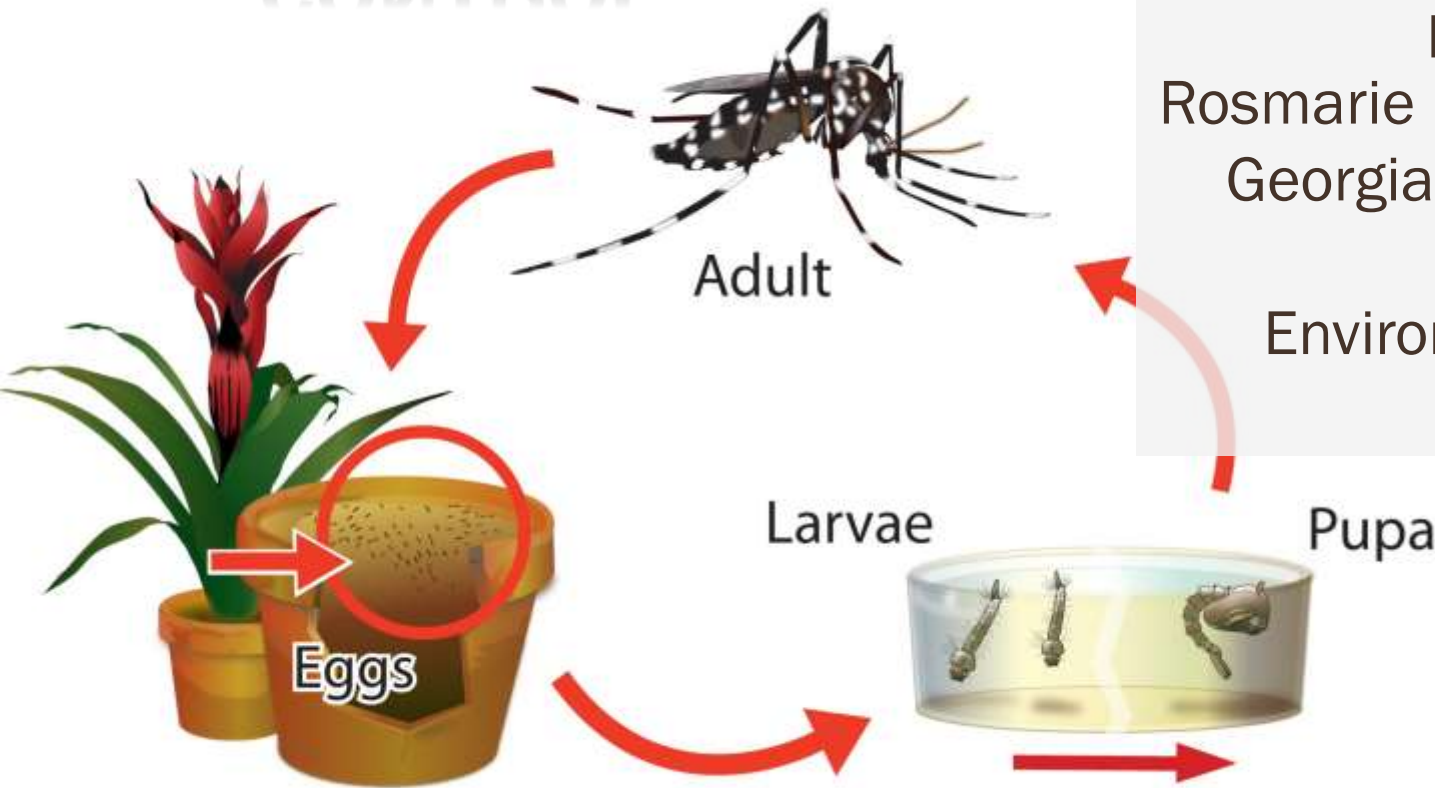


MOSQUITOES AND MOSQUITO CONTROL

Adapted from
presentation by
Rosmarie Kelly, PhD MPH
Georgia Department of
Public Health
Environmental Health
Section



