

HOW MCDs CHOOSE PRODUCTS

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Mosquito Control Pesticides

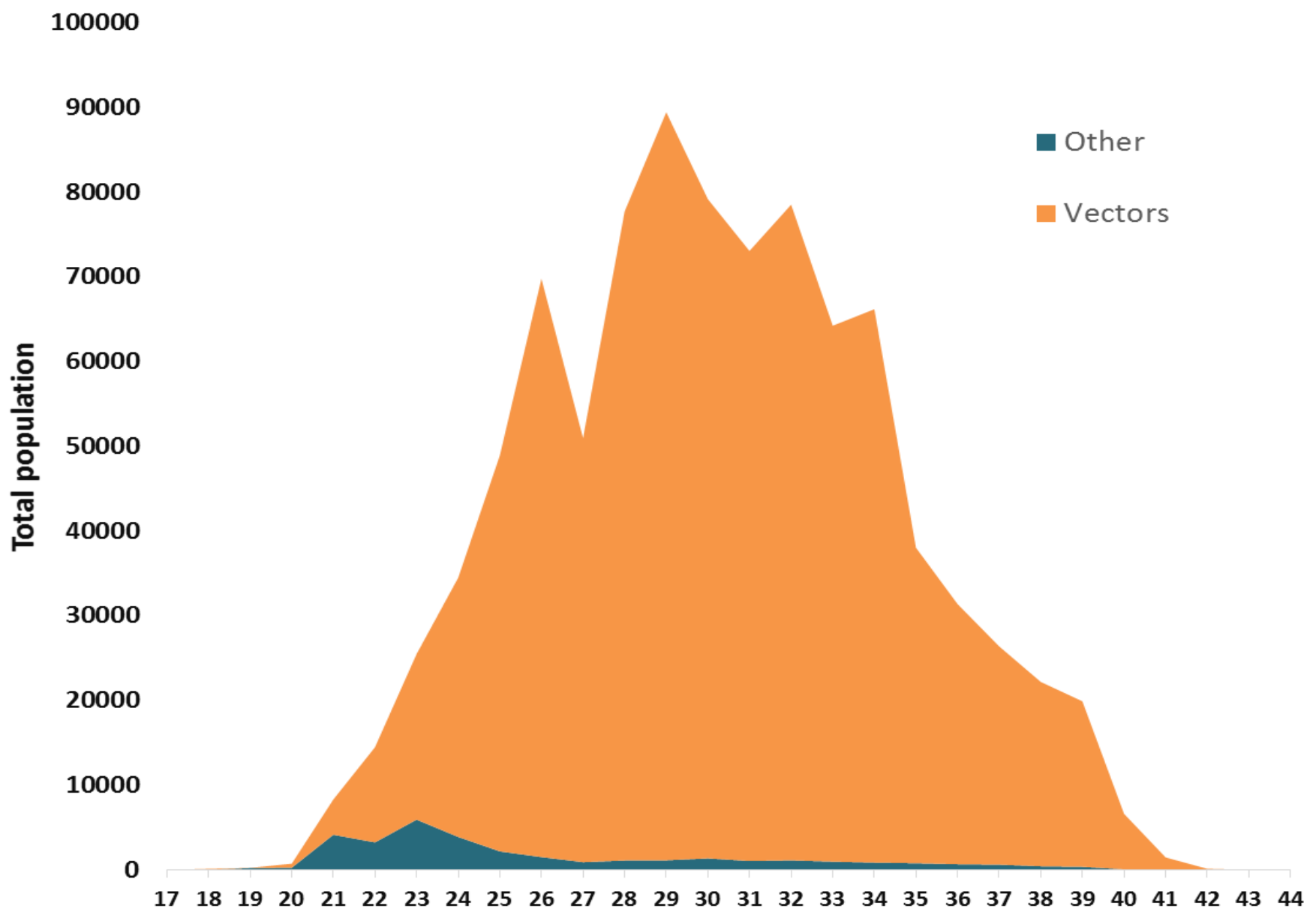
- Registered Federal EPA
- Approved by MA Pesticide Bureau
- Mosquito GEIR/EIR (1998, 2010)
- MDAR/ NHESP MOU (annual update)

