

## Annual Progress Reports due September 13, 2006

### Texas Imported Fire Ant Research & Management Project

**Title of project:** Applied Imported Fire Ant Research and Education Program

**Principal investigators:** Bastiaan "Bart" M. Drees, Professor, Extension Entomologist,  
Thomas W. Fuchs, Professor and Extension IPM Coordinator  
Roger Gold, Professor

**Major accomplishments to date** (September 1, 2005 through August 31, 2006):

Notable achievements included:

- EPA registration of Arinix® by Nix of America, a permethrin impregnated nylon which can be molded and sold in numerous forms to be used as barriers to prevent ant and other arthropod problems in electronic equipment. The barriers have a 3 to 5 year residual.
- EPA registration for use of Esteem® (pyriproxyfen) by Valent U.S.A. for use in cattle pastures. This is an addition to already registered materials, but provides an alternative to methoprene. The company is interested in registering the skip swath application directions which would reduce treatment cost for agricultural uses.
- Aerial application was demonstrated for the first time with technology developed by North Star Helicopters. A 100-acre horse pasture at Camp Strake Girl Scout Ranch (Montgomery Co.) And Britt Rice Exotic Game Ranch (Brazos Co.) Demonstrated the economic feasibility of this method of broadcast bait application. A survey of Texas' aerial applicators by P. Nester and B. Drees will link potential clientele in need of these services to service providers.
- Working with David Herd, CEO of Herd Seeder Co. resulted in calibration of several applicator models for application of imported fire ant control products. This company supports factory calibration for ant baits using blocking plates that result in more efficient application.
- Biological control agents (*Pseudacteon tricuspis* and *P. curvatus*) are being introduced to new parts of Texas (Denton, Polk, Bexar, Walker, Orange Counties) and beginning to spread through releases made coordinated and made by this project and Texas Cooperative Extension cooperators and volunteer through collaboration with USDA-APHIS, USDA-ARS, and the University of Texas.

Additional funding was leveraged through proposals submitted during this fiscal year:

1. Entomology Project Group Program Enhancement Funds (proposals rejected)
2. Taking the sting out of fire ants: A Proposal for an eXtension program - K. Flanders and B. Drees (eXtension call for action, FY2006, \$74,885)
3. USDA-ARS Area-Wide Fire Ant Suppression Program - B. Drees, A. Calixto, R. Puckett (Specific Cooperative Agreement 0500-00044-009-01S, Texas A&M University, June 14, 2001; USDA-ARS FY Jul 1 to Jun 30, 2006 - \$89,363.79, FY Jul 1 to Jun 30, 2007 -

\$77,260)

4. The Fire Ant Spacial Information Management System Revision and Expansion - B. Drees, R. Coulson, J. Cook and S. B. Vinson (Texas Imported Fire Ant Research & Management Project, FY2006-2007, \$144,714)
5. TDA County Surveys of 20 west Texas counties (\$12,500 subcontract)
6. Developed Memoranda of Agreements for funding from companies and manufacturers.

**Goals achieved:** Outcomes included: 1) development of new approaches and fire ant management technology; 2) design, implement, and evaluate demonstrations of new technology documenting resulting economic and environmental impact; and, 3) transfer technology through outreach education programs. Participation in the national Annual Imported Fire Ant Research Conference, Southwestern Branch of the Entomological Society of America and at other state, regional and regional conferences assured that participants had the most current information and that their contributions were recognized within the scientific community.

This proposal provided support for all or part of a number of positions and peronnel including B. Summerlin and L. Nelson (through R. Gold) and Dr. C. Barr, who resigned from Texas Cooperative Extension in April 2006 (through B. Drees). Funding for travel and collaborative projects requested for Extension Agents – IPM, and Extension Program Specialists – IPM (through T. Fuchs) was denied.

**Relevance to the Texas Imported Fire Ant Research and Management Project:** This project addressed this Plan's goal: to eliminate this imported fire ant as a major Texas' pest. Economic indicators being developed by Dr. C. Lard are helping document impact of this pest ant (see Drees and Lard 2006). New products, approaches and services provide new alternatives to consumers and professional pest management service providers.