Find this presentation at www.wchance3.wordpress.com/handouts



750,000 deaths/year

Most Dangerous Animal - www.sciencealert.com

A LITTLE BIT ABOUT MOSQUITOES

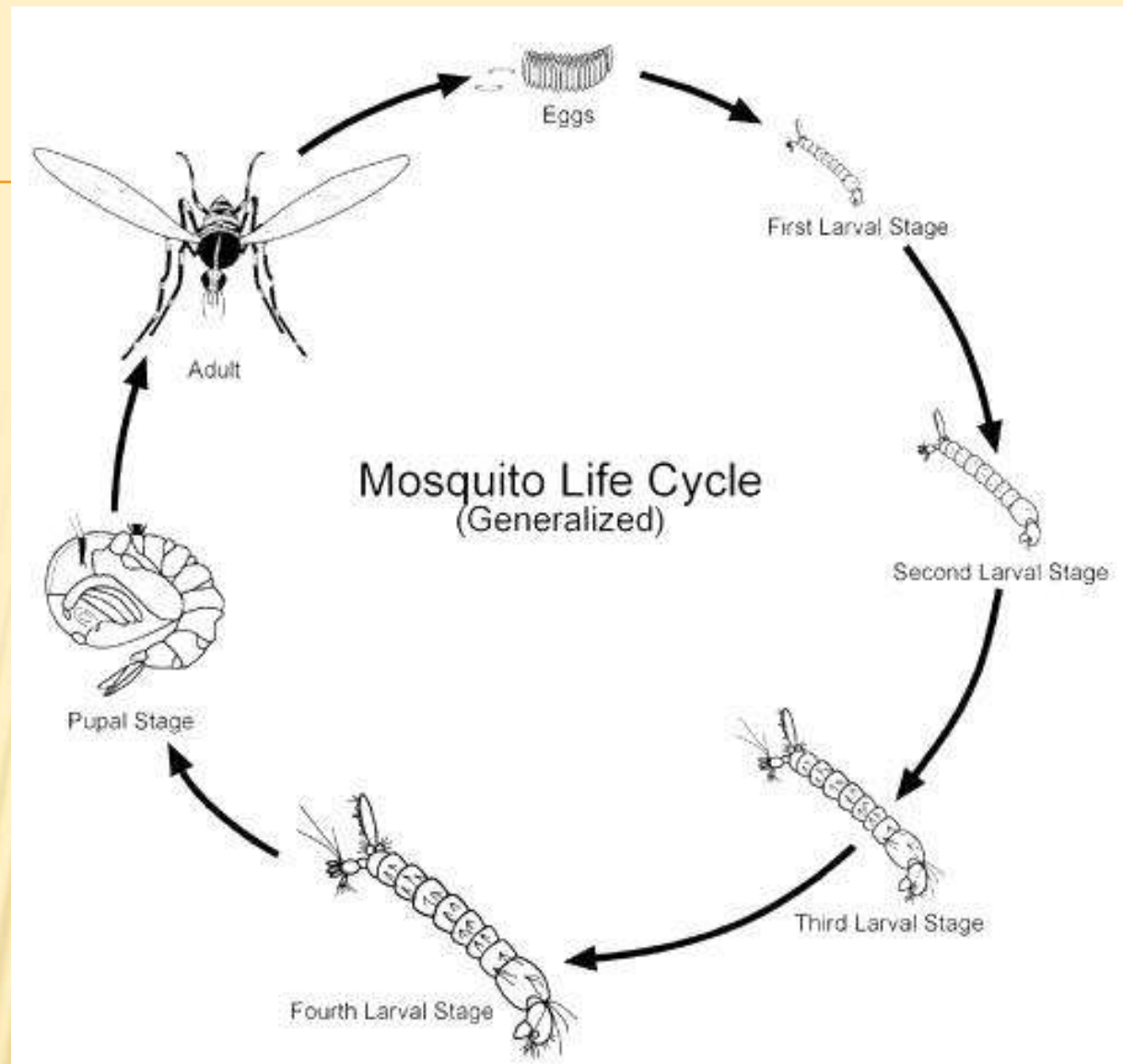
- ✗ Vectors of disease – WNV, Zika, Chickungunya, EEE (horses) etc.
- ✗ 60 species found in Georgia
 - ✗ Floodwater
 - ✗ Permanent water
 - ✗ Transient water
 - ✗ Container – tree hole/artificial
- ✗ When & where are they a problem?
- ✗ Where do they come from?



