

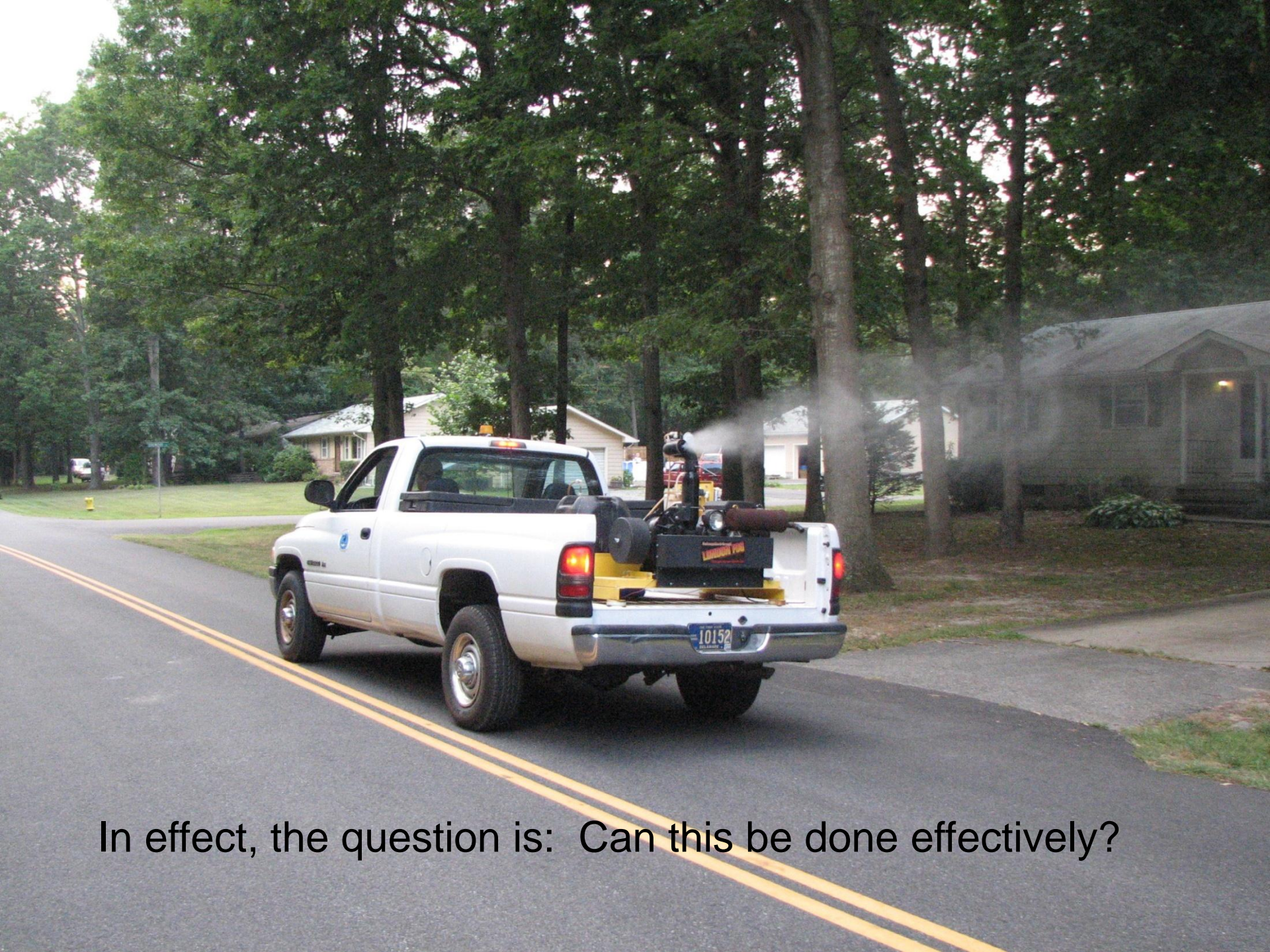


Preliminary Results: Field Trial Evaluations
of an Innovative Technique for Larval
Control of *Aedes albopictus*

