

Highlights and Impacts of FY '05 Projects Funded by the Texas Imported Fire Ant Research and Management Project

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Project Title: Applied Imported Fire Ant Research Program (Sept. 1, 2004 – Aug. 31, 2005)
(Note: see previous Highlights document for period covering FY 2004)

Significant Accomplishment	Impact on Imported Fire Ant Management
<p>1. New Products. The products, Advion® (Dupont) for professional use and Spretacide® Once and Done, containing the ingredient, indoxycarb (0.45 and 0.16%, respectively), were approved by the EPA and introduced into the market. Efficacy data supporting registration of these products were almost exclusively produced by this project under the direction of Dr. C. L. Barr.</p> <p>Arinix® (Nix of America) is a permethrin-impregnated nylon product which can be molded into any configuration. Based solely on laboratory data generated by B. M. Drees and B. Summerlin (collaborating with R. Gold and S. B. Vinson), EPA approved registration in 2005.</p> <p>Application technology development. In May 2005, TCE entomology faculty and staff brought together representatives from three industries to advance application methods for applying fire ant control products. David Herd, CEO of Herd Seeder Company traveled to the TAMU Riverside Campus from Indiana to meet with Dr. Anne Wiese of Bayer Crop Science to develop calibration procedures for their products CeaseFire Bait and Top Choice as well as Wellmark International Products Extinguish Plus and Probait. Extension Program Specialists (D. Charles Barr, Kim Engler and Molly Keck) and Extension Agents-IPM (Dr. Paul Nester and Elizabeth Brown), assisted Extension Entomologist,</p>	<p>Indoxacarb represents a major advance in fire ant bait technology. The toxic metabolite is fed to the entire colony and eliminates all members in 3 to 7 days following application. Although more expensive than other bait products, it's speed makes it an ideal "rescue treatment" for situations where rapid elimination of fire ants is desired.</p> <p>Industrial uses for Arinix are wide and variable. Used as barriers, these parts can protect sensitive electronic components such as relay switch mechanisms from foraging ants for 3 to 5 years or more. This use, alone can reduce the \$111 million annually lost to the electronics industry from imported fire ants in airconditioner and other utility housings.</p> <p>Results of efforts to work with applicator company representatives and applicator service providers should allow pesticide applicators in urban and agricultural landscapes more accurately apply baits for control of red imported fire ants, assuring cost-effective and environmentally sound use of these insecticides. Herd Seeder is one of the only companies to actively engage in product support for imported fire ant bait and granular products. Large-scale treatment is feasible only using aerial application. Ongoing demonstrations of Brazoria Co. sets of "ranchettes" treated in 2004 (P. Nester), the survey of service areas of Texas-based aerial applicators (crop dusters</p>

Dr. Bastiaan M. Drees, in conducting this field day on May 18, 2005. An aerial application survey, developed by P. Nester and B. Drees, has been sent TDA-registered service providers. In June 2005 a demonstration of aerial treatment with North Star Helicopters, Inc. with BASF cooperating, applied bait product to 100 acres of hay and horse pastureland at Camp Misty Meadow (Montgomery Co.) And 125 acres of exotic game ranch owned by Mr. Britt Rice (Brazos Co.).

or fixed-wing applicators) and the demonstration of helicopter application of fire ant bait will result in web-posting of service providers so clientele can access and contract with these firms. Whether applied by ground (Herd Seeders) or by air, large-acreage treatment for imported fire ant suppression hopefully will be available in the near future. Cost-effectiveness of treatments will determine the sustain ability and size of these markets in agricultural and mixed urban/agriculture sites.

2. Laboratory and Field Trials. Trials assessing of Esteem® Fire Ant Bait (pyriproxyfen) in field trials in collaboration with E. Brown and D. Mott and others in Williamson Co. And P. Nester and M. Heimer in Montgomery Co. have generated data supporting registration packet submission by the manufacturer, Valent U.S.A. to the EPA for use of this product in cattle pastures. Treatment types assessed included solid, broadcast application and the “hopper blend” using AmdroPro® (hydramethylnon) plus Esteem applied at half rates of each product per acre.