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LIFE CYCLE

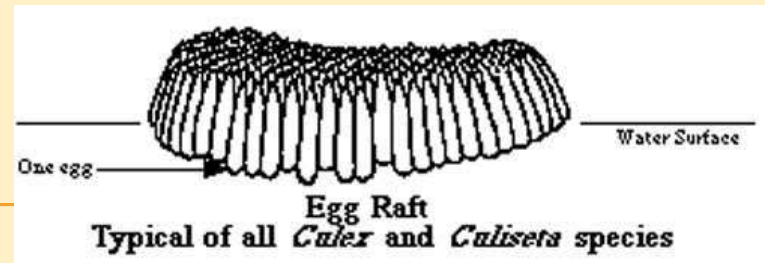
- ✖ Egg
- ✖ Larva
- ✖ Pupa
- ✖ Adult



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EGGS



- ✗ Eggs laid in permanent water hatch after incubation (2 – 5 days)
- ✗ Eggs laid in tree holes, containers, or floodwater areas will hatch when covered with water after a period of incubation
- ✗ Most eggs are very resistant to environmental conditions and may stay viable for many years

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www.wchance3.wordpress.com/handouts

ASIAN TIGER MOSQUITO EGGS (.5 MM)



YOU MUST BE LICENSED!

- ~~488 518 559~~ Commercial Mosquito Contactors Registered with GA Department of Agriculture
- 626 Category 41 (Mosquito Control) commercial applicators licensed
- 1301 Commercial Contractors in O&T (Cat 24)
- 3528 Category 24 certified applicators



NEED A CATEGORY 41 LICENSE?



www.tinyurl.com/PSEPUGA

Mosquito Biology, Surveillance and Control



Photo by David Ramsey, 2005

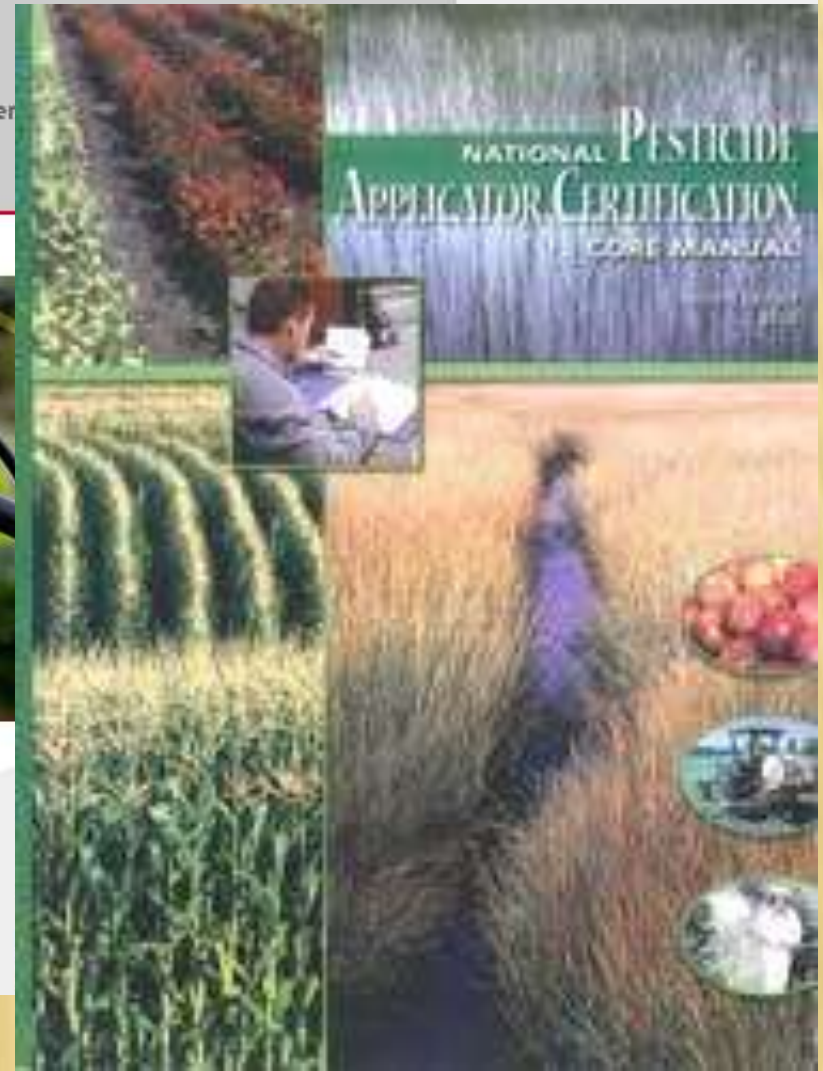
The University of Georgia Cooperative Extension Service
College of Agriculture and Environmental Sciences

The Georgia Mosquito Control Association

& Garden



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TESTING AT TECHNICAL COLLEGES

- ✖ Register @ gapestexam.com
- ✖ Create account
- ✖ Buy study manuals
- ✖ Core Exam?
- ✖ Testing fee \$45
- ✖ GDA license fee \$90
- ✖ 5 years – 10 hours

