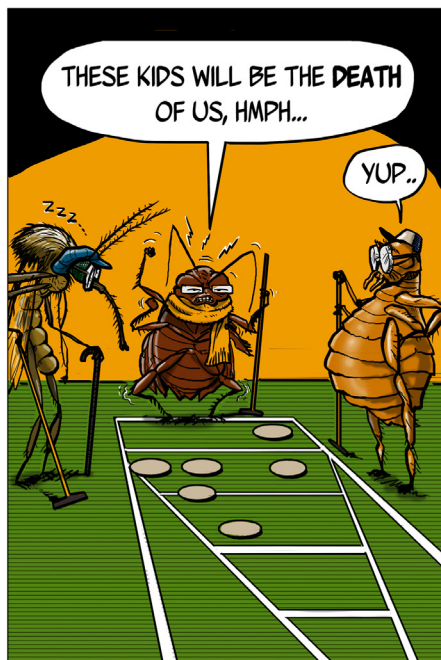
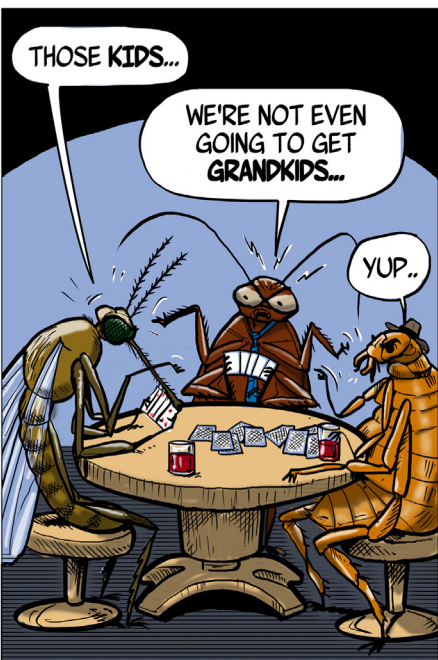
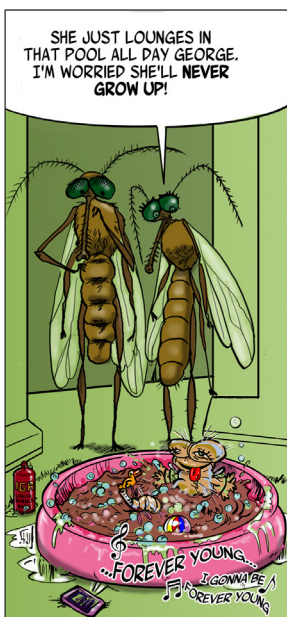
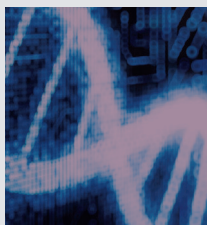
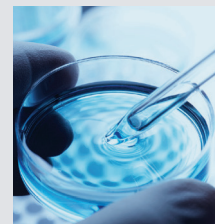
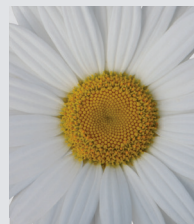




PMP PULSE!

Your Professional Pest Control Technical Source



What is an IGR?

Author: Anna Hansen

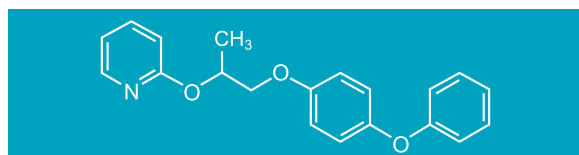
INSECT GROWTH REGULATORS (IGRs) are a type of insecticide that break the insect life cycle by interfering with growth and development. Simply put, the insect fails to properly grow into a mature adult. Some IGRs are targeted to specific pests, while others will be effective on many species. IGRs will often not kill the target pest, but can leave visible side effects, such as twisted wings. Other effects of IGRs can include reduced egg hatch and reduced fecundity in the adult. IGRs primarily impact immatures and will not kill adult insects. Therefore, it is important to apply IGRs in such a way that immatures will be exposed to them. Many PMPs like to combine IGRs with adulticides to incorporate multiple modes of action and address the adult population. IGRs are a popular choice as many are considered reduced impact on vertebrates.



HYDROPRENE



METHOPRENE



PYRIPROXFEN

What Species Should Juvenile Hormone Mimics Be Used On And Why?

