

# The Public Health Extension Specialist Role and Resources

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# A little background.....

- Wildlife biologist by training, received a Bachelors and Masters degree from Clemson. Worked 14 years at Clemson University as a Medical and Veterinary Entomologist
- Moved to UGA in 1999 when we moved the world's only black fly colony to Athens – 85% of time allocated to a Research Professional position running the Black Fly Research and Resource Center and maintaining and operating the lab.
- The previous extension specialist had a combined livestock and public health position
- Dr. Ray Noblet separated these roles, hiring Dr. Nancy Hinkle for the poultry and livestock role
- Assigned 15% of my time for extension role – mostly mosquito related
- 1999 arrival of West Nile virus in North America
- Immediately had me begin serving on the GMCA BOD



# Current Activities

- Fill the Public Health Extension Specialist role, but I'm not in a faculty position, considered staff, primarily research related
- I'm also a licensed commercial pesticide applicator in South Carolina and North Carolina
- Fortunate to be involved with a lot of different projects and aspects of entomology that provide experience and insight which is very useful in the extension entomology realm
- Serve as a resource to our county agents and assist with special problems that arise – favorite part of the work
- As I tell people.....when the phone rings, or the email arrives....I answer it.....a lot of times it's media contacts from all types – Atlanta and UGA provide a significant media presence



# Spreading the Word

- This is where all of you help me, the extension service, the citizens of Georgia and our profession in ways you probably don't realize – Information = Interest
- Can't place a value on the relationships we develop - networking
- I'll write 2-3 stories each year that are released via the CAES news wire
- Credited with a "Reach" of 523 million people last year by the college public relations department, over 452 million this year
  - USA Today – 59 million
  - Southern Living – 12 million
  - Atlanta Journal Constitution – 5 million
  - Athens Banner Herald – 388,000
  - Red and Black – 154,000
- Lot of very general questions - answers always focus on the biology of the pest and an IPM approach to solving problems in understandable language





# What might help today...

- I started at UGA in 1999 when West Nile virus arrived in NYC – mosquito literature and information was extremely plentiful
- Eventually the “powers to be” wanted UGA labeled literature
- As part of this role the extension service produces a number of resources
  - Circulars
  - Pest Management Handbook
  - Category 41 manual
- Trying to provide the most useful information in the most understandable terms
- Including a couple items produced by the GDPH



# Circular # 1155 - Mosquito Biology and Behavior

[https://secure.caes.uga.edu/extension/publications/files/pdf/C%201155\\_2.PDF](https://secure.caes.uga.edu/extension/publications/files/pdf/C%201155_2.PDF)

- Concise description
- Used historical mosquito literature
- Provides commonly used terms and descriptions

## MOSQUITO Biology and Behavior

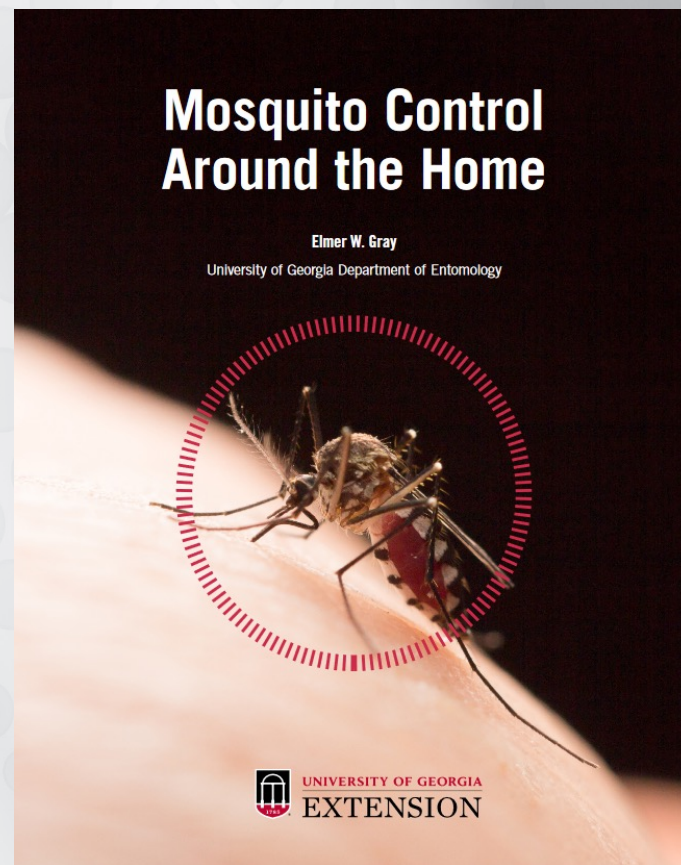
Elmer W. Gray, Department of Entomology



# Circular # 1266 - Mosquito Control Around the Home

[https://secure.caes.uga.edu/extension/publications/files/pdf/C%201266\\_1.PDF](https://secure.caes.uga.edu/extension/publications/files/pdf/C%201266_1.PDF)

- Developed for any type of resident – self help
- Uses an IPM approach
- Starts very small



# Circular # 1154 – Best Practices of Integrated Mosquito Management

[https://secure.caes.uga.edu/extension/publications/files/pdf/C%201154\\_4.PDF](https://secure.caes.uga.edu/extension/publications/files/pdf/C%201154_4.PDF)

- IPM approach
- Education and biology are critical
- Can be used in a step-wise manner as conditions and customers dictate

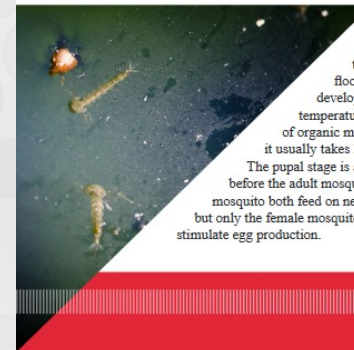
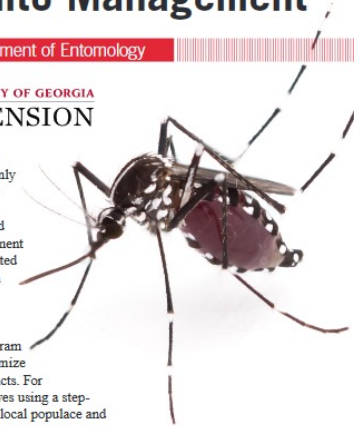


## Best Practices of Integrated Mosquito Management

Elmer W. Gray, Department of Entomology



Mosquitoes are common nuisance and public health pests around the world. As a result, mosquito control is commonly conducted using a wide range of techniques and products. In recent years, there has been greater recognition that mosquito control should be conducted in a more integrated and comprehensive manner. Integrated mosquito management (IMM) is based on the widely accepted concept of integrated pest management (IPM), which is a broad-based approach that integrates practices to control pests effectively, economically, and with environmental sensitivity. IMM incorporates the use of all available and necessary techniques and products to conduct a comprehensive program in which pest populations are efficiently managed to minimize economic damage, public health risk, and non-target impacts. For many localities conducting IMM, the approach also involves using a step-wise process that is conducted based on the desires of the local populace and the resources available.



