



Game On!

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When gaming on the Wii, Xbox or PlayStation, nothing feels better than moving up to the next level and gaining new powers to win the race or beat the bad guy.

In the real world, pest professionals have done just that by adding insect growth regulators (IGRs) to their treatment strategy.

Whether to combat cockroaches, bed bugs, stored product pests or drain and fruit flies, they're a powerful tool that can raise your game.

Building Your Cache. IGRs break the insect lifecycle. By mimicking a juvenile insect growth hormone, they interrupt the maturation process and prevent insects from reaching an adult stage, explained Central Life Sciences Special Product Development Director Doug VanGundy.

They also severely limit insects' reproductive abilities, causing non-working reproductive organs, reduced egg-laying capacity, and sterile eggs when directly

Profitability through Prevention

For pest management professionals, the key to profitability is efficiency and consistent control. That's why in today's economy, it's more important than ever to ensure that your product choices for both commercial accounts and private residences provide comprehensive, long-term control, preventing costly callbacks that can negatively impact your company's bottom line.

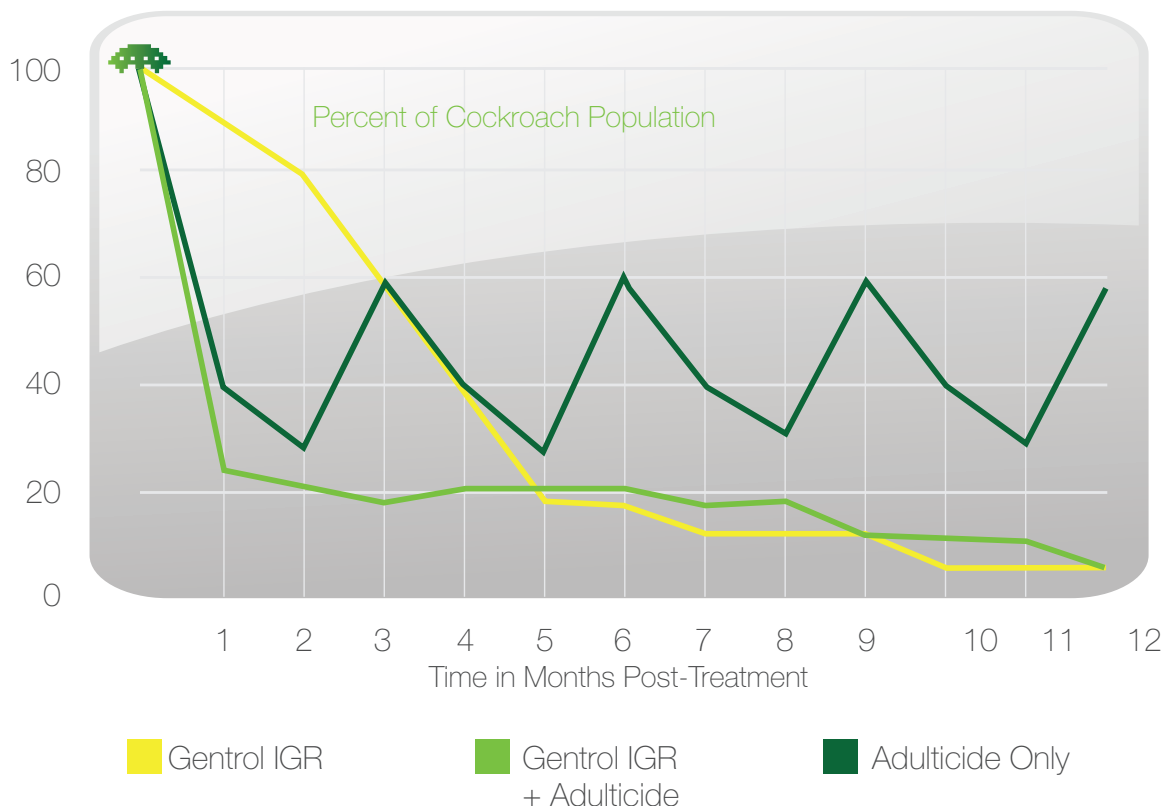
Zoëcon's comprehensive line of Insect Growth Regulators (IGRs) does just that – reducing callbacks and preventing re-infestations, resulting in more profit and less product waste for your business. As part of an Integrated Pest Management program, Zoëcon products' long-term control increase customer retention and allow pest management professionals to focus on business growth.

