# Challenges with Container-Inhabiting Invasive *Aedes* Mosquitoes

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Mosquitoes are a state problem
& need a state solution

# Container-Inhabiting Invasive *Aedes* Species

Highly invasive
Major nuisance

Peridomestic

Emergent/efficient vector

Difficult to control

**BIG PEST and PUBLIC HEALTH CONCERN**

# Door-to-door Source Reduction

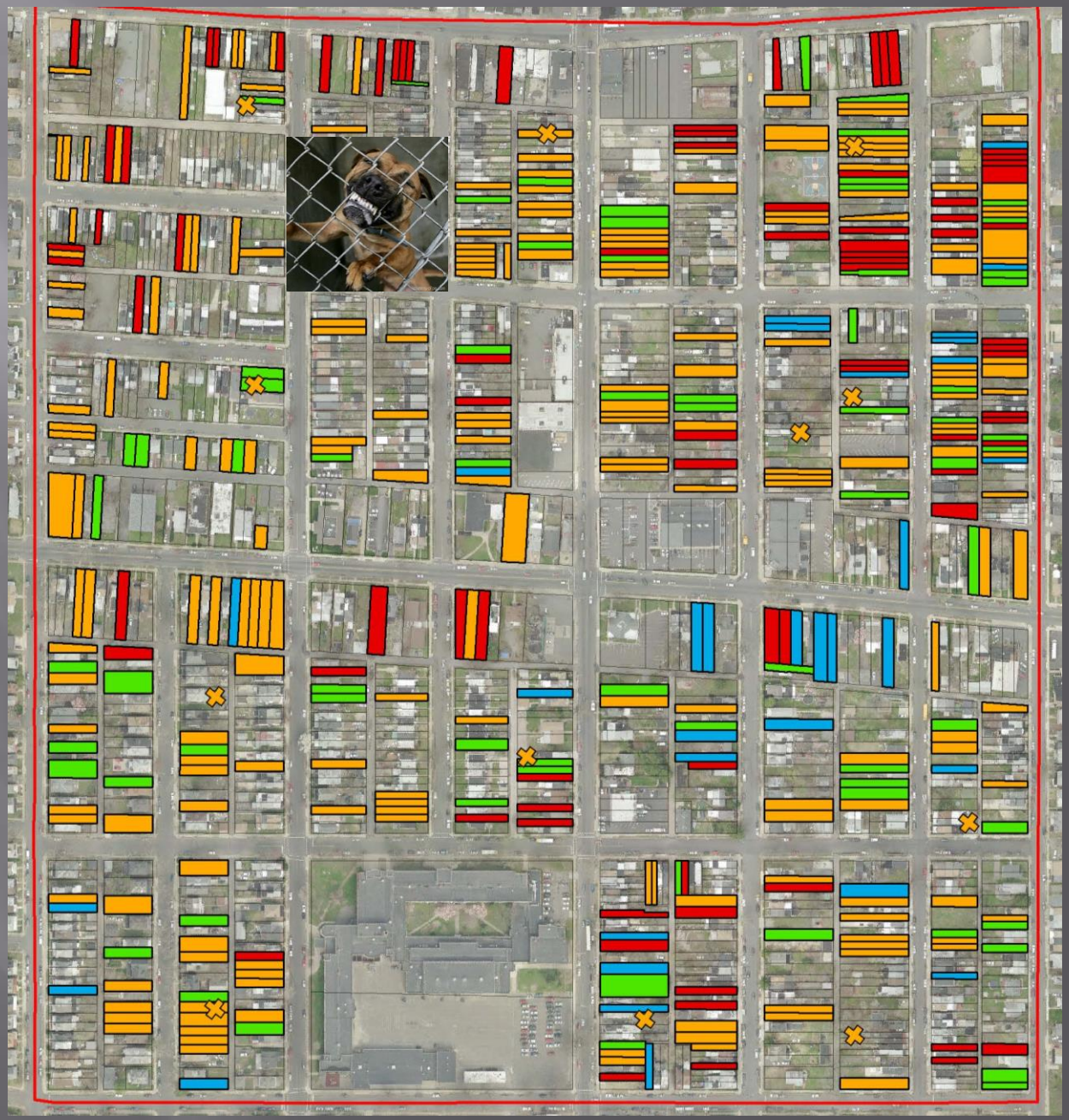
Labor intensive

Time consuming

Demoralizing

Access issues

Recurring trash



# Crouching Tiger, Hidden Trouble: Urban Sources of *Aedes albopictus* (Diptera: Culicidae) Refractory to Source-Reduction

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## Results

We were able to gain access, inspect, and treat 1,248 of the 1,251 parcels in the study site (Figure 1). 66.8% of the parcels were inspected and treated during all five monthly source reduction actions. 