

Green Methods and Products

For common and uncommon pests. General principles, details will vary in many cases depending on species, situation.

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A spiral-bound notebook with a cream-colored page. The word "COCKROACHES" is written in a bold, brown, serif font across the middle of the page. A thin horizontal line is drawn above the text. The metal spiral binding is visible on the left side of the notebook.

COCKROACHES

1. Which cockroach?

- American, Brown-banded, German, Oriental
- Australian, Smoky Brown, Surinam, etc.

2. Why is the cockroach there?

- Food, water, harborage?
- Isolated new introduction or established?

3. What do I need to do now?

A. If isolated new introduction

- remove
- resolve conducive conditions
- educate
- monitor
- follow up on next visits.

3. What do I need to do now? (continued)

B. If established, e.g., new account with existing problem.

- Physically remove as many as possible by vacuuming with HEPA filter, water-tolerant vacuum. Flush with compressed air if necessary.
- Multiple monitors will also remove/suppress.
- Seal all harborages.
 - Edges of wall-mounted fixtures.
 - Cracks and crevices.
- Place monitors
 - Out of the way of cleaning operations.
 - Standardized locations, mark on map, placard location or barcoded.
 - Clearly dated and initialed.

3. What do I need to do now? (continued)

- Bait? Use your judgment. Did you get them all?
 - If you bait, use containerized baits or other methods to ensure the bait can and will be removed once it's job is done.
 - Place to reduce potential for exposure.
 - Record placements/amounts to ensure removal.
 - Use pre-screened, pre-approved, non-volatile baits in gel or bait station formulations.
 - Wipe up any over-application.
 - Borates, indoxacarb, hydroprene; fipronil, hydramethylnon .
- Dealing with an established problem in a new account will take time and effort on the first visits. Build those costs into your fee structure. You may get fired for fixing the problem, get paid for your time.

4. What do I need to do to prevent the problem from recurring?
 - Check monitors religiously.
 - Identify, prioritize and assign improvements needed:
 - Clutter removal, clean dirty surfaces, seal food, repair plumbing leaks, dry mops properly, fill P traps in drains.
 - For Oriental cockroaches, address moisture issues.
 - Dehumidifier? Improve ventilation?
 - Seal entryways from moist area (e.g., crawlspace, sewer)?
 - For German cockroaches, check drains, clean and get them on a regular program for cleaning; remove cardboard boxes especially from food areas.

