

# PROGRESS REPORT FY 2009

## THE ALABAMA FIRE ANT MANAGEMENT PROGRAM

*...making fire ants easier to live with.*















AUBURN  
UNIVERSITY

ENTOMOLOGY AND PLANT PATHOLOGY

*Edited by Kelly Ridley and L.C. "Fudd" Graham*

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# FISCAL YEAR 2009 IN REVIEW

~The Alabama Fire Ant Management Program~

...making fire ants easier to live with.

Department of Entomology & Plant Pathology

Auburn University

Auburn, AL

## INTRODUCTION

OUCH! What bit me? Fire ants. Since their introduction through the Port of Mobile in the early 1900's fire ants have become one of the most invasive species this country has ever seen. Over the past 100 years fire ants have spread across the entire southeast, much of Texas and parts of California.

In Alabama, these tiny insects present a constant problem for stakeholders. The Alabama Fire Ant Management Program was established to bring research-based information to the

public in order to help them deal with these invasive pests.

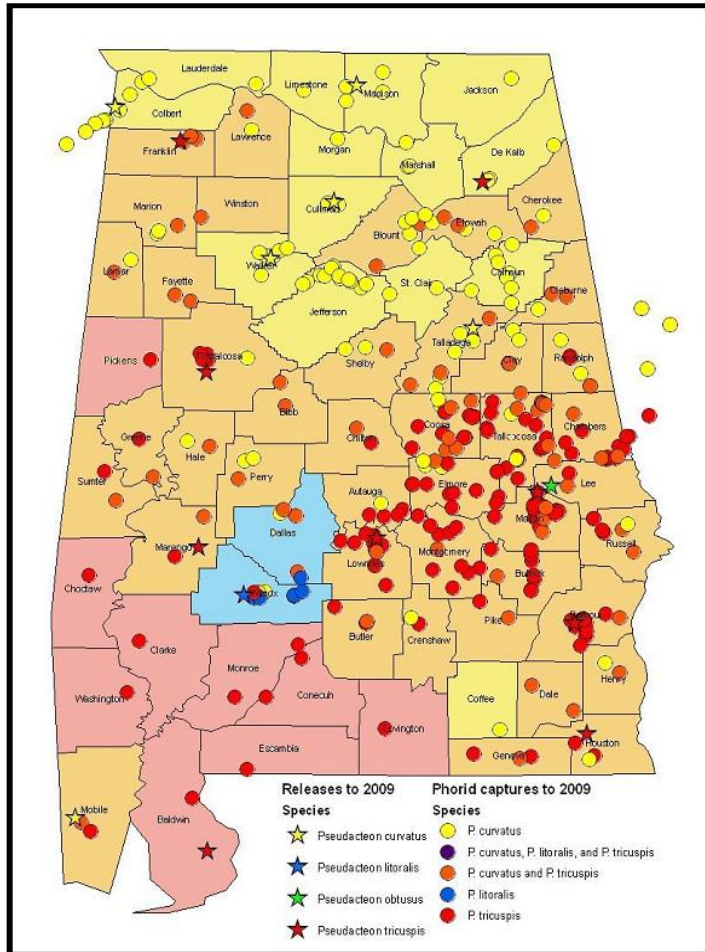
Although fire ants will never be eradicated in the U.S., our goal is to develop sustainable fire ant management techniques for Alabama stakeholders.

By working closely with other fire ant researchers across the globe, the Alabama Fire Ant Management Program is making large strides in understanding and utilizing fire ant biology and natural behaviors which are key when developing new management techniques.



Courtesy Kathy Flanders

## BIOLOGICAL CONTROL UPDATE: 2 SPECIES OF PHORID FLIES FOUND IN 70% OF ALABAMA COUNTIES



Location of phorid fly species in 2009

2009 marks the 13<sup>th</sup> year of the phorid fly program in the state of Alabama. Over these years the Alabama Fire Ant Management Program in cooperation with the Alabama Cooperative Extension System, Alabama A&M University and landowners across the state have conducted 17 releases of 4 different species of phorid fly.

With continued and extensive field collection of phorid flies in 2009, the program documented that there are 2 species of phorid fly found in 70% of Alabama counties. There are more than 20 species of phorid fly found in South America, the fire ants natural home. By continuing to increase the number of different species of phorid fly in Alabama we are hoping to see a balance take place between fire ants and their biological control agents, allowing our native ants to compete with the more aggressive fire ants.

Alabama is the only state in the U.S. where *Pseudacteon litoralis* has established. In 2009, the program collected *P. litoralis* in Dallas County, which is 10 miles northeast of the initial release site in Wilcox County.

## TEACHING MASTER GARDENERS ABOUT FIRE ANTS

Each year the Alabama Fire Ant Management Program puts together a fire ant display for the Alabama National Fair and the National Peanut Festival. In order to have someone with fire ant knowledge at the booth at all times to answer stakeholder questions, the program enlists the help of Master Gardeners.

In cooperation with the Alabama Cooperative Extension System the program conducts fire ant educational meetings for Master Gardeners on fire ant biology, biological controls and management.

In 2009, educational meetings were held in Montgomery and Dothan, with a total of 39 Master Gardeners attending. Master Gardeners donated ~136 hours of their time and made ~10,000 contacts with stakeholders!

Master Gardener Jerome Thomas speaking with stakeholders at the 2009 Alabama National Fair.

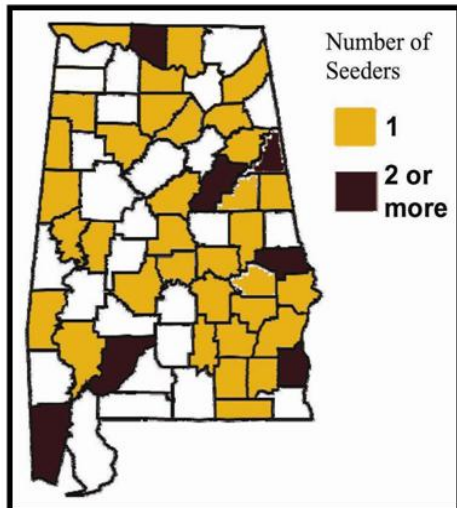


### EXTENSION: ONE-STOP FIRE ANT INFO SITE

The fire ant eXtension site found at: [eXtension.org/fire+ants](http://eXtension.org/fire+ants) is an Internet-based, nationwide resource of information and advice on fire ants.

This project targets the 85 million people who live in fire ant infested areas of the U.S. The end product is a 24/7 one-stop shopping place for advice on managing fire ants. The site received 11,000 unique page visits per month in 2009, which was double the number received in 2008.

## HERD SEEDERS IN ALABAMA



As of the end of 2009, there are 48 herd seeders located at county agent offices across the state. These seeders are used to apply fire ant bait in bulk across large acreages, and are available for stakeholders to borrow for FREE!

Please contact your local county agent office and get started with your fire ant management plan today.

## 2009: BY THE NUMBERS

- ◆ Additional Funding Leveraged: **\$735,452**
- ◆ Field Demonstrations: **22**
- ◆ Fire Ant Exhibits: **6**
- ◆ Hand-to-Hand Stakeholder Contacts: **~20,000**
- ◆ Mass Media Articles: **11**
- ◆ Presentations: **52**
- ◆ Publications: **22**
- ◆ # Publications Distributed: **~15,000**

Dr. Kathy Flanders teaching stakeholders about fire ant management at the 2009 Loachapoka Home Grounds Workshop



# Alabama Fire Ant Management Program Personnel and Cooperators



Auburn University, Department of Entomology & Plant Pathology

## Advisory Committee

Arthur G. Appel, Ph.D. – Department Chair  
 Kathy L. Flanders, Ph.D.  
 L. C. “Fudd” Graham, Ph.D.  
 Michael L. Williams, Ph.D.  
 Beth Guertal, Ph.D. – Department of Agronomy & Soils

## Researchers

Henry Y. Fadamiro, Ph.D.  
 David W. Held, Ph.D.  
 Xing Ping Hu, Ph.D.  
 Nannan Liu, Ph.D.  
 Li Chen, Ph.D.

Samual Addison Barden  
 Wei Ding  
 Marla Eva  
 Shane Parker  
 Alicia K. Phillips

Kelly Ridley  
 Charles Stephen  
 Marla Tanley  
 Krystal Waltman  
 Xin Yue



## Alabama Cooperative Extension System

Thomas Agee  
 Randall Armstrong  
 Somer Behel  
 Ronald Britnell  
 Chuck Browne  
 Danny Cain  
 Dani Carroll  
 Philip Carter  
 Doug Chapman  
 Willie Datcher  
 Henry D. Dorough  
 Rachel Dykes

Chip East  
 Dr. Olin “Buck” Farrior  
 Ted Gilbert  
 Tony Glover  
 Shane Harris  
 Rickey Hudson  
 Jimmy Jones  
 Ken Kelley  
 Mallory Kelley  
 Neil Kelley  
 David Koon  
 Willie Lampley

Janet Lovelady  
 Sallie Lee  
 James Miles  
 Rebecca Persons  
 Dan Porch  
 Mike Reeves  
 Jimmy Smitherman  
 Arthur Threatt  
 Reafield Vester  
 Dr. David West  
 Eddie Wheeler  
 Nelson Wynn



## Tuskegee Cooperative Extension System

George Hunter – Lowndes Co.



## Alabama Agricultural Experiment Station

Sand Mountain Research and Extension Center  
 Tony Dawkins – Station Superintendent



## Alabama A & M, Department of Plant & Soil Science

Ken Ward, Ph.D.  
 Rufina Ward, Ph.D.

## Alabama Fire Ant Management Program Personnel and Cooperators



**Alabama Department of  
Agriculture & Industries**



**U.S. Fish and Wildlife Service**



### **USDA-ARS**

Sanford D. Porter, Ph.D.  
Robert K. Vander Meer, Ph.D.  
David Oi, Ph.D.  
Steven Valles, Ph.D.  
Juan Briano, Ph.D.



### **USDA-APHIS**

Anne-Marie Callcott  
Ron Weeks, Ph.D.



### **Florida Department of Agriculture & Consumer Services**

Amy Croft

## **Local Cooperators**

|                     |                           |                       |                       |
|---------------------|---------------------------|-----------------------|-----------------------|
| <b>Baldwin Co.</b>  | Mark Kaiser               | <b>Macon Co.</b>      | Tim and Susan Gaasch  |
| <b>Barbour Co.</b>  | Lee Fenn                  |                       | Tony & Diane Silva    |
| <b>Cullman Co.</b>  | Mr. & Mrs. F.D. Alexander | <b>Marengo Co.</b>    | Lynn Crocker          |
|                     | St. Bernard Abbey Farm    | <b>Mobile Co.</b>     | Bruce Porter, USFWS   |
| <b>Franklin Co.</b> | Bob Rogers                | <b>Talladega Co.</b>  | Mike Duke             |
| <b>Houston Co.</b>  | Joe Carothers             | <b>Tuscaloosa Co.</b> | Munny Sokol Park      |
|                     | John McDaniel             | <b>Walker Co.</b>     | Dorman Grace          |
| <b>Lee Co.</b>      | Phil & Daria Story        | <b>Wilcox Co.</b>     | Jack Biddle           |
| <b>Lowndes Co.</b>  | George Hunter             | <b>Dadeville, AL</b>  | Stillwaters Golf Club |
|                     |                           |                       | Tommy Minor           |

## **Industry Acknowledgements**



Bruce Ryser



Jeffery Smith



*The miracles of science™*  
**HERA**  
SEEDER CO. INC.

Todd Himelberger











Doug Van Gundy

David Herd

***Sincere apologies to anyone inadvertently omitted from this list.***

*Trade names are used only to give specific information. The Alabama Fire Ant Management Program and the Alabama Cooperative Extension System do not endorse or guarantee any product and do not recommend one product instead of another that might be similar.*

## **Funding Leveraged By the Fire Ant Program:**

-  Fadamiro, H.Y. (PI). Isolation, Identification and Biological Activity of Novel Chemical Compounds Mediating Attraction of Parasitic Phorid Flies to Invasive Fire Ants. Auburn University Biogrants Program. \$20,000. May 1 2008-April 30 2010.
-  Flanders, K. L. and B. M. Drees. 2009. Support for leaders of the Imported Fire Ant eXtension CoP. CSREES eXtension, \$15,000.
-  Graham, F. Field evaluation for FMC. 2009. \$10,000.
-  Held, D.W. \$499,000 in competitive grants awarded with an additional \$4000 in industry support for research.
-  Merchant, M., J. Hurley and B. Bennett. 2007-2009. Multistate Evaluation of School IPM Cost Calculator and Training Model. SRIPM. Subcontract to Graham, F., \$14,020.
-  Oi, F., R. Baldwin, J. Hurley, M. Merchant and F. Graham. 2007-2009. Marketing IPM as Green School Technology. National EIPM Grant, \$78,432.
-  Oi, F. and F. Graham. 2007-2009. Urban IPM. eXtension Grant, \$40,000.
-  Oi, F., R. Baldwin, J. Hurley, M. Merchant and F. Graham. 2008-2009. Marketing IPM as Green School Technology. National EIPM Renewal Grant, \$55,000.

**Total Funding Leveraged: \$735,452**



**Publications: (\* denotes graduate student)**

- \*Chen, L., K. Sharma, and H.Y. Fadamiro. 2009. Fire ant venom alkaloids act as key attractants for the parasitic phorid fly, *Pseudacteon tricuspis* (Diptera: Phoridae). *Naturwissenschaften* 96:1421–1429.
- \*Chen, L., and H.Y. Fadamiro. 2009. Re-investigation of venom chemistry of *Solenopsis* fire ants. I. Identification of novel alkaloids in *S. richteri*. *Toxicon*. 53: 469–478.
- \*Chen, L., and H.Y. Fadamiro. 2009. Re-investigation of venom chemistry of *Solenopsis* fire ants. II. Identification of novel alkaloids in *S. invicta*. *Toxicon*. 53: 479–486.
- Fadamiro, H.Y., \*X. He, and \*L. Chen. 2009. Aggression in imported fire ants: an explanation for shifts in their spatial distributions in southern United States? *Ecological Entomology*. 34: 427-436.
- Flanders, K. L. 2009. 2009 Fire Ant Control Materials for Alabama Homeowners. Alabama Cooperative Extension System Circular ANR-175-A, rev.  
<http://www.aces.edu/pubs/docs/A/ANR-0175-A/ANR-0175-A.pdf>
- Flanders, K. L. 2009. eXtension Imported Fire Ants Update June 2009. Community of Practice Profile, [http://about.extension.org/wiki/Imported\\_Fire\\_Ants\\_Update\\_June\\_2009](http://about.extension.org/wiki/Imported_Fire_Ants_Update_June_2009)
- Flanders, K. L. 2008. eXtension Imported Fire Ants Update December 2008. Community of Practice Profile, [http://about.extension.org/wiki/Imported\\_Fire\\_Ants\\_Update\\_December\\_2008](http://about.extension.org/wiki/Imported_Fire_Ants_Update_December_2008)
- Flanders, K. L. 2009. eXtension Imported Fire Ants Update December 2009. Community of Practice Profile, [http://about.extension.org/wiki/Imported\\_Fire\\_Ants\\_Update\\_December\\_2009](http://about.extension.org/wiki/Imported_Fire_Ants_Update_December_2009)
- Flanders, K. L. and C. Hesselein. 2009. Annual Report for ETP 19F in 2008, Sustainable Management of Imported Fire Ants, Alabama Cooperative Extension System Program Reporting System
- Flanders, K., F. Graham, H. Dorough and V. Bertagnolli. 2009. Making Fire Ants Easier to Live With: Fire Ant Education and Outreach. Report for FY2008 Alabama Fire Ant Management Program.
- \*He, X., and H.Y. Fadamiro. 2009. Host preference in *Pseudacteon* phorid flies: response of *P. tricuspis* and *P. curvatus* to black, red and hybrid imported *Solenopsis* fire ants in multiple choice bioassays. *Biological Control*. 51: 116–121.
- Hu, X.P. and W. Ding. 2009. Do mound disturbance and bait placement affect bait removal and control efficacy in red imported fire ant (Hymenoptera: Formicidae) at different seasons? *International Journal of Insect Science*. 1: 3-9 (<http://www.la-press.com/do-mound-disturbance-and-bait-placement-affect-bait-removal-and-treatm-a1424>)
- Hu, X.P. 2009. Will disturbing mound and applying bait to mounds reduce fire ant foraging activity and effectiveness of control measures? Progress Report FY 2008, The Alabama Fire Ant Management Program p 48-50.
- Hu, X.P. 2009. Disturbed mound or not, fire ants take the bait. *Ag Illustrated*. December issue, page 9.
- Hu, X.P. 2009. Consequences of mound disturbance. *Pest Control Technology* August, pp, 100, 102, 104.
- \*Ngumbi, E., \*L. Chen, and H.Y. Fadamiro. 2009. Comparative GC-EAD responses of a specialist (*Microplitis croceipes*) and a generalist (*Cotesia marginiventris*) parasitoid to cotton volatiles induced by two caterpillar species. *Journal of Chemical Ecology* 35:1009–1020.

**Publications Accepted/In Press:**

- \*Barden, S.A. and D.W. Held. 2009. Control of red imported fire ant using Topchoice, Talstar, and Amdro, 2009. *Arthropod Manag. Test Reports*. (In press).
- Abraham, C., D. W. Held, and C. Wheeler. 2010. Monitoring the seasonal and diurnal activity of *Larra bicolor* (Hymenoptera: Crabronidae). *Applied Turfgrass Science* (In press).
- Held, D.W., C. Wheeler, D.W. Boyd Jr. 2009. Kaolin particle film prevent galling by *Gynaikothrips uzeli*. *Plant Health Progress*. doi:10.1094/PHP-2009-0407-02-RS

- Held, D.W. and C.H. Ray. 2009. Asiatic garden beetle, *Maladera castanea* Arrow (Coleoptera: Scarabaeidae) grubs found in damaged turf in Alabama. *Fl. Entomol.* 92: 670–672.
- R. C. Williamson, D. W. Held, R. Brandenburg, F. Baxendale. 2009. Turfgrass Insect Pests. In: B. Horgan (ed.) *Turfgrass Monograph* (Invited).

