Fire Ant Initiative Action Plan – FY 2006-2007

Maximum 500 words, double-spaced, type size at least 12 points, do not exceed boundaries. Include statement on anticipated outcomes.

The **red imported fire ant,** *Solenopsis invicta*, Buren is an invasive pest in part due to its extremely high reproductive capacity and adaptive ability. The onset of reproduction in insects is under complex control, environmental and endogenous biotic factors are involved. Several hormones control this process at different times (temporal regulation) and tissues (spatial regulation). In addition, hormonal factors from the male affect female fertility and sometimes, female behavior. In the case of social insects all these factors are even more complexly associated and regulated. For example in the fire ant, juvenile hormone affects the timing of mating flight, wing casting (dealation), and likely egg production. In polygyne (many queens) colonies, it is known that the dominant or primary queen suppresses the reproduction of subordinate queens, and this dominance hierarchy of reproduction provides an opportunity to conduct experiments that should lead to the isolation of the dominance-regulating factor(s) since the mechanism of dominance is not fully understood. Feeding is also tightly associated with reproductive capacity. Up to the present our understanding of regulation of reproduction in social insects is poor, including for the most studied social insect, the honey bee. Certainly knowledge is desperately needed to understand reproduction in ants and specifically the fire ant. We will continue to increase our knowledge of fire ant reproduction and develop the concept of reproductive control as a method to reduce the fire ant population. The ultimate goal is identifying hormones, peptides or other biochemical factors that could be delivered to control field populations or identifying the precise timing when known control methods could cause more impact.