The Accidental IPM Program

Amber E. Morgan, Associate Registrar for Collections
John Jacobs, Assistant Registrar for Collections
The Andy Warhol Museum, Pittsburgh PA

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The Andy Warhol Museum

- Opened in 1994 in Pittsburgh
- Originally built in 1911 as an industrial warehouse
- A collaborative project between the Carnegie Institute, The Dia Art Foundation, and the Andy Warhol Foundation for the Visual Arts
Collections

Over 12,000 works of art, 2,500 film and video elements, and an extensive archive of over 500,000 items combine to make the world’s most comprehensive single-artist museum.
612 boxes created by Andy Warhol. Although the contents are archival in nature, the *Time Capsules* are considered to be Warhol’s most extensive, complex and personal work of art.
Typical contents found in the *Time Capsules*
The cataloging process

• Three full-time catalogers were hired as part of a six-year project funded by The Andy Warhol Foundation for the Visual Arts and the Institute of Library and Museum Services to open, organize, and catalog every *Time Capsule*.

• Basic preservation actions completed along the way.
Not-so-Happy Bug Day

- Summer of 2011 – active infestation discovered

- No IPM program existed.

- No staff member officially appointed to lead IPM activities.

- Pest evidence found in *Time Capsules* was thought to be part of an earlier, treated infestation.
Immediate response

Entire collections processing area cleaned from top to bottom. Every piece of furniture moved and cleaned.
Post-cleaning

Processing area completely cleaned. Carpeting removed. Area prepared for processing all of the supplies and collections items that had been stored in the room.
3rd Floor closed to public

Entire floor closed to allow adequate room for clean up and processing infested materials.
Infested items

Everything in the space was sealed in plastic. Infested materials sealed to keep bugs in, clean materials sealed to keep bugs out. Infested supplies were discarded.
Infested *Time Capsules*

The *Time Capsules* are known to contain items that would attract pests. Unfortunately, many of the boxes had not yet been cataloged.
<table>
<thead>
<tr>
<th>Option 1</th>
<th>Option 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Continue regularly-scheduled cataloging project</td>
<td>• Suspend cataloging</td>
</tr>
<tr>
<td>• Address pest issues when they are discovered</td>
<td>• Open all <em>Time Capsules</em> as quickly as possible</td>
</tr>
<tr>
<td>• Risk spread of pest activity in the meantime and potential loss of collection materials</td>
<td>• Isolate objects that are attracting pests (food, cosmetics, etc.)</td>
</tr>
<tr>
<td></td>
<td>• Remove objects that cannot be frozen; cycle boxes through freezer</td>
</tr>
<tr>
<td></td>
<td>• Deal with tracking un-cataloged, un-numbered collection objects</td>
</tr>
</tbody>
</table>
Option 2

3rd floor remained closed as each *Time Capsule* was inspected for signs of pest activity.
## Time Capsules IPM Survey Sheet

**Box Number:** TC522  **Box Location:** Archives, Storage  **Date Opened for Survey:** 9/23/2011  **Surveyor(s):** Elena Vale, Mark Elia

- **Catalyst?**  
  - Already opened?  
  - Pens Found?  
  - Live Bugs?  
  - Type of Pest Found?  
  - Action Required at Box-Level?  
  - Quick Process?  
  - Food?  
  - Bubble wrap?

**Description of Action Required at Box-Level:** To be frozen

**Box-Level Notes:** Box was opened when retrieved, opened by Marie, 9/23/11.

**Preservation Notes:** TC522-121: 4x366, 4x366.4, 4x366.4, 4x366.4, and 4x366.4 were wrapped separately and placed in TC Overline Storage (CSS, 11-6, 6x6x6).