GEORGIA COMMERCIAL AND STRUCTURAL PEST MANAGEMENT TESTING SYSTEM TESTING CENTERS



HELP TO PASS THE CORE EXAM

<http://tinyurl.com/PSEPonline>

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A copy of your Order Receipt will be sent to your email address and the following steps will occur automatically once you submit your order:

Dr. Mickey Taylor will receive a notification of your order with your email address and contact phone number (for use if you incorrectly enter your email address). Dr. Taylor will enroll students approximately twice each workday, around 10:00 AM and again around 5:00 PM. You CANNOT self-register on the gaprocerts.com website any longer. He will send you a welcoming email with a user name and a temporary password. Your username will remain the same each time you log in to gaprocerts.com. However, you will be required to change the temporary password when you log onto the gaprocerts.com site for the first time.

Commercial Applicators

Private Applicators

Homeowners, Public Service Employees, & Volunteers

HELP TO PASS THE CAT 41 EXAM

Georgia Mosquito Control Association

www.GAmosquito.org



www.gamosquito.org/training.html

Home

About GMCA

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Information**

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**Mosquito
Information**

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Publications

Training

Training Opportunities

■ GA Pesticide Applicator's License - CAT 41 (Mosquito Control)

For pesticide applicators preparing to take the Mosquito Control Pesticide Applicators exam, help is as close as your computer!

Mosquito Control is a growing part of the pest control industry. Commercial applicators of mosquito control products need to have pesticide applicator certification in Category 41, Mosquito Control. UGA Entomologist Elmer Gray has recorded an online video to better prepare applicators to take and to pass the Category 41 pesticide exam.

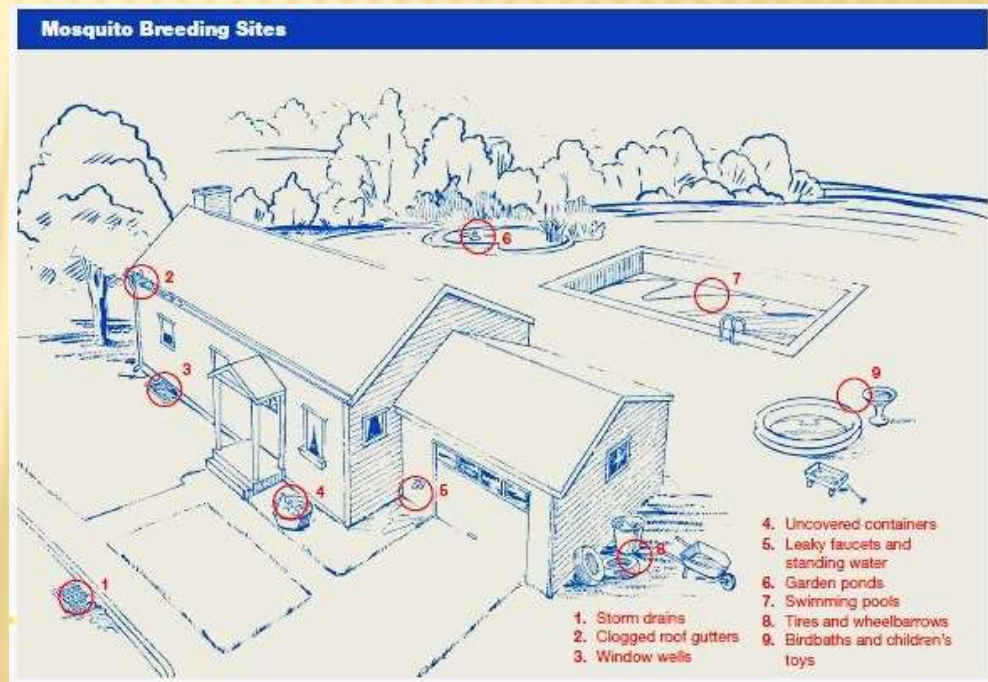
The new video that helps to prepare applicators to take the Mosquito Control (Category 41) exam is available below.

