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GREENPRO CERTIFIED PEST MANAGEMENT

GREENPRO

STUDY GUIDE

VERSION 2.0

This is the study guide for the GreenPro technician and salesperson exam. GreenPro is a service certification available exclusively to QualityPro accredited companies. One of the requirements of the GreenPro service certification is that every employee that performs or sells the company's GreenPro certified service has to pass the GreenPro exam. After passing the GreenPro exam at **www.npmatraining.org**, you will receive a certificate of completion.

There are six chapters in this guide. The first four focus on aspects of integrated pest management. The fifth chapter are test questions for you to practice study. The sixth chapter are the answers to the practice questions. The GreenPro exam is 50 questions long and time-limited to one hour. If you have any questions, please feel free to contact us at **qualitypro@pestworld.org**.

CONTENTS

Customer Education and Communication

1.1 WHAT IS GREEN SERVICE?

- The world has embraced "green" products, services, and ideas.
  - "Going green" is the catch-all phrase used for adopting business and lifestyle changes to reduce negative impacts on the environment.
  - Like all other industries, the pest management industry has seen the growing consumer trend toward "Green".
  - We are adopting tools and methods in green pest management service that reduce potential environmental impacts while still controlling pests.
- The term "environment" when used in green pest management service means not only the outdoor environment around buildings, but the human environment inside buildings as well.
  - The human environment includes effects on human and animal health.
  - The most important factor in reducing environment impacts indoors is reducing the occupants' potential exposure to pesticides.
- Green service is very different from how the industry used to perform pest control programs.
  - Monitoring for pests and conditions contributing to pests is of critical importance.
  - Far more time will be spent in inspecting a facility rather than killing pests.
  - Communications are far more detailed and more time-consuming than in traditional pest control, meaning detailed record-keeping, various types of reports and logs, and education of customers.
  - Pest prevention through improved sanitation and pest exclusion is emphasized.
  - Nonchemical tools and tactics are emphasized.
  - Pesticides are used only when necessary, in a way that minimizes risk.
- IMPORTANT: Green service does NOT require that you never use a pesticide.
  - However, pesticides are usually not your first choice when looking for a way to control a pest.
  - If you decide that you need to apply a pesticide, you choose a product and application method that
    - » Will control the pest effectively.
    - » Minimizes risk to people, pets, and the environment.
- Green service means strictly complying with the GreenPro service standards of QualityPro. The green standards have requirements in the following categories:
  - IPM performance.
  - Treatment strategies, both nonchemical and chemical.
  - Pesticide application.
  - Pesticide selection
  - Recordkeeping
- Integrated pest management (IPM) is the cornerstone of green service and includes:
  - Communication and educating customers about pests, pest management, responsibilities, etc.
  - Thorough inspections and monitoring to identify pest problems and conditions that might be contributing to pest problems.
  - Preventive actions such as pest proofing and trash management to keep pests from becoming a problem.
  - Physical pest management tools and tactics such as trapping, vacuuming, and using heat or cold to control pests.
  - Low impact use of pesticides (a "green" approach).
  - Follow-up and evaluation of pest management actions.

1.2 EDUCATING YOUR CUSTOMERS ABOUT GREEN SERVICE

- Customer education and communications are critical jobs for a PMP who is providing green service. There are a number of reasons for this:
  - Green service may be different from the typical pest control service that most customers have been used to.
  - Green service requires a higher level of customer cooperation through improving sanitation, pest proofing, making operational changes, etc.
  - Some customers will have an incorrect view of the tools and tactics used in green pest management.
- Some customers may think that green service requires one or more of the following:
  - Using only non-chemical pest management.
  - Applying pesticides only as a last resort.
  - Using only "least toxic" pesticides.
  - Using only FIFRA 25(b) exempt products.
  - Recycling paper and driving hybrids.

- When providing green service, you have a responsibility to educate your customers about the following issues related to green service:
  - An explanation of the specific green services that you are providing at the account.
  - The benefits and limitations of green service.
  - The customer's responsibilities in ensuring that green service works.
- Customer responsibilities in green service include the following:
  - Maintaining good sanitation and providing adequate housekeeping in order to limit food, water, and harborage sites for pests. This also includes:
    - » Following proper trash management practices, both indoors and outdoors.
    - » Minimizing clutter that provides pest harborage.
    - » Correcting moisture problems to limit conditions that attract moisture-loving pests.
  - Correcting structural problems that allow pest entry into the building or movement within the building (pest-proofing).
  - Correcting landscaping issues that may be attracting pests or providing access into the building.
  - Correcting lighting issues that may be attracting pests to the building.
  - Reviewing all reports and other communications from the PMP.

1.3 COMMUNICATIONS AND RECORDKEEPING IN GREEN SERVICE

- Green service communications include both verbal and written reports about conditions at the site.
- During service you should speak with people on site about critical issues such as:
  - Pests found.
  - Conducive conditions that may be contributing to pest problems.
  - Advice on the actions that need to be taken to correct these conditions.
- Written communications tend to be more detained and may include the following:
  - Consumer information sheets about green service.
  - Pest information sheets.
  - Product labels and consumer information sheets.
  - Pest sighting logs.
  - Pest activity records.
  - Service records/treatment records.
  - Sanitation reports/structural deficiency reports/ action reports.
- GreenPro standards require that the company maintains written records of all account activity including:
  - Name of technician.
  - Records of customer communications.
  - Corrective actions.
  - Pest activity.
  - Service provided (both nonchemical and pesticide service).
  - Date of service.
- All service records for service including applications and/or monitoring shall include the following information:
  - EPA and other registration numbers.
  - Product brand name.
  - Lot number of product.
  - Target pest.
  - Rate of application or % concentration.
  - Date and time of application.
  - Location or site of application.
  - Amount of finished product used.
  - Signatures of technician AND customer representative.
  - Certification or registration number of technician.
  - Emergency phone number.
  - Notes and observations and any other records required by the state pest management enforcement agency.
- A critically important function of green recordkeeping is to gather information to be used on a regular basis to evaluate the success or failure of the green service.
- Before each service, you should review the records to see if there are any pest trends you should address, if there have been recommendations that have not been followed, if the actions that you have taken have proved effective, etc.
- There should also be a periodic record review process that goes beyond the technician level.
  - The evaluation may occur quarterly, twice a year, or only once per year, but must be on a regular schedule.
  - A summary report is prepared, usually by a supervisor.
  - Part of the process may be a meeting with the customer, supervisor, and the technician.
  - Prior to this meeting, comments should be solicited from interested parties as to the effectiveness of the program and any problems noted.
- The evaluation should include input from concerned parties, review of inspection reports, sanitation reports, the logbook, and other records in order to:
  - See how the program is working.
  - Identify any changes that are necessary.

Pest Prevention

2.1 MONITORING AND INSPECTIONS

- Monitoring consists of regular and thorough inspections, accurate identification of pests, and assessment of conditions at the site. Monitoring includes gathering information about the following:
  - Identity and location of pests.
  - Areas of critical risk (food handling, food storage, trash areas, etc.).
  - Size of pest populations.
  - Conducive conditions that are contributing to pest problems such as:
    - Poor sanitation.
    - Improper food storage.
    - Poor trash handling.
    - Pest entryways (holes in walls, etc.).
    - Other factors that favor pest survival or entry into the building.
  - Management practices that could affect pest populations or pest management activities (trash pickup, inspection aisles in food accounts, lighting, construction, etc.).
  - Environmental conditions (temperature, moisture problems, weather or seasonal changes).
  - Any actions taken by the customer to correct conducive conditions.
  - Assessment of customer's satisfaction or dissatisfaction with previous service.
- Proper identification of pests is essential.
  - Different pests have different habits and food requirements.
  - What works to manage one pest may not work against another similar pest. For example:
    - One pest may be attracted to a trap while another similar pest is not.
    - "Gnats" may be fruit flies, drain flies, or phorid flies, each requiring different action.
  - If there is any doubt as to the proper identification of a pest, specimens should be brought back to the office for further identification or sent to an NPMA entomologist.
- There are three ways to collect information during your inspection:
  - Speaking with the customer, or, in commercial accounts, reading their comments in the logbook.
  - Walk-through visual inspections of all areas of the account, including the grounds.
  - Use of various types of monitoring traps.
- Technicians should check with the customer when possible regarding any pest sightings or "complaints" since the last visit.
- In commercial accounts also check any IPM logbook or the pest sighting log at the start of every inspection to identify locations where pests have been seen or suspected.
- Do not look just for the pests themselves, use a bright flashlight and look for other evidence of pests such as:
  - Droppings and frass from insects, rodents, and other pests.
  - Gnawing, tracks, and grease marks (from rodents).
  - Damage (such as exit holes in packaging).
  - Shed insect skins or webbing.
- Within a room not all sites are equally likely to be infested by pests. Higher risk areas include the following:
  - Cracks and crevices.
  - Corners, ledges, and hollows.
  - Equipment voids and structural voids.
  - Dark zones, shadow areas.
- Pests tend to follow straight lines. Look for pests, droppings, and other signs along the following:
  - Utility lines (electric, plumbing, computer cables, etc.).
  - Heating ducts/pipes.
  - Expansion joints/stress cracks.
  - Wall/floor intersection.
  - Pallet/shelf edges.
  - Equipment edges.
  - Rows of stored materials.
- Examine areas prone to infestations by the pests more commonly found in typical buildings:
  - Examine window sills regularly as many pests fly or crawl towards light. Also check inside ceiling light fixtures.
  - Many pests can be found behind baseboards, under furniture, behind moldings, in cracks in floors, behind radiators, or in air ducts.
  - Check around door jambs for cockroaches and spider webs. Spiders often spin their webs across gaps around doors to capture insects trying to enter.
- Check for new rodent droppings in likely areas:
  - At the floor/wall junction throughout all food preparation, eating, and storage areas.
  - On counters, stoves, food shelves and food prep surfaces.
  - In pantries and cabinets in food areas.
  - In the base of stoves, refrigerators, dishwashers.
  - Inside drop ceilings.

- Look for "conducive" conditions that might lead to pest problems.
  - Check for moisture problems, both indoors and out, which may lead to moisture-related pests such as carpenter ants, termites, or mold.
  - Look out for damaged screens, doors, and walls, which could allow pest entry.
  - Note any sanitation problems.
  - Be aware that fresh flowers and potted plants may be infested with insect pests.
- Inspect outdoors.
  - Heavy landscaping near the foundation and plants such as ivy growing on walls increases the risk of outdoor pests moving inside.
  - Moisture problems around the foundation, gutters, or air conditioning units can favor moisture-related pests.
  - Bright exterior lights may be attracting insects to the outside of the building, and these insects may be finding their way indoors.
  - Poor management of trash may be attracting rodents, which could find their way inside through utility lines or other openings.

2.2 MONITORING TOOLS

- For general household pests, the most common pest monitoring tools used for green service are the following:
  - Sticky traps, which use an adhesive to capture insects and other crawling pests.
    - » Sticky traps can be flat, triangular, box-like, or hanging tapes (for flying insects).
    - » Sticky traps are a simple and inexpensive way to monitor cockroaches, ants, flies, and other pests.
    - » Some sticky traps are available with lures to attract pests, most particularly cockroaches and flies.
  - Tracking patches to detect the footprints of rodents.
  - Insect Light Traps (ILTs) which, besides being a control tool, can be used to monitor flying insects.
- Other monitoring tools are used in special situations or in food-related accounts include:
  - Pheromone traps, which use chemical attractants to draw certain species of pests into the trap.
  - Food attractant traps (pitfall, fruit fly, etc.).
  - Grain probe traps.
  - Nontoxic rodent bait.
  - Bed bug monitoring devices.
  - Electronic monitoring devices for rodents.
- Monitoring tools are left on site between inspections and work 24 hours per day, seven days a week, and have other advantages as well:
  - They pinpoint precise areas of pest activity, even if pests are only active late at night.
  - They may capture pests, making accurate identification easier.
  - They help assess the size of the infestation, its level of development, and whether it is increasing or decreasing through time.
  - They gauge the program's success by comparing trap results before and after pest management action.
  - They can be used to collect numerical data as part of recordkeeping requirements.
- Sticky traps are good positive indicators of an infestation, but are not a guarantee that the area is pest-free.
  - If sticky traps are empty, the area may be pest-free.
    - » On the other hand, the traps could be in the wrong place, or the infestation could be in an unusual place.
    - » For example, there could be an isolated heavy infestation 15 feet away, but if there is no sticky trap there, you may miss it.
  - Capturing cockroaches or other pests in a sticky trap confirms pests and identifies the species.
  - By placing traps in various locations, a technician can locate focus areas (sites of high pest populations) or pest entry points.
- Sticky traps are generally poor tools for controlling pests.
- Cockroaches are the pest most often monitored with sticky traps, and the age distribution of pests on the trap can help determine a wide range of information about the pest population:
  - If all stages of the cockroach are captured, it's likely a large, long-standing population.
  - If only adults or large nymphs are captured, it may be a new infestation that has moved in from a cockroach focus nearby.
  - If mostly small nymphs have been captured, there will be a pocket of infestation within a few feet.
  - A bunch of cockroaches on one side of the trap tells you they are likely coming from that direction.
  - Are the trap catches decreasing? This suggests control actions are successful.
  - Are the trap captures increasing or remaining the same? You and your customer need to do more to control cockroaches.

