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GMCA Newsletter

Getting Ready for Mosquito Season
Mosquito control programs prepare for mosquito season by focusing on finding and eliminating/controlling breeding sites, controlling mosquito populations at both larval and adult stages, and educating the public about mosquito control measures. This involves removing standing water, doing larval and adult mosquito surveillance, larviciding and adulticiding appropriately, and promoting public awareness about safe mosquito-avoidance practices.

1. Prevention of Breeding Sites:

Remove standing water:
Mosquitoes lay eggs in standing water, so eliminating these breeding grounds is crucial. This includes emptying birdbaths, changing pet water bowls regularly, and disposing of items that can hold water, like tires and buckets.

Maintain public spaces:
Cleaning up parks, greenways, and other public areas helps prevent mosquito breeding by removing potential water sources.

Educate the public:
Public awareness campaigns can encourage individuals to take steps to eliminate mosquito breeding sites in their own yards and neighborhoods.

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Inside This Issue

(Excerpts From) The Intersection of Mosquito Management and Pollinator Protection

By Elmer W. Gray and Jennifer Berry

Mosquitoes can transmit a wide variety of pathogens and significantly reduce our quality of life with their aggressive biting behavior. Pollinators, and honeybees in particular, are a critical part of our natural environment, contributing significantly to food production and ecological diversity. Unfortunately, these two groups of insects often have overlapping habitats. As a result, proponents of both mosquito management and pollinator protection must find a way to communicate effectively and work together for the betterment of both society and these important entities.

Mosquitoes pose a significant public health risk due to their disease transmission potential. That being said, pollinators are extremely important and seemingly at risk. Pollination is necessary for the production of seeds and fruits in many crops, and bees outperform them all because of their dietary need for pollen and nectar, their hairy bodies that carry pollen grains easily, and their rapid flight from flower to flower.

Honeybees, along with other pollinators, are susceptible to pesticides, and significant bee kills have occurred due to mistimed or misguided pesticide applications. These types of events should not occur, and all parties involved must work in a more thoughtful and diligent manner to ensure that they don't. However, in today's society and economy, pesticide applications are conducted in many parts of our environment by a wide range of individuals with varying levels of training and expertise. Commercial pesticide applicators involved in mosquito control activities are required by law to possess a pesticide applicator's license, which typically includes pollinator protection training and education. In addition, all pesticide applications are regulated by the pesticide label, which now include pollinator awareness specifications. The training and

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2. Larval and Adult Surveillance

Larval Surveillance:

Routine larval surveillance provides a more complete and accurate record of sources of mosquito breeding, thereby providing documentation of mosquito production as a basis for treatment.
Ongoing larval surveillance allows for continuous evaluation of insecticide application and control results.
A clear understanding of species distribution, density and seasonal occurrence is facilitated through routine larval surveillance.
Routine larval surveillance enhances the knowledge provided by adult mosquito surveillance.

Adult Surveillance:

Adult mosquito surveillance involves monitoring and understanding adult mosquito populations to guide control efforts and assess disease risks. This includes trapping mosquitoes, identifying species, and analyzing data to determine the severity of outbreaks and appropriate management strategies.

Trapping:

Used to collect adult mosquitoes. Include CDC light traps, BG-Sentinel traps, Gravid traps.

Landing Counts:

These involve counting mosquitoes that land on and attempt to bite a person in a specific area.

Resting Boxes:

These simulate the resting environments of certain mosquito species, like tree holes, to capture them.

Surveillance helps determine the size, distribution, and species composition of adult mosquito populations. By identifying mosquito species and their prevalence, surveillance helps assess the risk of mosquito-borne diseases. Surveillance data informs decisions about the best control methods, such as larvicide applications or adulticide spraying.

3. Larval and Adult Control:

Larvicides:

These pesticides kill mosquito larvae before they develop into adults. They are applied to standing water sources to prevent mosquito populations from increasing.

Adulticides:

These pesticides kill adult mosquitoes. They can be applied through various methods, including aerial spraying or ground-based spraying.

Integrated Mosquito Management (IMM):

This approach combines various control methods, including larval and adult control, as well as source reduction and education, to achieve the most effective and sustainable mosquito management.

