

**Erika Asano**, University of South Florida, St.Petersburg, St.Petersburg, FL, USA  
Suzanne Lenhart, University of Tennessee, Knoxville, TN, USA

## **Optimal reproductive strategy for the fire ant (*Solenopsis invicta*) over multiple seasons**

In ant species, the queen ant spends her life mostly by laying eggs and the sterile workers forage, take care of the queen and broods, and defend their nest from predators. The queen of the fire ant (*Solenopsis invicta*) mates only once at the beginning of her reproductive life. She produces offspring (sterile workers and sexuals) until she uses up the sperm which she initially received. In the field, typical lifespan of queen is about 6 - 7 years although some may live much longer.

In our model, monogyne form of the fire ant colony is considered. We formulate and analyze a model using a system of differential equations to study the optimal resource allocation strategies over multiple seasons under different scenarios including seasonal variation in resource availability.