### TC522-121
- **Photo Description:** Photo of box with objects inside
- **Action Required:** Freeze
- **Date of Disposition:** 9/23/2011
- **Reason for Disposition:** Preparation

### TC522-101
- **Photo Description:** Photo of box with objects inside
- **Action Required:** Freeze
- **Date of Disposition:** 9/23/2011
- **Reason for Disposition:** Preparation

### TC522-102
- **Photo Description:** Photo of box with objects inside
- **Action Required:** Freeze
- **Date of Disposition:** 9/23/2011
- **Reason for Disposition:** Preparation

### TC522-121
- **Photo Description:** Photo of box with objects inside
- **Action Required:** Freeze
- **Date of Disposition:** 9/23/2011
- **Reason for Disposition:** Preparation

### TC522-151
- **Photo Description:** Photo of box with objects inside
- **Action Required:** Freeze
- **Date of Disposition:** 9/23/2011
- **Reason for Disposition:** Preparation

### TC522-152
- **Photo Description:** Photo of box with objects inside
- **Action Required:** Freeze
- **Date of Disposition:** 9/23/2011
- **Reason for Disposition:** Preparation

### TC522-153
- **Photo Description:** Photo of box with objects inside
- **Action Required:** Freeze
- **Date of Disposition:** 9/23/2011
- **Reason for Disposition:** Preparation

### TC522-154
- **Photo Description:** Photo of box with objects inside
- **Action Required:** Freeze
- **Date of Disposition:** 9/23/2011
- **Reason for Disposition:** Preparation
Isolation bins

Gasketed, air-tight bins now hold all of the food, cosmetics, medications, tobacco, and candies found in the *Time Capsules*. Items are double-bagged before being placed in the bins.
The *Time Capsules* today

Each is sealed in plastic and marked with a color-coded label indicating its infestation and/or treatment status
From this point on, this presentation gets pretty gross. You have been warned.
Typical *Time Capsule* object – a seemingly empty cookie tin.
Trace amount of food residue is enough to attract pests.
An entire box full of cookies is now full of carpet beetle larvae.
Chocolate items were reduced to dust.
Paper objects damaged by beetles searching for food.
Multiple generations of an active carpet beetle infestation.
Beetle casings on the surface. Backlighting reveals holes in this small canvas found in a *Time Capsule*. 
Transition from project to program

- The *Time Capsule* clean up work was done without an IPM program in place.

- Used Museumpests.net templates to create a full IPM Policy and Procedures document.

- Allowed staff to approach the rest of the collections in a more systematic, sustainable way.
“We’re gunna need a bigger boat.”
TIME CAPSULES IN ARCHIVES STORAGE
MITIGATION STRATEGY IN ARCHIVES STORAGE

A. Preservation survey with statistics
B. “Plus One” mitigation plan
C. Re-housing
D. Housekeeping & Containment
1) Random sampling of the **entire** Archives Collection.

2) Targeted sampling of **at-risk** collection items.

3) Prioritization sequence for mitigating **high-risk** collections.
The following tables present a summary of the statistical data collected during the pest mitigation project. (The full results along with the processing notes are documented in two spreadsheets: "Mitigation Notes & Plan.xls" and "Survey Form - Phase III.xls"). The purpose of the tables is to present data in a concise and useful manner in order to facilitate a prioritization sequence for continuing to mitigate the high-risk collection boxes housed in Archives Storage. In the interest of presenting easily readable tables, data gathered from surveying other Archives collection boxes (approximately 1183 boxes) that face less risk of infestation has been omitted. Some data was derived from: http://www.surveysystem.com/sscalc.htm.

