

Distribution of Imported Fire Ant Populations in Alabama

L.C. 'Fudd' Graham¹, R.K. Vander Meer², K. E. Ward³, R. N. Ward³ and V.E. Bertagnolli¹

¹Department of Entomology and Plant Pathology, Auburn University, Auburn, Alabama

²USDA-ARS, CMAVE, Gainesville, Florida

³Dept. of Plant and Soil Science, Alabama A&M University, Normal, Alabama

Introduction

The black imported fire ant, *Solenopsis richteri* Forel, was the first imported fire ant identified in the United States (Loding, 1929) and was originally referred to as *Solenopsis saevissima* (Fr. Smith). Wilson (1951, 1953) indicated that the population consisted of a "dark phase" for the first ten years or so that corresponded to the southernmost geographic variant of the South American population.

By 1957, Wilson and Brown reported a significant decline in the "dark phase" and an increase in the "light phase" in almost every locality except Lowndes and Noxubee Co. in Mississippi. In 1972, Buren's revision of the *S. saevissima* complex renamed the "light phase" *S. invicta* and the "dark phase" *S. richteri*. Range maps by Buren et al. (1974) show *S. richteri* located in north central to northeastern Mississippi and northwestern Alabama. More recent maps (Taber, 2000) show a similar range, but shifted somewhat further north and east, now extending to the Tennessee border.

Vander Meer et al. (1985) first detected a hybrid between the two species in Mississippi. Diffie et al. (1988) reported the hybrid from 10 counties in western Georgia and 22 counties in north central Alabama in surveys in 1985-6. Prior to this survey, we found the hybrid in Talladega County.

The purpose of this study is to determine the approximate location of each imported fire ant species in Alabama. This will allow us to release biological control agents on their preferred host.

Materials and Methods

A grid was superimposed on a map of Alabama. The grid is an extension of the one used by Diffie et al. (2002) in Georgia. The squares are approximately 27 km x 27 km. Worker ants were collected from three mounds at or near the intersection on the grid. These sites were surveyed during 2003 and 2004.

Ants were collected from each site by inserting a 30 x 80 mm plastic tube into a mound and capping it once at least 25 ants fell into the tube. Ants were chilled and approximately 25 were removed from the sample tube. These were placed into seven ml glass scintillation vials and covered with hexane. After 24 hours, the hexane was removed, added to a clean seven ml scintillation vial, and allowed to evaporate. These vials containing cuticular hydrocarbon residues from the ants were shipped to CMAVE in Gainesville, FL for species determination as described by Vander Meer et al. 1985.

2005 Annual Red Imported Fire Ant
Conference. Gulfport, MS.
March 22-24, 2005

Results & Discussion

Based upon collections in Georgia by Diffie et al. (2002), conversations with J. T. Vogt in Mississippi and our collections in Talladega County, we assumed that the southernmost line of the hybrid range would extend into central Alabama. Instead, the range appears to approach the central portion of Alabama from the north in the eastern (Randolph Co.) and the western (Pickens Co.) parts of central Alabama, but remains north of Birmingham in the middle of the state.

The southern two-thirds of the state appear to be infested primarily with *S. invicta*. One mound of the hybrid was found in Marengo Co. This was the only mound of the hybrid fire ant found south of Pickens Co.

S. richteri has only been found in the northeast and north central portion of the state, extending from near Huntsville to the west. One site near Courtland in Lawrence Co. had all three ant species at the site.

Buren (1972) speculated that the northward progression of *S. invicta* would be limited by winter kill conditions and that the species could be more successful in progressing northward in the eastern coastal plains. It follows that *S. richteri*, which comes from cooler regions in S. America, and the hybrid fire ant would be more vigorous in cooler ecological regions here.

We plan to continue mapping the ranges in the northern third of Alabama this summer. Data from this study will add to the current range information collected by Diffie in Georgia and Streett in Mississippi. It will also allow us to improve our biological control release protocols and to ensure that we release the correct biological control agent on the correct fire ant species.

Acknowledgements

The authors wish to thank Catherine Preston for laboratory analysis and Justin Mims, David Findlay, Christina Wolf, Brad Bennett, Jesse Stalons and April Dove for assistance collecting samples.

References Cited

- Buren, W.F. 1972. Revisionary studies on the taxonomy of the imported fire ants. J. Ga. Entomol Soc. 7:1-26.
- Diffie, S., R.K. Vander Meer, and W. Gardner. 2002. Range of the hybrid imported fire ant in Georgia, pp 164-167. In Proceedings of the 2002 Imported Fire Ant Conference. Athens, GA.
- Diffie, S., R.K. Vander Meer and M.H. Bass. 1988. Discovery of hybrid fire ant populations in Georgia and Alabama. J. Entomol Sci. 23:187-191.
- Loding, H.P. 1929. An ant (*Solenopsis saevissima richteri* Forel). Insect Pest Survey Bull. 9:241.
- Taber, W.E. 2000. Fire ants. Texas A&M University Press. 308 pp.
- Vander Meer, R.K., C.S. Lofgren, and F. M. Alvarez. 1985. Biochemical evidence for hybridization in fire ants. Florida Entomol. 68:501-506.
- Wilson, E.O. 1951. Variation and adaptation in the imported fire ant. Evolution 5:68-79.
- Wilson, E.O. 1953. Origin of the variation in the imported fire ant. Evolution 7:262-263.
- Wilson, E.O., and W.L. Brown, Jr. 1958. Recent changes in the introduced population of the fire ant *Solenopsis saevissima* (Fr. Smith). Evolution 12:211-218.

Grid Map

