



Pat Kelley, BCE

## Bad Bugs: Cigarette Beetle

The cigarette beetle, *Lasioderma serricorne*, is a serious economic pest to tobacco products, spices and numerous types of dried food goods. This pest beetle can also cause considerable damage to dried plants stored in herbaria, books in libraries and dried flower arrangements in people's homes.



Cigarette beetle, *Lasioderma serricorne*

Being in the family of beetles named Anobiidae, this beetle is related to several wood boring beetles such as the furniture beetle, *Anobium punctatum* and the deathwatch beetle, *Xestobium rufovillosum*. It is also related to its look-alike cousin, the drugstore beetle, *Stegobium punctatum*. Although the cigarette beetle is not a pest of wood, like their wood boring relatives, the adult cigarette beetles have inherited the ability to chew holes right through tough materials like cardboard, book covers, plastics and even thin metal foil. It can chew round holes right through lots of different packaging materials.

Cigarette beetles and other stored product pests never cease to amaze with the physical traits and abilities they have acquired over evolutionary time. A female granary weevil, with her long snout can bore a hole into a kernel of wheat and then spin on a dime and drop an egg into the hole from the tip of her abdomen without even looking. Indian meal moth larvae can completely cover the dried food goods they are eating with a thick layer of webbing to create their own micro-environments.

One of the most mind-boggling traits though is the symbiotic relationship that the cigarette beetle has with yeast-like organisms in its guts. These organisms allow cigarette beetles to digest toxic plant materials like tobacco and go unharmed. Tobacco contains small quantities of nicotine.



Cigarette beetles can digest toxic plant material like tobacco with the help of internal organisms.

If you didn't already know, nicotine by itself is deadlier than both arsenic and cyanide. A dose of 30 to 60 milligrams will kill a person. It can be even used as a pesticide to kill a wide range of insects. So just how can Cigarette beetles pull off eating such a toxic meal? Well, from a scientific perspective, the digestive tract of the cigarette beetle has small organ-like structures called mycetomes. Housed in these mycetomes are yeast-like organisms that will eat and de-toxify the tobacco leaf after the cigarette beetle larva has ingested it. The yeast-like organisms benefit by having a food supply brought right to them from the beetle larvae and the larvae benefit by not being killed from the nicotine and gaining valuable nutrition from an otherwise inedible food source. Termites, powderpost beetles and carpet beetles have similar organisms to help them digest things like wood and keratin in wool. The insect species and their internal companions make sure that their relationship continues in future generations. To do this, the female insect will pass along a few organisms from her ovaries to the egg she lays. And so the story goes as our pesty little friends continue to eat our tobacco, wool, and wood right out from under us. Just remember that in this case, it is the beast within the bug that makes it all work out.



*Cigarette beetles on tobacco leaves*

# Fumigants & Pheromones

Insects Limited, Inc.



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## The Gatekeeper Approach

Part 1 of a 3-part series on *The Gatekeeper Approach*



It is much safer and more economical to try to keep pests out rather than eliminate them after they become established. Like the vigilant keeper of the gate in the image above, food plants, museums, restaurants, grocery stores, households, or any other pest protected areas receiving inbound stored products need to stop unwanted visitors and enemies from entering.

THE GATEKEEPER APPROACH to pest control helps create a pest prevention program. The new FDA FSMA (Food Safety Modernization Act) program specifies prevention as a mandated requirement in food processing

facilities. A pest prevention program makes more sense than a pest control program. We work hard to eliminate a pest problem that could have been stopped at the door if someone had been trained and empowered to check each product entering the facility. A few examples of routes of entry that pests can take are; railcars of raw ingredients at a cereal processing plant, a new museum object of unknown origin, a pallet of potatoes at a super grocery store (open 24 hours a day, seven days a week), a sack of fresh produce to a restaurant, or a box of used clothing in a house. One fertile female cockroach, moth or flour beetle may begin reproducing fast enough to start a serious outbreak in just a few short months.

Gatekeepers need to be given the proper tools and be trained to inspect for signs of pest infestation as well as for the small intruders themselves. If a facility receives products or ingredients during three shifts, at least three Gatekeepers are required. The Gatekeeper should command respect by their appearance, skill, and attentiveness and they should have the authority to stop infested material from entering the facility.

Inspecting for rodent evidence is an art. The Gatekeeper should visually inspect for gnawing and should use a blacklight to inspect for urine and fecal pellets. Care should be taken because while rodent urine will fluoresce under a blacklight, many inks and glues will also fluoresce when inspected with the same light. To become familiar with the appearance and color of rodent urine, obtain a mouse from the pet store and place it on pieces of packaging material for a day or more. The urine stained paper can be inspected with the blacklight and retained for future comparisons.

To inspect for insects, a pheromone trap can be placed in food processing areas and storage warehouses where inbound ingredients arrive. They should be inspected

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weekly. Take care to replace the pheromone lure every 60-90 days. Placing the pheromone traps where new inbound ingredients are held will help pinpoint incoming insects in 24 hours or less. Rodents can also be detected on inbound pallets by placing a strip of glue traps around the perimeter of the pallets. Mice will cross this sticky strip and get permanently stuck. This information will help the Gatekeeper make decisions on how to handle the shipment.

Below is a Dirty Dozen Poster to help the Gatekeeper identify the bad bugs that they need to keep out.



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### "The Dirty Dozen"



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