### **Scientific Presentations:**

- \*Barden, S.A. and D.W. Held. 2009. Red imported fire ants (Hymenoptera: Formicidae) predation on life stages of Japanese beetles (Coleoptera: Scarabaeidae). Entomological Society of America, Dec 15, Indianapolis, IN.
- \*Barden, S. A. and D.W. Held. 2009. White grubs as an increasing pest of turfgrass. Alabama Turfgrass Association Annual meeting, Oct. 21, Auburn, AL.
- Fadamiro, H.Y. 2009. Chemical mediated interactions in insects: a case of fire ants and parasitic phorid flies. Chinese Academy of Sciences, Institute of Zoology. Beijing, China. October 23, 2009.
- Fadamiro, H.Y. 2009. Semiochemical mediated interactions in insects: a case study of fire ants, parasitic insects and a leaf beetle pest. South China Agricultural University, Guangzhou, China. October 26, 2009.
- Flanders, K. and B. Drees. Imported Fire Ant eXtension Network Meeting at the Annual Meeting of the Entomological Society of America, Indianapolis, Indiana, December 2008.
- Flanders, K., B. Drees, P. Nester, and M. Morgan. Imported Fire Ant eXtension Workday at the Annual Imported Fire Ant Conference, Oklahoma City, Oklahoma, April 2009.
- Flanders, K., B. Drees, and P. Nester. Imported Fire Ant eXtension: A new way of connecting experts to provide unbiased information for the client, at the Annual Meeting, Southwestern Branch Entomological Society of America, Stillwater, Oklahoma, February 2009.
- Flanders, K. L., B. Drees, M. Keck, and P. Nester. Update on eXtension. 2009 Imported Fire Ant & Invasive Ant Conference, Oklahoma City, Oklahoma, April 2009. (35%).
- Flanders, K. L. and B. M. Drees. Update on imported fire ant eXtension at the Annual Meeting, Southeastern Branch Entomological Society of America, Montgomery, Alabama, March 2009.
- Graham, F. Latest Control Strategies for Fire Ants. South Carolina Pest Management Professionals. Columbia, SC. February 10-12, 2009.
- Graham, F., S.D. Porter, V. Bertagnolli and K. Ridley. *Pseudacteon litoralis* in Alabama, Established, but Hard to Find. Imported Fire Ant and Invasive Ant Conference. Oklahoma City, OK, April 2009.
- Held, D.W. 2009. The novelty of being a generalist among herbivores and academics. University of Southern Mississippi, Biological Sciences Dept., Jan 23, Hattiesburg, MS (invited).
- Held, D.W. 2009. Detecting and monitoring activity of *Larra bicolor*. Entomological Society of America, Dec 16, Indianapolis, IN.
- Held, D.W. 2009. Entomology Research Update. Alabama Turfgrass Association Annual meeting, Oct. 21, Auburn, AL.
- Hesselein, C. and K. Flanders. Fire ant demonstration and education: counting is easy, evaluating is hard at the Annual Meeting and Professional Improvement Conference National Association of County Agricultural Agents, Portland, Oregon, September 2009. (also presented at the Annual Meeting of the Alabama Association County Agricultural Agents and Specialists, Demopolis, Alabama, June 2009).
- Hu, X.P. July 2009. Fire ant control using baits: what is new? College seminar at University of Sains Malaysia.
- Hu, X.P. August 2009. Think out of the box: fire ant control as an example. Pest control association workshop at Penang, Malaysia.
- \*Stephen, C. and Hu, X.P. 2009. Food-mediated behavior and biological justification in red imported fire ants. Entomological Society of America annual meeting, Dec. 13-16, 2009. Indianapolis, Indiana, USA.

### **Publications in Preparation:**

Liu, N., T. Li., C. Wang, and L. Zhang. 2010. Multiple P450 genes: their expression and protein activities in the red imported fire ant (in preparation).

**Professional Meeting Exhibits:**

Flanders, K. L. Fire Ant eXtension booth at the 2009 Annual Meeting of the National Association of County Agricultural Agents and Specialists, in Portland, Oregon, September 2009.

**Outreach Activities, Presentations, Teaching, and Teaching Materials:**

Agee, T. 4 presentations about fire ants to the Daffodil Club & the Dale Co. Retired Teachers Association, 2009.

Barden, S. A. and D.W. Held. 2009. White grubs as an increasing pest of turfgrass. Auburn University Turfgrass Field Day. July 23, Auburn, AL.

Behel S. Fire Ant Education for 4-H'ers (32 presentations).

Cain, D. Fire Ant Management, Walker County Master Gardener Class, Jasper, AL.

Cain, D. Fire Ant Management, elementary school, Walker Co., AL.

Dorough, H. Fire Ant Management in Cattle Operations (2 presentations), East Central AL.

Dykes, R. and D. Koon. Fire Ant Management for two Master Gardener Classes.

East, C. Fire Ant Management in Turf (2 presentations), Piedmont Area Athletic Turf Workshops, AL.

East, C. Entomology Classes, At-Risk Youth, Piedmont Area.

East, C. Fire Ant Management in Blueberry Operations, Field Day, Headland, AL.

Elmore, J. and R. Colquitt. Fire Ant Management, Shelby County Forage Field Day, 2009.

Flanders, K. Control of Fire Ants, at the Alabama Forage and Grassland Conference 2009: Grassroots Opportunities: Taking Science to Livestock Farms, Livingston, AL, December 10, 2009.

Flanders, K. Effective Fire Ant Control, at the Alabama Turfgrass Association 48th Annual Turfgrass Conference and Tradeshow, October 22, 2009.

Flanders, K. Fire Ant Management for Homeowners, at the Termites & Imported Fire Ant Biology and Management Seminar, Alabama Cooperative Extension System, Alabama Green Industry Training Center, Birmingham, AL.

Flanders, K. Kathy Flanders. Fire Ant Management for Industry Professionals, at the Termites & Imported Fire Ant Biology and Management Seminar, Alabama Cooperative Extension System, Alabama Green Industry Training Center, Birmingham, AL.

Flanders, K. Fire Ants, at the Alabama Cooperative Extension System Green Space IPM and Safety Update, Mobile, AL, September 8, 2009.

Flanders, K. Fire Ant Control Demonstration, at the Fall For Gardening Alabama Cooperative Extension System Home Grown Workshop, Loachapoka, AL.

Flanders, K. Fire Ant Control Demonstration, at the Fall For Gardening Alabama Cooperative Extension System Home Grown Workshop, Wetumpka, AL.

Flanders, K. Fire Ants, 6 Hands-on Sessions, Urban Youth Farm Day, Alabama Cooperative Extension System, Meridianville, AL.

Flanders, K., J. Davis and A. Adrian. eXtension Refresher Course Web Conference, May 18, 2009.

Flanders, K. Ayanava Majumdar, and Brenda Ortiz, Auburn Team Presentation, Indian Institute of Agricultural Research, Delhi, India, August 18, 2009.

Flanders, K. Ayanava Majumdar, and Brenda Ortiz, Presentation by Team Members at FSC, Punjab Agricultural University, Ludhiana, Punjab, India, August 26, 2009.

Graham, F. Fire Ant Control in Commercial and Residential Landscapes. Greater Birmingham Area Landscape Professionals Meeting, Birmingham, AL, February 12, 2009.

Graham, F. Fire Ant Control for Horse Owners. 2009 Alabama Horse Science Institute Meeting. Auburn, AL, March 28, 2009.

Graham, F. Fire Ant Control Tactics. Birmingham IPM Training. Birmingham, AL, April 2009.

- Graham, F. Home Fire Ant Control (3 talks). Farm, Home and Wildlife Expo. Clanton, AL, August 2009.
- Graham, F. Fire Ant Control. Annual Turfgrass Conference and Tradeshow. Auburn, AL, October 2009.
- Harris, S. Fire Ant Control Demonstration, at the Fall for Gardening Alabama Cooperative Extension System Home Grown Workshop, Wetumpka, AL.
- Held, D.W. 2009. Marketing insect monitoring and management to your customers and members. Alabama Turf Association Field Day, Auburn University Turfgrass Research Unit, July 23, Auburn, AL.
- Held, D.W. Newer chemistries for use against landscape and turf pests. Alabama Pesticide Dealer Recertification Training, Nov. 18, Montgomery, AL.
- Held, D. W. Insect pest management in turfgrass. Alabama Turfgrass Association Roadshow, Jan 21, Montgomery, AL.
- Held, D. W. Insect pest management in turfgrass. Alabama Turfgrass Association Roadshow, Jan 28, Birmingham, AL.
- Held, D. W. Insect pest management in turfgrass. Alabama Turfgrass Association Roadshow, Feb 4, Dothan, AL.
- Held, D. W. Insect pest management in turfgrass. Alabama Turfgrass Association Roadshow, Feb 11, Fairhope, AL.
- Held, D. W. Insect pest management in turfgrass. Alabama Turfgrass Association Roadshow, Feb 18, Huntsville, AL.
- Kelley, M. and M. Tomlin. Fire Ant Educational Exhibit at the Natural Resources Tour, Pintlala, AL.
- Ridley, K. and M. Kelley. Training for Master Gardener Volunteers for the Alabama National Fair. Montgomery, Al, October 2009.
- Ridley, K. and R. Dykes. Training for Master Gardener Volunteers for the National Peanut Festival. Dothan, Al, October 2009.
- Wheeler, E. and M. Reeves. Fire Ant Management, Strawberry/Organic Field Day.
- Wheeler, E. and D. Porch. Fire Ant Management, Muscadine Grape Pruning Workshop.
- Wheeler, E. Fire Ant Management, Square Yard Garden Workshop and Tour.

### **Mass Media:**

- Agee, T. Article on Fire Ant Management, Southern Star, Ozark, AL, 2009.
- Agee, T. Article on Fire Ant Management, Agee Insights Quarterly Newsletter, 2009.
- Cain, D. Article for a newspaper in Walker County (circulation: 12,000).
- Cain, D. Fire ant management on two TV broadcasts in Walker Co. (estimated audience 24,000).
- Gilbert, T. Fire Ant Management, Article for the Citizen of East Alabama Newspaper.
- Glover, T. Fire Ants, Birmingham News.
- Glover, T. Fire Ant Management, Fox 6 News.
- Graham, F. Fire Ant Management. Backyard Wisdom Radio Show. April 2009.
- Graham, F. Fire Ants and Wildlife. Wildlife Trends Journal. May/June 2009 issue.
- Graham, F. Phorid Flies in Alabama. Birmingham News. July 2009.
- Hu, X.P. Interviewed 5 times on the fire ant projects by newspapers and news communication groups.
- Miles, J. Fire Ant Management, Clear Channel Radio Network.

### **Demonstrations and Field Trials:**

- Britnell, R. Pasture demonstration, Morgan County, 2009.
- Browne, C. and D. Carroll. Sticks Country Music Festival, Waverly, AL, 2009.
- Browne, C. and D. Carroll. Native American Heritage Festival, Auburn, AL, 2009.
- Browne, C. and D. Carroll. Syrup Sopp'n Festival, Loachapoka, AL, 2009.
- Chapman, D. Bait Demonstration in Commercial Apple Orchard and Blueberry Planting, Isom Orchards, Athens, Limestone County, AL 2009.
- Coneva, E., C. East and N. Kelly. Bait Demonstration in Commercial Blueberries, Wlregrass Research and Education Center, Headland, AL, 2009.
- Datcher, W. and W. Lampley. 6 Head Start Centers, Sumter Co., AL 2009.

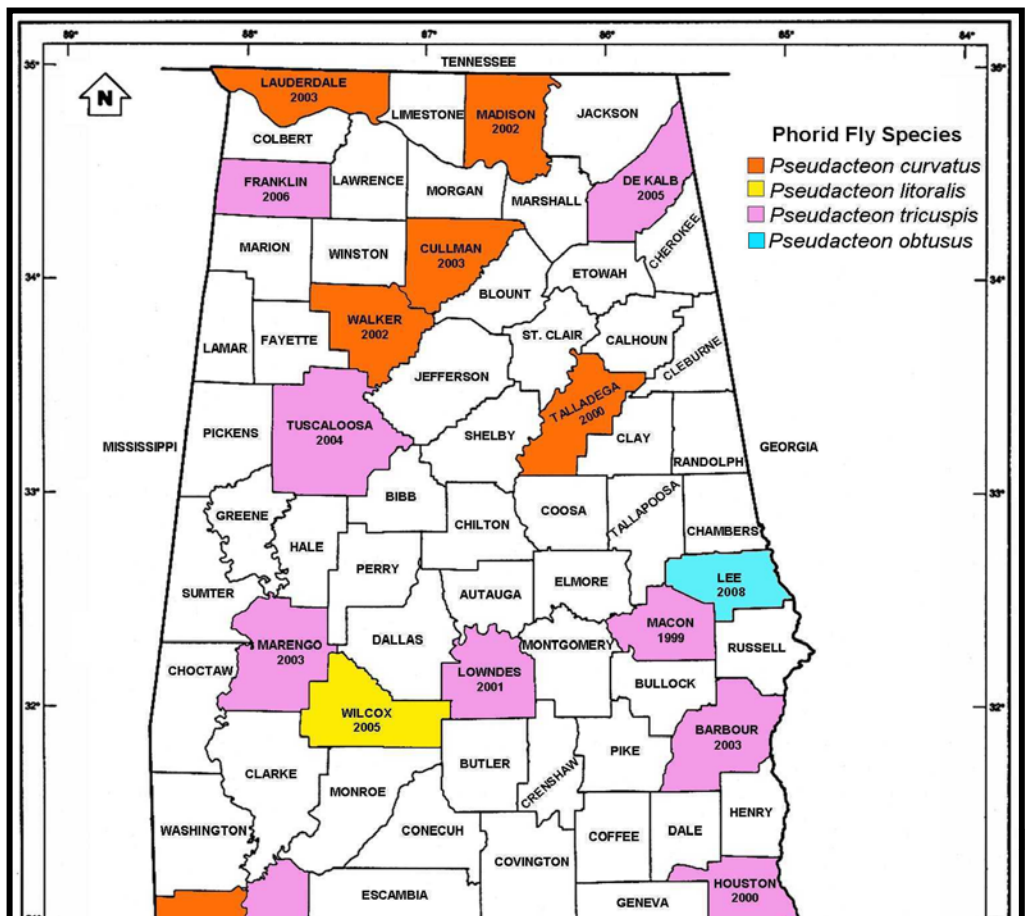
Datcher, W. and W. Lampley. 2 Home Lawn Demonstrations, Sumter Co., AL 2009.  
Dorough, H. 3 Bait Demonstration at Schools and Churches, Calhoun County, 2009.  
Glover, T. and 6 Master Gardeners. 6 Fire Ant Bait Demonstrations in Home Lawns, Jefferson County, 2009.  
Graham, F. and K. Ridley. Auburn University Horse Center. Auburn, AL, 2009.  
Graham, F. and K. Ridley. Auburn University's Ag Heritage Park. Auburn, AL, 2009.  
Graham, F. and K. Ridley. Auburn University Intramural Field. Auburn, AL, 2009.  
Graham, F. and K. Ridley. FMC chemical trial, Stillwaters Golf Club, Dadeville, AL, 2009.  
Hu, X.P. Home yard fire ant control – Can you apply bait after mowing grass. Six Field Trials. 2009.  
Jones, J., P. Carter, R. Hudson, R. Vester and R. Dykes. Peanut Festival Grounds, Dothan, AL 2009.  
Jones, J. Bait Demonstration, Headland First Baptist Church, 2009.  
Kelley, K. and A. Threatt. Bait Demonstration, Simpson Community House, Vinegar Bend, Washington Co., AL, 2009.  
Kelley, K. and B. Fariior. Bait Demonstration, Brewton Elementary School, Brewton, Escambia Co., AL, 2009.  
Miles, J. and C. Hesselein. Jon Archer Center Grounds, Mobile, AL, 2009.  
Porch, D. Annual Historical Civil War Re-enactment Grounds in Blountsville, AL.  
Reed, T. Sod Farm Bait Strip Test, Colbert County, AL, 2009.

