorities for the state, region, and nation is to conduct discrete IPM research projects and demonstrate results that homeowners and farmers can use to manage insect pests with minimal use of toxic insecticides.

Protocol for IPM Florida Grants:

Eligibility: All UF, IFAS faculty and staff members working in IPM.

Time Frame: Awards will be made by November 1, 2004. Funding period is for one year, ending September 30, 2005. Final reports/EDIS publications will be due December 2, 2005.

Award Amount: Approximately $80,000 is available for the IPM Grants this year. Most awards are expected to be $5,000 but exceptional projects may be awarded up to $10,000.

Selection of Awards: For the first year, IPM Florida will expedite the program by designating a multidisciplinary selection committee comprised of IFAS administrators. The IPM Florida Advisory Council will rank applications in the future.

Types of Eligible Projects: Examples of eligible projects include workshops, exhibits, website development, computer-based training, brochures, fact sheets, publications, mass media communications, local and distance education courses, tests of non-

chemical IPM technologies or products and practices that integrate pesticides, evaluation of IPM adoption by clientele groups, etc. Any project providing IPM for growers, industry groups, consumers, students, or the general public will be considered.

Selection Criteria: Projects that 1. Directly involve County Extension Faculty, 2. May have widespread impact on increasing IPM in Florida, 3. Have supplemental funds or in-kind resources already in place, 4. Include partnerships between IFAS and our clientele and 5. Have applicants that have great need and limited resources i.e., new agents/faculty.

Requirements: Priority will be given to projects with significant county faculty involvement. A one-page final report or draft EDIS publication will be required no later than December 2, 2005. The report will briefly describe project activities and outcomes (what you did and who benefited), methods of evaluating outcomes, and any appropriate quantitative measures of IPM dissemination and adoption. Projects must satisfy at least one (preferably more than one) of the following national IPM objectives: 1. Safeguarding human health and the environment, 2. Benefits achieved through IPM strategies or technologies, 3. Dissemination of IPM knowledge, and 4. Enhanced stakeholder collaboration.

IPM Florida Grants Awarded in 2004:

Project Title, PI, Funding
School IPM Project, Brevard Co Faith Oi $3,780.00
CD-ROM Series of Natural Enemies James Cuda $4,000.00
Flower Thrips in Southern Blueberries Oscar Liburd $5,862.00
Spanish Translation of IPM Pest Alerts Carrie Harmon $2,500.00
Beneficial Insects Display Charles Fedunak $4,100.00
Exotic Weed Management Training Clyde Smith $3,425.00
Demonstration of Residential IPM Gary Brinen $1,500.00
IPM Informational Kiosk Jennifer Welshans $5,500.00
IPM for Pinellas County Nurseries John Alleyne $5,311.00
Scout Training Class for Ornamentals Juanita Popenoe $1,700.00
Pests of Ornamentals and Landscape Kim Gabel $5,334.00
IPM Displays & Training for the Public Pamela Brown $3,250.00
Mosquito Abatement for Safety & Health Ralph Mitchell $6,410.00
Borer Traps as an Alternative Pest Control Theresa Friday $4,962.00
Nursery Scout Training Class Vera Gasparini $1,600.00
The Biological Control Brain Bowl William Overholt $7,150.00
IPM Practices for Orchid Production Wagner Vendrame $4,000.00
IPM Videos for Students & Public S. M. Scheiber $6,000.00
Chemical Control of Mosquitoes Roxannne Rutledge $4,050.00
Grand Total $80,434.00

We were very pleased to receive 46 proposals requesting a total of $295,488. We were able to fund 19 proposals from the $80,000 available and an additional 5 proposals totaling $12,930 from other sources. The goal was to fund as many proposals as possible by adjusting budgets and encouraging cooperation. The average IPM grant award was $4,500. All of the proposals described important IPM work, but primary consideration was given to those with Extension partnerships.

