

Fumigants & Pheromones

Digital Newsletter Delivered by Insects Limited, Inc.

Issue 160

Species Spotlight: The Rice Weevil (*Sitophilus oryzae*)



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Rice weevil (*Sitophilus oryzae*) and maize weevil (*Sitophilus zeamais*) can cause serious damage to stored grains. They are internal feeders and damage grain by boring holes into grain kernels reducing weight, nutrition, and overall quality.

Their movement through a grain mass can spread and encourage mold germination and their excrement leaves behind uric acid that causes grain rancidity. [Watch a time-lapse GIF of 100 rice weevils in popcorn over a one-year period.](#)

You can see how quickly they damage whole grain kernels and introduce and spread mold shortly thereafter.



Rice Weevil
(*Sitophilus oryzae*)

Description

- Adults have prolonged head or snout
- Adults are dark brown with 4 distinct lighter yellowish spots, about 2.5 to 4mm in length
- Adults are able to fly

Life History

- Females lay 300-575 eggs over a 5-8 month lifespan
- Females individually lay eggs within grain kernels
- Infestation can establish at temperatures as low as 59°F, but development is prolonged
- Optimum development takes place around 84°F at a relative humidity of 70%

Damage

- Feed on barley, corn, sorghum, rice, rye, and wheat
- Grains with round holes are a sign of infestation by emerging adults
- Can almost complete total destruction of product at high densities
- Infestation can lead to heating and increased moisture levels in grain

Learn Monitoring Tips & Tricks for the Rice Weevil at insectslimited.com

Insects Limited Product Guide

Our newest product guide is a must-see. The 20-page full-color and fully illustrated booklet can be viewed as a hard copy, online, or as a [PDF HERE](#).



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Issue 16060

Museum Monitoring Guidelines



Pat Kelley BCEE
President of Insects Limited

Trap Placement: When implementing an IPM program within a museum, library or historic house, one should begin by placing blunder traps un-baited flat, sticky glue traps) snug against the wall on either side of all doorways, in corners and every 50 feet (15 meters) in areas where susceptible materials are being stored or exhibited.

Susceptible materials can include any and all animal fibers including hair, fur, feathers, hide, animal protein, wood and other plant-based materials. An example of a recommended and effective blunder trap is the [Insects Limited Museum Monitors \(IL-1600\)](#).



A Museum monitor blunder trap placed correctly against a wall in a historic house.

Museum Monitor traps incorporate a very tacky glue that is excellent at grabbing and holding onto crawling insects that are passing through an area. It is essential to place the traps snug up against the walls. Insects tend to follow lines as they try to conceal themselves. The junction line where the floor meets the wall is where the largest traffic flow of insects exists. *Note: Blunder traps placed randomly in the center of a room rarely capture insects even in rooms containing large insect populations.* [Insects Limited's Museum Monitors](#) can also be divided into thirds for monitoring small spaces or discrete public exhibits. After placing traps around the doors and in corners, traps should be concentrated in areas that contain any of the susceptible materials listed above. The more traps that are placed out, the better the information that one will have to make well-informed pest management decisions. In high-risk areas or in areas containing materials with extremely high value, traps can be more densely placed every 5 -10 feet (1-3 meters) along the sections of the wall.

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Frequency of Trap Checks: Blunder traps and pheromone traps can be checked as often as staff allowances and budgets allow. If one is actively seeking information from a specific area, traps can be checked multiple times each day or even hourly. It is recommended to check traps at least weekly or monthly for early detection of pest issues. Some museums or historic houses are only able to check traps on a quarterly, bi-annual or annual basis due to staff availability or other hurdles. Any information that the traps can give to an IPM manager is better than no information at all. The longer that the traps go unchecked though, the better chance is that they become full of insects. It must be noted that once a trap becomes more than 50% full of insects or debris, it becomes much less effective at capturing insects. Also, insects left in a sticky trap for long periods can become food for carpet beetles and dermestid beetles which are themselves considered to be museum pests. In this respect, the full traps would become a breeding ground for the damaging pest species. For this reason, we recommend checking traps and replacing full traps on at least on a quarterly basis if not more frequently.



Varied carpet beetle larvae feeding on a cricket captured in a blunder trap

When checking the traps, a person trained in pest identification should become involved to identify what is being captured. A record of the species being captured should be noted along with the quantity of that insect present in each trap. [Insects Limited](#) can assist with insect pest identification. There are software programs that are designed to keep track of museum pest populations in monitors. One recommended software package for this purpose is Zpest Tracker: zpesttracker.com. Software programs like this can assist with record keeping and pest history that can assist in making Integrated Pest Management (IPM) decisions.

Pheromone Use: After the insect species have been identified in the blunder traps, and if they are a museum pest, the general area around the trap with the pests should be visually inspected to identify why the pests are there and where they are coming from. If the identified pest has a commercially available pheromone, monitoring lures can be used to effectively pinpoint the exact source of the infestation. The goals of most pheromone monitoring programs are to:

1. Indicate the presence or absence of the pest.
2. Locate the source of the pest if they are present.

Knowing the presence and location of pest insects in a large storage room or exhibit space allows the program administrator to treat or remove the infested material and achieve a pest-free facility. In order to achieve this, a focused visual inspection around the areas where trap captures are highest is needed.



A [Clothes Moth Bullet lure](#) placed into a [sticky trap](#) will let you know when a moth population is close by

The process to pinpoint the source is as such: Place the traps containing pheromone lures out in a grid pattern throughout the area, placing more traps around potential problem areas. Since pheromone traps attract the target insects to them, they can be hung or placed in all areas within a room and do not necessarily have to be placed up against a wall like the blunder traps. Allow the traps to collect data over a set time and check the number of insects in each trap. Focus your attention on the areas around the traps with the highest activity and perform a visual inspection for signs of infestation in those areas. If no visual signs are found, move new pheromone traps into a tighter grid pattern into the area around the trap or traps that are experiencing the highest activity. If a trap in this tighter grid is now capturing the most insects after several weeks, perform a detailed visual inspection around that trap to look for the source. Continue this process of tightening the grid of pheromone monitors until the area is considered manageable for detailed visual inspections. This may include physically opening storage boxes, drawers, and cartons to look for signs of pest activity.

