

## SURVEY AND REGULATORY PROGRAMS FOR THE IMPORTED FIRE ANT IN TEXAS AND RESEARCH ADDRESSING REGULATORY CONCERNS

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### ABSTRACT

Texas Department of Agriculture reduced the artificial spread of imported fire ant by undertaking various regulatory activities. These activities involved surveys, establishment and enforcement of quarantine requirements, implementation of compliance agreements, soil and sediment analysis for environmental monitoring, certification of locations free of imported fire ant (IFA) infestation, and certification of honey bee equipment and other quarantine articles for their export to IFA-free areas.

### RESUMEN

El Departamento de Agricultura de Texas ha reducido la propagación artificial de la hormiga brava importada emprendiendo varias actividades regulatorias. Estas actividades incluyen sondeos, el establecimiento de cuarentenas, la implementación de acuerdos de cumplimiento, el análisis de suelos y sedimentos para vigilancia ambiental, la certificación de áreas libres de hormigas bravas importadas y la certificación de equipo de apicultura y otros artículos de cuarentena para su exportación a áreas libres de hormigas bravas importadas.

### INTRODUCTION

The red imported fire ant (IFA), *Solenopsis invicta* Buren (Hymenoptera: Formicidae) has impacted almost every aspect of agriculture. As an integral part of the Texas Imported Fire Ant Research and Management Plan (<http://fireant.tamu.edu>), the Texas Department of Agriculture (TDA) plays a central role in preventing the artificial spread of this devastating pest into non-infested areas through regulatory and quarantine actions. TDA is involved in regulatory activities to help control the spread of IFA by undertaking various activities. The activities during the period of October 1998 to March 2001 are summarized below.

### REGULATORY ACTIVITIES

Quarantine detection and delimitation surveys were undertaken in the spring and summer periods using standardized protocols, developed for sampling IFA and preparing quarantine maps.

*Detection Surveys.* The counties along the leading edge of the known distribution of IFA were surveyed under the TDA-United States Department of Agriculture (USDA) Cooperative Agreement. They were continued through the Texas Imported Fire Ant Research and Management Plan (IFARMP) when USDA discontinued funding the surveys during FY 2000. TDA furthered the detection surveys through cooperative grants to Texas Tech University (TTU), Lubbock, and University of Texas (UT), Austin. The ant samples were verified by Don Christopher, Domestic Identifier, USDA-APHIS-PPQ, New Orleans, Louisiana. The data obtained was useful in evaluating the spread of IFA in non-infested counties and in making quarantine decisions.

*Delimitation Surveys.* Treatment efforts and quarantine decisions were based on the results from the detection surveys. These surveys were to determine the extent, containment or spread of infestation. If IFA was detected in a non-quarantined county, minor extant populations were treated, and county commissioners were encouraged to undertake community-wide control efforts involving public and the industries impacted. The decision to quarantine a county depended upon success and economic feasibility of containing and eliminating the infestations.

*Survey Results.* The reports of the survey findings were submitted to USDA and IFARMP. The TDA inspectors at the regional offices at Lubbock, Dallas, Tyler and San Antonio interacted with TTU and UT cooperators to share information on IFA sightings and treatment in the surveyed counties. TTU surveyed Archer, Baylor, Brewster, Clay, Throckmorton, Shackelford, Howard, Lubbock and El Paso counties, and UT surveyed Callahan, Coleman, Concho, Menard, Mills and Runnels counties (Fig. 1). In addition, UT researchers surveyed and found Crane, Crockett, Irion, Jim Hogg, Reagan, Starr, Sutton, Upton, Ward, Winkler and Zapata counties negative for the presence of IFA. The county commissioners in Brewster, El Paso, Callahan, Coleman, Concho, Menard, and Runnels counties planned treatment of the sporadic infestations found in those counties following the initial treatment by TDA. The IFA finds in Lubbock County were limited to the city of Lubbock, and the county commissioners were informed to treat the infestations to suppress and eliminate IFA populations to avoid further regulatory action.