83.3% were inspected four times, 94.6% three times, 98.5% twice, and 99.7% at least once. Overall, our actions resulted in a decline in the abundance of adult *Ae. albopictus* in the treated site by more than 75% compared to a matched untreated site [35], indicating a significant impact of the treatments we implemented. A wide variety of container types were present in the community (Table 1). The most abundant containers were small trash items (46.5%) and the

Of 20,039 wet containers inspected, 569 (2.8%) were found positive for mosquito larvae. In all, we identified eight mosquito species, but *Ae. albopictus* was the most common and was collected in 241 (42.3%) of the mosquito-positive containers (Table 1). *Culex pipiens* was the second most common

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PLOS ONE

# Area-Wide Ground Applications of *Bacillus thuringiensis* var. *israelensis* for the Control of *Aedes albopictus* in Residential Neighborhoods: From Optimization to Operation

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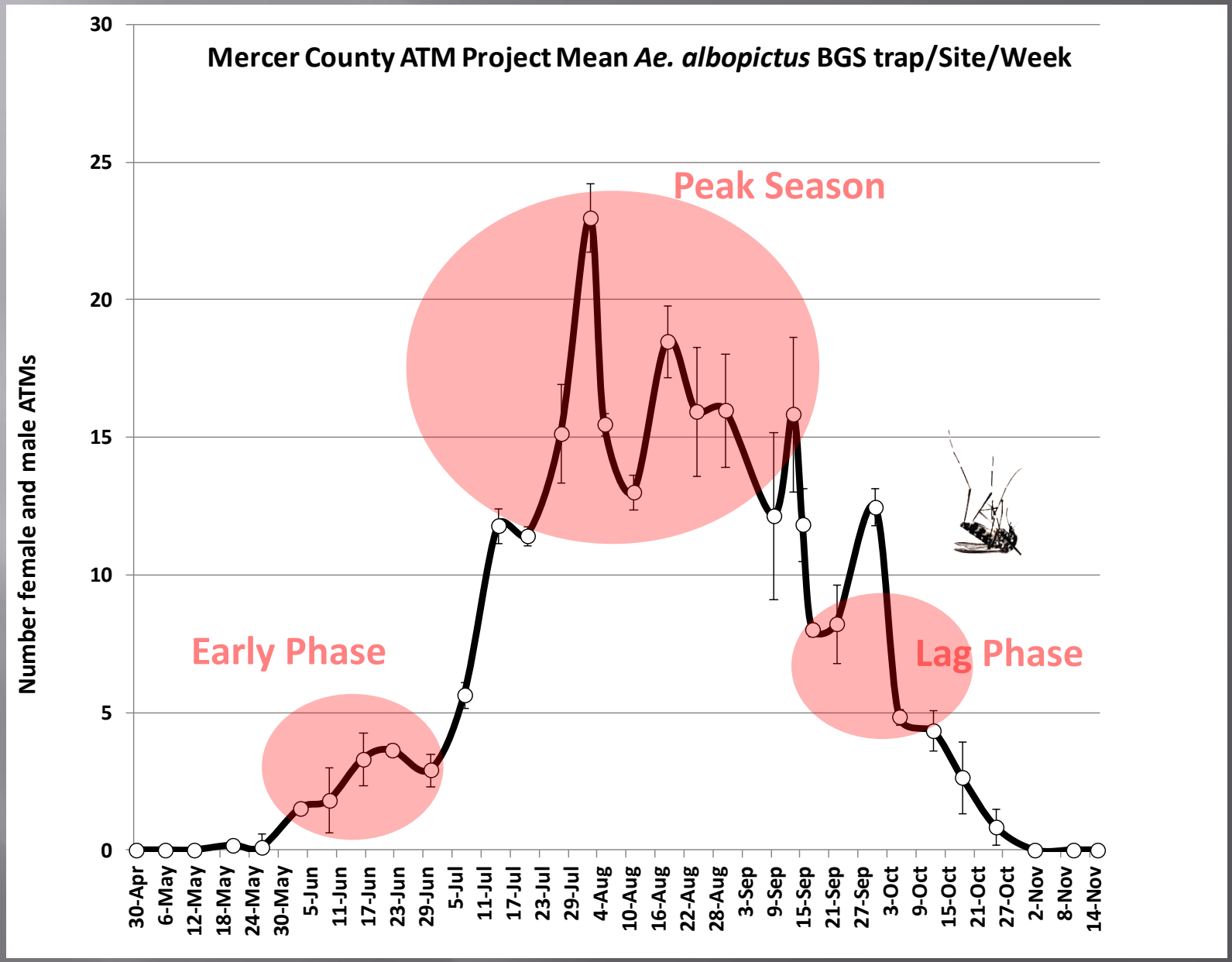
## Abstract