Anticipated EPA registration of Esteem for the cattle industry will allow cattle producers, hay producers and others (exotic game ranchers, hunting camps) to use this product in a manner similar to Extinguish®. The manufacturer remains interested, however, in developing a registration for use of this product as a “skip swath” treatment that would cut the cost of treatment (materials and time) in half, delivering a \$5/acre treatment desired by cattlemen and veterinarians surveyed for an “acceptable treatment cost.”

Additional trials are being conducted by collaborators with this program, including K. Engler, P. Nester, N. Riggs and M. Keck, C. Barr, A. Calixtro. Most are supported by outside funding and product donations.

Results of these and other laboratory and field trials have been compiled for posting on <http://fireant.tamu.edu> in a document entitled, “Red Imported Fire Ant Applied Research and Demonstration Reports 2003-2004” and contains 12 reports (62 pp.). Posting pending approval by K. Heinz.

3. Educational Programs. B. Drees and other collaborators with this project provide numerous educational presentations to Texas citizens and professional pest control operators and maintenance personnel annually. Reports of educational outreach activities can be viewed on <http://monarch.tamu.edu/>.

Educational program and delivery of current technology result in improved imported fire ant management and an increased awareness of research programs bveing conducted as TAMU (TAES and TCE) and in other institutions. Use statistics for the web site, <http://fireant.tamu.edu> document the success and visibility gained by outreach activities in Texas, the U.S. and the world.

Fact sheets and publications recently released include:
a) Flanders, K. L. And B. M. Drees. 2004. Management of imported fire ants in cattle production systems. ANR-1248. Alabama

B. Drees and Barr participated in the International Congress of Entomology and Imported Fire Ant Workshop in Brisbane,

Cooperative Extension System, Auburn, AL. 8 pp.
b) Drees, B. M. 2004. Towards a successful control of the red imported fire ant - The Texas Experience, pp.28-69. Proceedings of the Symposium on the Control of Red Imported Fire Ant. Sponsored by the Bureau of Animal and Plant Health Inspection and Quarantine Council of Agriculture, Council of Agriculture Executive Yuon and executed by the Taiwan Entomological Society, Taipei, Taiwan, Nov. 11.179 pp.

c) Drees, B. M., D. VanGundy, and D. Herd. 2004. Advances in imported fire ant bait technology: Extinguish® Plus, a blend of methoprene and hydramethylnon, and the modified Herd GT-77 model air-assisted applicator in Proceedings of the Red Imported Fire Ant Conference (D.Pollet, S. Johnson, P. Beckley and S. Clayton, eds.), Baton Rouge, LA, March 21-23. p. 41-45.

d) Nester, P. R., C. P. Bowen, and B. M. Drees. 2004. Lago Santa Fe Fire Ant Project, Santa Fe, Texas: The never ending story in Proceedings of the Red Imported Fire Ant Conference (D.Pollet, S. Johnson, P. Beckley and S. Clayton, eds.), Baton Rouge, LA, March 21-23. p. 50.

Australia, in Aug. 2004. In November, Drees was invited to tour imported fire ant infested areas in Taiwan at the request of the Bureau of Animal and Plant Health Inspection and Quarantine Council of Agriculture. In 2005, Drees and Barr hosted visitors from the Department of Primary Industries (DPI), Queensland, Australia, to assist them in conducting field research to detect low populations of foraging ants. Drees was presented with a DPI medal "in recognition of your contribution to the national fire ant eradication program". Also, S. B. Vinson and Drees hosted a entourage of Chinese visitors seeking information to address the incursion of *S. invicta* near Hong Kong. These are examples of international recognition of this program internationally.

