



Pest Need To Knows

Brought to you by the Bayer Pest Practices Team





Temprid[®] FX and Bed Bug Heat Treatments

by Joe Barile, BCE, Technical Service Lead, Pest Management & Public Health, Bayer Environmental Science

Many Pest Management Professionals (PMPs) have incorporated 'heat treatment' into their bed bug management service. Although heat can be effective in killing exposed bed bugs, it is difficult to promise eradication of the infestation using heat alone.

In heated areas, bed bugs will actively seek out 'cold sinks', areas that don't reach mortal temperatures. These survival harborage include wall voids, under carpets, and inside furniture hollows. PMPs agree that even when using heat, applications of residual insecticide liquids and dusts are required to provide successful bed bug elimination.

Heat treatments generally raise room temperatures to 120°-140° Fahrenheit, and hold the elevated temperatures for a period of four, or more, hours. Some PMPs have expressed concern over the impact these environmental conditions have on residual deposits of liquid insecticides and dust formulations.

Bayer has addressed issues where confusion between data read from product Material Data Safety Sheets (MSDS) was

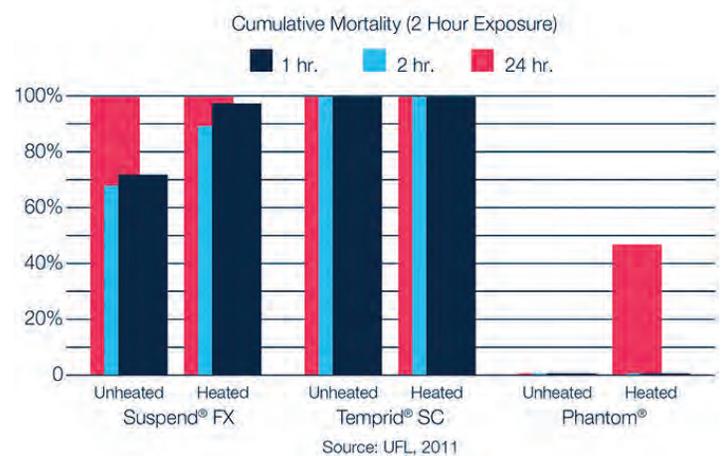
incorrectly interpreted between Fahrenheit and Centigrade (Celsius) scales. Reading the melting point of an active ingredient off a MSDS may initially cause concern where it may occur at a temperature that appears to fall in a heat treatment range. However, melting points on Bayer's MSDS are reported in degrees Centigrade. A melting point of 140°C is equivalent to 284°F, well below the effective temperature range of a bed bug heat treatment.

A research trial was performed by University of Florida researchers Dr. Phil Koehler and Dr. Roberto Pereira in June, 2011. In this trial, applications of residual insecticides and dusts were made on wood panels and allowed to dry (liquids) overnight. Half of the treated panels were exposed for eight hours to a temperature of 140°F. The heated panels were then allowed to acclimate back to room temperature overnight. Bed bugs were placed in arenas on both the heated and unheated treated panels, allowed to remain on the treated surfaces for two hours and then removed to a clean, untreated arena. The number of dead, knocked down, and live bed bugs were observed and recorded after exposure.



The conclusions of the trial are clear:

- // The eight-hour exposure to 140°F is a robust simulation of actual practice in heat remediation, where heat exposure typically only lasts for 3-4 hours and temperatures rarely exceed 125°F.
- // No liquid insecticide applied to the wood surface and then subjected to artificial heating, suffered any degradation of efficacy.
- // Complete mortality was provided at 24 HAT by all liquid treatments (including Temprid® FX, except Phantom®).
- // None of the dust formulations were negatively affected by the heating regime.



PMPs can apply Temprid FX and Bayer dusts before heat treatments with full confidence that they will benefit from the full performance potential that our products deliver.

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Brown Recluse Spider Management

by Gary Branness, Ph.D

The brown recluse spider, *Loxosceles reclusa*, is the most common and important species of *Loxosceles* spider in North America. These spiders are most common in the south-central United States (Fig. 1), although they may occur outside this natural range when transported in goods.

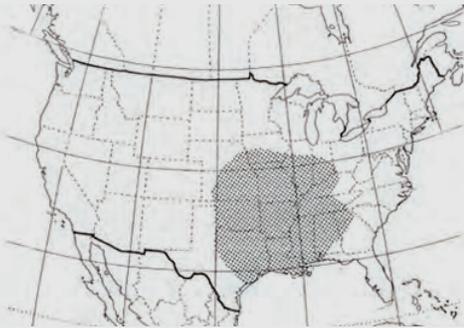


Fig. 1. Distribution of the brown recluse spider. (Illustration by R. Vetter, University of California-Riverside).

Brown recluse spiders usually have a dark brown violin-shaped marking on the upper portion of their bodies. Sometimes this marking is faded or missing, especially in young spiders. A sure way to identify the brown recluse is to carefully observe the eyes. Brown recluse spiders have six eyes that are paired and arranged in a half circle (Fig. 2).



Fig. 2. Close-up of the brown recluse spider. (Photo by J. Castner, University of Florida)

The brown recluse spider is best known for its bite and the ulcerous sore that develops (Fig. 3). The bite itself is usually painless, but after several hours intense pain and inflammation develops around the bite. After a few days, an ulcerous sore may form. This sore may become quite large and extend into underlying tissues. Healing is often a slow process. Seek medical attention if you believe you have been bitten by this spider. No specific anti-venom is available, but other treatments will help in healing. If possible, capture the spider so that a proper identification can be made.



Fig. 3. Ulcerous sore following the bite of the brown recluse.

Biology and Habits

Brown recluse spiders are long-lived, with a life span of two to four years. They feed on live and dead insects. Male spiders travel a much greater area within structures than females. Brown recluse spiders produce webs that are thin and have no definite pattern. Infestations of brown recluse spiders vary greatly in size. Vetter and Barger (2002) reported that more than 2,000 brown recluse spiders were collected during a six-month period from an older home in Lenexa, Kansas. As part of the same study, 30 spiders were collected from a home in Tulsa, Oklahoma. Amazingly, none of the residents in these homes were bitten by the spiders.



Need To Know Pest Management & Public Health

Sandidge conducted numerous inspections and identified the top 10 areas where brown recluse spiders are found in homes:

- // Near furnace and water heater
- // Second floor bedrooms – unoccupied
- // Any room without air conditioning or ventilation
- // Bathroom – behind toilet or tub
- // Near plants
- // Basement – under stairs
- // Basement – in piles of wood, boxes, carpet, clothing
- // Windowsills
- // Behind entertainment center
- // Bedrooms

Pest Management

The first step in effective management of brown recluse spiders is to conduct a thorough inspection of the property. Focus on likely spider habitats. Sticky traps can be used to locate infestations and aid in control. Wear gloves while conducting the inspection to avoid bites.

Non-Chemical Management

Five non-chemical spider-proofing methods have been identified by Hedges (2003):

- // Changing exterior lighting
- // Eliminating harborages
- // Removing spider webs from outside the structure
- // Sealing cracks and removing screens
- // Improving ventilation in attics and crawlspaces

Other tips for brown recluse spider control include:

- // Increase humidity and decrease the temperature inside; brown recluse spiders like it hot and dry
- // Set out numerous sticky traps in areas where spiders are found
- // Seal boxes of files or other papers with packing tape. Boxes must remain sealed for at least six months to kill spiders inside.

Insecticide Application

Bayer Environmental Science products are effective against brown recluse spiders. For best results, combine indoor and outdoor treatments using various formulations. Large brown recluse spider populations will require a repeat treatment.

Residual Insecticide Sprays:

- // Temprid® FX
- // Temprid Ready-to-Spray

Residual Dusts:

- // DeltaDust®

Indoors, make spot or crack and crevice treatments with residual insecticides directly to spiders and to entry points such as around water pipes, doors and windows. Treat areas where spiders normally feed or hide, such as baseboards, corners, closets, behind furniture or among stored items. In basements and crawl spaces, apply residual sprays to sill plates and other areas where spiders build their webs.

Outside, make spot treatments directly to spiders and to areas they are likely to occur, such as around windows and doors, near light fixtures, under eaves, under window shutters and in ornamental plants located near the structure. Residual dusts should be applied to cracks or voids that serve as entry ways or harborages for spiders. Brown recluse spiders travel on electrical wires in wall voids. Remove the cover to electrical outlets and apply dust to the void. Dusts are also a good choice for treating outside behind shutters and under siding. In moist areas, use waterproof DeltaDust. Use ULV aerosol products containing pyrethrum in attics or above drop ceilings to get spiders moving and in contact with sticky traps or residual sprays or dusts.

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<http://spiders.ucr.edu/>

www.recluseproject.ku.edu/

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Carpenter Ant

Control with Maxforce® Fleet™

by Joe Barile, BCE, Technical Service Lead, Pest Management & Public Health, Bayer Environmental Science

The term “Carpenter Ant” is used to describe 10-12 common species of the ant genus *Camponotus*. Four species of *Camponotus* are the most common structure-invading and damaging ants. Carpenter ants can be identified by these features: one-node on the pedicel; workers are polymorphic (size is variable within the colony); the profile of the thorax is evenly rounded with no spines; and in most forms the anus is surrounded by a small circle of hairs. Color is variable, but most common species are black or a combination of black and dark red.

Carpenter ant colonies are founded by mated single queens. The single-queen colonies range from a few hundred to 15,000 ants in the east, or over 100,000 ants in the west. A carpenter ant colony can survive for over 15 years.