- Avoid placing sticky traps in the open. Cockroaches and other crawling pests do not travel in the open if they do not have to.
- Think about where you normally find your key pests, and place the sticky traps nearby.
  - Put traps inside cabinets, on food storage shelves, under sinks and stoves, under equipment, in drawers, and next to trash cans.
  - Whenever possible, place traps horizontally against the edges of a wall or other vertical surface, near corners and sites where there has been cockroach spotting.
  - Emphasize sites where there is food available, or with potential pest entry points.
  - In food storage areas, place sticky traps on or under shelves and approximately ten feet apart.
    - » Place traps on different levels.
    - » Install traps on the floor in the corners of the room.
    - » Try to create a matrix in the storage area that will pinpoint a new infestation and help identify the infested goods.
- Traps should be checked at every regular service visit.
  - Number and date the traps.
  - Replace traps as needed, don't just leave them in place permanently.
  - Replace traps that have already captured a pest, record the capture information, and consider placing additional traps to identify the focus of the infestation.
  - Replace any trap whose glue has become dusty or dirty.
  - Follow the manufacturer's recommended replacement schedule.
    - » Three months is probably a maximum effective life for a sticky trap.
    - » Even though it can appear sound, the glue may have lost its holding power.
- Pheromone traps attract certain pests by incorporating pheromones, the natural chemical "scents" that insects use to communicate with each other.
  - Some are sex attractant pheromones that draw only the male insect.
  - Other pheromone traps use aggregation pheromones that attract both males and females of the same species.
  - A pheromone will only attract one species of pest or only a few closely-related species.
- Pheromone traps are specialty monitoring tools that you are most likely to use in the following circumstances:
  - To locate infestations of fabric pests such as clothes moths and carpet beetles.
  - To detect stored product infesting beetles (cigarette beetle, sawtoothed grain beetle, and others) and moths (Indian mealmoth, Mediterranean flour moth, and others) in commercial and institutional food operations (restaurants, cafeterias, plants).
  - To monitor for German cockroaches.
  - To trap house flies.
- Always follow the manufacturer's directions when using pheromone traps.
  - Check traps on a regular basis.
    - » Never let a pheromone trap go unchecked for longer than a month.
    - » Replace traps when they are dusty, dirty, or loaded with insects.
  - Remove and discard used traps.
  - Replace pheromone lures according to the manufacturer's directions.
  - Place traps away from air currents and moisture.
- Consider the insects' habits when placing pheromone traps.
  - Traps will catch more moths near the ceiling
  - and more beetles near the ground.
  - Use hanging traps only for flying insects.
  - Cockroach pheromone traps should be placed as you would sticky traps.
  - Don't place traps near doors, windows, vents, or loading docks where they could attract insects from outside.
- Number each trap and mark on a map of the room where you have placed the traps.
  - Keep a monitoring record of each trap's location, the date it was placed, and its catch at each inspection.
  - Some technicians record this information right on the trap itself.
- Any kind of trap (see later section on trapping), even those designed primarily for controlling pests, can also be used as a monitoring tool.
  - Insect light traps (ILTs) are effective monitoring tools for flying insects.
    - » Check collecting trays and glue boards at each service visit.
    - » Note: As you empty the tray or remove the glue board, also brush out the dead insects from behind the tray/board and from cracks and crevices.
  - Fruit fly traps will detect a newly emerging fruit fly problem.
  - Ant traps and monitors will detect foraging ants.
  - Yellowjacket traps will trap yellowjackets, hornets, and other flying insects.
  - Rodent glue traps not only capture rodents but anything else that contacts the glue.

- Keep good records and analyze your findings to identify new pest problems early. For example:
  - If large numbers of house flies suddenly are found in an ILT, you can be fairly sure that there is a nearby breeding source either inside, or if outside, then a window or door is being left open.
  - If the trap contains dermestid beetles in the winter, there is probably an infested site inside the building.
  - If an outdoor trap suddenly begins capturing yellowjackets, there is likely a developing nest nearby that should be investigated.
  - If a trap contains winged ants, there is a nearby nest.
  - If an indoor trap suddenly captures mosquitoes, someone is probably leaving a door open at twilight.
- There are other monitoring tools besides traps.
  - Rodent monitoring blocks look like rodenticide bait blocks but are nontoxic.
    - » They confirm rodent activity before toxic bait application ("bait and switch").
    - » They can be used inside stations just like a rodenticide, or out in the open and in other locations where rodenticides can't be used.
    - » They identify the species feeding (through gnaw marks and droppings) before you place a toxic bait, thereby protecting nontarget wildlife in a baiting area.
    - » They can overcome a rat's hesitancy to enter a bait station, and accustom rodents to feeding at preselected locations, improving kill when rodenticide or traps are then used.
  - A tracking patch is a light coating of nontoxic dust (such as talc) that is spread near suspected rodent activity areas and shows the tracks of any rodents (or other animals) that walk through it.
    - » Tracks in a tracking patch can identify the species and the direction of movement.
    - » A flashlight shined across the patch at a low angle gives the best view of the tracks.
    - » A tracking patch should not be used where there is a risk of contamination of food, even though the patch material is nontoxic.

2.3 PEST-PROOFING

- An important part of green service is recommending the pest-proofing actions that you feel are necessary to reduce pest problems.
  - Pest-proofing is usually done by the customer, custodial or maintenance staff.
  - In some instances it is done by the technician, depending on the circumstances and service agreement.
  - Extensive pest-proofing is usually done by the customer, although it may be contracted to the pest control company.
  - Caulking and minor screening may be done by the technician as part of regular service, or as an add-on service.
- There are three goals to pest-proofing in green service:
  - Exclusion, or keeping pests from entering a building.
  - Isolation, or keeping pests from moving from room to room within a building.
  - Harborage elimination, or eliminating pest hiding places and breeding areas.
- Pest-proofing can be as simple or complex, depending on the circumstances.
  - Repairing screens.
  - Caulking cracks and sealing small holes.
  - Physical alterations and major building repairs.
- Old buildings have many opportunities for pestproofing, and its use in such buildings can often have remarkable success.
- Major pest-proofing projects that require physical alterations can be expensive and time-consuming; however:
  - They usually are permanent solutions.
  - They often provide other benefits:
    - » Improving heat or cool air retention.
    - » Preventing water damage.
    - » Complementing building maintenance programs.
- Caulking, screening, repairing or stuffing holes, and other methods of manual exclusion on the perimeter can keep pests out of a building.
  - Pest exclusion is most effective against rodents, bats, flying insects, and the larger crawling arthropods such as large cockroaches, millipedes, and crickets.
  - Seal cracks and crevices in exterior walls.
  - Caulk, stuff, or seal openings around pipes and conduits where they enter the building.
    - » Use appropriate sealants. Foam sealants, for example, are usually not appropriate for rodents because they can easily chew through them.
    - » Don't limit this pest-proofing to ground level; pests can enter around utility lines entering on upper floors or at roof level.
  - In general, openings larger than 1/4 inch will allow mice to squeeze through.
  - Even for the smallest pests, caulking and sealing the obvious openings provides a measure of control.
    - » Some pests may find their way in, but many will not.
    - » This process can be time-consuming and expensive in older buildings.
  - 16 mesh screens will keep out most insects.

- Make other exterior pest-proofing recommendations as needed:
  - Repair screens on windows and doors and make sure they fit tightly.
  - Screen outside vent openings and air handlers to prevent outside insects from entering.
  - Install porcupine wire, pin and wire, or similar commercial products to keep birds from roosting on window ledges and other building surfaces.
  - A building may need bird netting installed to keep pest birds from roosting or nesting on the building.
- All exterior doors need to be kept closed and should not be kept open for ventilation unless protected by screens or air doors.
  - Stand on the dark side of a door and look to the other side in the light; everywhere you see light shining through is a potential pest entry.
  - Metal doors are best.
  - If exterior doors are made of wood, they should have metal flashing at the bottom of the door and on sills and jambs to prevent rodents from gnawing their way inside.
  - Doors that must be kept open, such as loading dock protected by air curtains (air doors).
- Doors to the outside need door sweeps, brush seals, thresholds, and weatherseals to keep pests out.
  - The benefits of door sealers are not only related to pest exclusion.
    - » Door sweeps, thresholds, and weatherseals reduce heating and air conditioning costs, and result in less sound and light infiltration.
    - » Often, utility savings in one year will cover the cost of the installations.
  - Compression seals can eliminate the space under roll-down bay doors in garages and in loading areas of commercial accounts.
- Do not ignore the roof. Rodents, insects, and birds can find their way inside at roof level. Look for the following:
  - Damaged or poorly fitted soffits and fascia boards.
  - Unscreened vents and air intakes.
  - Damaged flashing.
  - Missing bricks, damaged mortar, siding, shingles, etc.
  - Holes around utility wires, pipes, conduit.
- Pest-proofing within a building results in "pest isolation" by creating separate compartments, like waterproof doors do in a ship.
  - Pest isolation prevents pests from spreading throughout a facility, and makes them easier to control.
  - Installing caulk, mesh, and other sealants around pipes, utility lines, and other entries into the voids between rooms can isolate infestations in one area.
  - High pest risk areas should be physically isolated from the rest of the building by installing caulk, mesh, and other sealants.
- Make other recommendations to isolate pests as needed:
  - Repair or screen floor drains.
  - Screen interior vent openings.
  - Caulk crevices around doors, windows, vents, plumbing fixtures, equipment, cabinets, and counter tops.
  - Repair grout around wall and floor tiles.
  - Reattach loose tiles.
  - Repair cracks and pits in flooring, and damaged or deteriorated expansion joint liners.

2.4 GENERAL HOUSEKEEPING AND SANITATION

- Green service requires that the technician identify, report, and make recommendations to the customer to correct sanitation problems that may contribute to pests.
  - Identify sanitation problems during your inspection.
  - Document sanitation problems through good records.
  - Communicate with the customer on sanitation issues.
    - » Provide information on how the specific sanitation problem may lead to pests.
    - » Provide recommendations on how to correct those sanitation problems.
  - At later service visits, see whether or not the customer has corrected the sanitation problems adequately.
- In most cases it is the customer who corrects sanitation problems, but not always; Some green service companies:
  - Provide steam cleaning/degreasing services of kitchens, equipment, drains, dumpsters, etc.
  - Use vacuums as part of green service.
  - May clean up pest droppings, body parts, and other debris in critical areas.
- Be sure to repeatedly emphasize to your customer the importance of sanitation in pest management.
  - Removing readily available food and water for pests is an important way to prevent and reduce pests.
  - Cleaning up clutter is important, too, because clutter and debris provide harborage (living and hiding places) for pests.
  - Sanitation is not just an issue inside but outdoors as well, particularly at the building perimeter.

- Good sanitation is especially important in areas where food is prepared, eaten, or stored.
  - Food preparation surfaces should be cleaned promptly after use, and should never be allowed to remain dirty overnight.
  - Grease should be cleaned regularly from ovens, exhaust filters, and grease traps.
  - Kitchens should be "deep-cleaned" periodically to remove built up grease and food residues.
- There are special sanitation issues in commercial food accounts:
  - Floor drains should be treated regularly with enzyme-based or other biological cleaners.
  - Mop buckets should be emptied after use and wet mops and rags cleaned and hung to dry (to prevent fruit flies).
  - Floors must be cleaned daily, preferably in the evening.
  - Catch trays in insect light traps should be emptied regularly to prevent dermestids and similar pests.
  - There needs to be sanitation and inspection aisles in food processing and storage areas.
    - » An unobstructed lane 18-24 inches wide, painted white (sometimes yellow), completely around the inside of the exterior walls in processing and storage areas.
    - » A space 18-24 inches wide between rows of stacked product.
  - Stored packaged foods should be stacked on industrial grade, steel wire shelves that allow spilled foods to fall to the floor and make clean-up easier.
  - Food stored on pallets should be at least 18 inches away from the wall to allow inspection and cleaning.
  - The policy of FIFO or "first in, first out" ensures that foods do not remain in storage for too long. Older food products are more likely to become infested.
- Storage areas need to be free from clutter.
  - Clutter can lead to large mouse populations.
  - Cardboard boxes are a particular problem because they provide harborage sites for cockroaches and other pests.
  - Customers should be advised not to store old cardboard boxes or paper bags but to recycle or dispose of them quickly.
- Pests can occur anywhere in an account so good housekeeping is important in other areas besides kitchens and food storage areas.
- Be sure to address sanitation issues outdoors, as well.
  - Compost piles, leaf piles, debris piles, stacked wood, pipes, or building materials should be located away from the foundation and away from mulched areas.
  - Trash and food debris on the grounds, especially trash that accumulates around the foundation and under shrubbery, must be picked up.
  - Spilled food debris must be cleaned up regularly.