Author: Sandra Sleezer

JUVENILE HORMONE MIMICS (JHMs) work on many different species of insects. This makes them highly versatile for population control in several situations. They tend to work extremely well on insect species with complete metamorphosis. That means they have very different looking immature and adult stages, such as fleas and mosquitoes, going from egg, to larva, to pupa, to adult. However, they also have good efficacy on some insects with incomplete metamorphosis, such as cockroaches. Incomplete metamorphosis means there is a more gradual looking transition into adulthood going from egg, to nymph, to adult. Cockroaches are problematic in both the nymph and adult stage, but more so in the adult stage as they tend to travel farther and

become much larger and more visible. Preventing larger adult cockroaches and reducing reproduction with JHMs can be an extremely effective control tactic.






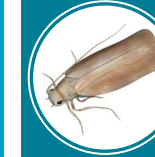
Using JHMs on immatures where the damage is caused by the adults, and not the immatures, is a great use of a JHM as it prevents damaging adults from occurring at all. Immature mosquitoes and fleas are prime candidates for JHM use.

Use of JHMs on insects with incomplete metamorphosis where the damage is caused by both the nymphal and the adult stages can also be very successful. However, you need to know the specific JHM works well on that species, such as pyriproxyfen on cockroaches.

Using JHMs on immatures where the damage is caused by the immature stage is generally not an ideal use of these products, as it will potentially increase the damage for a longer time before finally gaining control. I don't generally recommend JHMs for immatures of these types of species, unless you don't have any other options, or you are combining it with a faster acting insecticide. Some examples of these are stored product pests, such as red flour beetles, Indian-meal moths, clothes moths, and saw-toothed grain beetles.

There will always be exceptions to the rules, but I have found these to be helpful guidelines. I hope you find them useful too!

Examples of insect groups where juvenile hormone mimics (JHMs) are and aren't suited for use on immature stages

INSECT GROUP						
TYPE OF METAMORPHOSIS	Complete	Complete	Incomplete	Complete	Complete	Complete
DAMAGING STAGE(S)	Adult	Adult	Nymph/Adult	Larva	Larva	Larva
PRIME TARGET FOR IGR USE ON THE IMMATURE STAGE	Yes	Yes	Yes	No	No	No
Mosquitoes	Fleas	Cockroaches	Stored Product Pest Moths	Stored Product Pest Beetles	Fiber Feeding Moths	

What are the different types of IGRs?

Author: Anna Hansen

THERE ARE VARIOUS TYPES OF IGRs

The 2 most common types include hormone mimics and chitin synthesis inhibitors

Continue reading to learn about each type

HORMONE MIMICS






Molting is a complex process. A lot of things must happen at the right time and in the right order for a molt to be successful. Depending on hormone levels, an immature insect will either molt to the next instar, pupa, or adult. One of those hormones is juvenile hormone (JH). Common IGRs, such as pyriproxyfen, hydroprene, and methoprene, are juvenile hormone (JH) mimics. Insects exposed to these products experience an unnatural surge in JH, resulting in incorrect development.

CHITIN SYNTHESIS INHIBITORS

Insects do not have an internal skeleton like people do. Their skeleton is on the outside. This exoskeleton is largely made of chitin. Chitin is a fibrous polymer, comparable to keratin (the protein that makes up hair, nails, and horns in vertebrates). Immature insects have to shed their old exoskeleton to grow. Immediately after molting, the insect is soft and vulnerable. After some time, the exoskeleton will harden again. When exposed to chitin synthesis inhibitors (such as noviflumuron), this process is disrupted, and the insect cannot properly form its new exoskeleton. Without this structure in place, the insect will die.

OTHER MOLTING DISRUPTORS

Molting disruptors, such as cyromazine, do exactly like their name suggests. They are similar to chitin synthesis inhibitors but have a different mode of action. These tend to be very specific to their target pest.

