CT Environmental Health Association
April 9, 2019

Mosquito (or water) Management
Control of Larval and Adult Mosquitoes

Connecticut Department of
Energy and Environmental Protection

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

Mosquitoes

- 54 species in CT (~3000 worldwide, >200 in US)
- Only female bites (irritation and disease transmission)
- Univoltine vs. multivoltine (>risk)
- Overwintering strategies
- Emergence is temp dependent
- Specific vs. general feeding (>risk)

Created Wetlands/Stormwater BMP's:

"If you build it they will come." (?)

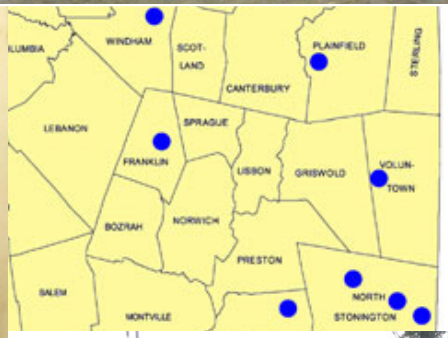
Connecticut Mosquito Management Program

- Mosquito surveillance - CAES
- Human surveillance - DPH/LHD
- Mosquito control/tech assistance - DEEP
- Domestic bird and animal - DoAg, UCONN
- Communication and public awareness - DPH/DEEP/CAES

IPM for Mosquito Control

- Monitoring and Surveillance
- Education
- Source Reduction
- Personal Protection
- Biological control
- Chemical control
  - -Larvaciding
  - -Adulticiding

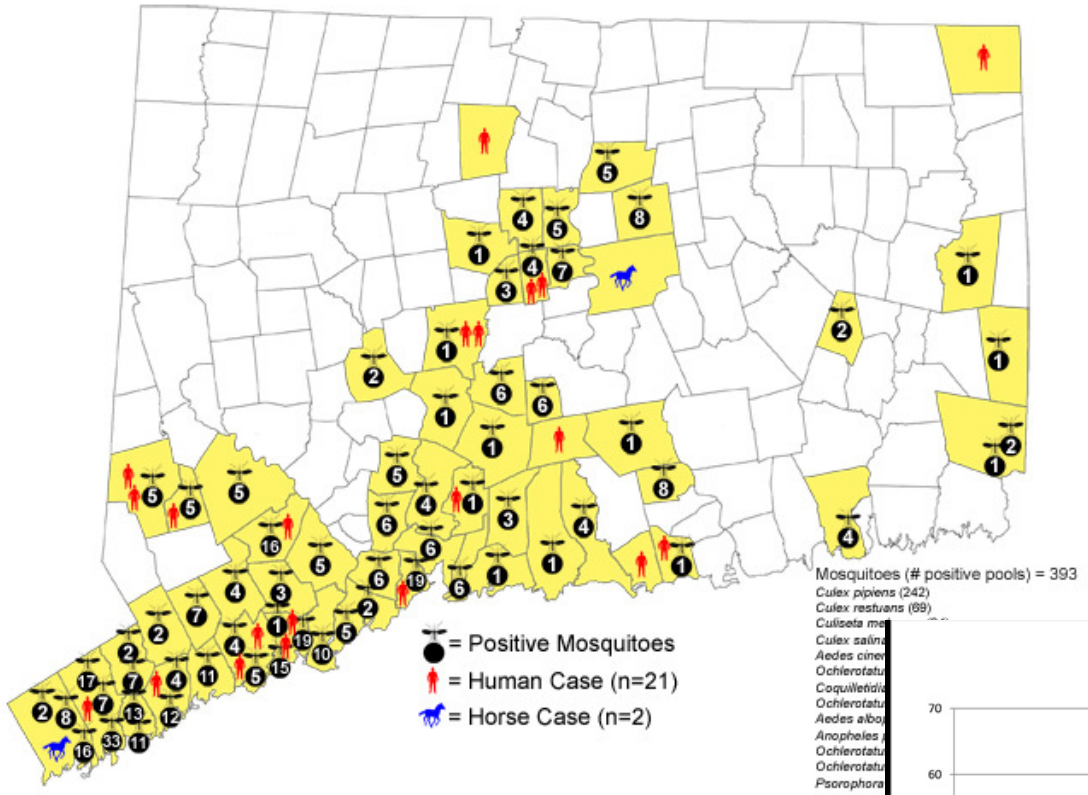
Trapping S



● = Trapping Statio

Updated: October 16, 2018

2018 West Nile Virus Activity



Mosquitoes (# positive pools) = 393

Culex pipiens (242)

Culex restuans (69)