2.5 TRASH MANAGEMENT

- Poor trash management is a major cause of pest infestations.
  - Garbage cans and recycling containers should have lids that close and should be emptied regularly.
  - Garbage cans should include plastic bag liners.
  - Bags should be taken out regularly to be stored in closed containers outside until trash pickup.
  - Garbage cans and recycling containers should be cleaned regularly to remove food debris and sugary residues.
  - The inside of the trash can underneath the plastic liner should not be allowed to accumulate spilled trash and should be inspected and cleaned regularly.
- In commercial accounts, dumpsters are a prime attractant for rodents, flies, birds, cockroaches, and other pests.
  - Poor dumpster management is a main cause of rat problems around a building.
  - Flies inside a building are often traced to flies attracted to and breeding around dumpsters outside.
- Dumpsters and compactors placed near doors, loading docks, and windows attract pests and bring them near natural points of entry into the facility.
  - Dumpsters should be located 50 feet or more from outside doors; 75 feet if at a food facility.
  - Dumpsters should be situated on a thick concrete pad that has foundation toes on the outside to keep rodents from burrowing under the pad.
  - If not installed on a pad, small dumpsters can be on wheels to keep them up off the ground.
  - Ideally, the dumpster area should slope to a sanitary sewer drain to handle runoff from cleaning.
- Dumpster lids should be kept closed.
  - If there's so much trash that the lid can't close, then a bigger container is required or the trash service needs to schedule more frequent pickups.
  - Users need to close the doors after they've deposited trash.
- Dumpsters should be washed out regularly using high pressure and a degreasing solution.
  - Drain holes should never be left open (except during cleaning).
  - Plugs should be in place or the opening should be screened.
- Dumpsters should not be damaged, leaking, or rusted through, and the lids should close properly. Otherwise, they should be replaced.

- Dumpsters should be checked by staff twice daily, and any trash picked up that didn't end up inside the dumpster.
  - Staff should also police the area immediately after the dumpster has been emptied or removed.
  - Spilled trash should never be allowed to remain overnight.
  - Cardboard boxes should be broken down or crushed and placed inside the dumpster or special cardboard recycling containers, not left on the ground.
- Limit the use of shrubbery around dumpster enclosures (see next section, Landscape Management).

2.6 LANDSCAPE MANAGEMENT

- Limit the use of shrubbery around dumpster enclosures.
  - Thick foundation plants might help conceal the dumpster from view, but they also conceal rodent burrows and accumulated garbage, and make inspection difficult.
  - Especially avoid thorny shrubs like barberry or pyracantha.
  - Make sure weeds or grass around a dumpster are trimmed close.
- Trees should not be close enough to touch a building since ants, squirrels, and rats (roof rats especially), often follow branches to enter a building.
  - Trim tree branches that touch the building.
  - Ivy, espaliered bushes, or other plants against walls should be avoided because ants, rodents, and other pests use them to find entry into buildings.
- Fruit and nut trees and berry bushes provide rodent food and attract other pests and, in some circumstances, may need to be moved or removed when located near a building.
- Thick low-growing ground covers such as juniper hide burrows and provide ideal rodent hiding places and runways.
  - When the plants fill in, the ground becomes impossible to inspect.
  - These types of plants also capture food debris and other trash, which is difficult or impossible to remove.
  - Recommend that your customer thin or remove dense shrubbery and ground covers around the building's foundation or wherever you find evidence of rodents under them.
- Customers should try and avoid mound-shaped, ground-hugging shrubs and instead use plants that have a wineglass shape or that are otherwise open at the base.
  - Thorny shrubs should also be avoided as they are difficult to inspect and prone to capturing wind-blown trash.
  - Large rocks, railroad ties, and similar landscape structures are attractive as rodent burrow sites and should be avoided.
  - Blooming plants should not be located near the building to minimize bee and wasp activity.
  - Lawns need to be cut regularly.
- Weeds are attractive nest areas for rodents.
  - Make sure that there are no weedy areas that are being ignored by your customer.
  - Weeds along fence lines or around abandoned equipment or debris are particularly attractive to rodents.
  - String trimmers should be used to mechanically manage weeds on a regular basis.
- Organic mulch near a building can be the source of many different pest problems:
  - Because organic mulches are made of plant material that gradually decomposes, they attract millipedes, sowbugs or pillbugs, cockroaches, slugs, earwigs, and crickets and other pests that feed on decaying material.
  - Mulch also draws pests that are attracted to the moisture and heat, pests that simply like the protected harborage that mulch provides, and pests that are there to feed on other pests.
  - Pests use a well-mulched foundation as a stepping stone to enter the structure.
    - During temperature extremes or if the mulch becomes too dry or too wet, these perimeter invaders may try to move inside.
- A heavy layer of wood mulch that is right up against the building can also enable subterranean termites to bypass a termiticide soil barrier.
  - Termites can travel through the protective mulch above ground and enter the building through foundation cracks, conduits, or weep holes in brick.
  - Most buildings should have a bare strip 6-12 inches wide at the foundation.
  - Food facilities should have a 2-3 foot wide inspection strip around the perimeter of the structure.
    - Advise your customer to place landscape cloth over this strip to keep weeds and grass from coming up, then leave the strip bare or cover with dirt, crushed stone, gravel, or sand.
    - As an alternative, regular herbicide applications can be used to keep the inspection strip clear of weeds.

2.7 LIGHT MANAGEMENT

- Bright outdoor lights attract insects of many types, both flying and crawling.
  - Even a small light can be seen for miles.
  - Bright security lights often become beacons that attract insects in large numbers.
- Insects can accumulate in large numbers under lights, and at doorways and windows.
  - Insects attracted to lights at the building perimeter often find their way inside.
  - Insects at lights may also attract spiders, scorpions and bats that feed on them.
- If a building's lights are causing pest problems, discuss with your customer how to change the lighting to prevent pest problems, while still retaining security and visibility.
- Insects and lighting is a complex issue. Here are the facts:
  - Many insects are attracted to high UV (ultraviolet) light, such as in fluorescent bulbs.
  - An insect may be attracted to a particular wavelength of light, but may only be attracted at a certain time of the night or at a certain time of the year or at a certain temperature.
  - Male insects may be attracted but not females.
  - rightness is also important. All else being equal, a 200 watt bulb will attract more insects from a longer distance than a 100 watt bulb.
  - Certain insects are attracted to heat and so also to lights that put out heat, such as standard incandescent bulbs, halogen bulbs, floodlights, and others using a glowing filament.
  - Another factor is competition from other lights. If the only bright light in the area is the one shining on the loading dock, every light-attracted insect in the area will zero in on that entrance.
- Your lighting recommendations will depend, to some extent, on the specific types of insects causing trouble.
  - Midges, for example, mostly fly to lights in early evening.
  - Midge problems can be reduced simply by waiting until one to two hours after sunset before turning on lights during a midge outbreak.
- There are many lighting alternatives that are less attractive to pests.
  - Replace high wattage bulbs with lower wattage (less bright) bulbs.
  - Lights with a yellowish, pinkish, or orange tint are less likely to attract insects.
  - Use sodium vapor lamps, LED bulbs, or others with low UV output instead of mercury vapor lamps and fluorescent lamps in high-risk areas.
  - Replace bulbs that put out a high amount of heat (such as halogen lamps and incandescent floodlights) where they are causing pest problems.
  - Direct or shield outside lights so that the light shines only where it's needed.
    - » Indirect lighting is less attractive to insects than direct lighting.
    - » When possible, install lights 15 to 20 feet away from the entryway, but facing toward it, rather than placing lights directly above doorways.
- There are other ways to minimize pest problems associated with lights.
  - Avoid bright flood lights shining on a white wall, particularly if near water, since the lights can attract swarms of midges and mayflies.
  - To minimize midges and other insects that fly only at dusk, set lights so that they do not turn on until at least one hour after sunset, preferably two.
  - Use curtains on windows or make sure lights are turned off in unoccupied rooms. Bright lights shining through windows can bring insects directly inside.
  - Create a perimeter of bright decoy lights every 100 feet at a distance of 250 feet or so from the building.
- Discuss security and aesthetic concerns with your customer before recommending changes in lights because lighting strategies that reduce insect problems almost always come with trade-offs:
  - Lights that are less attractive to insects may also be dimmer and less attractive to people.
  - Low-pressure sodium lamps wash out most colors, for example, making them appear yellow or gray, and should be used only where color rendition is not important.
  - High-pressure sodium lights are better at color rendition, but cause reds to appear brown.
  - Color-balanced, high-pressure sodium lights are better for people but may be more attractive to insects.

2.8 MOISTURE CONTROL

- For green service, you need to explain to your customer the connection between moisture and pests.
- Most pests need free water to survive and such water acts as a pest attractant.
  - Moist basements and ground floor levels attract moisture-loving pests such as springtails, millipedes, sowbugs, and earwigs.
  - Moisture in foods, books, and other materials attracts moisture loving pests such as pscocids and fungus beetles.
  - Most cockroach infestations are located near free water or very moist areas.
  - Moisture in walls may attract termites and carpenter ants.
- Leaks and condensation can provide conducive conditions for moisture-loving pests.
  - Leaky plumbing anywhere.
  - Excessive condensation from refrigeration.
  - Leaks in the roof.
- Many moisture problems are obvious because signs of moisture are visible.
  - Standing water.
  - Dripping condensation.
  - Water stains.
  - Mold and mildew.
  - Wet crawlspace.
- A moisture meter can be a useful tool to identify areas of high moisture that are not obvious during a visual inspection.
  - You can measure moisture in wood, drywall, roofing, plaster and brick.
  - By finding wet wood and other moisture hot spots, you pinpoint locations that may be attracting pests — and sometimes even locate the pests themselves.
- Part of green service is educating your customer how to minimize moisture around the building.
- Make sure that drainpipes, downspouts, or spigots are not emptying against the building.
  - Irrigation systems should not water excessively near foundations nor spray directly on building walls.
  - Splash blocks should be in place and downspouts should extend beyond the perimeter of the foundation.
  - Roof gutters should be cleaned, and stagnant water in containers and equipment should be emptied.
- Drainage of all wet areas must be adequate to prevent standing water which can breed mosquitoes and attract other pests.
- There should not be standing water in a crawlspace and soil in the crawl should be partially covered with a moisture barrier in areas with high soil moisture.
  - The crawlspace should also be adequately ventilated or designed to prevent moisture from penetrating the structure.
- Over-watered houseplants can breed various fungus gnats and even mosquitoes.

