



Release of Ant-Decapitating Flies, *Pseudacteon obtusus* and *Pseudacteon cultellatus*, at Little Rock Air Force Base and Camp Robinson, Arkansas

Project # 12-620

Background:

Imported fire ants are extremely important pests in the southern U. S., including on military installations. United States economic losses alone have been estimated at roughly \$6.3 billion annually (Lard et al. 2006). The greatest losses from fire ants are noted in residential households, electrical and communication equipment, agriculture, golf courses and schools. Because of their sting, which can result in severe allergic reaction, fire ants are a potential health hazard. They interrupt and diminish the ability of military personnel and others to participate in outdoor work (training, etc.), leisure and family activities. It is not uncommon for military personnel to be stung by fire ants during outdoor physical or marksmanship training in areas infested with fire ants. In addition, fire ants negatively impact native species (other arthropods and vertebrates) important to outdoor recreational activities on a military installation. Lastly, fire ant affinity for and attraction to electrical equipment can result in electrical circuit shorting, which can dramatically hamper military operations if the problem occurs on an aircraft runway or electronic gate.

To minimize the negative impact of imported fire ants to the military mission, a classical biological control release of ant-decapitating phorid flies was initiated. In the long-term, reliance on insecticides used to manage imported fire ants can be reduced.

Objective:

Long-term sustainable suppression of fire ants populations cannot be achieved through stand-alone chemical treatments. Effective insect control employs Integrated Pest Management (IPM). IPM is a systems approach to managing insect, mite, disease and weed pests. It uses a combination of the most compatible and ecologically sound pest suppression tactics to keep pest populations below levels that cause problems. IPM uses cultural, biological, chemical and sometimes regulatory methods. To benefit the military mission (training, testing, etc.), a classical biological control release of ant-decapitating flies (*Pseudacteon* spp.) was initiated. The long-term objective is to establish an expanding self-sufficient population of ant-decapitating flies which are important natural enemies (parasitoids) of imported fire ants. The desired eventual outcome is a reduction of fire ant densities so that reliance on chemical control can be significantly reduced.

Summary of Approach:

In the summer and fall of 2013, the ant-decapitating flies (also called phorid flies or scuttle flies), *Pseudacteon obtusus* and *P. cultellatus*, were released at Little Rock Air Force Base and Camp Robinson, Arkansas for biological control of imported fire ants (*Solenopsis invicta*, the red imported fire ant; *Solenopsis richteri*, the black imported fire ant; and *Solenopsis invicta* X *Solenopsis richteri*, the hybrid fire ant). These flies are important natural enemies of imported fire ants in their native range but are not widely established in the introduced range of imported fire ants. In an effort to improve the efficiency in which multiple species are released, colonies from one location were parasitized by both species. After ant-decapitating phorid flies become established, these releases will be compared with individual releases which occurred at another location. Sampling 112 days after initial summer release detected one *P. obtusus* at the combined release site, but sampling April and October 2014 did not capture either *P. obtusus* or *P. cultellatus*. However, *P. curvatus* (first released at LRAFB in June 2010) was widespread and abundant during Oct. 2014 sampling.

Release Locations:



Aerial view of release sites at Little Rock Air Force Base, Arkansas.



Aerial view of release sites at Camp Robinson, Arkansas.



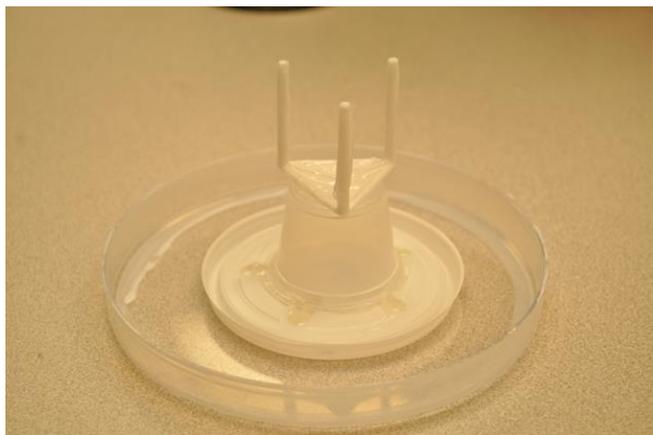
Imported Fire Ant Collections and Releases:



Imported fire ant that crawled onto PVC pipe were knocked into a bucket and weighed.



Imported fire ants were placed into snap-lid sandwich boxes and shipped overnight to the Florida Department of Agriculture, Biological Control Lab for parasitization. One week following shipment to Florida, parasitized imported fire ants were returned overnight to Little Rock Air Force Base and Camp Robinson, Arkansas for placement back into their colonies.



Following the releases of ant-decapitating phorid flies, pizza try-stand sticky traps (Puckett traps) were used to monitor their presence. Monitoring took place in 2013 and 2014 and will continue in 2015.

Benefit:

The long-term benefit of releasing ant-decapitating phorid flies as biological control against imported fire ants is reduced reliance on insecticide use and an increase in diversity of native ant species. Potential benefit to the military mission include cost savings (through lowered insecticide use), reduction in damage to electrical equipment, fewer fire ant stings inflicted on military personnel and improved outdoor training and recreational experiences.

Accomplishments:

During the 2013 releases, about 50,000 ant-decapitating phorid flies (*P. cultellatus* and *P. obtusus*) were released at Little Rock Air Force Base and about 64,000 were released at Camp Robinson. Although, monitoring in late 2013 collected one *P. obtusus* at Camp Robinson, sampling in 2014 resulted in no collection of *P. obtusus* or *P. cultellatus*, however, *P. curvatus* was widespread and abundant at all monitoring sites. It is much too early to determine the fate of *P. obtusus* and *P. cultellatus*. In previous work, it has taken three years to determine whether a release was successful. Monitoring will continue through 2017 to determine if *P. obtusus* and *P. cultellatus* are established.

Military personnel at both installations also received hand-on training in releasing and monitoring ant-decapitating phorid flies, how to estimate colony density and general fire ant control tactics. In addition, phorid fly release and monitoring protocols, a fire ant management plan and GIS data and maps were prepared for military personnel at Little Rock Air Force Base and Camp Robinson. These documents will be useful for follow-on work with fire ant management at both military installations.

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