Once well-secured in a natural site, a carpenter ant colony will establish a series of satellite colonies as far as hundreds of feet from the parent colony. Almost all colonies that establish in and damage structures are satellite colonies. Parent colonies (containing the queen, eggs, young larvae, and nursery workers), are connected to satellite colonies (containing late instar larvae, pupae, swarmer and foraging workers) by well defined ‘trunk’ trails. These trails may be clearly observed by PMPs as narrow paths devoid of vegetation or leaf litter.

In structures, carpenter ants will exploit areas where prolonged exposure to moisture has softened or weakened structural wood. Once established the satellite colony may expand into more sound wood and voids within the building.



(Clemson University – USDA Cooperative Extension Slide Series, www.ipmimages.org)

Carpenter ants do not eat wood like termites. They chew wood to expand their colony site and dispose of the excavated wood as ‘frass’. PMPs will observe the discarded frass close to nest sites, usually underneath a nest opening or ‘window’. Left unchecked, carpenter ants will cause significant structural damage to homes.



Need To Know Pest Management & Public Health

Carpenter ant elimination is best achieved by delivering an insecticide to the parent colony, killing the queen. Always read and follow label directions of insecticides.

An effective method to deliver active ingredients throughout the colony quickly is the use of baits. Like other ants, carpenter ants regularly share foods through cross-feeding, known as trophallaxis. Maxforce Fleet will eliminate foraging carpenter ants and kill the parent colony as well.

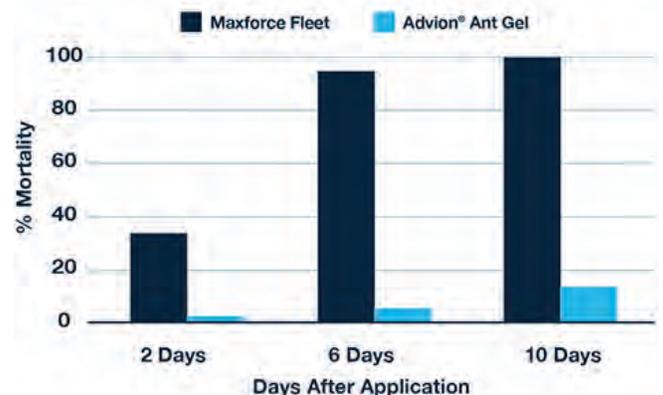
Maxforce Fleet is specifically formulated for *Camponotus* species. This high-moisture gel bait mimics natural honeydew, an important food source of ants. Maxforce Fleet also contains an ingredient that attracts carpenter ants. Apply gel along ant foraging trails, in cracks and crevices where ants occur, in cracks and voids where ants enter, or directly into nest sites. Apply Maxforce Fleet on the trunks of trees that contain parent and satellite nests. These trees can be identified by observing steady ant trailing up and down the trunk. Because carpenter ants forage primarily at night, apply the gel as late in the day as possible.

Maxforce Fleet is most effective in spring when carpenter ants are foraging for high-protein foods. Specially formulated with a balanced food matrix, this ready-to-use granular bait can be applied outdoors along ant trails, around the base of nest trees, as a perimeter treatment around buildings and as a broadcast treatment in yards.

Indoors, Maxforce Fleet can be applied into cracks and crevices, into wall and cabinet voids and broadcast in attics and basements that are inaccessible to children and pets.

Maxforce Ant Bait Stations (containing either hydramethylnon or fipronil) can be used to control carpenter ants, especially when no colonies are located in the structure. These child-resistant stations can be used wherever ants are a problem. The balanced bait matrix can be inspected through the red-tinted, clear lid. An adhesive back allows for placement on vertical or under surfaces.

Outstanding performance on carpenter ants



OE14USABYK-ECNI, Hansen, Camponotus Modoc.

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es.bayer.us/maxforce-ant-solutions

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Barricor™ SP with Merit® 2F *A tank-mix combination that solves* **Chinch Bug Problems**

by Dr. John Paige III, Principal Scientist, Bayer

Chinch bugs can become serious pests in southern lawns, and PMPs who perform outdoor perimeter services often encounter damaging populations of these pests.

There are many products labeled for the control or suppression of chinch bugs, but many PMPs rely on tank-mixes of insecticides with differing modes of action.

A recent trial was conducted on a sod farm in Brevard County, Florida. The St. Augustine grass on the sod farm was infested with damaging levels of chinch bugs. The trial used Barricor SP (a solid particle deltamethrin formulation) in a tank-mix with Merit 2F (a liquid imidacloprid). These two classes of insecticides together are known to provide potentiating effects on pests due to differing modes of action.

All treatments were applied at 2 gallons of water per 1,000 square feet and the rate of Merit 2F was held constant at 0.60 oz./1,000 square feet. Barricor SP was applied at 0.25 and 0.5 oz./1,000 square feet.

Pre- and post-treatment counts were taken by a suction device that vacuumed the bugs out of the plots so they could be counted and identified.

The results show that the tank-mix treatments were highly efficacious at controlling chinch bugs. Mortality rates early in the trial ranged from 97-100% mortality, and by the end of the 28-day trial the range was from 99-100%.

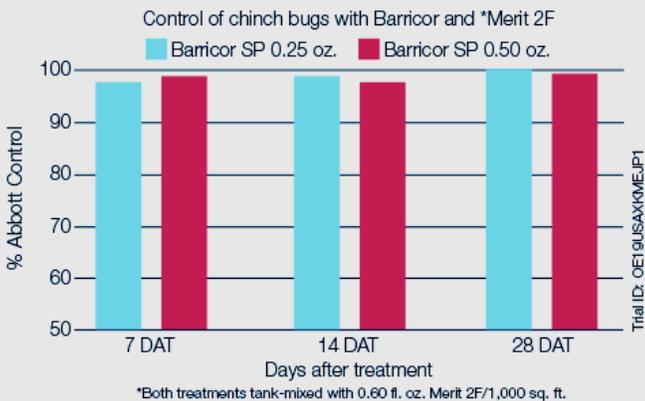
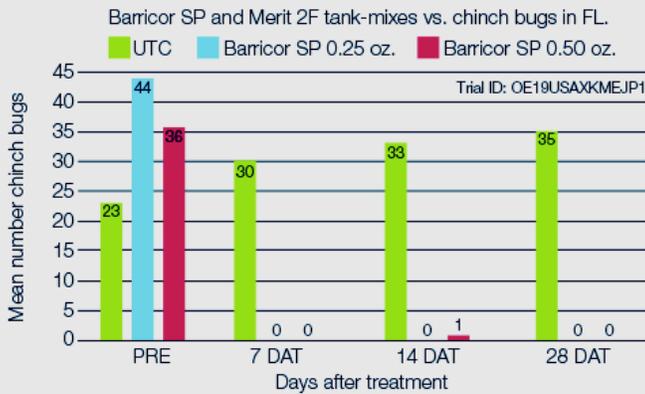
CNIs and pyrethroids provide potentiation together. The result is improved efficacy as the CNI overstimulates the nerve, and the pyrethroid preferentially binds to these open Na⁺ channels, causing depolarization and death in the target insect.





Conclusion

Test results clearly demonstrate that PMPs need not fear the arrival of chinch bugs as they now have tools to control these pests. Additional trials will continue to be conducted.



Tank mixtures: The applicable labeling for each product must be in the possession of the user at the time of application. Follow applicable use instructions, including application rates, precautions and restrictions of each product used in the tank mixture. Not all tank-mix product formulations have been tested for compatibility or performance, other than specifically listed by brand name. Always predetermine the compatibility of tank mixtures by mixing small proportional quantities in advance.

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Cluster Fly

Fact and Fiction

by Joe Barile, BCE, Technical Service Lead, Pest Management & Public Health, Bayer Environmental Science

In the late winter or early spring, adult cluster flies (*Pollenia rudis* F.) will 'magically' appear in windows, in light fixtures or on ceilings of brightly lit rooms. The flies are frequently reported as 'big house flies' that are slow, lethargic and easy to swat and kill. Unlike other large related flies, cluster flies are not pests of decaying organic matter. They have not been associated with organisms of filth, nor any disease transmission. Cluster flies are structural pests based on their overwintering behavior.

In autumn, adult cluster flies will begin to seek out overwintering sites. Natural sites for over-wintering include: under tree bark, in tree holes, and in caves. Structures offer cluster flies very favorable overwintering shelter. Flies will congregate on the southern and western exposures of buildings as autumn day temperatures drop. Sensitive to heat sources, the adult flies will enter buildings through any crack or opening that exists into the structure.

Cluster flies commonly enter buildings around door and window frames, through eaves and soffits, through vents, and along unsealed trim work.





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Once inside, the adult flies will go dormant inside wall voids, attics and other building spaces. It is not unusual to find thousands of overwintering flies 'clustered' together in a void of only a few square feet. On sunny days in late winter or early spring, growing warmth in the infested void will cause some adults to become active. Looking to escape, they will seek out bright lighted areas, thus appearing in windows and the light fixtures of suspended ceilings.

The most effective means of controlling cluster flies is physical exclusion. Seal cracks around doors and windows. Screen vents and soffit openings. Caulk around trim work to exclude fly entry. If cluster flies are a problem, you can assume that they will be an annual pest threat.