Vector definition:

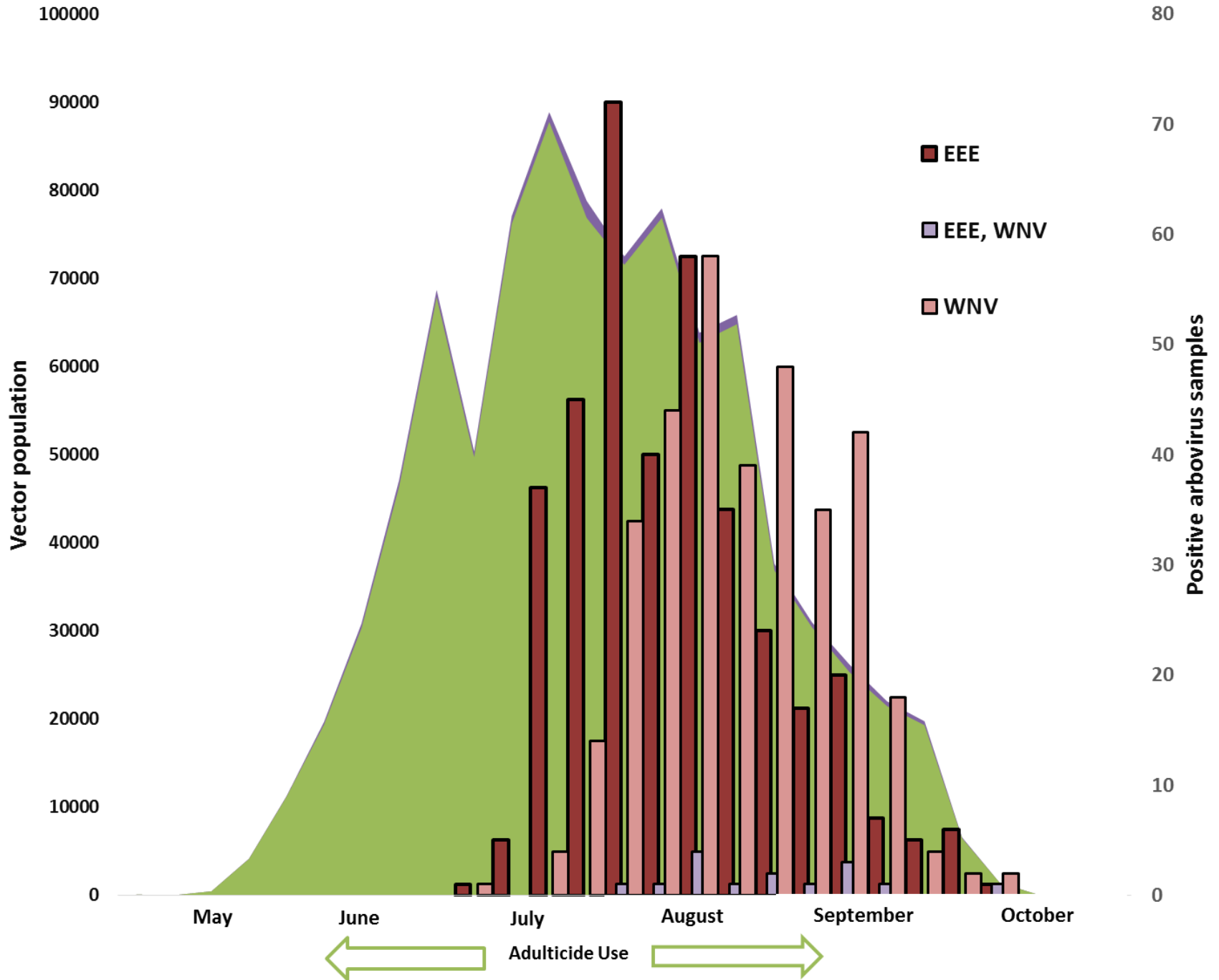
- **Vector- is a living organism that transmits an infectious agent from an infected animal to a human or another animal.**