Physical Pest Management

3.1 TRAPPING

- The three primary types of traps are these:
  - Rodent traps
  - Insect traps
  - Live traps for other vertebrates
- Traps are especially suited for green service because:
  - They are a nontoxic substitute for pesticide application.
  - They hold the pest for easy disposal.
  - They work to both control and to detect pests.
  - They generate data (numbers) that can be used to identify pest trends and to set triggers for taking additional control action (action thresholds).
- The most common traps used to catch mice and rats are glue traps, snap traps, and multiple-catch mouse traps (repeating mouse traps).
  - There are other kinds of traps that are less commonly used.
    - » There are several types of small "live traps" that will capture single mice alive to be disposed of or relocated.
    - » There are also electronic shock traps that use batteries and an electrocuting plate to kill mice or rats that enter the trap.
- There are several advantages to using traps to kill rodents:
  - There is no toxicant for rodents to carry away or translocate to potentially contaminate other sites.
  - Traps hold the rodent carcass so it can be disposed of, thus avoiding odor, insect problems, and possible disease transmission that occur when rodents die in hidden locations.
  - Ideal for sensitive sites where the use of pesticides may not be acceptable, or where the amount of pesticide used must be kept to a minimum.
  - Traps show you immediately whether the control has been successful.
  - A trapped rodent is out of circulation immediately, no longer feeding or contaminating food (a poisoned rodent may stay active for days).
  - Eliminates the possibility of poisoning to people, pets, and wildlife.
- Rodent snap traps are available as traditional wooden base, spring-operated snap trap, plastic or metal snap traps, and clam shell snap traps that can be set with one hand.
  - Mouse snap traps will not kill rats; larger, more powerful traps are required for rats.
  - Concentrate snap traps in areas where you see or suspect rodent activity, rather than evenly spacing them around the perimeter of a room or building.
    - » Place more traps in areas of high activity and fewer traps in other areas.
    - » Place traps along the route between the rodent's nest and its food source.
  - Place traps where there are large numbers of droppings since that is where the rodents are spending most of their time.
    - » Place traps along baseboards or edges of walls or other objects where there are obvious signs of rodent activity.
    - » Other good trapping sites are behind objects, and in dark corners, particularly where runways narrow funneling rodents into a small space.
  - Traps can also be set overhead along pipes, beams, rafters, etc., especially where you see rub marks.
    - » Fasten the traps to pipes or beams with nails, wire, heavy rubber bands, bungee cords, velcro straps, or hose clamps.
    - » Do not place traps above food processing areas.
  - Traps can be used inside cardboard stations, bait stations, or inside PVC pipe if the traps need to be hidden.
- Use a large number of traps; always overestimate the infestation.
  - A large number of snap traps set for a short period of time will be much more effective than a small number that are set for a long time.
- Because rats are neophobic (fear new objects), special procedures are usually necessary when trapping them.
  - Snap traps should be placed baited but unset for a few days or a week until the rats get used to them. physical pest management
  - Do not set traps directly on rat runs or in front of rat holes, offset them six inches to prevent rats from being spooked by a new object on their normal travel route.

  - Traps that have captured rats previously are often more effective than new traps because they may give off rat odors and pheromones.
  - For rats, place snap traps perpendicular to the wall or object.
- Traps for roof rats should be placed in somewhat different locations.
  - Set traps along branches, beams, ledges, and sills.
  - Traps can be attached to chain link fence poles or tree branches using cup hooks and rubber bands or bungee cords.
    - » Outdoor traps should be set only from dusk to dawn to avoid trapping nontarget animals like birds and squirrels.
  - Indoors, set traps in dark corners inside suspended ceilings, in attics, or in overhangs and soffits.
- Because mice are curious, you can improve your trapping results by moving boxes, pallets, shelves, or other objects in their territories to create new runways that lead to your traps.
  - Mice will investigate the changed territory thoroughly.
  - While getting rats used to traps can take some time, a mouse trapping program can be very successful very early.
  - After a week of trapping success, unset your traps for a week.
  - When you restart the trapping, move the traps several feet to new locations to take advantage of the mouse's natural instinct to investigate new things.
  - For mice, place snap traps perpendicular to the wall or object with the trigger next to the wall.
- Snap traps can be baited with a food bait or nest material, or left unbaited.
  - There are now ready-made baits specifically designed for rodent traps.
  - he baits are nontoxic and some of them are guaranteed free of peanut butter or other materials commonly associated with food allergy.
- Multiple-catch or automatic repeating mouse traps are large, metal or plastic traps that are capable of catching up to 30 mice without having to be reset.
  - Multiple-catch traps are for mice not for rats.
  - Mice are usually captured alive but can also be caught on a glue board placed inside the trap for easy cleaning and to contain hairs and droppings.
  - Multiple-catch traps installed indoors do not have to be anchored.
  - d) Multiple-catch traps work because mice are curious and will investigate new things in their territories.
  - "Mousy-smelling" traps generally improve trap catch.
  - Mice will usually enter the trap with or without a food attractant.
- Place multi-catch mouse traps in runways in dark corners, and along walls, stored materials, and equipment.
  - Place them flush against walls with the opening parallel to the runway.
  - Alternatively, they may be placed with an opening facing the wall but about 1.5 inches away from it.
  - When servicing multi-catch traps, first make sure there are no live mice inside that could escape.
  - Put mice and trap debris into a sealed trash bag and dispose of the bag.
  - Note: Some food plants require you to clean and disinfect any trap that has captured a mouse.
- Glue traps for rodents consist of a cardboard or plastic tray base covered with a sticky material.
  - Some models are covered or can be folded into a tent shape; others are perforated so they can be torn down to fit specific areas.
  - Traps are "prescented" with a food smell.
- Glue traps are less effective in extreme temperatures or if they become dusty or covered with debris.
  - In dusty, greasy, or damp areas, place glue traps inside rodent bait stations.
- Glue traps are most often used for mice.
  - Larger glue traps with more sticky surface can be used for rats.
  - Rats generally do not die quietly or easily on a glue trap and may carry the trap away if it is not securely anchored.
- Glue traps should be placed in the same locations that you would place snap traps, with the following exceptions:
  - Place glue traps lengthwise, parallel to the wall or other object that lines a runway.
  - Do not place glue traps in corners because mice slow down to explore corners and their whiskers may touch the glue warning them away.
  - Do not place glue traps in direct sunlight.
  - Don't place glue traps in extremely cold conditions (below 20 degrees F.), or near open flames or on hot pipes.
  - Place glue traps in "drop zones" where rodents are jumping down onto a surface.
- To increase effectiveness, set two or three glue traps side by side, about an inch apart, so that a rodent leaping over one will be caught in the second or third (this also works for snap traps).

- Insect traps come in many styles, but are designed primarily for monitoring insects (and other arthropods) rather than controlling them:
  - Sticky traps for crawling insects.
  - Pheromone traps for certain flying and crawling insects.
  - Fly traps.
  - Jar traps, especially those for yellowjackets.
  - Insect light traps (ILTs) for flying insects that are attracted to light.
- Some insect traps can be used to control insects when enough traps are placed in an infested area.
  - ILTs can control low levels of flying insects that occasionally enter a building from outside.
  - Certain stored product pests will be suppressed when enough pheromone traps (designed for that pest) are placed in a tight grid throughout a room.
  - Fly traps can suppress populations when placed in large enough numbers but are best used as a supplemental control tool to capture occasional fly invaders.
  - Cockroach traps can knock down a small infestation limited to a restricted area such as a pantry.
  - Yellowjacket traps can reduce an outdoor yellowjacket problem if many traps are used.
- In commercial food accounts, hospitals, and schools, ILTs can be a "first line of defense" control tool.
  - ILTs kill flies and other flying pests that have entered the building from outside or that have emerged from infested materials.
  - Entryways are key locations for ILTs.
  - A good first line of defense is large ceiling-hung traps mounted 15-25 feet inside of the loading dock and food delivery doors.
  - The traps should be mounted perpendicular to the door.
  - Make sure that the light won't be seen from outside and won't attract insects into the facility.
- Most ILTs, however, should not be ceiling-hung, but placed low.
  - ILTs installed within five feet of the floor will capture many more flies than ceiling-hung traps.
  - Install ILTs at key points along the flyways (paths) to stored or processed food; that's where the flies will be heading.
  - ILTs should be spaced at about 50 foot intervals in suspected flyways.
  - A narrow hallway is one of the best sites for a trap.
  - In food prep areas, place the traps to draw the insects away from the food.
  - Make sure nothing is placed in front of an ILT, which will render it ineffective.
- Note: You can't tell by looking at a glowing UV bulb whether it's working at full strength. Bulbs in continuous use should be changed every twelve months, or more frequently if the manufacturer recommends it, to coincide with the effective life of the bulb, even if they appear to be burning strongly.
- ILTs must be installed and maintained properly to be effective.
  - Most flying insects, such as moths, won't respond to lights more than 100 feet away.
  - Flies rarely respond if the light is more than 25 feet away.
  - You can greatly increase the effectiveness of the traps by placing the right trap in the right location.
- Fly traps come in a wide range of styles, in addition to insect light traps.
  - Flypaper comes in sheets and rolls.
  - Window-mounted traps are small and relatively inconspicuous, and designed to take advantage of the tendency of many flies to fly to windows.
  - Large wall-mounted traps use chemicals to attract the flies and glue to hold them.
  - Traps are also designed specifically for drosophila flies (fruit flies).
- Fly trapping should be viewed as a supplement to finding and eliminating the source of the flies or to preventing them from entering the building.
- Fly traps should be placed in the following general locations:
  - In areas of known fly activity.
  - In areas that need special protection to capture the occasional fly that enters the room.
  - Do not place over food preparation surfaces because fly parts may fall down and contaminate the surface.
  - Do not use flypaper or open traps where you can see trapped flies in areas where there visibility might be offensive.
- Yellowjacket traps capture yellowjackets, hornets, and other stinging insects as well as various flies.
  - They have been used successfully to reduce yellowjacket activity in the fall when yellowjackets are foraging around human food, drinks, and garbage.
  - Always use an adequate number of traps, typically far more than you would think.
    - For a serious fall yellowjacket problem around a large school and its grounds, or a recreation/picnic area you might need to trap ten or twenty thousand yellowjackets to significantly reduce the activity.
    - To trap that many yellowjackets successfully, you would need between fifty and one hundred traps used over a period of a week.
  - Sunny locations are the best trap sites.

- Pheromone traps were discussed under monitoring, but when used to try and suppress a pest population in a commercial food account, follow these general guidelines:
  - Place traps in a grid pattern, 20 to 60 feet apart, then concentrate the traps wherever you have trapped the target insect.
  - Place traps in areas where there have been pest problems and in hard-to-clean areas where there could be product spillage.
  - Place traps to avoid air currents and moisture.
  - Consider the insects' habits.
    - » Traps will catch more moths near the ceiling and more beetles near the ground.
    - » Use hanging traps only for flying insects.
    - » Cockroach pheromone traps should be placed as you would cockroach sticky traps.
  - Don't place traps near doors, windows, vents, or loading docks where they could attract insects from outside.
- Live traps are often used to trap wildlife inside buildings or on the grounds.
  - Use a properly sized and designed trap for the specific animal.
  - Stake down or otherwise secure the trap.
  - Allow the animal to get used to the trap by baiting it and locking it open for a few days.
  - Leave a short bait trail to the trap.
  - If possible, set the trap at the mouth of the target animal's burrow, otherwise set it along a regular travel path.
  - If the animal is entering the building, place a trap at the entrance point, for example, next to a crawlspace vent.
- Treat trapped animals gently and humanely.
  - Keep a trapped animal calm by keeping it in the dark; cover the cage with a tarp, sheet, burlap, box, etc.
  - Know and follow local regulations regarding release or euthanasia.
  - Animals that are to be released should be transported 5-7 miles away.
- Never release sick or lethargic animals. They may have a serious disease such as rabies. Contact the health department, local animal control, or the humane society.

3.2 VACUUMS

- Vacuuming can be used effectively to control many pests and is ideally suited for green service.
  - Vacuuming is the quickest way to knock down populations of aggregating pests such as boxelder bugs, cluster flies, clover mites, even yellowjackets, and for pests that come inside in waves, such as millipedes.
  - Vacuuming with a crevice tool can eliminate large pockets of cockroaches and bed bugs in heavy infestations quickly and effectively.
  - As an added benefit, vacuuming also removes roach droppings, body parts, egg capsules, and other allergens, as well as food particles and debris.
- For many pest problems, a vacuum may be all that is needed.
  - For other pest problems, a vacuum may be the only control method that is acceptable.
    - » Examples include ants or cockroaches living inside an oven.
- Special vacuum attachments allow vacuuming under appliances and around sensitive equipment like computers.
- After vacuuming, the vacuum bag should be dropped into a sealable plastic bag and discarded.
  - Be aware that bed bugs and a few other pests can remain alive after being vacuumed.
    - » Bed bugs, in particular, can hang on to brush bristles and the inside of the vacuum hose.
  - Some technicians vacuum up talc or corn starch at the end of every service to kill any pests that might have remained alive inside the vacuum bag.
    - » This abrades and desiccates any pests that might have remained alive, but it may not work against all pests.
- acuums should be equipped with high efficiency filters (100-series of "HEPA" filters) to capture cockroach, mouse, or other allergens that otherwise will become airborne.