Culiseta me

Culex salin

Aedes cine

Ochlerotatu

Coquillettidi

Ochlerotatu

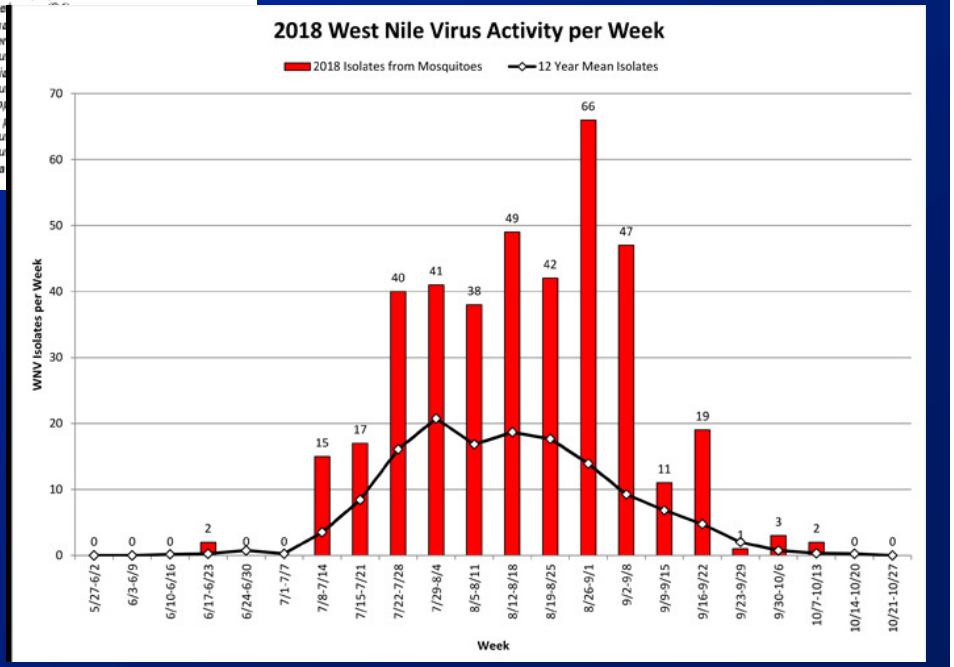
Aedes albo

Anopheles

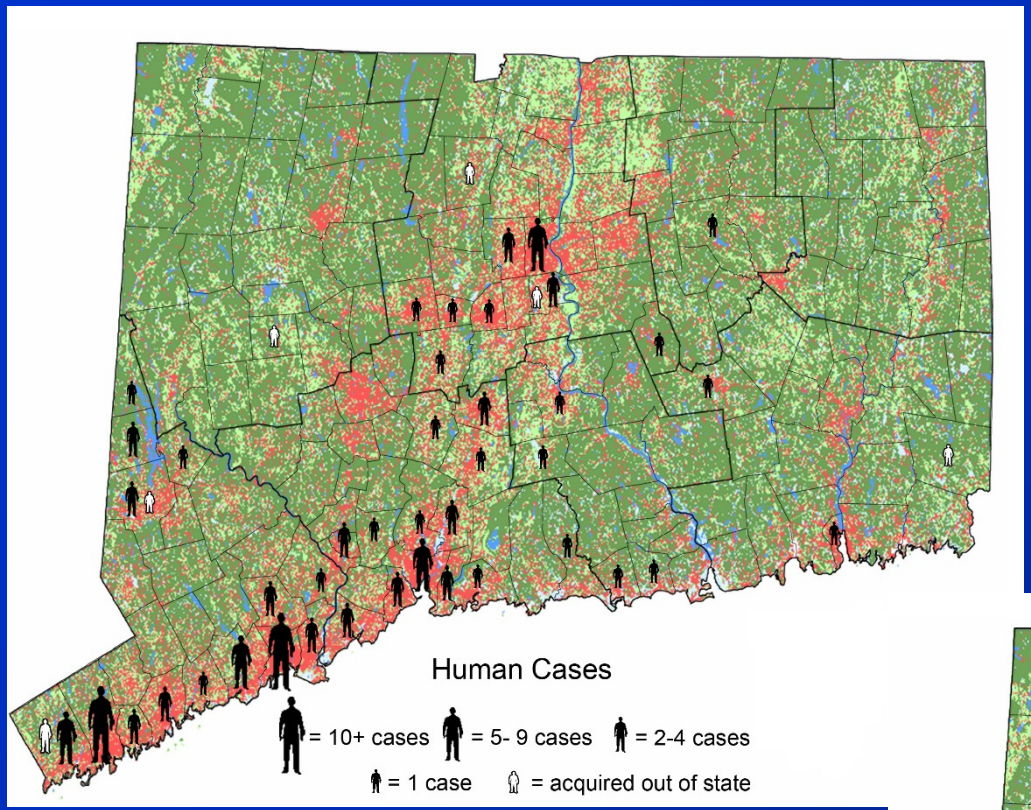
Ochlerotatu

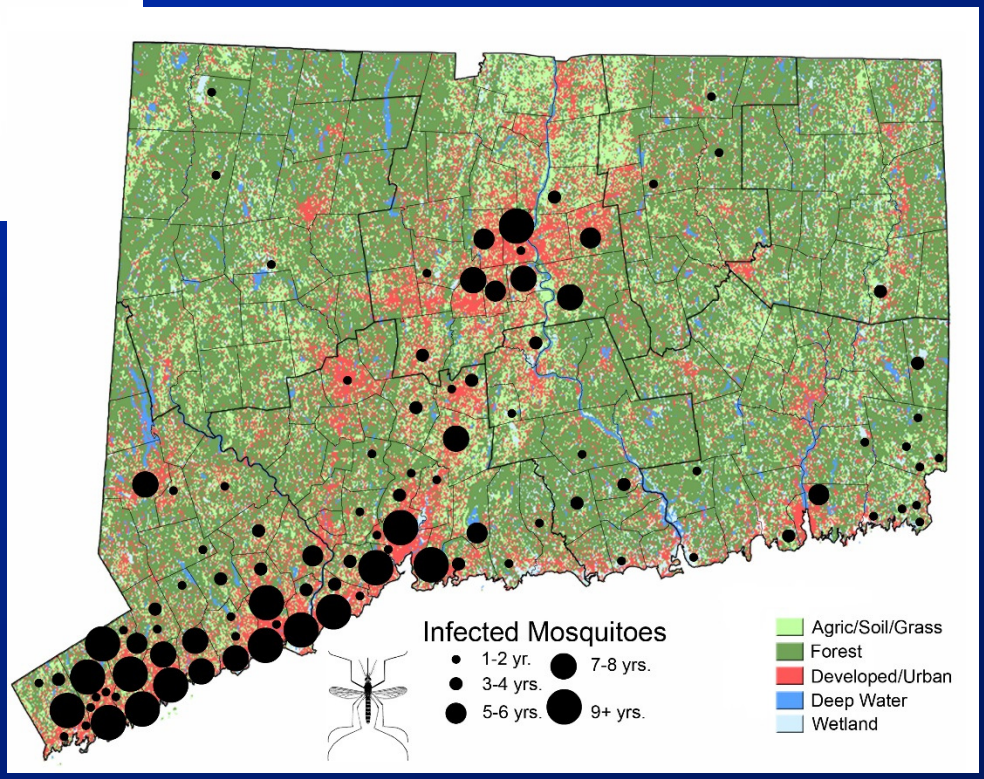
Ochlerotatu

Psorophora



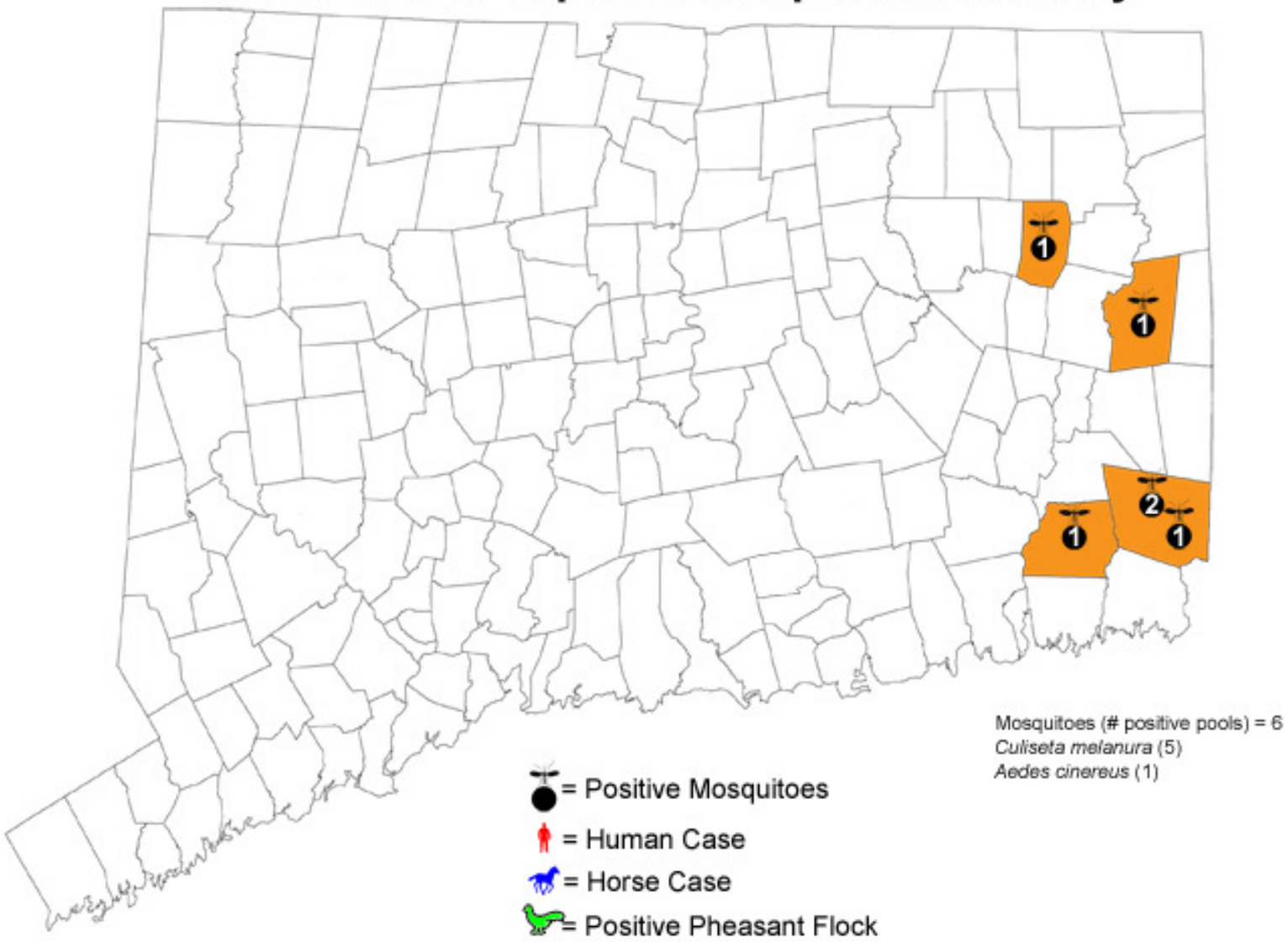
WNV 2000-2018:
157 human cases
(4 fatalities)





Updated: October 16, 2018

2018 Eastern Equine Encephalitis Activity



Elements of a Municipal Mosquito Control Program

- Educate your constituents (sources of mosquitoes).
- Clean up yards/neighborhoods. Stress source reduction/personal protection.
- Enforce public health regs: e.g., abandoned pools
- If contracting with private company, use only DEEP licensed applicators (Cat. 7f)
- Consider catch basin larvaciding. Coordinate with DPW clean outs. Also parks, schools (check regs).
- Judicious use of adulticides is OK.

Source reduction

Eliminate standing water around home and workplace.

Created Wetlands/Stormwater Basins:


Photo: N. Read

Recommendations

- 1:3 or 1:4 side slopes
- Veg/beaver management
- <72 hrs. detention
- **maintenance!**

Personal Protection Measures to Prevent Mosquito Bites

- Minimize outdoors activities at dawn and dusk or when mosquitoes are most active.
- Cover arms and legs (pants, long sleeves). Wear light colored, loose fitting clothing.
- Repair holes in screens.
- Avoid camping near swampy areas. Use netting on tents and outdoor playpens.

Personal Protection Measures
Repellants

- Repellants (are pesticides):

  DEET (<30-40%), picaridin, oil of lemon eucalyptus, IR3535 (on clothes or skin).
- Sprays, creams, towelettes.
- Have an adult apply repellants to children. <10% DEET - not around eyes/nose/mouth. Wash off when you come indoors.
- Permethrin-based products to clothes only. Kills mosquitoes and ticks.

