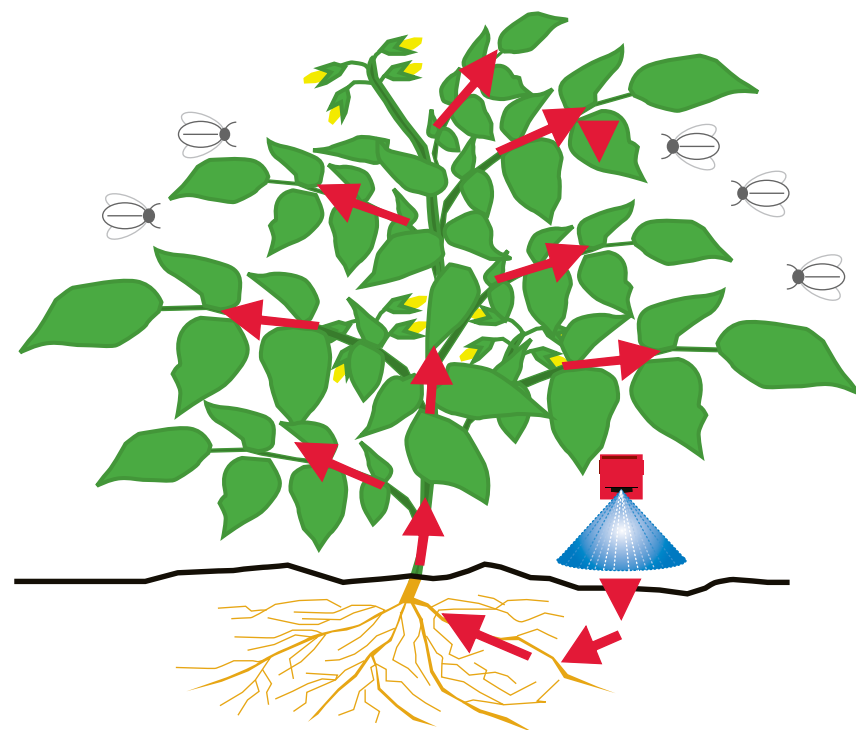


APPLICATION OF OPTIGARD FLEX TO LANDSCAPE ORNAMENTALS

Optigard Flex may be applied to landscape ornamentals to control honeydew-producing insects and thus, the ants that feed on their honeydew secretions. Use a 0.1% liquid dilution of Optigard Flex as a foliar or banded application and apply up to 2 gallons per 1,000 feet². Retreat as necessary to maintain control.



SUMMARY

Optigard Flex is a new non-repellent insecticide that is active against insects by both contact and ingestion. It is particularly effective against social insects such as ants but can be used to control a variety of nuisance insect pests such as cockroaches, beetles, earwigs, boxelder bugs, fire ants, etc. Thiamethoxam, the active ingredient in Optigard Flex, is a second-generation neonicotinoid insecticide that belongs to the thianicotinyl subclass and has a unique mode of action compared to other non-repellent insecticides currently on the market. Optigard Flex may be applied as a perimeter band, as a spot spray, as a mound drench, and to voids to control a wide range of insects. It may also be applied to trees and shrubs to control honeydew-producing insects that ants use as a primary food source. Optigard Flex offers the PMP true flexibility in treating ants and nuisance insects both in and around structures.

optigard[®] FLEX

LIQUID

TECHNICAL BULLETIN

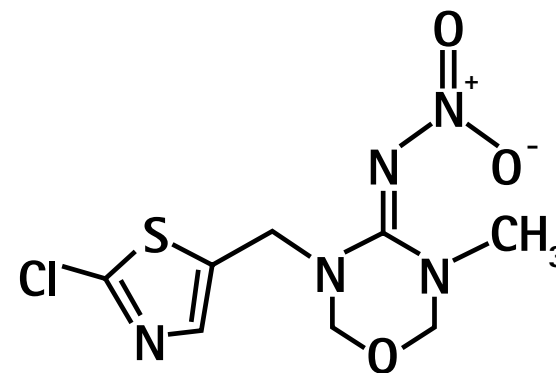
INTRODUCTION

Optigard[®] Flex insecticide is a liquid formulation that controls a wide range of insect pest species. Thiamethoxam, the active ingredient in Optigard Flex, is a second-generation neonicotinoid insecticide that belongs to the thianicotinyl subclass. Thiamethoxam has demonstrated ingestion and contact activity against a wide range of economically important pests. Products containing thiamethoxam are used to control insect pests of crops, turf, and ornamentals, as well as a wide range of urban pests, including ants, termites, cockroaches, beetles, and others.

Optigard Flex is readily transferred throughout social insect colonies by foraging workers, resulting in quick control of workers and reduction or elimination of colonies.

CHEMICAL AND PHYSICAL PROPERTIES OF THE ACTIVE INGREDIENT

Common Name:	Thiamethoxam
Chemical Name:	4 <i>H</i> -1,3,5-Oxadiazin-4-imine,3- [(2-chloro-5-thiazolyl)methyl]tetrahydro-5-methyl- <i>N</i> -nitro
CAS Registry No.:	153719-23-4
Chemical Structure:	



Empirical Formula:	C ₈ H ₁₀ ClN ₅ O ₃
Subclass:	Thianicotinyl
Water Solubility (25°C):	4,100 mg/l

ENVIRONMENTAL AND TOXICOLOGICAL PROFILE

Optigard Flex Signal Word: CAUTION

Hazard Indicator	Species	Optigard Flex
Oral LD ₅₀	Female Rat	>5,000 mg/kg body weight (Practically Non-Toxic)
Dermal LD ₅₀	Rat	>5,050 mg/kg body weight (Practically Non-Toxic)
Inhalation	Rat	>2.61 mg/1 air – 4 hours (Practically Non-Toxic)
Eye Irritation	Rabbit	Minimally Irritating
Skin Irritation	Rabbit	Slightly Irritating
Skin Sensitization	Guinea Pig	Not a Sensitizer

Thiamethoxam and its formulations have low acute toxicity to mammals by oral, dermal, and inhalation routes of exposure. Skin- and eye-irritation studies indicate that thiamethoxam is not mutagenic, teratogenic, neurotoxic, or a developmental toxicant. Toxicity studies have demonstrated a wide margin of safety to humans when applied following the label's directions for use and rates.

PRODUCT PROFILE FOR OPTIGARD FLEX

- Flexible use directions, including:
 - Labeled for indoor or outdoor use
 - Timing of applications is not limited
 - Approved for residential or commercial accounts
 - Can be applied as a liquid (general surface spray, crack-and-crevice) or a foam (application to structural voids)
- Advanced non-repellent insecticide with low use rates (0.05 to 0.1%)
 - Transfers throughout social insect populations
 - Kills insects by contact and ingestion
 - Non-staining, non-volatile
- Broad-spectrum control of ants and other nuisance arthropod pests including cockroaches
- Excellent efficacy against wood-destroying insects
- Systemic activity in plants helps control honeydew-producing insects that may serve as food source for ants

MODE OF ACTION

Thiamethoxam provides contact and ingestion activity on multiple stages of insect development. Thiamethoxam targets the nicotinic acetylcholine receptors in the insect's nervous system, resulting in death of the exposed insect. Neonicotinoids have a significantly different mode of action compared with other classes of insecticides (e.g. pyrethroids, phenylpyrazoles, pyrroles, etc.) commonly used for pest control. Thiamethoxam is non-repellent and can be transferred from exposed to unexposed insects that exhibit social behavior, such as ants and termites.

APPLICATION OF OPTIGARD FLEX

Optigard Flex is an easy-to-use, water-based, 21.6% suspension-concentrate (SC) formulation that readily disperses in water, has virtually no odor, and is compatible with commonly used application equipment, including liquid applicators, foam applicators, and direct-injection systems. Optigard Flex liquid is labeled for use with in-wall, fixed-tube delivery systems. The following are guidelines for applying thiamethoxam against various urban pests. Follow the Optigard Flex label for more specific instructions.

PRODUCT PACKAGE

	Equipment Used	Mix Into Tank	Ants and Other Nuisance Pests	Wood-Destroying Insects
Optigard Flex as a liquid	Liquid applicators (compressed air sprayers, backpack, or power sprayers)	Follow label directions for desired concentration	Outdoors as a general liquid spray to trails, spot treatment to pest entry points or as a perimeter foundation spray Use indoors as a crack-and-crevice application	Apply sufficient product to treat termite galleries and infested areas For control of wood-destroying beetles, apply a surface spray to wood located in attics or other non-living spaces
Optigard Flex as a foam preparation	Foam generating applicators	0.1% finished foam concentration See label for mixing instructions	Outdoors—apply spots of 2–4 oz finished foam at pest entry points to the structure Void application, applied from indoors or outdoors	Application to drywood termite galleries

USE OF OPTIGARD FLEX FOR PERIMETER PEST CONTROL

In addition to void and crack-and-crevice or spot applications, Optigard Flex may be applied as a perimeter band around structures to control ants and other occasional insect pests. Optigard Flex may be applied as a 0.1% spray to a band 2 feet up the exterior wall and 3 feet out from the foundation wall. An application volume of 2 gallons per 1,000 ft² is recommended.

RESULTS OF OPTIGARD FLEX TESTS FOR PERIMETER PEST CONTROL

Field Test: Control of Perimeter Pests Using Optigard Flex; RJM Contracting, Lake Mary, Florida, 2007.

A test was conducted comparing a perimeter application made with Optigard Flex with perimeter applications of a leading non-repellent insecticide. Optigard was applied in a 5-foot-wide band at a 0.1% rate. The other non-repellent was applied (according to label directions) as a band at a rate of 0.06%. Counts of insects around treated structures were made prior to application and at 1, 7, 30, 60, and 90 days after application. The percent reduction in perimeter pests is charted in the graph below (Figure 1).

Comparison of Optigard Flex With Leading Non-Repellent as Perimeter Application: % Reduction in Pest Counts

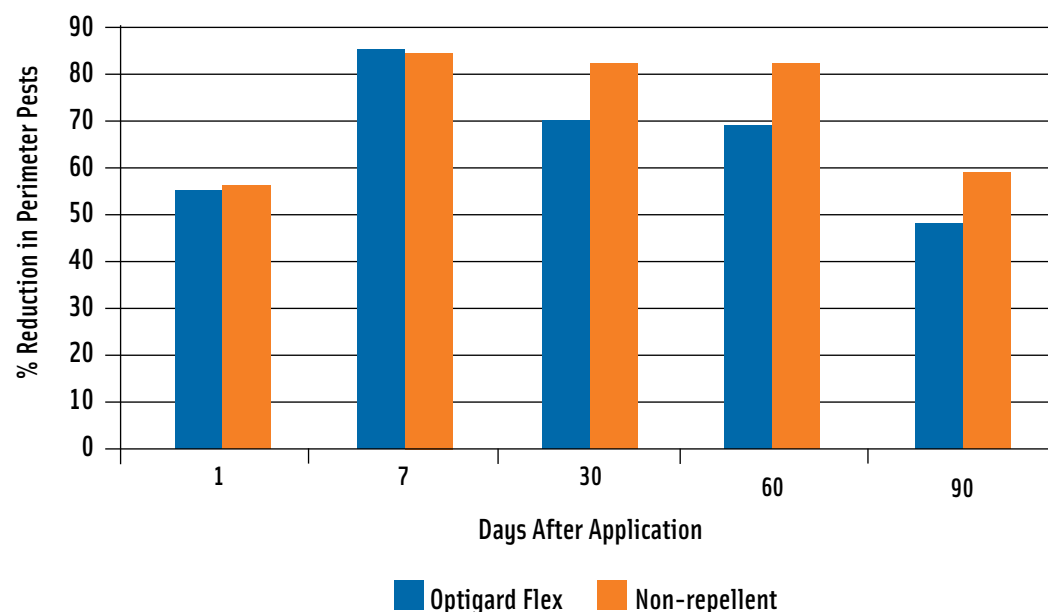


Figure 1

USE OF OPTIGARD FLEX FOR CONTROL OF ANTS AND OTHER NUISANCE PESTS

Optigard Flex is effective against a variety of ants and other nuisance pests. Application of Optigard Flex to void areas provides an additional point of treatment for nuisance pest problems. Application of Optigard Flex to structural voids is complemented by perimeter insecticide and bait applications. In addition to ants, Optigard Flex controls other nuisance pests, including beetles, crickets, boxelder bugs, ladybird beetles, earwigs, cockroaches, fire ants, etc. Control of these pests can be achieved by injecting 2–4 oz of foam at multiple points in voids of target areas where ants or other pests are trailing into a structure, or in areas near plumbing penetrations in kitchens or bathrooms, where pests often seek food or moisture. Applications inside void areas should be directed at the lower six inches near the sill plate, and extreme care should be taken not to contact electrical lines. Optigard Flex may be applied as a general perimeter spray or to cracks and crevices for control of nuisance insects. See label for specific application instructions.

RESULTS OF OPTIGARD FLEX TESTS WITH ARGENTINE ANTS

Laboratory tests have been conducted to determine the activity of Optigard Flex on various ant species and other nuisance pests. In addition, field tests have demonstrated the efficacy of Optigard Flex on multiple ant species.

Laboratory Panel Tests of Optigard Flex for Control of Ants (Syngenta Research Labs, Vero Beach, Florida).

Tests were conducted by Syngenta to determine the efficacy of Optigard Flex on several ant species, including Argentine ants. Tests were conducted on treated panels using foam preparations that delivered a finished concentration of 0.1% thiamethoxam. Figure 2 shows that Optigard Flex killed 100% of Argentine ant workers exposed to the treated surface within 48 hours.

Control of Argentine Ants With Optigard Flex

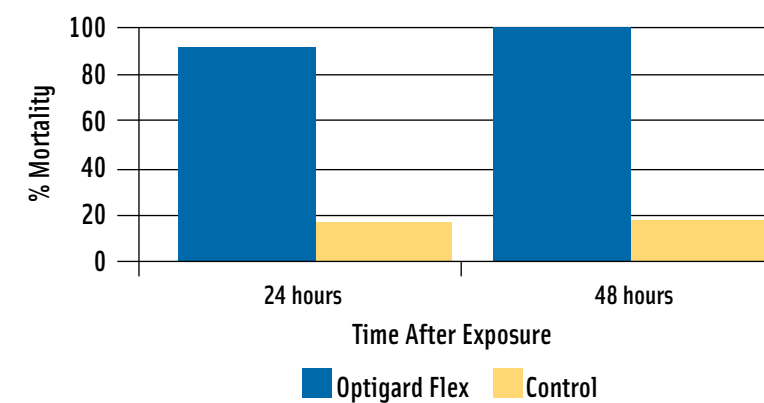


Figure 2

USE OF OPTIGARD FLEX FOR CONTROL OF DRYWOOD TERMITES

Termites can be classified into two major groups: subterranean termites and drywood termites. Both are considered serious pests of structures. Optigard Flex has exhibited excellent non-repellent activity against the drywood termite species. In laboratory and field tests, it is effective against several genera of drywood termites, including *Incisitermes* and *Cryptotermes*. Optigard Flex is effective in controlling drywood termite infestations when applied as a zone or localized area (spot) treatment on existing structures. Termite galleries should be located by using visual signs, e.g., fresh fecal pellets or blistered wood, the presence of live pests or mechanical sounding (tapping on the wood surface and listening for changes in sound to indicate changes in wood density). Common infestation areas of structures include around doors and window frames and around soffit areas. Use of specialized detection devices such as acoustic emission devices, microwave-based detection, or X-ray technology may also greatly improve the ability to identify infestation and effectively deliver treatment into termite galleries.

Application of Optigard Flex for zone or spot treatments of drywood termites should focus on controlling active infestations. Optigard Flex may be applied with equipment suited for injection of foam into termite galleries in wood. Optigard Flex is compatible with a wide range of foam-generating equipment, including hand-pump or power models. Injections should be made by drilling into termite galleries and applying a foam preparation of Optigard Flex into each injection hole.

RESULTS OF OPTIGARD FLEX TESTS WITH DRYWOOD TERMITES

Laboratory Tests: Non-Repellent Nature of Optigard Flex—Free Choice Trials (Scheffrahn, U of Florida, Ft. Lauderdale).

Bioassays were conducted with the Southeastern drywood termite, *Incisitermes snyderi*, using simulated termite galleries as test chambers. Termites were allowed free choice between treated and untreated chambers over a 49-day period, and mortality was recorded by observing termites through Plexiglass installed on one side of each chamber. Termites readily moved into the treated area of the test chamber, demonstrating that Optigard Flex was not repellent to drywood termites. Optigard Flex was highly effective in controlling drywood termites, with mortality nearly 100% at 49 days (Figure 3).

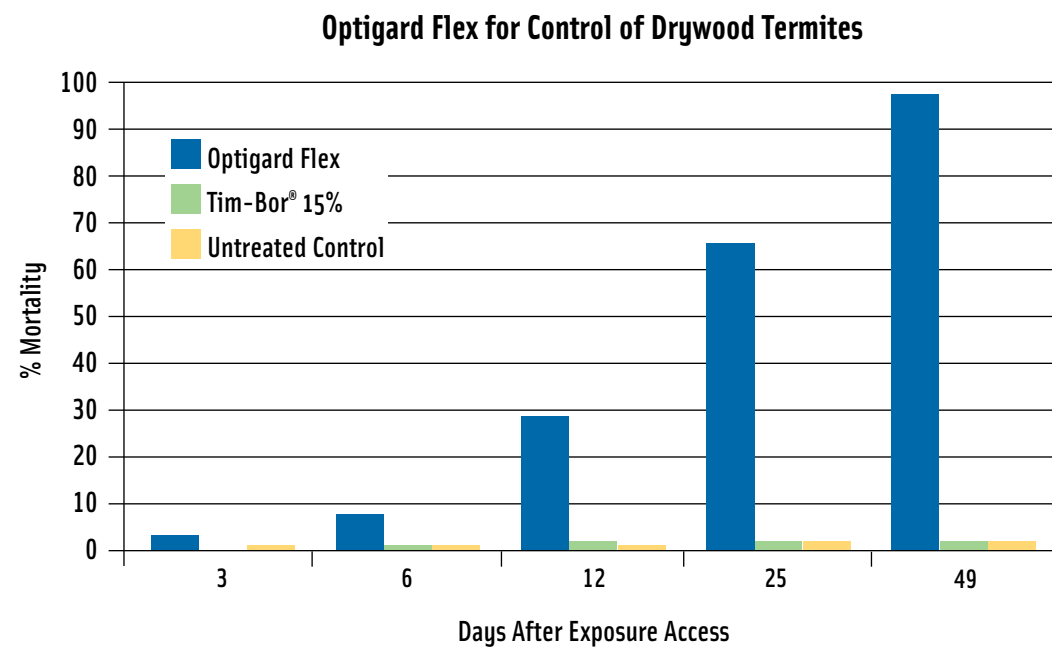


Figure 3

USE OF OPTIGARD FLEX FOR CONTROL OF COCKROACHES

In addition to void applications, crack-and-crevice or spot applications may be made to control cockroaches in areas not easily accessible to humans. Treatment areas include points or cracks between different elements of construction, spaces between equipment and floor or wall, openings leading to voids in walls, spaces beneath equipment or cabinets, or spaces between trim and floors or walls.

As a spot or crack-and-crevice treatment, apply 0.1% Optigard Flex dilution directly into cracks and crevices or other non-exposure areas as a low pressure spray using equipment capable of delivering a pin stream of insecticide. Applications may also be made as a foam preparation. Do not make general surface applications to living spaces.

RESULTS OF OPTIGARD FLEX TESTS WITH GERMAN COCKROACHES

Laboratory Test: Optigard Flex Evaluation of German Cockroach (Blattella germanica) Control Applied to Wood and Drywall, (BioResearch, Fresno, California).

Tests were conducted in small arenas treated with Optigard Flex as a foam application at 0.05%. Foam was applied to plywood and drywall substrates and aged for 0, 30, 58, and 90 days. German cockroaches were placed on the treated surfaces and mortality was recorded after 1, 24, 48, and 72 hours exposure at each surface-aging period. Results of the tests are given for plywood and drywall substrates.

