

SAM™ SERVICES

SUSCEPTIBILITY ASSESSMENT MAPPING

The true picture of species susceptibility
within a wide area program.



*“Courage is knowing what
not to fear.”*

PLATO

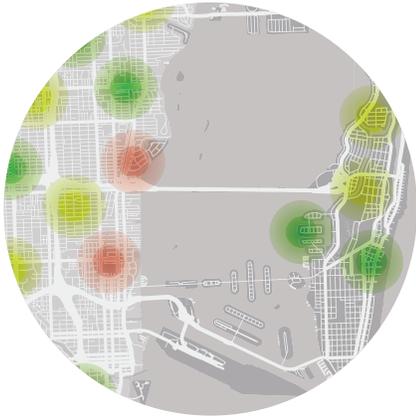
Who would have ever guessed that a truth spoken over 1,600 years ago would apply to mosquito control programs today?

The lack of adulticide choices with different modes of action legitimately gives public health professionals reason for concern. Every director fears developing resistance within their local mosquito populations.

It is also quite typical to hear of “resistance” as being area-wide or even regional in nature. Yet Zika’s emergence in 2016 led us to understand mosquito populations at a block-to-block level. And in doing so, **Clarke discovered susceptibility to an adulticide can vary by species and by neighborhood.** Knowledge gained from SAM™ can allay that fear.

SAM™

SUSCEPTIBILITY ASSESSMENT MAPPING



DIAGNOSTIC DOSE >>

The dose of insecticide that kills 100% of susceptible mosquitoes within a given time.

Six steps to a better understanding of how susceptible your mosquito populations are to the adulticides you're using

The process for conducting SAM™ is simple.

1. Assess

Clarke will work first with any historical surveillance data you have to understand the species mix within your district. We'll also assess geographic and land use variabilities that can impact population concentrations.

2. Select

With this information, sites for larvae and egg collection will be selected to best reflect the species of your district.

3. Collect

Eggs and/or larvae (species dependent) will then be collected by Clarke and overnighted to our partner lab at the USDA in Gainesville, FL.

4. Rear

The USDA lab will rear an F1 and F2 generation of each species selected for evaluation.

5. Assay

At the same time the F1 generation is being reared, a susceptible lab colony species matching those collected in your district will be used in a bottle bioassay with formulated products of your choice. This is done to determine the diagnostic dose (DD) and diagnostic time (DT) for each species with each formulation you choose to test. With this data, the F1 and F2 generations will be tested at the same dose ranges used to determine the DD.

6. Report Findings

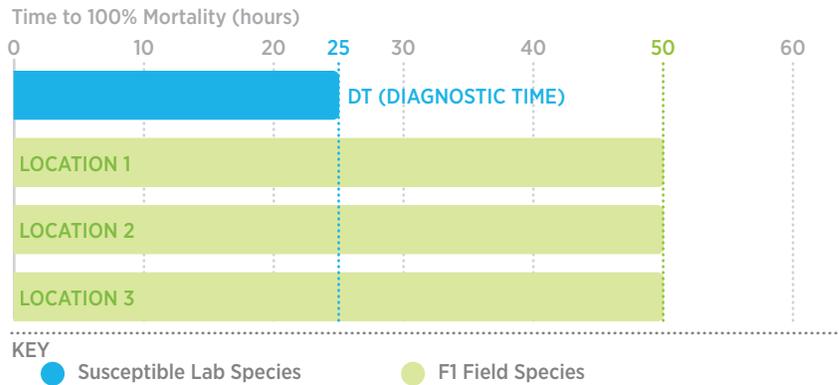
The more sites, species and formulations tested, the more meaningful insight will be. Look to the opposite page for an example of what can be revealed. Note the DT varies between products. Time to 100% control for varies, **but is achieved**. So the question to ask is: **is the delay in diagnostic time between the lab and field species** enough to concern you?