Reassessing your pest control solutions to incorporate IGRs into your treatment protocols can positively impact your operation's bottom line by reducing callbacks and increasing customer loyalty. To learn more, visit www.zoecon.com



Double Trouble for Insects

Efficacy of Gentrol® IGR in Combination with an Adulticide.



This chart illustrates the effectiveness of the IGR (S)-Hydroxyurea when used in combination with an adulticide.

touched by the IGR. Although IGRs don't kill pests outright, they interrupt reproduction "so the population crashes."

IGRs like Gentrol® work at a molecular level and stay active in the insects' environment for 60 to 180 days after application, said Richard Kramer, President, Innovative Pest Management, Brookeville, Md. It reaches areas that can't be treated with traditional liquid insecticides. Kramer worked with Gentrol while doing his Ph.D. research on the ef-

fects of IGRs on insect growth and development.

This translocation property is the IGR's biggest advantage, according to John Forbes, Quality Assurance Director, Rose Pest Solutions, Northfield, Ill. "You don't need to use a great deal for it to be extremely effective."

Antimite Termite & Pest Control General Manager Dave Taylor in Chino Hills, Calif., agreed. "Gentrol is like a secret agent" on a "search and destroy mission."

Game On!

“Cheat Code” for Success. IGRs are highly versatile and most professionals use them in combination with conventional insecticides.

“We like the Gentrol because it gives us some flexibility and ease of use when we mix it with another pesticide,” said Taylor.

“Gentrol was green 25 years ago,” said Zoëcon Business Manager John Neberz. As the inventor of IGRs, “we feel we have one of the best ones out there.”

Gentrol IGR Concentrate can be tank-mixed with emulsifiable concentrate or wettable powder insecti-

“Insect growth regulators fit nicely into ‘green’ pest management programs. “Gentrol was green 25 years ago,” observes Zoëcon Business Manager John Neberz.

It provides multiple levels of attack: Mixed with a residual pesticide, it gives “down the road protection” for pests that might enter the environment after the residual effect wears off. Regular cleaning can remove residual products, but the IGR attaches to organic material on walls and the undersides of counter tops and equipment – areas not cleaned as often.

When mixed with a non-residual pesticide for flushing jobs, Gentrol stays behind to interrupt the development stage of any insects missed during application, said Taylor.

It “takes care of the stragglers to keep them from reproducing” and causing a population rebound, VanGundy explained.

And Gentrol can be applied by itself, which will take longer to get results but is an option for customers who don’t want conventional pesticides applied, Taylor said.

Forbes has used it “where we don’t necessarily want to put an adulticide but we still want to have some protection.”

IGRs were the “first green solution for pest control,” said VanGundy. They are a “softer application” employing a different mode of action and are lower in toxicity than conventional pesticides.

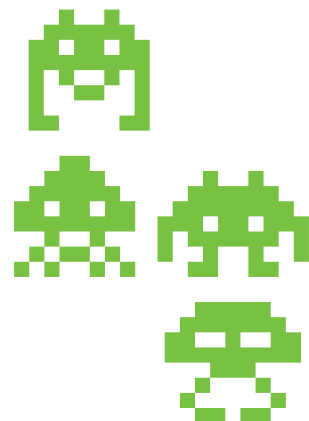
cides and used as a general surface spray, fogging, foam, spot, or crack-and-crevice application for commercial and residential accounts. A non-repellent, it can be sprayed over baits.

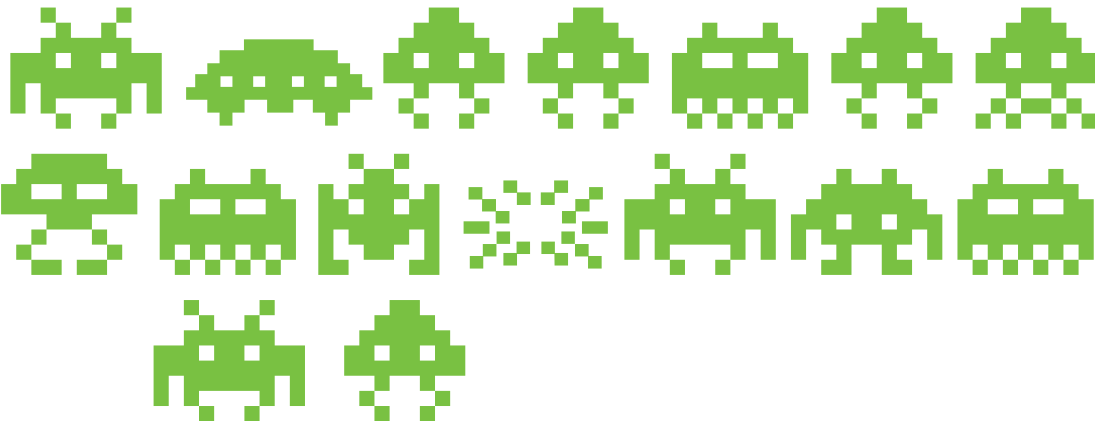
Gentrol Aerosol is designed for crack-and-crevice applications, and Gentrol Point Source is a clamshell-like slow-release device that’s activated by squeezing a small plastic vial of IGR onto filter paper. Placed under sinks, behind plumbing or in food pantries, it covers 75 square feet.