### Preservation Issues Identified

<table>
<thead>
<tr>
<th>Legacy Box Categories for At-Risk Collections***</th>
<th>Number of boxes identified in the Survey of Fall 2011</th>
<th>Number of boxes inspected and/or mitigated to date</th>
<th>Percentage of boxes inspected and/or mitigated</th>
<th>Confidence Interval (lower % = greater accuracy), (Confidence Level = 95%)</th>
<th>Number of boxes with signs of infestation</th>
<th>Percentage of boxes with signs of infestation</th>
<th>Percentage (and total count) of boxes containing vulnerable collection items</th>
<th>Percentage (and total count) of boxes NOT archival grade</th>
<th>Percentage (and total count) of boxes NOT using archival grade materials and/or standard techniques</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-Boxes</td>
<td>212</td>
<td>53</td>
<td>25.0%</td>
<td>11.7%</td>
<td>11</td>
<td>20.8%</td>
<td>52.8%</td>
<td>54.7%</td>
<td>92.5%</td>
</tr>
<tr>
<td>M-Boxes</td>
<td>126</td>
<td>22</td>
<td>17.5%</td>
<td>19.1%</td>
<td>4</td>
<td>18.2%</td>
<td>27.2%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Misc-Boxes</td>
<td>119</td>
<td>19</td>
<td>16.0%</td>
<td>20.7%</td>
<td>4</td>
<td>21.1%</td>
<td>47.4%</td>
<td>68.4%</td>
<td>68.4%</td>
</tr>
<tr>
<td>Idea-Boxes</td>
<td>41</td>
<td>7</td>
<td>17.1%</td>
<td>34.2%</td>
<td>1</td>
<td>14.3%</td>
<td>85.7%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>C-Boxes</td>
<td>52</td>
<td>21</td>
<td>40.4%</td>
<td>16.7%</td>
<td>0</td>
<td>0.0%</td>
<td>100.0%</td>
<td>9.5%</td>
<td>47.6%</td>
</tr>
<tr>
<td>Clothing/Textiles-Boxes</td>
<td>118</td>
<td>21</td>
<td>22.0%</td>
<td>17.0%</td>
<td>2</td>
<td>7.7%</td>
<td>100.0%</td>
<td>26.9%</td>
<td>38.5%</td>
</tr>
<tr>
<td>Other-Boxes</td>
<td>63</td>
<td>9</td>
<td>14.3%</td>
<td>30.5%</td>
<td>1</td>
<td>11.1%</td>
<td>11.1%</td>
<td>55.6%</td>
<td>66.7%</td>
</tr>
<tr>
<td>AME-Boxes</td>
<td>99</td>
<td>22</td>
<td>22.2%</td>
<td>18.5%</td>
<td>2</td>
<td>9.1%</td>
<td>18.2%</td>
<td>90.9%</td>
<td>90.9%</td>
</tr>
<tr>
<td>G-Boxes</td>
<td>6</td>
<td>6</td>
<td>100.0%</td>
<td>0.0%</td>
<td>0</td>
<td>0.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>ACE-Boxes</td>
<td>63</td>
<td>10</td>
<td>15.9%</td>
<td>28.7%</td>
<td>0</td>
<td>0.0%</td>
<td>0.0%</td>
<td>50.0%</td>
<td>80.0%</td>
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<tr>
<td>OSE-Boxes</td>
<td>28</td>
<td>6</td>
<td>21.4%</td>
<td>36.1%</td>
<td>0</td>
<td>0.0%</td>
<td>0.0%</td>
<td>83.3%</td>
<td>83.3%</td>
</tr>
<tr>
<td>Realia-Unboxed Items</td>
<td>25</td>
<td>11</td>
<td>44.0%</td>
<td>22.6%</td>
<td>4</td>
<td>36.4%</td>
<td>36.4%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

**Weighted Averages, Totals or Predicted Counts**

<table>
<thead>
<tr>
<th>Number</th>
<th>Percentage</th>
<th>Number</th>
<th>Percentage</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>952</td>
<td>21.7%</td>
<td>448</td>
<td>14.0%</td>
<td>612</td>
<td>751</td>
</tr>
</tbody>
</table>

***Legacy box categories are derived from the original gift register and may indicate the origins and / or contents of the boxes.
**PRIORITIZATION SEQUENCE**