Elmer W. Gray

University of Georgia
Department of Entomology

EDUCATION/COMMUNICATION

- ✗ The public should:
 - + Recognize the problem & the cause
 - + *Know how to help with mosquito control*



INSPECTING FOR LARVAL MOSQUITOES - BACKYARD BREEDING SITES

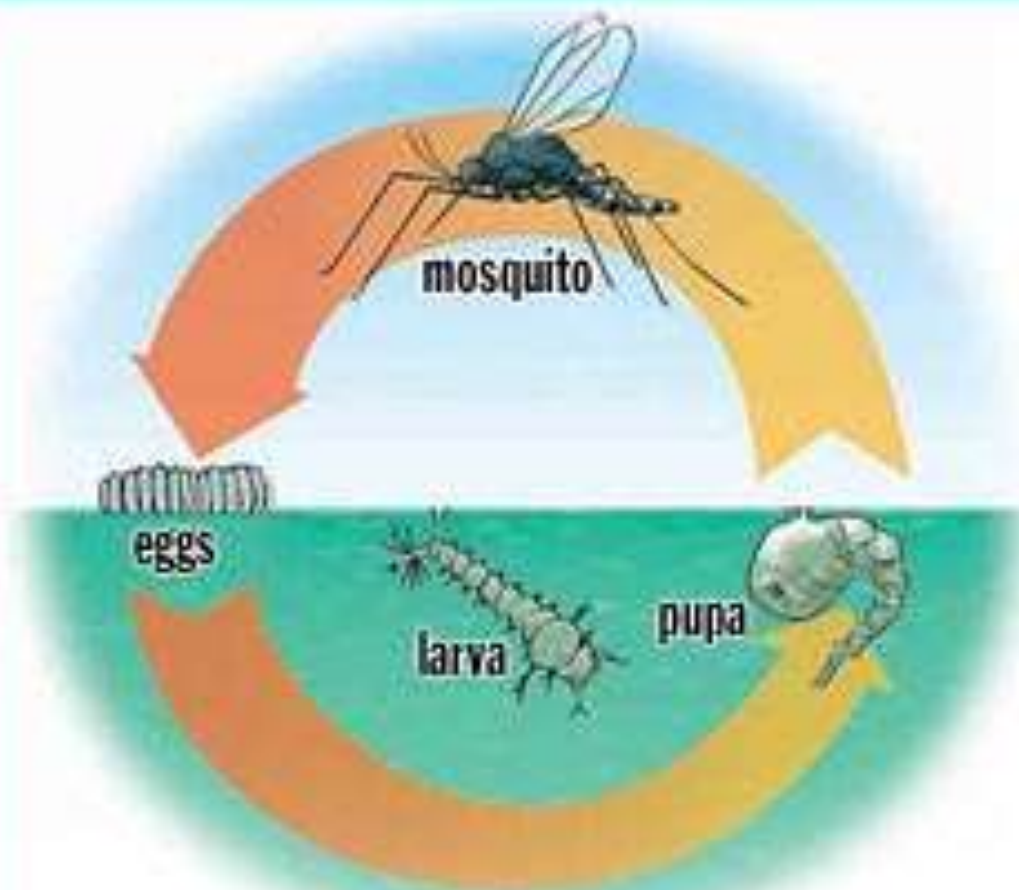


PONDS & ABANDONED POOLS

Gambusia – Mosquito Fish

Picture from Wikipedia





"Mosquitoes take about 7 days to complete life history.

The first three stages: eggs, larva and pupa are aquatic.

Therefore, the best way to prevent mosquito breeding is to remove stagnant water."