Pyrethroid insecticides have demonstrated effective residual control of cluster flies when applied at critical times of the year. Apply Temprid® FX on outdoor surfaces, around doors and windows, and areas where cluster flies may enter the building. Treat the entire building (all exposures). Contact local University Extension Services for treatment scheduling. In the northern U.S. the treatment period starts in August. In southern areas the treatment time is later in September.

Chemical treatment of overwintering cluster flies inside buildings is usually not recommended. Dusts and aerosols cannot penetrate the masses of insects harboring in voids. Control is incomplete and dead flies may attract scavenging pests such as dermestid beetles and ants next spring. If overwintering sites are accessible, the dormant cluster flies can be physically removed with a pest management-rated vacuum cleaner. Be prepared for removing significant amounts of insects. This author once removed 13, 30-gallon garbage bags of dormant cluster flies from a commercial structure in New York State.



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Preventive control of Fall Invading Pests with Temprid® FX Insecticide

by Gary Braness, Ph.D, Field Development
& Technical Services

Common Fall Invaders

Insects such as cluster flies, boxelder bugs, elm leaf beetles and Multicolored Asian Lady Beetles (MALB) are common overwintering pests. As temperatures cool in the fall, these insects are attracted to warm temperatures found on exterior walls exposed to the sun. They often occur suddenly in large numbers. After landing on exterior surfaces, the insects explore the area and locate entry points to wall voids, attics and other protected areas inside the structure. Once inside they may become a nuisance during the fall, winter and spring as they emerge and move to warmer areas in the structure, including living quarters.

In 2008, field trials with four pest management companies showed that preventive Temprid FX applications against fall invading insect pests on over 800 accounts resulted in over 50% less callbacks than standard insecticides.

Pest Management

Pest Management Professionals can provide effective control of these important pests. It's best to prevent their entry, since it's much more difficult to manage them once they have gotten inside.

Exclusion Methods

Sealing exterior gaps and cracks around windows, doors, eaves, roofs, siding and other potential points of entry before insects move to the structures is an important part of an effective prevention program. Damaged doors, vent screens, and window screens should be repaired. Tight-fitting door sweeps and rubber seals around garage doors can also be installed to prevent pest entry.

Exterior Insecticide Application

Despite these exclusion methods, exterior insecticide applications are often required.

Fall Invader Trials, 2008



Four Companies

- Premier Pest Elimination, Madison, WI
- East Tennessee P.C., Rogersville, TN
- Guardian P. C., Duluth, MN
- ABC Pest Control, Austin, TX
- Majority of treatments performed in 4Q08
- Pest spectrum: lady beetles (incl. MALB), boxelder bugs, cluster flies

Temprid

- 803 accounts
- 42 callbacks.....**5.2% callbacks**

Competitive

- Demand® CS, Dagnet®, or bifenthrin
- 832 accounts
- 84 callbacks.....**10.1% callbacks**



Temprid FX provides excellent residual, killing pests before they can enter structures. Make applications to areas around windows, under eaves, along rooflines and around foundations wherever these pests congregate. Timing (usually late summer and early fall) and thorough coverage are essential for effective management. Check with your local extension service for information on proper timing of applications.

Temprid FX is ideal for use against fall invaders. The maintenance rate of 8 ml per gallon of water is adequate under most conditions.

Treatment When Insects Are Inside

For a complete treatment or if insects are already inside, the most practical method of removal is to vacuum or sweep them up. Glue boards may also be used to control insects inside the structure. For relief from persistent problems, make spot treatments with Temprid FX to areas frequented by insects indoors, such as door and window casings. Application of insecticide dusts (i.e., Tempo® 1% Dust or DeltaDust®) to wall voids will help control pests where they harbor.



Cluster Fly:

Slightly larger than the house fly, thorax covered with golden hairs.



Boxelder Bug:

Adults are ½-inch in length, black with red lines.



Multicolored Asian Lady Beetle:

Similar to other lady beetles, but with black “M” on thorax.



Important: Before using the insecticide products listed above, read and carefully observe all label directions.

References

To learn more about the biology and control of MALB, visit the Ohio State University Extension web site – <http://ipm.osu.edu/lady/lady.htm>.

For information on comparative performance of insecticides in the control of MALB, visit the following web site: <http://ipm.osu.edu/lady/icup.htm>.

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Backyard Barrier Treatments:

*if your mosquito adulticide is doing its job,
you don't need to add an IGR to your tank*

by Dr. Kurt Vandock, Head of Community Health, Bayer

Insect Growth Regulators (IGR) are meant to be applied to labeled aquatic locations where the larval stage of mosquitoes are found. There are mosquito control products that come formulated with residual pyrethroids in combination with an IGR. But if your adulticide is doing its job, is an IGR necessary? Eliminating blood-feeding adult mosquitoes will end transmission of the diseases they vector.

Q: When applying a barrier treatment for mosquito control, is it a good idea to add a larvicide to the adulticide or use a combination product?

A: First, when applied according to label, a pyrethroid labeled for mosquito control should kill the adult mosquito when it comes into contact with the treated surface. With this simple fact established, any secondary effect from an IGR becomes irrelevant. Second, it is important to remember the standard pyrethroid label language found on all residual mosquito barrier sprays: "do not allow pesticide to enter or run off into storm drains, drainage ditches, gutters or surface waters". These are locations where an IGR would be effective, but if you have a pyrethroid in your formulation or tank-mix and you treat there, you are violating federal label.

Q: Do adult mosquitoes pick up the larvicide from the sprayed foliage and carry it to the breeding site where it will have its larviciding effect?

A: Perhaps they do, perhaps they do not. What is known, is that if a surface is treated with an effective adulticide, mosquitoes should die before laying their eggs. Even if they do carry an IGR, they would have to mate, take a blood meal, and find a location to lay their eggs before the IGR found its effective site. This takes days. Dead mosquitoes don't lay eggs.

Consider: If an application contained both a pyrethroid for adult control and a larvicide for larval control, why didn't the adulticide kill the adult mosquito when it landed on the treated surface or during the days following before it laid its eggs? The only plausible answer is that the adulticide is ineffective. So then why add an IGR? Either the adulticide is ineffective and doesn't kill the mosquitoes resulting in a need for the IGR, or you're wasting your

money by including the IGR because the adulticide is effective and the mosquito never has the opportunity to mate, take a blood meal, find a breeding site, and lay her eggs.

Q: Can one single mosquito carry enough larvicide to have an impact on a breeding site?

A: It is impossible to know the answer to this question since breeding sites, introduction of water, flushing, location, and presence of UV all impact such considerations. Furthermore, the quantity of larvicide a mosquito can pick up from a treated surface and the distance it can successfully carry over is unknown. Support of IGR autodissemination often utilizes data from laboratory studies in confined spaces with petri dishes. These are not real-world conditions and are not a reflection of how a product will perform. Laboratory studies alone are not conclusive and confusion exists in the scientific community regarding the true impact of autodissemination in a mosquito management program.

Q: From the time a mosquito hatches to maturity when it can reproduce and lay eggs is about a week. What else must happen for a mosquito to lay eggs?

A: Only females lay eggs and a blood meal **MUST** be taken before the female lays eggs. The justification often given by some manufacturers to include an IGR in a residual barrier treatment is because it results in decreased egg abundance or autodissemination of the IGR to cryptic, inaccessible breeding sites. These justifications lack logic and scholarly research, and require failure of the mosquito treatment. For nearly all mosquitoes, egg laying occurs only after a blood meal is taken. At this point in time, the treatment is ineffective due to biting activity, which will likely result in callbacks, and exposes people and animals to disease transmission.



Need To Know

Pest Management & Public Health

Remember, the only way to end transmission of diseases vectored by mosquitoes is to eliminate blood-feeding adults.

For effective mosquito control, consider using Suspend® PolyZone® adulticide. It doesn't require an IGR to effectively kill blood-feeding adult mosquitoes. Suspend PolyZone provides a long-lasting barrier treatment that resists wash-off and provides a sustainable solution at low rates, all while helping reduce mosquito populations in customers' backyards.

// Increase efficiency and kill more mosquitoes by eliminating a complicated and ineffective tank-mix

// End the breeding cycle – Suspend PolyZone residual lasts up to 90 days

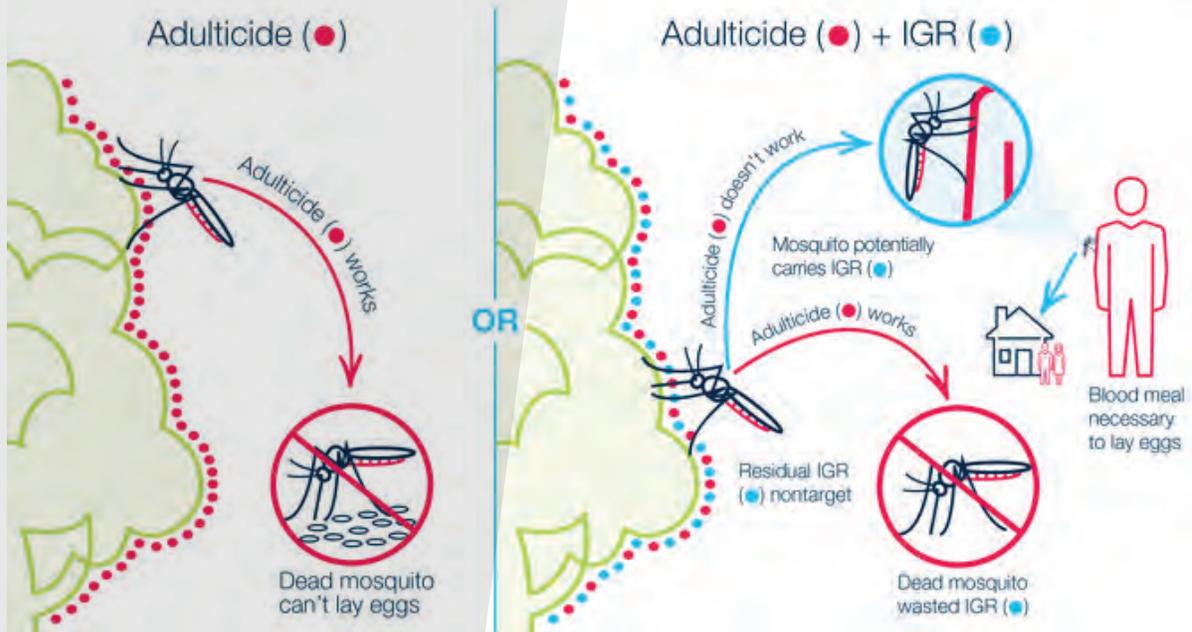
Don't waste time, money, and your reputation on adulticide/larvicide combinations when they may not be logical or effective for residential backyard services.