					
PRODUCT NAME	NyGuard	Archer	Pivot 10	Gentrol	Precor
MANUFACTURER	MGK	Syngenta	Control Solutions	Zoecon	Zoecon
SIGNAL WORD	Caution	Caution	Caution	Caution	Caution
ACTIVE INGREDIENT	Pyriproxyfen	Pyriproxyfen	Pyriproxyfen	(S)-Hydroprene	(S)-Methoprene
APPLICATION RATE PER GALLON TO TREAT 1500 SQ FT	Low	4 ml / 0.01%	1.5 oz / 0.01%	4 ml / 0.01%	1 oz
	High	12 ml / 0.03%	3 oz / 0.02%	12 ml / 0.03%	none
INDOOR APPLICATION	Space Spray	Yes	Yes	Yes	Common flea surfaces including carpets, upholstered furniture, and pet sleeping areas.
	Broadcast	Yes	Yes	Yes	
	General Surface	Yes	Yes	Yes	
	Spot	Yes	Yes	Yes	
	C&C	Yes	Yes	Yes	
OUTDOOR APPLICATIONS	Yes	Yes	Yes	No	No
FOOD HANDLING	Yes	Yes	Yes	Yes	No
TREAT STANDING WATER	Yes	Yes	Yes	No	No
TREAT IN ANIMAL FACILITIES	Yes	Yes	Yes	No	No
RESIDUAL	Fleas 7 Months Cockroaches 6 Months	Fleas 7 Months Cockroaches 6 Months	Fleas 7 Months Cockroaches 6 Months	4 Months	7 Months
APPLICATION PERSISTENCE	Binds and Stays in Place	Binds and Stays in Place	Binds and Stays in Place	Volatilizes	Volatilizes
REAPPLICATION	28 - 30 Days [Exterior]	21 Days Indoor and 14 Days Exterior	28 - 30 Days [Exterior]	14 Days [Bed Bugs]	Not Specified
LABELED PESTS	Broad Range	Broad Range	Broad Range	Cockroaches, Drain Flies, Fruit Flies, Fleas, Bed Bugs, and Store Product Pests	Fleas Only

Why Use IGRs for Cockroach Control?

Author: Christy Jones

SO, IF IGRS DON'T KILL COCKROACHES RIGHT AWAY, what's the point? I want them dead and I want them dead fast! We all enjoy seeing the immediate results of spray and kill, but IGRs are useful because they prevent future populations from occurring, which is important when you have a large cockroach infestation. If you have a resistant population, having insecticides with multiple modes of action and long residuals will give you better control.



Pyriproxyfen, an IGR found in NyGuard®, has a longer residual than typical adulticides, which means it will not only control the current cockroach population but also prevent other cockroach populations from establishing.

Combining baiting with an IGR residual spray can give you

the benefit of not only multiple modes of action, but also different exposure methods. Certain IGRs like pyriproxyfen have a risk profile that allows them to be used in places other insecticides can't, such as commercial kitchens and other food handling areas. IGRs can also be included in IPM programs and work to control not only cockroaches, but a wide range of other pests.

Exposure to IGRs affect adults and nymphs differently. Adults exposed to IGRs lay fewer eggs and those eggs are less viable. Nymphs exposed to IGRs experience morphology changes, such as becoming very dark (melanistic) and having twisted wing pads. Nymphs either die during the molting process or become infertile adults, causing the population to decrease until it disappears completely. IGRs also cause nymphs to become more susceptible to non-IGR insecticides, giving you superior, long-lasting cockroach control. So, the question is, why wouldn't you include IGRs in your cockroach control program?

Rotational Recommendations for Cockroach Baiting

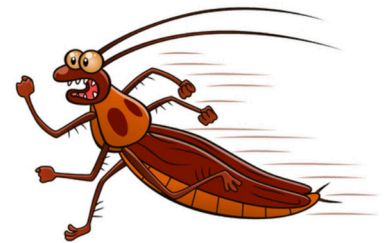
Author: Chris Swain



IN THE PAST 15 YEARS baits have become one of the most frequently used formulations/products for controlling cockroaches. Baits have proven to be efficient and effective at controlling cockroaches in commercial and residential settings. As with most products, over-utilization of a bait without a long-term strategy can lead to product failure. In the case of cockroach baits, using the same bait matrix for an extended period can lead to unacceptance of the bait by cockroaches. This is known as behavioral resistance or bait aversion. To avoid this, we recommend that you rotate bait matrices at least twice a year, however, more is probably better. Four rotations a year is probably the gold standard but the ability to do so will be dependent on an organization's operational capabilities. For larger pest management companies, four rotations a year might not be feasible. Another potential form of bait resistance is physiological resistance. In baits, physiological resistance generally refers to resistance to the bait's active ingredient. Currently most available data does not support the existence of frequent physiological resistance to cockroach baits. However, rotating both the matrix and the active[s] (specifically the mode of action) is not a bad idea. Doing both, if possible, would offer the maximum amount of protection from both forms of bait resistance.



COCKROACHES



American cockroaches have been recorded running 3.4mph, which is 5 ft in 1 second. That is amazingly fast considering their size. They go fastest when they run on their two hind legs.