*Regulatory Action.* Mills County was found positive for IFA and efforts to suppress, contain or eliminate the populations were determined to be insufficient. Therefore, a rule was proposed in Texas Register on December 29, 2000 to quarantine Mills County (Texas Register 25: 12874, 29 December 2000). A public meeting was held on January 25 at the county commissioners court at Goldthwaite. The final rule was published in Texas Register, quarantining Mills County effective March 2, 2001 (Texas Register 26: 1833, 2 March 2001).

*Quarantine Compliance.* Quarantine restrictions were enacted by bringing the nurseries under a TDA-USDA Compliance Agreement and by inspecting the nurseries for compliance. Class 2, 3 and 4 nurseries were inspected to determine if they ship nursery products outside the IFA quarantine area: a class 2 nursery was with a growing area of less than 10 acres, a class 3 nursery had a growing area between 10-20 acres, and a class 4 nursery had a growing area greater than 20 acres. From 1998-to date, nearly 244-268 facilities operated under the TDA-USDA Compliance Agreement. TDA inspectors conducted inspections of class 2, 3, and 4 nurseries and found them to be under compliance or authorities cooperated with the trading states to rectify any noncompliance incidents. Sampling of shipments, holding areas and nursery soil were planned to further evaluate the treatment compliance. Over 10,500 routine inspections were conducted annually at the nurseries and distribution centers to verify state and federal quarantine compliance.

*Honey bee Equipment Certification.* The Texas Honey Bee Equipment Compliance Agreement and Certification initiative was undertaken in 1999 in cooperation with the Texas Apiary Inspection Service and Beekeepers Association. In-state and out-of-state