**Publications submitted/published; presentations/posters presented at national technical meetings/conferences:**

**Presentations**

- Participated in Bayer Environmental Science's Landscape Pest Management Summits in Houston (Jan. 25) and Dallas Jan. 31) with Dr. C. L. Barr, making Imported Fire Ant Management presentations to over 200 professional pest management and grounds maintenance personnel. Dr. Barr provided CEU credits for Texas Department of Agriculture licence holders.
- Dr. Charles Barr developed and moderated a symposium (15 presentations) on imported fire ants at the Southwestern Branch meeting of the Entomological Society of America, Feb. 26-March 2, 2006 (<http://swbesa.tamu.edu>). Drees and Nester presented, "Aerial and ground application technology for large imported fire ant suppression programs".
- Participated in the product launch meeting for Valent USA for Esteem® fire ant bait registrered now for use in cattle and hay pastures, Mobile, AL, March 27, making a presentation after helping develop the program.

- Developed and conducted symposium (seven presentations) at the request of Dr. R. Gold for the 2006 National Conference on Urban Entomology, Raleigh, NC, May 21-24, entitled, "The imported fire ant' threat and management around sensitive accounts", moderated and made 2 presentations at this event, "Introductory remarks: The Texas experience" and "Concluding remarks."
- Presented paper (citation below) for the 15<sup>th</sup> Congress for the International Union for the Study of Social Insects.
- Developed Symposium on eXtension for the upcoming Annual Meeting of the Entomological Society of Entomology, Indianapolis, IN, Dec. 10-15, 2006.
- Made presentations annuals at the Imported Fire Ant Research Conference (citation below for 2005), with presentation in 2006 ("eXtension: Taking the sting out of imported fire ants" by K. Flanders and B. Drees) in press. Before and following this event in Mobile, AL, March 28-30, 2006, Flanders and Drees conducted meetings for the Pioneer Community of Practice cooperators to plan for developing content (FAQ's and decision modules) for the eXtension web site by launch at the 2007 annual meeting.

#### **Publications and Mass media**

- Revised fact sheets including: FAPFS016, FAPFS021, FAPFS035 posted on <http://fireant.tamu.edu>
- Developing TCE publication including a fire ant management section, "Poultry Pest Management" with J. Tomberlin.
- Was interviewed by Austin-American Statesman, Lowe's, National Geographic (for images), Wall Street Journal, Brisbane Courier, Antedote for Garden Tech, Prevention Magazine, PBS radio, Beaumont Enterprise. Sold and distributed numerous images.
- Conducted and completed 48 applied research and demonstration reports (**Appendix 1, 2, 3** and many posted on <http://fireant.tamu.edu>). Loss of Neal Lee, who was instrumental in posting reports and updating information has resulted in little progress in maintaining this web site since she retired in April 2006. Numerous additional trials are in progress (**Appendix 4**)

#### **International activities**

- Hosted Dr. Lou Lizhi, entomologist from Beijing, China, April 2-4, who is developing eradication plans for that country and conducted laboratory assessment of new potential bait insecticide for that country.
- Traveled at the request of the Department of Primary Industries and Forestry in Queensland, Australia, to Brisbane with Dr. Sanford Porter, June 9-24, to be part of the Science Review Team to assess progress in their Imported Fire Ant Eradication Program, ongoing since 2001 and costing \$175 million (AU). This was Drees' forth visit to help develop and assess this effort.

#### Refereed Scientific Journal Articles

Drees, B. M., B. Summerlin and S. B. Vinson. Submitted 2006. Foraging activity and temperature relationship for the red imported fire ant. Southwestern Entomol.

#### Extension Publications

- Drees, B. M., S. B. Vinson, R. E Gold, M. E. Merchant, E. Brown, K. Engler, M. Keck, P. Nester, D. Kostroun, K. Flanders, F. Graham, D. Pollet, L. Hooper-Bui, P. Beckley, T. Davis, O. M. Horton, W. Gardner, K. Loftin, K. Vail, R. Wright, W. Smith, D. C. Thompson, J. Kabashima, B. Layton, P. Koehler, D. Oi, A-M. Callcott. 2006. Managing Imported Fire Ants in Urban Areas, a Regional Publication Developed for: Alabama, Arkansas, California, Florida, Georgia, Louisiana, Mississippi, New Mexico, Oklahoma, South Carolina, Tennessee and Texas, B-6043. Texas Cooperative Extension, Texas A&M University, College Station, TX 22 pp. on <http://tcebookstore.org>.
- Merchant, M., and B. M. Drees. 2000, revised 2002, 2006. The Texas two-Step method: Do-it-yourself fire ant control for homes and neighborhoods. L-5070 (revised). Texas A&M University, College Station, Texas. Leaflet.
- Drees, B. M. 2006. Red Harvester Ants. E-402. Texas Cooperative Extension, Texas A&M University, College Station, TX, 4pp. <http://tcebookstore.org>.
- Drees, B. M. 2005. Managing household ant pests. B-6183. Texas Cooperative Extension, College Station, Texas. 13 pp.
- Barr, C. L., T. Davis, K. Flanders, W. Smith, L. Hooper-Bui, P. Koehler, K. Vail, W. Gardener, B. M. Drees, T. Fuchs. 2005. Broadcast baits for fire ant control. B-6099, Texas Cooperative Extension, College Station, TX. 10 pp.