**EVALUATION OF INTEGRATED PEST MANAGEMENT METHODS FOR RED IMPORTED FIRE ANTS**

L. C. "Fudd" Graham & Kelly Ridley  
 Department of Entomology & Plant Pathology  
 Auburn University

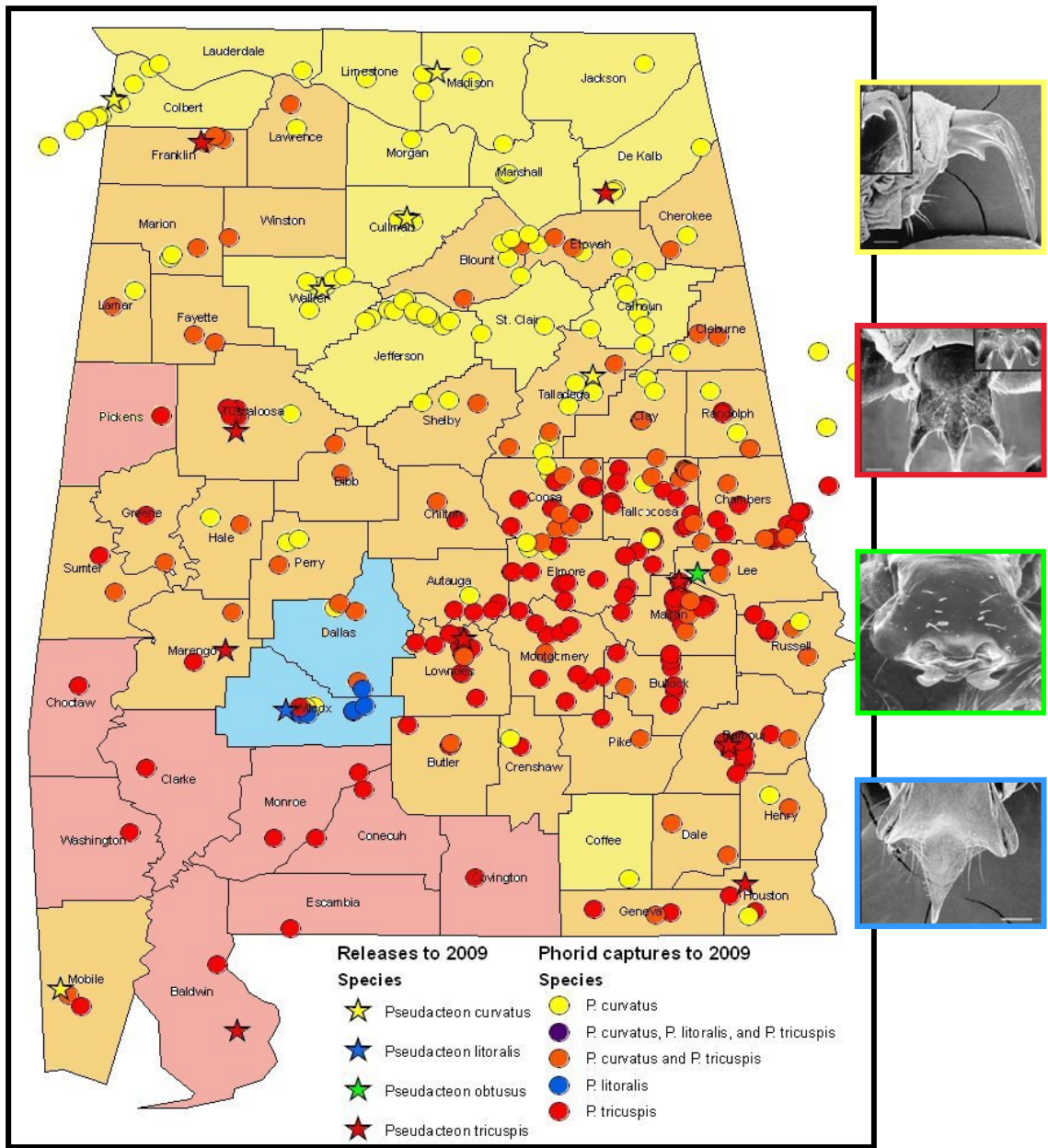
**Phorid Flies in Alabama:**

Thanks to support from the Alabama Legislature and the Alabama Department of Agriculture and Industries, we have completed the 13<sup>th</sup> year of the phorid fly program in Alabama. Four species of phorid fly have been released in 17 counties as of 2009 (Figure 1) through the cooperation of the Department of Entomology and Plant Pathology of Auburn University, the Alabama Cooperative Extension System, the Department of Plant and Soil Science of Alabama A&M, Tuskegee University, the Alabama Agricultural Experiment Station, USDA-ARS, USDA-APHIS, Master Gardeners and landowners across the state of Alabama.



**Figure 1:** Counties where phorid flies were initially released in Alabama

Phorid flies are sampled extensively throughout the state each year as part of our agreement with the USDA. Last year we found at least one phorid species in every county in the state. **In 2009, we found two species of phorid fly established in ~70% of Alabama counties (see orange counties in Figure 2).**



**Figure 2: Phorid fly captures in Alabama, orange counties have 2 species established.**

Alabama was the first state to successfully establish two phorid species and the third state to establish three phorid species. **Along with this, Alabama is the only state where *P. litoralis* has established (Wilcox Co.) and in 2009 we recovered this species 10 miles northeast of the initial release site (see blue counties above).** We continued to monitor for *P. obtusus* in 2009. This species was released in 2008 in Lee County but has not yet been recovered in the field; we are planning another release of this species in 2010.

| Species                      | # Counties Released | # Counties Found | Attacks & Attracted By   |
|------------------------------|---------------------|------------------|--|
| <i>Pseudacteon tricuspis</i> | 9                   | 53               | <u>Attacks:</u> <i>S. invicta</i> only, medium workers<br><u>Attracted by:</u> mound disturbances      |
| <i>Pseudacteon curvatus</i>  | 6                   | 56               | <u>Attacks:</u> <i>S. richteri</i> & hybrid, small workers<br><u>Attracted by:</u> mound disturbances  |
| <i>Pseudacteon litoralis</i> | 1                   | 2                | <u>Attacks:</u> <i>S. invicta</i> & hybrid, largest workers<br><u>Attracted by:</u> mound disturbances |

**Each phorid fly species prefers a particular fire ant species, different sizes of workers, and are attracted to different fire ant behaviors (Figure 3).** In South America, the fire ant's natural home, there are over 20 known species of phorid fly, these species, combined with other biological control agents keep a balance between fire ants and the other native ants. When fire ants were brought to the U.S. they rapidly expanded due to their aggressive nature and lack of any biological control agents. **By releasing multiple species of phorid fly in Alabama we hope to create a balance between fire ants and native ants, thus giving the native ants a chance against the more aggressive fire ants.**

**Figure 3:** Species of phorid fly released in Alabama, the species of fire ant they attack and what they are attracted by.



|                            |   |   |  |
|----------------------------|---|---|--|
| <i>Pseudacteon obtusus</i> | 1 | 0 | <u>Attacks:</u> <i>S. invicta</i> & hybrid, largest workers<br><u>Attracted by:</u> mound disturbances / foraging ants / trailing ants |
|----------------------------|---|---|--|

**This phorid release program is a cooperative project between the Alabama Fire Ant Management Program, USDA-ARS and USDA-APHIS.** The USDA provides phorid flies for field release and the data collected is shared with the USDA. The data we collected on phorid expansion in Alabama was shared with the USDA-ARS and USDA-APHIS, as per agreement, and will soon be available in a publication on the regional establishment and spread of *P. curvatus* and *P. tricuspis*. Researchers at the USDA were attempting to estimate phorid movement in the Southeast when our data was received. In Alabama, our phorid fly sampling program is more robust than most states and shows that phorid movement from release sites is progressing more rapidly than expected. **Due to our extensive sampling of phorid flies in 2008 and part of 2009, the estimates of phorid spread for all states were revised for the new publication and the revisions relied extensively on data collected in Alabama by the Alabama Fire Ant Management Program.**

The Alabama Fire Ant Management Program also collects data yearly on mound numbers and individual mound size at all phorid fly release sites that are still accessible. These data are stored and will be analyzed to determine effects of phorid flies on fire ant populations in Alabama.

### **Fire Ant Chemical & Equipment Trials:**

In 2009, the Alabama Fire Ant Management Program conducted a fire ant chemical trial for FMC® on several new control products at Stillwaters Golf Club in Dadeville, AL. Data were collected for the pre-count, two minutes post-application and four hours post application on May 20, 2009. Three month data were collected on August 26, 2009, and six month data were collected on November 11, 2009. All these data were for mound numbers within each plot, each original plot containing ten active fire ant mounds, and a control of water only was used.

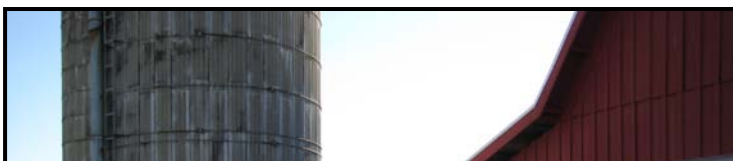
Tests such as these will become increasingly more important as fire ant control products containing the active ingredient Fipronil are removed from the consumer market, and companies are looking for new products to take their place.



A pendulum actions spreader from Tarver Equipment Company<sup>®</sup> was tested on September 24, 2008 to determine if the spreader was capable of spreading fire ant bait at recommended rates. The spreader was able to spread bait within recommended rates, but there were problems with the spreader. We were not able to completely shut down the spreader to the point that no bait leaked and we were not able to get a consistent spreading rate. Plans were made to work with Henry Dorough, Extension REA, in Talladega County and Josh Elmore to address application and calibration problems and to test on a large scale. Tarver Equipment Company<sup>®</sup> had been contacted and was working with us to address the problem of bait leaking out when the spreader was turned off. This work was scheduled to be done in September of 2009, but has been delayed and will be repeated in 2010.

### **Fire Ant Demonstrations on the AU Campus:**

**The Alabama Fire Ant Management Program has three on-going bait demonstrations on Auburn's campus.** The first, started in 2005, is located at Ag Heritage Park, is sponsored by Wellmark International<sup>®</sup> and uses Extinguish Plus<sup>®</sup> twice per year (**Figure 5**). The second was started in 2007 and is located at the AU Horse Research & Teaching Unit, which is the site where the AU Equestrian Team trains and competes (2008 Hunt Seat National Champions). Esteem Fire Ant Bait<sup>®</sup>, provided by Valent<sup>®</sup>, is spread late summer-early fall (**Figure 6**). The third demonstration, which began in 2008, is located at the AU Intramural Field and is sponsored by Dupont<sup>®</sup> where Advion Fire Ant Bait<sup>®</sup> is spread at the beginning of every fall semester. Applications at each site are different because each site is used differently. These demonstration sites allow us to refine our bait recommendations for Alabama residents. **If you want to see the effectiveness of fire ant baits, visit these parts of campus on your next visit to AU.**



**Figure 6:** Auburn University's Equine Center, another fire ant bait demonstration site.



## MAKING FIRE ANTS EASIER TO LIVE WITH: FIRE ANT EDUCATION AND OUTREACH

Kathy Flanders<sup>1</sup>, Fudd Graham<sup>1</sup> & Tim Reed<sup>2</sup>

<sup>1</sup>Department of Entomology and Plant Pathology, Auburn University

<sup>2</sup>Alabama Cooperative Extension System

### Fire Ants at the Fair:

Each year, the Alabama Fire Ant Management Program creates a fire ant exhibit for use at public events. The 2009 exhibit was created by Kelly Ridley and Fudd Graham, it was used to highlight the accomplishments of the Alabama Fire Ant Management Program and give practical tips to stakeholders on managing fire ants. The booth targets children and their parents, with educational materials ranging from coloring books to live ants and decapitating flies, as well as educational publications. **More than 6,000 coloring books and 1,400 other publications on fire ants were distributed at the events.** Over 6,000 bookmarks were distributed that directed clients to the fire ant eXtension site. Booths were staffed for more than 210 hours, during which we estimated we

increased the knowledge about fire ants of at least 2,000 people. **We believe they will use this knowledge to change how they control fire ants, so that they get better fire ant control using safer materials while spending less money.**

### The booth was used at the following events:

- 🐜 Alabama Pest Control Association Meeting, Auburn, AL, February 2009
- 🐜 Alabama National Fair, Montgomery, AL, October 2009
- 🐜 National Peanut Festival, Dothan, AL, November 2009
- 🐜 Auburn University's Fall AgRoundup, Auburn, AL, November 2009
- 🐜 Natural Resources Landowners Tour, Montgomery, AL, November 2009

### Staffing The Booth & Training Volunteers:

Members of the Fire Ant Management Team and Master Gardeners staffed the booth at the Alabama National Fair. Kelly Ridley and Regional Extension Agent Mallory Kelley conducted a training session to better equip 26 Master Gardeners to answer fire ant related questions at the Alabama National Fair. Another training session was held in Dothan to work with the Southeast Alabama Master Gardeners who helped work the National Peanut Festival. This training was led by Kelly Ridley and Regional Extension Agent Rachel Dykes. Fudd Graham, Kelly Ridley, Jerri Caldwell and Henry Dorough staffed the booth at AgRoundup in Auburn.



Master Gardener Jerome Thomas working the fire ant booth at the Alabama National Fair.  
Courtesy Kathy Flanders

### Master Gardeners & Extension Agents At The Fair:

#### Alabama National Fair:

**Master Gardeners:** Jeanette Kempter, Judy May, Linda Carleton, Ellen Clute, Jane Martin, Richard Moore, Betsy Negron, Jose Negron, Annie Smith, Marie Tomlin, Jerome Thomas, Nancy Waggoner, Anthony Yarbrough

**Alabama Cooperative Extension System:** Dani Carroll, Ellen, Huckabay, Mallory Kelley

**Auburn University:** Arthur Appel, Jerri Caldwell, Marla Eva, Henry Fadamiro, Kathy Flanders, Fudd Graham, David Held, Xing Ping Hu, Nannan Liu, Tim Nafziger, Alicia Phillips, Kelly Ridley, Krystal Waltman

#### National Peanut Festival:

**Master Gardeners:** Jim Coles, Janine Coles, Sheron Enfinger, Barbara Oliver, Kathy Bragg, Carol Anne Seay, Joyce Dees, John Johnston, Cheryl Fair, David Ellis, Glenda Ellis, Maggie Sickler, Glen Swicegood, Pam Meredith, Carolyn Crenshaw, Angela Munson, Suzie

Alabama Fire Ant Management Program - Fiscal



Bell  
 McDonald, Maggie Sickler, Phyllis Irland,  
**Alabama Cooperative Extension System:** Rachel Dykes,  
 Reafield Vester

Ronnie Bell, Jane  
 Jimmy Jones,

National Peanut Festival logo  
 Courtesy NPF website

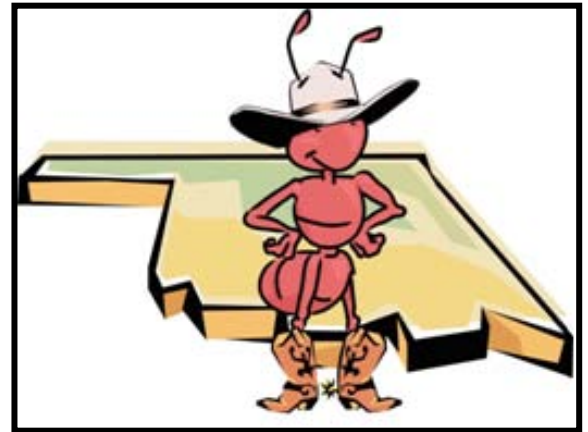
### By The Numbers:

- 🐜 Master Gardeners **donated 85 hours** at the Alabama National Fair!
- 🐜 Master Gardeners **donated 97 hours** at the Alabama Peanut Festival!
- 🐜 Through their contacts at the fair, Master Gardeners **increased knowledge about fire ant management in ~2,000 stakeholders!**

### Fire Ant Training for Extension Agents:

#### 2009 Imported Fire Ant and Invasive Ant Conference:

This year the conference was held in Oklahoma City, Oklahoma from April 7-9. This meeting **gathers fire ant experts from across the globe** and allows them to discuss and review research findings from other fire ant programs. In 2009, two Extension Agents from Alabama attended the meeting to gain further fire ant knowledge. Those agents were: Sallie Lee and Henry Dorough. Also, several specialists and program assistants attended the meeting, they were: Kathy Flanders, Fudd Graham, Chazz Hesselein, Virginia Morgan, and Kelly Ridley.



2009 Imported Fire Ant Conference Logo  
 Courtesy Jeanetta Cooper

#### Web Conference On eXtension:

In May, Extension Agents had an opportunity to participate in a web conference with emphasis on the fire ant eXtension website ([www.extension.org/fire+ants](http://www.extension.org/fire+ants)). These meetings were held by Kathy Flanders, Anne Adrian and Jonathan Davis. At this web conference, they showed how eXtension can help extension agents do their jobs. Emphasis was placed on the Ask-the-Expert system, in which Extension agents answer questions submitted by clients through county-based widgets or the national eXtension site. With this further training, Extension Agents are better equipped to answer fire ant related questions from stakeholders.

#### Imported Fire Ant eXtension:

**eXtension is an Internet-based, nationwide resource of information and advice from Cooperative Extension.**

Nine specialists or professionals from the Alabama Cooperative Extension System are on the leadership team responsible for developing and marketing an eXtension



eXtension Logo  
 Courtesy eXtension.org

module on imported fire ants, [www.extension.org/fire+ants](http://www.extension.org/fire+ants). More than 40 Extension agents from Alabama are members of the fire ant community of practice, and participate by reviewing content, marketing the eXtension site, and answering questions about fire ants.


**This project targets the 85 million people who live in fire ant infested areas of the U.S.** The end product is a 24/7 one-stop shopping place for advice on managing fire ants. **The site received 11,000 unique page visits per month in 2009, which was double the number received in 2008.**


### **eXtension Improves Rapidly:**


- 🐜 Launched at the Imported Fire Ant Conference in April 2007 in Gainesville, FL.
- 🐜 **A work day was held** after the 2009 Imported Fire Ant Conference; used to review all the frequently asked questions, add new content, and plan new features for the site.
- 🐜 2009: The [Museum of Novel Fire Ant Control Methods and Products](#) and the [Master Gardener Module](#) were made public, additional video & gif files were incorporated into the basic information.
- 🐜 The Regional Information Section was expanded.
- 🐜 **The eXtension publication Fire Ant Control: The Two-Step Method and Other Approaches was translated into Spanish** and is now available at: [Control de Hormigas Bravas: El Método de Dos pasos y otros Métodos](#)
- 🐜 **Several members of the fire ant eXtension Community of Practice attended the 2009 National eXtension Conference in October in St. Louis, Mo.,** they were: Anne Adrian, Jerri Caldwell, Glenda Freeman, Fudd Graham, Virginia Morgan, and Carol Whatley.

### **People in Alabama Involved in eXtension:**

- 🐜 **Dr. Kathy Flanders**, Extension Entomologist and Associate Professor, Department of Entomology and Plant Pathology, Auburn University, is co-leader of this initiative.
- 🐜 **Dr. Anne M. Adrian**, Co-leader, Extension Computer Technology Unit, Alabama Cooperative Extension System, facilitates web conferencing, internet video-conferencing, chat sessions, and other methods used to create and maintain the fire ant eXtension web portal.
- 🐜 **Dr. Jeffrey Bastuscheck**, Contracts and Grants Specialist, Alabama Cooperative Extension System, facilitates the process of applying for and administering the eXtension grants.
- 🐜 **Mr. Sergio Ruiz-Córdova**, Research Assistant IV, translates eXtension products into Spanish. & **Janet Lovelady**, Agent Assistant I, Lauderdale Co., helps edit these documents.
- 🐜 **Dr. M. Virginia Morgan**, Co-chair, ACES eXtension Work Team, Alabama Cooperative Extension System, provides guidance on design, marketing, and assessment of the eXtension products.
- 🐜 **Kerry P. Smith**, Alabama Master Gardener Program Coordinator and Ag Program Associate, Dept. of Horticulture, Auburn University, co-chaired the fire ant training module for Master Gardener Community Advisors.