Competent Vectors in MA

Species	Active period	Eastern Equine Encephalitis (EEE)	West Nile (WNV)	Jamestown Canyon	Other
<i>Aedes abserratus</i>	April-August			x	
<i>Aedes albopictus</i>	May-October	x	x		Chikungunya (CHIKv), Dengue (DENV), <i>Dirofilaria immitis</i> (DI), Zika (ZIKv)
<i>Aedes canadensis</i>	May-October	x	x	x	Cache Valley (CVV), Highlands J (HJV), LaCrosse (LACv)
<i>Aedes cantator</i>	May-October	x	x	x	CVV, HJV
<i>Aedes cinereus</i>	May-October	x	x	x	CVV, HJV
<i>Aedes sollicitans</i>	May-October	x	x	x	CVV
<i>Aedes sticticus</i>	April-August	x	x	x	CVV, Trivittatus (TVT)
<i>Aedes taeniorhynchus</i>	May-October	x	x	x	CVV
<i>Aedes triseriatus</i>	May-October	x	x	x	CVV, HJV
<i>Aedes trivittatus</i>	May-October	x	x	x	CVV, TVT, Potosi (POTv), DI
<i>Aedes vexans</i>	May-October	x	x	x	Japanese Encephalitis (JEV), TVT, Western Equine Encephalitis (WEV), HJV
<i>Anopheles punctipennis</i>	May-October	x	x	x	CVV, HJV, TVT
<i>Anopheles quadrimaculatus</i>	May-October	x	x		CVV, HJV
<i>Anopheles walkerii</i>	May-October	x	x		CVV, HJV
<i>Coquellettidia perturbans</i>	June-October	x	x	x	CVV, Flanders (FLV), HJV, TVT
<i>Culex pipiens</i>	May-October	x	x		St Louis Encephalitis (SLV), WEV, CHIKv, FLV, HJV
<i>Culex restuans</i>	May-October	x	x	x	FLV, HJV
<i>Culex salinarius</i>	May-October	x	x		FLV, HJV
<i>Culiseta melanura</i>	May-October	x	x		CVV, FLV, HJV, WEV
<i>Culiseta morsitans</i>	May-October	x	x	x	HJV
<i>Psorophora ferox</i>	May-October	x	x	x	CVV, HJV, JCV, TVT



Of all species caught in the last 15 years, **95.69%** have been shown to be competent vectors for EEEv, **97.27%** are competent for WNV.



Common Pesticide Classes for Larviciding

B.t.i & B. sphaericus

- Naturally occurring bacteria
- MOA
 - Break down of the bacteria into toxic crystals which when eaten cause the cell wall rupture of the midgut
- Larvae must be feeding

Spinosad

- Naturally occurring bacteria
- MOA
 - Neurotoxin that causes muscles to flex uncontrollably
- Larvae must be feeding