Biological control

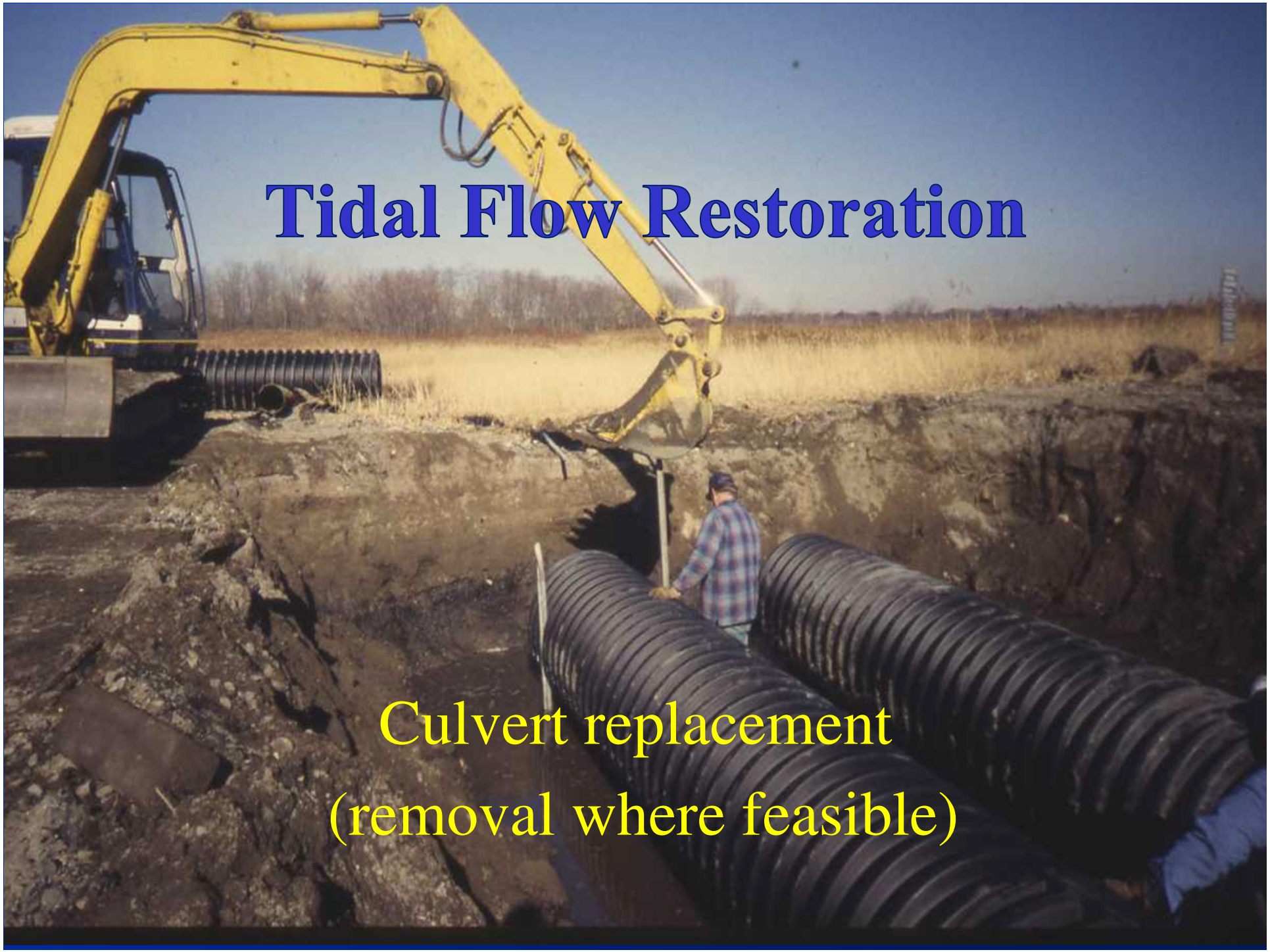
The control of a pest by the introduction of a natural enemy or predator

- Gambusia (mosquito fish), guppies, dragonfly nymphs.
- *Introduction of non-native orgs in open waters is prohibited in CT
- OK in water gardens, abandoned pools, closed systems (no outlet).
- Mummichogs, fathead minnows, sunfish, ‘top minnows’ - OK