 **Dr. Carol A. Whatley, Glenda Freeman, Maggie Lawrence, and Mario Lightfoote**, Extension Communications, Alabama Cooperative Extension System, provided expertise in technical writing, copy editing, marketing, and video production.

 **Dr. Paul L. Mask**, Assistant Director, Agriculture, Forestry and Natural Resources, Alabama Cooperative Extension System, and Professor, Agronomy and Soils, Auburn University, is the Administrative Advisor.

 **C. Somer Behel**, Agent Assistant I, Lauderdale Co., has submitted content for the Youth Module. The material is in review.

### The following people are also involved in eXtension:

They help by providing, editing, and reviewing content, answering questions about fire ants, and marketing the web site.



**Auburn University:** Fudd Graham, Henry Fadamiro, Xing Ping Hu, Jerri Caldwell, Kelly Ridley



**Alabama Cooperative Extension System:** Randall Armstrong, Robert Boozer, Chuck Browne, Danny Cain, Doug Chapman, Kenneth Creel, Willie Datcher, Thomas Daugherty, Henry Dorough, Rachel Dykes, William East, Wayne Ford, Tommy Futral, Ted Gilbert, Jonathan Gladney, Tony Glover, Gary Gray, Tinsley Gregg, Warren Griffith, Shane Harris, Charles Hesselein, Ellen Huckabay, James Jones, Ken Kelley, Mallory Kelley, David Koon, Willie Lampley, Sallie Lee, Ayanava Majumdar, Charlie Mason, Gerald (Mike) McQueen, Danny Miller, Charles Pinkston, Dan Porch, Timothy Reed, David Robinson, Terry Shackelford, Donna Shanklin, Jimmy Smitherman, Lewis Tapley, Jimmy Todd, and Anthony Wiggins



**Alabama A&M University:** Rufina Ward, Ken Ward



**Tuskegee University:** George Hunter, Rory Stephens, William Hodge

### Fire Ant Educational Programs Conducted by Alabama Cooperative Extension System:

Alabama Cooperative Extension Agents and Specialists conducted a variety of educational programs, including workshops and field demonstrations. **Fire ant demonstrations allow Extension agents to show the general public the ease and effectiveness of fire ant bait applications.** Fire ant baits are the most cost-effective way to treat moderate to large areas for fire ants. Small amounts of the insect control chemical are placed on small morsels of fire ant food. When this bait is spread over an area, fire ant workers are amazingly efficient at finding the bait, carrying it back to their nest, and passing it around among themselves. This eventually delivers the insect control chemical to the queen, the heart of the colony. **Forty-seven Herd seeders for applying fire ant bait are available in Alabama. They are located at county offices of the Alabama Cooperative Extension System (see map below).** Please contact your local county agent to begin your fire ant control treatments today!

Extension agents routinely incorporate information on managing fire ants in their educational talks and workshops. Fire ant education may be part of other programs being done, or may be the topic of a dedicated workshop. **The extension reports found later in this document show how educational products developed with support from the Alabama Fire Ant Management Program are used.**

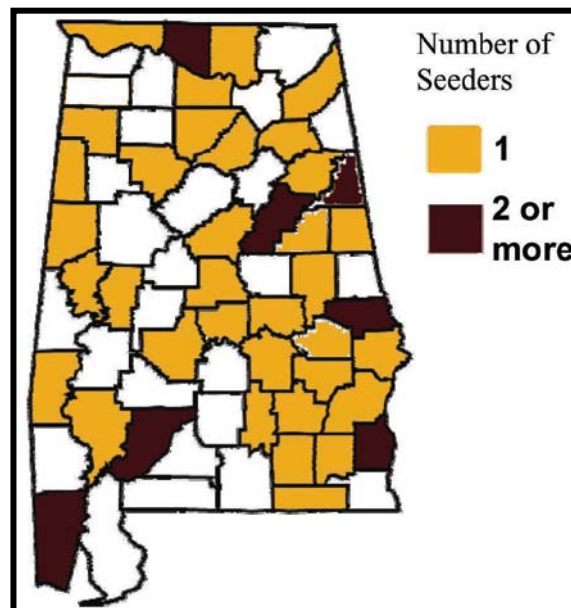
**Location of the Herd Seeders Used to Apply Fire Ant Bait:**

**FUMIGANT TOXICITY OF ESSENTIAL OILS TO THE RED IMPORTED FIRE ANT**

Dr. Arthur G. Appel & Marla J. Eva  
Auburn University

**Introduction:**

Increasing public concern effects of traditional bromide and sulfuryl prohibition of methyl Environmental Protection the investigation of **Essential oils are safer fumigants and could or on objects that are sealed, such as vehicles, sewer**



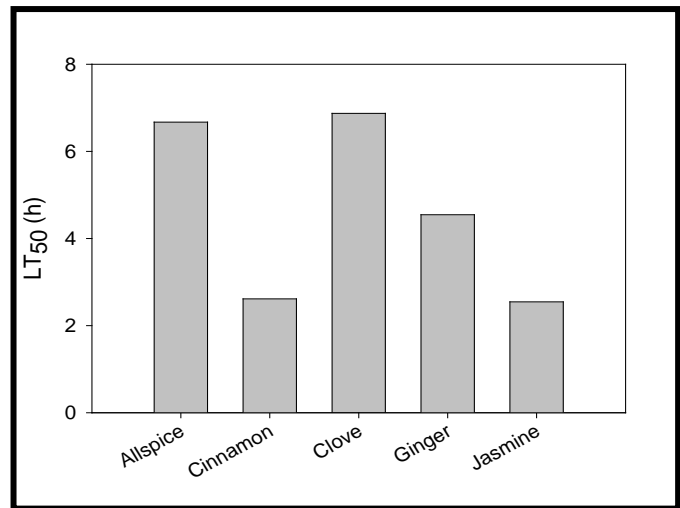
about potentially negative fumigants, such as methyl fluoride, and the future bromide by the United States Agency (EPA), has stimulated botanical alternatives. **alternatives to traditional potentially be used in areas isolated or can be tightly kitchens, ships, transport systems, sensitive**

**equipment, and storage and household items.** Essential oils are secondary plant substances that are



an excellent alternative to traditional fumigants because of their **low toxicity to humans and wildlife and short residual period.**

Fumigation is the most common method used to control stored product pests because it is effective against most insect pests, can easily penetrate the product to reach the insect inside the grain, and leaves little residual. **However, fumigant action, especially fast penetration, makes them ideal for rapid control of red imported fire ants through mound injection. Rapid control is necessary in areas where fire ants and humans may come into contact such as schools, daycare centers, hospitals, and nursing homes.**



Essential oils and their constituents have also been tested for fumigant toxicity against a variety of other insects including the cat flea, copra mite, click beetle, Japanese termite, house fly, and the human head louse. All of these species were susceptible to several essential oils and their constituents. Our previous studies with essential oil extracts showed that red imported fire ants were susceptible to allspice, cinnamon, clove, ginger, and jasmine extracts. Ten  $\mu\text{l}$  of an extract was deposited in a 0.95-liter jar with 10-15 ants (**Fig 1A**). LT<sub>50</sub> values ranged from 2.5 h for jasmine oil to 6.9 h for clove oil (**Fig 1B**). Essential oil extracts are blended compounds including monoterpenoids. The exact concentration of each component in an extract may vary considerably between seasons and even fields. **Therefore, the purpose of this study was to determine the fumigant toxicity of individual essential oil components to the red imported fire ant.**

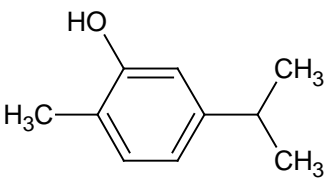
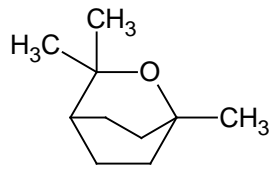
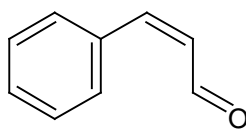
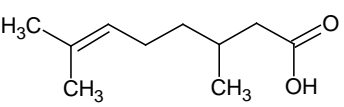
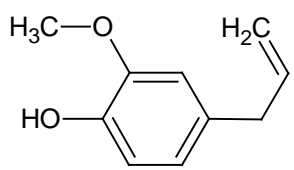
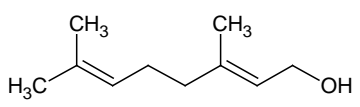
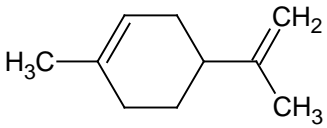
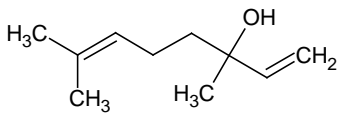
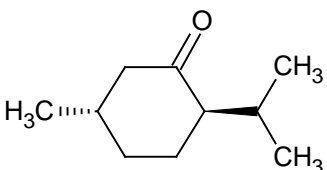
### **Methods and Results:**

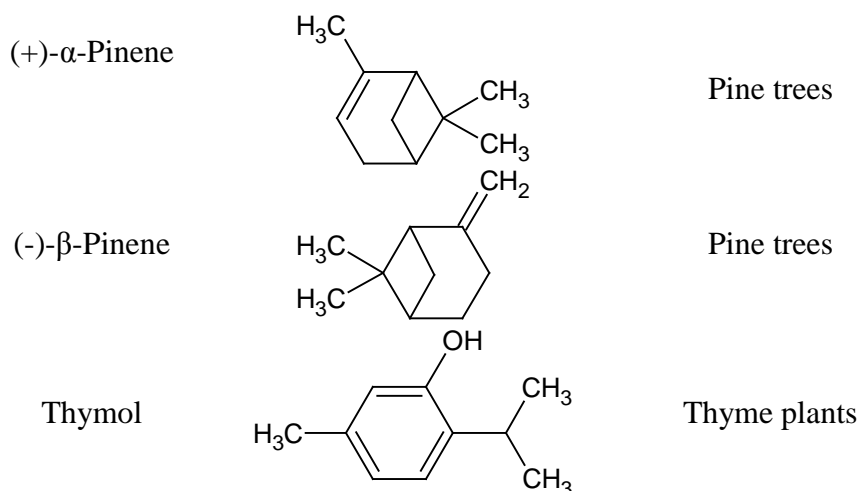
**Figure 1:** Fumigation toxicity assay (A) and LT<sub>50</sub> values for 1-9 h continuous exposure (B).

**Insects.** Worker red imported fire ants were collected from monogyne colonies on the Auburn University campus, Lee County, Alabama, U.S.A.

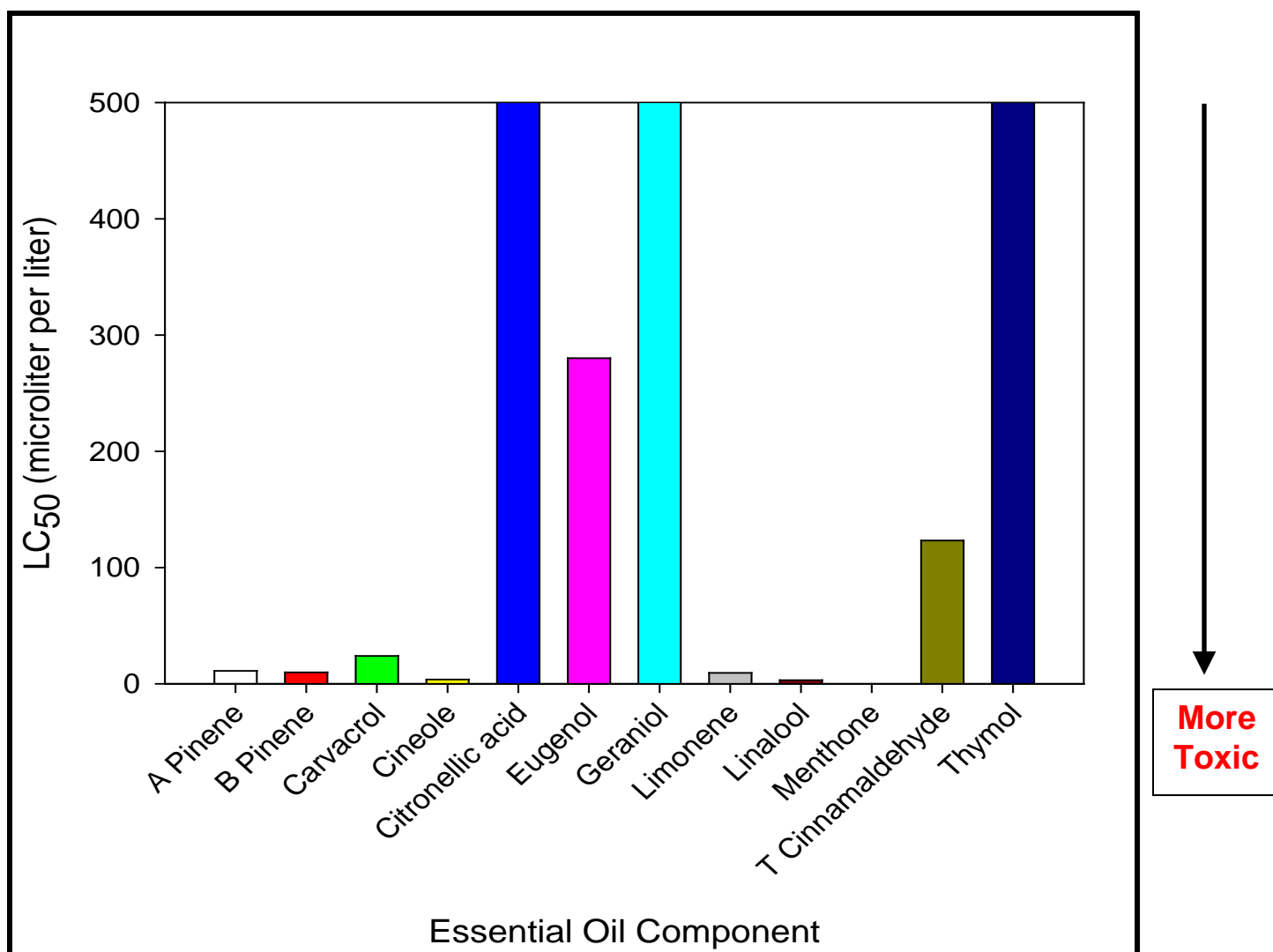
**Essential oils.** Extracts containing essential oils were obtained from Sigma-Aldrich (St. Louis, MO) and are seen in **Table 1**.

|   |
|---|
| <b>Table 1: Essential oil components used in the fumigation study</b> |
|---|

| <b>Oil component</b>         | <b>Structure<sup>a</sup></b>  | <b>Derivation<sup>b</sup></b>                      |
|------------------------------|---|--|
| Carvacrol                    |    | Thyme plant  |
| 1,8-Cineole                  |    | Eucalyptus trees                                   |
| <i>Trans</i> -Cinnamaldehyde |    | Bark of cinnamon trees                             |
| Citronellic acid             |   | Stems and leaves of citronella grass               |
| Eugenol                      |  | Dried flower buds of clove trees                   |
| Geraniol                     |  | Petals of various roses<br>Geraniums<br>Lemongrass |
| S-(-)-Limonene               |  | Rind of citrus fruits                              |
| (-)-Linalool                 |  | Sweet basil<br>Plants in Lauraceae family          |
| (-)-Menthone                 |  | Peppermint plant                                   |



Fumigation toxicity was determined by sealing 10-15 ants in a 0.95-L glass jar with 10  $\mu$ l of water and 1-500  $\mu$ l of an essential oil component (**Fig. 1**). Mortality was recorded at 60 min and probit analysis was used to estimate the lethal concentration that killed 50% of the ants ( $LC_{50}$ ).  $LC_{50}$  units are in  $\mu$ l essential oil component per liter of air ( $\mu$ l/l).



**Figure 2: Toxicity of essential components to the red imported fire ant.**

Toxicity of essential oil components ranged from 0.083 µl/l for menthone to >10,000 µl/l for citronellic acid (Fig. 2). **The most toxic essential oil components were cyclic aliphatic hydrocarbons (1,8)-cineole, (-)-menthone, (+)- $\alpha$ -pinene, (-)- $\beta$ -pinene, and S-(-)-limonene.** Ring size and the presence of a carbonyl functional group may have also contributed to the toxicity of the compounds.

**Our goal now is to determine the most effective essential oil component, or mixture of components, in actual fire ant mound injection studies.** We will also be examining how the toxicity of these components is affected by mound soil type and moisture.

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## IDENTIFICATION AND SYNTHESIS OF CHEMICALS THAT ATTRACT PHORID FLIES TO FIRE ANTS

Dr. Henry Y. Fadamiro  
Auburn University

### Project Objectives:

**The main goal of this project is to identify and synthesize novel chemicals that attract parasitic phorid flies to fire ants.** Specific objectives are to 1) identify biologically active components of fire ant chemicals attractive to phorid flies (i.e. venom alkaloids) using coupled gas chromatography electroantennogram (GC-EAG) and analytical (e.g. GC-MS) techniques, and 2) synthesize novel compounds identified in objective 1 above.

**Objective 1: Identification of the active components of fire ant semiochemicals eliciting responses in *Pseudacteon* phorid flies using GC-EAG and GC-MS techniques.** We have made significant progress on this objective, which is to determine the identity of the chemicals that attract phorid flies to fire ants. First, we tested the electroantennogram (EAG) response of the phorid fly, *P. tricuspis* to extracts of key body parts and glands of workers of the red imported fire ant, *S. invicta*. **The results confirm that the poison (venom) gland/sac is the key source of compounds which elicited strong antennal activity in *P. tricuspis* (Fig. 1).** Follow-up studies were conducted by using a combination of bioassay-guided fractionation and behavioral bioassays to test the hypothesis that attraction of this parasitoid to fire ants is mediated by venom alkaloids. The results confirm the response of *P. tricuspis* to physiologically relevant amounts of the two venom alkaloid fractions (*cis* and *trans* alkaloid fractions) of red imported fire ant (Fig. 2). Further analysis by coupled gas chromatography-electroantennogram detection (GC-EAD) revealed nine venom alkaloid components including two novel 2,6-dialkylpiperidine that elicited significant antennal activity in *P. tricuspis*. This is the first

demonstration of the role of venom alkaloids of ants as attractants for their natural enemies. The results have recently been published in *Naturwissenschaften*, a high ranking journal. **The discovery has also generated significant interest and attention worldwide and was recently highlighted in several news/media outlets including Science News Magazine, US News and World Report, Biocontrol News and Information, Auburn Daily, and AAES Impact.** See below for links to the research news.