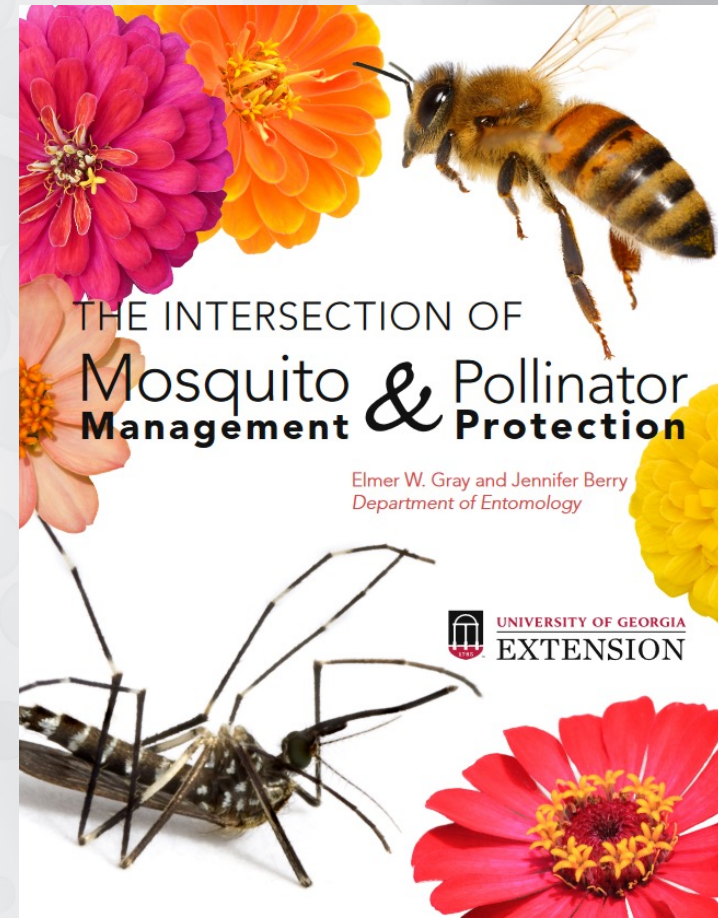
**All mosquitoes (Diptera: Culicidae) require standing water for their larval and pupal development.** Female mosquitoes deposit their eggs on the surface of standing water or in places that later become flooded or filled with water. After the eggs hatch, the larvae develop through four instars. Under ideal conditions of warm temperatures and abundant food (small plants, animals, and particles of organic matter), the larval stage may only require five to six days, but it usually takes longer. After completing the larval stage, pupation occurs. The pupal stage is a period of transition and often requires two to three days before the adult mosquito emerges onto the water's surface. The male and female mosquito both feed on nectar and other plant juices to provide energy for flight, but only the female mosquito seeks a blood meal to acquire the nutrients needed to stimulate egg production.



# Circular # 1188 – The Intersection of Mosquito Management and Pollinator Protection

[https://secure.caes.uga.edu/extension/publications/files/pdf/C%201188\\_1.PDF](https://secure.caes.uga.edu/extension/publications/files/pdf/C%201188_1.PDF)

- Developed as a result of our discussions at the 2019 GMCA
- Focuses on both sides of the discussion
- Raised my awareness of the public's concern about residential mosquito control



## Stinging and Biting Pests

Revised by Elmer W. Gray, Extension Entomologist  
Original manuscript by Beverly Sparks

When insects, mites, and ticks bite, they often inject saliva to digest the tissue and aid in the feeding process. Your body's reaction to the components of the saliva causes the itching, redness, and swelling that is associated with these bites. In addition to the saliva, insects and scorpions that sting and spiders that bite often inject venom, which is used to subdue prey or protect themselves. This venom usually produces a painful reaction in people. Bees and wasps that live in colonies can attack in large numbers, potentially exposing victims to dangerous amounts of venom. These insects typically cause the most problems when they perceive their nest is threatened.

For most people, a single sting will cause pain, swelling, and stiffness (if the sting was in a joint). The discomfort may last only an hour or two or for one or more days. Some people can develop more serious reactions. Swelling may involve an entire arm or leg, last several days or require hospital treatment.

A third type of reaction is called *anaphylactic shock*. In a few people the immune system reacts severely and within minutes after receiving a sting they may develop: (a) nausea and constriction in the chest; (b) difficulty breathing and swallowing; (c) a drop in blood pressure; (d) blue color in the skin (due to lack of oxygen); and, in extreme cases, (e) unconsciousness or death.

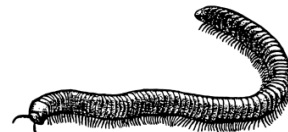
People who develop more than just the normal symptoms from a single sting should see their physician about the need to be desensitized. People concerned about experiencing severe reactions to stings should consider the need to carry an allergy first-aid kit with them when afield.

