ADAPCO
more in control℠
550 Aero Lane
Sanford, FL 32771

Mosquito bytes

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Product SPOTLIGHT...

AGNIQUE® MMF

AGNIQUE® MMF Mosquito Control Products have been evolving to offer more choice in delivering surface films to mosquito producing habitats. First introduced as a 100% active liquid, the options were limited to package size to accommodate different use patterns. For treating large areas of standing water, AGNIQUE® MMF is available in 53-gallon drums, 275-gallon totes or bulk. For smaller areas, it is available in 2.5 gallon jugs and 1 qt spray bottles. The benefits are the same regardless of package size. MMF is delivered ready-to-use in a highly refined, colorless and odorless state that quickly spreads to give an invisible surface film. Low dosing (0.2 – 1 gallon/acre) and film persistence (14 days on average) give cost effective control of larvae, pupae and emerging adults with low non-target impact. And MMF has no habitat restrictions (even labeled for potable water). MMF attacks a critical point in mosquito control, the presence of pupae. If pupae are present, you either treat with a surface film, or wait for adults to take flight.

The AGNIQUE® MMF product line expanded in 2009 with MMF G, a 32% granule. Dean Oester, Business Development Manager for the AGNIQUE® MMF brand says "formulating 32% active liquid in a granule that releases quickly when applied to water was not a trivial task. In fact, 32% liquid in a granule formulation pushed granulation technology to a new level." MMF G provides the benefits of the liquid while also offering the industry the first granular pupicide. MMF G will broadcast 50 feet or more with a Maruyama or similar equipment, and easily penetrates vegetation; getting MMF to the water's surface.

In 2010, the MMF label was amended with new dilution language. The specified solvent, called MMF Diluent, is a natural, renewable solvent, so there are no restrictions to the allowed habitats. Dilution is not for everyone, but for equipment designed to apply higher volume output, MMF can now be conveniently diluted to fall within those operational parameters.

And something new for 2011 will be MMF G in a water soluble packet, called PAK 35. PAK 35 will be an easy to apply, pre-measured delivery system. Each packet will treat up to 160 sq. ft. of surface, making it ideal for catch basins, ponds, pools and other small areas of standing water. "The AGNIQUE® MMF product line is committed to the mission of protecting public health, safely and responsibly", says Oester.

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A Letter from Chris Pederson

Here we are again, closing out yet another calendar year. Although 2010 was a drier than normal year for most of Florida, we had many counties reporting virus activity. Mosquito counts were low, but due to the heavy virus activity, districts were busy monitoring species and treating populated areas. Fewer than normal aerial adulticide missions were required because of the isolation of the viruses. The response was larviciding and ground ULV applications, along with public education.

Next year could present some challenges for our industry. Feel confident that ADAPCO has the essential tools to help your program comply with new NPDES laws, such as our GeoPro and Monitor line of products. With the threat of indispensable products being taken from our toolbox, I'd like to say thank you to those who have expressed support for the re-registration of Resmethrin. As an industry we need to continue to fight to keep all of our active ingredients available.

ADAPCO will continue to support our partnering vendors and offer our customers effective products to help protect public health, such as Zenivex RTU and Spheratax SPH 50G WSP, which we introduced in 2010. As highlighted in our latest Product Spotlight article, we're pleased to announce the availability of Agnique MMF G in a water-soluble packet for 2011.

ADAPCO continually prides itself on offering you quality customer service. As the year comes to an end, and anytime you need our support, please don't hesitate to contact me with any and all of your mosquito control needs. Thank you for your partnership this year. It gives me great pleasure to work with such dedicated professionals and I look forward to the challenges we will face in 2011.

Happy Holidays from ADAPCO!
Chris Pederson
ADAPCO Sales Representative

Getting the Most Out the RAMP® Laboratory Assay

Over the past decade, Response Biomedical's Rapid Analyte Measurement Platform (RAMP®) has been widely adopted across the country as the "assay of choice" by hundreds of mosquito control agencies for the identification of West Nile Virus in feral mosquito pools. Over the past decade we have collected and compiled a significant amount of data and experiences from RAMP users. As a result we have compiled a comprehensive users' experience whitepaper to enhance the effective use of RAMP. Highlighted below are a few high points from RAMP user experiences:

Sample Considerations

- Mosquitoes with blood-engorged abdomens should be excluded.
- If a delay in preparing mosquito homogenates is anticipated, store mosquitoes at (-20°C).
- Mosquitoes should be frozen in batches of 50 mosquitoes or less.
- Supernatant samples should be run as soon as possible after preparation; however they can be stored in refrigerated conditions (2 to 8°C) for a maximum of 24 hours.
- Samples should be allowed to equilibrate to room temperature before testing.