Common Pesticide Classes for Larviciding

Larvicidal Oil

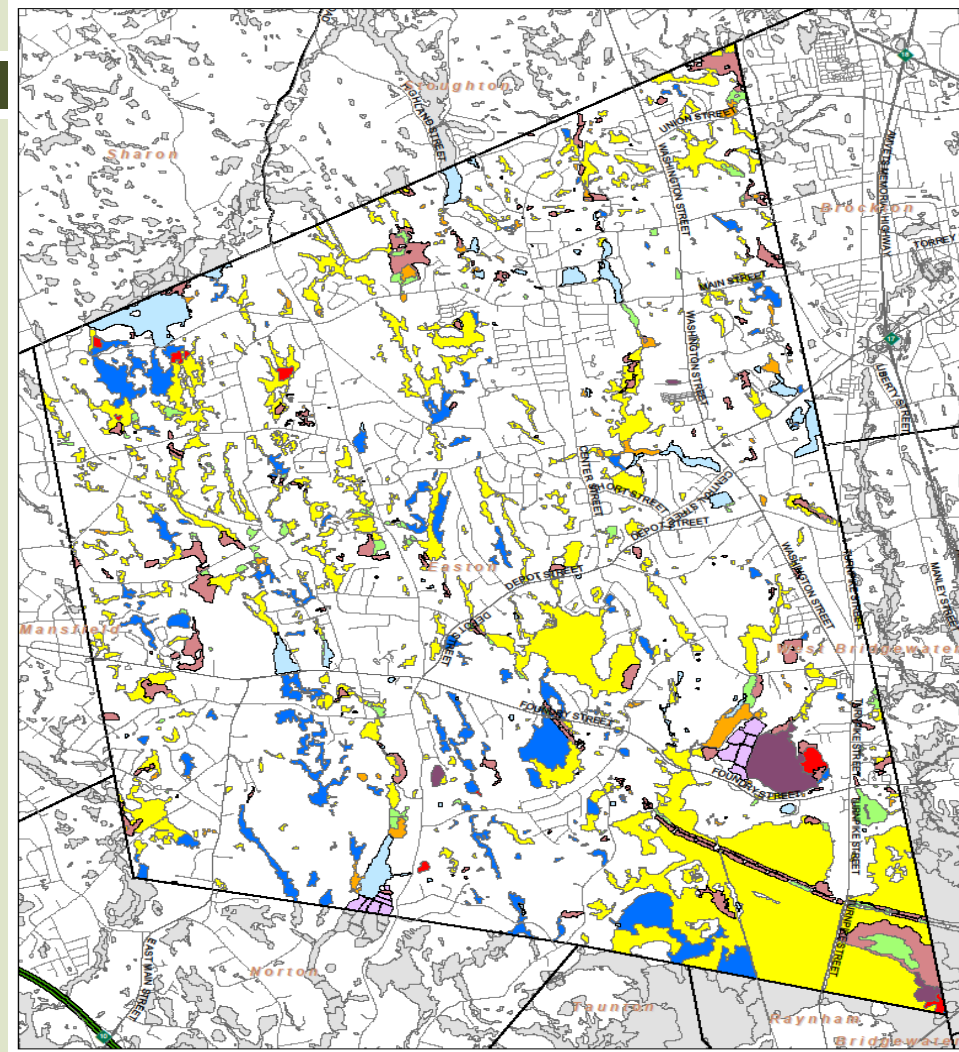
- Petroleum distillates
- MOA
 - Surface film that reduces the surface tension making it difficult for breathing tubes to attach
- Effective against all immature stages

Methoprene

- Insect growth regulator
- MOA
 - Prevents the reduction of juvenile hormone and prevents the larval or pupal development
- Larvae absorbed through the cuticle or ingested

How to choose a larvicide?

- Habitat type
- Size
- Accessibility
- Species
- Instar
- Time of year
- Efficacy



Common Chemical Classes for Adulticiding

Pyrethroids

- A man-made molecule modeled after pyrethrins which are natural insecticides extracted from the chrysanthemum flower.
- MOA
 - Binds to sodium channels resulting in hyperexcitation of the nerve cell.

Common Active Ingredients

- Sumithrin
- Sumithrin & Prallethrin
- Etofenprox

- Synergist-not a pesticide
 - Piperonyl Butoxide

Requires direct contact with the mosquito

ULV Application Guidelines

- Small droplet size
- Low application rate ~ 1.0 oz/acre
- 300ft effective range
- Truck speed: 5-15 mph
- Not less than 50-55°F
- Not while raining
- Not in winds of greater than 10 mph
- Made between Dusk and Dawn
 - Targets mosquitoes' feeding period
 - Atmospheric stability
 - Reduces non-target effects



When to choose an adulticide?

- Accessibility
- Species
- Population size
- Time of year
- Age of mosquito
- Detection of virus
- Rotation/Resistance



Aerial Adulticide

- ANVIL[®] 10 + 10 ULV
 - Product pre-approved by MA working group
 - Product used in 2006, 2010, 2012, 2019 & 2020
- Active Ingredient
 - Sumithrin 10.00% and Piperonyl Butoxide 10.00%
- Rate: 0.62 oz/acre
- Applied using fixed wing