### Stinging

Bees, wasps, hornets, fire ants, and scorpions that inject venom from the tip of their abdomen are sometimes considered beneficial because of their importance in pollination or because they prey on other pest insects. However, anyone who has ever been stung by one of these creatures will usually think otherwise! After being stung, it is important to immediately remove the stinger and venom sac if they are present at the sting site. This can be done with a fingernail, the edge of a credit card or tweezers. Immediate removal will stop venom from being released. Avoid squeezing the venom sac. Wash the site with soap and water and apply cold compresses to relieve the pain and swelling. For more

pronounced reactions, apply hydrocortisone cream or calamine lotion to reduce itching and swelling. If itching and swelling are bothersome, take an oral antihistamine like diphenhydramine (Benadryl) or chlorpheniramine (Chlor-Trimeton). For severe reactions, seek immediate medical attention.

Home remedies include applying wet salt to the site within 5 min of being stung. Leave the salt in place for 30 min. In theory, the salt will draw the venom from the wound. Similar results have been obtained with moistened tobacco, wet baking soda or wet aspirin. These home remedies have not been proven scientifically, but won't hurt you if you choose to use them.



Millipede

Millipedes are not poisonous, but many species have glands capable of producing irritating fluids that may cause allergic reactions in some individuals. The defensive sprays of some millipedes contain hydrochloric acid that can chemically burn the skin and cause long-term skin discoloration. The fluid can also be dangerous to the eyes. It is not advisable to handle millipedes with your bare hands. Persons handling millipedes may notice a lingering odor on their hands. After contact with millipedes, wash hands thoroughly with soap and water until the odor is gone. The solvents ether or alcohol will also help remove the noxious fluid.



Centipede

Most centipede species feed on small creatures such as insects. They catch their prey with their powerful jaws and then kill it by injecting it with venom. Occasionally, humans may be bitten by centipedes, but the poison usually produces a moderate reaction similar to a bee sting. People who are allergic to insect venoms and other toxins may suffer severe reactions to centipede venom. Most centipede bites are uncomplicated and self-limiting. Treatment recommendations include washing the bite site with soap and water, applying ice or cool wet dressings and taking analgesics for pain.

## Millipedes & Centipedes

Revised by Elmer W. Gray, Extension Entomologist  
Original document produced by Dr. Beverly Sparks

Millipedes and centipedes are not insects. They are actually more closely related to lobsters, crayfish and shrimp. However, unlike their marine cousins, millipedes and centipedes are land dwellers. They are most often found in moist habitats or areas with high humidity.

Millipedes and centipedes do not carry diseases that affect people, animals or plants. Millipedes do occasionally damage seedling plants by feeding on stems and leaves, and may enter homes in large numbers during periods of migration and become a considerable nuisance. They do not cause damage inside the home, although they may leave a stain if they are crushed. Centipedes, which have poison glands and can bite, pose an occasional threat to humans.

### Description

Millipedes are often called *1,000-legged worms* or *rain worms*. They are wormlike, with rounded body segments that each bear two pairs of legs. The head is rounded with short antennae. Species can vary in length from less than 1 to 2 or more inches. They are light brown to black in color.

Centipedes are often called *100-legged worms* and have one pair of legs on each of their body segments. All centipede species are more or less wormlike and have a flattened body with a distinct head that bears a pair of long antennae. Jaws containing poison glands are located on the first body segment immediately behind the head. Depending on the species, centipedes can vary in length from 1 to 12 or more inches when mature. The most common centipede species found in Georgia are less than 5 inches long. Centipedes vary in color from light yellow to dark brown and reddish brown.