Assay Preparation and Technique

- Vortex the mosquitoes until a completely homogenized mixture is achieved.
- Centrifuge samples sufficiently to ensure 100% of the mosquito parts are out of the liquid phase.
- The mixing within the Assay Tip must be performed slowly and deliberately 10 times. The sample has been properly mixed when the pink spot disappears from the Assay Tip.
- You must ensure there are no bubbles introduced into the Sample Buffer during mixing or when the sample is dispensed into the Test Cartridge.
- The buffer solution is specific to the test kit lot. Do not interchange buffer solutions among kits.
- Use of expired kits is not recommended and will result in erroneous data.

Results Interpretation

- Many RAMP customers have incorporated a user defined threshold and "grey zone" for making operational decisions that is based on an operational risk evaluation. Anything below the "grey zone" is assumed to be negative; anything above the "grey zone" is assumed to be positive; and they submit only those samples that fall within the "grey zone" for RT-PCR confirmation.
- Your treatment or notification thresholds should be considered when determining what threshold and values to set for your "grey zone", as well as considering how to operationally handle the samples that fall into the "grey zone" in the absence of prompt RT-PCR confirmation.
- Contact ADAPCO for additional recommendations on setting a user defined threshold.

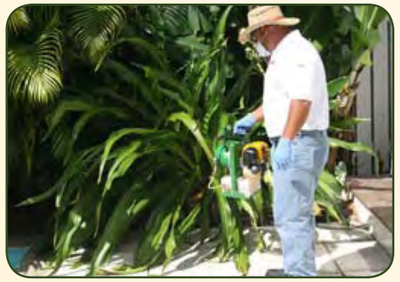
RT-PCR Confirmation

- There is a very specific protocol required to verify RAMP samples with PCR. Any deviation from the required procedure will result erroneous confirmations.

We will be more than happy to supply additional information upon request via email at info@myadapco.com. We encourage all users to share their experiences and make available to us any correlation data so we can continue to improve the availability of information to all users.

A District Deals with Dengue

The significant amounts of rainfall in the Florida Keys this year were not from the typical threat of hurricane season the Keys are so accustomed to; but the rain brought a new threat: dengue fever. The Key West dengue outbreak produced 27 confirmed cases in 2009 and 56 confirmed cases so far in 2010.



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There's no doubt the Florida Keys Mosquito Control District runs a successful operation. As Director Ed Fussell proudly states, "We are the only program I know of that operates in a national marine sanctuary, conducting Bti larval control in protected wilderness areas." Fussell attributes this to the District's high level of competence and good control techniques. In addition, the District's extensive surveillance program, comprised of 44 dedicated inspectors, has successfully prevented the Aedes albopictus species from becoming established in the Keys and hopes to similarly control the dengue vector, Aedes aegypti, using all available resources.

However, the dengue outbreak meant that traditional control methods for salt marsh mosquitoes of aerial adulticiding using Dibrom and larviciding using Bti granular products would no longer be sufficient. For the District, protecting the 100 square miles of the Keys from dengue-transmitting Aedes aegypti presented a domestic problem: the mosquitoes breed around citizens' homes looking to feed on humans.

Mikki Coss, Domestic Program Supervisor, explains that the expansion of the District's domestic program was critical in attacking dengue-transmitting mosquitoes. "We added 8 more inspectors this year, so now 23 inspectors go door-to-door, doing their best to get into every property throughout the Keys." The team inspects artificial containers around homes, tree holes and garbage cans, going through each yard and eliminating any standing water they find. Plus, there are inspectors that focus solely on drains -- with more than 4,000 drains in Key West alone that breed continually. The domestic program is critical, because it's the only control method that reaches mosquitoes inside the homes.

The Florida Keys Mosquito Control District was being presented with yet another challenge.

Amidst the dengue outbreak, the District recognized Permethrin seemed to have become less effective, recognizably slower in acting on adults and no longer reliable in killing the Aedes aegypti. The District is not wasting any time taking precautions in the

event the resistance increases: they have already begun using chlorpyrifos in hand-held adulticide units and will continue laboratory testing on alternative products. The District understands the importance of protecting active ingredients, so that tools are available when resistance occurs. Deputy Director Andrea Leal emphasizes the importance of resistance monitoring, "We do testing once a year on products that are used regularly to see what the local mosquito population is doing versus a known susceptible population."

