



Fire Ants (*Solenopsis invicta*)

Economic and Ecological Impact: Imported fire ants from South America have become a large and growing menace to livestock, humans, crops, and to wildlife diversity. Swarming worker ants sting repeatedly if disturbed, a serious problem for several hundred thousand people with allergic reactions to fire ants. Hungry colonies also damage crops and attack livestock. Fire ants cause considerable damage to outdoor electrical equipment. In the absence of natural pathogens, parasites and predators they have rapidly spread across the southern United States. Fire ants infest over 320 million acres of land in 13 southern states and Puerto Rico, with costs from damage and for control estimated to exceed \$6 billion/year. Newly established populations have recently invaded New Mexico and California, and isolated infestations have also been reported in Arizona, Oregon, Washington, Kentucky, and Maryland. Fire ant densities average about 1,500-3,000 ants per square yard in areas around homes and farms. That works out to be 4-8 tons of fire ants per square mile.

Significant Accomplishments: From the late 1970s through the 1990s, ARS scientists at the Center for Medical, Agricultural and Veterinary Entomology (CMAVE), in Gainesville, Florida, developed and tested five environmentally-friendly baits that have been successfully commercialized and are in wide public use. These baits provide effective fire ant control in yards, parks and school grounds, but are impractical for agricultural use. CMAVE scientists are currently focusing on self-sustaining host-specific biological control agents because they have the potential to permanently suppress imported fire ants over wide areas. Fire ant populations in the U.S. are 5-10 times higher than in their native range of Brazil and Argentina. These higher densities are likely the result of escape from natural enemies left behind in South America. Consequently, CMAVE scientists are searching for effective host-specific natural enemies that can be safely released into the United States. They have already successfully established two species of fire ant decapitating flies (Phoridae: *Pseudacteon*; Figs. 1 and 2) at numerous sites across the Southeast. A third species is being trial released and a fourth is awaiting release from quarantine. In addition, they are working on several host-specific fire ant diseases. The objective is to release self-sustaining and highly specific enemies so that the balance of nature shifts against the imported fire ants and their populations drop to levels that are no longer a problem.



Fig. 1. A fire ant decapitating fly, *Pseudacteon* sp., hovering over its next victim.



Fig. 2. The result: a decapitated fire ant!

Future: ARS researchers will screen and release additional natural fire ant enemies and evaluate their impacts on fire ant populations. They have also initiated a program to determine molecular basis for aspects of fire ant biology and behavior in order to develop more specific and effective control baits.

Funding: This research is funded from USDA-ARS base funds and contributed funds from various partners and stakeholders.