Integrated Marsh Management

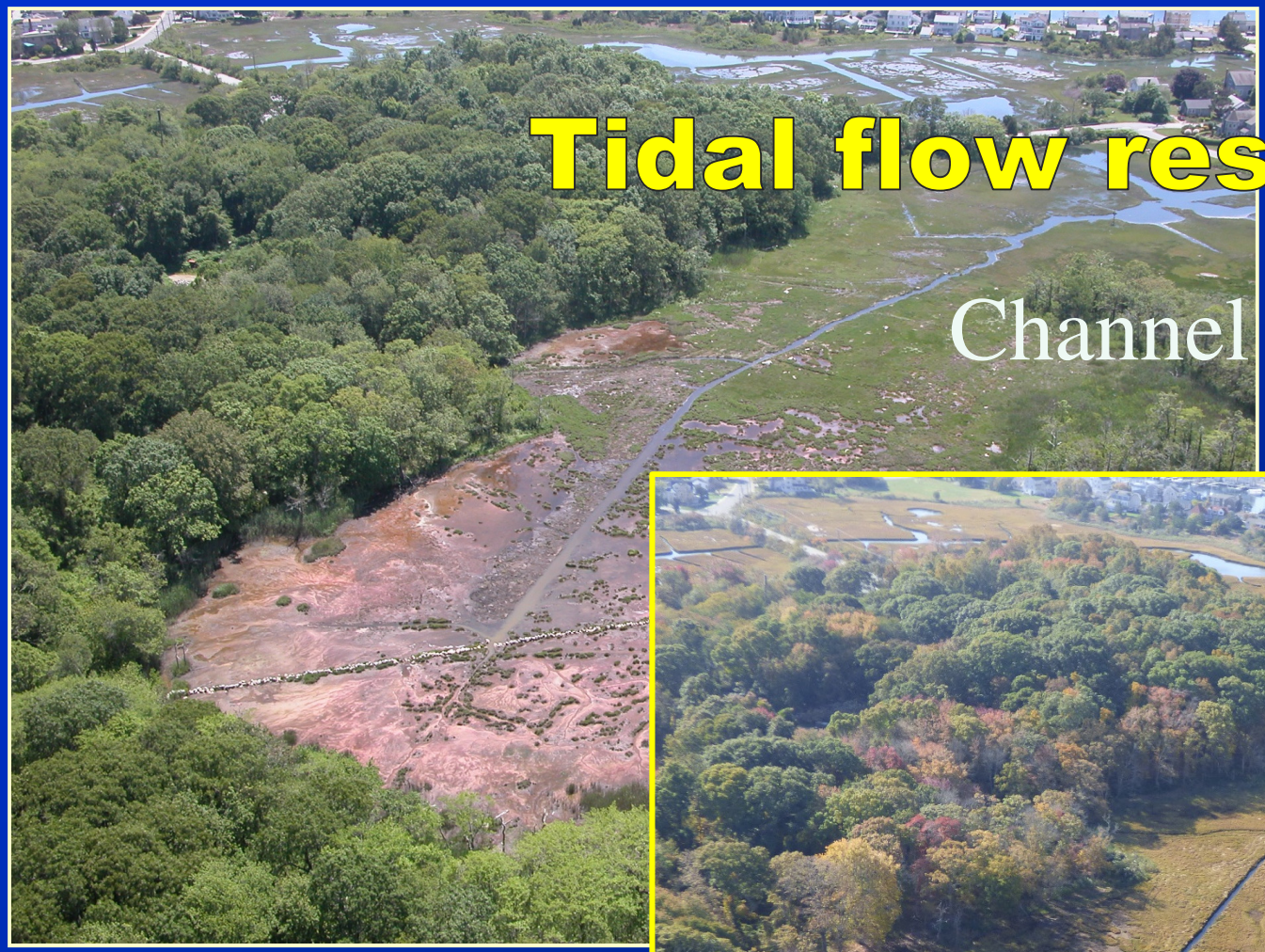
- A holistic approach to wetlands management utilizing a variety of techniques to achieve site specific goals.
- These techniques can be simple or complex.
- IMM takes into consideration many aspects of wetland management/restoration including mosquito control, vegetation management, wildlife habitat enhancement, hydrologic modification and education.
- Usually involves partnerships to share resources.

Open Marsh Water Management (OMWM)


Tidal Flow Restoration
Culvert replacement
(removal where feasible)

Tidal flow restoration

Channel recleaning



Chemical control

- Larvaciding
- Pupaciding
- Adulticiding

PPE for the handler/applicator

Read the label!

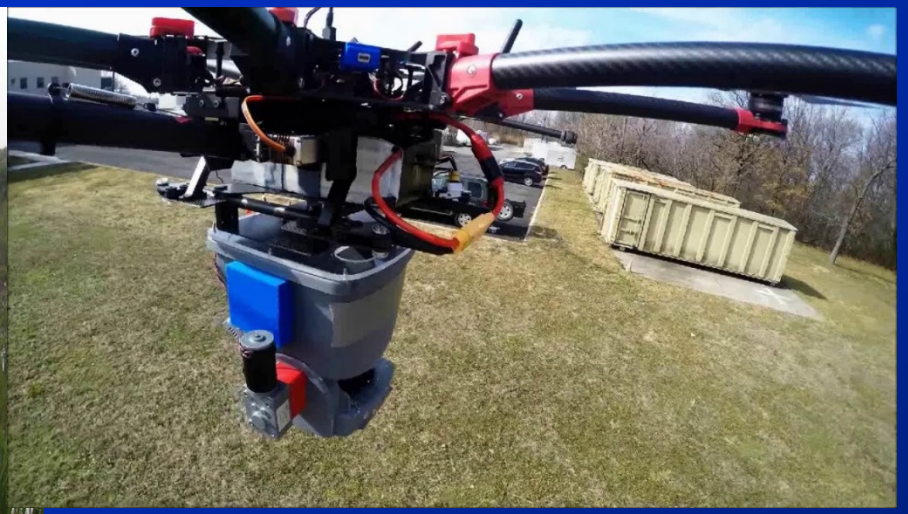
Wear PPE appropriate to the pesticide.
(disposable gloves, glasses, long sleeves, mask, respirator)