## Protect Yourself FROM TICKS



Revised by Elmer Gray, Extension Entomologist

Previous versions of this manuscript were written by Burton Evans and Beverly Sparks, Former Extension Entomologists

**Ticks** are one of the most important groups of arthropods in Georgia due to their disease transmitting capabilities. In Georgia, ticks are known to transmit several diseases, with Rocky Mountain Spotted Fever and Lyme disease being the most common. **Tularemias** a long-recognized disease also transmitted by ticks, as are the more recently recognized diseases Anaplasmosis, Human Ehrlichiosis (pronounced err-lick-e-o-sis), Southern Tick-Associated Rash Illness (STARI) and Heartland virus. Ticks can also cause infections if their mouthparts break off when they are removed from the skin and can leave persistent welts resulting from reactions to their saliva. If tick populations are high in recreation and camping areas, participation may drop off, causing monetary loss to the leisure industry. Costs to control ticks in yards and homes and on pets and people can also be significant.



# Georgia Department of Public Health - website and team

- Wealth of information
- Easily connects to other resources
- Arbovirus Summaries are must read information!

A screenshot of the Georgia Department of Public Health website. The page is titled "Mosquito-borne Diseases" and is part of the "Epidemiology" section. The left sidebar contains a navigation menu with categories like "Healthcare Associated Infections", "Acute Disease Epidemiology", "Emerging Infections Program (EIP)", "Viral Hepatitis", "Epidemiology Emergency Preparedness", "Occupational Health and Safety Surveillance", "HIV/AIDS Epidemiology Section", "Health Behaviors and Injury", "Disease Reporting", "Influenza", "Stroke", "Drug Surveillance Unit", and "Zoonotic Vector Borne Diseases". The main content area includes an introduction to mosquito-borne diseases, a list of diseases such as Brucellosis, Creutzfeldt-Jakob Disease (CJD), Eastern Equine Encephalitis, Hantavirus Pulmonary Syndrome (HPS), Leprosy (Hansen's Disease), and Leptospirosis, and a "Mosquito-bite Prevention" section with a "FIGHT THE BITE" button. A "Learn More" button is also present at the bottom of the page.

An official website of the State of Georgia. How you know

GEORGIA DEPARTMENT of PUBLIC HEALTH

About DPH ▾ Health Topics ▾ COVID-19 ▾ Vital Records ▾ Women and Children ▾ Immunizations ▾ Environmental Health ▾ Epidemiology ▾

Epidemiology > Zoonotic Vector Borne Diseases > Mosquito-borne Diseases

## Epidemiology

- Healthcare Associated Infections ▾
- Acute Disease Epidemiology ▾
- Emerging Infections Program (EIP)
- Viral Hepatitis ▾
- Epidemiology Emergency Preparedness ▾
- Occupational Health and Safety Surveillance
- HIV/AIDS Epidemiology Section ▾
- Health Behaviors and Injury ▾
- Disease Reporting
- Influenza ▾
- Stroke ▾
- Drug Surveillance Unit
- Zoonotic Vector Borne Diseases ^

## Mosquito-borne Diseases

Mosquitos can carry diseases and may transmit those diseases through a bite (while feeding). Although mosquito bites can be annoying (and itchy), most mosquito bites do not result in infection. However, preventing mosquito bites is the best way to decrease your chance of getting mosquito-borne diseases.

Several mosquito-borne viruses circulate in Georgia yearly and can cause disease in humans and other animals. The most reported mosquito-borne virus in Georgia is **West Nile virus**. However, other diseases such as **Eastern Equine encephalitis**, La Crosse encephalitis, and Saint Louis encephalitis virus have also been previously detected in Georgia. Mosquito-borne viruses are most active in late spring through early fall, although this can vary based on local weather.

Additionally, some travelers can become ill with mosquito-borne diseases while traveling abroad (sometimes called "exotic diseases"). The most commonly reported of these is **Malaria**. However, travelers should also be concerned about Chikungunya, Dengue, Yellow Fever, and **Zika**. Travelers should inform themselves about diseases (including vectorborne) that may circulate in their destinations by reviewing information on the CDC's **Travelers' Health Page** [external link] and contacting their healthcare provider for more information.

### Mosquito Bite Prevention

The best way to avoid mosquito-borne illnesses is to avoid mosquito bites.

[FIGHT THE BITE →](#)

### Mosquito-borne Disease Information For Healthcare Providers

Information specifically for healthcare providers.