4. What do I need to do to prevent the problem from recurring?
(continued)

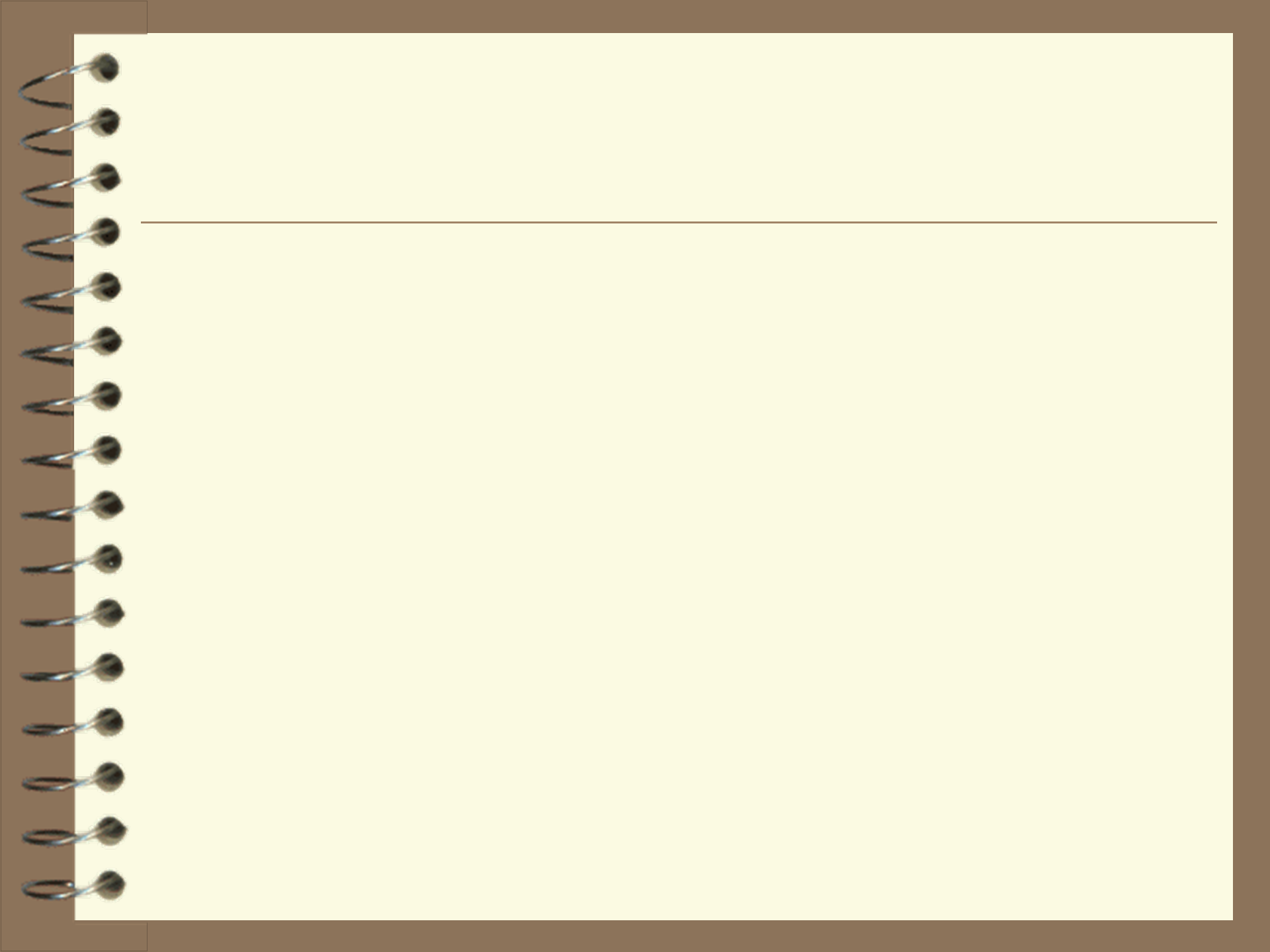
- Minimize action client needs to take by doing it yourself (e.g., drain cleaning) and charging for it.
- For those actions the client must take:
 - Create awareness of the problem.
 - Persuade the client that change is in their interest.
 - Obtain a commitment to make the change.
 - Support implementation.
 - Confirm/validate, evaluate and adjust.
- Follow up supervisor to supervisor if recommendations are not followed.
- Follow up with a supervisor if the cockroach problem persists.

5. Ongoing service

- Remove baits once problem is resolved.
- Schedule thorough re-inspection in three months, six months, one year to assess/repair/replace sealants, check on client behaviors. Decrease frequency once good performance established.
- Continue to monitor.

6. Spray-applied liquids are ineffective, can de-activate baits and create unnecessary potential for exposure. Do not use spray-applied liquids for cockroaches.

7. Any dust or granular formulations should be used in locations that are sealed after use. Wipe up any over-application.



A spiral-bound notebook with a cream-colored page. The word "RODENTS" is written in a bold, brown, serif font on the left side of the page. A horizontal line is drawn across the page, positioned above the word. The spiral binding is visible on the left edge.

RODENTS

1. Which rodent?

- Mice; Norway rat, roof rat.

2. Why is the rodent there?

- Mice: Access to food, water, harborage.
- Rats: Adjacent habitat, food, water, harborage.

3. What do I need to do now?

- A. Interior: live repeating traps, snap traps in tamper-resistant stations; shock traps; large number of traps, numbered, placed overnight and removed in the morning if large population.
- B. Exterior: Traps or bait-block rodenticides in tamper-resistant stations; and/or pelleted rodenticides placed deep into burrows to reduce rejection.

3. What do I need to do now? (continued)

Sanitation

- Resolve any current access to food, water, shelter.
- Remove clutter to allow proper inspection and cleaning.

Exclusion

- Seal all access points.
 - Screen vents, seal fascia and roof.
 - Door sweeps.
 - Seal cracks and crevices.

3. What do I need to do now? (continued)

- Rodenticide bait selection
 - Use only CAUTION label formulations.
 - Use only block formulations in tamper-resistant bait stations , or pellets deep in burrows.
 - Place to reduce potential for tampering, e.g., out of sight, secure station to substrate.
 - Record placements to ensure regular servicing.
 - Anti-coagulants or not, reduce potential for exposure. “Natural” cholecalciferol is also acutely toxic. First generation anti-coagulants require multiple feeding. Is using less of a more toxic second-generation product a valid trade off?
 - Use non-toxic blocks to monitor where pressure is not constant.