The increasing range of *Aedes albopictus*, the Asian tiger mosquito, in the USA and the threat of chikungunya and dengue outbreaks vectored by this species have necessitated novel approaches to control this peridomestic mosquito. Conventional methods such as adulticiding provide temporary relief, but fail to manage this pest on a sustained basis. We explored the use of cold aerosol foggers and misting machines for area-wide applications of *Bacillus thuringiensis* var. *israelensis* (VectoBac WDG) as a larvicide targeting *Aedes albopictus*. During 2010–2013 we performed initially open field

# 2008-2011 Combined



Research Article

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# Truck-mounted area-wide applications of larvicides and adulticides for extended suppression of adult *Aedes albopictus*

Isik Unlu,[a,b*] Ary Faraji,[a,c] Gregory M Williams,[a,d] Sebastien Marcombe,[a,e] Dina M Fonseca[a] and Randy Gaugler[a]

## Abstract

**BACKGROUND: Given the lack of vaccines for most vector-borne diseases, vector control is often the primary option for disease control. *Aedes albopictus* are difficult to control because the immatures primarily develop in containers ubiquitous in residential properties. Conventional adulticide campaigns often result in brief, rebounding population declines, so incorporating new techniques into an integrated pest management program is imperative. We performed combined area-wide applications of the larvicides *Bacillus thuringiensis* var. *israelensis* and pyriproxyfen with the adulticide sumithrin and prallethrin to achieve extended suppression of *Ae. albopictus* populations in Trenton, NJ, USA. We deployed bioassay cups to assess the spatial penetration and efficacy of the applications.**

**RESULTS: Inhibition of adult emergence was significantly higher in the treatment bioassay cups than in laboratory controls ($z = 4.65$, $P < 0.0001$) and field control bioassay cups ($z = 8.93$, $P < 0.0001$). We observed a lower trend in adult numbers following season-long combined application of pyriproxyfen and adulticide, with numbers of adult *Ae. albopictus* at the treatment site up to five times lower than at the control site.**

**CONCLUSION: Pyriproxyfen is a powerful mosquito larvicide and pupacide with low mammalian toxicity that shows promise**

THE AMERICAN MOSQUITO CONTROL ASSOCIATION

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*American Mosquito Control Association*

January 2017


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