Mosquito barrier sprays

"Entities are not to be multiplied beyond necessity."

"The simplest explanation is most likely the best."

// Occam's Razor



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Important Label Considerations for Mosquito Service

by Joe Barile, BCE, Technical Service Lead, Pest Management
& Public Health, Bayer Environmental Science

Mosquito service has become a significant growth segment for Pest Management Professionals (PMPs). Applying a labeled residual insecticide as a barrier treatment is an important component in providing effective service.

PMPs would be well-served to pay close attention to product label directions of the residual insecticides they may be considering. Label compliance is an obligation under the Federal Insecticide, Fungicide, Rodenticide Act (FIFRA).

Many PMPs choose Suspend® PolyZone® as their mosquito residual product. The proprietary polymer formulation in Suspend PolyZone was originally developed specifically to combat mosquitoes that may carry malaria in Africa where the harsh environment can destroy unprotected pyrethroids. The polymer locks the active ingredient in place and protects it from the elements, even in tough conditions. So, many PMPs count on the unstoppable staying power of Suspend PolyZone to deliver the protection their customers need.





Need To Know

Pest Management & Public Health

Additionally, recent changes in label language for bifenthrin-containing products make Suspend PolyZone a clear choice for PMPs.

Product	Talstar® P	Bifen I/T	Bifen XTS	Suspend PolyZone
PPE Required	Yes ¹	Yes ¹	Yes ¹	No
Retreatment Interval	Lo Rate: 1X/7 Days High Rate: 1X/28 Days	Lo Rate: 1X/7 Days High Rate: 1X/28 Days	Lo Rate: 1X/7 Days High Rate: 1X/28 Days	21 days, or as necessary to maintain adequate control
Wind Speed Restriction	No app with wind speed >10 MPH	No app with wind speed >10 MPH	No app with wind speed >10 MPH	None

1-All pesticide handlers (mixers, loaders and applicators) must wear a long-sleeved shirt and long pants, socks, shoes and chemical-resistant gloves. After the product is diluted in accordance with label directions for use, and/or when mixing and loading using a closed spray tank transfer system (such as an in-line injector system), shirt, pants, socks, shoes and waterproof gloves are sufficient. In addition, all pesticide handlers must wear a respiratory protection device when working in a non-ventilated space. All pesticide handlers must wear protective eyewear when working in a non-ventilated space.

Suspend PolyZone provides effective residual mosquito control even in harsh weather conditions with service-friendly label language.

environmentalscience.bayer.us

For more information, contact your local Bayer Pest Management & Public Health Representative.

ALWAYS READ AND FOLLOW LABEL INSTRUCTIONS.

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Maxforce® Impact® Cleans Large Cockroaches from Sanitary Sewers

by Dr. John Paige III, Senior Scientist, Pest Management & Public Health, Bayer Environmental Science

Maxforce Impact is a reduced-risk product perfect for modern cockroach bait rotation strategies and is free of all the Big 8 allergens. The efficacy of Maxforce Impact against German cockroaches is well-known, but Maxforce Impact is also effective against multiple species of large cockroaches such as American, oriental and smoky brown cockroaches.

Maxforce Impact is labeled for use in typical areas such as schools, healthcare facilities, food processing areas, and multi-unit housing. But Maxforce Impact is also one of the only products on the market labeled for use in sanitary sewers.

Recent research shows not only how effective this product is at controlling large cockroach species in sanitary sewers, but also how complaint calls inside buildings associated with those sewer systems can be minimized.

Sanitary sewer systems at a major resort in the Central Florida area were inspected and treated with Maxforce Impact. Counts of American cockroaches were conducted, and the complaint calls inside the buildings also were tracked.



Photo 1. Bait spots placed ca. 2 inches (5 cm) below the lid of the sanitary sewer. (Refer to the Maxforce product label for complete application directions and restrictions.)

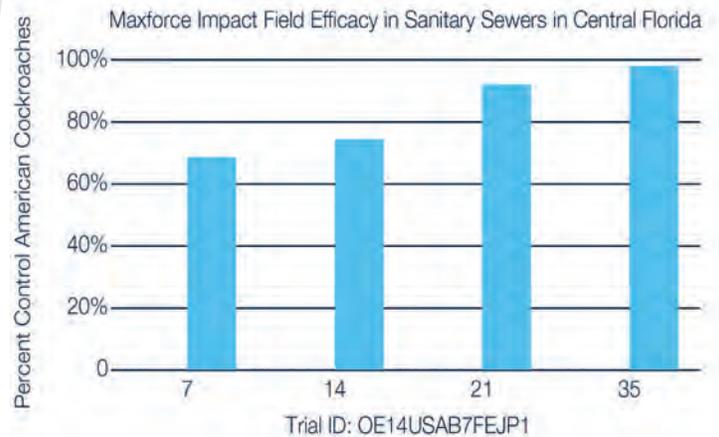


Need To Know

Pest Management & Public Health

Perhaps, most important, the number of complaint calls for large cockroaches inside the resort buildings dropped drastically. In fact, there was not one single call for extra services for large cockroach activity during the trial.

The results of this research demonstrate that while most people think of Maxforce Impact as a reduced-risk gel bait ideal for German cockroach rotational strategies, it is also labeled for sanitary sewers, is effective against large cockroaches, and can make PMPs more efficient by reducing the requests for callbacks and extra services.



For more information, contact your local **Bayer Pest Management & Public Health Representative.**

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Maxforce® FC Select Roach Killer
Bait Gel sets the standard for

Cockroach Control

by: Dr. Nonggang Bao & Deborah Koufas

Two cockroach gels, Transport® Roach Bait (0.35% acetamiprid) and Matrix® Roach & Ant Bait (2.15% hydramethylnon) are both making bold claims against the “leading brand”. Neither company provided much evidence to support their claims, so we decided to put them to the test.

The first thing we noticed is that both Transport and Matrix labels state the products contain peanuts. Peanut allergy is one of the most common food allergies, affecting 1.5 million Americans, according to the *American Academy of Allergy, Asthma & Immunology*. Even in tiny amounts, peanut protein can cause severe reactions. Peanuts are responsible for nearly 100 deaths and 15,000 emergency room visits each year, says the *Food Allergy & Anaphylaxis Network*, a nonprofit group based in Fairfax, Virginia.

Maxforce Baits – by design
do not contain peanut products.

At Bayer, we are well aware of this issue because we regularly receive inquiries from concerned consumers asking whether or not our baits contain peanut products.

Head-to-Head Comparison

Data in this bulletin compares each product against three different German cockroach strains collected with the help of PMPs from problem accounts, and maintained by Bayer Environmental Science at our Development and Technical Center in Clayton, North Carolina. Bayer has studied more than 50 different strains of German cockroaches to help solve the problem of bait aversion. The following strains were selected to provide product comparisons across a range of different degrees of bait aversion.

24-hour Bait Consumption Ratio	Maxforce® FC Select vs.	
	Transport	Matrix
DTX	4.5 x	17 x
CNC	4 x	20 x

1. Bait Preference Test

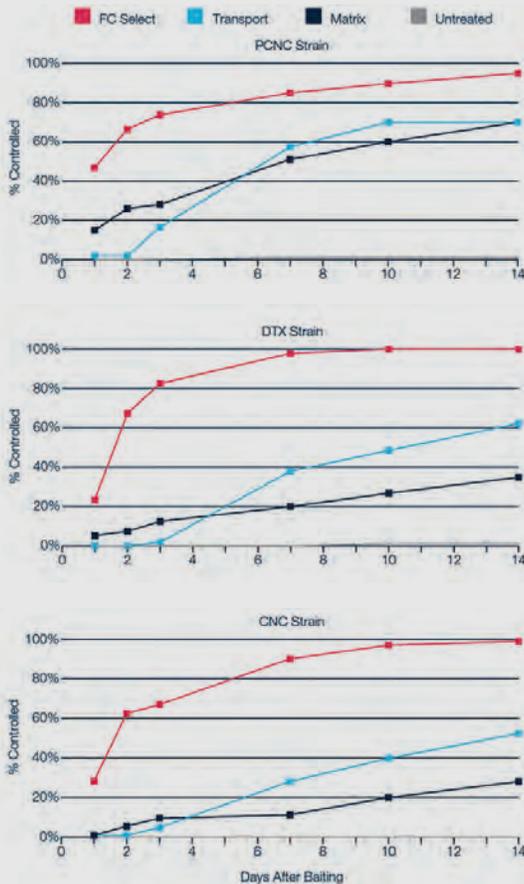
When given a choice in side-by-side testing, cockroaches preferred Maxforce FC Select Gel regardless of whether the strain was bait averse or not.