Profiled Program Impact

Enhancing the New Plant Medicine Program

Issue: Plant health practitioners who are knowledgeable in all aspects of the prevention, diagnosis and management of plant health problems, Plant Doctors, are needed to synthesize the complex plant health data essential manage pests with minimal risk to human health and the environment. The UF, IFAS Plant Medicine Program is designed to provide all segments of agriculture with rapid, accurate, and scientifically sound diagnoses and management strategies for all types of plant health problems through the activities of broadly trained Plant Doctors. Plant Doctors are having a positive impact on worldwide agriculture by increasing the productivity, usefulness, and profitably of plants while lessening non-target effects of management practices to humans and the environment.

What Was Done: Basic curriculum for the multidisciplinary Plant Medicine Program has been established with courses and practical training in all relevant departments, including Agronomy, Entomology/Nematology, Horticultural Sciences, Plant Pathology, Soil and Water Science, and other plant sciences. Students are being trained in the science, practice and business of the profession of plant medicine that will enable them to implement IPM practices. Florida's edaphic and climatic conditions and crop diversity present students with an ideal opportunity for hands-on experience in diagnosing and managing plant health problems of all types. Under the guidance of their Supervisory Committee students tailor their studies to their crop or other career interests. In addition, certificate programs currently exist for DPM students in Tropical Agriculture and Environmental Policy and are planned in the near future for Regulatory Agriculture and Sustainable Crop Production. The D.P.M. degree requires 90 semester credits of graduate course work plus 30 semester credits of internship. Half of the internship requirements are fulfilled by working with faculty who supervise the soil testing, insect identification, plant disease diagnosis, and nematode assay clinics of the UF, IFAS in Gainesville. Elective internship opportunities are available in the private sector and with USDA, APHIS, PPQ; FDACS, DPI; CDFA, and other governmental agencies.

Impact: Graduates of the Plant Medicine program practice IPM in a variety of careers. Positions held by graduates and current students include the following:

Crop Consulting- Crop Consultant, Glades Crop Care, Inc., Jupiter, FL
Teaching- Agricultural Instructor, Suwannee High School, Suwannee, FL
Regulatory- Pest Survey Specialist, USDA-APHIS/PPQ, Cleveland, OH; Chief Plant Protection Officer, Ministry of Agriculture, Jamaica; Program Coordinator, FDACS/DPI Cooperative Agricultural Pest Survey, Gainesville, FL
Extension- Research Associate, UC Berkeley, CA; Assistant in Pesticide Information, Southern Region IPM Center, Gainesville, FL; Regional Specialist Extension Agent, Tampa Bay, FL
Plant Health Management- Horticulture Manager, McGuire Center for Lepidoptera and Biodiversity, Gainesville, FL; Plant Health Specialist, Skinner Nurseries, Jacksonville, FL; Pest Management Specialist, Breakers Resort Hotel, Palm Beach, FL.

Resources

Funds Supporting State IPM Program

	Federal Allocation	Other Federal Funds		State Funds		Other Funds	
Fiscal Year	Actual	Planned	Actual	Planned	Actual	Planned	Actual
2000	180,200	3,000	3,000	0	0	0	0
2001	180,200	3,000	3,000	0	0	49,530	49,530
2002	180,200	5,000	5,000	0	0	47,709	207,579
2003	179,029	5,000	5,000	0	0	0	210,000
2004	180,200	5,000	164,871	0	0	0	458,295

Budget Notes

Budgetary Comments for This Year: Smith Lever 3(d) IPM funding for the Florida IPM program was $180,200 in FY 2002, $179,029 in FY 2003, and $164,871 in FY 2004. The FY 2004 funds were used to support IPM program operations ($31,000 for travel, meetings, vehicle maintenance, computer equipment, office equipment, extension materials, OPS assistance, etc.), the Assistant IPM Coordinator's salary ($54.000), and the IPM Florida grants program ($80,000). Budget Notes: UF, IFAS non-3d support included salary and benefits for a full-time IPM Coordinator, facilities for the faculty and staff, a vehicle, and assistance from IFAS Communications Services (1/4-time IT assistant). The federal 3d funds were augmented with Hatch and competitive grant funds and Department of Entomology and Nematology office, computer, graphics and facilities support. The IPM Office is housed in the Department and some University of Florida funding is provided to support facilities and key personnel. The 3d funds have been leveraged to enable the following IPM Florida grant supported projects: Title/Source Start Date Role Net Funding Detecting and Controlling Grape Root Borer in North Florida Vineyards/ Florida Grape Growers Association (FGGA) 7/03 Co-PI $ 7,500 Initiative to Protect the U.S. from Invasive Species and Enhance Trade, USDA- APHIS 9/03 Co-PI $ 27,250 Mass Rearing and Release of Boreioglycaspis melaleuca against Melaleuca USDA-APHIS 9/03 Co-PI $ 19,568 Florida and Offshore Biological Control Initiative Against Invasive Species, USDA-APHIS 9/03 Co-PI $ 104,545 Integrated Pest Management of Pest Mole Crickets in Puerto Rico and Florida, USDA-TSTAR 10/04 PI $ 99,992 Incorporating Alternative, Multi-Tactic IPM into the Crop Planning Process of Florida Vegetable Growers/USDA-PMAP 9/03 PI $ 40,467 Management of Caribbean Fruit Fly, Pink Hibiscus Mealy Bug, and Other Invasive Pests/USDA-APHIS 2/04 Co-PI $ 13,500 Landscape Maintenance IPM Training to Promote Reduced-Risk Pest Management Practices/EPA-PESP 10/04 PI $ 40,000 Enhancing Distance Education in Integrated Pest Management/USDA-HEC 10/04 Co-PI $ 58,700 Southern Region Pilot Program to Evaluate ChemSearch/USDA-CSREES 12/04 Co-PI $ 18,651 IPM Toolboxes to Reduce Pesticide Use in Urban Communities/EPA 12/04 Co-PI $ 13,122 Principles of Plant Pest Risk Assessment and Management/USDA-APHIS 6/04 Co-PI $ 15,000 TOTAL $ 458,295

IPM Program Staff. are listed as the number of Full Time Equivalents (FTEs) supported by the funds above. This includes support staff, para-professional staff and professional staff.

	Total FTEs Supporting IPM Program Staff	
Fiscal Year	Planned	Actual

2000	4.5	4.5
2001	5.0	5.0
2002	4.0	4.0
2003	3.0	3.0
2004	2.0	3.0

Other Staff Supporting State IPM Program. IPM Programs are usually supported by a mix of paid IPM program staff (listed above) and two other groups:

- **Cooperators** -- Employees of universities (e.g., extension agents, research and extension faculty), government entities (e.g., department of agriculture officials), or other organization employees (e.g., growers, crop consultants, processors) who support the IPM program as part of their full time occupation. Cooperators are not paid from IPM funds, but cooperate on IPM projects as "part of their job."
- **Volunteers** -- Volunteers cooperate with the IPM program, but not as "part fo their job" (e.g., master gardeners, event volunteers).

	Number of Cooperators		Number of Volunteers	
Fiscal Year	**Planned**	**Actual**	**Planned**	**Actual**
2000	0.0	0.0	0.0	0.0
2001	5.0	5.0	0.0	0.0
2002	20.0	50.0	7.0	10.0
2003	30.0	70.0	10.0	17.0
2004	40.0	85.0	10.0	115.0

***Area of Emphasis* Cotton**

Program Activities and Outcomes

Research on the development of tactics used in cotton IPM has been underway for more than 25 years at the North Florida Research and Education Center. Training sessions for cotton pest management technicians (Field Scouts) have been conducted throughout north Florida by NFREC personnel for the past 20 years. During this time research projects have focused on breeding cotton for pest resistance, conservation and utilization of natural enemies, selective use of chemicals, use of cultural practices to suppress pest infestations, and development of a variety of pest monitoring techniques and treatment thresholds.

During each of the past few years, 80,000 to 100,000 acres of cotton were harvested in north Florida. It continues to be a profitable crop for many farmers in north Florida because of a number of factors, including a successful boll weevil eradication program, alternative crops that are less attractive from an economic standpoint, well adapted varieties, and a broad range of tools for pest and crop management. However, with production costs in the range of $300 to $400 per acre, cotton growers need up-to-date, accurate information on pest and crop management practices that are economically sound. Florida currently has very limited research on cotton production, so information from other states and countries was reviewed and adapted for incorporation into Florida's existing production system.