<table>
<thead>
<tr>
<th>Box Category</th>
<th>Number of boxes identified in the Survey of Fall 2011</th>
<th>Number of boxes inspected and / or mitigated to date</th>
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<td>11</td>
<td>44.0%</td>
<td>22.6%</td>
<td>4</td>
<td>36.4%</td>
</tr>
<tr>
<td><strong>WEIGHTED AVERAGES, TOTALS OR PREDICTED COUNTS</strong></td>
<td><strong>523</strong></td>
<td><strong>112</strong></td>
<td><strong>21.4%</strong></td>
<td><strong>8.22%</strong></td>
<td><strong>24</strong></td>
<td><strong>21.4%</strong></td>
</tr>
</tbody>
</table>

**PROCESSING PLAN FOR NEXT PHASE:** Number of additional boxes to be mitigated in order to reduce the the Confidence Interval for each box category to \(\leq 13\%\). (Reducing the Confidence Interval decreases the margin of error and results in greater accuracy for predicting the probability of infestation.)
# “PLUS ONE” MITIGATION PLAN

## CS08 - BOXES TO BE MITIGATED

<table>
<thead>
<tr>
<th>BOX</th>
<th>REASON</th>
<th>LOCATION</th>
<th>BOX CATEGORY</th>
<th>BOX TYPE</th>
<th>OLD BOX SIZE</th>
<th>MITIGATION DATE</th>
<th>PROCESS</th>
<th>NEW BOX SIZE</th>
<th>TBD / NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>B021</td>
<td>infested</td>
<td>CS08; A; 07</td>
<td>B-box, compressed</td>
<td>bankers</td>
<td>12 x 15 x 10</td>
<td>5/9/2012</td>
<td>FULL</td>
<td>Standard</td>
<td>moths?</td>
</tr>
<tr>
<td>B020</td>
<td>adjacent to B021</td>
<td>CS08; A; 07</td>
<td>B-box, compressed</td>
<td>bankers</td>
<td>12 x 15 x 10</td>
<td>5/10/2012</td>
<td>Quick</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>B019</td>
<td>shares shelf with B021</td>
<td>CS08; A; 07</td>
<td>B-box, compressed</td>
<td>bankers</td>
<td>12 x 15 x 10</td>
<td>5/10/2012</td>
<td>Quick</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>B029</td>
<td>infested</td>
<td>CS08; B; 02</td>
<td>B-box, compressed</td>
<td>bankers</td>
<td>12 x 15 x 10</td>
<td>5/8/2012</td>
<td>FULL</td>
<td>Standard</td>
<td>Liquids</td>
</tr>
<tr>
<td>B030</td>
<td>adjacent to B029</td>
<td>CS08; B; 02</td>
<td>B-box, compressed</td>
<td>bankers</td>
<td>12 x 15 x 10</td>
<td>5/9/2012</td>
<td>Quick</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>B028</td>
<td>adjacent to B029</td>
<td>CS08; B; 02</td>
<td>B-box, compressed</td>
<td>bankers</td>
<td>12 x 15 x 10</td>
<td>5/9/2012</td>
<td>Quick</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>B054</td>
<td>infested</td>
<td>CS08; C; 03</td>
<td>B-box, compressed</td>
<td>bankers</td>
<td>12 x 15 x 10</td>
<td>4/30/2012</td>
<td>FULL</td>
<td>Standard</td>
<td>Liquids</td>
</tr>
<tr>
<td>B053</td>
<td>adjacent to B054</td>
<td>CS08; C; 03</td>
<td>B-box, compressed</td>
<td>bankers</td>
<td>12 x 15 x 10</td>
<td>5/1/2012</td>
<td>QUICK</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>B052</td>
<td>shares shelf with B054</td>
<td>CS08; C; 03</td>
<td>B-box, compressed</td>
<td>bankers</td>
<td>12 x 15 x 10</td>
<td>5/1/2012</td>
<td>QUICK</td>
<td>Standard</td>
<td>Fragile</td>
</tr>
<tr>
<td>B062</td>
<td>infested</td>
<td>CS08; C; 06</td>
<td>B-box, compressed</td>
<td>bankers</td>
<td>12 x 15 x 10</td>
<td>5/2/2012</td>
<td>FULL</td>
<td>Modified Flatbox</td>
<td></td>
</tr>
<tr>
<td>B061</td>
<td>adjacent to B062</td>
<td>CS08; C; 06</td>
<td>B-box, compressed</td>
<td>bankers</td>
<td>12 x 15 x 10</td>
<td>5/3/2012</td>
<td>QUICK</td>
<td>Standard</td>
<td></td>
</tr>
<tr>
<td>B063</td>
<td>adjacent to B062</td>
<td>CS08; C; 06</td>
<td>B-box, compressed</td>
<td>bankers</td>
<td>12 x 15 x 10</td>
<td>5/2/2012</td>
<td>QUICK</td>
<td>Standard</td>
<td>Fragile</td>
</tr>
</tbody>
</table>