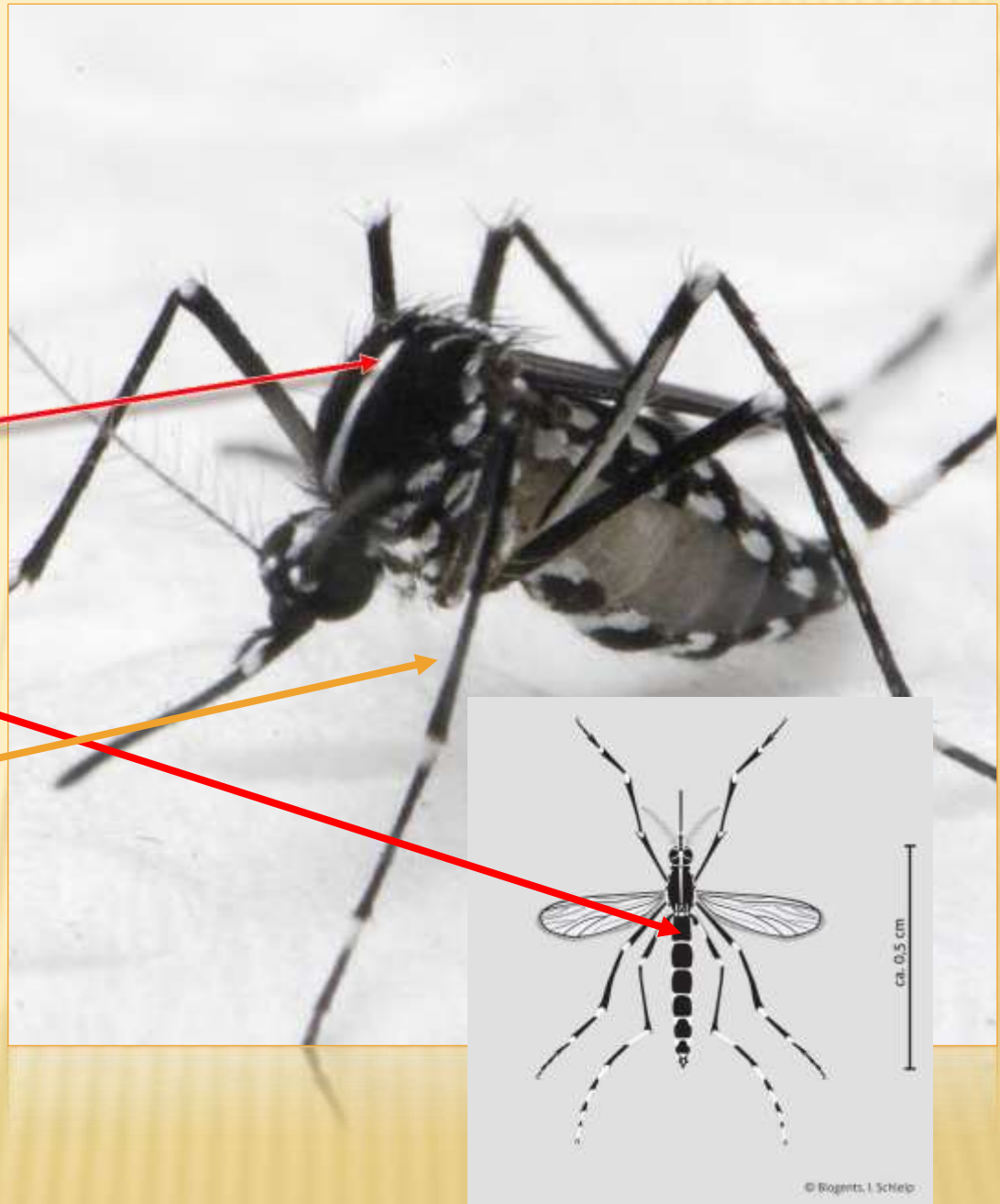
IF POSSIBLE, ID!



Some Common Mosquito Species	Larval Habitat	Biting Time	Flight Range
<i>Aedes albopictus</i> (Asian Tiger) <i>Aedes aegypti</i> (Yellow fever)	artificial containers & tree holes	Day	100 - 300 yards
<i>Culex quinquefasciatus</i> (Southern House)	ground pools, catch basins, artificial containers	Crepuscular (Twilight), Night	1/4 - 1/2 mile
<i>Aedes vexans</i> (Inland floodwater)	Flooded grassy and wooded areas	Day, Twilight, Night	5 - 8 miles
<i>Coquillettidia perturbans</i>	Cattail marshes	Twilight, Night	1 - 5 miles

ASIAN TIGER *Aedes albopictus*

- Adult *Aedes albopictus* are easily recognized by the bold black shiny scales and distinct silver white scales on the palpus and legs.
- The scutum (back of thorax) is black with a distinguishing white stripe down the center.
- The abdominal tergites (back of abdomen) are covered in dark scales.
- Legs are black with white basal scales on each tarsal segment.



GA Pest Management Handbook -

<http://tinyurl.com/y92ufwta>

- ✖ Elmer Gray and Ray Noblet, UGA Entomologists
- ✖ Recommendations for
 - + ULV and thermal ground applications
 - + Aerial applications
 - + Larval control applications



Table 1. Label Recommendations of Insecticides for Use as Ultra Low Volume and Low Volume Sprays in Ground Applications for the Control of Adult Mosquitoes

INSECTICIDE/ TRADE NAME	MOA	APPLICATION		REMARKS AND PRECAUTIONS
		FLOW RATE FL OZ/MIN	SPEED MPH	
<i>chlorpyrifos</i> Mosquitomist One ULV	1B	3.9-7.8	10	Non-corrosive, quick knockdown, low odor and low mammalian toxicity. 100 ft water set back. Breaks down quickly.
Pyrifos One Mist ULV EC		1.9-15.5	5-20	
PyroFos 1.5 ULV		1.4-10.5	5-20	
<i>chlorpyrifos + permethrin</i> ULV Mosquito Master 412	1B + 3	2.3-12.9	5-15	A choice where insecticide resistance is a serious concern.
<i>deltamethrin</i> DeltaGard	3	1.0-60.9	5-20	No piperonyl butoxide (pbo) in formulation, Type II pyrethroid.
<i>etofenprox</i> Aqua Zenivex E20	3A	0.9-40.4	10-20	Can be diluted with water.
Zenivex E4 RTU		2.25-18.0	5-15	Newer product that may be helpful if resistance is a concern.