Four publications related to pest management in cotton were completed or updated in 2004. Presentations made at scout training meetings during the year included the following: "Identification of Cotton Insect Pests," "Scout Responsibilities and Safety," "Growth and Development of a Cotton Plant," "Identification of Cotton Insect Pests," and "Scouting Procedures in Cotton."

Cotton growers must decide when the last harvestable boll will be set and protect those bolls from late season pests, such as stink bugs. Since most of our cotton has the Bt technology, special care must be taken to control stink bug. More information can be found at
http://nfrec.ifas.ufl.edu/Newsletters/Archive2004/Newsletter_08_02_04.pdf
There is an Update on Hardlock of Cotton at
http://nfrec.ifas.ufl.edu/Newsletters/Archive2004/NEWSLETTER%20_03_1_04.pdf

Method of Collecting Information
Information was collected from internet links and through reports of county extension faculty and state specialists, which includes personal observations and discussions with clientele groups. Extension activities were documented through the UF/IFAS Faculty Accomplishments System (UNIFAS) reports. Details of public events and training sessions are recorded, including numbers of participants.

Major Pests
stinkbugs
bollworm
cotton aphid
beet armyworm
tobacco budworm
fall armyworm
thrips
tarnished plant bug
Leading Indicators

Indicator 1.1 Number of production units or entities using IPM

Year	Planned	Actual	Measurement Unit
2000	10000.0	90,000	acres
2001	20000.0	95,000	acres
2002	30000.0	95,000	acres
2003	70000.0	90,000	acres
2004	30000.0	87,000	acres

Indicator 1.3 Total amount of high risk pesticides applied

Year	Planned	Actual	Measurement Unit

2000	1.75	0.5	individuals
2001	1.65	0.5	individuals
2002	1.55	0.5	individuals
2003	1.45	1.1	individuals
2004	1.35	1.7	individuals

Indicator 3.4 Producers trained

Year	Planned	Actual	Measurement Unit
2000	45.0	12.0	individuals
2001	50.0	10.0	individuals
2002	50.0	33.0	individuals
2003	50.0	49.0	individuals
2004		57.0	individuals

Indicator 3.5 Private sector personnel trained

Year	Planned	Actual	Measurement Unit
2000	10.0	5.0	individuals
2001	10.0	5.0	individuals
2002	10.0	5.0	individuals
2003	10.0	3.0	individuals
2004	10.0	5.0	individuals

Indicator 3.6 Public sector personnel trained

Year	Planned	Actual	Measurement Unit
2000	5.0	0.0	individuals
2001	5.0	0.0	individuals
2002	5.0	0.0	individuals
2003	5.0	0.0	individuals
2004	5.0	4.0	individuals

Indicator 4.1 Public events involving collaborations

Year	Planned	Actual	Measurement Unit
2000	4.0	2.0	individuals
2001	5.0	3.0	individuals
2002	5.0	3.0	individuals
2003	6.0	2.0	individuals
2004	6.0	4.0	individuals

***Area of Emphasis* Ornamentals**

Program Activities and Outcomes

With a wholesale value of over 1.7 billion dollars, Florida's ornamental plant nursery industry is one of the most rapidly growing segments of agriculture in the state. Ornamental crops have a high aesthetic value and are intensively managed to produce fast growth with minimal pest pressure. The industry is heavily dependent on pesticide use and consumers demand "perfect" plants at the time of purchase while growers desire to minimize risk. The industry is constrained from changing their management practices because of the economic market and various environmental factors. There is a low price structure for finished crops, increased regulation of water volume used by nurserymen, increased monitoring of ground water quality, fewer pesticides available for cost-effective pest management, more invasive pests, and more restrictions on pesticide application procedures and employee re-entry following pesticide use. The implementation of IPM is a viable alternative to strict pesticide use in certain situations in commercial ornamental production.