3.3 THERMAL CONTROL

- Some materials that are infested with pests can be disinfested with dry heat, steam, or cold.
- Dry heat kills insects, and even their eggs.
  - Holding a specimen at a temperature of 130°F for three hours will kill any insect.
  - Some insects are even more susceptible to heat.
    - » All stages of bed bugs will be killed at a temperature of 118°F when held for two hours.
    - » Simply placing bed bug infested clothing and items in a clothes dryer for 30 minutes will also kill the bugs
  - Small items can be heated in an oven to kill infesting pests.
  - Larger items may require a commercial kiln.
  - Items can also be placed inside storage pods, panel trucks or trailers, or under tarps and then heated with portable forced-air heaters to raise the temperature to the desired level.
- Heat treatment of equipment, an individual room, or an entire facility is done occasionally.
  - Against flour beetles and similar stored product pests in cereal mills and other facilities.
  - For bed bug control.
  - For drywood termite control.
- Various types of heaters are used, most commonly propane or electric.
  - Care must be taken not to damage materials, wood floors or heat sensitive equipment.
  - Sprinklers and other fire suppression systems have to be modified to prevent them from going off.
- Steam can be used to kill bed bugs.
  - Steam is most often used on mattresses, box springs, upholstered furniture, inside wooden furniture, and carpet edges.
  - Steam treatment will kill any bed bugs that the steam can reach.
  - There is a limited kill zone around the treatment head so it must be placed in direct contact with the treated material.
  - There is a risk of heat damage and moisture buildup in treated material.
- Most pests can be also killed by freezing infested materials in a large commercial freezer that can reach temperatures of 0°F or lower for at least 48 hours, although four to six days is preferable.
- Spot cold treatment can also be done with special equipment that sprays a "snow" of frozen carbon dioxide.
- Low, but above-freezing temperatures, usually 40-42°F, can be used to protect items in storage.

3.4 OTHER METHODS OF PHYSICAL PEST MANAGEMENT

- Items that are heavily infested with cockroaches, bed bugs, and other pests can be wrapped in plastic, taped, and disposed of in the trash.
  - Such action is most suitable to disposable items like a cabinet full of old paper bags, old cardboard, etc.
  - Disposal of other infested goods, such as furniture and fixtures, is at the customer's discretion but is usually unnecessary.
- Mattress and box spring encasements can be used to help control bed bugs and dust mites by trapping them inside.
- Moisture reduction can prevent and sometimes even suppress or eliminate certain insect and mite populations.
  - Examples include millipedes, springtails, and psocids, which require relatively high levels of moisture to survive.
  - In some cases simply reducing moisture levels through structural changes, ventilation, or using dehumidifiers will eventually desiccate and kill the pests.
  - Even when reduced moisture does not kill the pests directly, it may make it impossible for them to reproduce.

Pesticides

4.1 INTRODUCTION: THE GREEN APPROACH TO PESTICIDES

- The primary methods of pest management in green service are as follows:
  - Nonchemical strategies such as sanitation, harborage reduction, and physical, mechanical, cultural, and biological controls.
  - But no matter how aggressively you use these nonchemical strategies, pests may sometimes take the upper hand, and pesticides may be needed.
  - In addition, if an infestation is established when service begins, or if nonchemical strategies are unavailable, impractical, unsatisfactory, or not economically viable, pesticides may need to be used.
- Pesticides are often very effective at killing pests and when used properly the benefits are easy to see. By killing pests, pesticides also:
  - Protect health by controlling disease-causing pests and stinging insects.
  - Improve quality of life by eliminating cockroaches, bed bugs, etc.
  - Protect property by preventing termites
- But every pesticide is toxic to some degree and so pesticides present risks as well as benefits to people and the environment.
  - The risk can range from negligible to severe, depending on the toxicity of the pesticide and the degree of exposure.
  - People exposed to excessive levels of a pesticide may suffer short-term or long-term health effects.
  - Children are especially susceptible to certain pesticides.
  - Pesticides in the environment can damage nontarget plants and animals, contaminate water, cause fish kills, etc.
- The indiscriminate use of pesticides is unacceptable in green service.
  - Pesticides are only applied according to need and not by predetermined schedule.
  - Exceptions are for situations where such application is required. Examples include the following:
    - » Required by the customer or by customer policy.
    - » Required by regulatory agencies or agency auditors.
- When used as part of green service, pesticides shall be applied only in such a way as to minimize the risk to non-target organisms and the environment, including water quality.
- In some green programs, pesticides are not used until a pest reaches some predetermined level called an "action threshold."
  - An action threshold is the point at which a technician takes action to reduce a pest's numbers.
    - » Examples might include 3 cockroaches in a sticky trap or 5 flies in a hallway.
  - Below that action threshold, no direct control action is taken (although action may be taken to correct sanitation, clutter, and other problems that can lead to pests).
  - Only if a pest reaches its predetermined action threshold does a technician take action to control that pest.
- When a pesticide is necessary, it shall be applied:
  - With a precise application technique.
  - In the smallest area to be effective.
  - Using the minimum quantity of pesticide necessary to achieve control.
- A residual pesticide may only be applied in one of the following ways:
  - As a directed treatment to a void or other inaccessible area, crack and crevice, or to other areas humans would not normally contact.
  - As a spot treatment both outdoors and indoors.
  - Contained in a bait station.
- A pesticide must be applied according to the label and in compliance with U.S. Environmental Protection Agency and state laws and regulations.
  - The company and applicator must have the proper licenses and state registration or certification (if applicable).
  - Pesticide reporting requirements must be followed.
- An applicator, prior to and while applying a pesticide outdoors, shall first evaluate current conditions including:
  - Equipment to be used.
  - Meteorological conditions (including predicted rainfall).
  - The property to be treated (including irrigation and sprinkler systems).
  - The surrounding properties to determine the likelihood of harm or damage to non-target species.
- No pesticide application shall be made or continued when:
  - There is a reasonable likelihood that the application will expose persons or clothing of persons not involved in the application process.

  - There is a reasonable possibility of damage to, or contamination of, non-target plants, animals, or other public or private property, including water running off or running near a treated area during or any time after the treatment.
- Fogging with pesticides in the interior of structures where humans live or work shall not be used unless all other methods of control have been exhausted.
  - Note that the point-source application of insect growth regulators is not categorized as fogging.
- Perimeter pesticide treatments around the outside of structures shall not be used unless all other methods of control have been exhausted.
- If the use of rodenticides are necessary, they shall be placed in tamper-resistant bait stations that are anchored to the substrate.
  - There are exceptions to this rule for using tamper-resistant bait stations:
    - When used for baiting in secure or locked areas.
    - When placed in inaccessible voids.
    - When baiting in sewer lines.

4.2 SELECTING AND USING PESTICIDES IN GREEN SERVICE

- There is no list that tells you which pesticides may or may not be used in green service; you make the decision based on conditions at the site. This means choosing the pesticide product:
  - Whose end-use material (the spray or dust or aerosol that is actually applied including any residues that are left behind) poses the lowest risk to people.
  - Which will have the least impact on the environment (such things as water quality, air quality, nontarget animals and plants, and endangered species).
- When choosing between similar effective pesticide products, PMPs performing GreenPro service choose the best product after conducting a "risk assessment" and evaluating four risk variables:
  - Toxicity
  - Potential environmental impact
  - Potential for exposure
  - Sensitivity of the site
- *Toxicity* is the degree to which a chemical is poisonous.
  - It is a physical characteristic of a material just like its boiling point.
  - The more toxic a chemical is, the less of it is required to do damage.
  - The toxicity of a chemical is not the same thing as its hazard.
  - The toxicity of a product can be approximated by the signal word (CAUTION, WARNING, DANGER, DANGER-POISON) on the label.
- There are both acute and chronic effects.
  - Acute effects are the adverse effects of a substance which result either from a single exposure or from multiple exposures in a short space of time (usually less than 24 hours).
    - To be described as acute, the adverse effects should occur within 14 days of the administration of the substance.
    - Examples of acute effects include skin or eye irritation, cholinesterase inhibition or any other quickly apparent physiological impact such as difficult breathing, nausea or headaches.
  - Chronic effects, on the other hand, are harmful effects over an extended period usually after repeated or continuous exposure.
    - Examples of chronic effects (not necessarily attributed to pesticides) include cancer, reproductive damage, birth defects, or endocrine disruption.
- There are also allergic effects. Some pesticides are more likely than other to cause allergic reactions in some people, although not in others.
  - Allergic reactions are not thought to occur during a person's first exposure, but may occur after subsequent exposures.
  - Allergic reactions can range from itchy, watery eyes to rashes, all the way to systemic effects such as asthma.
  - Allergy is of special concern in sensitive sites such as those with ill or elderly residents, or with very young children.
- PMPs performing GreenPro service always check the precautionary statements on the pesticide label for statements about allergy and sensitization and evaluate the potential for allergic reactions when choosing products and application methods for a particular site.
- The toxicity of the end-use product (for example, the spray applied to a surface after being diluted) is often much less than the packaged pesticide product.
  - Two pesticide products with the same signal word may pose different risks to people in the treated area if, say, one is designed to be used full strength and the other to be mixed with water and diluted to a 1% solution.
- People can be exposed to pesticides in several ways.
  - Applicators face the greatest risk of exposure, especially during mixing and application.
  - People can also be exposed by entering treated areas too soon after application, before sprays have dried, dusts have settled out, or airborne residues have disappeared.
  - People may be exposed to small but continuous doses if they work, live, or play in rooms with pesticide residues on rugs, furniture, food preparation surfaces, etc., or by inhaling volatile residues in the air.

  - Small children may be exposed by touching, licking, or eating pesticide residues.
  - Spills caused by accident or carelessness can cause pesticide exposures.
- Pesticides can damage the environment if misused.
  - Runoff of pesticide can contaminate ground water (for drinking or irrigation) or surface water (streams, ponds, estuaries, etc.), where it can also impact nontarget aquatic organisms.
  - Drift can carry airborne residues into nontarget areas such as a neighbor's property, fish pond, vegetable garden, pet water bowl, play areas, or into a ventilation system.
  - Misapplication can damage plants and kill nontarget organisms.
- *Environmental impact* is of major concern for pesticide applications outdoors and for termite treatment.
  - PMPs performing GreenPro service should favor products and application methods with lesser risks to ground water, surface water, bees, and other nontarget animals and plants, as well as reduced chances of drift or other movement into nontarget areas.
  - PMPs performing GreenPro service check for environmental impacts on the *Environmental Hazards* section of the pesticide label.
- The *potential for exposure* during or after treatment varies with both the product and the application method used at the site.
- Risks to human health or the environment are the result of both the toxicity of and exposure to a product (risk = exposure + toxicity). For example:
  - The potential hazard to occupants of a room of an insecticide applied into a hidden void is much less than the hazard of the same product when applied as a fan spray to an accessible surface.
  - The potential hazard to children and pets of a rodenticide secured inside a tamper-resistant bait station is much less than the same rodenticide applied to the ground.
  - A PMP can effectively reduce risk by reducing the potential exposure to a toxic substance.
- Reducing risk from pesticides used in green service is often more about how and where you apply the pesticide rather than its toxicity.
  - Choose application methods that reduce the risk of exposure to people, pets, and other nontargets.
  - Apply the pesticide to inaccessible and hidden or protected areas whenever possible.
  - PMPs performing GreenPro service favor formulations such as insecticide baits, and application methods such as void treatment and crack and crevice application, that reduce the risk of exposure.
  - The risk of exposure can also be reduced by applying products as needed rather than on a schedule.
- When applying liquid, bait, or dust insecticides, crack and crevice treatment reduces potential exposure.
  - Crack and crevice treatment means small amounts of insecticide spray, dust, or bait applied into cracks and crevices, or voids where insects hide.
  - Apply insecticide as deeply as possible into the crack or void.
  - Typical crack and crevice application sites would be inside hollow legs of equipment, behind countertop splash guards, in cracks or missing grout in ceramic tile, around conduits and the flange where pipes enter walls, floor or ceiling, inside motor housings, and around drip trays under refrigeration units.
  - A "crack and crevice only" labeling does not allow treatment of exposed surfaces.
  - Liquid application is best done with a crack and crevice extension tip. Use a pressure of 8-15 psi and avoid any splashback.
  - Treatment of electrical panels and boxes must be done with extreme care according to the label, and liquids should not be used.
  - Dusts are applied into cracks and crevices and wall and cabinet voids using a hand duster. Never dust into ceiling voids that are above food-handling areas.
- Spot treatment limits potential exposure, though not as much as crack and crevice treatment, but are still acceptable in green service.
- *Spot treatment* is a limited application to areas where insects may occur.
  - Spot treatments are usually done with a flat fan nozzle.
  - Treated sites may be on floors, walls, or bases of equipment but should not be areas that may come in contact with food or utensils.
  - Individual spot treatments cannot exceed two (2) square feet and spot treatments should not constitute more than 20% of the surface.
- In some cases, a *perimeter barrier treatment* outdoors to prevent pest entry can reduce potential exposure for people inside by eliminating the need for interior treatment.
  - A perimeter barrier treatment is the application of pesticides to thresholds and other entrances, the foundation, and the soil adjacent to the foundation.
  - A barrier treatment may be made with residual sprays, dusts, or granules.
  - Barrier treatments are primarily targeted to outdoor pests that may become invaders or nuisances when their populations build up.
- For insects and other arthropod pests indoors, baits are often the best choice if an insecticide is considered necessary.
  - Baits are specific to certain pests and are very effective against those pests.