4. What do I need to do to prevent the problem from recurring?

- Monitor with traps or non-toxic blocks inside mouse RTU stations; rat tamper-resistant stations. Date, initial; standardized location, mark on map, placard on wall or barcoded. Check religiously.
- Monitor with flashlight for droppings.
- Rats, exterior: Monitor visually for burrows, grease marks, droppings.
- Identify, prioritize and assign improvements needed:
 - Interior: detail cleaning, clutter removal, create inspection aisles, seal food, repair plumbing leaks, dry mops properly.
 - Exterior: screened vents, door sweeps, exposed ground (no ivy), non-cavernous landscaping.

4. What do I need to do to prevent the problem from recurring? (continued)

- Minimize action client needs to take (e.g., exclusion work) by doing it yourself and charging for it.
- For those actions the client must take:
 - Create awareness of the problem.
 - Persuade the client that change is in their interest.
 - Obtain a commitment to make the change.
 - Support implementation.
 - Confirm/validate, evaluate and adjust.
- Company must follow up supervisor to supervisor if recommendations are not followed.
- Technician must follow up with a supervisor if the rodent problem persists.

5. Ongoing service

- Remove traps, replace rodenticide blocks with non-toxic blocks for monitoring once problem is resolved.
- Schedule thorough re-inspection in three months, six months, one year to assess/repair/replace sealants, check on client behaviors. Decrease frequency once good performance established.
- Continue to monitor for droppings and/or feeding.

6. Tracking powder and liquid baits are not necessary and create unnecessary potential for exposure. **WARNING** label formulations are unnecessary.

A spiral-bound notebook with a cream-colored page and a brown cover. The spiral binding is on the left side. A horizontal line is drawn across the page. The text "BED BUGS" is written in a bold, brown, serif font on the left side of the page, below the horizontal line.

BED BUGS

1. Why is the bed bug there?

- Invasion from adjacent infested area.
- Imported on furniture, etc.

2. What do I need to do now?

- Identify extent of infestation.
- Consider units, rooms adjacent to infested ones to be infested.
- Work from outside in, to avoid driving bed bugs out into uninfested units/rooms.
- Carefully communicate the entire process with the client so there will be no misunderstanding. Use a special contract. Provide a fact sheet.

2. What do I need to do now? (continued)

- Follow prep routine, removing clothing, bed linens directly into plastic bags in the infested area, then removing for high temp washing.
- Thoroughly steam with high-temperature steamer including cracks and crevices.
- Carefully inspect to find all possible harborages including joints in furniture, baseboards, picture frames, etc.
- Thoroughly and carefully vacuum after steaming.
- Use mattress covers designed to contain/exclude bed bugs.
- Complete follow up inspection 3 and 6 months later. Decrease frequency once good performance established.

2. What do I need to do now? (continued)

- Pesticide selection
 - Use only CAUTION label formulations.
 - EcoExempt IC2 as a contact insecticide is an option for some surfaces.
 - Dusting voids with limestone, diatomaceous earth is also an option.
- Any dust or granular formulations should be used in locations that are sealed after use. Wipe up any over-application.
- Dry heat also an option, must be sufficiently hot for a long enough duration. Use specialty equipment.
- Freezing also an option.

3. What do I need to do to prevent the problem from recurring?
- Inspect religiously every three months.
 - Detection dogs can be useful.
 - Company must follow up supervisor to supervisor if recommendations are not followed.
 - Technician must follow up with a supervisor if the bed bug problem persists.
- Other parasitic arthropods
 - Lice are a medical issue. Non-toxic treatments are available.
 - Fleas are best managed with commercial strength vacuuming, steaming and/or pet treatments. Spray-applied pesticides are not effective for fleas. Oral medications reduce exposure potential vs. surface applied.

A graphic of a spiral-bound notebook with a cream-colored page and a brown cover. The spiral binding is on the left side. A horizontal line is drawn across the page, and the text "FLYING INSECTS" is written in a brown, serif font below it.

FLYING INSECTS

1. Which flying insect?

- Fruit flies, phorid flies, moth flies (drain flies), filth flies.
- Cluster flies, fungus gnats.

2. Why is the insect there?

- Larvae breeding in decaying organic matter.
- Fungus gnats breeding in potted plants.
- Flies attracted by odors, light.
- Cluster flies attracted by silhouette of building.

3. What do I need to do now?

- Remove flies with vacuum, fly swatter, trapping with light or odor-baited traps.
- Remove larvae by removing/cleaning up organic matter in drains, cracks/crevices. Don't spread listeria!

4. What do I need to do to prevent the problem from recurring?

Sanitation

- Resolve access to breeding sites, e.g., clean drains regularly, including hidden or difficult to reach drains. Enzyme –based cleaners work well.
- Educate client to stop overwatering interior plants.
- Remove clutter to allow proper inspection and cleaning.