GA Pest Management Handbook - lots of info!

Chloropyrifos - Non-corrosive, quick knockdown, low odor and low mammalian toxicity. 100 ft water set back. Breaks down quickly.

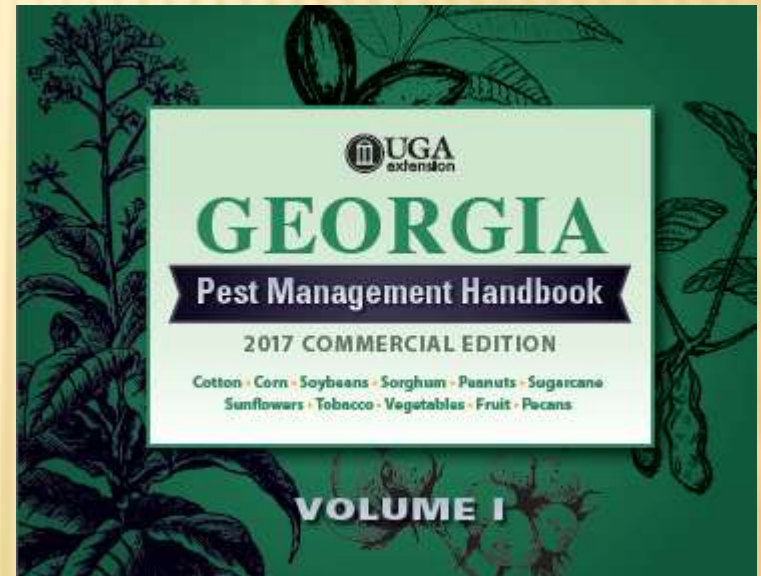
Naled - Best choice for salt-marsh mosquitoes, very safe environmentally, no water set back, however highly corrosive to all equipment

Aqua Perm-X UL 30-30 (Permethrin/PBO)
Widely used and highly effective. Maintain the rate in the 0.0035 lb/A range. Some resistance along Gulf Coast. 100 ft water set back.

<http://tinyurl.com/y92ufwta>

Free online

Hardcopy with flashdrive - \$50



Larvicides – stop them before they start!

The timing of **larvicide** application is dependent on the control agent.

IGRs – Insect Growth Regulators- mimic an essential insect hormone

- Methoprene & Pyriproxifen – Juvenile Hormone analog
- Other IGRs upset chitin formation and kill insects as they molt

Monomolecular films

- the larvae are unable to attach to the water surface & breathe

Spinosad

Bacterial toxins

- *Bacillus thurengensis israelensis* and *B.t. sphearicus*
- Must be ingested by the larvae
- toxins are released by the mosquito gut pH

<http://www.epa.gov/opp00001/health/mosquitoes/control.htm>



Area & Barrier Treatments - good for day biters?

- Mosquitoes are at rest most of the time on plants and protected surfaces
- Should NOT be dripping off the surfaces!
- Should NOT be applied to flowers
- Morning and evening work well for Asian Tiger
- ***Beware drift!***



WHAT ABOUT DRIFT?

Local county says mosquito spraying is killing its bees

By: Berndt Petersen

Updated: Jun 26, 2017 - 7:56 PM



ULV Area Sprays for evening & night biters

ULV sprayers dispense very fine aerosol droplets that stay aloft and kill flying mosquitoes on contact. Usually use small quantities of pesticide active ingredient, typically less than 3 ounces per acre, which minimizes exposure and risks to people and the environment.

