Take Back Our Yards: Using GATs to Control Mosquitoes in Our Town

What is Take Back Our Yards?
A program that started in Puerto Rico and was brought to the US last year, specifically to College Park, MD. It involves the use of GATs, which must be placed in 80% of yards in the town to have the intended effect. Residents must also eliminate potential mosquito breeding sites by eliminating or treating standing water in their yards.

What are potential mosquito breeding sites?
Rain barrels, bird baths, fish ponds, clogged rain gutters, a hole in a tree, horse troughs, wheel barrows, recycle bins, extension pipes on water spouts, open soda cans, the rims of pots, etc.

Why can’t we just spray for the mosquitoes?
Mosquitoes are becoming resistant to insecticides and professional spraying can’t reach backyards. Also, spraying can kill honey bees.

What kind of mosquitoes are we targeting?
Aedes aegypti. They are day-biting mosquitoes that moved into MD in 1995. They transmit Zika, Dengue, and West Nile Virus.

What are the GATs and how do they work?
The effectiveness of the trap depends on removal of other breeding sites. The GATs kill female mosquitoes and their eggs, preventing population growth. If you are concerned about the slight possibility of larvae reaching the water and hatching, you can place ¼ of a mosquito dunk in 3 liters of water in the bucket; however, this is not required.

When should the GATs be placed in our yards?
It is best to start early in the season since the population multiplies exponentially. Our aim is to have the GATs in the yards before April because that is when our mosquito season begins and we want to have them in place to catch the first generation of mosquitoes that appear.

Where can I buy a GAT?
They will be sold at the presentation taking place on March 25, 2017, at The South Mountain Heritage Society, 3 E. Main St., at 4pm. You can also purchase them through Rachel (ramcmaho@syr.edu) and Rebecca (newtling@aol.com).

How much do the GATs cost?
$17 for one, if you purchase two, the cost is $30. GATs are being made available at cost to residents.

How many should I purchase?
Our aim is to have at least one per yard, but the more you have, the more mosquitoes you will eliminate.

Do I need to do any maintenance on the GATs?
Yes, you should spray the dome with canola oil and clear out the dead mosquitoes at least once a month. You should check the GATs regularly to ensure that they have not tipped over and still have enough water in the bottom to be effective.

Are viruses like Zika, Dengue, and West Nile really a concern for me and my neighbors?
Yes, as of February 2017, there have been 4,091 cases of Zika, 164 of which were in MD. From 1999-2015 the US had 43,937 cases of West Nile virus and MD had 328 cases.

Where can I find more information?
If you would like more information regarding the health risks associated with mosquitoes you can visit:
https://www.cdc.gov/features/stopmosquitoes/
https://www.cdc.gov/niosh/topics/outdoor/mosquito-borne/
http://phpa.dhmh.maryland.gov/pages/west-nile.aspx

If you want more information regarding the GATs, or would like to order more if the town runs out, you can visit:

The instruction manual for GAT traps is included here:
The BG-GAT trap was developed by Dr. A.E. Eiras from the Universidade Federal de Minas Gerais, Belo Horizonte, Brazil and Prof. Scott Ritchie from the James Cook University, Cairns, Queensland 4870, Australia.

Publications:


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**Table of Contents**

Function .................................................................................................................................................. 3

Product Components ............................................................................................................................... 4

Assembling the Trap ............................................................................................................................... 5

Removal of the Mosquitoes .................................................................................................................... 8

Maintenance ........................................................................................................................................ 8

Positioning .......................................................................................................................................... 8

Technical Data .................................................................................................................................... 8

Contact ............................................................................................................................................. 8
Female mosquitoes are attracted by water and oviposition cues and enter the transparent chamber through the funnel. Once in the chamber mosquitoes try to escape through the translucent windows where they are exposed to oil/insecticide. The catch bag provides a barrier between mosquitoes and the infused water as well as retains dead mosquitoes.

To kill the mosquitoes, a killing agent (e.g., canola oil or a residual surface spray insecticide) can be applied to the inner wall of the translucent chamber:

1) A thin film of cooking oil can be wiped on the inside of the translucent chamber. The oil “wets” the wings of the mosquitoes, making flight impossible. We recommend a neutral oil like canola and vegetable oil. You can also use the aerosolised versions of these oils. Avoid using light or flavored oils such as olive oil, sesame oil and walnut oil as they may inhibit entry.

2) Alternatively you can use residual surface spray insecticides that will kill mosquitoes through contact (for example Mortein Outdoor Barrier Surface Spray, imiprothrin 0.3 g/kg and 0.6 g/kg deltamethrin Reckitt Bensckiser Pty. Ltd.).