The Florida extension effort in nursery IPM has concentrated on educating clientele in the principles and benefits of IPM, and training them in the skills needed to fulfill the scouting requirements of the industry. Demonstration nurseries and scout training schools scheduled around the state have been very successful at drawing attention to the benefits of IPM. Public and nurserymen awareness (web site, newsletter, newspaper articles) on management of the killer cycad aulacaspis scale. Due to the very damaging hurricanes, the annual IPM Nursery Scout Training for 2004 had to be provided to 18 registrants in a rescheduled program. The format was a three-day intensive hands-on course that taught pest identification and scouting methods. A diagnostic plant clinic at MREC, in conjunction with an Orange County extension agent, was provided for commercial ornamental producers in the central Florida area. Growers were able to submit pest and disease samples for free diagnosis and extension agents handled 329 diagnostic samples in 2004. With proper diagnosis, IPM strategies for controlling the problem could be established.

Nineteen new fact sheets created for the website can be found at http://cfextension.ifas.ufl.edu/Nursery%20Production/Woody/woody.htm. These fact sheets provide key plant/key pest information for woody plant material and scouting recording sheets for some plants. An educational program on Sudden Oak Death was presented to 15 participants. This program will be provided again if SOD is found in Florida in 2005.

Method of Collecting Information

Information was collected from reported internet links and through reports of county extension faculty and state specialists, which includes personal observations and discussions with clientele groups. Extension activities were documented through the UF/IFAS Faculty Accomplishments System (UNIFAS) reports. Details of public events and training sessions were recorded, including numbers of participants.

Major Pests
aphid
fungus gnats
mealy bug
mites
whiteflies
Leading Indicators

Indicator 1.1 Number of production units or entities using IPM

Year	Planned	Actual	Measurement Unit
2000	4600.0	3,600	acres
2001	5100.0	3,600	acres
2002	5600.0	3,600	acres
2003	6100.0	4,000	acres
2004	6600.0	4,000	acres

Indicator 1.3 Total amount of high risk pesticides applied

Year	Planned	Actual	Measurement Unit
2000	12.0	9.0	individuals
2001	12.0	8.0	individuals
2002	7.0	8.0	individuals
2003	6.0	7.0	individuals
2004	5.0	7.0	individuals

Indicator 2.1 Economic benefit obtained

Year	Planned	Actual	Measurement Unit
2000	200.0	200	$
2001	200.0	200	$
2002	200.0	200	$
2003	200.0	200	$
2004	200.0	200	$

Indicator 3.2 IPM educational materials delivered

Year	Planned	Actual	Measurement Unit
2000	2.0	3.0	publications
2001	2.0	3.0	publications
2002	2.0	3.0	publications
2003	2.0	42.0	publications
2004	2.0	29.0	publications

Indicator 3.3 People participating

Year	Planned	Actual	Measurement Unit
2000	1700.0	3,500	individuals
2001	1800.0	3,500	individuals
2002	1900.0	2,489	individuals
2003	2000.0	5,362	individuals
2004	2001.0	5,500	individuals

Indicator 3.4 Producers trained

Year	Planned	Actual	Measurement Unit
2000	200.0	1,000	individuals
2001	200.0	1,000	individuals
2002	200.0	1,973	individuals
2003	200.0	4,250	individuals
2004	200.0	1,700	individuals

Indicator 3.5 Private sector personnel trained

Year	Planned	Actual	Measurement Unit
2000	1000.0	1,000	individuals
2001	2000.0	1,000	individuals
2002	2000.0	1,000	individuals
2003	2000.0	4,250	individuals

2004	2000.0	4,250	individuals

Indicator 3.6 Public sector personnel trained

Year	Planned	Actual	Measurement Unit
2000	20.0	15.0	individuals
2001	20.0	15.0	individuals
2002	20.0	16.0	individuals
2003	20.0	15.0	individuals
2004	20.0	15.0	individuals

Indicator 4.1 Public events involving collaborations

Year	Planned	Actual	Measurement Unit
2000	50.0	35.0	number of events
2001	50.0	35.0	number of events
2002	50.0	81.0	number of events
2003	50.0	116	number of events
2004	50.0	80.0	number of events