#### Miscellaneous Publications

- Drees, B. M., A. Calixto, R. Puckett. 2006. Annual Report on the USDA-ARS Area-Wide Red Imported Fire Ant Management Project in Texas July 1, 2005 - June 30, 2006 (internal report to USDA-ARS)
- Drees, B. M. And C. F. Lard. 2006. Imported fire ant: Economic impacts justifying integrated pest management programs *in* Proceedings, XV Congress International Union for the Study of Social Insects, July 30 - Aug. 5, Washington, D. C., P. 114-115.
- Drees, B. M. 2005. New directions in imported fire ant control. *Landscape Management* 6(44):40-48.
- Drees, B. M. 2005. New management options for cattle production systems. *In* 17<sup>th</sup> Annual Texas Plant Protection Conference Program Abstracts. P. 25.
- Drees, B. M., B. Summerlin, P. Nester, E. Brown and M. Heimer. 2005. Utility boxes and pasturelands: Imported fire ant management product assessments for Arinix® and Esteem®. *in* Proceedings of the Red Imported Fire Ant Conference (R. Weeds, A. Callcott, S. James, D. J. Meloche, and M. Collins, eds.), Gulfport, MS, March 22-24. p. 33-36.

**Signature:**

**Date:** Sept. 6, 2006



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## Appendix 1. RED IMPORTED FIRE ANT APPLIED RESEARCH AND DEMONSTRATION REPORTS 2003-2004

Compiled by: Bastiaan M. Drees, Professor and Extension Entomologist posted on <http://fireant.tamu.edu>

Page	Title
<b>Field trials:</b>	
1	Evaluation of Esteem® Fire Ant Bait (pyriproxyfen) for suppression of imported fire ants in agriculture - B. M. Drees and E. Brown
5	Efficacy of Esteem® (pyriproxyfen) fire ant bait treatments compared to standard treatments for cattle pastures - B. M. Drees, P. Nester, and M. Heimer
8	Evaluation of Safer® Ant Killer as a mound drench treatment for the red imported fire ant - K. M. Engler
11	Effects of the organic Texas Two-Step Method compared to individual mound treatments with spinosad fire ant bait - K. M. Engler, B. M. Drees and M. Barton
15	Releases of parasitic phorid flies to establish natural enemies of the red imported fire ant in Denton and Polk Counties, Texas - B. M. Drees, A. Calixto, J. N. Cooper, M. Currie, C. Gulley, K. Engler, and C. L. Barr
<b>Laboratory trials:</b>	
23	Foraging activity and temperature relationship for the red imported fire ant - B. M. Drees and B. Summerlin
30-50	Nix of America trials: Development of Arinix® (permethrin-impregnated nylon):
30	Assessment of permethrin-impregnated nylon cylinders to repel foraging red imported fire ant workers - B. M. Drees and B. Summerlin
40	Assessment of permethrin-impregnated nylon prototypes to repel foraging red imported fire ant workers - B. M. Drees and B. Summerlin
48	Assessment of vapor and contact insecticidal properties of permethrin-impregnated nylon to red imported fire ant workers - B. M. Drees and B. Summerlin
51	Laboratory assessment of granular bifenthrin and fipronil treatments on colonies of the red imported fire ant - Bastiaan M. Drees and B. Summerlin
58	Evaluation of red imported fire ant food preferences in small colonies with or without brood - B. M. Drees and B. Summerlin
60	Preference of worker red imported fire ants to colony container color under laboratory conditions - B. M. Drees and B. Summerlin
63	Laboratory assessment of pyriproxyfen and spinosad imported fire ant baits and response to removal of queen ants from colonies - Bastiaan M. Drees and B. Summerlin
67	Evaluation of weep hole cover for exclusion of red imported fire ants -Bastiaan M. Drees