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Delaware Mosquito Control

Purpose and Objectives:

- *Aedes albopictus* are becoming the #1 Pest Species in Delaware
- A great nuisance species, potential to transmit disease
- Outside of adulticiding, there are no effective control strategies
- Source Reduction & Public Education is largely a wasted effort; and, hand-applying larvicides to small containers is too labor intensive for large scale population control/reduction.
- Conversations with Peter Connelly at the 2008 MAMCA Meeting led us to believe that traditional larviciding techniques could be modified to target *albopictus*
- Purpose of this Research: Can large geographic areas be larvicided with ULV technology to control *Ae. albopictus*?



In effect, the question is: Can this be done effectively?

Test Methodology: Field Efficacy Trials with Bti

- Test Design: Make Test as Simple as Possible!!
- Installed a 4x3 grid upon a newly cut soybean field (50, 100, 200 & 300 ft intervals)
- London Fog 18-20 was calibrated to deliver 24.2 fl oz Bti per acre (75% label rate) within an assumed 300ft swath
- Pressure was set to 1.5psi to maximize droplet size
- 10 larvae per Petri-dish (mixed instar) placed in an open agricultural field
- Mortality measured at 24 hrs and 48 if necessary
- Triplicate experimental controls were employed

Methodology Cont.

- Spray took place on June 25, 2008; 45 minutes before sunset
- Larvae allowed to remain in test plot for 10 minutes after spraying
- Larvae remained in Petri-dishes during evaluation period
- Controls were employed and handled the exacting manner as treatment