***Area of Emphasis* School IPM**

Program Activities and Outcomes

The goal for our 2004 school IPM project was to implement verifiable IPM in Brevard County, starting with three pilot schools. There are 89 schools in this district and 73,000 students. With assistance from Marc Lame (Indiana University) and Dawn Gouge (Arizona State), we began training target groups: custodians, teachers, administrators, and cafeteria staff. All of these cooperators learned the basic concepts of IPM and utilized them to manage pest problems within schools. The foundation of our very effective IPM program was good sanitation, with trash disposal and sound structural maintenance also playing important roles. Staff and students were instructed in how their actions could increase or decrease pest problems in the schools. With sound IPM practices, many pest problems were avoided. At the mid-point review, one school had a 65% reduction in pesticide applications and a second had 35%. A third school with a pest control technician not employing the IPM program had a 3% increase in pesticide use. Pest problems in the “IPM schools” either decreased or did not become worse according to occupants, even with hurricanes. Custodians also noted that cleaning became more efficient because significant amounts of clutter were removed.

The primary means of disseminating School IPM information in Florida is the School IPM Website (http://schoolipm.ifas.ufl.edu), which is cited by schools across the

nation. For example, a school IPM manual published by Michigan State University states that "The National School IPM Web site - sponsored by EPA and maintained by the University of Florida... is the number one resource site for school IPM." In 2004 this site recorded 167,611 distinct visitors and 272,433 page views. In addition, numerous Word files of various lengths were developed for downloading into newsletters and other printed media.

The school IPM program in Florida is co-chaired by an urban entomologist and a landscape entomologist. Low-risk strategies for athletic turf, ornamentals and playgrounds are being developed. School personnel were recognized for meeting IPM benchmarks and pest proofing structures. The program is expanding beyond the pilot schools in Brevard County and into additional counties. Major accomplishments continue to be documented in Pest Press (http://schoolipm.ifas.ufl.edu/news). School IPM certification is available from the IPM Institute of North America.

Method of Collecting Information

State specialists provided estimates of IPM adoption. Extension activities were documented through the UF, IFAS Faculty Accomplishments System (UNIFAS) reports. The enrollment was recorded for educational seminars, including the number of school districts that participate. Evaluations of all educational activities were conducted at mid-term and the end of the implementation phase. The number of site visits and pages requested was recorded for the School IPM Website.

Major Pests

ants
cockroach
spider
wasps
weeds
head lice
all pests
rodents

Leading Indicators

Indicator 1.1 Number of production units or entities using IPM

Year	Planned	Actual	Measurement Unit
2000	40.0	40.0	school districts
2001	45.0	45.0	school districts
2002	50.0	47.0	school districts
2003	55.0	40.0	school districts
2004	60.0	48.0	school districts

Indicator 1.3 Total amount of high risk pesticides applied

Year	Planned	Actual	Measurement Unit
2000	0.5	0.26	individuals
2001	0.4	0.2	individuals
2002	0.3	0.2	individuals
2003	0.2	0.26	individuals
2004	0.1	0.2	individuals

Indicator 3.2 IPM educational materials delivered

Year	Planned	Actual	Measurement Unit
2000	60000.0	60,000	Individuals
2001	65000.0	65,000	Individuals
2002	75000.0	68,000	Individuals
2003	80000.0	68,000	Individuals
2004	85000.0	87,000	Individuals

Indicator 3.3 People participating

Year	Planned	Actual	Measurement Unit
2000	3000.0	3,000	individuals
2001	3250.0	4,900	individuals
2002	3500.0	5,000	individuals
2003	3750.0	5,000	individuals
2004	4000.0	5,500	individuals

Indicator 3.5 Private sector personnel trained

Year	Planned	Actual	Measurement Unit
2000	1000.0	1,000	individuals
2001	1100.0	1,500	individuals
2002	1200.0	1,500	individuals
2003	1300.0	1,200	individuals
2004		3,200	individuals

Indicator 3.6 Public sector personnel trained

Year	Planned	Actual	Measurement Unit
2000	1000.0	1,000	individuals
2001	1100.0	1,000	individuals
2002	1200.0	1,000	individuals
2003	1300.0	1,000	individuals
2004		1,500	individuals