## CS09 - BOXES TO BE MITIGATED

<table>
<thead>
<tr>
<th>BOX</th>
<th>REASON</th>
<th>LOCATION</th>
<th>BOX CATEGORY</th>
<th>BOX TYPE</th>
<th>OLD BOX SIZE</th>
<th>MITIGATION DATE</th>
<th>PROCESS</th>
<th>NEW BOX SIZE</th>
<th>TBD / NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clothing (Loan) shares shelf with B021</td>
<td>CS09; A; 07</td>
<td>textile, large</td>
<td>archival</td>
<td>36 x 3 x 22</td>
<td>4/17/2012</td>
<td>Quick</td>
<td>TEXTILE BOX - XL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clothing (Loan) shares shelf with B021</td>
<td>CS09; A; 07</td>
<td>textile, large</td>
<td>archival</td>
<td>36 x 3 x 22</td>
<td>4/17/2012</td>
<td>FULL</td>
<td>TEXTILE BOX - XL insect activity found</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shoes #118 shares shelf with B029</td>
<td>CS09; B; 02</td>
<td>shoe</td>
<td>archival</td>
<td>8 x 12 x 6</td>
<td>4/17/2012</td>
<td>Quick</td>
<td>SHOE BOX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boots #117 shares shelf with B029</td>
<td>CS09; B; 02</td>
<td>shoe</td>
<td>archival</td>
<td>8 x 12 x 6</td>
<td>4/17/2012</td>
<td>Quick</td>
<td>SHOE BOX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boots #121 shares shelf with B029</td>
<td>CS09; B; 02</td>
<td>shoe</td>
<td>archival</td>
<td>8 x 12 x 6</td>
<td>4/17/2012</td>
<td>Quick</td>
<td>SHOE BOX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shoes - Misc shares shelf with B062</td>
<td>CS09; C; 06</td>
<td>shoe</td>
<td>archival</td>
<td>8 x 12 x 6</td>
<td>4/17/2012</td>
<td>Quick</td>
<td>SHOE BOX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cameras - Pol shares shelf with B062</td>
<td>CS09; C; 06</td>
<td>other</td>
<td>non-archival</td>
<td>other</td>
<td>4/18/2012</td>
<td>Quick</td>
<td>Standard Box</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B565 shares shelf with B062</td>
<td>CS09; C; 06</td>
<td>B-box, legacy</td>
<td>TC-size</td>
<td>14 X 18 X 10</td>
<td>4/18/2012</td>
<td>Quick</td>
<td>Oversized Box - Long</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cameras shares shelf with B054</td>
<td>CS09; C; 03</td>
<td>B-box, compressed</td>
<td>bankers</td>
<td>12 x 15 x 10</td>
<td>4/19/2012</td>
<td>Quick</td>
<td>Standard Box</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cameras shares shelf with B054</td>
<td>CS09; C; 03</td>
<td>B-box, compressed</td>
<td>bankers</td>
<td>12 x 15 x 10</td>
<td>4/19/2012</td>
<td>Quick</td>
<td>Standard Box</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cameras shares shelf with B054</td>
<td>CS09; C; 03</td>
<td>B-box, compressed</td>
<td>bankers</td>
<td>12 x 15 x 10</td>
<td>4/20/2012</td>
<td>Quick</td>
<td>Standard Box</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
RE-HOUSING: EXAMPLE A

