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Pest Monitoring Case Study:
Pinpointing a Clothes Moth Infestation at the Denver Museum of Art

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Overview:

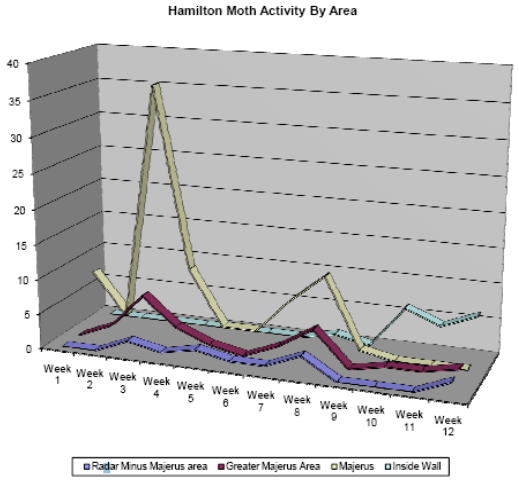
In 2006, the Denver Art Museum was in the completion phase of the new Libeskind-designed Hamilton wing of the museum. With one end of the building finished, art installation began in a temporary gallery space. Soon it became evident that some sort of pest issue was at hand. Installers were frequently spotting webbing clothes moths flying around the gallery. After three months of monitoring the problem, a dead pigeon was found behind the drywall. After extraction, the moth infestation immediately ended.

Background:

The new wing of the Art Museum was not yet complete when the installation of art began. It was known that there had been birds, mice, squirrels and even a cat inside the building during construction. Also, the construction workers were not prohibited from eating inside the building. Temperature and humidity controls were functional in the completed portions of the building, piping in up to 45% humidity and maintaining 68 degrees Fahrenheit. Installers began noticing small gold moths in the temporary gallery almost immediately. At this point there was already art in the room, though none of it contained any protein material likely to attract the moths. The museum's IPM expert was notified and implemented a daily monitoring program.

Methods used to determine the source of the infestation:

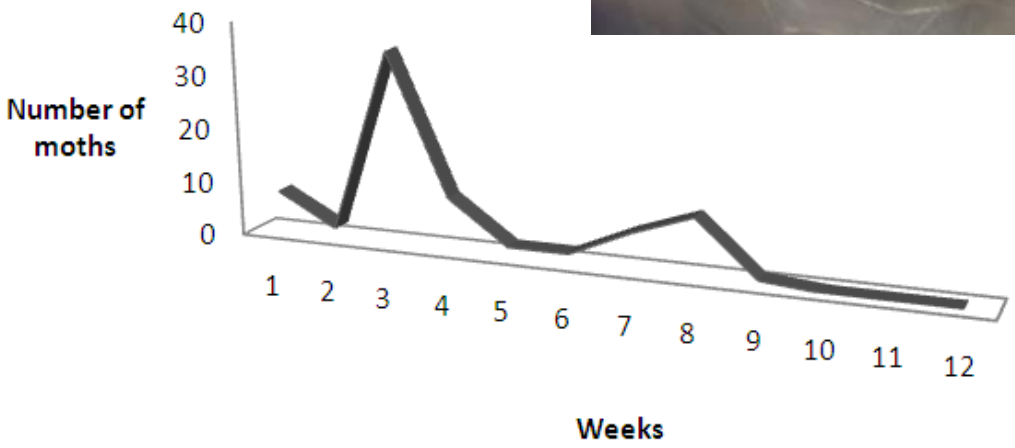
A visual inspection of all completed spaces was done each day, as well as an invasive trapping regimen using clothes moth pheromone traps in addition to general pest pheromone traps. As numbers of trapped and located specimens passed well over 100 in the affected room, it became evident that the concentration of pests was coming from one particular wall (yellow data line).



The painting on this wall (a 15 panel piece) was removed two times to ensure that the infestation was not present inside the stretchers. No evidence of larvae, damage, webbing or eggs was found, though adults were found on the wall behind the painting. This particular wall is jagged, with the protruding section being the most affected. Just to the side of this was a fire extinguisher box inset into the wall. The box was removed for an inspection of the inside of the wall. Though moth carcasses were found inside this section, no live specimens were recovered. This confirmed, however, that the infestation was coming from inside the wall. It was decided to penetrate the wall just behind the painting and use a scoping camera to inspect the area. A plumber was hired to bring his camera and monitor. The hole was cut above the ceiling tiles to prevent dust and wall damage near the art. All art was covered and permission from the art owners was secured before the process began. As the camera slowly descended toward the floor, the culprit came into site. After an adjustment to the camera location, it was determined that the source of the infestation was a dead bird just behind the drywall.

How the problem was resolved:
The location was noted, a work area was tented off, proper safety precautions were taken (including masks, gloves etc.), a panel was removed from the wall and the bird was secured and sealed in plastic. Upon further examination of the bird carcass, clothes moth larvae, frass and eggs were identified.

After the removal of the bird, the presence of moths in the gallery decreased to zero almost immediately.



Equipment used:

Webbing clothes moth pheromone lures
General cockroach food pheromones
Sticky traps
Plastic
Tape
Scoping camera with monitor
Scissor lift
Saw
Dust masks
Nitrile gloves
Polyethylene Baggies
LED flashlight
Aspirator
Tweezers
Microscope
Pest log book
Excel spreadsheet and graphing program

Issues concerning health, and safety of staff and collections:

With an Integrated Pest Management practitioner on staff, it was an immediate decision to not use chemicals to mediate this infestation. Not only would they be dangerous for staff and collections, but without finding eggs or larvae they would be useless to stop the infestation.

Safety of the collection was taken into consideration as more and more art was installed. All artwork containing protein material was left until last for installation, after the resolution of the moth problem. After the source of the infestation was deemed to be a dead bird, appropriate precautions were taken to make sure the staff removing the bird was properly equipped so that they not have any direct contact with it. They wore masks and gloves and worked in a plastic tent. Once removed, the bird was sealed in plastic and disposed of.

No chemicals were employed and no damage was done by the moth infestation.

How the museum continues to monitor the facility:

The Denver Art Museum has a very active IPM program, currently being monitored by Collections and Conservation staff. Through the assistance of former employees and graduate students, all of the collections storage spaces are set up with general pest monitoring procedures. All incoming objects of any risk are frozen and inspected. With any sign of increased activity, the monitoring timing and number of monitors is increased. Continued contact with regional IPM experts assists in identification and advice for any issues that arise.

References:

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- Ohio State University Extension Fact Sheet Clothes Moth Fact Sheet http://ohioline.osu.edu/hyg-fact/2000/2107.html