Larvacides

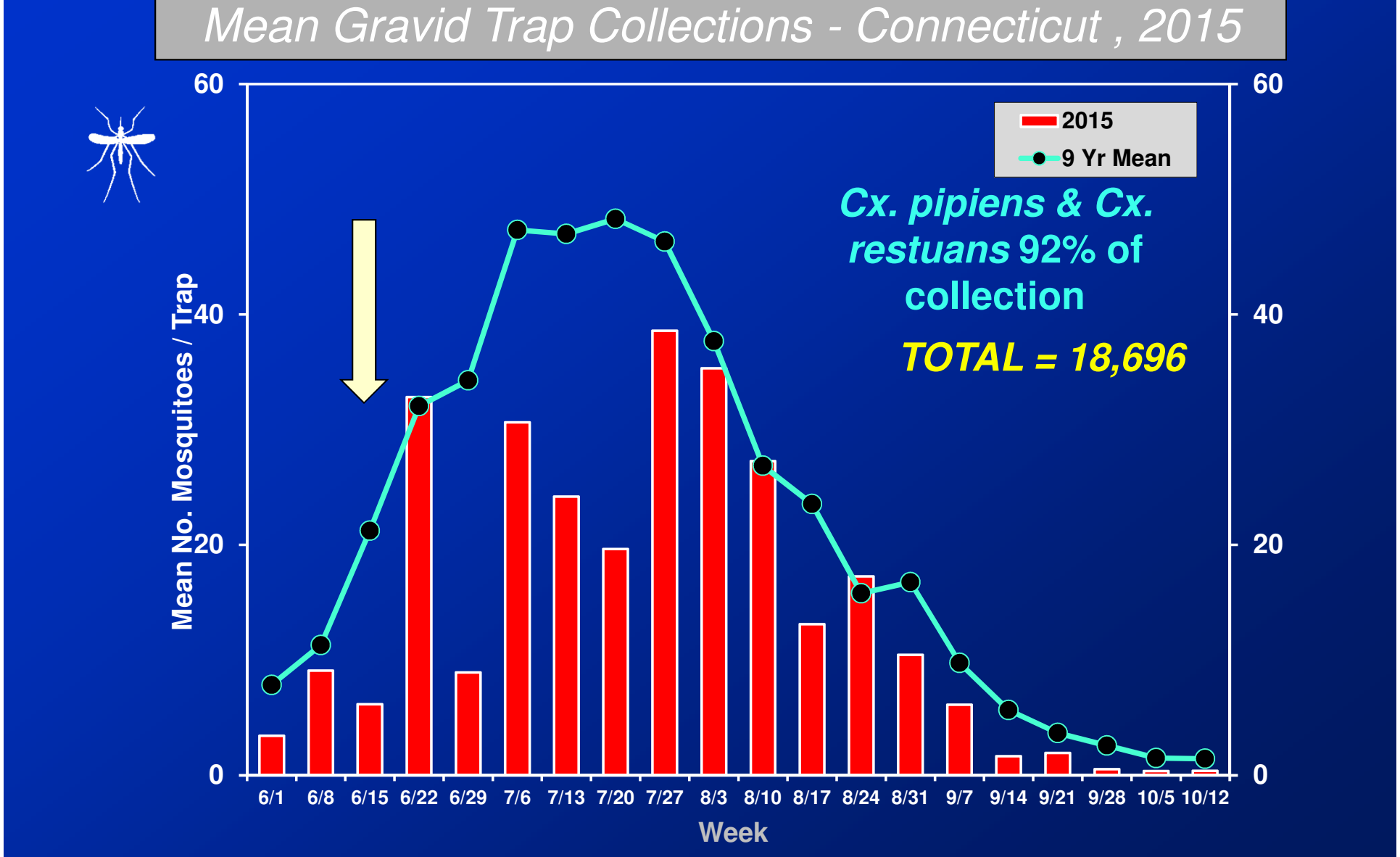
Applied to water where larvae are active or to areas likely to produce mosquitoes (pre-emergent).
Formulations: liquid, granular, pellets, briquettes, WP, EC

- Organophosphates (temephos) – not regist in CT
- Biologicals
  - Bti (Bacillus thuringiensis var. israelensis)
  - Bs (B. sphaericus)
  - Spinosad (Natular®)*
- Insect growth regulators (IGR's)*
  - Methoprene (can't use in coastal zone except in New Haven, PA13-197)

