

**Mosquitoes are biting pests and they can transmit diseases!**

*Adult female mosquitoes feed on blood to provide nutrients for the eggs they produce. If a female mosquito is infected with a disease-causing agent, such as a virus, it is possible for her to pass it on to the human or animal she is biting. The most important mosquito-transmitted diseases in Florida are:*

- **West Nile**
- **St. Louis Encephalitis**
- **Eastern Equine Encephalitis**
- **Dog or Cat Heartworm**

*For more information on these diseases and what to do to avoid them, visit the UF/IFAS Mosquito Information Page website at:*

*<http://mosquito.ifas.ufl.edu>*

*or Encephalitis Information System at:*

*<http://eis.ifas.ufl.edu>*



### Prevent mosquito breeding around the home

- Inspect your yard and remove any unnecessary water-holding containers such as tires, bottles, cans, and buckets.
- Replace water in bird-baths and other necessary water-holding containers every 3–4 days, especially in the summer months.
- For rain barrels that are used to collect water for gardening, cover the open end with a mesh screen; the screen will prevent mosquitoes from laying eggs in the water.
- Never introduce water hyacinth or water lettuce into backyard ponds. They are invasive, non-native aquatic plants and there are several mosquito species that will attach to the roots and stems of these plants during the mosquitoes' immature stages. <http://plants.ifas.ufl.edu/assessment.html>
- Apply insect repellents according to the label to prevent mosquitoes from blood-feeding.

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### **Biological Control of Mosquitoes**

**Let the predators eat the mosquitoes so the mosquitoes don't eat you!**



Photo: Sean McCann, UF/IFAS/FMEL

### **INTEGRATED PEST MANAGEMENT for MOSQUITO CONTROL:**

- **Source Reduction**
- **Biological Control**
- **Chemical Control**

# Predators and Pathogens of Mosquitoes

Mosquitoes develop in aquatic environments before they are able to fly. The life stages they go through are:

Egg • Larva • Pupa • Adult



The larvae and pupae live in aquatic habitats. It is during this phase of the mosquitoes' life that their numbers can be significantly reduced by predators and pathogens.

Predators eat the mosquito larvae.

Most of the predators occur regularly in Florida ponds and ditches. In some counties, the mosquito control office will provide fish to the public.

Pathogens must be eaten by the mosquito larvae to have an effect on them. The pathogens that are available include 2 types of bacteria that specifically kill mosquitoes and do not harm non-target organisms. They can be purchased at most garden supply and hardware stores in the form of "dunks" or pellets. The scientific names for the bacteria are *Bacillus thuringiensis israelensis*, or "B.t.i.", and *Bacillus sphaericus* or "B.s."

## Predators

Fish

Copepods

Dragonfly nymphs

Predatory mosquitoes

## Pathogens

Bacteria

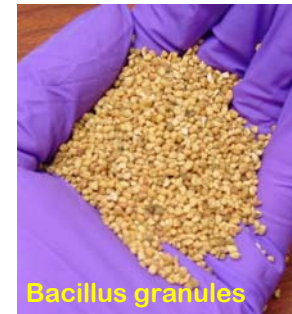
*Bacillus thuringiensis israelensis*

*Bacillus sphaericus*



Predatory mosquito larvae

Photo: Stephen Doggett



Bacillus granules

Copepod



Photo: Jorge Rey, UF/IFAS/FMEL



Mosquitofish

Photo: Chris Appleby, USGS

### WHAT ABOUT BATS AND BIRDS?

Bats will eat mosquitoes, but they also eat many other types of insects.

Birds will eat mosquitoes, but just like the bats, they eat an assortment of other insects and organisms.

It is never a good idea to rely on bats or birds alone to reduce the number of biting mosquitoes around your home.