

Fumigants & Pheromones

Digital Newsletter Delivered by Insects Limited, Inc.

Issue 153

Hey Buddy, Mind if I Use Your Pheromone?

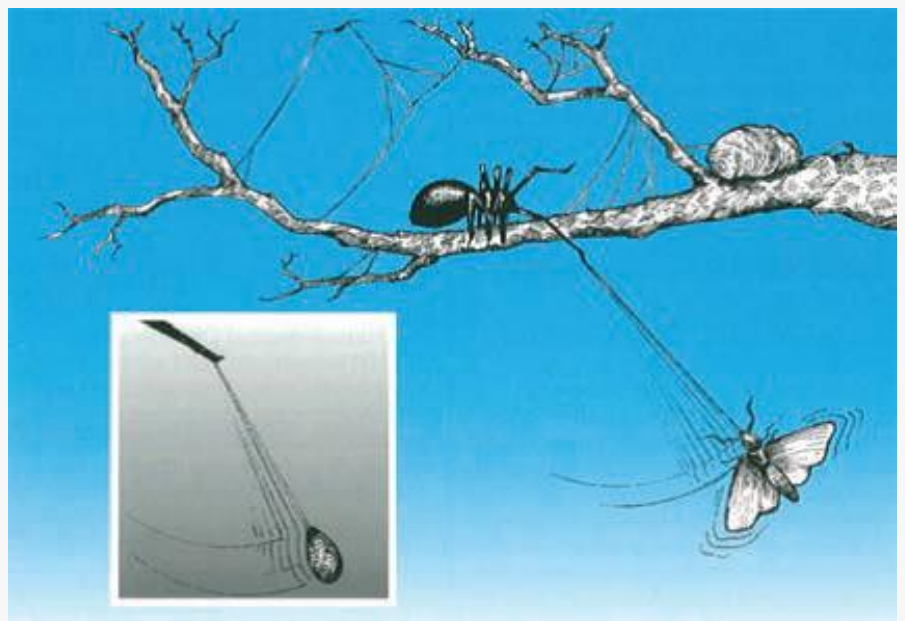


Patrick Kelley, BCE
President of Insects Limited

In the amazing world of nature, several unique species of insects and spiders actually produce or respond to the pheromones of other insects for their own benefit. This intriguing phenomenon has developed over evolutionary time within certain species that share the same living environment.

Insect species that exploit the pheromones of other species are doing so because it gives them an advantage to survive. Let's look at some examples nature has provided.

Bolas spiders of the family aranidae are not even true insects, but they produce the sex pheromone of Pyralid moths.



A Bolas Spider draws in a male moth with the female moth pheromone and captures it.

The clever spiders attract their moth prey right to them without even having to move. Bolas spiders are incredibly adept at swinging a sticky silk blob at the end of a line of silk (bolas). When the male moths approach the pheromone scent, the spiders maneuver their bolas and rope-in the unsuspecting moth for a juicy feast.

(Note: The term "bolas" comes from the age-old hunting tool used mainly in South America that incorporates two heavy weights connected by a long rope. The bolas is thrown and it entangles the feet of its large prey and brings it to the ground until the hunter can approach).

Pheromones

Insects live in a world of odors. They use these olfactory cues to direct a variety of complex social behaviors, including courtship, mating, and egg laying... [Read More](#)



Butterfly larvae of the family Lycaenidae produce a substance that mimics the pheromone of ants that they share a home with. As the vulnerable butterfly larvae feed on edible plant leaves, approaching ants would typically look at the larva as an easy meal. Instead, the larvae produce a pheromone odor that mimics the attending ants in the colony while at the same time offering up a liquid food substance from their glands. While competing ant species look at the larvae as “dinner”, the home colony views the larvae as a food source and a “brother.”



The butterfly larvae even have a second line of defense in their pheromone pocket. If they are attacked by an outside ant colony, the larvae produce an alarm pheromone that mimics the alarm pheromone of the home ant colony. The home colony will respond and fight the other attacking ants to the death while protecting the sly and deceitful butterfly larvae.

Photo: GREGORY G. and MARY BETH DIMIJIAN - Lycaenid moth larvae produce an ant brood pheromone that makes the ants think it is one of them.

The Pine Engraver beetle, *ips pini*, is a common bark beetle and important pest of pine trees in the Great Lakes region of North America. When a male pine engraver beetle discovers a suitable pine tree to attack, he emits an aggregation pheromone that attracts other male and female engraver beetles to that tree. Large numbers of pine engravers will gather on that single tree to mate, lay eggs and begin a new generation of engraver beetles.