Basic layout of a 3x3 Chemical Test



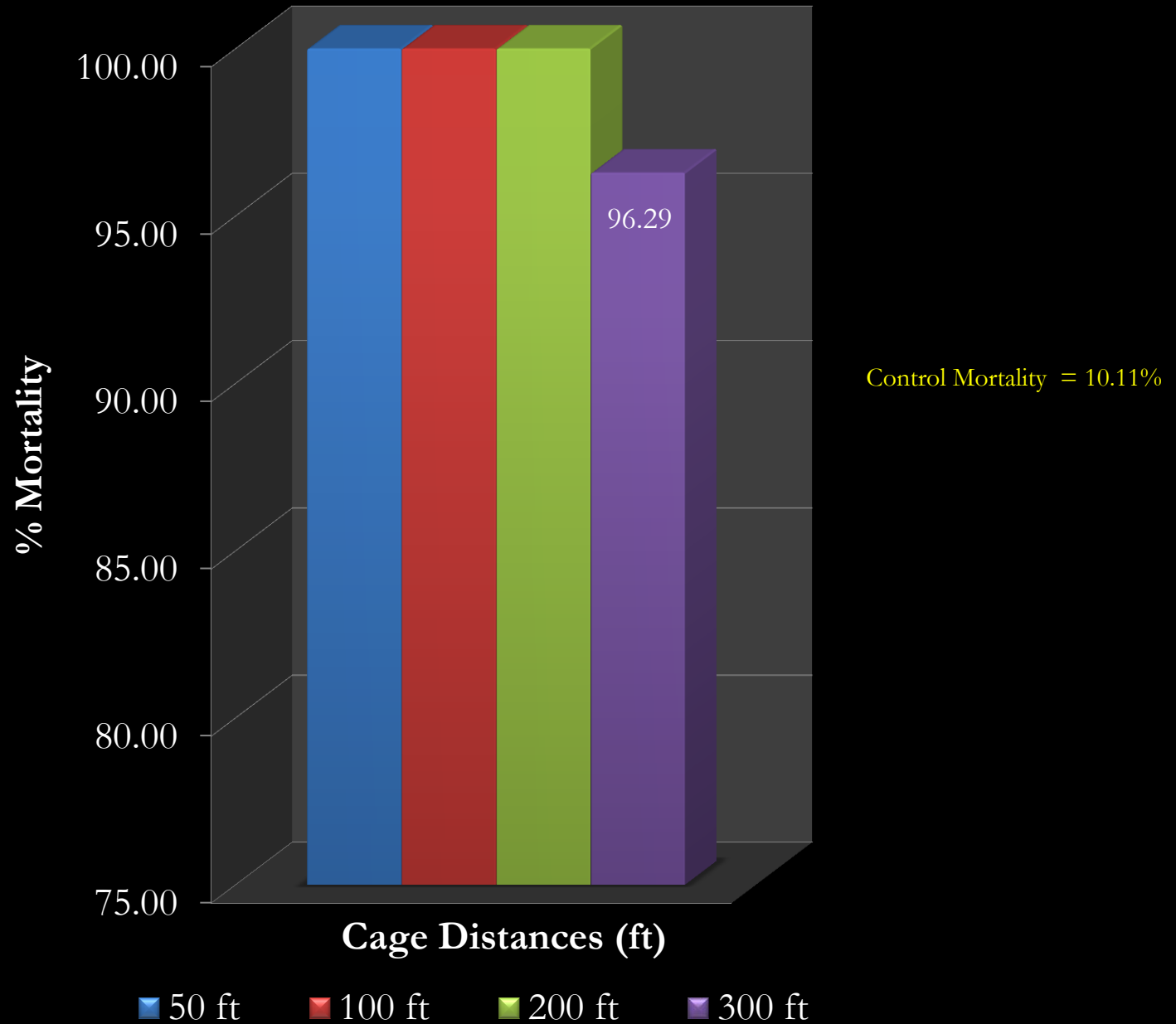


Notice Petri-dishes down-wind of ULV Sprayer

Our Concerns:

- Is an un-encapsulated water-based product too volatile (evaporative) to serve as an effective mosquito control agent?
- What is the dispersal patterns? Swath width?
- What is the behavior of the spray cloud?
- Is the chemical effective upon albopictus?
- Is this a huge waste of time? If not, why are we the 1st to try it?

Vectobac 12AS Field Trial Results; Rate = 24.2 fl. oz/ac; 24hr Mortality



Moving onward.....Make the Test a Little More Difficult

- **Phase 2:** Can we kill albopictus larvae within an obstruction
 - Test Design: Replicate Phase 1 and add an “Obstruction” component
 - Tested upon a 3x3 grid in a newly cut soybean field (100, 200 & 300ft intervals)
 - London Fog 18-20 was re-calibrated to deliver 24.2 fl oz Bti per acre (75% label rate) within an assumed 300ft swath
- Pressure was set to 1.5psi to maximize droplet size
- 10 larvae per Petri-dish (mixed instar**) placed in an open agricultural field
- Mortality measured at 24 hrs and 48 if necessary
- Triplicate experimental controls were employed

(** Caused Problems in interpreting data)