Exclusion

- Screen vents, windows, doors especially around food/trash handling areas.
- Door sweeps.
- Seal cracks and crevices to prevent organic matter accumulation.

4. What do I need to do to prevent the problem from recurring?
(continued)

- Light/odor traps can be good monitors and suppress populations.
- Minimize action client needs to take (e.g., drain cleaning, exclusion) by doing it yourself and charging for it.
- For those actions the client must take:
 - Create awareness of the problem.
 - Persuade the client that change is in their interest.
 - Obtain a commitment to make the change.
 - Support implementation.
 - Confirm/validate, evaluate and adjust.

4. What do I need to do to prevent the problem from recurring?
(continued)

- Company must follow up supervisor to supervisor if recommendations are not followed.
- Technician must follow up with a supervisor if the flying insect problem persists.

5. Ongoing service

- Interior and exterior drain cleaning
- Schedule thorough re-inspection in three months, six months, one year to assess/repair/replace screens, door sweeps, check on client behaviors. Decrease frequency once good performance established.
- Continue to check/maintain light/odor traps.

6. Spray-applied pesticides are generally not necessary and create unnecessary potential for exposure.

- For cluster flies, sealing them out, light traps, glue traps may not be adequate. A residual insecticide may be required and should be applied only to the area where flies are entering the structure. Use CAUTION label options.

A graphic of a spiral-bound notebook with a cream-colored page and a brown cover. The spiral binding is on the left side. A horizontal line is drawn across the page, and the text "STINGING INSECTS" is written in a brown, serif font below it.

STINGING INSECTS

1. Which stinging insect?

- Wasps, hornets, yellow jackets, bees.
- Fire ants.

2. Why is the insect there?

- Nesting site on, in or near building.
- Attracted to food, sugary drinks, flowering plants, trash.

3. What do I need to do now?

- Interior: Remove flying insect with vacuum or fly swatter.
- Exterior: Physically remove nest carefully, with proper protective equipment if needed. Use botanical or soap-based spray-applied pesticide if needed.

4. What do I need to do to prevent the problem from recurring?

Sanitation

- Clean outdoor trash cans, dumpsters and keep clean.

Exclusion

- Screen vents, windows, doors especially around food/trash handling areas.
- Door sweeps and keep exterior doors closed.
- Seal cracks and crevices on building exterior to prevent nesting.
- Avoid planting flowering plants around entryways.
- Avoid placing trash receptacles near entryways.
- Use trash receptacles with spring-loaded doors for exterior use.

4. What do I need to do to prevent the problem from recurring?
(continued)

- Yellow jacket traps can be good monitors and suppress populations.
- Minimize action client needs to take (e.g., trash receptacle cleaning) by doing it yourself and charging for it.
- For those actions the client must take:
 - Create awareness of the problem.
 - Persuade the client that change is in their interest.
 - Obtain a commitment to make the change.
 - Support implementation.
 - Confirm/validate, evaluate and adjust.

4. What do I need to do to prevent the problem from recurring?
(continued)

- Company must follow up supervisor to supervisor if recommendations are not followed.
- Technician must follow up with a supervisor if the stinging insect problem persists.
- Fire ants: Maintain thick, healthy turf to discourage nesting. If necessary, bait 1-2 times per year. Bait when ants are actively foraging (spring, fall and generally mid-morning to mid-day) so that bait is picked up quickly. Use CAUTION-labeled products without chronic toxicity issues. Baiting typically requires less pesticide and is more effective than mound treatments.

5. Ongoing service

- Inspect the exterior of the structure, adjacent trees on a regular basis.
- Continue to check/maintain yellow jacket traps.

6. Neurotoxic spray-applied pesticides are not necessary and create unnecessary potential for exposure. Botanical formulations are an effective substitute.

Any dust or granular formulations should be used in locations that are sealed after use. Sealing nest entryways on the exterior of buildings should be done only after the colony is dead to avoid forcing insects inside the structure. Wipe up any over-application.

A spiral-bound notebook with a cream-colored page. The word "ANTS" is written in a brown, serif font on the left side of the page. A horizontal line is drawn across the page, positioned above the word. The spiral binding is visible on the left edge.

ANTS

1. Which ant? Absolutely critical to identify the ant correctly!
 - Argentine, acrobat, crazy, odorous house, pharoah, etc.
 - Carpenter ants.
2. Why is the insect there?
 - Nesting site on, in or near building.
 - Attracted to food and water.
3. What do I need to do now?
 - Interior: Remove trailing ants with vacuum or soapy rag. Wipe up any pheromone trail with soapy water.
 - Seal entryways.
 - Exterior: Generally action not needed. Diversionary baiting may help for Argentine ants, e.g., place bait station outside, gradually move bait station further away from structure.