Indicator 4.1 Public events involving collaborations

Year	Planned	Actual	Measurement Unit
2000	3.0	3.0	individuals
2001	4.0	3.0	individuals
2002	5.0	15.0	individuals
2003	5.0	10.0	individuals
2004	5.0	15.0	individuals

***Area of Emphasis* Tomato**

Program Activities and Outcomes

Prior to the initiation of an IPM program in 1978, virtually no vegetable acreage in the Manatee-Hillsborough County area was being scouted. Growers were spraying twice weekly with at least two insecticides tank-mixed in each spray. This was equivalent to at least 48 doses of insecticide per crop. Following the introduction of an IPM program based on twice weekly scouting and spraying on demand, an estimated 75% of the tomato acreage now is scouted and insecticide doses have been cut at least in half. Even growers who have no formal scouting program have reduced their use of insecticides based on the experiences of their neighbors. Despite these gains in scouting and spraying on demand, opportunity exists to increase the percentage of the tomato acreage in west-central Florida that is scouted and to reduce further the amount of insecticide applied. An education effort was initiated through on-farm visits to encourage growers who currently do not base their spray decisions on scouting to implement formal scouting to aid in deciding when and what to spray. Research and education on the management of key pests in tomatoes has benefited tomato growers throughout Florida.

Funding was received during 2003 from the USDA Pest Management Alternatives (PMAP) program to develop IPM extension materials for tomato and pepper growers. As the basis for this project, growers were surveyed in 2004 to determine future needs and goals of IPM research. We collected the many scientific and extension publications that are available for tomato pest management and are using the information to compile a Tomato and Pepper Decision Sourcebook that will be available in 2005. Through research and extension publications, and county extension programs, growers have access to a considerable amount of information. However, Sourcebook will make it available in an easy to read and update format. Growers, researchers and extension agents individually have vast experience in

many of the specific components of effective IPM. The relevant information and tools needed for effective crop planning are being assembled to support up-front pest management decisions. The goal is to prevent pest outbreaks, rather than try to control heavy infestations.

Method of Collecting Information

Information was collected through reports of county extension faculty and state specialists, which includes personal observations and discussions with clientele groups. Extension activities were documented through the UF/IFAS Faculty Accomplishments System (UNIFAS) reports. Details of public events and training sessions were recorded, including numbers of participants. In some cases participants were asked to complete questionnaires evaluating the programs. Relevant publications (fact sheets, pointers, meeting proceedings, newsletters, trade journal articles and other extension publications) were recorded. Visits to Websites were tabulated.

Major Pests

nutsedge
Fusarium
target spot
bacterial spot
silverleaf whitefly
viruses
soil-borne pests
root-knot nematodes

Leading Indicators

Indicator 1.1 Number of production units or entities using IPM

Year	Planned	Actual	Measurement Unit
2000	20.0	20.0	percentage of acres
2001	30.0	30.0	percentage of acres
2002	45.0	75.0	percentage of acres
2003	60.0	75.0	percentage of acres
2004	75.0	75.0	percentage of acres

Indicator 3.2 IPM educational materials delivered

Year	Planned	Actual	Measurement Unit
2000	7011.0	2,858	Individuals
2001	7511.0	6,000	Individuals
2002	8011.0	8,000	Individuals
2003	8511.0	8,781	Individuals

2004	9011.0	8,500	Individuals

Indicator 3.3 People participating

Year	Planned	Actual	Measurement Unit
2000	7000.0	3,218	Individuals
2001	7500.0	5,500	Individuals
2002	8000.0	8,000	Individuals
2003	8500.0	7,421	Individuals
2004	9000.0	7,700	Individuals

Indicator 3.4 Producers trained

Year	Planned	Actual	Measurement Unit
2000	20.0	130	Individuals
2001	30.0	150	Individuals
2002	45.0	400	Individuals
2003	60.0	375	Individuals
2004	75.0	140	Individuals

Indicator 3.5 Private sector personnel trained

Year	Planned	Actual	Measurement Unit
2000	151.0	130	Individuals
2001	184.0	150	Individuals
2002	201.0	400	Individuals
2003	218.0	375	Individuals
2004	268.0	140	Individuals