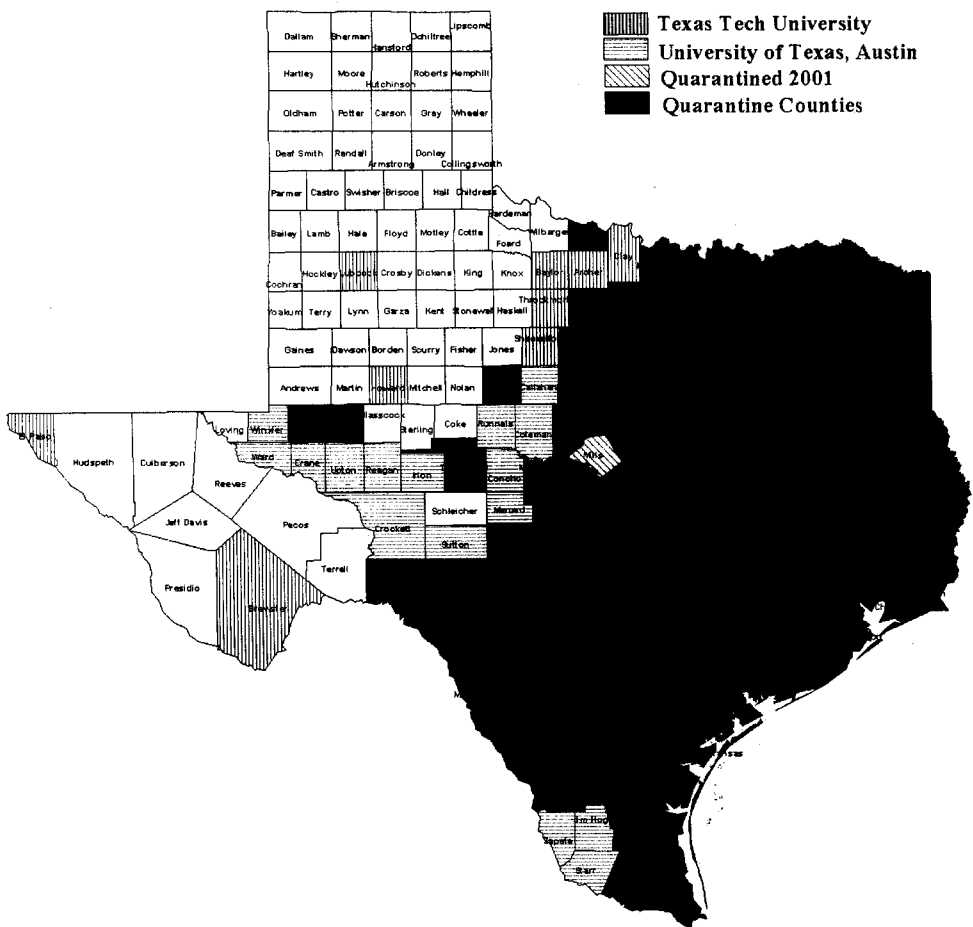


FIG. 1. Red Imported Fire Ant Surveys Conducted During 1998-2001 by Texas Department of Agriculture Collaborators

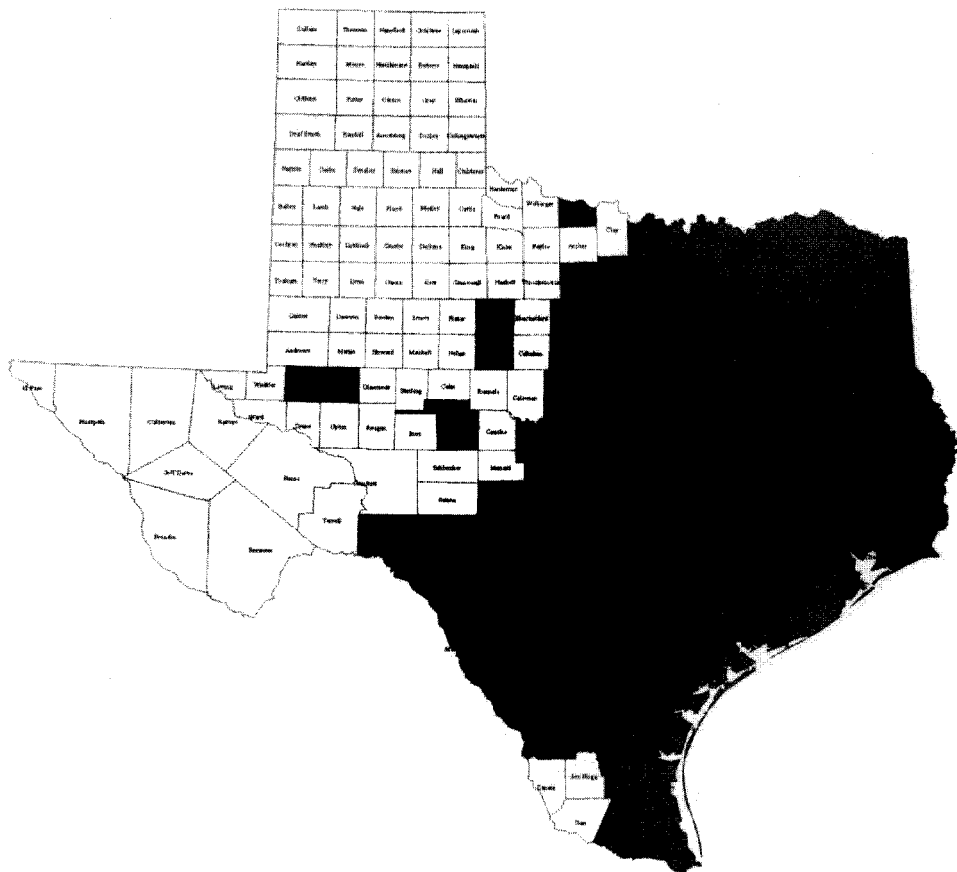


FIG. 2. Red Imported Fire Ant Quarantined Areas (shaded counties) in Texas, March 2001.

beekeepers that winterize apiaries in Texas were informed about the compliance requirements, to facilitate transportation of IFA-free beehive equipment from the regulated areas to IFA-free areas. The efforts were encouraged by USDA as well as other states shipping and receiving honey bees for crop pollination.

The beekeepers that routinely treated their holding areas and kept records were certified after site and equipment inspection. They were cautioned to remove the soil from all the equipment on trailers to avoid IFA from attracted and transported. TDA inspectors certified over 70 apiary shipments for transport from September 1999 to February 2001 involving 11 beekeepers that signed the compliance agreement. Texas supplied about 90% beehives to the almond orchards in California for pollination. Arizona and California rejected 3 shipments or delayed shipments due to the interception of foraging IFA or other ant species. During a panel meeting at San Antonio on March 28, 2001, the beekeepers, state departments of agriculture and USDA considered to regard apiaries similar to regulated articles other than nursery stock under the state and federal IFA quarantines.

*Road Station Inspections.* Road station inspections were conducted in cooperation with the Texas Department of Public Safety. The objective was to detect and prevent the spread of harmful insect pests and plant diseases, including IFA, during high export periods of spring and summer. The operation focused on the inspection of vehicles transporting articles regulated under the Texas Agriculture Code (§71.008, Vernon's Texas Codes, West Publ. St. Paul, 1995), and the Code of Federal Regulations [7 CFR (Agriculture), §301.81, U.S. Gov. Printing Office, Washington, D.C.]. Over 44,000 vehicle inspections were conducted expending nearly 420 inspection hours at the operating sites.

*Public Awareness Efforts.* Quarantine maps were produced to educate the public about the IFA quarantines, and to update the growers and distributors impacted by regulations when moving quarantined articles to the IFA-free areas (Fig. 2). The information was shared with cooperating agencies, and grower and distributor associations. Presentations were made at the annual Texas Beekeepers Association, Greenhouse Growers Association, Texas Nursery and Landscape Expo, and hay producers, cattlemen and turf growers meetings on IFA compliance agreement procedures and bee equipment certification. The quarantine maps were distributed at TDA display booths and were also made available in an electronic format at the TDA Homepage, <http://www.agr.state.tx.us>. The efforts increased awareness among shippers regarding the quarantines and enhanced compliance during hay, nursery stock and bee equipment exports to the IFA-free areas.

## METHODS DEVELOPMENT AND REGULATORY RESEARCH

*Survey and sampling procedures.* Surveys were conducted by selecting four approximate sites in each corner and one in the middle of the county. Previous detection sites with sporadic IFA occurrences were also surveyed. A standardized sampling procedure was developed based on available information (Bhatkar and Vinson 1987). Soil and ambient temperatures and habitat data were collected at each site using a sampling data sheet. Ten 20 ml screw-cap polyethylene scintillation vials, containing four pre-moistened cat food pellets were distributed three meters apart at the survey site and collected after 30 minutes. The finds were recorded on the data sheet for each vial. The vials were labeled for site, county, date and collector. Mound samples were collected by inserting a sampling vial, sparingly applied with talcum powder at the inner rim of its opening. The reproductives from the mounds were collected in the same vial. Number of mounds along the two meter sample transect were counted and mounds in the infested area estimated. The vials were placed on ice in a cooler to immobilize the ants, food

pellets were removed with forceps, and 70% ethyl alcohol was added as a preservative. The ants were identified using the available taxonomic keys and sent to USDA-APHIS-PPQ Domestic Identifier for confirmation using the prescribed Sample Determination Form PPQ 391.

*Sampling for environmental monitoring.* Dredge samples from water and sediment were obtained from water bodies around the nurseries under compliance to detect the environmental health effects of treatment chemicals. The samples were sent to USDA Environmental Monitoring Laboratory, Gulfport, MS for analysis using a prescribed USDA Form PPQ 1020.

*Nursery soil sampling for residue analysis.* Nursery stock destined for shipment to IFA-free areas was sampled by scooping one liter soil from five different plant containers into zip-lock bags. Each sample was labeled for site, treatment date, contents, collection date and collector and sent to USDA Environmental Monitoring Laboratory for analysis.

*Honey bee equipment certification.* The beekeepers signed a compliance agreement with TDA to get their bee equipment certified for export to the IFA-free areas. They treated a designated shipping area starting in July-August until the shipment during January to March. The equipment was brushed or washed free of soil and held on a concrete, tarp or plastic surface to avoid contact with the ground. The hive pallets, shipping area, exterior and interior of the hives, and treatment, holding and shipping records were inspected prior to issuing an export phytosanitary certificate.

*Hay movement.* Stacked hay devoid of IFA infestation and in direct contact with the soil and hay stored on a plastic, tarp or concrete surface at a treated holding area, was allowed movement to the IFA-free areas during the periods of hay shortage.

## REGULATORY RESEARCH

Research information was sought in the following areas to improve and facilitate the techniques to export quarantined articles to IFA-free areas by funding projects:

*IFA foraging in beehives.* Bees defended hives against the intruding foragers by fanning them away with wings. They sealed hives with propolis that was repellent to ants. Foraging or nesting activity by IFA inside the hives was not observed. Foraging on the ground was prevalent in around 92% of the 45 test hives. Holding pallets in soap water harnesses deterred ants from accessing hives. Richard Deslippe and William Melvin, Texas Tech University, Lubbock, reported their results elsewhere.

*Treatment of bee equipment for IFA infestation.* Treating beehive placement area and lower pallets of double palletized beehive with chlorpyrifos (Lorsban 4E) protected the pallets and beehives from IFA for up to 7 weeks. Installing beehives on treated pallets was intended to keep the foraging bees from contacting the infested bee equipment. Ronald Weeks, Jr., Texas A&M University, College Station, and co-investigators have reported details of their tests.

*Pasture treatment of IFA for hay bales.* Pasture and storage area around round and square hay bale, treated with broadcasted application of hydramethylnon (Amdro) reduced the foraging by IFA on the hay bales. Ronald Week, Jr. and coauthors reported their test results.

*Ammoniation of hay bales to treat IFA.* The results of treating artificially infested round hay bales by injecting with 35.75 liters of anhydrous ammonia were inconclusive. IFA moved to the ground prior to the treatment as reported by William MacKay, University of Texas, El Paso.

*Fire Ant Spatial Information and Management System (FASIMS).* A survey information retrieval, analysis, integration and data management project for research, policy and public information was undertaken by Robert Coulson and FASIMS research group (<http://fireant.tamu.edu/maps/index.html>). The historic information on the

distribution and density of mono- and polygynous populations of IFA (Porter et al. 1991), against ecoregions, rainfall pattern and human activities in Texas (transit roads and urbanization) could be spatially analyzed.

#### OTHER ACTIVITIES

TDA commented in support of continued funding for the federal IFA quarantine during the USDA-APHIS IFA Public Meeting on March 28, 2000 held at Austin, Texas. The need for developing a strategy to deregulate areas where IFA infestation is not present was brought out (Drees et al. 2000). The absence of a quarantined pest for three years from an infested area has generally been accepted for deregulation. An amendment was proposed to Texas Agriculture Code (4 TAC, Chapter 9, Subchapter J, Imported Fire Ant Quarantine) to quarantine Mills County, with a final adoption on March 2, 2001 (Texas Register 26: 1833). IFA quarantine map was posted at TDA Website under pest alerts ([http://www.agr.state.tx.us/producer\\_info/regulatory/reg\\_fire\\_ant.htm](http://www.agr.state.tx.us/producer_info/regulatory/reg_fire_ant.htm)) and was updated with Mills as a quarantined county. A proposal submitted by Bowie county commissioner's office and Texas Agricultural Extension Service to manage IFA was approved on March 30, 1999 under the Texas Agriculture Code 77.004. The Bowie County plan served as a successful model for others intending to implement similar plans after the state approval.

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