The IGR’s flexible label and use patterns let professionals carry fewer products to control a host of pests.

Power Boost: Savings Gain. Antimite technicians don’t always understand why Taylor is “so insistent that they use the Gentrol.” But let’s face it: Sometimes technicians are rushed, can’t get access to areas, or are limited to where they can apply residual products due to label restraints. Using the IGR “gives me a little buffer,” he explained.

And it helps prevent the costs of re-infestation, re-treatments and callbacks. “Those are all concrete expenses the pest control operator wants to avoid,” said Neberz. ⏻





Battle Plan: A History of IGRs

Insect Growth Regulators (IGRs) have been around a lot longer than you might think.

The first were created in 1968 by Zoëcon, the company founded by Carl Djerassi, the co-inventor of the human birth control pill. Zoëcon successfully applied this knowledge and other technology to insects, synthesizing dozens of IGR molecules.

Three were produced commercially: Methoprene, Kinoprene, and Hydroprene, the active ingredient in Gentrol® IGR Concentrate.

IGRs were new territory for the industry and in the mid-1970s the EPA used the term “biorational” – now widely used to describe softer chemicals – to describe the Zoëcon technology.

Hydroprene is available in three formulations: an

emulsifiable concentrate that can be mixed with water and other products as a liquid spray, foam or fog; an aerosol for crack-and-crevice treatments; and Point Source, a slow-release device that’s activated by squeezing a small vial of the IGR onto a strip of filter paper and placed under sinks and in pantries. It covers areas up to 75 square feet.

Over the years, Zoëcon has revised its label for Gentrol, formerly known as Gencor, to meet pest professionals’ needs. Most recently it was approved for bed bug control and remains the only IGR labeled for that pest.

Cook’s Pest Control has relied on it for more than 17 years. It’s an established part of the company’s protocol, said Technical Director Stephen Gates.

Zoëcon is a division of Central Life Sciences. 

Bonus Round: Bed Bugs

Professionals on the front lines of bed bug control know strategy and skill are essential. So is having the right tools to launch a “two-pronged attack,” said Antimite Termite & Pest Control General Manager Dave Taylor.

That’s why many have added an Insect Growth Regulator (IGR) to their treatment protocol to help prevent re-infestations and provide long-term control.

Innovative Pest Management President Richard Kramer treats 100-plus apartments each week for the subversive pests and added Gentrol IGR – the only IGR labeled for bed bugs – to his tank mix 10 years ago.

Because of its molecular volatility, the IGR gets into walls, furniture, cracks and crevices and other materials pros cannot treat with traditional liquid insecticides, he explained. “I’m surprised we get as good of control as we do in some of these environments,” given that tenants often won’t launder clothing and bedding and remove clutter.

It has “a good chance” of getting to the pests so we can get a handle on the population, said Taylor.

Gentrol IGR won’t kill adult bed bugs, but it does stop their lifecycle. In studies generated to satisfy EPA registration requirements, 66 percent of bed bug nymphs exposed to the IGR died before molting into adults, and 92 percent of the surviving nymphs were unable to reproduce.

“Some unpublished information in the public domain has suggested the IGR caused bed bug females to produce more eggs, but in our own studies we did not see this,” said Central Life Sciences Specialty Product Development Director Doug VanGundy. Typically, IGRs cause a reduction in egg production in normal adult females that are directly exposed to the IGRs, according to VanGundy.