3. Public Awareness and Education:

Promote responsible disposal of items that can hold water:

Encouraging proper disposal of tires, buckets, and other containers can help prevent mosquito breeding.

Provide tips on how to avoid mosquito bites:

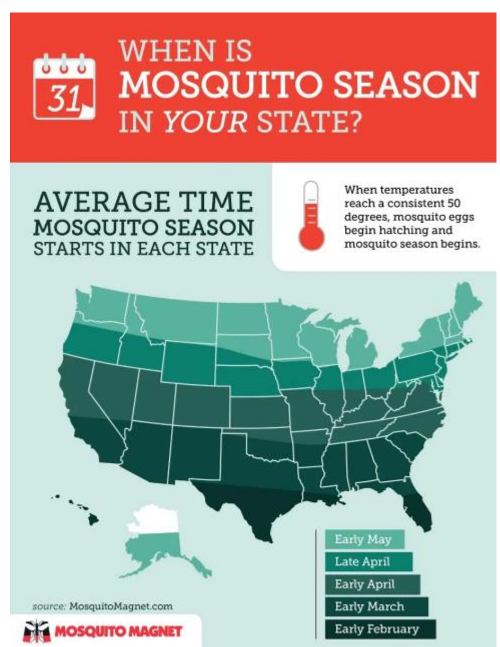
This includes wearing long sleeves and pants, using insect repellent, and avoiding peak mosquito activity times (dawn and dusk).

Inform the public about the risk of mosquito-borne diseases:

Public health organizations and local authorities can inform the public about the diseases that mosquitoes can transmit, such as West Nile virus, Zika virus, and malaria.

By focusing on these strategies, mosquito control programs can effectively prepare for mosquito season and protect communities from mosquito-borne diseases and bites.

https://vectorbio.rutgers.edu/outreach/ipm.php



education of all pesticide applicators is of high importance and emphasis for UGA Cooperative Extension.

While all pesticide applicators bear a significant responsibility to minimize pollinator exposure to pesticide applications, beekeepers also have a responsibility to inform applicators about the presence and location of their honeybee colonies.

Pesticide applicators, and mosquito control districts in particular, cannot avoid honeybee colonies if they are not aware of their presence. Consequently, the best thing a beekeeper can do to protect their hives from mosquito control activities is to be educated about the local mosquito control practices.

For mosquito control practitioners, knowing a honeybee colony is present is just part of the equation. Mosquito control is a complex issue. It is conducted in a wide range of habitats and social structures and includes both public health and nuisance aspects. There are usually valid reasons to justify the effort and expense of a mosquito control application. Either surveillance data has identified a significant nuisance population, there is a public health issue due to an identified disease transmission risk, or multiple complaints have been received. No matter the cause, mosquito populations that are building to levels sufficient to warrant a mosquito control application should be targeted in a comprehensive manner.

Mosquito control professionals should fully support the use of UGA Extension Circular 1154, Best Practices of Integrated Mosquito Management (https://extension.uga.edu/publications/detail.html?number=c1154), which includes a stepwise progression of activities that will suppress a mosquito population in the most efficient manner. Education, source reduction, surveillance and larviciding can all be conducted prior to considering an adulticide application. Education is the foundation that all levels of mosquito control build upon. Knowledge of the mosquito life history provides a better understanding of how to target the pest populations most effectively using the wide range of techniques that are available.

While mosquito control personnel work to minimize adulticide applications using IMM best practices, the responsibility for the health and welfare of bee colonies rests ultimately with the beekeeper. As a result, there are things beekeepers can do to minimize the risk to their hives. In addition to communicating with the local mosquito control authorities, hives can be located in a deliberate manner. Strategically positioning hives 300 feet or more away from potential truck spray routes can significantly decrease the potential exposure to all ground-based adulticide applications. For situations where hives will be located closer to spray routes, barriers such as fencing, hedges, or shrubbery can offer significant protection by reducing the exposure potential. Barriers on two sides are good, but a three-sided barrier would be even better. Hive openings should face away from the potential spray route, again reducing the potential for bees to be exposed to mosquito control applications.