BEFORE

AFTER
RE-HOUSING: EXAMPLE B

BEFORE

AFTER
HOUSEKEEPING & CONTAINMENT

TENT

TOOLS & SUPPLIES
MITIGATION STRATEGY - REVIEW

A. Preservation survey with statistics
B. “Plus One” processing plan
C. Re-housing
D. Housekeeping & Containment
PEST MONITORING WITH DOCUMENTATION & DATA ANALYSIS

A. Trapping concepts
B. Diagrams of the trap locations
C. “Database” for tracking pest hits
D. Inspection log on every trap
“When the light is green, the trap is clean.”
### DATABASE FOR TRACKING HITS

<table>
<thead>
<tr>
<th>COMMON NAME</th>
<th>FAMILY OR SUBFAMILY</th>
<th>GENUS</th>
<th>SCIENTIFIC NAME</th>
<th>RISK FACTOR</th>
<th>PREFERRED FOOD SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cigarette Beetle</td>
<td>Anodiidae</td>
<td>Lasioderma</td>
<td><em>Lasioderma serricorne</em></td>
<td>High</td>
<td>Starches</td>
</tr>
<tr>
<td>Drugstore Beetle</td>
<td>Anodiidae</td>
<td>Stegobium</td>
<td><em>Stegobium paniceum</em></td>
<td>High</td>
<td>Starches</td>
</tr>
<tr>
<td>Black Carpet Beetle</td>
<td>Dermestidae</td>
<td>Attagenus</td>
<td><em>Attagenus unicolor</em></td>
<td>High</td>
<td>Proteins</td>
</tr>
<tr>
<td>Varied Carpet Beetle</td>
<td>Dermestidae</td>
<td>Anthrenus</td>
<td><em>Anthrenus verbasci</em></td>
<td>High</td>
<td>Proteins</td>
</tr>
<tr>
<td>Minute Brown Scavenger Beetle</td>
<td>Latridiidae</td>
<td>not differentiated</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silverfish</td>
<td>Lepismatidae</td>
<td>Lepisma</td>
<td><em>Lepisma saccharina</em></td>
<td>High</td>
<td>Starches</td>
</tr>
<tr>
<td>Firebrat</td>
<td>Lepismatidae</td>
<td>Thermobia</td>
<td><em>Thermobia domestica</em></td>
<td>High</td>
<td>Starches</td>
</tr>
<tr>
<td>Book Lice or Psocids</td>
<td>Liposcelidae</td>
<td>Liposcelis</td>
<td>not differentiated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Powderpost Beetles</td>
<td>Lycitinae</td>
<td>Lycus</td>
<td>not differentiated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ant</td>
<td>not differentiated</td>
<td>not differentiated</td>
<td></td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Gnats or flies</td>
<td>not differentiated</td>
<td>not differentiated</td>
<td></td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Spider</td>
<td>not differentiated</td>
<td>not differentiated</td>
<td></td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Moth - other</td>
<td>not differentiated</td>
<td>not differentiated</td>
<td></td>
<td>Low</td>
<td></td>
</tr>
<tr>
<td>Weevil</td>
<td>not differentiated</td>
<td>not differentiated</td>
<td></td>
<td></td>
<td>Moderate</td>
</tr>
<tr>
<td>Beetle - other</td>
<td>not differentiated</td>
<td>not differentiated</td>
<td></td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Saw-toothed Grain Beetle</td>
<td>Silvaniidae</td>
<td>Oryzaephilus</td>
<td><em>Oryzaephilus surinamensis</em></td>
<td>High</td>
<td>Starches</td>
</tr>
<tr>
<td>Unidentified beetle</td>
<td>TBD</td>
<td>TBD</td>
<td>not identified</td>
<td>High (potential)</td>
<td></td>
</tr>
<tr>
<td>Unidentified larvae</td>
<td>TBD</td>
<td>TBD</td>
<td>not identified</td>
<td>High (potential)</td>
<td></td>
</tr>
<tr>
<td>Unidentified fragments</td>
<td>TBD</td>
<td>TBD</td>
<td>not identified</td>
<td>TBD</td>
<td></td>
</tr>
<tr>
<td>Unidentified insect</td>
<td>TBD</td>
<td>TBD</td>
<td>not identified</td>
<td>TBD</td>
<td></td>
</tr>
<tr>
<td>Casemaking Clothes Moth (CMCM)</td>
<td>Tineidae</td>
<td>Tinea</td>
<td><em>Tinea pellionella</em></td>
<td>High</td>
<td>Proteins</td>
</tr>
<tr>
<td>Webbing Clothes Moth (WCM)</td>
<td>Tineidae</td>
<td>Tineola</td>
<td><em>Tineola bisselliella</em></td>
<td>High</td>
<td>Proteins</td>
</tr>
</tbody>
</table>
BASIC DATA ANALYSIS