The debate over the IGR’s effectiveness “never deterred me,” said Kramer, who worked with Gentrol as part of his Ph.D. research. The IGR has “enhanced our program” at a minimal cost.



Next-Level Cockroach Control

When the enemy is the German cockroach, it pays to have “levels of defense,” said Stephen Gates, Technical Director, Cook’s Pest Control, Decatur, Ala.

His first attack: baits that knockdown the population. Though it’s still possible to miss some roaches or have new ones introduced to the environment.

Hence, his second level of defense: an Insect Growth Regulator like Gentrol® for long-term control. The IGR halts the cockroach lifecycle by interrupting the maturation process. When the pests reach the adult stage they are rendered sterile. Twisted or curled wings are a visible indicator that the IGR is working.

Gates uses Gentrol Point Source to treat commercial kitchens. The slow-release device is activated by squeezing a plastic vial of IGR onto a strip of filter paper. It can be placed under cabinets and behind pipes and covers a 75-square-foot area.

“In regards to baiting, Gentrol is an ideal product,” said Innovative Pest Management President Richard Kramer, who studied the effects of IGRs on insect growth and development for his Ph.D. program. IGRs stimulate feeding in roaches as they try (against the odds) to change into adults, he explained.

Rose Pest Solutions Quality Assurance Director John Forbes found the IGR helpful to control roaches in a large hospital kitchen. Getting access to the pests’ harborage areas was particularly challenging, given the loads of equipment and many half-walls with counters for food preparation.

His team used Gentrol IGR Concentrate with a fogging product at night, but still some areas were difficult to reach. At the two-week follow-up visit, he saw roaches with curled wings in areas not directly treated. “It made me feel very good” to take care of the situation despite not having full access, said Forbes.

As with any infestation, “you don’t want to put a Band-Aid® on it, you want to solve the problem,” Gates said. Gentrol is a “lasting product that will help solve that problem.”

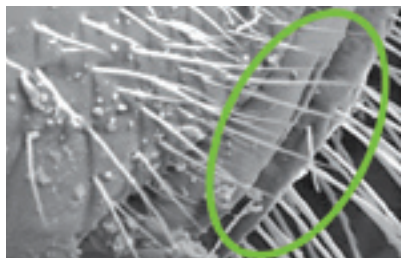


Figure 1. Normal male bed bug reproductive organ (paramere).

IGR Effects on Insects

Gentrol® contains the Insect Growth Regulator (S)-Hydroprene. (S)-Hydroprene is a synthetic copy of naturally occurring insect biochemicals. IGRs prevent insects from completing their normal development into the adult stage. In insects with gradual metamorphosis, such as cockroaches and bed bugs, the impact is

on the last nymphal instar, causing adults to have twisted wings (cockroaches), darkened cuticles, and non-functional reproductive organs. Gentrol® Aerosol and Gentrol® IGR Concentrate work on bed bugs, as in cockroaches, by preventing the nymphs from developing into reproductively functioning adults.

Rank Up: Stored Product Pest Solutions

Whether in commercial or residential accounts, stored product pests pose a real control challenge. They like to hang out in highly sensitive areas... namely, our food.

Consider home pantries infested with grain insects. Finding the source, and treating around food products, containers and other stored items can take "a great deal of time," said John Forbes, Quality Assurance Director, Rose Pest Solutions, Northfield, Ill.

He said adding an Insect Growth Regulator (IGR) like Gentrol® to the treatment protocol breaks the pests' lifecycle and provides long-term control.

Forbes often uses Gentrol Point Source, slow-release device that's activated by squeezing a small vial of the IGR onto a strip of filter paper. The IGR covers an area of 75 square feet.

Any insect that comes within the treated area is going to be affected, Forbes explained. "You've got something there that you know is going to be working for you."

Dave Taylor, general manager at Antimite Termite & Pest Control, uses the IGR to help control cigarette beetles, sawtoothed grain beetles, Indian meal moths and confused flour beetles in schools, warehouses and commercial storage areas. "It is a helpful tool," he said, that has "a lot of flexibility."

Gentrol IGR Concentrate can be mixed with other products or used alone as a surface spray, crack-and-crevice treatment, and ultra-low-volume – or fogging – application.

The immediate goal is to control the infestation, said Forbes. Adding an IGR to the program helps prevent the pests from recurring in the future. "It's all about the long term."