  - Compared to many other insecticide formulations, baits have relatively low toxicity and hazard to people.
  - Baits do not easily vaporize to produce airborne residues.
  - Many baits are designed to be placed in voids, cracks and crevices, further reducing hazard.
  - Bait stations provide their own voids, cracks and crevices.
  - Baits are typically not considered a risk by people who are otherwise nervous about pesticides.
  - Bait treatments do not leave behind any noticeable odor.
- Insecticide baits are available for cockroaches, ants, termites, crickets, and other pests.
  - Baits come in many formulations: bait stations, injectable gels, pastes, granules, and liquids.
  - Insecticide bait may be packaged inside tubes or syringes that you squeeze to apply, or designed to be applied by various types of bait "guns" or with a small spatula or putty knife.
  - The main benefits of injectable baits over other baits are that the placements are hidden, and that the baits are more easily placed inside cracks, crevices, and voids.
- The *sensitivity of the site* to pesticide exposure also affects the choice of product.
  - Schools, medical facilities, homes with infants or with ill or elderly individuals, and other locations with people or animals that are more susceptible to pesticide exposure require special consideration and a greater margin of safety.
  - The same is true when servicing outdoor areas with special environmental concerns, such as a high water table, nearby marsh, or endangered species.
  - When a pesticide is necessary in such a sensitive site, PMPs performing a GreenPro service choose only products and application methods having the very lowest risk potential.

4.3 WHERE TO FIND HAZARD INFORMATION REGARDING PESTICIDES

- The U.S. Environmental Protection Agency and state pesticide registration processes are designed to ensure that when a product is used in accordance with its labeling, there is a "reasonable certainty of no harm to human health or the environment."
- Two documents supply information on handling and use of a particular pesticide product, on storage and disposal, and on hazards to people and the environment:
  - Pesticide labeling.
  - Safety data sheet (SDS).
- The pesticide label provides instructions telling how to correctly use the product.
  - Where it can be used.
  - What pests are controlled by the product.
  - Directions for mixing and application.
  - It briefly highlights how toxic the pesticide is to people, and discusses ways to reduce risks (precautions).
  - The label is the law regarding the use of the product and should be read each and every time a pesticide is used.
- The safety data sheet, called an SDS for short, is a guide to the hazards of a pesticide.
  - An SDS has some of the same information that you can find on a pesticide label.
  - But it provides more technical details on (1) identification and ingredients, (2) potential hazards, and (3) safety recommendations.
- For some products there are consumer information sheets that provide technical information related to the end use product which is more suitable for your customer.
- Pesticides are grouped into categories based on how toxic they are to people, animals, and the environment.
  - Special identifying words — called "signal words" — are printed in large letters on every pesticide
  - label to show how toxic the product is.
  - The signal words are DANGER, WARNING, and CAUTION.
  - The signal words refer to the toxicity of the concentrated material inside the original container; if the material is diluted the toxicity will be reduced significantly.
- Pesticide products labeled DANGER are highly toxic.
  - If the concentrate was swallowed, as little as a taste to a teaspoonful could kill the average person.
  - All highly toxic pesticides that are very likely to cause acute illness through oral, dermal, or inhalation exposure, also will carry the word POISON printed in red and the skull and crossbones symbol.
  - Products that have the signal word DANGER due to skin and eye irritation potential will not carry the word POISON or the skull and crossbones symbol.
- Pesticide products labeled WARNING are moderately toxic.
  - They may cause acute illness from oral, dermal, or inhalation exposure, or they are likely to cause moderate skin or eye irritation.
  - The fatal oral dose for the concentrate is estimated to be between one and three teaspoonfuls.

- Pesticide products labeled CAUTION are slightly toxic or relatively nontoxic and have only slight potential to cause illness or skin or eye irritation.
  - The vast majority of pesticides used by pest management professionals in our industry carry caution labels and so are classified as slightly toxic or relatively nontoxic.

4.4 PESTICIDE SAFETY IN GREEN SERVICE

- It is a violation of law to use a pesticide in a manner inconsistent with its labeling.
  - Always read label instructions before every application.
  - Always follow the label instructions for every application.
- You must exactly follow all mandatory statements and instructions on a label.
  - A mandatory statement will contain such key words as "must," "shall," and "will," or it will use an expression such as "do not," "use only," or "for use only by."
  - Statements containing words like "should," "may," and "it is recommended that" are suggestions only and you may depart from them.
- Use pesticides only if the site of your application is specified on the pesticide label.
- If the use of a rodenticide bait is necessary, place the bait in a tamper-resistant bait station that is anchored to the substrate.
  - There are exceptions to this rule for using tamper-resistant bait stations:
    - When used for baiting in secure or locked areas.
    - When placed in inaccessible voids.
    - When baiting in sewer lines.
- Choose formulations of rodent bait that are least susceptible to bait translocation, which is when rodents (or other animals) carry bait out of the treatment site into a new area.
  - Blocks are the best bait formulation to use inside a bait station because they are easily secured on rods to prevent the rats from moving the bait out of the station.
  - Loose pellets are usually the best choice when burrow baiting since they are not as easy to kick out of a burrow as other baits.
- When using pesticides, work carefully to prevent spills.
  - A spill is any accidental release of pesticide.
  - The spill may be minor, requiring little cleanup effort, or it may be major, involving large amounts of pesticide and serious contamination.
  - Even a spill that appears minor can endanger you, other people, and the environment, especially if mishandled.
  - Large leaks or spills require specially trained and equipped emergency crews.
- The early steps you take to control a pesticide spill can reduce or eliminate damage or injury, and the faster you act, the less chance the spill will cause harm.
  - Carry a spill control kit in your vehicle.
  - Be sure you know what to do before you have a spill.
- If you have a pesticide spill, be calm and reasoned but work quickly to protect people and the environment.
  - Try to enlist responsible help.
  - Remember to protect yourself and others who are working on the spill.
  - Use personal protective equipment (PPE).
  - Follow proper spill control and decontamination procedures as developed by your company.
- Ground water can become contaminated with pesticides and decontamination of this water can be difficult or impossible. Contamination can occur when:
  - Rain carries dissolved pesticide down through
  - the soil (a process called leaching).
  - Pesticide is back-siphoned from pesticide tanks.
  - Termiticides enter wells during termite treatment.
  - Pesticides, particularly concentrates, are not disposed of properly.
- Protect ground water from contamination by following the label and good application practices:
  - Assess the risk of ground-water contamination before treatment by checking soil type, looking for wells, cisterns, springs, streams, storm drains, and other potential routes to ground water, and knowing the depth of the ground water in an area.
  - Choose products least likely to leach (check the label or contact the manufacturer).
  - Avoid spills and clean up any spills immediately.
  - Use a backflow preventer and/or air gap when filling spray tanks.
  - Do not apply outdoor applications if rain is forecast, or if the ground is saturated or frozen.
- Pesticide applicators are legally responsible for "properly" disposing of their leftover pesticides including all of the following:
  - Rinsewater — solutions used to rinse application equipment and product containers.
  - Empty containers — containers that retain pesticide residues.
  - Unused pesticides — old pesticides, unusable, diluted pesticides, or unidentifiable materials.
  - Contaminated soil — soil or other substrate (carpets, furniture, spill control products) contaminated from spills.

- Check the label for specific disposal instructions for a particular product.
  - Instructions will usually be found in a section called "Disposal" or "Storage and Disposal."
  - Sometimes, however, the disposal instructions may be found under a different heading so be sure to read the entire label.
  - State rules may sometimes be more specific on methods of disposal so be familiar with them.
- When you clean a sprayer or other application equipment, you cannot just pour the rinse water down the drain.
  - The rinse water from this cleaning, called "rinsate," contains diluted pesticide.
  - If you can, handle this rinsate just as you do rinsate from triple-rinsed containers — use it in a sprayer as a diluent or an end-use dilution.
  - Otherwise, this diluted pesticide must be disposed of as a hazardous material.
- Drift is the movement of the pesticide away from the site or pest you are treating and into nontarget areas.
  - Pesticide drift is the responsibility of the applicator and, when it occurs, may be considered a misapplication under FIFRA.
- Learn how to anticipate and avoid problems with drift.
  - Drift is most common outdoors with power sprays.
  - Drift is most likely during outdoor application with wind 10 mph and higher.
  - Other factors, such as temperature, humidity, and droplet size also contribute to pesticide drift.
- When treating outdoors, technicians need to check for things that could be contaminated by pesticide drift. Examples include fish ponds, play areas, vegetable gardens, sandboxes, swing sets, intake vents, laundry on the line, lawn furniture, pet water bowls, pet runs, bee hives, vehicles, and streams.
- When spraying outdoors, take steps to reduce the risk of drift.
  - Do not spray when wind is blowing toward sensitive areas.
  - Do not spray when it is windy.
  - Use the lowest application pressure practicable.
  - Choose a nozzle that produces a coarse spray.
  - Use a commercial "drift reduction" (thickening) agent in your tank.
- Pesticide drift can, on rare occasions, occur even hours or days after an application.
  - A dried wettable powder residue might be tracked into a restaurant's kitchen on a worker's shoes.
  - The day after a perimeter treatment of a home, a storm can blow piles of treated leaves into a nearby fish pond.
- Pesticide drift can happen during indoor applications, as well.
  - Fans, air conditioners, and blowers create indoor wind that moves pesticide where it is not wanted.
  - Even void treatment can generate drift if applied under too high a pressure, drifting out of the void through holes, electrical outlets, or vents.
- Green service emphasizes communication with your customer, including communication about potential pesticide hazards.
  - Customers should have access to product labels and consumer information sheets for any pesticide used on their property.
  - Communications may also include notification and/or posting when pesticides are applied.
- Some facilities, especially schools, require advanced notification before pesticides are applied.
  - Notification of parents and staff is primarily the responsibility of the school.
    - The technician may be required to provide advanced, written notice to the school before using a pesticide, or before using certain pesticides, or before using pesticides in certain areas.
    - Insect baits, pastes, gels, antimicrobials, or other materials used in ways presenting minimal risk of human exposure are often exempt from notification and posting requirements, but this will be determined by specific school policy.
  - Some schools also send notices home to those parents who wish to be informed before pesticide application.
  - A school may have a registry of students and staff who are sensitive to pesticides. These people must be notified before pesticides are applied.
- Some customers may require that notices of future pesticide treatment be posted, in advance, at the building entrance, lobby, and area to be treated.
  - The process of putting up notices of treatment is called "posting."
- Signs are also posted on the day the pesticide is to be applied, and typically instruct people not to enter the treated area, and instruct staff not to remove the signs for a period of at least 24 hours or for the label-specified reentry period, whichever is longer.
  - Door hangers, warning notices, and instructional sheets can warn people that an area was treated, identify the pesticide applied, tell them when they may reenter the room, and provide other instruction and warnings.
  - The more specific the warnings, the better.
  - Use the pesticide label as your guide.
  - Outdoors, the notices or markers must be placed around the perimeter of the treatment area.
  - Indoors, notices are sometimes placed on main doors and near sites of planned applications.

