

I. UPDATE ON *THELOHANIA SOLENOPSAE* INOCULATION AND INFECTION STUDIES
II. SEQUENTIAL APPLICATION OF INSECT GROWTH REGULATING AND METABOLIC INHIBITING FIRE ANT BAITS

David H. Oi and David F. Williams
 USDA-ARS Center for Medical, Agricultural, and Veterinary Entomology
 1600 SW 23rd Drive, Gainesville, FL 32608

I. Update on *Thelohania solenopsae* inoculation and infection studies.

Field inoculations of the microsporidium, *Thelohania solenopsae* were made, in 1998, in 10 southern states [AL, AR, FL, GA, LA, MS, NC, OK, SC, & TN] to assess the impact of *T. solenopsae* on fire ants under different climatic conditions. In 1999, infections have been detected in 7 of these states [AR, AL, FL, GA, LA, MS, NC], however spread of infection has been limited. *T. solenopsae* infections in the field have typically been found in polygyne populations. Infections were detected in an inoculated monogyne site located in Florida. Inoculations were made to 5 colonies in July 1998, and in July and November 1999, infections were detected in 2 and 6 non-inoculated colonies, respectively.

Nearly 3 years of monitoring an inoculated polygyne field site in Florida, *T. solenopsae* infections have spread to over 85% of the fire ant nests sampled. Fire ant populations at this site have fluctuated, with a maximum decrease of 62%.

To further assess the host range of *T. solenopsae*, colonies of the southern fire ant, *Solenopsis xyloni*, which is a pest of almonds, were inoculated with red imported fire ant brood infected with *T. solenopsae*. After 12 weeks, colony infections were not evident, but this study is still in progress.

T. solenopsae spores were detected in 93% of the male alates (n=45 from 7 colonies) and 75% of female alates (n=133 from 9 colonies) initiating mating flights from infected colonies. Infections were also detected in 14 field collected, newly mated queens. Adult workers were produced by 9 of these queens. All infected queens died, with an average life span of 61 days (range 26-135 d).