*requires Aquatic permit from DEEP



Timing of application for Culex control



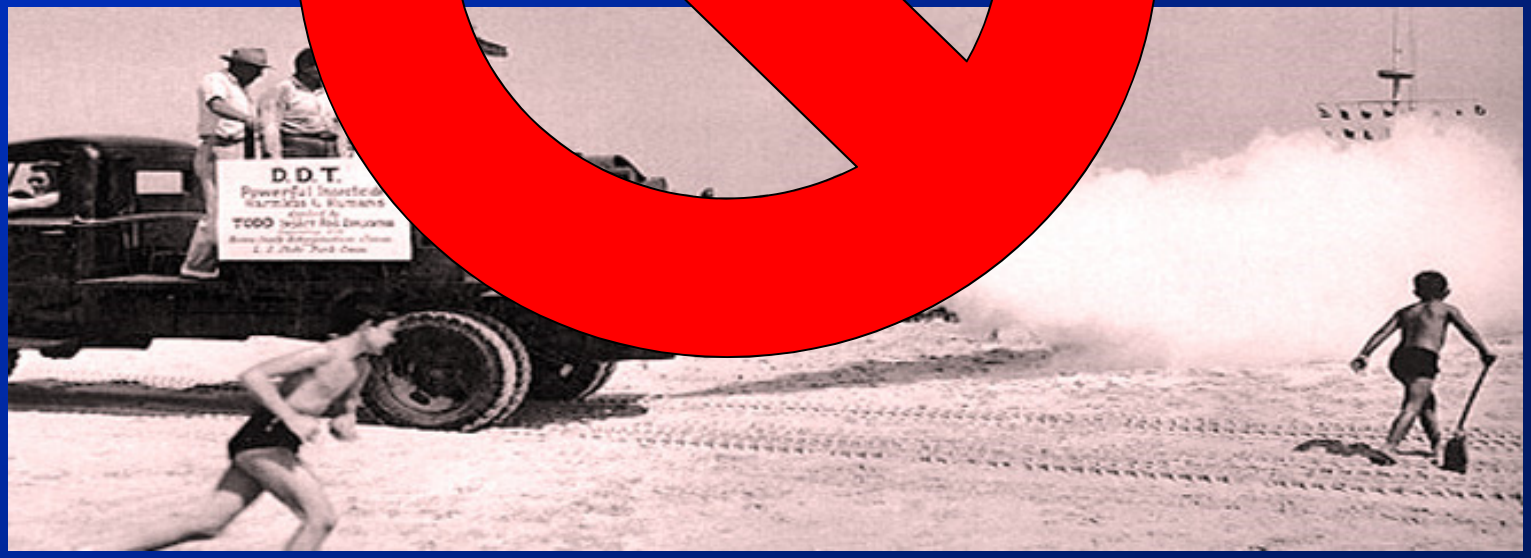
Pupacides

control of pupae and larvae by suffocation

- Surface films (Agnique MMF)
- Oils/alcohols

*requires Aquatic permit from DEEP

Adulticiding (“spraying”)



Adulticiding

Barrier spray

Adulticiding

Ultra low volume (ULV)

Truck mounted spraying

Aerial application

Adulticides

Organophosphates (OP's) - malathion

Natural pyrethrum – derived from chrysanthemums (very expensive)

Synthetic pyrethroids (most anything ending in "thrin"), resmethrin (1st gen syn py); -sumithrin, permethrin, deltamethrin, bifenthrin, etc. Potential for resistance.

Etofenprox (Zenivex®) – an ether vs. an ester.

EPA exempt products (25b)
may not hold up to mnfctr claims

- garlic, essential oils, torches, coils, plants, citronella candles, wristbands, a good cigar
  - buyer beware! CR report.
- "All Natural" doesn't mean all safe
  - arsenic
  - strychnine
  - hemlock (Socrates' "last call")

Other devices and myths

Sonic devices

Mosquito trap/”magnet”

Misting systems

Bug zappers

Bats and birds

Other Biting Flies

Greenhead Fly (Tabanidae)

Coastal saltmarshes

Horse and Deer Flies (Tabanidae)

Brackish and freshwater wetlands/mud

Black Flies (Buffalo gnats) (Simuliidae.)

freshwater streams and rivers

Biting midges ("No-See-Ums") (Ceratopogonidae)

pond bottoms and coastal marshes

Stable Fly (Muscidae)

compost, manure, rotting vegetation


House fly

Want to know more?

CT Mosq. Mgt Program: www.portal.ct.gov/mosquito

Amer. Mosq. Control Assoc: www.mosquito.org

Nat'l Cent. Disease Contr. and Prev: www.cdc.gov

Rutgers Univ (NJMCA): vectorbio.rutgers.edu/outreach

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