### Science News Magazine

[http://www.sciencenews.org/view/generic/id/47468/title/Venom\\_attracts\\_decapitating\\_flies](http://www.sciencenews.org/view/generic/id/47468/title/Venom_attracts_decapitating_flies)

### US News and World Report

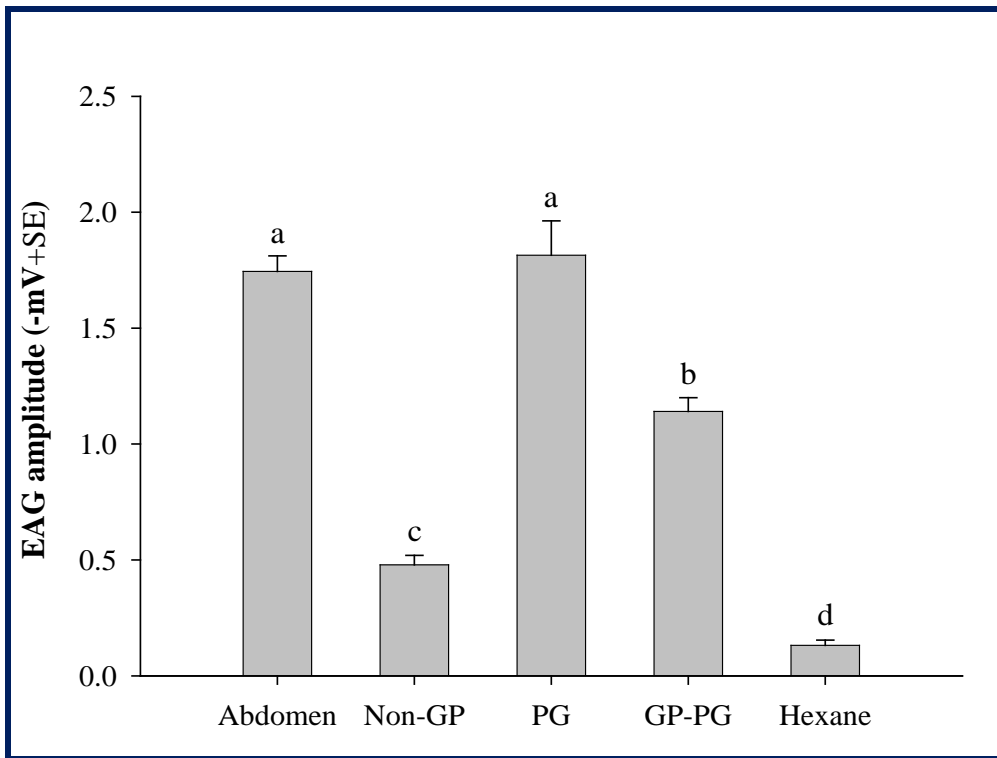
<http://www.usnews.com/articles/science/2009/09/20/ant-venom-attracts-decapitating-flies.html>

**Objective 2:** Synthesis of novel biologically active chemical components of fire ant venom alkaloids (identified in Objective 1).

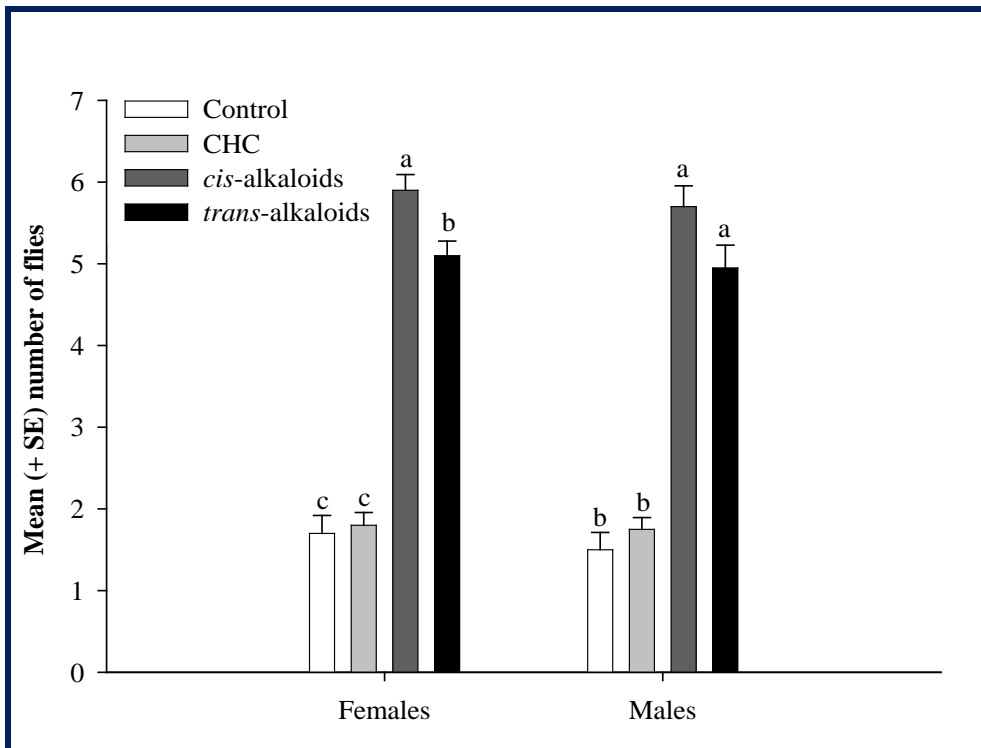
Work is presently ongoing to synthesize the novel fire ant alkaloids identified in Objective 1. The synthetic alkaloids will then be evaluated as attractants for phorid flies. This part of the research is being conducted in collaboration with Dr. Anne Gorden, an Organic Chemist at Auburn University.

### **Practical Applications of the Project**

This project has potential practical benefits to U.S. agriculture, public health and the environment by suggesting novel environmentally friendly strategies for control of invasive fire ants. **Identification of new chemical compounds used as attractants by parasitic phorid flies to locate fire ants will assist in current efforts at utilizing phorid flies as biological control agents for fire ants. For instance, such compounds could be used to attract phorid flies to fire ants for parasitism.**

**Figure 1:**

Electroantennogram (EAG) response of female *P. tricuspis* to extracts of red fire ant abdomen and its different parts (non-gland part = Non-GP, poison gland/sac = PG, gland part without the poison gland/sac = GP-PG). Means followed by different letters are significantly different ( $P < 0.05$ , Tukey-Kramer HSD test).



**Figure 2:** Response of female and male *P. tricuspis* in a four-choice olfactometer to major chemical (cuticular hydrocarbons = CHC, *cis* alkaloid and *trans* alkaloid fractions) obtained from *S. invicta* body extracts (tested at 1 fire ant worker equivalent). Note that control is a mixture of hexane and acetone in the ratio of 20:1. Figure shows mean ( $\pm$  SE) number of flies attracted per 15 min. Means for the same sex having no letter in common are significantly different ( $P < 0.05$ , Tukey-Kramer HSD test).

## RIFA-WHITE GRUB INTERACTIONS

Dr. David Held  
Auburn University

### Introduction:

The red imported fire ant (*Solenopsis invicta*) is one of the most damaging arthropod pests of managed turfgrass in the southeastern United States. Red imported fire ants (RIFA) create large above surface mounds that house their colonies causing physical damage to mowing and sod equipment, aesthetic damage, and possibly most important, medical problems to hyper-allergenic humans. **Despite these problems, RIFA is also a voracious natural predator of many economically-important pests.** In turfgrass, for example, RIFA is the primary consumer of eggs of the twolined spittlebug and fall armyworm eggs and larvae, common pests of centipede and bermudagrasses (**Picture 1**).



**Picture 1:** Fire ants attacking a fall armyworm, a pest of pasture and turfgrasses.

Researchers and turf managers across the southeast have reported an increase in white grub damage. White grubs are the immature stage of native and introduced species of beetles that consume roots of grasses in home lawns, golf courses, and sports turf

**(Picture 2).**

Surprisingly, there is little published research on RIFA predation on white grubs.

### This project investigated the following questions:

1. Do popular insecticides applied for RIFA actually increase white grub problems?
2. What life stages (eggs, grubs, adults) of white grubs are most vulnerable to predation by RIFA?
3. Are beetles of certain grub species more vulnerable than other species?



**Picture 2:** White grubs consume the grass roots resulting in stunting or death of the grass.

### Question 1:

Experiments were conducted in 2009 at Grand National on the Robert Trent Jones Golf Trail in Opelika, AL. To answer the first question, plots of turfgrass in the rough were treated with one of these insecticides; TopChoice<sup>®</sup>, Talstar EZ<sup>®</sup> and Amdro<sup>®</sup> for control of RIFA with another set of untreated control plots on each site. RIFA populations in each plot were monitored throughout the summer using a hotdog baiting technique to verify that the treatments worked. In the fall, plots were sampled for white grubs to determine if treated plots had greater numbers of grubs than the untreated controls (**Picture 3**).

### Question 2:

To answer the second question, we conducted mound challenges where individuals of a particular life stage were exposed for 24 h to fire ant predation. We located active RIFA mounds and subjected the different life stages to foraging for a 24-hour period. Eggs were exposed in moist soil in a petri dish placed underground (**Picture 4**). Grubs and adult beetles were exposed in PVC cylinders (**Picture 5**). After 24 h, the cylinders or dishes with eggs were recovered and the number of surviving individuals were determined.



**Picture 3:** Each plot was sampled for white grubs. Grubs were collected and brought to the lab for identification.

### Question 3:

Female beetles enter the soil to lay eggs. The last question evaluated whether adult beetles of different species varied in their susceptibility to RIFA predation. These tests were also done using the PVC cylinders located 2 m from an active mound. Adult Japanese beetle and green June beetles, two common white grubs species, were used in two separate experiments.



**Picture 4 (left) & 5 (right):** Life stage tests were conducted 2 m from an active mound.



### Results:

In the field study, **the insecticides significantly reduced RIFA abundance as expected. However, these reductions didn't increase white grub abundance.** Untreated plots had an average of 14.6 grubs per sample. Plots treated with Amdro® and Talstar® actually had fewer grubs per plot (5.6 and 8, respectively). The TopChoice®-treated plots had an average of 21.4 grubs but this wasn't significantly greater than the controls. Interestingly, no single species of grub was in the majority in our samples. We identified six species of white grubs from the sampled plots. Most are common species, however, one species is rare in turf or pastures.

**Based on the experiments with various life stages we found that eggs are the most susceptible to predation.** Around 70% of eggs were consumed in 24 h versus 25% of grubs. Adult beetles are also not as vulnerable as eggs. In 24 h, 11% of the adult Japanese beetles were consumed versus just under 2% of adult green June beetles. Large, well-developed larvae that we used tend to be much more aggressive than the smaller, younger grubs. Studies are planned next year to compare predation on these younger stages. Adults are likely less susceptible because of their hard exoskeleton and ability to crawl or fly away.

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## FOOD-MEDIATED BEHAVIORAL JUSTIFICATION OF FIRE ANTS TO MOUND DISTURBANCE

Dr. Xing Ping Hu & Charles Stephen  
Auburn University

### Introduction:

Ants are among the most successful taxa. Their complex behavioral characteristics enable them to adapt to virtually any environment. **A classic example of this is the Red Imported Fire Ant (*Solenopsis invicta*), which was introduced into North America through Mobile, AL in the 1930s and has since caused extensive economic and ecological damage.** This is due in large part to their dynamic polyethism and worker caste polymorphism. Worker size and age are believed to coarsely regulate task selection: older large-size workers forage, mid-aged medium-size defend, and young small-size care for brood <sup>(1)</sup>.

Behavioral tests can improve the interpretation and ecological relevance of standardized test results of pesticide toxicity and efficacy. The use of bait products in Integrated Pest Management plans to control fire ants has been popular because of the merit characters. We have demonstrated that applying baits immediately following mound disturbance actually results in a faster bait removal, opposing the speculation that fire ants would stop bait foraging after disturbance. **In 2009, we further investigated the mechanism of food-mediated behavioral justification of fire ants to mound disturbance: a fine-tuned task selection within these worker types.** The objective is to understand how combined stimuli of nest disturbance and immediate offering of food affect worker task selection and relocation.

**Our hypothesis is that workers will fine-tune their task allocation to foraging in disturbed nests, irrespective of the role designated by their age and size.**

### **Materials and Methods:**

Experiments were conducted at mean ground temperatures of  $26 \pm 1.5^\circ\text{C}$  on clear days with  $\leq 15$  km/h winds. Active mounds (diameter =  $41 \pm 7$  cm; height =  $14 \pm 4$  cm) with visible surface exit holes were selected for testing. The top 1/3 of treatment mounds were opened with a shovel and baits were immediately applied around the lower 2/3 of the mound at the labeled rate. Four nests were used in each experiment. Control mounds were not disturbed. Four replicate mounds were used in each of the following experiments.

**Experiment 1:** Worker size distribution immediately following the combined stimuli of disturbance and food offer.

Bait particles were observed from the moment a worker picked it up until it was carried into the nest. Ten baits were followed at each nest, and worker size and time was recorded. The maximum observation period at each nest was 5 min. The proportions of workers displaying defense, foraging, and brood removal were compared statistically between the treatment and control.

**Experiment 2:** Sequential task selection shift induced by nest disturbance and food offer.

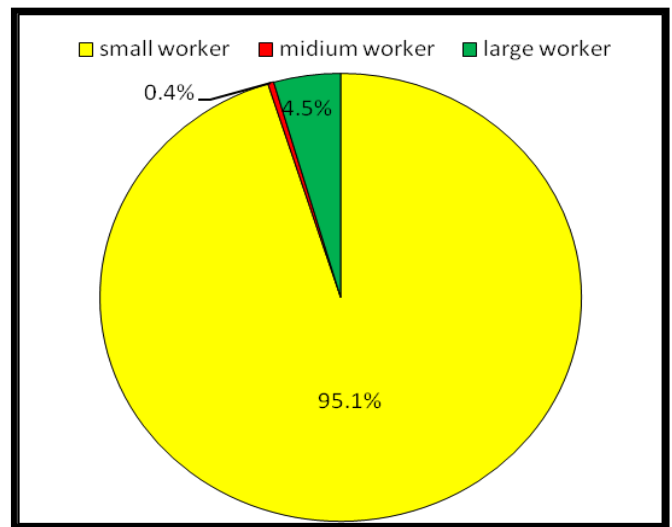
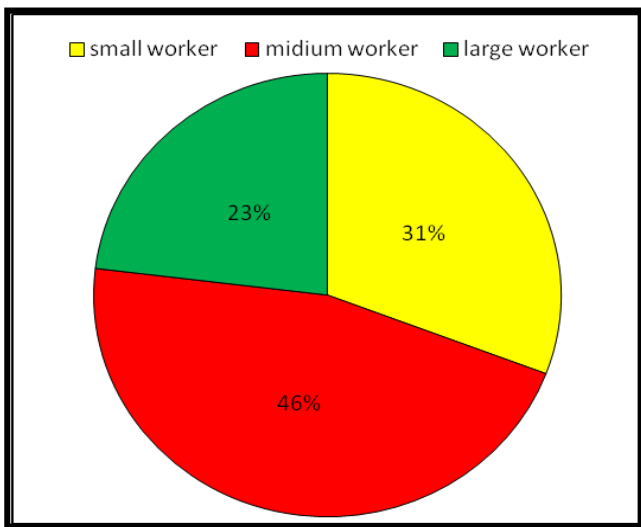
Four 10cm X 10cm quadrats located on the lower 2/3 of each mound were used to record changing proportions of different worker types exhibiting defensive or foraging behavior over a 20 min. period. Proportions were recorded at 1 min. intervals for the first 10 min. and 5 min. intervals thereafter. We defined foraging as non-aggressive workers picking up bait, and defending as aggressive behaviors (e.g. mouth opening, jetting) and brood removal.



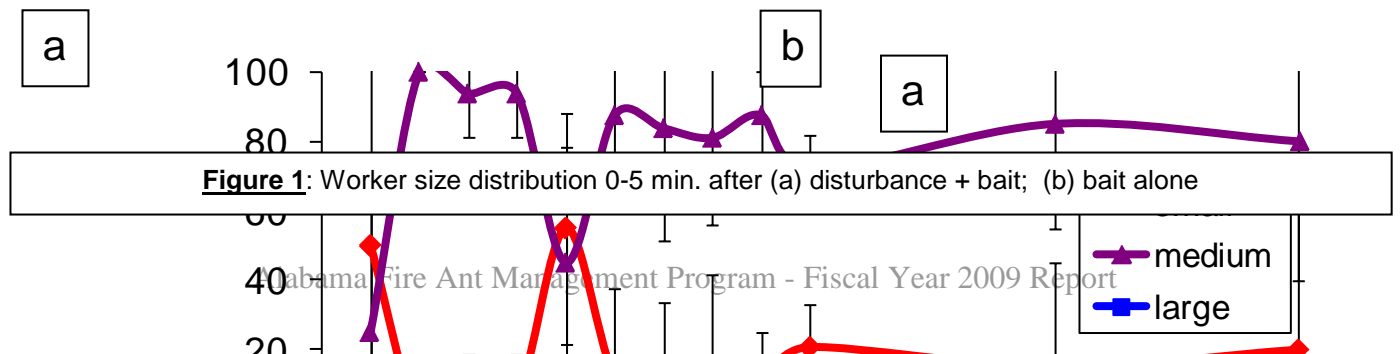
**Left:** Fire ant bait product on a fire ant mound. **Right:** Undisturbed fire ant mound.