The checkered beetle, *thanasimus dubius*, is a specialist predator that feeds exclusively on the insects within trees killed by bark beetles. Checkered beetles are much larger than bark beetles and they have voracious appetites. They have been said to eat several times their own weight in a single day. Checkered beetles have become so specialized in the Great Lakes region that they are strongly attracted to the aggregation pheromone that pine engraver males emit. These predators pick up the pheromone scent of the bark beetles and will fly to the tree and immediately begin feeding on the pine engravers.



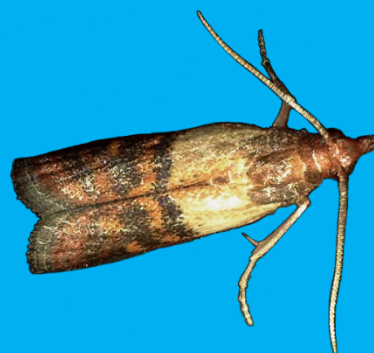
*Photo: BILL BARR
Adult Checkered beetle attacking a Pine Engraver beetle.*

These are just a few of the examples that nature gives us in the amazing world of pheromones. The next time you find yourself placing a moth pheromone lure into a sticky trap, remember that you're not too much different than the clever bolas spider drawing in her prey!

Quality Pheromones and Trapping Systems

Insects Limited manufactures and sells pheromone lures and traps for insect pests of dried food, textiles, grain, carpets, taxidermy, and tobacco.

www.InsectsLimited.com



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The Art of Science at Insects Limited



James Feston, BCE
Director of Product Research

We have a saying at [Insects Limited](#). It's not fancy, wordy, or punny but it really does guide our thinking across the company and is the necessary foundation of our science.

“Start with the Insect First”

This simple saying, and the fact that the whole company lives it, makes my job as product director easy. From our customer service, logistics, marketing, and sales, each of us interreacts with customers in different ways and recognizes problems from different points of view, but when we get together to discuss solutions for our customers, everyone knows where to start and I get the opportunity to shape these ideas into new and improved products.



One of the unique aspects of our company is the resources and knowledge we have been building for the last 30 years. We have 3 fulltime Board-Certified Entomologists (BCEs) on staff, a full-sized and dedicated lab, and an extensive collection of live stored product insects on-site (both in the rearing chamber where they are supposed to be as well as the escapees that crawl across the desk with disconcerting regularity).

Photo: Our insect rearing chamber houses all the big names in stored product pests

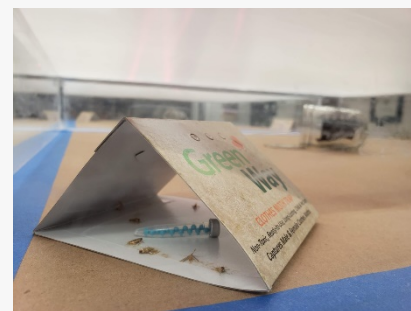
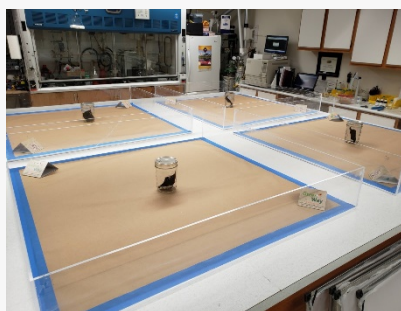


The Reasons Why We “Start with the Insect First”

Since its inception, one of **Insects Limited's** company mottos has been to “**Start with the Insect First**” before planning a strategy to eliminate or reduce that pest. What does that really mean? [Read More](#)



Each batch of pheromone undergoes quantitative analysis on our gas chromatograph as well as live-insect behavioral testing where we “ask the insects” if the batch meets standard.



Additionally, one of [Insects Limited's](#) greatest resources is our connections and partnerships with industry leaders, government agencies, and academics throughout the world. We can maintain these relationships through our shared dedication to solving insect problems and the science developed around them.

Both our infrastructure and connections make our work in the lab exciting, interesting, and best of all, straightforward (as much as science can be straightforward anyway). Some pest problems can become quite complex when you add in pest biology, food source, environmental conditions, etc. No matter how complex the problem is that we are trying to solve, when developing a new product, we follow the same steps;

1. Problem (Identify a problem)
2. Idea! (By researching and starting with what we know about the Insect)
3. Test it (Test the idea small scale in the lab and return to step 2. Let's face it, this always results in a return to step 2 a few times!)
4. Field Trial (Once the kinks are worked out, we get together with our industry, government, or academic partners to bring our potential products out into the field to verify efficacy)
5. Manufacture the tested product using the best available components
6. Offer the proven solutions to our customers

This **commitment to research and testing** is what allows us to stand behind every product that goes out the door.