Study Questions

1. CUSTOMER EDUCATION AND COMMUNICATION

1) How do pest management companies "go green"?
   a) Establish a green image through color changes (green vehicles and uniforms) and green advertising
   b) Eliminate the use of pesticides for controlling pests
   c) Adopt tools and methods that reduce potential environmental impacts
   d) Offer lawn care and ornamental pest management

2) Which statement below is TRUE when talking about the term "environment" in green pest management service?
   a) The environment is limited to the area around the outside of buildings
   b) The environment includes the human environment inside buildings
   c) The environment is the attitudes of customers about pesticides
   d) None of the above

3) Which statement is TRUE about green service?
   a) Monitoring for pests and conditions contributing to pests is of critical importance
   b) Far more time will be spent actually controlling pests than in inspection
   c) Technicians follow strict protocols and are not decision-makers
   d) All of the above

4) How are pesticides used in green service?
   a) Pesticides are never used in true green service
   b) Only baits, boric acid dust, or EPA-exempt products are used
   c) Pesticides are used when necessary
   d) Pesticides are only used outdoors

5) Which of the following is the cornerstone of GreenPro service?
   a) Integrated pest management
   b) Less toxic pesticide selection
   c) Nonchemical pest management
   d) Customer education

6) Why are customer education and communications critical for green service?
   a) Green service may be different from the pest control service the customer has had
   b) Green service requires a higher level of customer cooperation
   c) Some customers will have an incorrect view of green service
   d) All of the above

7) Who is usually responsible for correcting structural problems in green service?
   a) Technician
   b) Supervisor
   c) Customer
   d) None of the above

8) When providing green service, you are also required to educate your customer in which of the following topics?
   a) Customer responsibilities
   b) Label comprehension
   c) Crack and crevice application
   d) Recycling

9) What is the best description of green service communications?
   a) Talking with people on site
   b) Writing reports
   c) Verbal communications and written reports
   d) Service records

10) What is the best procedure for determining the success or failure of your service?
   a) Reviewing written records
   b) Surveying residents or staff at the account
   c) Asking your on-site contact
   d) Meeting with your supervisor

11) Why should you review written records before each service?
   a) To see of there are any pest trends you should address
   b) To check that recommendations have been followed
   c) To see what actions have been taken so that you can evaluate their effectiveness
   d) All of the above

2. PEST PREVENTION

12) Which one of the following tasks is NOT part ofmonitoring in green service?
   a) Replacing cockroach bait
   b) Identifying pests and their locations
   c) Identifying conducive conditions
   d) Assessing customer satisfaction with service

13) Why is proper identification of pests essential?
   a) Different pests have different habits and food requirements
   b) What works for one pest may not work against another similar pest
   c) One pest may be attracted to a trap while another similar pest is not
   d) All of the above

14) What should be your strategy when inspecting a room for pests?
   a) Spend more time in areas at higher risk of pests
   b) Thoroughly inspect all areas of the room to ensure you don't miss anything
   c) Look for live pests, do not waste your time on droppings, damage, etc.
   d) Concentrate on floor level harborage areas

15) Which of the following areas should be considered a high-risk pest site?
   a) Equipment voids and structural voids
   b) Bright, well lighted zones
   c) The center of a shelf or work surface
   d) All of the above

16) Why are utility lines, wall/floor intersects, rows of stored materials, and equipment edges good inspection sites?
   a) They tend to be warm and pests like warmth
   b) They tend to be dark and pests like dark over lighted areas
   c) They run in straight lines and pests tend to follow straight lines
   d) None of the above

17) Which is a likely site for rodent droppings?
   a) Inside drop ceilings
   b) On counters, stoves, food prep surfaces
   c) In the base of stoves and refrigerators
   d) All of the above

18) What is a conducive condition?
   a) A condition that might lead to pest problems
   b) Screens on windows
   c) Caulking/sealants around pipes and utility entry points
   d) All of the above

19) Which of the following tools can be used to monitor pests?
   a) Sticky trap
   b) Tracking patch
   c) Insect Light Trap (ILT)
   d) All of the above

20) Which of the following can be used to monitor pests in a food account?
   a) Peanut bait
   b) Tracking powder
   c) Nontoxic rodent bait
   d) None of the above

21) Which monitoring tool uses chemicals to attract pests?
   a) Pheromone trap
   b) Tracking patch
   c) Insect light trap
   d) All of the above

22) Which of the following statements is TRUE about sticky traps?
   a) They can help identify the focus of the infestation
   b) They work for all pests
   c) If sticky traps are empty the area is pest free
   d) All of the above

23) Which of the following statements is TRUE about monitoring tools in general?
   a) They work 24 hours per day, seven days a week
   b) They pinpoint precise areas of activity for nighttime pests
   c) They help assess the size of the infestation and its level of development
   d) All of the above

24) What does it tell you if you capture cockroaches on only one side of a sticky trap?
   a) That you are likely dealing with a large, longstanding population
   b) That you may be dealing with a new infestation that has moved in from a nearby infested site
   c) That there is a pocket of infestation within a few feet
   d) That the cockroaches are coming from that direction

25) What does it tell you if you capture adult cockroaches and various sized nymphs in a sticky trap?
   a) That you are likely dealing with a large, longstanding population
   b) That you may be dealing with a new infestation that has moved in from a nearby infested site
   c) That there is a pocket of infestation within a few feet
   d) That the cockroaches are coming from that direction

26) What does it tell you if you capture only adult cockroaches and large nymphs in a sticky trap?
   a) That you are likely dealing with a large, longstanding population
   b) That you may be dealing with a new infestation that has moved in from a nearby infested site
   c) That there is a pocket of infestation within a few feet
   d) That the cockroaches are coming from that direction

27) What does it tell you if you capture mostly small nymphs in a sticky trap?
   a) That you are likely dealing with a large, longstanding population
   b) That you may be dealing with a new infestation that has moved in from a nearby infested site
   c) That there is a pocket of infestation within a few feet
   d) That the cockroaches are coming from that direction

28) Which is the best location for placing a sticky trap for capturing cockroaches?
   a) Stuck in the middle of a cabinet door
   b) The back corner of a food shelf
   c) On a stove top
   d) At least 3 feet from cockroach spotting

29) What should you do if a sticky trap captures pests?
   a) Replace the trap
   b) Record the capture information
   c) Consider placing more traps in the area
   d) All of the above

30) What is the maximum effective life for a sticky trap?
   a) 1 week
   b) 1 month
   c) 3 months
   d) 1 year

31) Which statement is TRUE about pheromones?
   a) Sex pheromone traps usually only attract male insects
   b) Sex pheromone traps usually only attract female insects
   c) Aggregation pheromone traps usually attract only males
   d) Aggregation pheromone traps usually attract only females

32) For which pests are pheromone traps available?
   a) Certain species of ants
   b) Certain fabric pests such as clothes moths
   c) Roof rats
   d) All of the above

33) Never let a pheromone trap go unchecked for longer than what time frame?
   a) 1 week
   b) 1 month
   c) 3 months
   d) 1 year

34) Which statement is TRUE regarding pheromone traps?
   a) Traps will catch more moths near the ceiling and more beetles near the ground
   b) Traps will catch more beetles near the ceiling and more moths near the ground
   c) Place traps near doors, windows, vents, or loading docks
   d) None of the above

35) How can rodent monitoring blocks improve your use of rodenticides?
   a) They let you confirm rodent activity before toxic bait application
   b) They can overcome a rat's hesitancy to enter a bait station
   c) They protect nontarget wildlife in a baiting area
   d) All of the above

36) Which statement is TRUE about tracking patches?
   a) They can be used to identify the species and the direction of movement
   b) A flashlight shined across the patch at a high angle gives the best view of the tracks.
   c) A tracking patch should be used where there is a risk of contamination of food
   d) All of the above

37) What are the three goals of pest-proofing in green service?
   a) Monitoring, control, exclusion
   b) Caulking, sealing, control
   c) Control, monitoring, physical alteration
   d) Exclusion, isolation, harborage elimination

38) Which type of building typically requires the most pest-proofing?
   a) New buildings
   b) Old buildings
   c) Frame buildings
   d) Brick buildings

39) Which of these is an example of pest-proofing?
   a) Applying a sealant around pipes
   b) Applying gel bait to exterior crack
   c) Steaming
   d) All of the above

40) Which of the following is a potential additional benefit to doing physical alterations for pest-proofing?
   a) Solution is permanent
   b) It can improve heat or cool air retention
   c) It can compliment building maintenance programs
   d) All of the above

41) Which statement is TRUE about pest exclusion?
   a) It is equally effective for pests of all sizes
   b) It is most effective against smaller pests
   c) It is most effective against larger pests
   d) It is only effective against rats

42) What is the minimum size opening that a mouse can squeeze through?
   a) 1/8 inch
   b) 1/4 inch
   c) 1/2 inch
   d) 1 inch

43) Which statement is TRUE about expandable foam sealants?
   a) Rodents can easily chew through them
   b) They should never be used for pest proofing
   c) They should be your primary exclusion tool
   d) They are too expensive for pest exclusion

44) What are the benefits of door sealers such as sweeps, brush seals, and the like?
   a) They keep out insects, rodents, and other pests
   b) They reduce heating and air conditioning costs
   c) They reduce sound and light infiltration into a building
   d) All of the above

45) How can you best pest-proof a loading dock door to prevent flying insects from entering?
   a) Install an air curtain
   b) Require doors to be closed at all times
   c) Install a line of pheromone traps to intercept pests
   d) All of the above

46) Which is the best method to keep birds from roosting on window ledges?
   a) Install an air curtain on top of window
   b) Apply an avicide to the ledges
   c) Install porcupine wire or pin and wire to ledge
   d) Repair screens

47) What is the best way to keep rodents from entering a building through holes around electrical utility lines?
   a) Apply an appropriate sealant to seal the holes
   b) Apply expandable foam in the holes around the pipes
   c) Stuff the holes with copper mesh
   d) Apply a rodenticide tracking powder into the holes

48) Which of the following techniques can result in "pest isolation" within a building?
   a) Installing air doors at loading docks
   b) Sealing around utility line entry points to the building
   c) Repairing screens on windows
   d) Sealing around pipes that run between floors or rooms

49) Which of the following is generally NOT the responsibility of a green technician?
   a) Upgrading housekeeping services
   b) Reporting clutter in a storage area
   c) Providing recommendations to remove grease around cooking surfaces
   d) Documenting that a customer has corrected a sanitation problem

50) Which of the following statements is TRUE about sanitation in commercial kitchens?
   a) Dirty food preparation surfaces should be cleaned first thing in the morning
   b) Food preparation surfaces should never remain uncleaned overnight
   c) Floors must be washed down weekly
   d) All of the above

51) Why must mop buckets be emptied after each use and wet mops and rags cleaned and hung to dry?
   a) To prevent odor problems
   b) To eliminate fruit fly breeding
   c) To prevent house flies
   d) To reduce the risk of mice

52) Why do catch trays in ILTs need to be emptied regularly?
   a) To avoid dermestids
   b) So the trays do not overflow
   c) To track insect problems
   d) All of the above

53) How wide does an inspection aisle (sanitation aisle) need to be in a food storage or processing area?
   a) 6 inches
   b) 6-12 inches
   c) 12-18 inches
   d) 18-24 inches

54) Which statement is TRUE regarding food storage areas?
   a) Managers need to practice FILO (First In Last Out) when storing food
   b) Advise customers to store all cardboard packaging together rather than spread throughout the area
   c) Stored packaged foods should be stacked on industrial grade, steel wire shelves
   d) All of the above

55) Which statement is TRUE regarding garbage cans and plastic liners?
   a) Well designed garbage receptacles shouldn't require a plastic liner
   b) Liners should not be removed until garbage pickup is scheduled
   c) Technicians should take out liners and inspect underneath them
   d) All of the above

56) Which statement is TRUE about dumpsters?
   a) Flies inside a building are often traced to flies attracted to and breeding around dumpsters outside
   b) Dumpsters should be located 50 feet or more from outside doors; 75 feet if at a food facility
   c) Dumpsters should be situated on a thick concrete pad that has foundation toes on the outside
   d) All of the above

57) Which statement about dumpsters is FALSE?
   a) Drain holes should never be left open (except during cleaning)
   b) Dumpsters should be checked by staff twice weekly, and any trash picked up that didn't end up inside the dumpster
   c) Customers should limit the use of shrubbery around dumpster enclosures
   d) Staff should police the area immediately after the dumpster has been emptied

58) Which type of plant is LEAST attractive to rats and mice?
   a) Mound-shaped shrubs
   b) Wineglass-shaped shrubs
   c) Ground covers such as juniper or ivy
   d) Espaliered bushes grown against a wall

59) Why do thorny bushes present a special problem regarding rodents?
   a) Thorny bushes provide a protected hiding place
   b) Thorny bushes are difficult to inspect
   c) Thorny bushes capture food debris and other trash
   d) All of the above

60) What is the main pest management issue when trees are planted close to a building?
   a) Branches that touch the building
   b) Shade on the building
   c) Leaves that fall to the ground
   d) Root intrusion

61) What is the primary reason to avoid blooming plants near entryways and public areas?
   a) To minimize bee and wasp stings
   b) To make the area less attractive to rats and mice
   c) To limit food competition with baits
   d) To keep pest birds out of the area