The Florida Keys Mosquito Control District has high hopes that its 80 full time and 25 part time employees will be successful in protecting the population from dengue fever in the coming year. With the help of a new larviciding program they have been testing, the District will be able to execute helicopter spraying using a new Bti formulation to attack the Aedes aegypti larvae. In fact, the District will be the first in the U.S. to use the new WDG formulation as a means to controlling Aedes aegypti by aerial larviciding.

Mosquito Overwintering Strategies

Daniel Markowski, PhD
Vice-President
Vector Disease Control, Inc.

As the season winds down for us, we all want to take some time off and rest. Likewise, mosquitoes go into their own form of offseason hibernation. Understanding the various overwintering strategies of various mosquito species can often lead to better control practices in the spring. As we all know, mosquitoes have 4 life stages: egg, larva, pupa, and adult. Depending upon the species and sometimes climate, they can successfully survive the winter in the egg, larval or adult stage.

Mosquito dormancy is prevalent in all temperate climates where the year round climate does not support year-round development. Several factors, especially the latitude, will determine the duration of dormancy. Dormancy is the result of the mosquito entering a state of diapause. Diapause refers to a physiological state of arrested development induced by specific environmental cues, such as decreasing daylight hours and decreasing temperatures.

Species of Aedes, Ochlerotatus, and Psorophora will typically overwinter in the egg stage. There are 2 types of diapause in eggs – facultative and obligate. Facultative egg diapause is a feature of many multivoltine species and is induced when pupae or adults are exposed to lower temperatures and shorter light cycles. These species will lay diapause eggs which will not hatch until the proper photoperiod is restored in the spring, despite periods of warmer weather during the winter. Knowledge of your local mosquito species and their appropriate photoperiod for ending diapause can be instrumental in developing early season larval surveillance schedules.

Obligate egg diapause is a characteristic of univoltine species and refers to diapause that occurs regardless of current temperature and light cycles patterns. This type of egg diapause is typical of snowpool Ochlerotatus species. Diapause begins regardless of summer temperatures and is broken only after the eggs have experienced the cold winter temperatures followed by an appropriate light cycle.

Some Anopheles, Culiseta, Ochlerotatus, and Coquillettidia species overwinter in the larval stage and are able to survive in habitats with frozen surface water. Larval diapause is induced by similar environmental cues as in facultative egg diapause. During the winter months, larval metabolism is greatly reduced; subsequently, larval development is halted. Typically, larval overwintering takes place in the 3rd and 4th instar stages and in breeding sites that do not completely freeze or freeze for only a short time. Therefore, for larval overwintering species, a severely cold winter can cause high mortality rates. Hence, if these species are of concern in your area, a warm winter can lead to more spring larviciding than expected. However, keep in mind that overwintering larvae are

largely metabolically inactive and feed only minimally, so early season use of microbials may have limited success.

Anopheles, Culex, Culiseta, and Uranotaenia will often overwinter as adults. When larvae and pupae are exposed to cooler temperatures and shortening light cycles, the resultant adult females will enter a state of reproductive diapause. Shortly upon emerging, they'll seek out hibernating shelters (hibernaculae) that typically remain free of frost such as caves, stables, rodent burrows, cellars, and sewer systems. The females will almost always mate and sugar feed to develop internal fat reserves. However, their eggs do not reach the resting stage. Although diapausing Culex will rarely feed on blood prior to entering hibernaculae, Anopheles regularly take blood meals from nearby hosts. Fall and winter surveys can be conducted to locate the primary locations of overwintering mosquitoes. Adulticide treatments can then be made to these structures during the winter or very early spring; thereby, reducing the number of adult mosquitoes emerging with warmer temperatures. For example while in New York City, our program regularly inspected and treated known hibernaculae in Fort Totten, Queens, in an effort to reduce the number of overewintering, WNV-infected Culex.

So while sitting back this winter enjoying the quiet and peace of the off season, it's a good idea to consider the mosquito species present in your area and how they may be overwintering themselves. Getting a jump on them while they're hibernating can lead to a more effective control program when the weather warms and we all begin to emerge from our often self-imposed hibernations