[LEARN MORE →](#)

Last updated 07/21/2023

# Arbovirus Summaries

## Produced by Dr. Ros Kelly and her team

- Extremely useful information
- Many different aspects
- Represents the work of many
- Great resource when dealing with the media

Arboviral Summary Statistics—Georgia 9/13/23 Total Counties in Georgia: 159

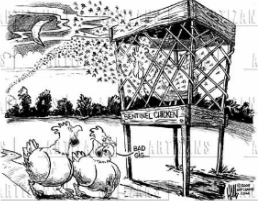
**2023 Human Cases (exotic)**

Virus	Country of Origin	# cases
Dengue	Bahamas	1
	Honduras	1
	India	1
	Jamaica	1
	Mexico	3
	Peru	1

**QUICK STATS**

**Animal Cases, 2023**

Cook—1 EEE+  
 Charlton—2 EEE+  
 Houston—1 EEE+  
 Lee—1 EEE+  
 Richmond—1 EEE+



**Sentinel Chickens, 2023**


Chatham—2 EEE+

**Dead Birds, 2023**

no positives reported to date


**2023 Human Cases (endemic)**

District 1-2	1 WNV+	PVD	District 3-2 (1)
District 3 (1,2,3)	4 WNV+		District 7-0 (3)
District 7-0	2 WNV+		
District 8-2	1 WNV+		



**Mosquito Pools, 2023**

Chatham—36 WNV+  
 1 EEE+  
 DeKalb—3 WNV+  
 Fulton—25 WNV+  
 Lowndes—3 WNV+



**Mosquito Anatomy:** Labrum, Maxillary palp, Mandibles, Labium, Maxilla

**Mosquito**

\*Presumptive viremic blood donors (PVDs) are people who had no symptoms at the time of donating blood through a blood collection agency, but whose blood tested positive when screened for the presence of West Nile virus. Although we report WNV PVD to the CDC for epidemiological tracking purposes, we do not count these as cases in our state.



# Resources

- Elmer W. Gray, 706-338-0266, [ewgray@uga.edu](mailto:ewgray@uga.edu)
- [Mosquito Control Around the Home | UGA Cooperative Extension C1266](#)
- [Mosquito Biology and Behavior | UGA Cooperative Extension C1155](#)
- [Best Management Practices of Integrated Mosquito Management | UGA Cooperative Extension C1154](#)
- [The Intersection of Mosquito Management and Pollinator Protection | UGA Cooperative Extension C1188](#)
- <http://www.caes.uga.edu/departments/entomology/extension/controlling-mosquitoes.html>.
- Pesticide Applicator Certification Manual – Category 41- Mosquito Biology, Surveillance and Control
- Category 41 Training video on the GMCA website ([www.gamosquito.org](http://www.gamosquito.org))

# Live Vector Resources

## Register today with BEI Resources

The BEI Resources Live Vector Catalog offers a growing array of arthropods that serve as vectors for the transmission of diseases such as **malaria, Lyme disease, trypanosomiasis, leishmaniasis and arboviruses**. Available live vectors include:

Phlebotomine sand flies



Triatomines



Black Flies



**Additional reagents, such as antibodies, hybridomas, genomic libraries, nucleic acids and primers, are also available to support the advancement of vector research.**

Contributors to the program include the **CDC** (mosquitoes, ticks, reduviids), **WRAIR** (sand flies), **FR3** (soft-bodied ticks) and **UGA** (black flies)



Mosquitoes



Ticks

For information and resources provided by these institutions and research groups, as well as protocols for **Aedes and Anopheles mosquitoes, ticks, sandfly and flea maintenance and research**.

**No-cost products from [www.BEIResources.org](http://www.BEIResources.org)**

Simple request form on our website. No-cost vector products available to researchers worldwide.

BEI Resources is funded by the National Institute of Allergy and Infectious Diseases (NIAID) and managed by ATCC. Materials are distributed only to established qualified research laboratories with facilities and safety programs appropriate for the level of material requested.



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