[Insects Limited](#) has a talented group of BCEs that are genuinely interested in helping people find solutions to their insect problems through science. I know this because every day, between coming up with new ideas, testing new products, and rearing insects, we take phone calls from customers ranging from homeowners that want to know what the “little black beetle bug on the windowsill” is to massive food facilities and nationwide distributors. No two phone calls are ever the same, but there is one guarantee, and it's that we will first identify the insect and then suggest the absolute best steps to take, or best products to purchase.

We know that these recommendations are grounded in science and that we are confident that we can stand behind the products that we produce.



The [SightTrap](#) is one example of a proven product taken to the market by [Insects Limited](#) to solve the issue of the lag in the time that insects emerge in facilities before our customers realize the emergence.

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The Current Technology-Driven IPM Revolution



Jeff Waggoner, ACE

The stage is set and everything is powered up, plugged in, and reporting for duty online. The account rodent monitoring devices, insect pheromone monitors, my phone, my computer, my security system. and my refrigerator are all connected to the web. Apparently, I need milk but my ongoing argument with my refrigerator is not of your concern. Let's stick to the topic of rodent and insect monitoring.

Your rodent catch data is readily available at the site, yes? In most programs, we observe that information lying dormant in "the binder", on a receipt or perhaps in some database.



New! DynamicIPM™ Logo

FSS, INC. developing a new twist on an old service model

Trending is pulled once per year and is reviewed (hopefully) and back it goes. That valuable, painstakingly acquired data certainly is not shared among other sites. But, for a client that has multiple sites, it is important to understand how activity from one problematic site might impact another. There is no shortage of moving products that may be infested from one site to another and infecting each in the network causing 10s or 100s of thousands of dollars in inspection, exclusion, trapping, and fumigation costs. I think nowadays we all can relate to just how quickly things can spread. Ahem (clears throat). So, in that spirit, let's "flatten the curve".

Photo: Heat Map from Bayer's Digital Pest Management online portal



FSS, INC.

Fumigation Service & Supply, Inc. is a professional, highly skilled company trained in current fumigation techniques, integrated pest management and ever changing safety requirements offering products, service, and education. www.FumigationZone.com





It's not that rodents have the destruction of the human race as an objective, but they are vying for the same real estate and similar resources. Not to mention they did cause a bit of a stink back in the mid-1300s. We study the behavior to get better at control. Based on the behavioral neuroscience study from Richmond University, rodents learned how to drive in changing patterns to collect Froot Loops. I believe some rodents are indeed more aware than some humans. I'm not so sure that rodents don't understand us better than we know. They certainly know where there are humans, there's food, warmth, and shelter. See the Richmond University study here: <https://news.richmond.edu/releases/article/-/16721/research-scientists-at-university-of-richmond-teach-rats-to-drive-results-may-inform-future-research-strategies-for-mental-health-treatments.html>

Photo: Richmond University study observes rodents using drive thru options to find food.

[FSS](#) is developing a new IPM program referred to as DynamicIPM™ to help more effectively and efficiently conduct pest management operations that yield results. We are working with web-based monitoring devices from Bayer, Corteva, [Insects Limited](#), and Victor that provide the insight and transparency expected in the industry, but rarely delivered. FSS is showing the value in corporate dashboard analysis. When you have insight into a network of sites it becomes easier to focus on outliers (book recommendation: *Outliers* by Malcolm Gladwell). DynamicIPM™ is not a cost-savings initiative. Rather, it is a changing approach to an aging industry methodology that adds value. The equipment does add some cost to routine services. However, this value-added approach can save companies far more in lost production time, damage, recalls, and potentially fatal brand-damaging events.

Let's face it, some sites have issues and will always have issues, some don't and never will. Sometimes humans "get in the way". Treating each site the same rather than addressing the outlier(s) seems like a bad methodology. Using a modern approach, we can transform unproductive technician time, improve awareness, and do real detective work that will actually prevent problems.

DynamicIPM™ programs adapt to address real-time situations as they occur. The system feedback from a broader view shows threat levels compared to other locations and soon, your geographic risk level is calculated from thousands of connected devices. As we deploy more and more sensors, we will have up to the second, unbiased, data-based risk awareness at our fingertips. This IoT monitoring technology can help prevent disease outbreak and create safer environments for our food. Despite my "connected" refrigerator one day refusing to keep my food cold because we had a disagreement on milk inventory.

If you can cut off the finger to save the rest of the body, that finger has to go. We need to understand these risks better and how we can manage the rodents. Why allow one site to be the finger that kills the body? Be proactive and save the world! OK, maybe we don't save the world, but I do believe we are building a better IPM program. Technology has improved awareness and added transparency for our clients. That is impacting the industry in a profound way and I think that's a pretty cool thing too.

This is an exciting time for the industry and especially for [FSS](#). We have learned a lot in the past couple of years while deploying many remote systems. We expect to continue to learn and deliver on our promise to be innovators in the industry.

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