Drain and Fruit Fly Control: Unlocking Success

Cook's Pest Control Technical Director Stephen Gates has trusted Insect Growth Regulators (IGRs) to help control cockroaches for years, so when faced with particularly challenging drain fly infestations he knew where to turn.

Gates generally uses a microbial to control the pests, but for bad drain fly problems he also applies Gentrol® Aerosol after business hours. Or if a restaurant has many drains, his crew will mix microbial and Gentrol IGR Concentrate in a foaming machine and treat all the drains at once.

Drain flies become a problem within structures when they breed in the liquids commonly found in drains and garbage disposal areas of structures. Adult flies are poor fliers and are found in significant numbers on walls or flying weakly in the area they developed. Adults are more active at night and are seen hovering near the breeding site. During the day, they rest on vertical surfaces indoors and in protected areas outside. Adults feed on nectar and polluted water. When drain flies are a persistent problem within a structure, dirty drains are usually the culprit. That's when insect growth regulators can be beneficial.

Gates applies the IGR around the drain collar and lid – "that's where a lot of your fly problems are coming from" – as an extra line of defense. The IGR prevents the pests from becoming reproductive adults, which breaks their lifecycle and results in long-lasting control.

"It's a great supplemental product," he said. 🔄



Electron microscopy shows that in cockroaches and bed bugs the organs responsible for normal copulation and reproduction do not develop. In the case of male bed bugs, the paramere – or reproductive organ – fails to develop normally. As a result, successful copulation cannot occur (see Figure 1 at left

and Figure 2 at right).

In insects with complete metamorphosis such as stored product pests, moths, or drain flies, the impact occurs in the pupal stage, causing death. In certain flour beetles, there is an impact on the ovaries of the female, causing sterility. 🔄

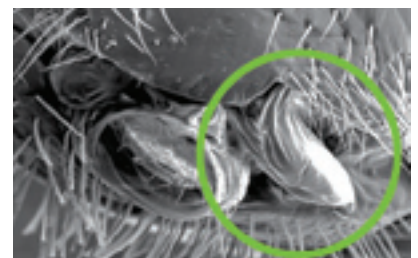


Figure 2. Gentrol® affected male bed bug reproductive organ (paramere). Exposed male bed bug molted into an adult, but with the paramere deformed.

Zoëcon Professional Products

The Toolbox for Professional Pest Control Operators.

Gentrol® Point Source

COCKROACHES • STORED PRODUCT INSECTS

Gentrol® Point Source has all the benefits of an Insect Growth Regulator in a discreet, non-spray formulation. Application is as simple as squeezing the raised end of the plastic, adhesive-backed device to release Gentrol IGR onto a filter paper. The active ingredient (S)-Hydroprene prevents insect larvae and nymphs from becoming adults, and helps stop future infestations. The discreet delivery system of Gentrol Point Source is ideal for food handling establishments, hospitals, nursing homes and any area where spraying isn't acceptable, such as electrical boxes, pantries and computer equipment. It also is an effective method of application when used in locations like commercial kitchens, where there is a risk of washing the product away.



Gentrol® Aerosol

COCKROACHES • STORED PRODUCT INSECTS • DRAIN FLIES • FRUIT FLIES • BED BUGS

Gentrol® Aerosol contains the Insect Growth Regulator (S)-Hydroprene, which disrupts the insects' normal development, preventing pupae from becoming adults and sterilizing nymphs as they become adults. As a general surface spray or spot treatment, Gentrol Aerosol is applied with a sweeping motion over a surface. Its visible, dissipating foam virtually eliminates the chance of missing any areas. Use the Gentrol Aerosol extension tube for simple, accurate application in hard-to-reach areas.



Gentrol® IGR Concentrate

COCKROACHES • STORED PRODUCT INSECTS • DRAIN FLIES • FRUIT FLIES • BED BUGS

Gentrol® IGR Concentrate travels deep into wall cavities, as well as cracks and crevices, reaching the insect pests that other treatments miss. (S)-Hydroprene, the active ingredient, prevents larvae and nymphs from becoming normal reproductive adults, thereby preventing future generations of infestations. Gentrol IGR Concentrate spreads out from its point of application, creating a much larger treated surface than conventional insecticides. Pests encounter Gentrol the same way they encounter other insecticides – by traveling on or contacting a treated surface. The long-term control of Gentrol IGR Concentrate is ideal for use in warehouses, food handling establishments, schools, hospitals, nursing home and numerous other locations.



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