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GMCA Newsletter

Volume 4, Issue 1

April 28, 2023

Mosquitoes in Winter

It's not mosquito season yet.....but it sure is wet!

By Elmer W. Gray, Public Health Extension Specialist

Even now, few of us are thinking about mosquitoes and the multitudes of problems they can cause when consistently warmer weather arrives. However, with rain totals well above normal across the southeast, it's a good time to take inventory of where water is standing for any length of time and of what can be done to eliminate it. All mosquitoes require standing water for their larval and pupal stages to develop. As a result, any standing water that can be eliminated today is one less site where pest populations can develop as temperatures continue to warm in the coming weeks.

Georgia is home to at least 63 species of mosquitoes. This is a significant number for one state and is a result of the wide range of habitats that occur across the state from the northern mountains to the southern marshes and swamps.

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Larval Mosquito Control for Homeowners

By Elmer W. Gray, Public Health Extension Specialist

Mosquitoes are common nuisance and public health pests of man and animals around the world. The most efficient and cost-effective manner to suppress mosquito populations is to use an Integrated Pest Management Approach. This approach involves learning how and where mosquitoes develop and trying to eliminate the standing water where larval mosquitoes occur. If pest populations persist, it becomes necessary to identify exactly what species is causing the problem and where the pest population is developing. Larval habitats that cannot be eliminated through source reduction techniques can be treated with an Environmental Protection Agency (EPA) approved larvicide. If the larval habitats cannot be identified, or are distant, or expansive, adulticide applications may be required.

All mosquitoes require standing water for their larval and pupal development. Mosquito eggs are deposited on soil that will become flooded, above the water line in natural or artificial containers, or on the surface of standing water. Upon hatching, the larva develops through four stages, or 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 pupa is a

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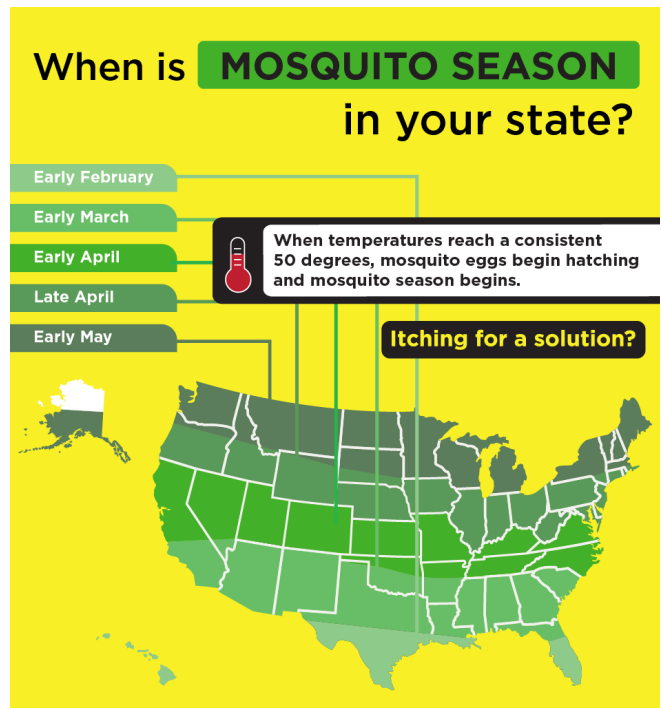
In the central and northern areas, most mosquito populations will not begin to become active until the warmer days of late February and March. In the more southern and coastal regions, some mosquito activity can occur nearly year-round, although last Christmas' freeze, and cold spells in March and April, surely inhibited mosquito activity across the entire region. However, mosquitoes are highly adaptive, and one (or more) cold snaps will do little to impact populations later this spring. Most mosquitoes overwinter as eggs, and the eggs will not hatch until warmer temperatures, increased daylight, and appropriate wetting conditions are present. Some mosquitoes overwinter as adults and spend the colder days of winter hiding in protected areas like catch basins, storm drains, culverts, barns, and sheds, ready to emerge once temperatures rise.

No matter how the mosquitoes overwinter, everyone can take precautions today to help prevent pest populations later this season. Take notice as to what is holding water and where water is standing and try to eliminate the sites. Source reduction, the elimination of standing water, is one of the key premises of an Integrated Pest Management approach (education/communication, source reduction, surveillance, larviciding and adulticiding) to mosquito control. By eliminating standing water today, we reduce the potential need for pesticide applications later. The benefits of this approach are numerous and include protecting pollinators, preserving pest susceptibility, and saving money. It will also potentially prevent early disease transmission.