PEST TRAP - HIT FREQUENCY - ARCHIVES STORAGE

% OF TRAPS WITH HITS

TOTAL NUMBER OF HITS

DATES


10.00%  8.00%  6.00%  4.00%  2.00%  0.00%

8/9/2012, 6.76%
8/9/2012, 19
11/26/2012, 11
2/27/2013, 1.02%
2/27/2013, 3
4/30/2013, 6
4/30/2013, 2.04%
8/30/2013, 9.80%
8/30/2013, 29

% OF TRAPS WITH HITS

TOTAL NUMBER OF HITS
INSPECTION LOGS
ON EVERY TRAP
IN SITU
LOG
A. Trapping concepts

B. Diagrams of trap locations

C. “Database” for tracking pest hits

D. Inspection logs on every trap
GOING FROM PROBLEM TO PROGRAM: 5 KEYS TO BEATING IPM CHALLENGES

#1 KEY: Start simply; grow organically and customize in iterations.
“But it goes to eleven.”
GOING FROM PROBLEM TO PROGRAM: 5 KEYS TO BEATING IPM CHALLENGES

#3 KEY: Action Thresholds

#4 KEY: Proportional Responses

Action Thresholds + Decision Matrix = Proportional Responses to IPM challenges
DECISION MATRIX

COLLECTIONS

ENVIRONMENT

DIAGNOSTIC TOOLS

TREATMENT OPTIONS
#5 KEY: CONTINUOUS IMPROVEMENT

UV LIGHT TRAPS         PASSIVE FUMIGATION
5 KEYS TO BEATING IPM CHALLENGES - REVIEW

1. Start simply
2. Capture metrics
3. Action thresholds
4. Proportional responses
5. Continuous improvement

Capturing Metrics - This is Spinal Tap, http://taoteaching.files.wordpress.com/2009/11/spinal_tap_but_it_goesto_eleven1.jpg

THE ACCIDENTAL IPM PROGRAM

AMBER E. MORGAN

Associate Registrar for Collections
The Andy Warhol Museum
117 Sandusky Street
Pittsburgh, PA. 15212
T 412.237.8306
E morgana@warhol.org

JOHN SAMUEL JACOBS

Assistant Registrar for Collections
The Andy Warhol Museum
117 Sandusky Street
Pittsburgh, PA. 15212
T 412.237.8312
E jacobsj@warhol.org

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