4. USDA-ARS Area-Wide Fire Ant Suppression Program. Two 300 acre plots continue to be monitored and periodically treated to suppress imported fire ants. At the Five-Eagle Ranch near Caldwell, biological control agents monitored (*Thelohania*) or released (phorid flies, *Pseudacteon tricuspis* and *P. curvatis*) are expected to reduce re-invasion by fire ants following periodic aerial application of a "hopper blend" (AmdroPro® plus Extinguish®). Control using chemical methods appears to be sustainable at up to 90 percent (based on pre-treatment levels). Comparisons of peripheral areas, suggest biological control agents may be having some effect (C. Barr). In May 2005, specimens of *P. curvatis* collected by R. Pucket and A. Calixto suggest that releases made in 2005 were successful. ARS funding from this endeavor continues through Summer of 2006 with the possibility of additional funding for up to 2 years, and supports 60% of the salary for C. Barr, and 100% for A. Calixto and R. Pucket.

The establishment of two species of fire ant parasitic phorid flies (*P. tricuspis* and *P. curvatis*) plus the occurrence of the fire ant disease, *Thelohania*, at the Five-Eagle Ranch is the first time in Texas history three biological control agents are present and active in a single site. The potential of assessing the impact of these natural enemies of fire ants in Texas and in an improved pasture setting is now possible. Because similar trials are underway in Florida, South Carolina, Mississippi and Oklahoma, and impact assessments made locally will be either supported or not based on data from these other sites or "replicates." The USDA Area-Wide Fire Ant Suppression Program guidelines changes somewhat for 2005-2006, with less emphasis being given to the initial two sites per state. We are currently seeking additional smaller area-wide sites to demonstrate whole-operation fire ant management approaches using justifiable "whole-operation" or "targeted" approaches.

5. USDA-APHIS Phorid Fly Release Program. Previous releases of *P. tricuspis* at two sites in Denton Co. In collaboration with J. Cooper, B. Hickman, K. Engler, C. Barr, A. Calixto, and Master Gardening volunteers were unsuccessful. In 2005 a second site was established where releases of *P. curvatis* were made in summer 2004. To date, no flies of either species have been recovered from these sites. A similar situation occurs in Polk Co., where collaborators M. Currie, C. Gulley and A. Calixto, were unable to establish *P. Tricuspis* at a previous release site. However, Oct.-Nov. (Fall) releases of *P. tricuspis* at a new site was a success when one specimen was recovered in May 2005. After successful establishment, impact assessment can commence. This process may take several.

Establishment of phorid flies is the first step in implementing sustainable biological control of imported fire ants in Texas. The accessibility of *P. Curvatis* through USDA collaborations places TAMU/TCE in a unique position nationally. Although much work is underway at UT by Dr. L. Gilbert and co-workers, the UT laboratory is not able to mass produce candidate species for field establishment and is not focused on the most promising of the phorid species, *P. curvatis*. Much is unknown about these parasites, including what habitat, environment or other set of conditions are required for successful establishment. Through trial and error, we have been able to establish these parasites at over 3 locations (Caldwell, Livingston, Vidor). Sites are being monitored for impact assessment.

**Source and
Amount of Funds Leveraging Current Fire Ant Project**

1. B. Drees and C. Barr (TCE) - USDA rea - Wide Fire Ant Suppression Program (USDA-ARS), \$126,750 for 2005-2006 (Agreement/Contract #58-6615-1-229)
2. C. Barr - industry grants, contracts, and gifts (pays 40% of his salary)(DuPont, FMC, Bayer CropScience)
3. B. Drees - industry grants, contracts and gifts (Valent USA, Nix of America, Rainbird Corp., Itron, Bayer CropScience), including product donations (BASF, Wellmark International).
4. P. Nester, W. Brown, K. Engler, M. Keck - industry grants, contracts and gifts have provided opportunities for collaboration (co-PI) and cooperation with B. Drees being involved in plot design, field work, statistical methods and analysis, report writing and reviewing.
5. Proposals developed and submitted but not funded (Project Group Enhancement Funds, Texas Department of Agriculture IPM funding program).