When mosquito control practitioners notify beekeepers of an adulticide application, hives can be covered with moist burlap, sheets, hive nets, or any other type of breathable material to keep bees in the hive during the timed application and reducing the potential for pesticide deposition on the hive. Keeping the foragers inside for a short period will help to reduce any potential residual pesticide exposure. However, honeybees have the potential to forage up to 5 miles in search of pollen and nectar and as a result can be exposed to pesticides in many scenarios beside mosquito control applications. This biological trait requires that beekeepers be cognizant of all facets of the environment around their selected colony site location. Mosquito control is usually conducted to reduce the potential for disease transmission or reduce nuisance populations. The less densely populated an area, the less likely it is to have significant mosquito control activity.

The recent rise in individual yard treatments for mosquito control has significantly increased the number of residual barrier treatments being conducted in some communities. Concerned homeowners need to communicate with their neighbors, particularly when vegetation that is highly attractive to pollinators is present near property lines.

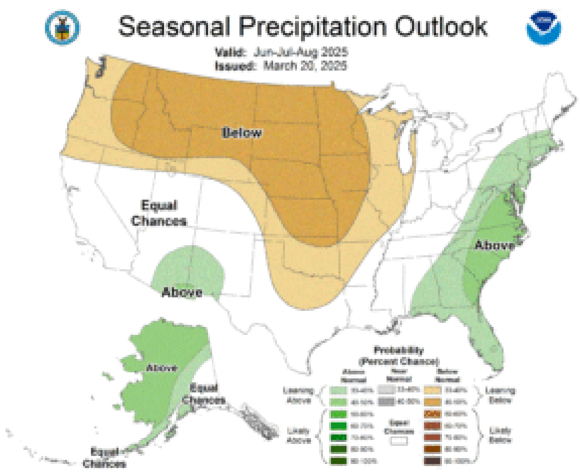
When possible, vegetation that is most attractive to pollinators should be planted toward the center of a property so that pollinators are less likely to be exposed to a neighbor's control treatments. Fences and vegetative border plantings that are less attractive to pollinators will also help to minimize the impact of a neighbor's pesticide application. In addition to civil communication between neighbors about pesticide applications, creating a cooperative, diligent approach to eliminating standing water in a community to reduce mosquito habitats can go a long way toward protecting all of our pollinators.

In summary, both mosquito control practitioners and beekeepers play a vital role in reducing the risk of pesticide applications to pollinators. Mosquito control should be conducted according to best practices of IMM. It is at this point that communication, hive placement, and care becomes the most important parts of the intersection of mosquito control and pollinator protection. Beekeepers should know when mosquito spraying is taking place and mosquito control must know where honeybee colonies are located in order to minimize pollinators being exposed unnecessarily. Enhanced training, education, and communication should become routine practice for both groups in order to reduce the exposure of all types of pollinators to mosquito control applications.

https://secure.caes.uga.edu/extension/publications/files/pdf/C%201188_2.PDF

Mosquito Predictions for 2025 in the SE United States

According to available information, and likely someone with some data and a model or two (or perhaps a crystal ball), in the Southeast USA for 2025, mosquito populations are predicted to be affected by a few factors, including a potential mid-summer surge and the possibility of an early start to the season.



- **Climate Change:**

  Warmer temperatures and altered weather patterns, such as increased rainfall or droughts, can create favorable breeding environments and extend mosquito seasons.

- **Human Activities:**

  Urbanization and land use changes can create new breeding sites and disrupt natural mosquito control measures.

- **Mosquito Adaptations:**

  Studies suggest mosquitoes may be adapting to warmer temperatures, potentially allowing them to thrive in previously unsuitable areas.

- **Disease Transmission:**

  Increased mosquito populations can lead to higher risks of mosquito-borne diseases like West Nile virus, dengue, and Zika.

- **Control Measures:**
  Human interventions, like insecticide use and biological control, can impact mosquito populations, making predictions complex.

Predictions and Implications:

- **Increased Risk:**

  Climate change and urbanization are likely to increase mosquito populations in many areas, potentially leading to higher risk of disease transmission.