## Appendix 2. Result Demonstrations FY2005

in Integrated Pest Management "Urban IPM Program 2005" compiled by Dr. Paul Nester posted on <http://fireant.tamu.edu>

### Field Trials

- Evaluation of pyriproxyfen bait, Esteem®, treatment programs of various re-applications per year for red imported fire ant suppression in pastures - B. Drees, P. Nester and M. Heimer (Valent U.S.A.)
- Evaluation of second-year pyriproxyfen bait, Esteem®, treatment programs for red imported fire ant suppression in pastures - B. Drees, E. Brown (Valent U.S.A.)
- Evaluation of "edge effect" from fipronil granule (TopChoice®) treatment areas to protect internal targets - B. Drees, K. Engler, A. Wiese, J. Reinert (Bayer CropScience)
- Evaluation of "edge effect" from fipronil granule (Over 'N Out®) treatment areas to protect internal targets - B. Drees, P. Nester, T. LeRoy, M. Heimer (Contract Packaging, Inc.)
- Evaluation of spinosad (Entrust®) formulations as individual red imported fire ant mound drenches - K. Engler, B. Drees, P. Nester
- Assessment of Arinix®, permethrin-impregnated nylon parts, to protect transformer utility housings from red imported fire ants - M. Keck, B. Drees
- Evaluation of phorid fly releases in Denton (*P. Curvatis*) and Polk (*P. Tricuspis*) Counties - B. Drees, K. Engler, J. Cooper, M. Currie, C. Gulley, A. Calixto
- Calibration of Herd Seeder models to apply "new" imported fire ant bait products - B. Drees, D. Herd, A. Wiese, P. Nester, E. Brown, M. Keck, K. Engler, C. Barr
- Demonstration of aerial application of imported fire ant bait products to Camp Misty Meadows (Montgomery Co. And Britt Rice exotic game ranch (Brazos Co.) with North Star Helicopter, Inc. - B. Drees, P. Nester, T. Leroy, M. Heimer, K. Kamowitz, D. Vangundy (BASF, Wellmark International)
- Laboratory and field assessment of acetamiprid formulations as a contact insecticide granular treatment for the red imported fire ant - B. Drees, B. Summerlin, P. Nester, T. Leroy, M. Heimer (Henry Yang, SLLI)
- Assessment of fire ant control treatments: 1) baits (BAS320UBI versus Advion®), 2) liquid formulations for imported fire ant foraging suppression (Allectus®, bifenthrin and BAS320); and, 3) combination products and formulations (bifenthrin plus imidacloprid, etc.) - P. Nester and B. Brees (BASF, Bayer CropScience)
- Ongoing and new community-wide fire ant management programs: 1) Lago Santa Fe subdivision, Galveston Co.; and, Wood Glen subdivision, Williamson Co.- P. Nester, W. Brown, B. Drees, C. Barr

### Laboratory Trials

- Evaluation of aged Arinix®, permethrin-impregnated nylon parts, as barrier treatments prohibiting red imported fire ant workers from foraging on a food lure target - B. Drees and B. Summerlin

Evaluation of Arinix®, permethrin-impregnated nylon parts, to eliminate foraging ants to suppress red imported fire ant workers from foraging on a food lure target not protected by a barrier - B. Drees and B. Summerlin

Evaluation of glass beads prohibiting red imported fire ant tunneling - B. Drees, S. B. Vinson, B. Summerlin

Bait product preference evaluation - B. Drees and B. Summerlin

#### Proprietary Agreement work

Evaluation of Rainbird® electric circuit boards exposed to imported fire ant foraging - B. Drees and B. Summerlin (Rainbird Inc.)

Evaluation of Itron parts exposed to imported fire ant foraging - B. Drees, B. Summerlin and S. B. Vinson (Itron, Inc.)