3) Another option is to place a sticky card into the transparent chamber.

Do not spray the black bucket or entry funnel. This will repel mosquitoes! Retreat the translucent chamber monthly.

1 Heringer et al. (2016): Evaluation of alternative killing agents for Aedes aegypti in the Gravid Aedes Trap (GAT). Journal of Medical Entomology (submitted)
Product Components

1. Catch bag

2. Funnel

3. Transparent chamber

4. Black bucket with drainage holes
Assembling the Trap

1. Unpack all parts and check if everything is there.

2. Fill the black bucket with water up to the drainage holes (about 3 liters). Insert hay infusion (for example 10 g of dry hay\(^2\) [F1]), or other organic materials (for example 1 g of rabbit chow per litre or 10 mg of alfalfa pellets per liter) as oviposition attractants. If you want to add additional lures like the BG-Lure, pop out the white Biogents disc from the hole in the transparent chamber [F2] and place the BG-Lure cartridge into the hole. If you don’t use the BG-Lure anymore, make sure that the hole is plugged so that the mosquitoes cannot escape. Mosquitoes will lay eggs through the mesh. Therefore it is a good idea to prevent larval development e.g. with Bti or an insect growth regulator such as methoprene pellets in the water.

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Please note:
The smell of the new plastic of the traps might have repellent effects on the mosquitoes. Therefore, we recommend to store the traps with some water outside for two weeks before using them in the field to get rid of the smell.

3. To kill the mosquitoes, we recommend two options that can be applied to the inner wall of the translucent chamber:

**Option 1: Cooking oil\(^1\)**

A thin film of cooking oil can be wiped on the inside of the translucent chamber [F3]. The oil “wets” the wings of the mosquitoes, making flight impossible. We recommend a neutral oil like canola and vegetable oil. Alternatively you can use the aerosolised versions of these oils. Avoid using light or flavored oils such as olive oil, sesame oil and walnut oil as they may inhibit entry.

**Option 2: Residual surface insecticides**

A killing agent (e.g., residual surface spray insecticide) can be applied to the inner wall of the translucent chamber [F4] to kill mosquitoes through contact (for example Mortein Outdoor Barrier Surface Spray, imiprothrin 0.3 g/kg and 0.6 g/kg deltamethrin Reckitt Bensckiser Pty. Ltd.). Do not spray the black bucket or entry funnel. This will repel mosquitoes!

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\(^1\) Heringer et al. (2016): Evaluation of alternative killing agents for *Aedes aegypti* in the Gravid *Aedes* Trap (GAT), Journal of Medical Entomology (submitted)

4. Put the catch bag over the open end of the transparent chamber. Tighten the top part of the catch bag by pulling the cord of the bag tightly [F5 - F7]. You should attach the catch bag with the seam facing outwards in order to avoid mosquitoes getting stuck in the seam.
5. Insert the funnel in the chamber [F8].

6. Rotate the funnel clockwise to secure it [F9].

7. Mount the trap by placing the funnel and transparent chamber on the black, water filled trap bucket [F10].
Removal of the Mosquitoes

Identification is complicated if the insects stay in the trap for more than a week and dry out or if they get wet.

Removal of the mosquitoes:
Remove the funnel.

For direct sorting / identification in the field: Loosen the catch bag and remove it from the transparent chamber. Mosquitoes can then be removed with forceps or poured into a white tray for sorting.

For returning the catch to the lab (e.g. for identification/classification): Loosen the catch bag and remove it from the transparent chamber. Then close the net by pulling the cord of the catch bag tightly shut [F11]. It is best to put the catch bag in a freezer for at least an hour to kill the mosquitoes. Put a new catch bag over the open end of the transparent chamber as described in F5 - F7.

Positioning

The black colour of the BG-GAT attracts mosquitoes from some distance. So, the trap needs to be placed where it is readily visible, but protected from rain. Please do not hide the BG-GAT in the bushes!

Important: Ensure that the trap is sheltered from rainfall.

Even though rainfall does not damage the trap, there are some negative effects of rain:
- The mosquitoes can be damaged and difficult to identify.
- Mosquitoes avoid rain and prefer sheltered positions. In sheltered positions the catch rate can therefore be higher.

If you don’t find a naturally sheltered position for the trap, it would be best to position the trap under a roofed area, or a self-made shelter to keep it out of direct rainfall.

Technical Data

Weight: 0.6 kg
Dimension: 27 x 38.5 cm

Contact

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Further information about the BG-GAT: