

Optigard Cockroach Gel Bait Technical Bulletin

Introduction

[Optigard® Cockroach gel bait](#) from Syngenta is a ready-to-use formulation for controlling indoor and outdoor cockroaches. Optigard Cockroach may be used against German, Asian, brown-banded, American, Australian, brown, smokybrown and other species that live in or around structures. It is effective against species or strains that are resistant, either physiologically or behaviorally, to other gel baits or liquid applications.

Bait-averse cockroaches are susceptible to its powerful combination of the unique active ingredient and highly palatable bait matrix. The active ingredient, *emamectin benzoate*, is an advanced-generation derivative of avermectin, and has not previously been used for cockroach control. In other areas of pest management, *emamectin benzoate* has demonstrated excellent activity against economically important pests in agricultural crops and landscape trees.

After ingestion, the active ingredient remains viable within cockroach feces and tissues. This allows for transfer to other cockroaches that haven't directly been exposed to the bait, resulting in secondary kill. While behavioral characteristics and nutritional requirements of each cockroach species vary, most species are omnivorous and are readily cannibalistic. Therefore, even in the presence of an ample food supply, cockroaches will readily consume dead nestmates and are not repelled by those that have died from ingesting the bait.

Environmental and Toxicological Profile

Hazard Indicator	Species	Optigard Cockroach
Oral LD ₅₀	Female rat	> 5,000 mg/kg body weight (practically nontoxic)
Dermal LD ₅₀	Rat	> 5,050 mg/kg body weight (practically nontoxic)
Eye contact	Rabbit	Minimally irritating

Product Profile

- Unique active ingredient is effective against resistant and non-resistant cockroaches
- Broad-spectrum control of normal and bait-averse German cockroach strains, as well as American, Oriental, brown-banded and other cockroach species
- Highly palatable bait matrix
- Non-repellent and non-staining
- Bait is ingested by foraging cockroaches and transferred to other non-foraging individuals in the colony
- Dual-target site action at the muscle and nervous system
- Secondary kill occurs via both coprophagy and necrophagy
- Population reduction occurs within days of placement

- Approved for use in cracks and crevices, indoors, outdoors and in refillable bait stations
- Packaged in a ready-to-use syringe complete with plunger for easy application
- May be applied with standard bait guns
- Even consistency for ease of application
- Resists running when placed on vertical surfaces

Dual-Target Site Action at the Muscle and Nervous System

Because of the unique structure of the *emamectin benzoate* molecule, Optigard Cockroach targets two sites to help control cockroaches. After ingestion, the active ingredient causes chloride channel activation. The active ingredient then affects gamma-aminobutyric acid (GABA) receptors at the inhibitory nerve-muscle junction and glutamate-H receptors on muscle surfaces, resulting in insect paralysis and death.

Application of Optigard Cockroach

Optigard Cockroach is an easy-to-use, 0.10% gel formulation. It can be applied using a syringe applicator or bait injector tools.

PRODUCT PACKAGE	APPLICATION GUIDELINES
Optigard Cockroach 30-g syringe	<ul style="list-style-type: none"> - Spot placements of 0.25 to 0.50 g of bait (1/8 to 1/4 in. diameter) should be placed where cockroaches harbor or forage - Bait may also be applied as a bead approximately 1/8 in. thick and approximately 2 in. long - May also be used in refillable bait stations

Application Sites

Optigard Cockroach is effective against cockroaches found indoors or outdoors.

For use indoors, apply bait to areas where cockroaches harbor or forage, including:

- Cracks, crevices and corners
- Behind kitchen appliances and baseboards
- Under sinks, pipes and water heaters
- Attics, crawl spaces and garages

For use outdoors, make applications to cracks and crevices around:

- Windows and doors
- Porches and screens
- Eaves, sills, soffits and expansion joints
- Sewer areas and garbage-holding areas
- Under stairways
- In open crawl spaces, garages, basements
- Other cockroach harborage/foraging areas

In all cases, bait must be placed out of the reach of children and pets.

Field and Laboratory Trials

Conducted in the presence of competing cockroach food sources under challenging conditions

Field trials in Florida, Indiana and California compared the activity of Optigard Cockroach with Maxforce® FC Select roach killer bait gel against German cockroach populations in apartment complexes. Combined results showed Optigard Cockroach outperformed Maxforce FC Select at all time periods after initial bait placement. Optigard Cockroach achieved 90% control of German cockroaches 14 days after treatment, with 99% control 35 days after treatment (Figure 1).

Mean control of German cockroaches in apartment complexes in Florida, Indiana and California

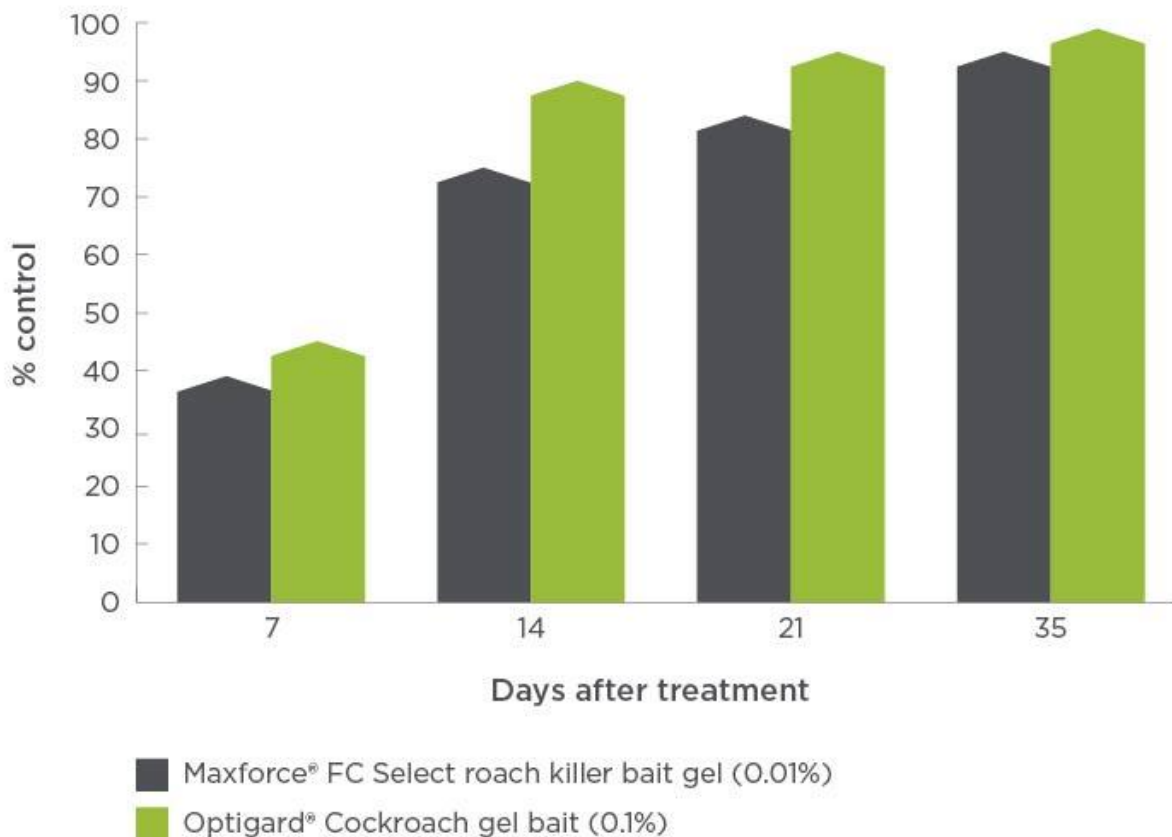


Figure 1. Source: RJM Contracting, T019979-04

Secondary Kill Studies (Coprophagy)

To test transfer of the active ingredient through coprophagy, bait-averse and non-averse (normal) adult German cockroaches were allowed to feed on Optigard Cockroach. The resulting fecal material was provided to first instar nymphs as a natural food source. Three days after exposure to adult feces excreted by Optigard Cockroach-fed adults, mortality of bait-averse and normal nymphs was 64% and 43% respectively. By day seven, 100% mortality of bait-averse nymphs occurred, with 96% mortality of normal nymphs (Figure 2).

Efficacy of Optigard Cockroach (0.1%) against German cockroach nymphs via coprophagy