Organophosphates

- Naled (usually only by aircraft)
- Malathion

Pyrethroids

- Permethrin
- Resmethrin
- Sumithrin
- etc

Zenivex – lower risk pyrethroid



Foggers - Advantages & Disadvantages

<http://tinyurl.com/ya3puo9q>



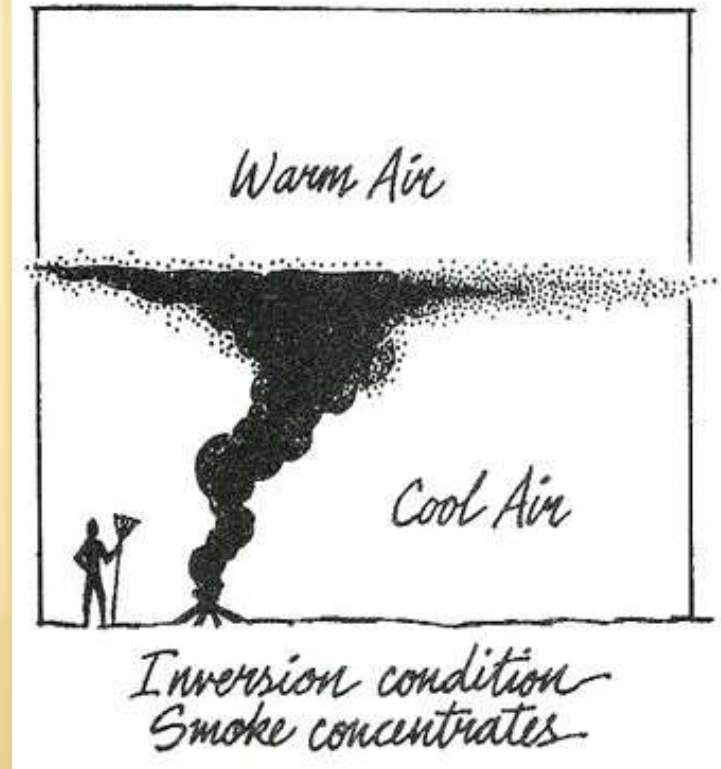
Thermal
VS
Cold

From Insect Cop online



ULV and Foggers

Use the proper droplet size!
And the proper rate!
How will you calibrate it?
Ask the manufacturer!
Use ULV and Foggers during
temperature inversions
May work better for evening &
night biting mosquitoes



GEORGIA MOSQUITO CONTROL ASSOCIATION


www.georgiamosquito.org

Website has info -

- Mosquito id
- Newsletter
- Disease info


Mosquito ID classes –
contact

rosmarie.kelly@dph.ga.gov for more
information



DIDEEBYCHA

Georgia Mosquito Control Association www.GMosquito.org



The GMCA Newsletter - DIDEEBYCHA - is a means of spotlighting various programs throughout Georgia, as well as a way of providing the membership with information about topics of interest to mosquito control.

Chikungunya

Is Georgia at risk?

In 2001, the CDC and the Pan American Health Organization jointly released a document entitled "Preparedness and Response for Chikungunya Virus Introduction in the Americas" (<http://www.cdc.gov/chikungunya/>). In late 2013, Chikungunya was found for the first time on islands in the Caribbean, where it has persisted and continued to spread.

Chikungunya fever is an emerging, mosquito-borne disease caused by the Chikungunya virus. It is transmitted predominantly by *Aedes aegypti* and *Ae albopictus*, the same species involved in the transmission of dengue. Chikungunya is an RNA virus that belongs to the Alphavirus genus in the family Togaviridae. The name chikungunya derives from a word in Makonde and roughly means "that which bends," describing the stooped appearance of persons suffering with the characteristic painful arthralgia.

Epidemics of fever, rash, and arthritis

[Continued on page 4...](#)

<p>Mosquito Surveillance: Using the Data</p> <p>Mosquito surveillance is an important part of mosquito control. Where arboviral diseases occur, mosquito testing is an equally important component of mosquito surveillance.</p> <p>Page 2</p>	<p>Tiger, tiger...<i>Aedes albopictus</i></p> <p>The introduction of the Asian tiger mosquito, <i>Aedes albopictus</i>, had a profound impact mosquito control in Georgia.</p> <p>Page 3</p>	<p>Program Spotlight</p> <p>Jack Vereen, former director of the Liberty County Mosquito Control program, passed away on March 10, 2014.</p> <p>Page 6</p>
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MOSQUITO RESOURCES

- ✕ www.Gamosquito.org (GMCA)
- ✕ www.MAMCA.org (MAMCA)
- ✕ www.mosquito.org (AMCA)
- ✕ <http://www.ent.uga.edu/pmh/> Georgia Pest Management Handbook
- ✕ <http://www2.epa.gov/mosquitocontrol> (EPA)
- ✕ <http://npic.orst.edu/pest/mosquito/control.html> (National Pesticide Information Center)
- ✕ <http://agr.georgia.gov/pesticides.aspx> (GDA)

Find this presentation at www.wchance3.wordpress.com/handouts

PUBLIC HEALTH ENTOMOLOGIST

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<http://www.GAmosquito.org>

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