Once a source of the infestation is found, the object or objects should be treated on-site or covered and removed to prevent the further spread of this pest. Consult with [Insects Limited](#) for safe and effective pest treatments for museum objects.



Diagram showing [NoSurvivor® Pheromone Traps](#) placed out in a grid pattern within a storage area

Tips & Tricks

1. Place blunder traps (non-baited sticky traps) against the wall on either side of every door, in corners and every 50 ft (15 meters) in areas where there is a potential food source for the pest insects.
2. More traps can be placed against the wall in areas where highly susceptible materials are stored or exhibited or in areas that contain highly valuable materials.
3. Identify the insects within the trap to check general environmental trends and for specific museum

Clothes Moth Kits

Clothes Moth Pheromone Bullet Lures for Webbing Clothes Moths (*Tineola bisselliella*), Casemaking Clothes Moths (*Tine pellionella*) and Brown-dotted Clothes Moths (*Niditinea fuscella*).



pest insects. If a large number of temporary invader insects/arthropods (E.g. millipedes, crickets, ants, spiders, ground beetles, etc.) are present, examine the seals around doors and windows or other physical openings into the structure that may allow pest entry. Keep in mind that insects can sometimes enter through gaps that are only 1 mm wide. Door sweep installations, foundation repairs, filling gaps with caulk or other pest-proof barriers can eliminate these temporary invaders.

4. If the identified species are specific museum pest insects (E.g. clothes moths, carpet beetles, cigarette beetles, drugstore beetles, etc.) an immediate inspection of the surrounding areas should be performed to see if a source can be found and treated or removed. If no source is found, check to see if a commercially available pheromone exists for that insect.

5. If the specific museum pest insect has a commercially available pheromone, place the traps containing that pheromone lure out on a grid pattern (Check manufacturer's recommendations for spacing) throughout the area. Place a majority of the traps available in areas near insect food sources. Allow the traps to collect data over a set time and check the number of insects in each trap. Focus your attention on the areas around the traps with the highest activity and perform a visual inspection for signs of infestation in those areas. If no visual signs are found, move new pheromone traps into a tighter grid pattern in the area around the trap that is experiencing the highest activity. If a trap or traps in this tighter grid is now capturing the most insects, perform a detailed visual inspection around those traps to look for the source. This may include physically opening boxes, drawers, and cartons to look for signs of insect activity.

6. Once a source of the infestation is found, it should be treated on-site or covered and removed to prevent the further spread of this pest.

For more information on how Insects Limited provides solutions for cultural heritage institutions to preserve their valued collections from pest damage, visit insectslimited.com/museums

Museum Pest Challenges Solved



Tailored Monitoring

Accurately monitoring for pest populations allows pest managers to make informed decisions that benefit your collections and staff.

Insects Limited will assist you in tailoring your monitoring program to best fit your institution, your space, and your budget needs.



Safe & Effective Treatment Programs

When pesticide treatments become a necessity, it is essential to find a solution that will best protect museum objects and the people around them. Whether it's anoxia, freezing, carbon dioxide, or plain and simple sanitation, the experts at Insects Limited can guide you through a pest treatment plan that works for you.



Pest Consultations by Experienced Entomologists

Insects Limited employs three Board Certified Entomologists with extensive experience in dealing specifically with museum pest issues and the concepts of integrated pest management (IPM) in museums. We are available for consultations and recommendations for all institutions.

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Insects Limited Announces New Team Members

[Insects Limited](#) is excited to welcome new team members, Colleen O'Rourke and Jeffrey Mills.

Colleen is filling the newly created position of Account Manager

Colleen is originally from Vincennes, Indiana and graduated from Indiana University in 2016. During the past five years, Colleen lived in Chicago while growing personally and in her career.

"The success and growth we have seen in recent years has allowed us this opportunity to add a resource person to the sales team whose sole focus will be to provide our valued distributors with the assets they need to be successful in providing our products to their customers. Colleen comes to us with a strong sales background that will meet the needs of our customers, and she has a wonderful personality that will fit our culture and core values as a company," said Insects Limited Vice President, Tom Mueller.

In her downtime, Colleen likes to play tennis, watch the latest Netflix series, and explore new restaurants.

"I am most excited about helping Insects Limited become the future of pest management and effective pheromone technology, said Colleen."

Jeff comes onboard as the Shipping Manager for [Insects Limited](#).

Jeff brings over 20 years of domestic and international shipping experience along with extensive inventory proficiency. Originally from Muncie, IN, Mills has worked in warehousing operations in multiple cities across the U.S. as well as working for 4 years in China.

Insects Limited President, Pat Kelley, said, "Jeff will be a wonderful addition to our team. His energetic personality along with his experience in logistics and supply will be a boost to both our company dynamics and our customer's experience."

As the Shipping Manager, Mills will streamline the fulfillment process making sure that Insects Limited's customers receive their shipments in a timely manner while working with suppliers and the internal production team to simplify the inventory process.

"I could not be more pleased to join the team at Insects Limited. In doing so, I have joined with the industry leader and I look forward to contributing to an already incredible company," said Mills.

Jeff's interests include drinking coffee, running, cycling, English history, and Astronomy.

Say hello to Collen at c.orourke@insectslimited.com

Say hello to Jeff at j.mills@insectslimited.com