Need To Know

Pest Management & Public Health

(Note: Position of each bait placement was changed in different replicates to remove any variance or preference due to proximity.)



2. Performance

In a replicated efficacy study, Maxforce FC Select provided excellent control of each strain. Both Transport and Matrix did not perform as well against each bait-averse strain and the pyrethroid resistance non-bait-averse PCNC strain (see charts).

Summary

- // Maxforce FC Select Gel controls both normal and bait-averse German cockroaches.
- // Bait-averse German cockroach strains in this study clearly showed significant aversion to both Transport and Matrix gel baits.
- // Transport and Matrix did not provide as much control of the non-bait averse, pyrethroid-resistant strain (PCNC) in this test.

Research Commitment

Over the last 14 years, cockroach bait aversion has become an important issue on three different occasions, and each time, Maxforce has risen to the challenge. The Bayer Research and Development Team has the expertise, has committed the resources and will continue to study bait aversion. So the next time roaches change their behavior, you will be ready.

For more information, contact your local Bayer Pest Management & Public Health Representative.

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Maxforce® FC Magnum Roach Killer Bait Gel
and Maxforce FC Roach Bait Stations: *registered for*

Pantry Pests

by Dr. John Paige III, Senior Scientist, Pest Management
& Public Health, Bayer Environmental Science
and Dr. Phil McNally

The labels of two well-known and efficacious cockroach control products, Maxforce FC Magnum Roach Killer Bait Gel and Maxforce FC Roach Bait Stations include directions for use on controlling exposed, adult stages of many pantry pest beetles. These products are registered for use in commercial, industrial and residential areas, including food/feed handling establishments.

This important use for these products came about almost by accident when Wayne Walker, ACE, Senior Pest Control Technician with the Department of Housing at the University of Florida, noticed many dead pantry beetles and weevils under Maxforce FC Roach Bait Stations that were originally placed for cockroach control (Fig. 1). His mention of this observation to Bayer Environmental Science employees created interest in research with these products and these pests.

Research was conducted in-house and with respected contract researchers on the major pantry pest beetle species.

Results presented at the 2007 Entomological Society of America International Research Conference showed that both products proved extremely effective in controlling the pests.

How to Use:

Of course, the best course of action is always to follow the basic tenets of integrated pest management (IPM). A thorough inspection should be conducted to identify and remove the infested foodstuffs before applying the bait. Applications of the bait should be handled in the same manner as is done for cockroach control, applying small amounts of gel bait in voids, cracks and crevices, behind and under cupboards and other difficult to reach areas where insects may hide. Containerized bait stations should be placed adjacent to voids or cracks and crevices in the same types of areas. Labels are available on environmentalscience.bayer.us.



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The application rate of gel is dependent on the level of infestation. For light to moderate infestations, 1-2 dime-sized spots or a 1.5-3 inch bead per square yard should be applied. For heavy infestations, the application rate should be doubled.

For effective control using the containerized bait stations, use 4-6 stations per 100 square feet of horizontal surface area, but do not place more than 24 bait stations in a residence. The stations will adhere to a vertical surface by peeling off the protective strip on the back of the station.

The use of either of these products in the field will help PMPs become more efficient and profitable because PMPs will only have to remove infested foodstuffs, but not have to cover other foodstuffs. Additionally, these passive treatments are a “greener” option than traditional insecticide applications.



Fig. 1. Dead stored product below Maxforce FC Roach Bait Station.



For more information, contact your local **Bayer Pest Management & Public Health Representative.**

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Reading Roach Traps

for German Cockroach Management

by Joe Barile, BCE, Technical Service Lead, Pest Management & Public Health, Bayer Environmental Science

The use of monitor traps (i.e. 'sticky traps', 'roach traps', glue boards) to detect and monitor cockroach activity is required in today's modern IPM program. Sticky traps gather cockroach activity data 24/7.

Although monitor traps are simple in design, PMPs should follow these guidelines to receive the full benefit of these devices:

- Place traps as close as possible to known or suspected harborages. Use the concept of 'Zone Management' to concentrate efforts where roach activity has been observed or is highly likely.
- Place traps along roach 'routes of travel', along walls and in corners, between harborages and resource (food and water) sites.
- Place traps in areas where incoming goods that may be infested with roaches are first received or stored in your accounts.
- Keep traps dry and clean (dust-free). Roaches weigh very little; a small film of moisture or dust will render a trap useless. If necessary, place traps inside small rodent bait boxes to avoid exposure to moisture and dust.
- Don't be stingy. Use a sufficient number of traps to accurately monitor the entire account. Traps are inexpensive for the information they collect. Once a trap has 'captured' roaches, it should be replaced.
- It is highly recommended that all traps be dated to evaluate the level of activity based on time. Record the location and level of activity. A trap placement/locator map is helpful if multiple parties service and/or inspect the roach activity.

- Wherever possible, remove traps prior to inspections by health agents or associated inspectors. The presence of captured roaches may be recorded as a violation.
- Sticky traps capture more than cockroaches. Use trap findings to monitor and record the presence of other pests such as ants, flies and spiders.

How To Read Roach Traps

The physical presence of a cockroach on a monitor may be significant enough to initiate an action plan. However, the experienced IPM practitioner will be able to interpret more than just positive activity from their monitors.

Some Examples:



This monitor indicates an active cockroach habitat to the right of the trap.

Direct your attention to the right.



This monitor indicates an active cockroach habitat to the left of the trap.

Direct your attention to the left.



Need To Know Pest Management & Public Health



This monitor indicates almost exclusive immature (nymph) roach activity. This condition indicates that a nearby harborage is very heavily infested and almost 'full'.

Cockroach nymphs are the first stage of the roach population that is displaced when population pressure is high and new harborages must be found. This PMP needs to address this situation quickly before more roaches displace and establish new, widespread harborages.



This monitor indicates all adult activity, with mostly males trapped. This trap indicates that the PMP should assume that new cockroaches may have been introduced into the account, and frequently on infested incoming goods. This type of activity is often observed in accounts where an effective IPM program is established and the roach infestation has been eliminated and maintained roach-free for an extended period of time. This PMP should investigate all close by sources of incoming goods, supplies or packages that may be infested with hitch-hiking cockroaches.



This monitor indicates only fragments of cockroach bodies. In some cases only the legs of the trapped roach remain. This PMP should inspect for mice or American roaches. Both mice and American cockroaches will feed on trapped German roaches. Usually if the problem is American roaches, some of those species will be trapped as well making the ID easy.

For more information, contact your local
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Silverfish *and Firebrats*

by Joe Barile, BCE, Technical Service Lead; Pest Management & Public Health Bayer Environmental Science

Silverfish and firebrats belong to one of the most primitive groups of insects in the order Zygentoma (formerly Thysanura). In this bulletin I will use the term silverfish to describe the morphology and behavior collectively.

Silverfish are commonly distributed throughout North America with four species (one being a firebrat) having been recorded as structural and food pests. Firebrats differ from silverfish only in their preferred harborage requirements of relatively high temperatures, usually provided by man-made appliances (water heaters, boilers, furnaces).

These insects are small (from one-half to less than one inch in length) and carrot-shaped with the head being the broad end. There are two long cerci and a single long tail appendage appearing at the end of the abdomen. They have long thread-like antennae. Silverfish get their common name by the presence of dull gray/silver scales that cover their bodies.

Silverfish prefer habitats that are warm and moist, but can tolerate exposures to extremes of heat and cold seasonally and inside structural spaces like attics and crawl spaces.

Silverfish are secretive pests that do not like brightly-lit spaces nor sites with moving air currents. They are commonly discovered at night when entering a room and turning on a light.



Silverfish are fast-running insects and when startled, will run around before escaping to a dark, quiet space.

Silverfish develop through ametabolous metamorphosis. Nymphs appear identical to adults, except for size and scale presence (until the third molt). Immatures will molt anywhere from 15 to 30+ times to reach adulthood. Silverfish are unusual in that they continue to molt after reaching adulthood. Physical mating does not occur. Instead, males will deposit a ball of sperm (spermatophore) and females absorb the deposit when walking over them. Total life span can be over five years.

Silverfish are general scavengers and omnivores. They are attracted to foods with a high content of starchy carbohydrates. They have a history of damaging paper goods, books (pages and bindings) and wall coverings that contain sizing and adhesives made from animal and/or plant sources. They will feed in pest nesting sites (insects, mammals, and birds), and are also attracted to stored foods that are typically aged and frequently contaminated with fungus. Silverfish can endure an extended period of starvation (>1 year).



Need To Know Pest Management & Public Health

Management of Silverfish

Non-Chemical

Outdoors: Maintain perimeter sanitation, air flow and ornamental pruning. Seal cracks and openings around windows, door frames and utility penetrations.

Indoors: Control humidity and encourage air flow in basements, crawl spaces and attics. In living spaces, maintain floor-level sanitation by dusting and vacuuming regularly. Change furnace filters regularly. Inspect books, albums, scrapbooks, game and toy boxes for activity or damage, and keep storage areas clean. Importantly, make sure any rodent bait stations are cleaned and freshly-baited, and remove any other pest nesting material and droppings, sanitizing surfaces after removal*.