Everyone can work towards eliminating standing water in their community. Start in your yard by picking up items blown around by storms, emptying buckets and other containers, making sure tarps and covers don't contain pockets of water, recycling unused tires, and ensuring any trays or dishes under last year's potted plants are empty. While doing all of this, try to eliminate

items that are not being used or re-position items so that they won't hold water in the coming months. On a larger scale, clear out drains, ditches, and downspouts so the drainage infrastructure is operating as designed, or contact your local governmental agency about sites that could be potential habitats.

Peak mosquito season is a long way off, but the rainy season is here. A little work today can give us a head start to enjoy spring even more when it finally arrives. 🦟



nonfeeding stage and is a period of transition. It often requires two to three days before the adult mosquito emerges onto the water's surface. The male and female mosquitoes both feed on nectar and other plant fluids to provide energy for flight, but only the female mosquito seeks a blood meal to acquire the nutrients needed to stimulate egg production.

The most efficient way to break this lifecycle is to target the larval stages when they are confined to their standing water habitats. If the larval habitat cannot be eliminated through source reduction techniques (tip and toss, improved drainage, community cleanup...), there are a wide variety of safe and effective larvicides available. The optimum formulation and active ingredient are typically chosen based on the type of larval habitat being targeted and the resources available. Larvicides approved by the EPA include the active ingredients: *Bacillus thuringiensis* subsp. *israelensis* (Bti), *Bacillus sphaericus*, Spinosad, methoprene, pyriproxyfen and mineral oil. There are combination products available for specialty situations. Mineral oil-based products also serve as pupacides. These active ingredients are typically available as either liquid, granular or pelletized formulations. Briquettes, dunks, or water dispersible pouches are available for catch basins and other confined areas (i.e., rain barrels, cisterns, or pools). The mosquito fish, *Gambusia affinis* is also an effective biological control option for some locations.

When a larval habitat has been located, the most effective and practical manner of larvicide application should be identified. Areas of open water with limited vegetation can be effectively treated with a variety of formulations. Often a liquid formulation applied with a backpack or pump-up sprayer can be used in a cost-efficient manner. Larger areas may require a motorized pumping system. For areas of standing water with extensive vegetation, a granular or pelletized formulation will often be best suited. These formulations will penetrate through the vegetation to the aquatic habitats below and can

be applied with a variety of cyclone spreaders or backpack blowers. These products are applied in a weight or volume of product/unit of area (i.e., lbs/acre or fluid oz/acre). Applying any of the formulations at the proper rate is critical to the effectiveness of the application. No matter what product or formulation is chosen, it is essential to carefully read and follow the pesticide label as **The Label Is The Law!** A complete list of approved larvicides can be found in UGA Extension Special Bulletins 28 and 48, the *Georgia Pest Management Handbook*. For additional information please contact Elmer W. Gray at ewgray@uga.edu. ☞



[C1266.pdf Mosquito Control Around the Home 1.pdf](#)

Getting Prepared for Mosquito Surveillance

First, prepare your traps and charge your batteries.

Trap Types

CDC Light Traps can be used in a variety of ways to sample different species of adult mosquitoes. The Centers for Disease Control and Prevention (CDC) has developed a portable trap that runs off a 6-volt battery or 4 “D” cell batteries. The commonly used CDC trap is fitted with a light source and a CO₂ source, located at the top of the trap to attract adult mosquitoes. As the mosquitoes approach the trap, a small fan draws them into a net, which is located at the bottom of the trap. Many mosquitoes are active during the evening and into the night, so CDC traps are most often deployed at dusk and picked-up after dawn.

Gravid Traps use a dark container (plastic tray) with an organic-water mixture as the attractant. They are lightweight, portable, and powered by a 6-volt battery. Typically, a fan housed above the water draws the gravid females into a box or net, although there are several types of gravid traps available. These traps are very important to a mosquito control program’s disease surveillance in that they collect gravid females (blood fed females ready to lay eggs). Highly organic water used as the attractant will predominately catch *Culex* species, which are important vectors of WNV.