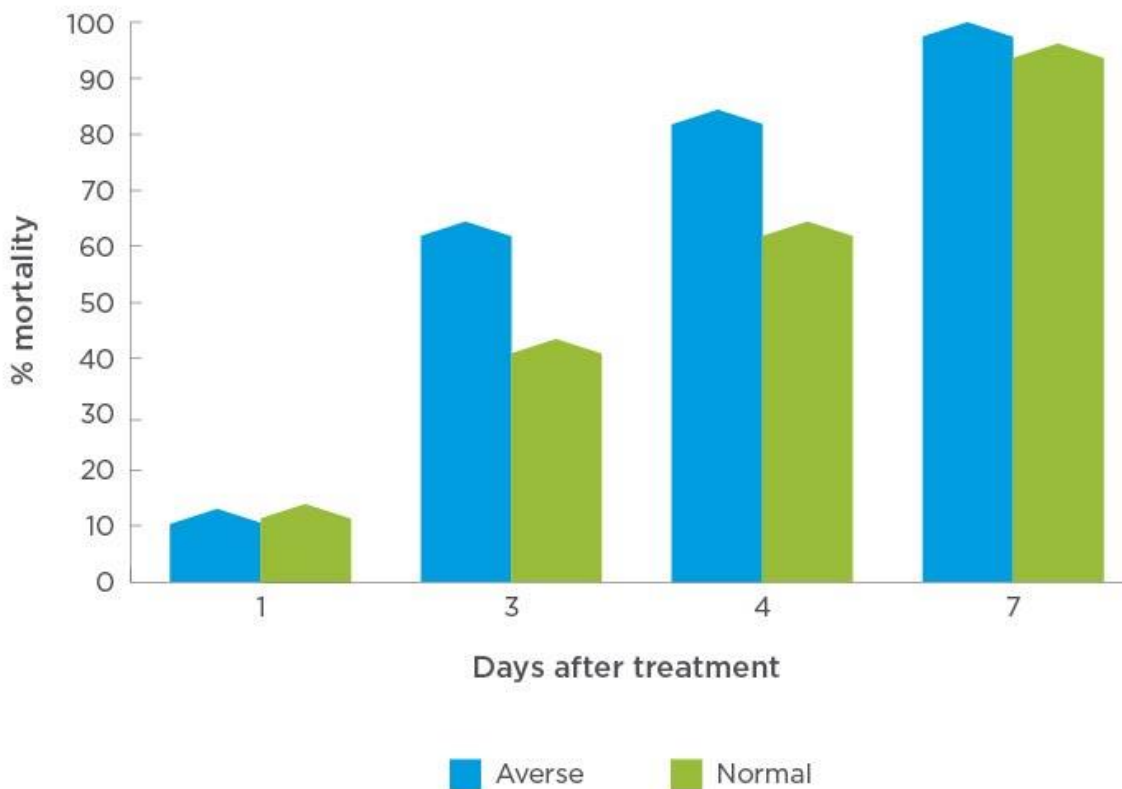


Figure 2. Source: Syngenta Research Laboratory, Vero Beach, USVLO10042006/USVLO10052006Vero. Both control strains remained at zero mortality.

Secondary Kill Studies (Necrophagy)

To test transfer of the active ingredient through necrophagy, nymphal German cockroaches were provided ample amounts of Optigard Cockroach. Bait-killed nymphs were then collected and provided to adult males as a food source. By four days after exposure to dead nymphs, mortality of adult males reached 40%, with 70%, 97% and 100% mortality at five, seven and nine days respectively (Figure 3).

Efficacy of Optigard Cockroach (0.1%) against German cockroach nymphs via necrophagy