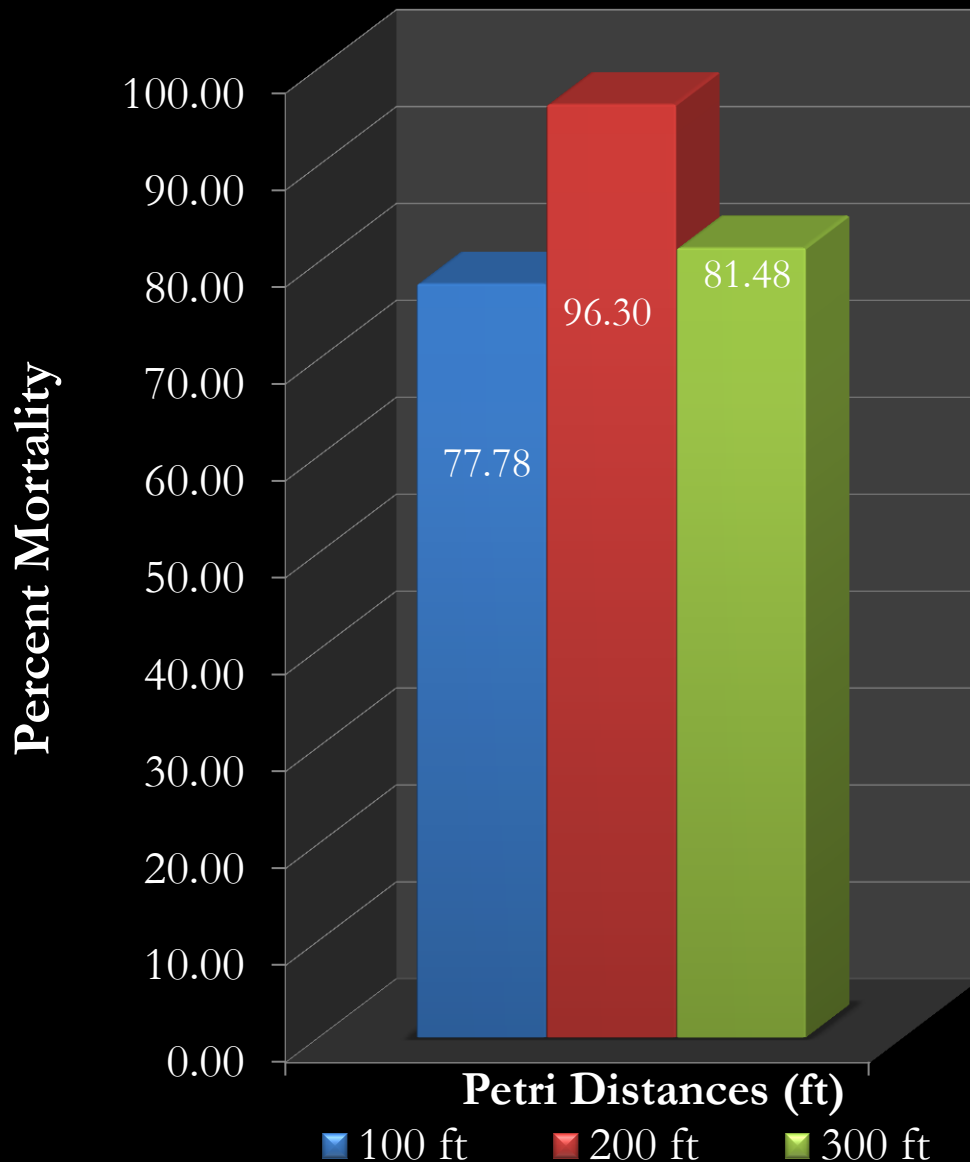








Vectobac 12AS Field Trial
Rate = 24.2 fl. oz/ac; 48hr Mortality
Larvae Located in Petri dish in 5 Gallon Buckets