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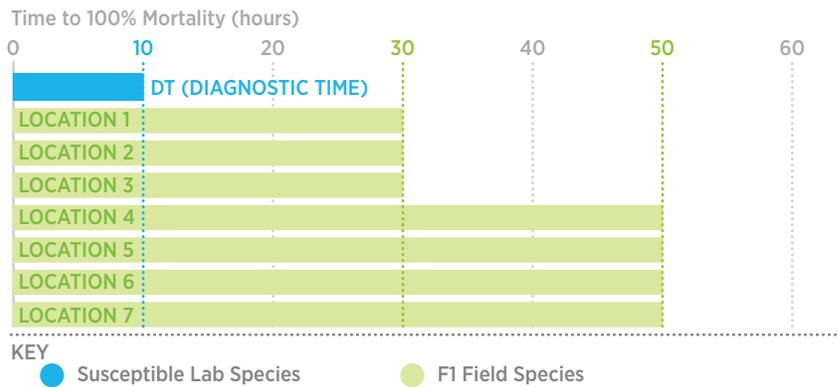
RESULTS EXAMPLE

From a study of 14 locations and three formulated products, this selection of results demonstrates the type of real variability found. The key lesson learned was: **Susceptibility to an adulticide varies neighborhood to neighborhood**, regardless of the active ingredients of class chemistry.

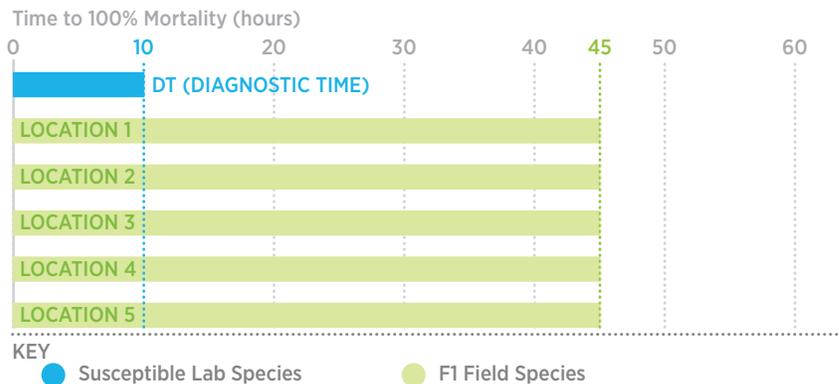
Organophosphate + Pyrethroid



Pyrethroid



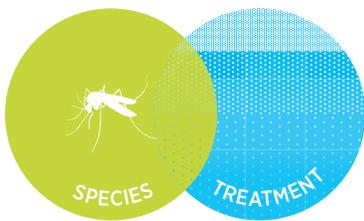
Pyrethrin



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HOW TO USE SAM™ DATA

SAM™ is a quick and efficient way to paint a **relative performance picture** between products in multiple areas throughout your district and against multiple species.



SAM™ is *not* a definitive tool to tell whether or not the natural population of mosquitoes in the test area “have resistance.” SAM™ provides a comparative understanding of the local population’s susceptibility to a specific adulticide formulation.

Questions to ask when reviewing SAM™ data

Are there any locations where you are falling below an acceptable control level for your district? And, what is your threshold?

Is the time to 100% control the same for a given species in all locations? If not, understanding why is a next step.

Is there variability in results by location for a given product? If so, understanding why is important, and might suggest a product rotation.

Next steps

It is possible SAM™ may show strong product performance against the species tested. If so, you maintain your current course of adulticide usage.

If SAM™ results raise a yellow flag, the next best step is to do a field trial. It is the only absolute way to verify the level of product susceptibility in a local mosquito population.



*Making communities around the world
more livable, safe and comfortable.*

The World Needs



Mosquito Control

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Clarke is a public health company that makes communities around the world more livable, safe and comfortable by pioneering, developing and delivering environmentally responsible disease prevention and habitat management solutions.

In 2008, Clarke founded The Clarke Cares Foundation, a non-profit created to provide disease prevention support for communities with critical needs.

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