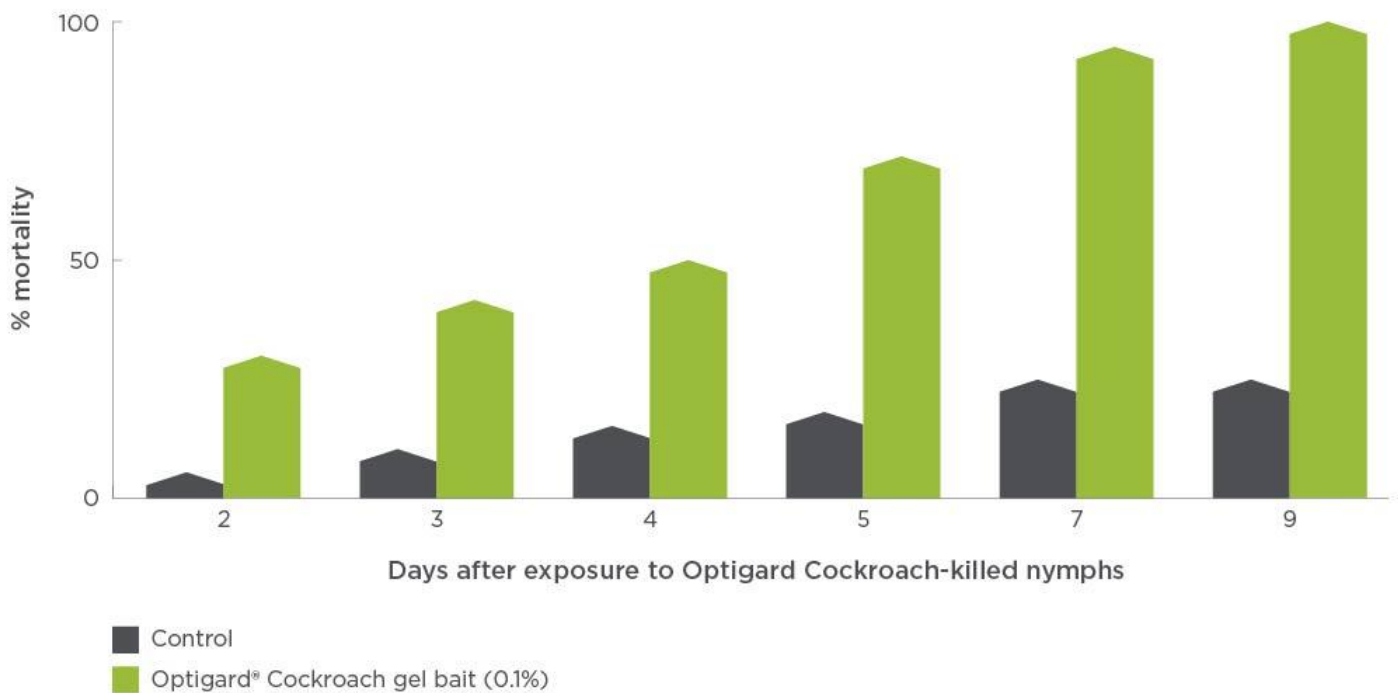


Figure 3. Source: Syngenta Research Laboratory, Vero Beach, USVL010132007

90% Recipient Mortality from Secondary Transfer

- Donor = cockroach that was fed bait with active ingredient
- Recipient = cockroach that only had access to donor for food source
- Frozen male control = no active ingredient; untreated

Donor mortality (primary; % dead) of Optigard Cockroach-fed adult males

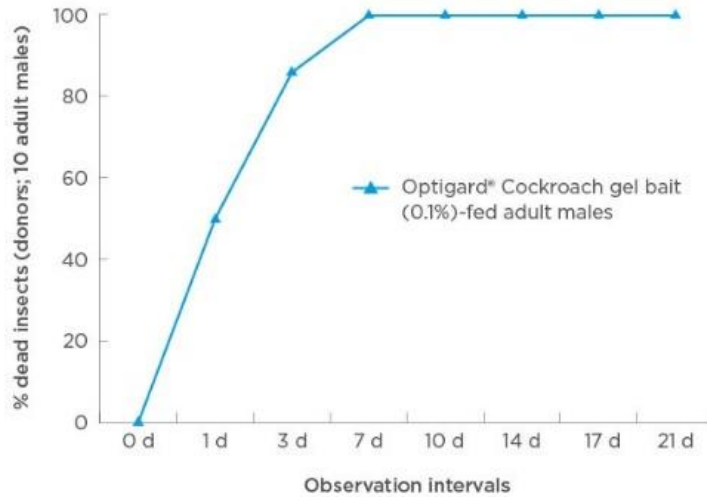


Figure 4A. Source: USNI015312015

Recipient mortality (secondary; % dead)

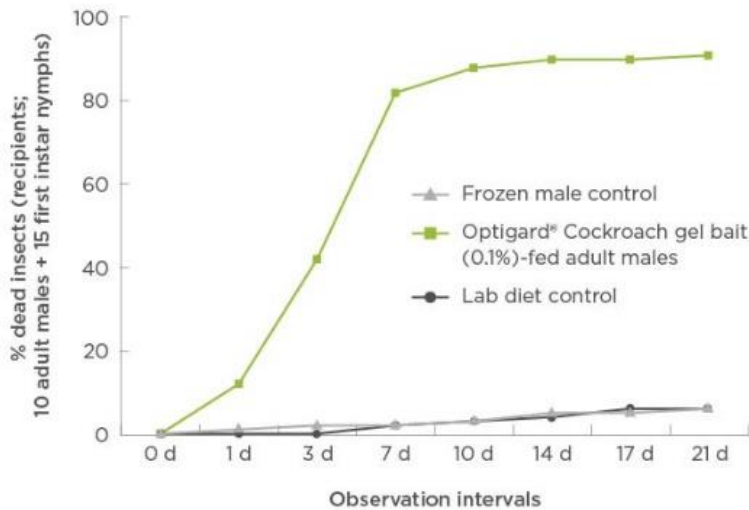


Figure 4B. Source: USNI015312015

Make Proven Cockroach Control Your Competitive Edge

The [SecureChoiceSM Cockroach Assurance Program](#) from Syngenta combines an integrated pest management (IPM) approach with proven products for comprehensive cockroach control. The program's [IPM Guide](#) outlines three phases of treatment: an initial visit, follow-up visit and continued maintenance and prevention including best practices for inspection and monitoring.

The IPM Guide recommends a 90-day rotation of the following products to help manage insecticide resistance and bait aversion:

- [Advion[®] WDG insecticide](#) and [Optigard Cockroach](#)
- [Optigard Flex liquid insecticide](#) and [Advion Evolution cockroach gel bait](#)

By following the protocol, cockroach infestations will be reduced by at least 90% during the first four visits over a 60-day period. If adequate reduction is not achieved, Syngenta will provide the appropriate quantity of Syngenta products to cover the retreatment as described in the SecureChoice Cockroach Assurance Program.

For more information, visit SyngentaPMP.com/Cockroach

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