- **Wider Geographical Range:**

  Mosquitoes may expand their geographical range into previously colder areas, posing new risks to communities.

- **Need for Preparedness:**

  Public health agencies and communities need to prepare for potential increases in mosquito populations and the associated health risks.

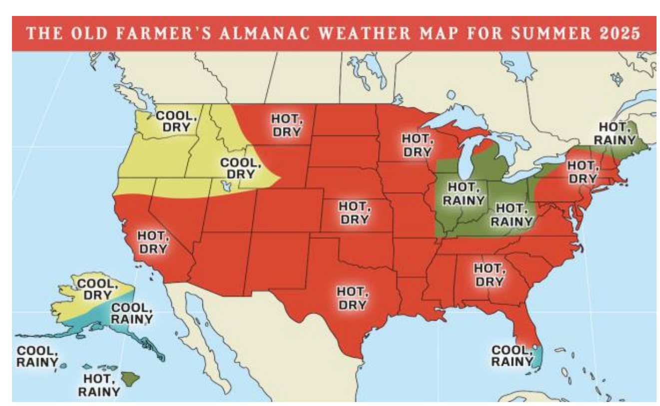
Spring

Two general themes stick out in the 2025 spring forecast: warmth and wetness. Thanks to a solar cycle, which is set to reach its 11-year peak this summer, the United States is expected to see higher-than-average temperatures throughout April and into May, with a few regional exceptions.

Summer

After last year marked one of the hottest summers since weather has been recorded, the Old Farmer's Almanac's forecast is predicting that this summer will be just as intense. The outlook predicts near-normal temperatures in most parts of the country in June, with July and August expected to see a buildup of heat.

In summary, while the precise future of mosquito populations is uncertain, current trends and scientific understanding suggest a greater potential for mosquito-borne diseases and a need for proactive measures to mitigate the risks.



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Reviewing the 2024 mosquito season in Chatham County, Georgia

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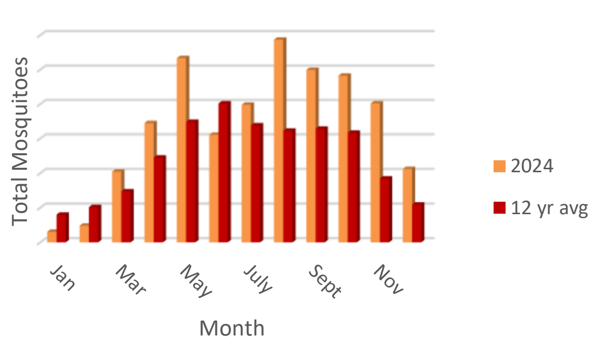
2024 was a bit of an unusual mosquito year in Chatham County. Mosquito trapping began in January with below average numbers, which continued into February. However, by March the mosquito population climbed well above the twelve year average, a trend that basically continued through the entire year with the exception of June (Figure 1). Trapping initiated

Figure 1. Total mosquito catch in 2024 and 12-year average (2012-23)



on 1/2/24 and ended on 12/30/24. Although trapping was primarily accomplished with gravid traps (47.56%) or CDC light traps (46.53%), exit traps (5.54%) affixed to our sentinel chicken cages, and BG Sentinel traps (0.37%) were also used to a much lesser degree in 2024 (Table 1).

Table 1. Trap type and total mosquito catch in 2024.

Trap Type	Trap Nights	Total ♀♀'s	Total ♂♂'s
BGS	12	2894	245
CDC	1494	241823	210
Exit	178	833	0
Gravid	1527	162107	11522

A total of 407,657 female mosquitoes were caught in 2024 over the course of 3211 trap nights at 139 sites across our service area. This total was comprised of 38 species from 11 genera. The four species most often encountered were *Culex quinquefasciatus* (33.93%), *Ochlerotatus taeniorhynchus* (12.60%), *Culex nigripalpus* (12.18%), and *Culex salinarius* (9.24%). *Aedes vexans*, *Ochlerotatus sollicitans*, and *Ochlerotatus atlanticus* were also captured at moderate rates (Table 2).

Table 2. Mosquito species collected in 2024.