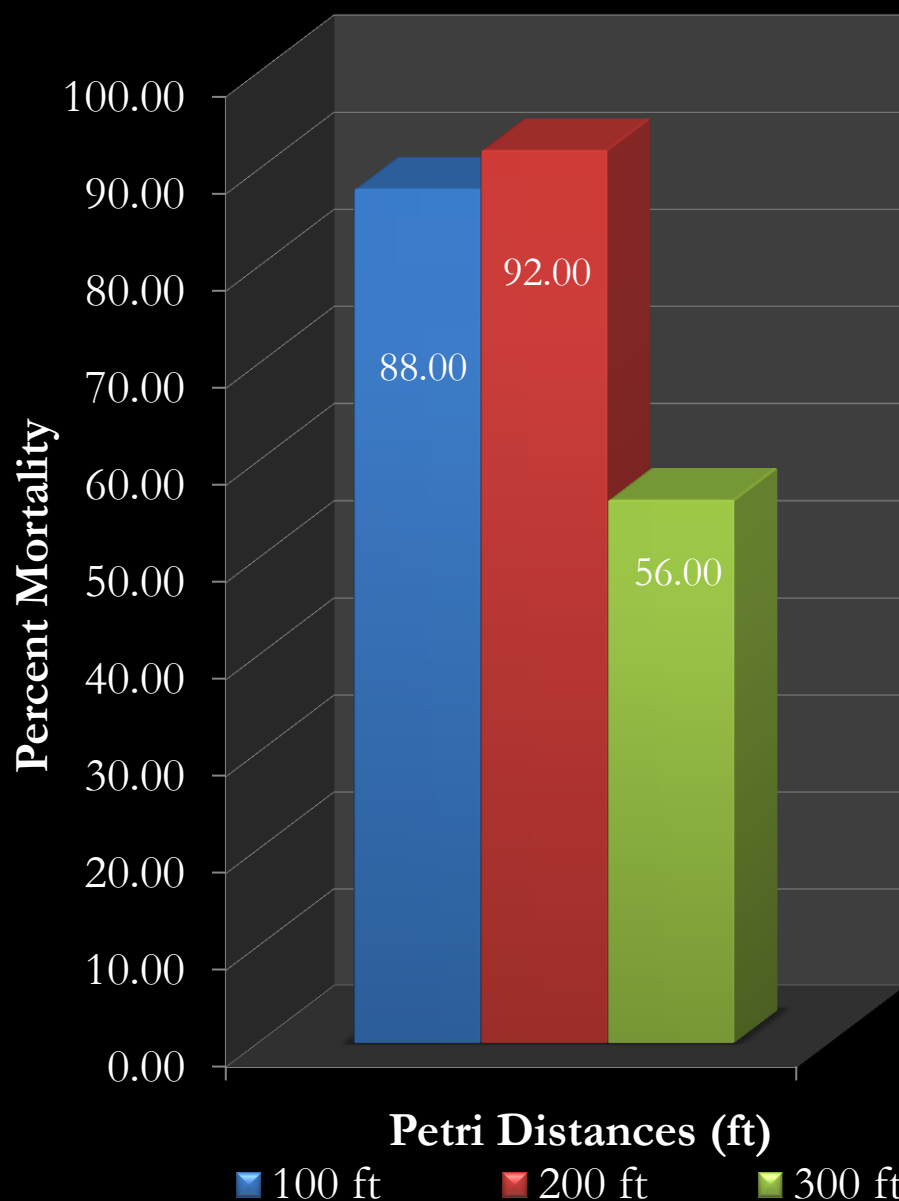


Control Mortality = 10.0%

9% of the Treatment Population had pupated within 48hrs of chemical application

Overall average Mortality = 85.19%

Vectobac 12AS Field Trial
Rate = 24.2 oz/ac; 48hr Mortality
Larvae Located in Petri dish in Open-Air



Control Mortality = 16.67%

11% of the Treatment Population
had pupated within 48hrs of chemical
application

Overall average Mortality = 78.67

But is aerosol Bti an appropriate larvicide to be applied in the public arena? Does it “spot” cars, houses, toys, etc? Will the public accept this form of mosquito control?



In this test, chemical deposition was imperceptible.

But.....





FEAST Bti

What Other Larvicide Options are Available?

- Phase 3: **Methoprene**
- Methoprene can be highly diluted and applied at a lower final dilution rate
- Tests with Methoprene on the “Black-Car” test reveal no perceptible deposition when sprayed within 20 ft
- We had already demonstrated an ability to “kill” mosquitoes with ULV-applied larvicides . As such
- Methoprene was tested within a 200-ac residential community
- Habitat: Semi-wooded, wind sheltered, older community with some yards containing typical albopictus-breeding containers
- Placed a total of 15 300-mL Petri dishes each containing 10-late instar larvae among 5 yards throughout the neighborhood