**Use appropriate Personal Protective Equipment when servicing these areas.*



Insecticides

Outdoors: Apply a labeled residual insecticide as a perimeter treatment and re-apply at recommended intervals. **Temprid® FX** will provide exceptional strength and flexibility; **Suspend® PolyZone®** will provide extended residual control, resisting wash-off and ultraviolet breakdown. **Indoors:** Treat with labeled liquid residual insecticides into cracks and crevices, and spot treat areas where activity has been reported. **Temprid FX** and **Suspend SC** are excellent choices. Use **Temprid Ready-to-Spray** to inject into deep cracks and crevices and conveniently treat hard-to-reach sites. Dust wall voids behind wall outlets and switch plates, and under insulation in attics. Treat crawl spaces especially along the sill plate. Use **DeltaDust®** where moisture may compromise dust performance. **Maxforce® Complete** granular bait is labeled and effective against silverfish. Use in areas of high activity for extended control. Consider applying a small amount in rodent stations if silverfish are a persistent problem.

For more information, contact your local
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Representative.**

es.bayer.us/maxforce-ant-solutions

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Brown Marmorated Stink Bug

by Joe Barile, BCE, Technical Service Lead, Pest Management & Public Health, Bayer Environmental Science

The Brown Marmorated Stink Bug (BMSB), *Haylomorpha halys*, is an invasive pest insect that originates in Asia. First reports in the U.S. were made in Pennsylvania in the late 1990s. Today, this insect is found throughout the eastern two thirds of the U.S., on the West Coast and in Southern Canada.

BMSB is a serious agricultural pest in North America, attacking many tree fruits, berries, soybeans and succulent portions of ornamentals. Farmers have had to abandon IPM programs to prevent damage to their crops. For Pest Management Professionals (PMPs), this insect is a nuisance pest where large numbers of bugs move onto and into homes in late summer seeking overwintering sites (very similar to cluster flies, Asian lady beetles and boxelder bugs).

BMSB is not a pest of public health, nor does it damage structures directly. However, numbers of invading bugs can be dramatic.

BMSB adults are about ¾-inch long (see photo) and an overall brown color with light bands on their antennae. Their abdomen is covered with a distinct 'mosaic' pattern of blue/brown markings along the margin of their body (exposed on nymphs, under the wings of adults).

It is not completely understood how many generations occur each season. **BMSB overwinter as adults and begin to congregate on structures in mid-to-late summer.**



Photo: Susan Ellis, Bugwood.org



Need To Know

Pest Management & Public Health

Because this is an invasive pest, natural and biological controls have not established themselves against BMSB. Populations invading from natural areas will remain very high for years.

Non-chemical control: as with any nuisance invader, exclusion is the most permanent method of controlling BMSB:

- // Seal openings around window and door frames.
- // Make sure screens (window, door and vents) are in good repair.
- // Check utility entrances (gas, water, electric, phone, cable) and seal appropriately.
- // Trim ornamental shrub and tree branches off the building surface to prevent direct access and promote air flow around the structure.

Customers that experience BMSB activity should be advised to expect annual reoccurrences until natural controls establish a balanced population.

Bayer Temprid® FX is effective as both a contact and residual insecticide against BMSB. Temprid FX may be applied against BMSB in states that allow application against non-labeled pests where the site(s) of application are present on the label. Temprid allows for perimeter applications on and around structures and foliar applications on non-blooming plants.*

In 2010, Bayer Environmental Science (BES) performed a series of demonstration trials with PMPs against BMSB. As a result of these trials, BES has formulated a Service Recommendation utilizing Temprid FX during the summer months to manage populations around structures to reduce the build-up of this nuisance pest.

**Check local regulations for compliance.*



For more information, contact your local
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Need To Know
Pest Management & Public Health

Suspend® PolyZone® Drums

A Sustainable Option for PMPs

Bayer offers Suspend PolyZone 30-gallon drums to the professional pest management marketplace. Pest management professionals (PMPs) can minimize their environmental footprint by reducing the frequency of triple rinsing and disposal of service containers. At Bayer, we provide our professional customers with added benefits, tools, and support to make the adoption of Suspend PolyZone drums smooth and easy to execute. The Suspend PolyZone Advantage Drum Program can save you time and money.

Adopting Suspend PolyZone Drums is Easy

Bayer provides you the following items and services free of charge:

- // Bayer Advantage Pump System
- // Empty service containers
- // Service container labels
- // Drum pickup service*
- // Training and support

Suspend PolyZone Pump Program

For PMPs looking to use higher volumes of Suspend PolyZone, Bayer has created the Advantage Pump Program. To qualify, PMPs must agree to purchase a minimum of two 30-gallon drums, annually.

*Drum Pick Up Instructions

- // Contact Container Service Network (CSN) by phone at 1-866-225-6629 or via email at logistics@containerservicesnetwork.com
- // You will receive a call within 2 business days to schedule a pick-up date with a 2-3 hour pick-up window
- // Single rinse the empty drum(s)
- // Note: someone will need to be available to assist with loading the empty drums onto the trailer



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Suspend® PolyZone® – the better choice for

Mosquito Control

Suspend PolyZone is a residual barrier spray that provides proven efficacy on mosquitoes for up to 90 days.

by Dr. Kurt Vandock, Head of Community Health, Bayer

What makes Suspend PolyZone better?

Suspend PolyZone features a proprietary polymer layer that protects the active ingredient from weather, UV exposure, irrigation, spray rinsing, and mechanical abrasion. This controlled-release formulation, ensures your treatment will continue to control targeted pests for up to 90 days. With Suspend PolyZone there are no phytotoxic effects, staining, or rapid degradation under UV light as observed in other pyrethroids. Suspend PolyZone has been tested and shown to control important species of mosquitoes known to transmit Zika, West Nile, Dengue and Chikungunya.

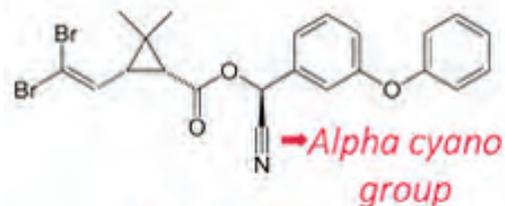
Powerful performance against resistant mosquitoes.

The most commonly used active ingredients for mosquito control are older generation Type I pyrethroids such as bifenthrin, permethrin, phenothrin, and allethrin.

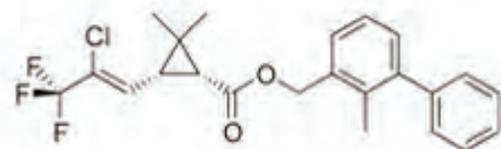
Type II pyrethroids like deltamethrin, are second generation pyrethroids and contain an additional chemical group (alpha-cyano) that protects them from the insect enzymes that easily break down Type I pyrethroids. Because of this, Suspend PolyZone is an effective tool for combatting mosquitoes that are resistant to common Type I pyrethroids.¹

While similar, the distinct types of pyrethroids are detoxified by very different pathways.

- // Type I pyrethroids are detoxified predominantly by esterases.
- // Type II pyrethroids are detoxified predominantly by cytochrome P450 and Microsomal monooxygenase activity.



Deltamethrin

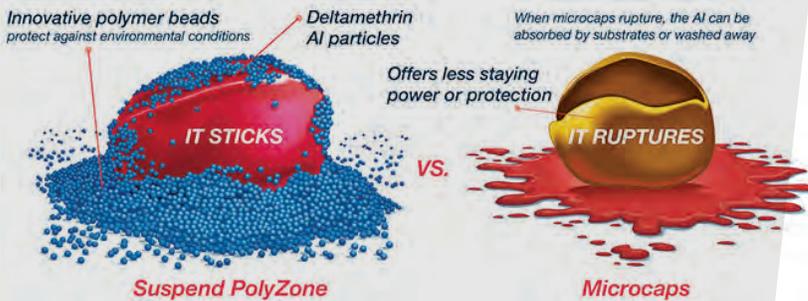


Bifenthrin



Unlike microcaps, Suspend PolyZone stays put.

The proprietary polymer layer of Suspend PolyZone adheres to porous or aggressive surfaces like wood, brick and concrete. Microcaps can be washed away by rain, irrigation and other environmental conditions. The staying power of Suspend PolyZone makes it ideal for targeting both crawling and flying insects like mosquitoes, which are exposed only when they come to rest on a treated surface. Suspend PolyZone coverage is there where it counts.