Species	Total	Percentage
Ae albopictus	3837	0.94%
Ae japonicus	1	0.00%
Ae vexans	26594	6.52%
An atropos	167	0.04%
An crucians	7472	1.83%
An punctipennis	11	0.00%
An quadrimaculatus	221	0.05%
Cx coronator	3476	0.85%

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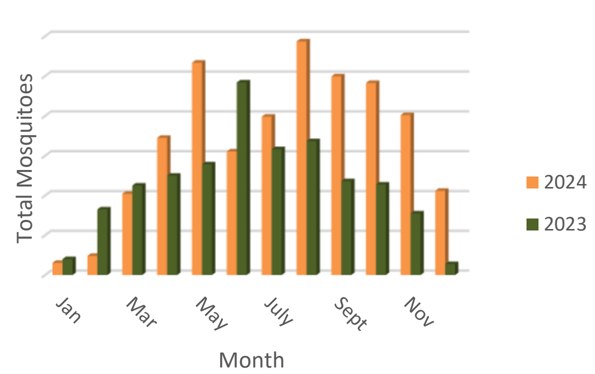
Cx erraticus	8305	2.04%
Cx nigripalpus	49653	12.18%
Cx quinquefasciatus	138330	33.93%
Cx restuans	7466	1.83%
Cx salinarius	37673	9.24%
Cx territans	23	0.01%
Cx spp	7832	1.92%
Cs inornata	6	0.00%
Cs melanura	276	0.07%
Ma titillans	603	0.15%
Oc atlanticus	18135	4.45%
Oc canadensis	3642	0.89%
Oc dupreei	2942	0.72%
Oc fulvus pallens	31	0.01%
Oc infirmatus	10797	2.65%
Oc mitchellae	30	0.01%
Oc sollicitans	18540	4.55%
Oc sticticus	419	0.10%
Oc taeniorhynchus	51378	12.60%
Oc triseriatus	130	0.03%
Cq perturbans	4362	1.07%
Or signifera	60	0.01%
Ps ciliata	113	0.03%
Ps columbiae	822	0.20%
Ps ferox	4153	1.02%
Ps horrida	1	0.00%
Ps howardii	15	0.00%
Ps mathesoni	7	0.00%
Tx rutilus	1	0.00%
Ur lowii	58	0.01%
Ur sapphirina	75	0.02%

By comparison, in 2023, a total of 270,908 female mosquitoes were collected over the course of 2901 trap nights at 127 sites. The average number of mosquitoes collected per trap night in 2023 was 93.38, compared to 127.10 in 2024. Although 37 species of mosquitoes were identified in both years, *Aedes japonicus* was not seen in 2023, while *Aedes aegypti* was not observed in 2024. In 2023, monthly totals were higher in four months (January, February, March, and June), but lower in all other months (Figure 2).

Figure 2. Total mosquito catch in 2024 and 2023



We submitted 1493 pools for testing to the Southeastern Cooperative Wildlife Disease Study (SCWDS) at the University of Georgia, and an additional 2300 pools were tested in-house. Of the 1493 pools sent to Athens, 125 pools were detected with West Nile virus (WNv) and 17 pools with Flanders virus. Ninety-three pools tested in-house were positive for WNv and one pool was positive for eastern equine encephalitis. The full complement of pools (all 3793) were derived from twelve species of mosquitoes, although the majority of samples consisted of *Culex quinquefasciatus* (66.20%), *Culex nigripalpus* (14.63%), and *Culex erraticus* (5.33%). Other species contributed to a lesser amount of the overall species makeup of samples, although groups of *Culex* individuals too damaged to accurately identify to species were also included among our samples (6.06%). Although *Culiseta melanura* accounted for only 0.07% of the total mosquito catch in 2024, this species made up almost 3% of our pool composition.

In 2024, West Nile virus was found in mosquito samples from 24 locations in the county (Figure 3).

The total of 218 positive pools recorded in 2024 marked the highest yearly total of positive WNv samples since testing began in 2001. Much of the WNv activity in 2024 occurred in the historically high WNv "hot zone" within the metro Savannah region (44.50%) of the county. The amount of

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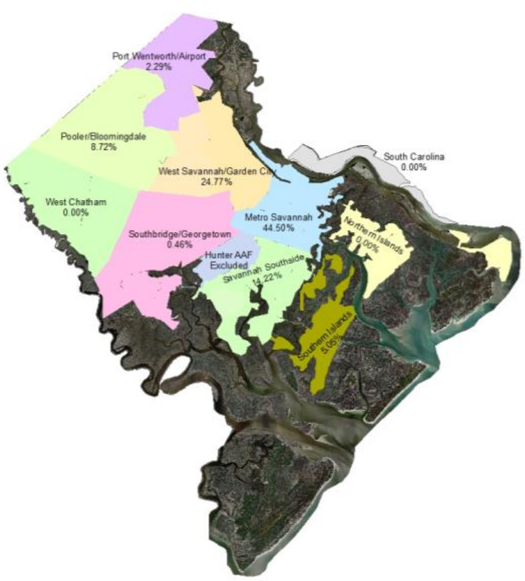
Figure 3. Locations of positive mosquito pools for West Nile virus in Chatham County, 2024.

virus recorded within the south side of Savannah (14.22%) which served as a focal point for the virus in 2022 and 2023 dropped considerably in 2024, although the West Savannah/Garden City region (24.77%) had substantial activity in 2024, as it did in 2023 (Figure 4).

Figure 4. Percentage of positive West Nile virus mosquito pools in Chatham County by region, 2024.



The virus that causes eastern equine encephalitis (EEE) was detected in one pool containing 50 *Culiseta melanura*. The mosquitoes from this pool were collected late in the season on November 4 in the northwestern region of the county previously associated with EEE (see Figure 5). However, none of our sentinel chickens seroconverted for EEE or any other mosquito borne virus in 2024.

Figure 5. Location of positive eastern equine encephalitis mosquito pool.

Flanders virus was found in 17 samples from twelve locations in Chatham County during 2024. All but one of these samples contained *Culex quinquefasciatus*. The lone exception was a sample consisting of *Culex erraticus*. The distribution of mosquitoes carrying Flanders virus was scattered throughout the county in suburban to rural areas (see Figure 6).

Outside of surveillance work, our source reduction staff ditched a total of 33,505 feet, and cleaned out another 21,435 feet of ditches. This work was confined to the Dredge Material Containment Area (DMCA) situated mostly along the South Carolina side of the Savannah River. The area consist of thousands of acres of compartments where sediment is deposited from dredging operations within the main channel of the river. An unfortunate result of these operations is the production of ideal larval habitat

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Figure 6. Location of positive pools for Flanders virus in Chatham County, 2024.

used by two species of salt marsh mosquitoes (*Ochlerotatus taeniorhynchus* and *Oc. sollicitans*). Both species are highly attracted to people and capable of traveling long distances, often impacting residents several miles away. During 2024, ditching operations were conducted in cells 12A, 13A, 13B, 14A, and 14B of the entirety of the DMCA. (Figure 7).

Figure 7. Ditching Operations in Chatham County, 2024.

Technicians conducted 1063 service requests that were generated through the county's citizen notification system (QAlert). Technicians also conducted 7242 ground inspections on known larval habitats throughout the year, and treated 155 acres by hand. An additional 264 sites encompassing 5268 acres were treated by our aircraft for larval mosquitoes. 681,324 acres were treated aerially for adult mosquitoes and another 14,437 acres were treated with ground ULV equipment. Staff also treated 9,485 catch basins in late May and early June as part of our normal West Nile virus prevention program.

In addition to our normal mosquito work, staff assisted the Georgia Department of Agriculture with the collection of information on the recently introduced yellow-legged hornet (*Vespa velutina*). This invasive species of hornet poses a threat to native pollinators, as well as established populations of either feral or farmed honey bees (*Apis mellifera*). In all, 68 sites were trapped during 2024 by CCMC technicians. Trap sites generally corresponded to locations where mosquito traps were deployed on a regular basis. Trapping for hornets began in April and continued through December. A total of 296 yellow-legged hornets were captured from 26 sites. The first hornet was caught on July 1 and the last on December 13.