3. What do I need to do now? (continued)

- Baits
 - If you bait, use containerized baits or other methods to ensure the bait can and will be removed once it's job is done.
 - Place bait to reduce potential for exposure.
 - Record placements/amounts to ensure removal.
 - Use pre-screened, pre-approved, non-volatile baits in gel or bait station formulations.
 - Liquid baits may be used in a refillable bait stations placed in non-visible areas.
 - Wipe up any over-application.
 - Borates, indoxacarb, sulfluramid; fipronil, hydramethylnon

4. What do I need to do to prevent the problem from recurring?

Sanitation

- Keep food and food trash in sealed containers.
- Resolve condensation or other issues that may provide water source.

Exclusion

- Screen vents, windows, doors especially around food/trash handling areas.
- Door sweeps and keep exterior doors closed.
- Seal cracks and crevices on building exterior to prevent nesting.
- Avoid placing trash receptacles near entryways.
- For carpenter ants, replace moist or damaged wood; keep wood piles away from building.

4. What do I need to do to prevent the problem from recurring? (continued)

- Minimize action client needs to take (e.g., sealing cracks and crevices) by doing it yourself and charging for it.
- For those actions the client must take:
 - Create awareness of the problem.
 - Persuade the client that change is in their interest.
 - Obtain a commitment to make the change.
 - Support implementation.
 - Confirm/validate, evaluate and adjust.

4. What do I need to do to prevent the problem from recurring? (continued)

- Company must follow up supervisor to supervisor if recommendations are not followed.
- Technician must follow up with a supervisor if the ant problem persists.
- Invading ants in southern regions may be very challenging to manage without perimeter barrier spray-applied residual pesticides. If exclusion, sanitation and diversionary baiting are not adequate, a CAUTION label residual pesticide may be needed. Where possible, spot treat, treat only when ant activity is at unacceptable levels.

5. Ongoing service

- Interior and exterior inspection.
- Schedule thorough re-inspection in three months, six months, one year to assess/repair/replace door sweeps, sealants, check on client behaviors. Decrease frequency once good performance established.
- Continue to check/maintain diversionary bait stations.
- Occasional invaders (crickets, spiders, scorpions) rarely need action beyond physical removal and improvement in exclusion, e.g., repairing/replacing door sweeps, window and vent screens. Ongoing service should include wiping (Webster) or vacuuming webs and spiders. Insect monitors can detect and suppress spider and cricket populations.

A graphic of a spiral-bound notebook with a cream-colored page and a dark brown cover. The spiral binding is on the left side. A horizontal line is drawn across the page, approximately one-third of the way down. The text "STORED PRODUCT PESTS" is centered on the page in a bold, brown, serif font.

STORED PRODUCT PESTS

1. Which pest? Absolutely critical to identify the correctly!
 - Many moth and beetle species, e.g., carpet beetles, Indian meal moths.
2. Why is the insect there?
 - Adult or larval food source.
3. What do I need to do now?
 - Dispose of all infested food or disposable objects, vacuum adjacent area including cracks and crevices.
 - Remove infested object for off-site freezing or heating.

4. What do I need to do to prevent the problem from recurring?

Monitoring

- Use pheromone or light traps, or insect monitors as appropriate for the species. These can detect insects and suppress populations.

Sanitation

- Keep food stores current, last in, last out.
- Clean, vacuum objects at risk frequently.

Exclusion

- Screen vents, windows.
- Door sweeps and keep exterior doors closed.
- Seal cracks and crevices on building exterior.
- Contain object (carpet, clothing) in pest-proof container (garment bag, cedar-lined trunk or closet).

4. What do I need to do to prevent the problem from recurring?
(continued)

- Minimize action client needs to take (e.g., proper inventory rotation, sanitation) by doing it yourself and charging for it.
- For those actions the client must take:
 - Create awareness of the problem.
 - Persuade the client that change is in their interest.
 - Obtain a commitment to make the change.
 - Support implementation.
 - Confirm/validate, evaluate and adjust.

4. What do I need to do to prevent the problem from recurring?
(continued)

- Company must follow up supervisor to supervisor if recommendations are not followed.
- Technician must follow up with a supervisor if the stored product and fabric pest problem persists.
- Very rare situations may require chemical fumigation.

5. Ongoing service

- Interior and exterior inspection.
- Schedule thorough re-inspection in three months, six months, one year to assess/repair/replace door sweeps, sealants, check on client behaviors. Decrease frequency once good performance established.
- Continue to check/maintain pheromone traps, light traps and/or insect monitors if appropriate.