Indicator 3.6 Public sector personnel trained

Year	Planned	Actual	Measurement Unit
2000	74.0	145	Individuals
2001	91.0	150	Individuals
2002	99.0	150	Individuals

2003	107.0	150	Individuals
2004	132.0	150	Individuals

Indicator 4.1 Public events involving collaborations

Year	Planned	Actual	Measurement Unit
2000	3.0	4.0	Individuals
2001	4.0	6.0	Individuals
2002	4.0	20.0	Individuals
2003	4.0	42.0	Individuals
2004	4.0	17.0	Individuals

***Area of Emphasis* Turf**

Program Activities and Outcomes

Turfgrass production and maintenance are important components of Florida's economy and the overall Green Industry. The turfgrass industry in Florida includes and/or affects all people living in or visiting Florida because nearly all people use it on a daily basis. Thus, due to the size and scope of the turfgrass industry, problems and challenges are constantly presented.

Turfgrass is produced on sod farms but is subsequently grown in many areas, including yards, parks, cemitaries, golf courses, rights-of-way, pastures, etc. The maintenance of quality turfgrass helps reduce soil erosion, filters pollutants, reduces water loss, and is aesthetically pleasing. However, as with other aspects of the Green Industry, turfgrass managers depend greatly on pesticide use to maintain quality turf. Certain insect pests (e.g., mole crickets, chinch bugs) reoccur in similar areas each year, or are difficult to control, and current pesticides have short residuals and must be applied repeatedly to gain adequate control. Turfgrass managers and consumers (e.g., golf course members) do not tolerate damage that interferes with their purposes for the grass. Other constraints, including increased monitoring of ground water quality, the availability of fewer pesticides, and greater restrictions on pesticide application procedures. The implementation of integrated pest management is a viable alternative to strict pesticide use in certain situations in turfgrass production and maintenance.

Renovation of “Turf Areas” was updated in 2004 (EDIS website). Master Gardener groups met for field days around the state thorough the year for seminars on turf IPM. This provided a very effective means for disseminating new and effective IPM strategies. One of these meetings was at the UF, IFAS Turfgrass Field Day in Gainesville where a fairy ring management demonstration and other IPM strategies were showcased. UF, IFAS turfgrass field experts from around the state also participated in a turf pest management strategic plan meeting at Griffin Georgia. Pathologists, entomologists, nematologists, and weed and turf scientists prepared a Southern Turf Pest Management Strategic Plan which will be submitted to the USDA Office of Pest Management Policy through the Southern Region IPM Center. In

Florida, most individuals working in turf IPM spent much of their time responding to diagnostic requests, phone calls, e-mails and office visits for turf problems from different clientele.

Method of Collecting Information

Information was collected through reports of county extension faculty and state specialists, which included personal observations and discussions with clientele groups. Extension activities were documented through the UF/IFAS Faculty Accomplishments System (UNIFAS) reports. Details of public events and training sessions were recorded, including numbers of participants.

Major Pests
Leading Indicators

Indicator 1.1 Number of production units or entities using IPM

Year	Planned	Actual	Measurement Unit
2000		0.0	acres
2001		200	acres
2002	500.0	646	acres
2003	1000.0	775	acres
2004	1500.0	1,500	acres

Indicator 3.2 IPM educational materials delivered

Year	Planned	Actual	Measurement Unit
2000	20.0	25.0	publications
2001	30.0	32.0	publications
2002	45.0	47.0	publications
2003	50.0	74.0	publications
2004	55.0	57.0	publications

Indicator 3.5 Private sector personnel trained

Year	Planned	Actual	Measurement Unit
2000	1000.0	900	individuals
2001	1000.0	1,400	individuals
2002	2000.0	2,411	individuals
2003	2000.0	3,822	individuals

2004	2500.0	4,000	individuals

Indicator 3.6 Public sector personnel trained

Year	Planned	Actual	Measurement Unit
2000	300.0	350	individuals
2001	400.0	500	individuals
2002	500.0	540	individuals
2003	600.0	530	individuals
2004	700.0	600	individuals