## Appendix 3. Applied Fire Ant Research Result Demonstration Handbook 2003 - 2005

Compiled by C. L. Barr to be posted on <http://fireant.tamu.edu>

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## Appendix 4. 2006 Applied Research and Result Demonstrations

- work in progress

Funded projects:

- eXtension modules and FAQ's
- TDA survey of 20 SW Texas counties
- USDA Area-Wide Fire Ant Suppression Program

Field trials:

- Evaluation of Arena at the George H. Bush Presidential Library Grounds - Elizabeth "Wizzie" Brown, Paul Nester, Johnny Johnson, Bill Summerlin, Bart Drees
- Bayer and BASF product evaluations at the Magnolia Sports Park, Montgomery Co., TX - Paul Nester, Mike Heimer, Elizabeth "Wizzie" Brown and Bart Drees
- EUP trial with metaflumazone fire ant bait, Montgomery Co. - Paul Nester
- EUP trial with metaflumazone fire ant bait, Bexar Co., Molly Keck
- Esteem II: Evaluation of treatment patterns and frequencies of pyriproxyfen (Esteem) fire ant bait - Bart Drees, Paul Nester and Mike Heimer
- Henry Yang: Evaluation of granular fipronil formulations (Over 'N Out) at the Collin Co. Junior College campus - Jim Reinert, Kim Schofield, Jim McCoy, Bart Drees
- Treatment and dragging of mounds in a Collin Co. horse pasture - Kim Schofield, Rick Maxwell, and Bart Drees
- Evaluation of mound drench products (Canada Petroleum Products) - Elizabeth "Wizzie" Brown, Bart Drees
- Release and spread of phorid fly species (Denton Co., Bexar Co.) - Molly Keck, Kim Schofield
- Assessment of Arinix barriers to protect transformer units - Molly Keck, Bart Drees (add Collin, CPS)
- Assessment of red imported fire ants on insect fauna at Attwater Prairie Chicken National Wildlife Refuge - Mike Morrow, Janet Roach, Bart Drees, Paul Nester
- Effects of different fire ant management techniques on non-targeted ants and their interactions for the control and re-invasion of fire ants - (Burlson, Co, Coryell Co.) - Alejandro Calixto, Marvin Harris, Charles Barr.
- Evaluation of different food lures for determining fire ant population densities in relation to colony counts in pastures. Alejandro Calixto, Aldo Gardea

Ongoing:

- WoodGlen Community Wide Fire Ant Management - Elizabeth "Wizzie" Brown, Bart Drees, Paul Nester
- Repellency of Red Imported Fire Ants, *Solenopsis invicta*, to Dillo Dirt, a Sewer Sludge Based Compost Material - Elizabeth "Wizzie" Brown, Jody Slagle, Kevin Anderson

From 2005:

- Calibration of Herd spreaders for applying fire ant control products - Bart Drees, Molly Keck, Kim Engler/Schfield, Paul Nester, Elizabeth "Wizzie" Brown, Charles Barr
- Evaluation of indoxacarb bait and bifenthrin granular suppression of imported fire ants - Elizabeth "Wizzie" Brown

- Evaluation of molasses for management of red imported fire ant mounds - Elizabeth "Wizzie" Brown
- Evaluation of metaflumazone formulations for imported fire ant control in Montgomery Co. - Paul Nester, Mike Heimer, Bart Drees
- Advion (indoxacarb) result demonstration at the Overton City Park - Scott Ludwig, Paul Nester
- Survey of aerial applicators on providing imported fire ant control treatment services in Texas - Paul Nester, Bart Drees

#### Landscape IPM:

- Assessment of treatments (Bayer Environmental Sciences) for control of the Florida wax scale on hollies, Brazos Co. - Bart Drees, Carlos Bogran, Elizabeth "Wizzie" Brown, Bill Summerland
- Assessment of treatments (Facin) for control of the Florida wax scale on hollies, Dallas Co. - Kim Schofield, Bart Drees
- Evaluation of Texas leafcutting ant bait application in open and closed bait stations - Bart Drees

#### Lab trials

- Evaluation of a novel bait from China - Bart Drees, Bill Summerlin
- Removal of glass beads by fire ant workers - Bart Drees, Bill Summerlin
- Hole sizes to prevent entry/escape by pest ants - Bart Drees, Bill Summerlin, Brad Vinson
- Detection of food lure (hot dog slice) odors by foraging red imported fire ants - Bart Drees
- Assessment of Arena (straws and media trials) rates for imported fire ant mortality - Elizabeth "Wizzie" Brown, Bill Summerlin, Bart Drees