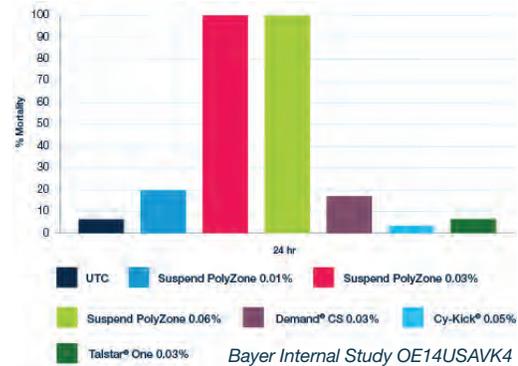
Mammalian & environmental safety

- // Deltamethrin is not classified by the EPA as a possible human carcinogen, unlike other technologies on the market.
- // Despite its high usage² in the state, deltamethrin is less frequently detected in the urban watersheds of California than most other pyrethroids.
 - Deltamethrin was detected 85% less frequently than another leading pyrethroid.³

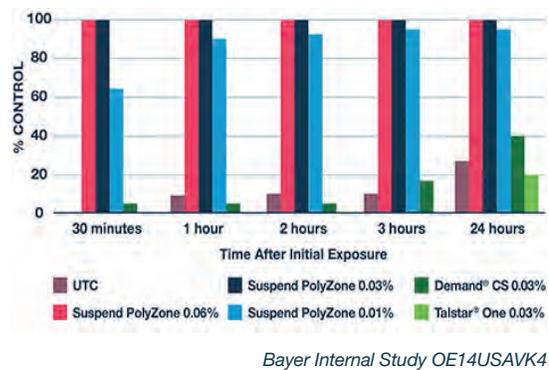
Trusted performance with fewer callbacks

- // Proven performance at multiple rates 0.01% - 0.06% (0.25% - 1.5 fl. oz./gal.)
 - Suspend PolyZone gives you a longer residual than other pyrethroids, up to 90 days.
- // Proven reduction in callback frequency. Fewer re-services can improve fleet utilization, ultimately reducing footprint.

Culex quinquefasciatus | 56-day residual / 24-hour mortality / 3-min. exposure



Aedes Aegypti | 28-day residual / glazed tile / 3-min. exposure



- // Other products cannot beat the unstoppable staying power of Suspend PolyZone.⁴
- // On foliage and abrasive surfaces, Suspend PolyZone outperforms the competition.

For more information, contact your local Bayer Pest Management & Public Health Representative.

environmentalscience.bayer.us

1 – Systematic review on pyrethroid toxicity with special reference to deltamethrin. Journal of Entomology and Zoology Studies 2014; 2 (6): 60-70
 2 – A “Top 5” active ingredient, cited as “most often used” by 60% of respondents in 2010 Survey of California PMPs by PWG
 3 – DPR Ambient Monitoring Report (2015): https://www.cdpr.ca.gov/docs/emon/pubs/ehapreps/report269_13-14.pdf
 4 – Source: Bayer ES Study: OE14USAVK4

ALWAYS READ AND FOLLOW LABEL INSTRUCTIONS.



Tick Management

by Joe Barile, BCE, Technical Service Lead, Pest Management & Public Health, Bayer Environmental Science

Recent media reports have pushed ticks into the public health spot light. Ticks are documented vectors of multiple pathogenic bacteria, protozoans and viruses. Serious diseases vectored by ticks include Lyme disease, Powassan virus and human babesiosis. Pest Management Professionals (PMPs) can look at tick management services not only as a growth opportunity, but as a contribution to public well-being.

Ticks are not insects, but belong to the class Arachnida (mites, spiders, and scorpions are fellow members). Ticks are blood-feeding ectoparasites. They only feed on host-provided blood through their development. The tick life cycle is: egg, larva (six-legged), nymph (eight-legged), adult. Mating occurs on the host. After mating, the female drops from the host to lay eggs (based on specie, from ~200 to over 5,000!) in the environment.

There are two families of ticks: the soft ticks (Family: *Argasidae*) and the hard ticks (Family: *Ixodidae*) identified by the visible presence or absence of a hard plate (scutum) behind the head visible from above (hard ticks). Soft ticks have more than one nymphal stage; hard ticks usually have only one nymphal stage.

Ticks can be 'one-host' ticks; spending their developmental lifespan (larva to nymph to adult) on one host, or 'multi-host' ticks that complete a develop stage (larva to nymph) by finding and feeding from a host, then dropping off the host into the environment where molting to the next stage occurs.

Then the tick finds a new host and completes the next stage of development (nymph to adult) on another host. For multi-host ticks, the host animal preference usually changes to a larger animal. It can take multiple years for a tick to complete its life cycle and if an immature tick cannot find a suitable host between development stages it may be able to 'starve' for over one year or until a host becomes available.

Ticks are most abundant in sites where a consistently moist and humid substrate exists and direct long-term exposure to sunlight is absent. A leaf-litter floor beneath a forest canopy protects the immature stages of ticks and the natural presence of wildlife like deer mice, chipmunks, ground squirrels and rabbits provide the critical primary host animals.





In a residential setting, the interface between managed landscapes (lawns, yards) and the woodland are ideal sites that are often referred to as a 'tick zone'. Pets and people that enter these zones can become exposed to questing (host-seeking) ticks.

Tick management service should consist of the following:

Non-Chemical:

- Maintain landscapes keeping turf healthy and trimmed.
- Prune ornamentals in the perimeter zone to promote air movement and reduce moisture around the structure.
- Remove clutter (firewood, toys, outdoor furniture), especially adjacent to potential tick habitat where host rodents may hide.
- Recent research indicates that raking fallen leaves and yard debris into the forest edge area helps tick development. Remove raked leaves and yard debris from the property or compost/move it as far from the managed landscape as possible.

Pets:

- Maintain tick control on all dogs and cats (consult a veterinarian or follow all label directions on consumer products).

Clients:

- Advise clients to avoid movement into the tick zone and teach children not to enter these areas.

Acaracides:

Fortunately, ticks are susceptible to Bayer residual insecticides; Temprid® FX, Tempo® Ultra SC/WP, Suspend® PolyZone® and Suspend SC. Apply according to label directions* for ticks. Treat leaf-litter and substrate where developing ticks harbor. Start treatments in spring when soil temperatures reach 50°F. Treat at 30-60-day intervals until first frost, or year-round in warmer regions.

Compared to spraying, an effective and convenient formulation for tick management is DeltaGard® G insecticide. This contact granular formulation falls through foliage into leaf-litter and releases deltamethrin into this harborage site. In a field study, an application of DeltaGard G provided 97%-100% control of *I. scapularis* (Black-legged Tick) for 12 weeks post treatment (Schulze, et al, j. Econ Ent 98(3): 976-981, (2005).

**Check local regulation for licensing requirements to treat sites.*



For more information, contact your local
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Winter Ant Baiting

Inside Structures with Maxforce®

by Joe Barile, BCE, Technical Service Lead, Pest Management & Public Health, Bayer Environmental Science

Ants naturally go into a state of inactivity during winter months. However, colonies (whole or satellite) that may pass the winter inside or under structures, may become active.

Such conditions may occur under building slabs, around heat ducts and furnaces, around appliances, and when the stronger, late-winter sun warms building voids. The sudden appearance of ant species such as carpenter ants (*Camponotus spp.*), odorous house ants (*Tapinoma sessile*), pavement ants (*Tetramorium caespitum*), and Little Black Ants (*Monomorium minimum*), can generate calls while there is still snow on the ground.

PMPs may respond by applying aerosol and/or residual insecticides to areas of observed activity only to be frustrated when new complaints are received within a day or two. A more effective method is to apply the appropriate Maxforce ant bait to areas of entry to 'intercept' winter foragers.

////// High moisture baits, such as **Maxforce Quantum Ant Bait** and **Maxforce Fleet™** are especially attractive to winter foragers.





Need To Know

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Typically, these colonies are 'winter stressed' seeking food and more importantly, water. The humidity levels in building interiors drop dramatically during heating season, putting additional stress on ant colonies.

High moisture baits, such as Maxforce Quantum Ant Bait and Maxforce Fleet are especially attractive to winter foragers.

Just as it occurs during the warm season, Maxforce ant baits will be shared among the colony members. The Maxforce Domino Effect® will result in elimination of the colony.

Maxforce Fleet is the preferred product for controlling foraging carpenter ants. Its honeydew-like matrix is formulated with specific feeding stimulants that carpenter ants find Simply Irresistible™.

Place the appropriate Maxforce ant baits into cracks and crevices that ants have been reported emerging from.

Look for activity around utility and plumbing penetrations, around appliances generating heat, and anywhere ants may find food and water.

Maxforce Quantum may be applied in the supplied bait stations in areas inaccessible to children and/or pets. Remember to read and follow all product label directions.

With the environmental and physiological stress that these winter foragers endure, interception baiting will result in fast, effective elimination of activity before your customers even notice a problem and call for a reservice. Remember that winter activity may be an indication of a larger infestation that will return 'in-season' as colonies become active again. Make a note to reinspect, or plan a comprehensive ant management program when the warm weather returns.

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Mosquitoes in the News: *What can PMPs Do?*

by Joe Barile, BCE, Technical Service Lead, Pest Management & Public Health, Bayer Environmental Science

It has been hard to miss the media coverage regarding the Zika Virus outbreak. There have been over 50 confirmed human cases diagnosed in the U.S. as this document is being prepared, and the World Health Organization (WHO) has declared a Global Public Health Emergency. All U.S. diagnosed cases are in people who have recently traveled to countries where the virus is established.

Zika is a virus first isolated from the Zika Forest in Uganda in 1947. Humans can be exposed to the virus from the bites of certain species of day-flying *Aedes* genus mosquitoes, most commonly in the western hemisphere by the species *Aedes aegypti* and *A. albopictus*. Through the 1950s, virus activity was restricted to a narrow equatorial band in Africa and Asia. It has since spread through the Pacific Islands and in 2015 to South America, Mexico and multiple Caribbean Islands.

Symptoms of Zika include headaches, fever, a possible rash, joint pain and possible conjunctivitis (eye inflammation). In most cases, only one in five healthy, exposed individuals experience a mild illness and fully recover. Pregnant women exposed to the virus may pass the virus to their developing fetus, possibly resulting in a condition known as microcephaly (reduced head size in the infant with high likelihood of brain damage). Since the outbreak of Zika in Brazil, health authorities have reported abnormally high numbers of microcephaly in infants. Zika is also suspected to possibly cause neurological conditions including a condition known as Guillian-Barré.

Transmission of the virus is from human to human via the bite of an infected mosquito or, as recently confirmed, through sexual contact with an infected individual. Birds or other animals (other than primates) are currently not known hosts or carriers. Once infected, an individual with Zika virus can infect mosquitoes for only a short time, usually about a week. There is no vaccine for Zika; there is no cure or therapy for Zika-infected individuals other than symptomatic care.

Health experts report that Zika should not become widespread in the continental United States due to our temperate climate, with most of the country experiencing a winter season that prevents year-round vector (mosquito) activity. However, in areas of the country where the two mosquito species of concern (*A. aegypti* and *A. albopictus*) are established, there may likely be sporadic outbreaks. These areas include much of the southeastern U.S., especially along the Gulf Coast to Texas, and localized areas of the Southwest and California.

This outbreak will raise public awareness regarding the risk of exposure to a mosquito-borne disease, and may locally result in an increase in requests for mosquito control services by Pest Management Professionals (PMPs). Residual Barrier Treatments can provide residents relief from the nuisance of biting mosquitoes. However, we advise PMPs to be cautious in communicating the level of protection that typical PMP-provided mosquito services (residual barrier treatments) may provide. PMPs cannot promise or predict that their service will kill every potentially disease-bearing mosquito that is found in a customer's property.



Mosquitoes, including known Zika vectors, can travel great distances; even riding wind and air currents, from non-treated areas onto a customer's property. Additionally, a PMP has no control of the potential exposure of a customer's family members outside of the treated property. PMPs should not make any statement or promise of disease control or protection when offering their mosquito service.



Mosquito Control Protocol

Mosquito abatement service will be provided based on the following service categories:

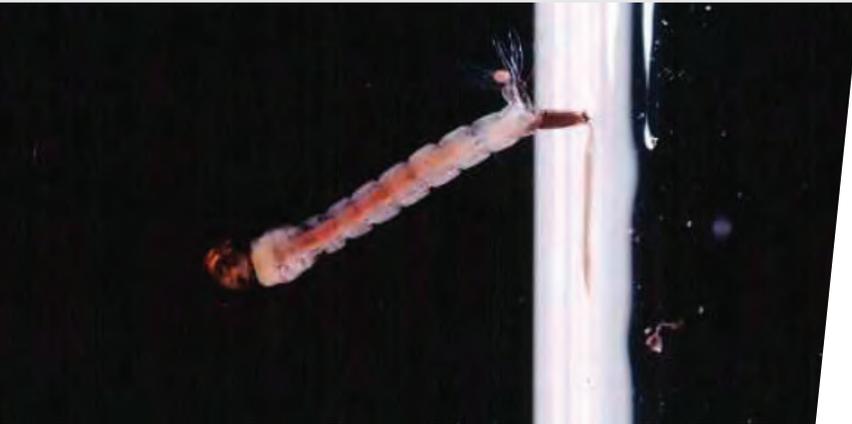
1. Inspection of property for conditions conducive to mosquito development (i.e. breeding). Notify the customer contact of such conditions, and recommendations for modification to conditions on the property to eliminate or reduce mosquito development.
2. Applications of larvicides (where appropriate) to mosquito-bearing stagnant water and/or to areas subject to periodic flooding that will allow immature mosquitoes to develop.
3. Application of Suspend® PolyZone® Insecticide as a residual barrier treatment to foliage and structures where mosquitoes will shelter and rest.
4. Reporting to customer any changes in property conditions that may provide mosquitoes additional harborages or developing sites.

Evaluations and Treatment

On initial, and every, visit: Technicians will walk and inspect the property upon arriving (and before ANY application of pesticides). Inspect for natural and man-made conditions that allow water (rain or irrigation) to collect and lay stagnant (non-moving) on the property. Naturally-moving water (streams, rivers, brooks) can be ignored as mosquitoes will not develop in moving water. Man-made containments (maintained swimming pools, fountains, reflecting ponds, fish-bearing ornamental ponds) where the water is moving, agitated, contains fish or is chemically treated may be ignored as they will not support mosquito development. Abandoned or poorly-maintained swimming pools or ornamental ponds should be inspected for breeding. Key examples of natural breeding sites include: stagnant drainage ditches, septic sumps, tree holes, and 'low spots' on property that regularly flood and hold water after significant precipitation events. Key examples of artificial breeding sites include: neglected birdbaths, neglected fountains, neglected pet water bowl, discarded or unused vehicle tires, neglected swimming pools (including covers and child wading pools), toys (pails, sandboxes, riding toys), discarded beverage cans and bottles, flower pots and planters, blocked gutters, tarps, and boat and snowmobile covers.

Learn to identify mosquito larvae and pupae in habitat and point out activity to customer contact when found. Advise on recommendations to change standing water conditions (if possible) to eliminate the breeding source.

If Larviciding and/or adulticiding applications are appropriate, inspect to determine best application techniques to prevent potential runoff and/or drift of applications from target sites. Inspect for non-target presence or activity (all pets, children, visitors, pollinating insects, wildlife) that must be prevented before application. Refer to product labels for details.



Larviciding

Always read and follow all product label directions.

If conditions are appropriate (standing, stagnant water that will be continually, or regularly present, and is a source of developing mosquitoes) apply an approved larvicide according to the product directions. Biological larvicides (Bti) and/or biorational larvicides (methoprene) present a reduced hazard to non-targets.

Formulations are available (solid granules, briquettes and donut-shaped 'dunks') that may be applied by hand. Apply at label rates, and at intervals as directed on the larvicide label.

Adulticide Barrier Treatment

Always read and follow all product label directions.

Suspend PolyZone Insecticide can be utilized as the residual insecticide product for barrier treatments. Best results will be realized when Suspend PolyZone is applied through powered 'mist-blower' equipment. Applications of Suspend PolyZone by power sprayers and/or hand-held sprayers (i.e. 'backpack' or B&G® sprayers) are allowed by the label, but are not as efficient as mist-blowers.

The high velocity of the blower propelling the product to the application site, as well as the small particle size, will allow the product to penetrate foliage and adhere to the underside of leaves where mosquitoes rest.

Outdoor residual mosquito control is maximized when applied from a powered backpack mist-blower that is calibrated to maintain a small droplet size with high delivery velocity. This allows the product to penetrate dense foliage, provide more uniform coverage, and wet the target application area without excessive runoff. For example, when utilizing the Stihl® SR450 backpack mist-blower, the adjustable flow rate varies from a setting of 1 (lowest volume) to 5 (highest volume).

Utilizing a setting of "2" on the SR450 is optimal as it allows enough product to be delivered at an efficient pace while minimizing waste. When using a lower flow rate such as "2" on the SR450 with high velocity (maximum throttle), the droplets are broken up more than at high flow rates resulting in reduced droplet size and improved efficacy and distribution. It is important to note that application equipment and settings vary greatly between manufacturers and models, so care must be taken to establish what settings provide the optimal spray pattern for the selected equipment.

Tips of the Trade: Spray patterns from backpack mist-blowers can be further improved by utilizing a diffuser. This part is usually included with a mist-blower and is a simple plastic piece that is attached to the end of the discharge chute. Diffusers break apart the spray cloud, allowing the product to disperse, delivering it in hard-to-reach areas where mosquitoes may be resting.



Need To Know

Pest Management & Public Health

Suspend PolyZone is formulated to be diluted in water only. Do not dilute in oil or solvents. The use of a spray additive (spreader/stickers or wetting agents) is not recommended. The polymer included in the PolyZone formulation helps to adhere the active ingredient to treated surfaces and resist wash-off from precipitation and/or irrigation. Dilution rates range from 0.01% to 0.06% active ingredient (Deltamethrin). Use the low or mid rates when service intervals are short (i.e. monthly service) and mosquito pressure (activity) is low or normal; use higher rates for longer service intervals and/or when mosquito pressure is high ('every-other-month', quarterly, or seasonal). The high rate (0.06%) is recommended for fast knockdown in sites with high population density or activity.

Dilute Suspend PolyZone, according to the label directions, in the sprayer. Apply the dilution, as a mist, to foliage of trees, shrubs, and ornamental plantings, as well as turf and ground cover, under decks, around building foundations and other places where mosquitoes may rest. Comply with all label directions regarding weather conditions and non-target exposure warnings.

Apply in a manner that allows the treated mist to penetrate foliage canopies and reach the undersides of leaves, the preferred resting location for mosquitoes. Be sure to include the 'upper' canopy of trees and ornamentals where possible. Mosquitoes harbor in areas close to bird roosting sites (birds are natural sources of blood meals for many pest species of mosquitoes). Whenever possible, make applications with your back to the property boundaries to avoid drift onto neighboring properties.

Label restrictions for outdoor pyrethroid treatments must be followed. Be aware of wind and weather conditions that may prevent or restrict treatment.

Structures may be treated for residual mosquito control; comply with label restrictions. Apply to sites where mosquitoes will rest. These sites are generally in shaded areas protected from direct sunlight and wind. Such sites may include: under decks and porches, under soffits and overhangs. Avoid runoff of sprays.



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