BG Sentinel Traps are essentially a collapsible, fabric container with a white lid with holes covering its opening. In the middle of the cover, air is sucked into the trap through a black catch pipe by an electrical fan, drawing approaching mosquitoes into a catch bag. The trap is baited with the BG-Lure, a dispenser which releases a combination of non-toxic substances that are also found on human skin. The BG-Sentinel is especially attractive for *Aedes aegypti*, *Aedes*

other species. With the addition of carbon dioxide, the BG-Sentinel is an excellent surveillance tool for mosquitoes in general.



Data to Collect

For all traps, record the date, general weather conditions (temp, humidity, sun/cloud, wind speed, etc), latitude & longitude, address, county, health district, and time of day.

Setting the Traps

1. CDC CO² Baited Light Traps - Used to capture female mosquitoes seeking a blood meal.
 - Depending on humidity and temperature, bait trap w/ 2 – 3 lbs. of dry ice per night of trapping.
 - Placement and setup considerations
 - Protection from morning sun
 - Place trap set-up away from:
 - competing light sources (non-full moon nights best)
 - smoke / fume emitting areas (e.g., industrial plants)
 - areas of high wind
 - public view
 - livestock or pets
 - Place trap in an open area near good mosquito resting surfaces (e.g., abundant vegetation (i.e., trees, shrubs, sheds, stables, sewers/culverts, etc.) and / or areas where birds congregate (e.g., grain storage, livestock feeding areas, etc.)
 - Place the top of the light trap 4' – 5' above the ground
 - Set traps out around 4 pm
 - Run traps overnight
2. Gravid Traps: Used to capture female container-breeding mosquitoes seeking to oviposit.
 - Trap baited w/ an infusion of water and straw/hay.
 - Infusion recipe:
 - ingredients
 - a pound of straw/hay
 - 30 gallons of water
 - larvicide (unless you will use this same infusion to collect eggs for pesticide resistance testing)
 - let ferment for approx. 4 to 5 days
 - Fill trap infusion reservoir / tub to within 1" to 1.5" of bottom of vertical suction tube.
 - Drill an overflow hole into the wall of the reservoir tub at the maximum infusion level to keep the level of the infusion below the suction tube (i.e., rain).
 - Placement considerations:
 - Protection from the morning sun
 - A plastic grocery bag placed over the collection net will protect the captured mosquitoes from moisture
 - Place near mosquito resting areas (e.g., abundant vegetation, outbuildings, sheds, sewers/culverts, etc.), areas where birds congregate (e.g., grain storage, livestock feeding areas, etc.), and / or near oviposition sites, but not near enough that such sites compete (e.g., adjacent to a livestock water tank)
 - Do not place near an ant mound
 - Set trap out around 4 pm

- Run traps overnight
3. BG Sentinel Traps: Used to capture female mosquitoes seeking a blood meal. Especially attractive for the yellow fever (or dengue) mosquito, *Aedes (Stegomyia) aegypti*, the Asian tiger mosquito, *Aedes (Stegomyia) albopictus*, the southern house mosquito, *Culex quinquefasciatus*, and selected other species.
- Bait trap w/ BG-Lure.
 - Placement and setup considerations
 - Protection from morning sun
 - Protection from rain
 - Place trap set-up away from:
 - competing light sources (non-full moon nights best)
 - smoke / fume emitting areas (e.g., industrial plants)
 - areas of high wind
 - public view
 - livestock or pets
 - Place trap in an open area near good mosquito resting surfaces (e.g., abundant vegetation (i.e., trees, shrubs, sheds, stables, sewers/culverts, etc.) and / or areas where birds congregate (e.g., grain storage, livestock feeding areas, etc.)
 - Do not place near an ant mound
 - Place under cover and sheltered from rain
 - Set traps out around 4 pm
 - Run traps overnight
4. Trap Collection:
- Collect traps late morning to minimize damage and morbidity to captured mosquitoes
 - Harvest your catch by pinching off the capture net while the fan is still running and tying the lace around the top of the net securely but not tightly
 - On a piece of white paper, identify the capture net with trap location / site ID and collection date (using a pencil), and place in the net for later reference (DO NOT USE POST-ITS).
 - Place nets into a cooler with dry ice or in a freezer to knock them out or kill them the mosquitoes.
5. At the lab:
- Transfer the dead mosquitoes from the collection nets to petri dishes
 - It is recommended that contents of the collection net be emptied into a white tray where mosquitoes are separated from non-mosquito captures and then placed into the petri dish for sorting and identification.

The Georgia Mosquito Control Association



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