Methoprene Test Methodology

- Applied with a LF18-20 at 1.5 psi applying 12.1 fl oz/acre and 1.0 fl oz Altosid per acres (max)
- Test performed on 8/19/2008; starting 45 minutes before sunset and finishing at sunset
- Test samples removed from site after spraying complete and transferred to clean emergence cages; fed 10% solution of sucrose water and monitored daily for 16-days
- Controls handled exact manner as treatment





DOMINANT WIND DIRECTION

SITE #3

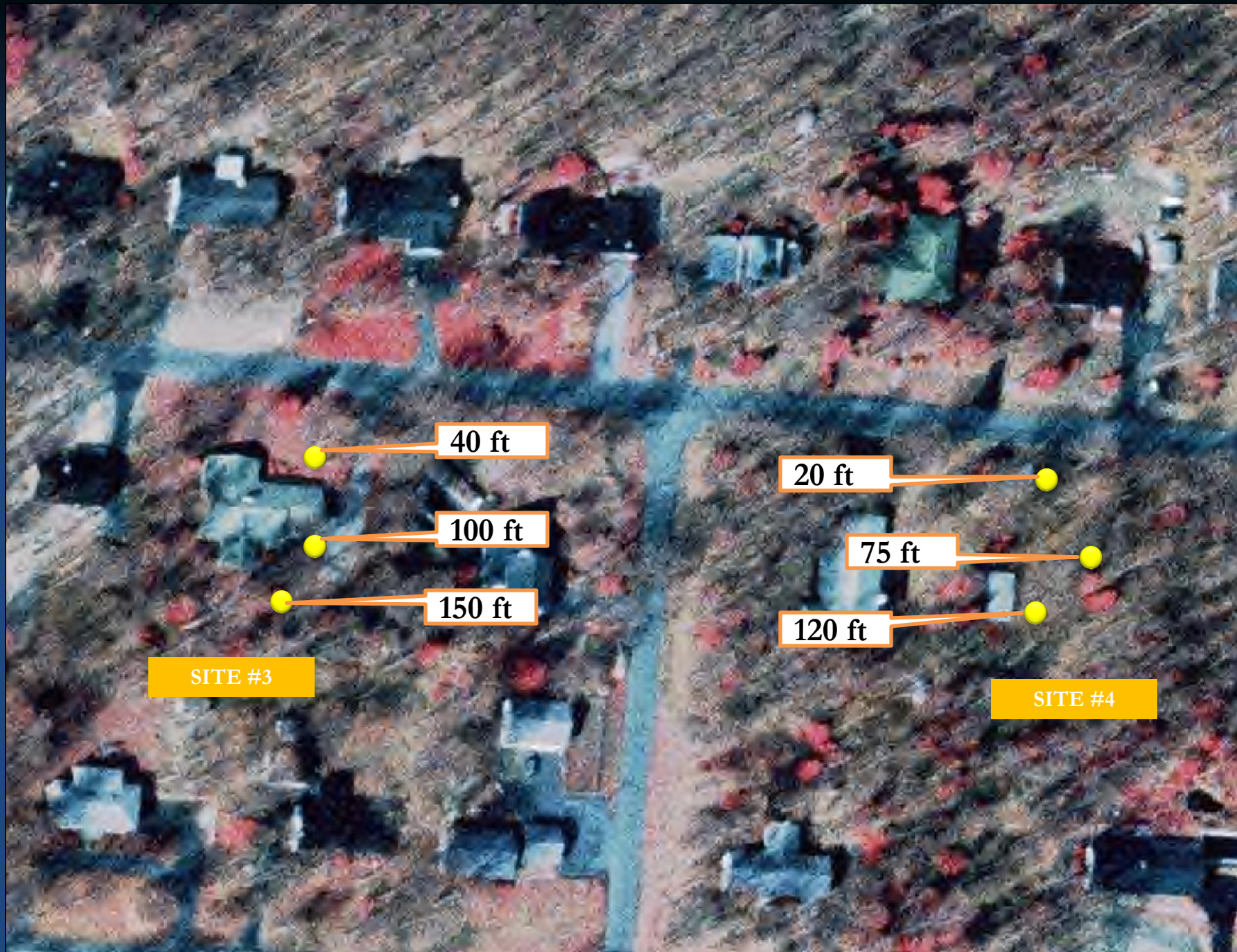
SITE #4

SITE #2

SITE #1

SITE #5





40 ft

100 ft

150 ft

SITE #3

20 ft

75 ft

120 ft

SITE #4









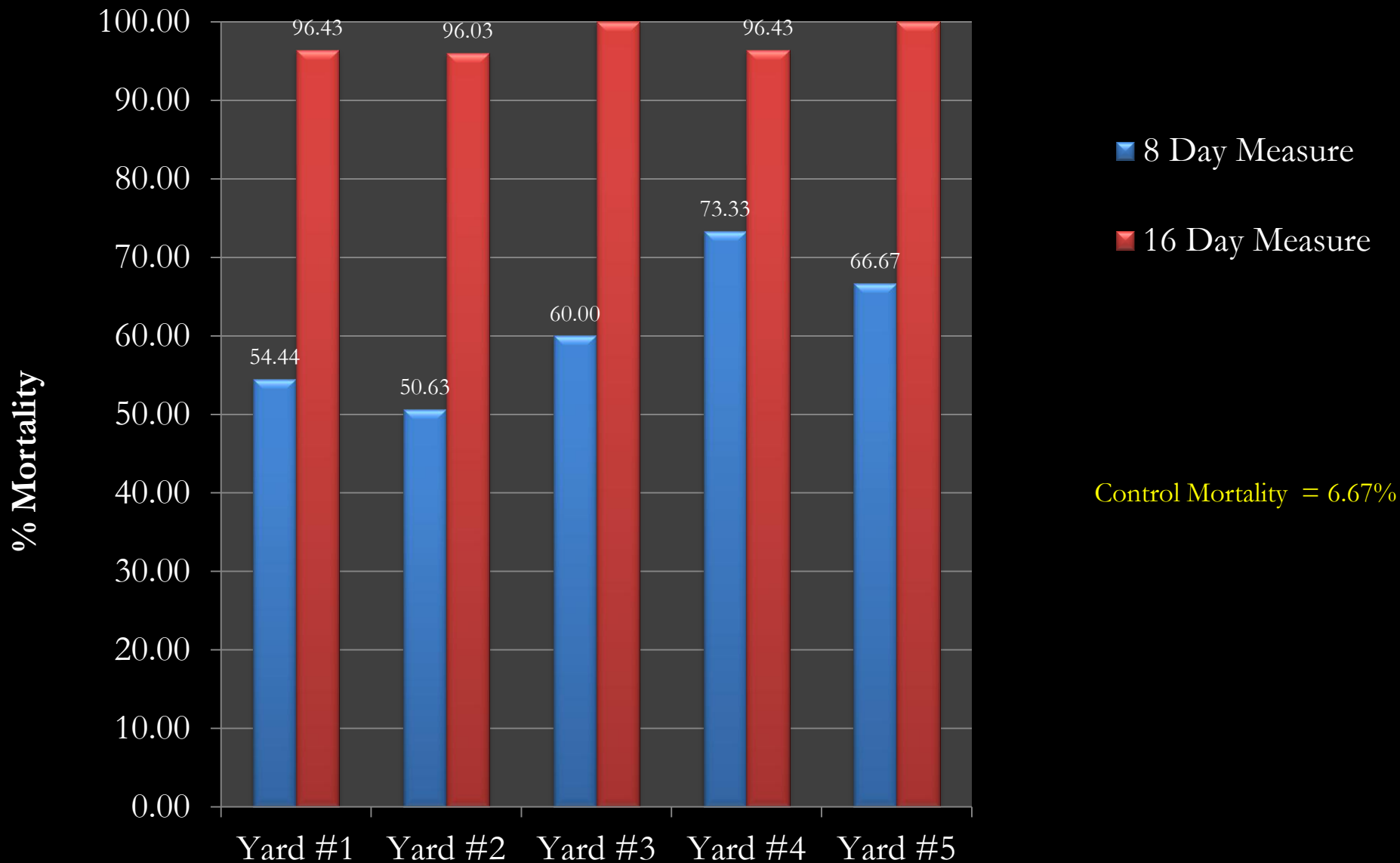






Test Site #4

Aedes albopictus Larvicide Efficacy Trial
Altosid Concentrate, 1.0 fl oz/ac
8/19/2008





Altosid[®]

LIQUID LARVICIDE MOSQUITO GROWTH REGULATOR

Supplemental Labeling

FOR CONTROL OF MOSQUITO LARVAE USING ULV APPLICATION

EPA Reg. No. 2724-392

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

Read the label affixed to the container for **Zoëcon[®] Altosid[®] Liquid Larvicide Mosquito Growth Regulator** before using.

IMPORTANT

Use of **Zoëcon[®] Altosid[®] Liquid Larvicide Mosquito Growth Regulator** according to this labeling is subject to the use precautions and limitations imposed by the label affixed to the container for **Zoëcon[®] Altosid[®] Liquid Larvicide Mosquito Growth Regulator**.

For Control of Mosquito Larvae Using ULV Application:

For ground application to terrestrial sites, apply at the rate of 3 - 4 ounces of product per acre to water-holding containers and other small bodies of water that breed mosquitoes. Use equipment capable of applying a fine mist or ULV. Follow equipment manufacturer's recommendations when making applications. Direct spray applications to sites where mosquitoes breed. These sites include tires and tire piles, potted plants, tree holes, garbage bins, cans, birdbaths, rain barrels, and other water-holding containers and small bodies of water. Reapply as breeding sites become reinfested or when monitoring indicates an increase in adult populations.

For information or in case of emergency, contact 1-800-248-7763. www.altosid.com

This supplemental label expires on **October 6, 2012** and must not be used or distributed after this date.

Registrant:

This labeling must be in the possession of the user at the time of pesticide application.

Wellmark International
1501 East Woodfield Road 2004Y
Schaumburg, Illinois 60173

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November, 2011
Schaumburg, IL

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Altosid®

LIQUID LARVICIDE CONCENTRATE

Supplemental Labeling

FOR CONTROL OF MOSQUITO LARVAE USING ULV APPLICATION

EPA Reg. No. 2724-446

DIRECTIONS FOR USE

It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

Read the label affixed to the container for **Zoëcon® Altosid® Liquid Larvicide Concentrate** before using.

IMPORTANT

Use of **Zoëcon® Altosid® Liquid Larvicide Concentrate** according to this labeling is subject to the use precautions and limitations imposed by the label affixed to the container for **Zoëcon® Altosid® Liquid Larvicide Concentrate**.

For Control of Mosquito Larvae Using ULV Application:

For ground application to terrestrial sites, apply at the rate of $\frac{3}{4}$ - 1 ounce of product per acre to water-holding containers and other small bodies of water that breed mosquitoes. Use equipment capable of applying a fine mist or ULV. Follow equipment manufacturer's recommendations when making applications. Direct spray applications to sites where mosquitoes breed. These sites include tires and tire piles, potted plants, tree holes, garbage bins, cans, birdbaths, rain barrels, and other water-holding containers and small bodies of water. Reapply as breeding sites become reinfested or when monitoring indicates an increase in adult populations.

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Conclusion

- ULV Foggers traditionally designed for adulticide applications can be modified for use to deliver larvicides (lower psi, install larger pumps and plumbing)
- *Aedes albopictus* appear to be tremendously vulnerable to Bti and methoprene
- Bti is likely NOT suitable for public applications via ULV methodologies
- Methoprene shows great promise for continued research and for public arena applications