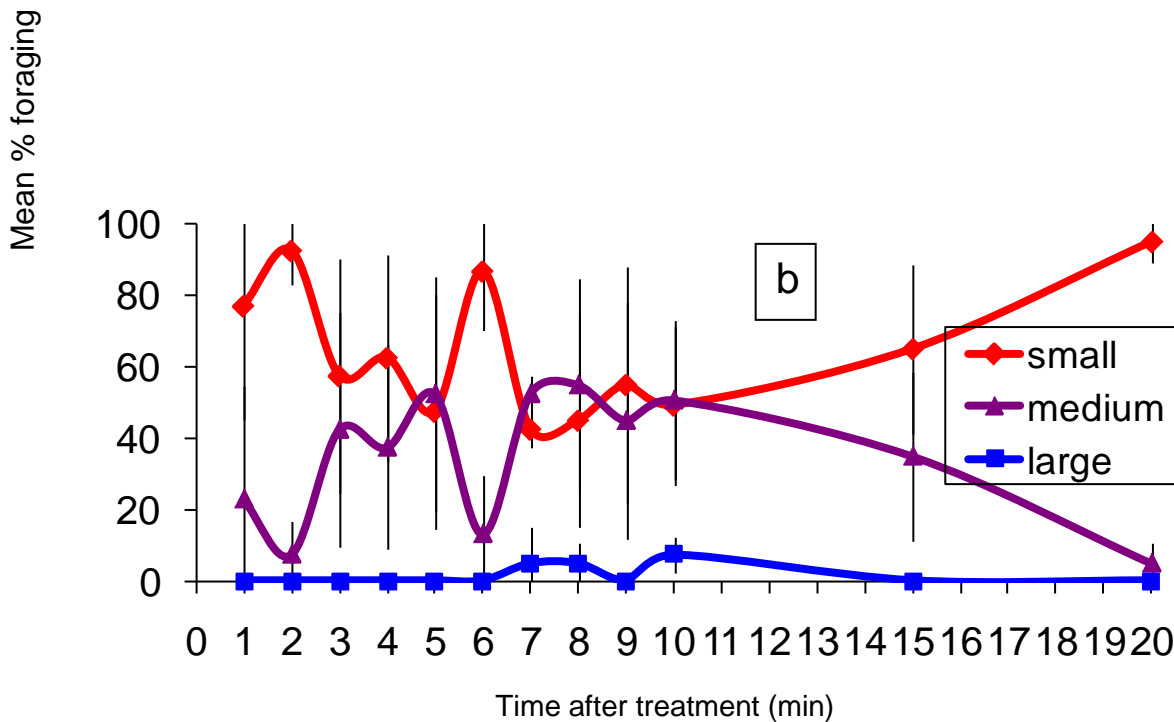
**Results:**

All worker types removed bait from disturbed nests (**Fig. 1a**), and predominantly small workers removed bait in control nests (**Fig. 1b**). Bait particles were brought into the nest through exit holes or gaps generated by disturbance, and this happened over less time in disturbed nests.



In disturbed nests (**Fig. 2a**), proportionately more small and medium workers foraged in the first 5 min., after which medium workers foraged more. In control nests (**Fig. 2b**), small and medium workers proportionately foraged the most until 15 minutes following bait application, after which small workers predominated. Defensive behavior was proportionately highest at 0-5 min. after disturbance and continued at reduced levels until 7 min. post-disturbance.





1. **Figure 2:** Worker size distribution 0-20 min. after (a) disturbance + food offer; (b) food offer

### Summary & Discussion:

All disturbed worker types foraged once they encountered baits, despite proportionately more individuals being defensive. Effects of worker fine-tuned task allocation continued in medium workers at disturbed nests throughout the observation period. **This observation indicates that accessible food items induce unplanned foraging in disturbed workers, and workers fine-tune their task allocation to foraging in disturbed nests, irrespective of the role designated by their age and size.** This behavior decision could be made to balance the risk and benefit of the colony. **Control data from Experiments 1 and 2 had more small workers foraging immediately following food offer. This reflects the literature: small workers are most common within nest mounds and most likely to encounter baits on the mound surface<sup>(2)</sup>. Without major disturbance, few defending medium workers came out and larger workers were presumably in subterranean foraging tunnels<sup>(2)</sup>. Our study bolsters the argument that disturbing fire ant nests does not affect the ability of ants to forage poisoned bait<sup>(3)</sup>. Our results are highly significant to fire ant control within highly disturbed anthropogenic systems, such as the growing turfgrass industry.**

## References:

- <sup>(1)</sup>Cassill, D.L. and W.R. Tschinkel. 1999. Task selection by workers of the fire ant, *Solenopsis invicta*. Behavioral Ecology and Sociobiology 45:301-310.
- <sup>(2)</sup>Haight, K.L. 2008. Ontogeny of the defensive stinging behavior of the Fire Ant, *Solenopsis invicta*. Journal of Insect Behavior 21: 147-152.
- <sup>(3)</sup>Hu, X.P. and Ding, W. 2009. Do mound disturbance and bait placement affect bait removal and treatment efficacy in red imported fire ant (Hymenoptera: Formicidae) indifferent seasons? International Journal of Insect Science 1: 7-13.-----

## CHARACTERIZATION OF P450 GENE EXPRESSION AND ACTIVITIES IN THE RED IMPORTED FIRE ANT

Dr. Nannan Liu  
Auburn University

### Introduction:

Insect cytochrome P450s are implicated in the biosynthesis and degradation pathways of endogenous compounds, such as pheromones, 20-hydroxyecdysone, and juvenile hormone (JH) (Reed et al., 1994; Sutherland et al., 1998; Winter et al., 1999), and thus play important roles in insect growth, development, and reproduction. Insect P450s are also involved in detoxication of exogenous compounds, such as insecticides (Feyereisen, 1999; Scott, 1999) and plant toxins (Berenbaum, 1991; Schuler, 1996). Although cytochrome P450s have been extensively studied in some insect species, P450s and their functions in social insects, including ants, wasps, bees and termites, are less well characterized.

**Recently, our group identified 18 P450 genes presented in the fire ant** (Liu and Zhang 2004, Liu et al. 2010 in preparation, Fig. 1), the expression of which were specifically overexpressed in the fire ant worker but not in other castes and developmental stages. Based on these results, we hypothesized that the fire ant worker was the only form in the fire ant colony that has the ability to respond to both the exogenous chemicals released from environment, such as insecticides, and the endogenous compounds emitted from the fire ant queens, such as pheromones. To test our hypothesis, in the current study, we characterized the correlation of the P450 gene expression and the levels of total P450 content and P450 activities in the fire ant.

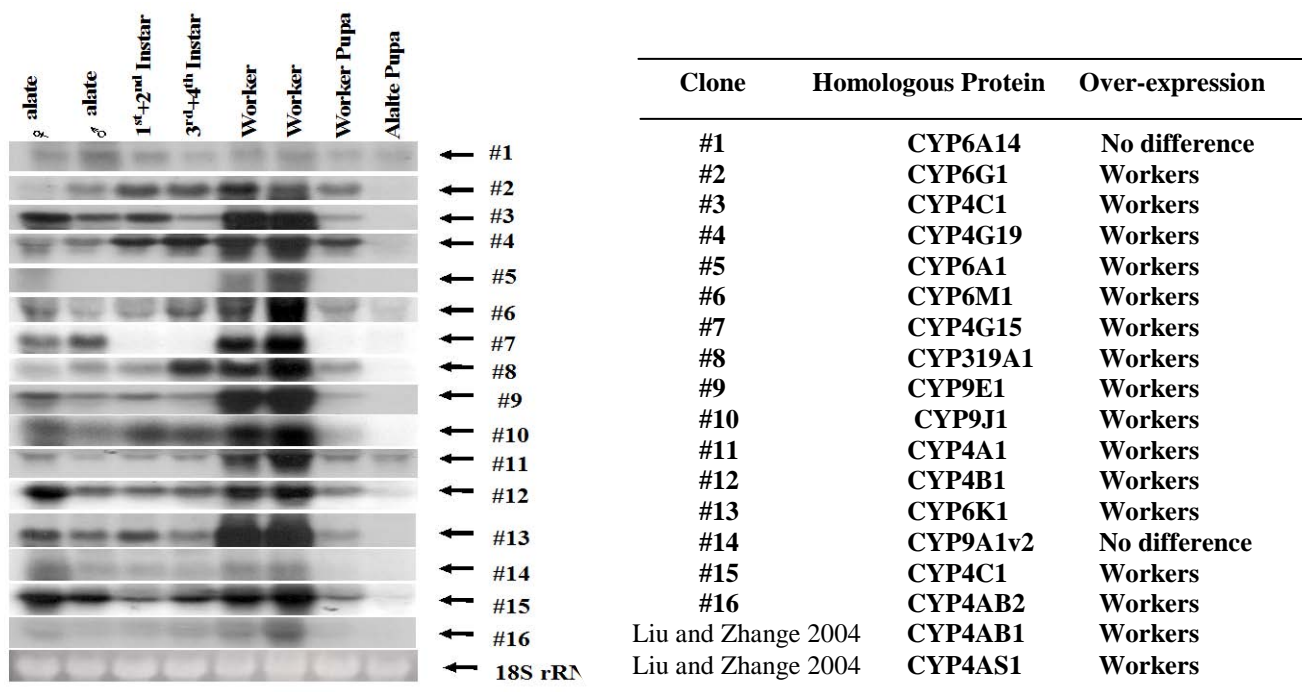
### Study and Results:

**The specific objective of our FY 2008-2009 project was to characterize the correlation of cytochrome P450 gene expression with the total P450 content and P450 activities in the red imported fire ant.** To determine whether the pattern of P450 gene expression reflects the general

pattern of protein activity in the fire ant, we examined the total cytochrome P450 content by measuring the P450-CO-binding pigment and cytochrome P450-activity by measuring 7-ethoxycoumarin-O-deethylase (ECOD) activity. The larvae, workers, male alates, female alates (winged) and queens (wingless) of the fire ant were used in the measurements.

Our previous results revealed that the 18 P450 genes were developmentally and caste specifically regulated in red imported fire ants and most of these P450s were overexpressed in the workers with no significant differences between large workers and small workers (**Fig. 1**).

**Figure 1:** Northern blot analysis of 18 cytochrome P450 genes in different life stages and castes of red imported fire ants



Our current results showed that the total cytochrome P450 content and P450 activity was also developmentally and caste specifically regulated in red imported fire ants with the descending order of worker > (statistically significant greater than) alate female > alate male > larvae (Table 1, Fig. 2). These results were strongly correlated with the level of P450 gene expression (Fig. 1). The caste-specific overexpression of P450 genes and proteins suggests the importance of these P450 genes and proteins in workers of the red imported fire ant. This finding also reveals that the fire ant worker is the major, if not the only, form in the fire ant colony responsible for metabolism of endogenous compounds in workers and response to queens' chemical signals through their overexpressed or increased P450 gene expression, which, in turn, results in decreased P450 proteins and increased P450 activities.

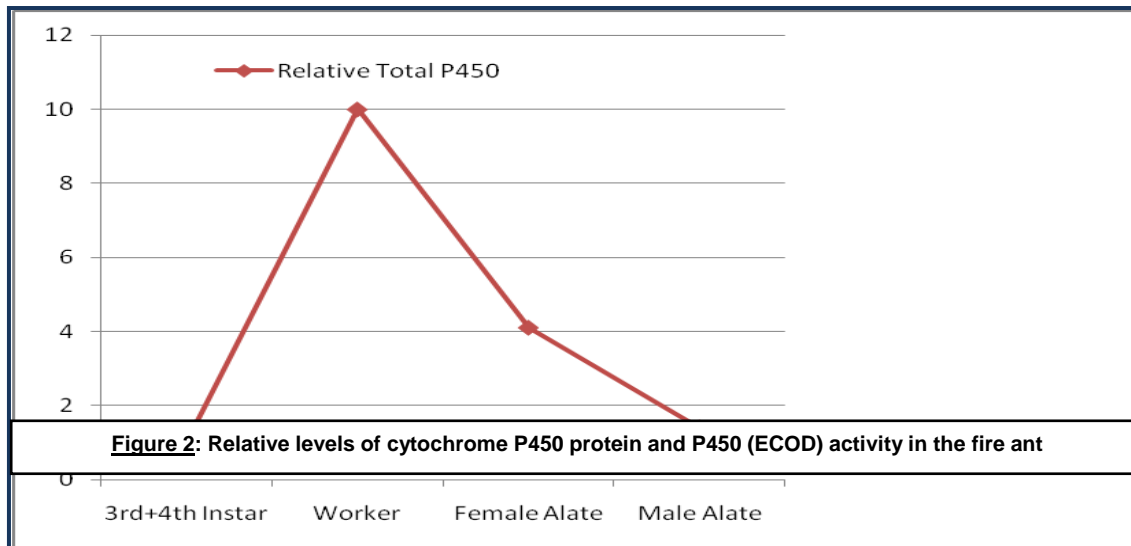
**Table 1:** Total cytochrome P450 protein and P450 (ECOD) activity in the fire ant

| P450 levels<br>Castes                   | Total Cytochrome P450 |                  |                    | P450 (ECOD) Activity |              |                    |
|---|-----------------------|------------------|--------------------|----------------------|--------------|--------------------|
|   | n <sup>a</sup>        | nmole/mg protein | Ratio <sup>b</sup> | n <sup>a</sup>       | Activity     | Ratio <sup>b</sup> |
| 3 <sup>rd</sup> +4 <sup>th</sup> Instar | ~150                  | 0.09 ± 0.003     | 1.0                | ~300                 | 0.02 ± 0.001 | 1.0                |
| Worker                                  | ~300                  | 0.92 ± 0.11      | 10 <sup>***</sup>  | ~600                 | 1.20 ± 0.18  | 60 <sup>***</sup>  |
| Female Alate                            | ~150                  | 0.37 ± 0.02      | 4.1 <sup>**</sup>  | ~300                 | 0.31 ± 0.04  | 16 <sup>**</sup>   |
| Male Alate                              | ~100                  | 0.15 ± 0.01      | 1.7 <sup>*</sup>   | ~300                 | 0.07 ± 0.01  | 3.5 <sup>*</sup>   |

<sup>a</sup> The total fire ant numbers used in each the experiment.

<sup>b</sup> relative to 3<sup>rd</sup>+4<sup>th</sup> Instar.

\* Significantly greater than 3<sup>rd</sup>+4<sup>th</sup> Instar (P≤0.05).



**Figure 2:** Relative levels of cytochrome P450 protein and P450 (ECOD) activity in the fire ant

**Significa**

**nce:**

Our research is extremely important because it comprises the first effort to characterize multiple P450 gene expression and activities in the fire ant. This study provides information on how the fire ants metabolic system responds to the chemical stimulation responsible for the fire ant social structure.

## EVALUATION OF 3 BAITS FOR CONTROLLING FIRE ANTS INFESTING SOD IN 2009

Tim Reed  
Extension Entomologist

**A strip trial was conducted to evaluate the efficacy of 3 baits to control fire ants.** The study was conducted in a field of established Bermuda grass sod near Leighton, AL in Colbert county. Baits tested were Extinguish<sup>®</sup> at 1.65 lbs. product per acre; Extinguish Plus<sup>®</sup> at 1.6 lbs. product per acre; and Amdro



Field demonstration site in Colbert County  
Courtesy Tim Reed

Fire Ant Bait<sup>®</sup> at 1.93 lbs. product per acre. The rates applied of Extinguish<sup>®</sup> and Extinguish Plus<sup>®</sup> were slightly greater than the recommended label rates of 1.5 lbs. of material for each product. The 3 bait treatments and the control (untreated) plots were each 160 feet by 298 feet (1.1 acres) and were adjacent to each other. Fire ant population density in plots prior to and after bait application was determined by placing 25 small pieces of hot dog on 1 inch x 1 inch sections of index cards in the center of each plot and counting the hot dog pieces having feeding by fire ants. Counts were made 30 minutes to

one hour after all hot dog pieces were placed in the plots. The number of hot dog “hits” in each treatment on May 19 (the day before treatment applications) was Extinguish<sup>®</sup> (12/25), Amdro Fire Ant Bait<sup>®</sup> (11/25), Extinguish Plus<sup>®</sup> (12/25) and control (6/25). Baits were applied May 20 from 2:10 to 3:10 p.m. using a Herd seeder. No rainfall occurred within 24 hours of the bait application. Fire ant feeding activity was checked on five dates extending from May 27 until August 20. When fire ants were present at a feeding station the “hit” was recorded and the number of fire ants present at the station was counted. This count was used to derive a density rating (d.r.) with a high number present (>15) being recorded as high (d.r. = 3), a medium number present (6-15) being recorded as medium (d.r. = 2) and a low number present (1-4) being recorded as low (d.r. = 1). The overall density rating was obtained by tallying the d.r. values for each plot on a given sampling date. The effect of each treatment on fire ant numbers are shown below (**Table 1**). Treatments are presented in the order they were located in the field.



**Table 1: Fire ant feeding activity following bait application**

| Date    | Extinguish |                 | Amdro  |    | Extinguish Plus |    | Control |    |
|---------|------------|-----------------|--------|----|-----------------|----|---------|----|
|         | # Hits     | DR <sup>1</sup> | # Hits | DR | # Hits          | DR | # Hits  | DR |
| 5/27/09 | 12         | 27              | 0      | 0  | 1               | 3  | 6       | 13 |
| 6/16/09 | 10         | 21              | 0      | 0  | 3               | 6  | 5       | 13 |
| 7/01/09 | 10         | 22              | 4      | 10 | 2               | 4  | 5       | 14 |
| 7/20/09 | 6          | 12              | 9      | 25 | 9               | 16 | 11      | 30 |
| 8/26/09 | 0          | 0               | 3      | 3  | 4               | 7  | 3       | 6  |

\*1 DR is overall density rating

During the first three sampling dates the Amdro Fire Ant Bait® and Extinguish Plus® treatments had less fire ant feeding activity than Extinguish®. However, 2 months post-application the Extinguish® treatment had the least amount of fire ant feeding activity. The sod was harvested prior to the last sampling date and this may have impacted the numbers of fire ants foraging in the plots on 8/26.

## EAST ALABAMA HOME GROWN WORKSHOPS

Mallory Kelley & Shane Harris  
Regional Extension Agents, Home Grounds, Gardens & Home Pests

In 2009, extension agents Mallory Kelley and Shane Harris hosted three Home Grown Workshops that included information on fire ant management. **These workshops included hands on training to demonstrate how to calibrate a fire ant bait spreader.** Participants had an opportunity to calibrate hand-held fire ant bait spreaders. The Workshops were held in Loachapoka, Wetumpka, and Anniston. 122 people attended these training sessions. A follow up survey showed that **51% of participants who received fire ant training then purchased and used a fire ant bait product.** Furthermore, **69% of all workshop participants shared the knowledge they gained with others.**



Shane Harris explaining to homeowners how to spread fire ant bait at the Anniston Home Grown Workshop, 2009.  
Courtesy Shane Harris

Mallory Kelley also coordinated an educational workshop for 26 Master Gardeners who volunteered at the Fire Ant Booth at the Alabama National Fair.

Agent Kelley and a Master Gardener set up a booth on fire ant control for a Natural Resources Land Owners Tour event in Montgomery County. **The purpose was to help people learn how to control fire ants in their home lawns as well as in their pasture land.** About 50 people were reached with the information.

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## ENLISTING MASTER GARDENERS TO FIGHT FIRE ANTS

Rachel Dykes & David Koon  
Regional Extension Agents, Home Grounds, Gardens, and Home Pests

### Training the trainers:

Agents Dykes and Koon included a fire ant management class in both of their Master Gardener volunteer training classes in 2009. They trained 22 Master Gardeners in Houston County and 14 in Coffee County.

**Sometimes, the most effective way to educate a community on a particular issue is by reaching the children.** Agent Dykes worked with Master Gardener volunteers to educate local school children about fire ants. The coloring books and the eXtension youth module on fire ants was used for these school visits and Kindergarten day at the Alabama Peanut Festival.



**Treat fire ant mounds in high priority areas such as beneath a mail box.**  
Courtesy Kathy Flanders

The fire ant booth at the Peanut Festival was a success. Kelly Ridley conducted a training for the booth volunteers on fire ant management basics. There were 18 Master Gardener participants in that training. A total of 34 volunteers manned the booth at different times. They gave out fire ant management information, coloring books, stickers, tattoos, and heavily promoted the eXtension fire ant website. **The Master Gardeners gave information to approximately 5,400 people.**

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## FIRE ANT ACTIVITIES

Eddie J. Wheeler  
Urban Regional Extension Agent, Marshall County

### Fire Ant Workshops:

#### 1. Muscadine Grape Pruning Workshop:

A presentation on fire ant biology and management by Dan Porch, Blount County Extension Coordinator, was a part of the workshop conducted on March 11, 2009. The workshop was conducted at Wenker's Vineyard located in Martling, Alabama owned by Jerry and Mary Wenker. The other topics discussed during the workshop were: benefits of pruning, pruning tools, safety, proper pruning techniques for muscadines, followed by a hands-on pruning session. **Thirty six (36) individuals participated in the workshop.** The fire ant publications distributed at the workshop included ANR-0175A, Fire Ant Control Materials for Alabama Homeowners, ANR-1161, Getting The Most Out of Your Fire Ant Bait. Bookmarks promoting a source of fire ant management information and eXtension were also handed out.

Read More At: **Muscadine Grape Pruning Workshop** by By **EDDIE J. WHEELER** from **MARSHALL COUNTY** for **ETP20B** on 2009-07-20, Co-author: **DANIEL WADE PORCH**:  
[https://ssl.acesag.auburn.edu/etp/eval\\_public\\_view.php?id=4a65493952e2d](https://ssl.acesag.auburn.edu/etp/eval_public_view.php?id=4a65493952e2d)

#### 2. Strawberry/Organic Field Day:

A presentation on fire ant biology and management by Mike Reeves, Regional Extension Agent, Commercial Horticulture was a part of the field day conducted on May 20, 2009. The field day was conducted at Gypsy Ranch located in Altoona, Alabama owned by Cricket and Kim Adams. The other topics discussed during the field day were: soil fertility and soil conservation, followed by a tour of the certified naturally grown operation that includes vegetables, strawberries with the use plasticulture, other fruits, shiitake mushrooms, hay and a greenhouse. **Fifteen (15) individuals participated in the field day.** The fire ant publications distributed for the presentation included ANR-0175A, Fire Ant Control Materials for Alabama Homeowners, ANR-1161, Getting The Most



**Michael Reeves conducts a fire ant management training.**  
Courtesy Eddie Wheeler



**Producers attending the strawberry/organic field day.**  
Courtesy Eddie Wheeler

Out of Your Fire Ant Bait. Bookmarks promoting a source of fire ant management information and eXtension were also handed out.

Read More At: **Strawberry/Organic Field Day** by EDDIE J. WHEELER from MARSHALL COUNTY for ETP20B on 2009-08-28, Co-author: MICHAEL D REEVES [https://ssl.acesag.auburn.edu/etp/eval\\_public\\_view.php?id=4a985f5dd2833](https://ssl.acesag.auburn.edu/etp/eval_public_view.php?id=4a985f5dd2833).

### 3. Square Yard Gardening Tour/Field Day:

Extension Agent Wheeler made a presentation on fire ant biology and management as a part of the tour conducted on June 17, 2009. The tour was conducted at Famco Farms owned by Grover and Barbara Williams of Guntersville, Alabama. The other topics discussed during the tour were: small fruits, soil fertility and vegetables. **Twenty one (21) individuals participated in the tour.** Fire ant products, especially baits, were available for observation and discussion. The fire ant publications distributed for the presentation included, ANR-0175, Imported Fire Ants in Lawns, Turf and Structures, ANR-0175A, 2007 Fire Ant Control Materials for Alabama Homeowners, ANR-1161, Getting The Most Out of Your Fire Ant Bait and ANR-1185, The Hidden Truth about Red Imported Fire Ants. Bookmarks promoting a source of fire ant management information and eXtension were also handed out.

## 4-H & FIRE ANTS

C. Somer Behel & Randall Armstrong  
Alabama Cooperative Extension System

In February, Lauderdale County 4-Hers participated in a fire ant program during their in-school club meetings. The topics discussed in the programs were, how red imported fire ants came to the United States, different ant body parts, ant's life cycles, ant mounds, and what to do if you are stung by an ant. At the end of the program the 4-Hers played fire ant jeopardy. The youth really enjoyed the red imported fire ant program. **Agents presented 32 programs to 1550 youth.** The fire ant jeopardy game is being reviewed for inclusion on the fire ant eXtension site.

Read More At: **4-H and Fire Ants** by CHESSIE SOMER BEHEL from LAUDERDALE COUNTY for PPA22 on 2009-07-09  
[https://ssl.acesag.auburn.edu/etp/eval\\_public\\_view.php?id=4a56439f289b9](https://ssl.acesag.auburn.edu/etp/eval_public_view.php?id=4a56439f289b9)



Somer Behel shows a fire ant mound model made in Lauderdale County.  
Courtesy Somer Behel

## TRAINING MASTER GARDENERS TO CONDUCT FIRE ANT MANAGEMENT DEMONSTRATIONS

Tony Glover

Regional Extension Agent, Home Grounds, Gardens, Home Pests & Commercial Horticulture



Fire ant mound next to sidewalk.  
Courtesy Bart Drees

**Six bait demonstrations in home lawn situations in the Birmingham area were conducted by Tony Glover.** He

enlisted the help of Master Gardeners to aid him in the demonstrations. All said that they had fire ant problems, and were currently using individual mound treatments with contact insecticides to control ants. **First, he conducted a classroom training session, in which the participants**

**increased their level of knowledge about fire ants by 48%.** After the training, all participants indicated that they would change the way they were managing fire ants as a

result. All thought the broadcast bait technique would be safer and more environmentally sound, and 3/4 of them felt the bait-based approach would be more cost effective and would provide better control. He showed the participants how to apply the fire ant bait in their own yards, then provided them with Extinguish Plus® fire ant bait. The bait was broadcast between mid-May and mid-June.

**During the summer, participants noticed that the bait worked well in reducing number of fire ants.** However, by September, populations of foraging fire ants were as high as they had been just before treatment. This is not entirely unexpected, since winged queens can fly in and establish new colonies. The rainy summer provided ample opportunities for fire ant mating flights. **Standard recommendations call for applying this type of fire ant bait twice a year to maintain control. A second application of bait would have been warranted in the fall.** Only two participants provided data on what they were spending on fire ant control before the workshop/demonstration. For those participants, two applications of fire ant bait would have been slightly cheaper than their current method of fire ant control, and would have been safer and more environmentally sound.

## FIRE ANT DEMONSTRATIONS IN HENRY & HOUSTON COUNTIES

James Jones, Rachel Dykes, Reafield Vester, Rickey Hudson & Philip Carter  
Alabama Cooperative Extension System

**National Peanut Festival (NPF) Fairgrounds Demonstration:**

Counts of fire ant mounds were made one month before the opening of the National Peanut Festival. Amdro Pro Fire Ant Bait was spread on October 5, 2009 at 1.5 lbs / acre. Fire ant control was good to excellent on NPF Fairgrounds and Amphitheater area. Some fire ants were discovered near main buildings in areas not heavily spread with product. **Some 50,000 people attended the festival, and there were no reports of fire ant stings. Some 15,000-18,000 people attended the concerts, and no fire ant stings were reported in the amphitheater area where the concerts were held.** 100% control was observed in the food court area, which was spread with Amdro Pro® at the rate of 2 pounds per acre.

### Headland First Baptist Church Orchard Demonstration:

In the orchard, there were 13-15 mounds per acre before spreading fire ant bait. Amdro Pro® fire ant bait was spread at 1.5 pounds per acre approximately 4 weeks prior to the Fall Festival. **Some 700 children and volunteers participated in the FBC Fall Festival on October 24th and no reports of fire ant activity or stings occurred during the festival.** Post-treatment counts were 1 to 2 mounds per acre. Orthene® was used as a mound treatment to speed up kill and for escape mounds.

## KEEPING THE PUBLIC SAFE FROM FIRE ANTS

Charles "Chuck" Browne & Danielle Carroll  
Alabama Cooperative Extension System

During the 2009 Calendar year, agents in the Lee County Extension Office put in 3, major fire ant demonstrations in high visibility areas. They also instructed hundreds of homeowners on proper fire ant bait application through office visits, home visits, phone calls and email correspondence.

### Demonstration 1:

County Extension Coordinator Chuck Browne received a call from Mr. Sherill Parker of Waverly, Alabama during the first week of April. Mr. Parker's farm was hosting the Sticks Country Music Festival the weekend of April 16-19.

Preconcert preparations involved setting up music stages, preparing the grounds for both tent and RV camping and mowing the amphitheater shaped pasture where guests could view the bands.

During preparations, **it was discovered that the near 100 acre site was heavily infested with Red**



Parker Hill, the location for the 2009 Sticks Country Music Festival.  
Courtesy Chuck Browne

**Imported Fire Ants, approximately 60-80 mounds per acre. Between 15,000 and 20,000 guests were expected for the event.**

Due to the time of year, weather factors and the short time frame to work with before the concert, most baits would not be effective in fire ant control. Browne contacted entomologist Dr. Kathy Flanders and Alabama Fire Ant Management Coordinator Dr. Fudd Graham for technical assistance. Both agreed that Advion<sup>®</sup>, which is a new fast-acting type of fire ant bait, would be the best choice.

Browne procured a hitch mounted bait spreader and Mr. Sherill Parker purchased 100 lbs. of the bait material. The morning of Wednesday April 8th, 2009 Browne and Parker met on the farm. Following several days of rainfall, it was 28 degrees F that morning and it was feared temperatures would be too cold that day for application. However, by 11:00 am temperatures were in the 60's and the bright sunshine had warmed the ant mounds. The ants were observed foraging crumbled potato chips. The bait was applied between the hours of 1:00 pm and 3:00 pm on April 8th.



**Crowd at the Sticks Country Music Festival.  
Courtesy Jerri Caldwell**

On Friday April 10th, Browne visited the farm and noticed considerable decline in the ant populations on 10-15 randomly chosen mounds. On the morning of Monday April 13th, Browne, Parker, Graham and Kelly Ridley performed an extensive inspection of the total area treated (approximately 100 acres) and **found very few to no living ants in any of the mounds.** The few mounds with live ants were individually treated with Orthene<sup>®</sup>.

Mr. Sherill Parker considered the project a total success and said **“I’m sure glad you guys were there and able to come through for me. I’m retired S.C.S. and have worked with extension all my life from 4-H through my adult career. I don’t know what we would do without y’all.”**

### **Demonstration 2 & 3:**

Two local fall festivals occur the same weekend in October in Lee Co., Alabama. The Native American Heritage Festival and the Loachapoka Syrup Sopping / Lee County Historical Fair were both held the weekend of October 23, 2009. Both sites occupied approximately 2 acres and each had a small fire ant population as observed by County Extension Coordinator Chuck Browne and County Extension Agent Danielle Carroll during the summer months.

On Friday, September 24, 2009, Browne and Carroll applied Extinguish Plus® at a rate of 1.5 lbs bait per acre on both sites. Timing was such that it was 4 weeks before both festivals. **Visits to both sites the week of the festivals resulted in no live mounds observed.** The Native American Heritage festival drew about **100 participants** while the Syrup Sopping / Historical Fair in Loachapoka regularly has **20,000 plus visitors.**

**In all three cases, significant numbers of people were not negatively impacted by Red Imported Fire Ants due to the resources and information provided by the Alabama Fire Ant Management Program.**

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## FIRE ANT EDUCATION EFFORTS IN WALKER COUNTY

Danny Cain & Rebecca Persons  
Alabama Cooperative Extension System

### Fire Ant Education in 2009:

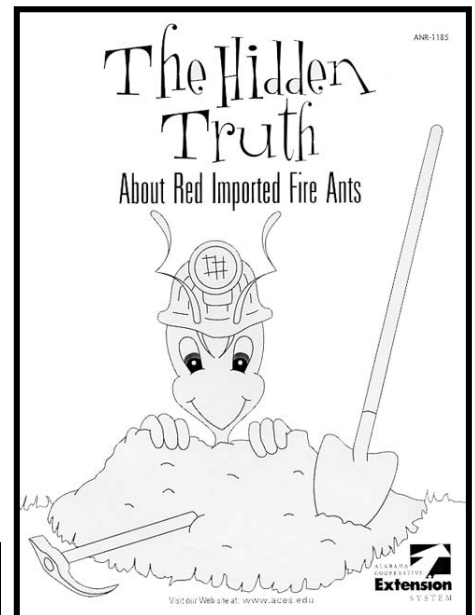
**Danny Cain worked on several things involving fire ant education, such as:**

1. Two segments on fire ant control products on local cable TV (240,00 is their estimated potential viewing audience).
2. One newspaper column on fire ant in home landscape (12,000 estimated circulation).
3. Applied Extinguish Plus® on 40 acres of pasture land with a local producer using the Herd Seeder our office was provided.
4. Taught fire ant management for Walker County Master Gardener program (15 participants).
5. Taught a session of fire ants using RIFA Coloring books for local elementary school after-school program (30 participants).

**Rebecca Persons distributed fire ant educational materials:**

She distributes the fire ant coloring books to 4-H'ers. She targets the Junior Master Gardener groups and others like Girl Scout/ Boy Scout Day Camps. She also uses them at competitive events like Compact Tractor or Plant and Soil Science.

Fire ant coloring book distributed  
by Alabama Cooperative Extension





## EXTENSION COMMUNICATIONS REPORT

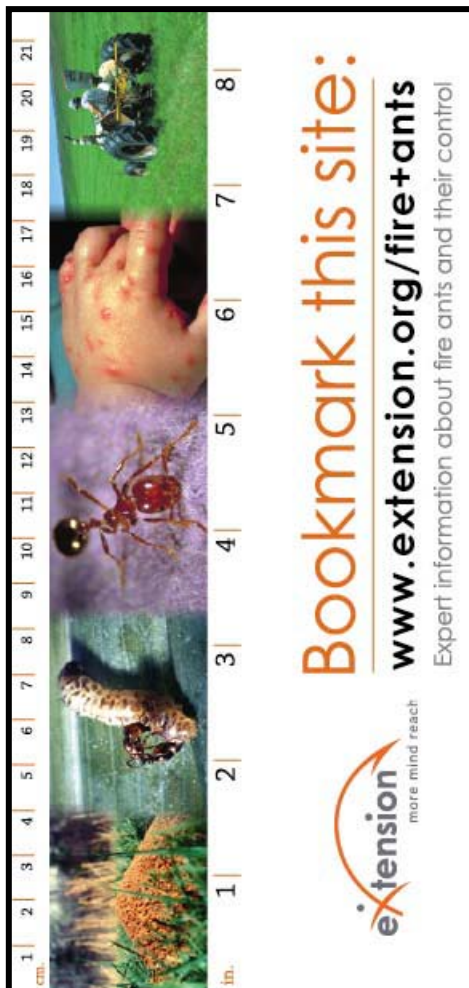
Glenda Freeman

Communications Editor III, Communications Unit, Alabama Cooperative Extension System

The Communications and Marketing Department of the Alabama Cooperative Extension System has been contributing to the Alabama Fire Ant Management Program since the program began. **For example, each year, the department prints at least 10,000 copies of The Coloring Book ANR-1185, "The Hidden Truth About Red Imported Fire Ants."** Artists and editors in the department revise this book as needed.



Stickers promoting the eXtension fire ant site



Bookmarks that promote the eXtension fire ant site

**Freeman copy**

**edits FAQs and other content for the eXtension Fire Ant Community of Practice.** She works on the eXtension Manual of Style, which indirectly affects the fire ant educational efforts. She handles the reprinting of all fire ant eXtension marketing materials such as Z-0475, "eXtension Fire Ant Bookmarks." The department designed the bookmarks, as well as a window shade exhibit, stickers, magnetic signs, and a print on demand poster, to promote fire ant eXtension.

**Margaret Lawrence, Specialist III, writes news releases on fire ants for publications in newspapers and on eXtension.** She facilitates marketing efforts of the CoP, as well as production of video and audio materials for the eXtension site. She also produces radio spots highlighting fire ant management and research.

**Mario Lightfoote, Producer/Director IV, produced "Fire Ant Control Made Easy," which is available on You Tube and as individual chapters on fire ant eXtension.** This video has been revised twice, and is widely used by Extension agents in their

educational programming. He oversees the uploading of video and audio content for fire ant eXtension.

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## FIRE ANT MANAGEMENT EDUCATION EFFORTS IN MONTGOMERY COUNTY

Jimmy Smitherman  
County Extension Coordinator, Montgomery County

Montgomery County answers a lot of questions about fire ants throughout the year via agents and Master Gardeners. We also loaned out the Herd Seeder to individuals who wanted to spread their own bait. The Master Gardeners also helped man the fire ant booth at the Alabama National Fair.

One specific activity that we worked on in 2009 was a fire ant booth at the Natural Resources Tour on October 29, 2009 in the Pintlala community. **We had 110 registered people which included participants, exhibitors, and instructors.**

Mallory Kelley, Horticulture REA, and Marie Tomlin, Master Gardener, displayed the Herd Seeder along with some fire ant bait. They gave out publications and answered questions from the participants.

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Fire ant bait in relation to a quarter  
Courtesy Jimmy Smitherman

## FIRE ANT MANAGEMENT AT SUMTER COUNTY HEAD START CENTERS

Willie Datcher & Willie Lampley  
Alabama Cooperative Extension System



Teaching a Head Start employee about fire ant management  
Courtesy Willie Datcher

Willie Lampley and Willie Datcher started fire ant demonstrations at 6 Headstart Centers in Sumter County in October of 2007, and continued through 2008. **In 2009, they were again asked to conduct the demonstrations, but more importantly, to provide some training to two Head Start Center employees so that they could learn to treat the centers themselves.**

They also established a couple of demonstrations with homeowners to compare the bait with the other mound treatments that the homeowners were using. They discussed the idea of doing a demonstration with the homeowners in a subdivision and also talked about doing a workshop on fire ant control. The homeowners that participated were very impressed with the bait. At least one homeowner has interest in controlling fire ants on a neighborhood basis. He has talked with some of his neighbors about the possibility of going in together to purchase some bait to use in the neighborhood.



A Sumter Co. homeowner who is exploring the possibility of a neighborhood fire ant management program  
 Courtesy Willie Datcher

## FIRE ANT MANAGEMENT IN APPLE AND BLUEBERRY OPERATIONS

Lloyd D. Chapman  
 Commercial Horticulture Regional Extension Agent, Limestone Co.

### Cost Savings of Broadcasting Baits vs. Individual Mound Treatments:

The owners of Isom Orchards in North Alabama treated their 3 acre apple orchard with Esteem Ant Bait® in March 2009. This application reduced the number of active fire ant mounds in late May by 90%. They applied bait around each visible mound, according to label directions. The cost of that application was \$330 (fire ant bait was \$250 and approximately \$80 in labor costs). **Extension agent Doug Chapman broadcasted a bait treatment in June in order to demonstrate that growers can save money by broadcasting the bait.** His costs to treat the same orchard for fire ants were \$68 for all 3 acres. Chapman also broadcast bait on heavily infested blueberry plantings on the same farm. By September, fire ants were totally controlled in both plantings. The owner was pleased with the results of the demonstrations. Chapman reported that in January 2010, there were few, if any, fire ant mounds found in the treated areas.

### Switch to a Sustainable Bait-based Approach:

In 2008, Mr. John Robinson who operates Gin House Farm in Somerville, AL participated in a broadcast bait demonstration. He was so pleased with the results that he purchased more Esteem® ant bait and applied it in 2009. This change to a sustainable bait based approach makes sense for

this Pick-Your-Own blueberry operation. The farm is open to the public and people bring children, infants in strollers and elderly people to the farm. **Therefore, fire ants are a huge liability issue for Mr. Robinson.** Prior to the first demonstration, he had had numerous complaints about the fire ants and one person threatened civil action over the fire ants.



Left: Demonstration at the Gin House Farm in North Alabama  
Right: Demonstration of a Herd seeder being used to distribute fire ant bait  
 Courtesy Doug Chapman

## ADVION FIRE ANT BAIT WINS AT HISTORICAL CIVIL WAR RE-ENACTMENT!

Dan Porch

County Extension Coordinator, Blount County

The annual Historical Civil War Re-enactment in Blountsville, Alabama was hosted this year on May 2, 2009 by the Blountsville Historical Society and Clanton's Brigade of Forrest's Cavalry Corps. Students and others who attended the annual event learned about life during the Civil War era, and the manner in which battles were fought. Historical buildings on the site were used, and volunteers who participated in the event dressed in period clothing to make the event as realistic as possible. Organizers of the event were Mrs. Jane Wright and Mrs. Joyce Thompson, who have close ties with the Blount County Extension Office through the Master Gardener's program and the Blount County 4-H Shooting Sports Club. **They approached county**



A fire ant free area makes for an enjoyable event for all!  
 Courtesy Dan Porch

**Extension Coordinator, Dan Porch, about the possibility of controlling Red Imported Fire Ants during the event. He agreed to utilize the Herd seeder, supplied by the Alabama Fire Ant Management Program, and his ATV to apply a bait product that would be effective.**

The problem with applying bait was the timing of the event. Baits should be applied when temperatures are above 60 degrees F while ants are actively feeding. Bait also needs to remain dry and in good condition for 24 hours, allowing ants time to get bait back to the mounds. Rainfall will make the bait less attractive. Most bait needs 4 – 8 weeks to control ants, depending on the active ingredient. Also, the weather in late March and early April was not conducive for application of bait products.

After discussing the matter with Dr. Kathy Flanders, Extension Specialist and Danny Cain, Extension Coordinator in Walker County, it was suggested that I try bait called Advion®, made by DuPont®. Advion's active ingredient works to kill ants quickly but not before they can get it back to the mound. Advion's flier indicates 80 - 100% of the mounds will be killed within 72 hours. The perfect bait for quick clean-up for events such as the Forrest-Streight Re-enactment!



Todd Himelberger, Sales Representative for DuPont®, graciously agreed to supply bait for the demonstration. Bait was applied at the 1.5 lb. / ac. rate on 4/25/09 to the 8 acre site. Ten mounds in two locations were flagged prior to bait applications and hot dog tubes were used to determine ant activity. There was greater ant activity in the mowed areas around buildings

Hotdog tubes used to capture fire ants  
Courtesy Dan Porch

and in the vendor area than in the un-mown (at time of application) parking and camping area. Mounds were checked on Tuesday, April 27th. 80% of the mounds flagged in the vendor and building area were killed; one appeared sick and one appeared healthy. 80% of the mounds in the parking and camping area were still active. The historical park was re-visited the last week of June for mound counts. **Only one active mound was found where Advion® had been applied.** Mrs. Thompson, Event Coordinator, wrote "While cold weather and rain hampered your efforts to educate the public, we are sold on the product Advion®." Jane Wright, President of the Blountsville Historical Society, said "there was a noticeable decrease in the number of fire ant hills and activity." **Advion® was the only choice in this situation and it saved the day at the Forrest-Streight Raid Re-enactment. It saved money by reducing the time and materials required to treat individual mounds. Also, by reducing the number of ants, it reduced the liability that comes with a fire ant infestation. Everyone in attendance benefited from the use of the product.**

This is a success story from the Alabama Cooperative Extension System  
([https://ssl.acesag.auburn.edu/etp/eval\\_public\\_view.php?id=4b06c1088e7c9](https://ssl.acesag.auburn.edu/etp/eval_public_view.php?id=4b06c1088e7c9))

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## EAST ALABAMA FIRE ANT DEMONSTRATIONS

William "Chip" East  
Regional Extension Agent, Commercial Horticulture

This past year, two athletic turf meetings were conducted in the piedmont region of the state. **Many aspects of turf management were discussed in this meeting, including fire ant management.** One participant admitted the fire ant management information was the main reason he attended the meeting. During the year I have had several contacts with those meeting participants, and most of their questions relate to fire ant management. Auburn turf specialist Dr. Dave Han and Dr. Beth Guertal helped conduct these meetings, and County Extension Coordinators Rick Beauchamp, Yvonne Thomas, and Debby Mathews helped with the planning of these meetings as well. For more information see Athletic Turf Meeting, a Success Story for the Alabama Cooperative Extension System ([https://ssl.acesag.auburn.edu/etp/eval\\_public\\_view.php?id=4a9d893fd81e7](https://ssl.acesag.auburn.edu/etp/eval_public_view.php?id=4a9d893fd81e7))

**I conducted three entomology classes for at risk youth from several counties in which fire ant biology and management was discussed.** These youth keep a journal of the things they learn while in class. After reading their comments, it is obvious they now know more about fire ants than they did before they attended the class.



Chip East conducting a fire ant biology training  
Courtesy Chip East

A large blueberry meeting was conducted at the Wiregrass Research and Extension Center (see report from Elina Coneva below) which many current and potential blueberry growers attended. Many participants had additional questions about fire ants that were answered. Many others had comments about fire ants and were very pleased to receive the information.

In addition to these meetings I speak individually with many homeowners, commercial fruit and vegetable farmers, and nursery producers about fire ant management. **Fire ants are a major concern for our pick-your-own operations such as blueberry and strawberry farms. Those farmers are always interested in fire ant management information.**

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## EAST ALABAMA FIRE ANT DEMONSTRATIONS

Elina Coneva  
Fruit Crop Extension Specialist, Auburn University

### **Fire Ant & Bait Demonstration in Headland:**

On May 28, 2009, over 50 blueberry producers from the Wiregrass area attended field demonstrations featuring fire ant bait control in a blueberry orchard as part of a Commercial Blueberry Production Workshop. The meeting took place at the Wiregrass Research and Extension Center in Headland. The fire ant demonstration was conducted early in the growing season to provide the blueberry growers with timely information on the proper bait type, equipment and techniques used to control fire ant populations in a commercial blueberry farm. Chip East, Regional Extension Agent for East Central Alabama discussed how the fire ant bait spreaders work, the baits labeled for fruit production areas, how and when to properly apply the bait, etc., and Neil Kelly, Regional Extension Agent for South East Alabama provided the bait spreader that allowed the attending growers to gain a hands-on experience spreading bait. Commercial Horticulture Team members Dr. Elina Coneva and Bobby Boozer planned and coordinated the workshop. Other topics discussed at this meeting included an overview of cultural methods designed for sustainable blueberry production in the Wiregrass area, fertilization practices for blueberries, irrigation system maintenance, and Specialty Crops Aspect of the New Farm Bill. Organizers would like to thank the Southern Region Sustainable Agriculture Research and Education Program for their generous support that made the educational program possible.

**Several of the attending blueberry growers expressed their opinion that the knowledge on the fire ant bait control acquired at the meeting would aid in managing this important pest in their farms.**

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## FIRE ANT MANAGEMENT IN WASHINGTON & ESCAMBIA COUNTIES

William "Ken" Kelley, Arthur Threatt & Olin "Buck" Farris  
Alabama Cooperative Extension System

Extension agents Kelley and Threatt conducted two fire ant demonstrations at the Simpson Community House in Vinegar Bend, Alabama. **A total of 50 people attended the meetings to observe how to apply fire ant bait on the grounds of the Community Center.** The remainder of the bait was given to those who attended the meeting. Program participants were very impressed with the programs and the information presented. The fire ant bait was donated by Doug van Gundy, Central Brands®.



Ken Kelley demonstrates the use of a Herd seeder to distribute fire ant bait  
Courtesy Ken Kelley

**In May 2009 extension agents Kelley and Farris conducted a demonstration of fire ant biology and management at an elementary school in Escambia County.** Five children from each of the 2<sup>nd</sup> grade classrooms at Brewton Elementary School were chosen to participate in a fire ant "class" where they were taught some basic fire ant biology/control situations and given publications to

take home to "educate" their parents. The students "flagged" all of the fire ant mounds in a section of the school. That evening the bait was applied to the school grounds.

## HAY AND FORAGE DEMONSTRATIONS IN MORGAN COUNTY

Ronald Britnell  
County Extension Coordinator, Morgan Co.

Ronald Britnell demonstrated the use of the herd seeder on 30 acres of pasture land in September 2009. This is part of an on-going effort to make the spreaders available to Morgan County cattlemen for use in spreading fire ant bait. The program has been so successful that a new



Ronald Britnell using a  
Herd seeder



seeder had to be purchased this year, since the

previous one was worn out.

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## SHELBY COUNTY FORAGE MANAGEMENT FIELD DAY

<sup>1</sup>Joshua Elmore & <sup>2</sup>Ricky W. Colquitt

<sup>1</sup>Advisor III, Natural Resources Programs, Auburn University

<sup>2</sup>County Extension Coordinator, Shelby County

Forage production is a leading agricultural crop in Shelby County with 9200 acres harvested in 2007-08. Production generated 13,000 tons in 2007, according to the USDA 2007-08 Ag Census, which ranked the area 1.4 tons/acre below the overall state average of 1.8 tons/acre. This program was needed to help farmers stay abreast of the latest information regarding forage crop management, pest management, weed identification and herbicide usage. "We want to provide information that will be helpful for the farmers who have been producing forage all their lives, as well as provide relevant up to date information to people who have just moved to the area into small-acreage farms that need help and guidance with farming in the Shelby County" said Ricky Colquitt, Shelby County Extension CEC.

Extension educational activities included hands on demonstrations calibrating sprayers and seeders, clover seed inoculation, and global positioning system (GPS) use on the farm. GPS demonstrations consisted of acreage measurements with hand held units as well as light bar systems which are rapidly gaining in popularity among Alabama producers. Light bars consist of a GPS antenna, GPS receiver, and guidance display. The GPS antenna transmits correction signals to the GPS receiver which interprets it as an actual location (latitude and longitude). These systems are most frequently used for spraying and fertilizer applications. Guidance systems allow farmers to more accurately apply inputs to crops. Growers report GPS guidance systems have helped them by reducing application overlap and skips in the field, increasing driver ease, and maximizing efficiency in the field.

Weed control options **as well as fire ant control options in pastures and hayfields** were also discussed. This program was conducted on Saturday, August 22nd, 2009 and included a series of four demonstrations and two presentations at Ronnie Cook's Farm near Wilsonville. The county Extension office in Shelby County hosted the Forage Management Field Day partnering with the Shelby County Cattlemen's Association and the Shelby County Farmers Federation. Ricky Colquitt, Shelby County CEC and Josh Elmore, Advisor III Natural Resource Programs facilitated the programs and manned the demonstrations. The group consisted of 43 cattle and horse farmers.

Based upon comments from producers in attendance such as the following, we feel this program was a success. "This program was needed because forage production, herbicide and pesticide use, and global positioning systems all have practical use on the farm" stated Jamie Cates, cattle producer. "I never thought about using a GPS unit to measure acreage" said Bill Johnson, cattle producer "I'm going to go

home and check all my pastures". "The cost of the light bar system will pay for itself in a short time with the reduction in skips and overlaps" commented Jamie Tate, cattle producer and row crop farmer.

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## FIRE ANT EDUCATION EFFORTS IN ANNISTON AND TALLADEGA COUNTIES

Henry Dorough  
Regional Extension Agent, Animal Sciences and Forages

Extension agent Henry Dorough gave two of talks that included fire ant management. In fall 2009, he received donated fire ant bait to treat two schools (Munford Elementary and Sacred Heart of Jesus Catholic School in Anniston) and Sacred Heart of Jesus Catholic Church in Anniston.

He attended the Annual Imported Fire Ant Conference in Oklahoma City in 2009, and participates as a reviewer for content of fire ant eXtension. He also is active in eXtension's Ask-the-Expert System.

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## TERMITE AND IMPORTED FIRE ANT BIOLOGY AND MANAGEMENT SEMINAR

Sallie Lee, Nelson Wynn & Tony Glover  
Alabama Cooperative Extension System

**Extension Agents Lee, Glover, and Wynn organized a workshop on April 30, 2009 that was designed to educate homeowners, pest control operators, commercial turfgrass managers, and others about fire ants and termites.** The workshop was held at the AL Green Industry Training Center at the North Shelby Library (AGITC/NSL). Master Gardeners gained up to 5 Continuing Education Units for attending the workshop. Ten pesticide recertification points were provided for the categories HPC, OTPS, and WDC. All attendees appreciated the workshop but

homeowners/residential/MGs really raved about what they learned.

Sallie Lee attended the Annual Imported Fire Ant Conference in Oklahoma City in 2009, and participates as a reviewer for content of fire ant eXtension. All three agents participate in eXtension's Ask-the-Expert System.



**Kathy Flanders teaching about fire ant biology and management**  
Courtesy Sallie Lee

## CALHOUN COUNTY FIRE ANT EDUCATION

David West  
County Extension Coordinator, Calhoun County

Calhoun County personnel promoted the eXtension fire ant site. They responded to numerous calls and questions regarding fire ants. They included the the fire ant coloring books in their Earth Day educational supplies for 800 4th graders.

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## FIRE ANT EDUCATION EFFORTS IN RUSSELL COUNTY

Theodore Gilbert  
County Extension Coordinator, Russell Co.

1. Educational booth at Russell County Back to School Bash.
  2. Educational booth at Riverwalk Fair in Phenix City.
  3. One newspaper column on fire ants for the Citizen of East Alabama in home landscape.
  4. Display of publications at a local feed and seed store.
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## INTELLIGENT PLANT MANAGEMENT SERIES INCLUDES FIRE ANT EDUCATION

Chazz Hesselein & James Miles  
Alabama Cooperative Extension System

On May 28, 2009, as part of Commercial Horticulture REA James Miles' "Intelligent Plant Management Series," a fire ant education class and fire ant bait application demonstration was conducted. The class began by having attendees take a pre-test. **Following the pre-test Extension Horticulturist Chazz Hesselein, presented information on fire ant biology, the different types and characteristics of fire ant baits and fire ant bait application tips including a home calibration method.** The fire ant bait application was demonstrated by applying fire ant bait to the area adjacent to the Jon Archer Agriculture Center's Master Gardener demonstration garden. Fire ant mounds were flagged prior to the application so that attendees could watch the progress of the bait's activity when they came to their weekly classes. Following the fire ant education presentation and bait application demonstration a post-test was administered. The average pre-test score for 9 participants was 52%. **The average post-test score was 73%, an increase of 40 percentage points over the pre-test average.**