62) Which statement is TRUE related to pest management and weeds?
   a) Make sure that there are no weedy areas that are being ignored by your customer
   b) Weeds along fence lines or around abandoned equipment or debris are particularly attractive to rodents
   c) String trimmers should be used to mechanically manage weeds on a regular basis
   d) All of the above

63) Which statement about mulch and pest management is TRUE?
   a) To minimize weeds, organic mulch should be applied 4-inches deep in a 3-foot wide band around the foundation
   b) Termites can travel through the protective mulch above ground and enter the building through foundation cracks, conduits, or weep holes in brick
   c) Organic mulches decompose into components that repel millipedes, sowbugs or pillbugs, cockroaches, slugs, earwigs, and crickets
   d) Organic mulch will reduce moisture around the foundation

64) What recommendation should you make to a food plant to reduce pest problems at the foundation perimeter?
   a) Create a bare strip 6-12 inches wide along the foundation
   b) Create a 2-3 foot wide inspection strip around the perimeter of the structure
   c) Apply a band of mulch 4-inches deep in a 3-foot wide around the perimeter
   d) Plant a ground cover along the foundation wall

65) Which statement is TRUE about exterior lights?
   a) Even a small light can be seen for miles.
   b) Bright security lights often become beacons that attract insects in large numbers.
   c) Insects attracted to lights at the building perimeter often find their way inside.
   d) All of the above

66) Which statement is TRUE about insects and lights?
   a) All things being equal, a 200 watt bulb will attract about the same number of insects as a 100 watt light
   b) Female insects may be attracted but not males
   c) An insect may only be attracted at a certain time of the night or of the year
   d) All of the above

67) Which lighting alternative will be less attractive to pests?
   a) Mercury vapor lights rather than sodium vapor lights
   b) Sodium vapor lights rather than mercury vapor lights
   c) High heat lights rather than cool lights
   d) High wattage versus low wattage

68) Which lighting scheme will attract the most insects to a building?
   a) Flood lights shining on white wall
   b) Flood lights shining onto trees
   c) Lights that turn on two hours after sunset
   d) Decoy lights around the property perimeter

69) Which statement is TRUE regarding moisture and pests?
   a) For green service, you need to explain to your customer the connection between moisture and pests
   b) Most pests need free water to survive and such water acts as a pest attractant
   c) Leaks and condensation can provide conducive conditions for moisture-loving pests
   d) All of the above

70) What is the best way to identify moisture problems that are not obvious during visual inspection?
   a) Checking high risk areas with a moisture meter
   b) Checking high risk areas with thermal imaging equipment
   c) Reviewing maintenance records
   d) Interviewing maintenance workers

71) Which statement is TRUE regarding moisture control?
   a) Chronically wet soil in crawlspaces should never be covered with a moisture barrier
   b) Splash blocks should be in place and downspouts should extend beyond the perimeter
   c) Stagnant water in containers and equipment should be checked weekly for mosquitoes
   d) All of the above

3. PHYSICAL PEST MANAGEMENT

72) Why are traps especially suited for green service?
   a) They are a nontoxic substitute for pesticide application
   b) They work to both control and to detect pests
   c) They generate data (numbers) that can be used to identify pest trends
   d) All of the above

73) What are the most common traps used for rodent control?
   a) Glue traps, snap traps, multiple-catch mouse traps
   b) Glue traps, snap traps, live traps
   c) Bait stations, glue traps, snap traps
   d) ILTs, multiple catch traps, snap traps

74) Which statement is TRUE about snap traps?
   a) Install them every 5-10 feet in an infested room
   b) Place more traps in areas of high activity and fewer traps in other areas
   c) Do not use snap traps on pipes or beams
   d) All of the above

75) How many traps should you use in a room with lots of recent mouse droppings in 5 different areas?
   a) 1-5 traps
   b) At least 5 traps
   c) 20 traps or more
   d) Use baits not traps

76) Rats are “neophobic.” What does this mean?
   a) Rats avoid light
   b) Rats fear new objects
   c) Rats investigate new objects
   d) Rats aggregate together

77) Which statement is TRUE when trapping rats?
   a) Snap traps should be placed baited but unset for a few days or a week until the rats get used to them
   b) Set traps directly on rat runs or in front of rat holes
   c) Place snap traps parallel to and against the wall
   d) All of the above

78) Which of the methods below is the best way to avoid trapping squirrels and birds when using snap traps outside to control roof rats?
   a) Set traps only from dusk to dawn
   b) Spray traps with animal repellent
   c) Place traps on the underside of tree branches or ledges
   d) Use only meat or fish for bait

79) Which statement is TRUE about trapping mice?
   a) You can improve your trapping results by moving boxes, pallets, shelves, or other objects in their territories
   b) A mouse trapping program can be very successful quickly
   c) Place snap traps perpendicular to the wall or object with the trigger next to the wall
   d) All of the above

80) Which statement is TRUE about multiple-catch traps?
   a) Work equally well for mice and rats
   b) Work because mice are curious
   c) "Mousy-smelling" traps depress trap catch
   d) Require a food bait to capture mice effectively

81) How should multiple-catch traps be placed?
   a) Flush against walls and stored materials with the opening parallel to the runway
   b) Flush against walls and stored materials with the opening perpendicular to the runway
   c) In well-lit corners and edges
   d) All of the above

82) When servicing multiple-catch traps, what is your first task?
   a) Check that trap is secured to floor
   b) Make sure there are no live mice inside that could escape
   c) Put mice and trap debris into a sealed trash bag and dispose of the bag
   d) Clean and disinfect the trap

83) To improve the effectiveness of glue traps in dusty sites you should:
   a) Replace them weekly
   b) Place them only under shelves and tables
   c) Place the traps inside rodent bait stations
   d) Do not use sticky traps in dusty areas

84) How should rodent glue traps be placed?
   a) Lengthwise, parallel to the wall or other object that lines a runway
   b) In corners whenever possible
   c) At least 3-feet apart when placed along runways
   d) All of the above

85) Which control tool is considered the best "first line of defense" to kill flies and other flying pests when they first enter commercial food accounts, hospitals, and schools?
   a) Fly paper
   b) Sticky traps
   c) Pheromone traps
   d) ILTs (Insect Light Traps)

86) Which statement in TRUE regarding ILTs?
   a) ILTs installed within five feet of the floor will capture many more flies than ceiling-hung traps
   b) ILTs installed within five feet of the floor will capture many more moths than ceiling-hung traps
   c) Make sure that the light can be seen from outside
   d) A narrow hallway is a poor site for an ILT

87) When should you replace the bulb in an ILT?
   a) When the light is noticeably dimmer than before
   b) Every 6 months
   c) Every 12 months
   d) Every 3 months

88) What is the maximum distance over which an ILT will attract insects?
   a) 25 feet for moths,100 feet for flies
   b) 50 feet for both flies and moths
   c) 100 feet for moths, 25 feet for flies
   d) 100 feet for both flies and moths

89) Which statement is TRUE about fly traps?
   a) An advantage to fly traps is that they can be placed over food preparation surfaces
   b) Fly traps should be viewed as a supplement to eliminating the source of the flies
   c) All fly traps require chemical attractants to be effective
   d) All of the above

90) Which statement is TRUE about yellowjacket traps?
   a) They can reduce yellowjacket activity in the fall when yellowjackets are foraging around human food, drinks, and garbage.
   b) For a serious fall yellowjacket problem around a large school and its grounds you might need to trap ten or twenty thousand yellowjackets
   c) Sunny locations are the best trap sites.
   d) All of the above

91) When placing pheromone traps to suppress (not just monitor) an Indianmeal moth population in a food warehouse, how should you first place the traps?
   a) In a grid pattern, 20 to 60 feet apart
   b) In a grid pattern, 75 to 100 feet apart
   c) Every 20 feet around the perimeter
   d) Near doors, vents, and other sites with air flow

92) Which statement is TRUE about pheromone traps?
   a) Traps will catch more moths near the ceiling and more beetles near the ground.
   b) Use hanging traps only for flying insects.
   c) Cockroach pheromone traps should be placed as you would cockroach sticky traps
   d) All of the above

93) When live-trapping animals, you should:
   a) Keep a trapped animal in an uncovered trap or cage
   b) Follow local regulations regarding release or euthanasia
   c) Animals that are to be released should be transported at least 1 mile away
   d) All of the above

94) If a trapped animal appears sick, you should:
   a) Release them immediately
   b) Release them 5-7 miles away
   c) Euthanize them immediately
   d) Contact local animal control or the health department

95) Which statement is TRUE regarding vacuuming and green service?
   a) Vacuuming is the quickest way to quickly knock down populations of aggregating pests such as boxelder bugs, cluster flies, and clover mites
   b) Vacuuming with a crevice tool can remove pockets of cockroaches and bed bugs in heavy infestations
   c) Vacuuming may be the only acceptable control method in some situations such as ants or cockroaches living inside an oven
   d) All of the above

96) What risks may be associated with vacuuming pests?
   a) Vacuums can become infested
   b) Vacuums can spread pests
   c) Vacuums can spread allergens
   d) All of the above

97) Which temperature and duration of heat treatment insures kill of all insects and all stages?
   a) 130°F for 1 hour
   b) 130°F for 3 hours
   c) 113°F for 1 hour
   d) 113°F for 3 hours

98) Which heat treatment will kill all stages of bed bugs?
   a) 130°F for 1 hour
   b) 118°F for 1 hour
   c) Thirty minutes in a clothes dryer set on high
   d) All of the above

99) Which statement is TRUE about heat (thermal) treatments?
   a) There are no risks associated with typical heat treatments
   b) Whole room heat treatments can trigger fire suppression systems
   c) Heat treatment will usually not kill eggs
   d) All of the above

100) Most pests can be also killed by freezing infested material at what temperature and for how long?
   a) 32°F for 24 hours
   b) 32°F for 48 hours
   c) 0°F for 24 hours
   d) 0°F for 48 hours

101) How can a mattress encasement be considered a green control tool?
   a) It cannot
   b) It traps bed bugs or dust mites inside so that they eventually die
   c) The insecticide incorporated in the encasement kills pests
   d) It reduces moisture and moisture related pests

102) Which pests can sometimes be controlled simply through moisture reduction?
   a) American and German cockroaches
   b) House flies and flesh flies
   c) Springtails and psocids
   d) All of the above

4. PESTICIDES IN GREEN SERVICE

103) Which statement is TRUE about pesticides in GreenPro service?
   a) Pesticides are almost never used
   b) Only organic or "green" pesticides are used
   c) Only low toxicity pesticides are used
   d) Pesticides are applied according to need

104) Which statement is TRUE about pesticides?
   a) Protect health by controlling disease-causing pests and stinging insects
   b) People exposed to excessive levels of a pesticide may suffer short-term or long-term health effects
   c) Children are especially susceptible to certain pesticides
   d) All of the above

105) When used as part of green service, pesticides shall be applied only:
   a) In such a way as to minimize the risk to non-target organisms and the environment
   b) In cracks and crevices and voids, or outdoors
   c) As baits or as crack and crevice treatments
   d) All of the above

106) What is an "action threshold"?
- a) The point at which a customer agrees to correct a deficiency
- b) The point at which a technician takes action to control a pest
- c) The point above which no more pesticides may be applied
- d) The point at which a supervisor must become involved

107) When a pesticide is necessary, it shall be applied:
- a) With a precise application technique
- b) In the smallest area to be effective.
- c) Using the minimum quantity of pesticide necessary to achieve control
- d) All of the above

108) Which application of a pesticide is normally permitted in green service?
- a) A directed treatment to a general area
- b) A spot treatment to a wall
- c) A general treatment to a room
- d) All of the above

109) An applicator, prior to and while applying a pesticide outdoors, shall first evaluate:
- a) Meteorological conditions
- b) Irrigation and sprinkler systems
- c) Surrounding properties
- d) All of the above

110) Which statement is TRUE regarding green pesticide application?
- a) No fogging in inhabited structures unless all other control methods have been exhausted
- b) No point-source application of IGRs
- c) No perimeter treatments
- d) All of the above

111) Which statement is TRUE when using rodenticides?
- a) Bait stations are always required
- b) Baits can not be used in sewers
- c) Bait stations are unnecessary when baiting in secure or locked areas
- d) Baits can not be placed in inaccessible voids

112) When choosing a pesticide product for green service you should:
- a) Choose a product that is listed on the Quality Pro Green List
- b) Choose only FIFRA 25(b) "exempt" products
- c) Choose products whose end-use material poses the lowest risk
- d) All of the above

113) Which four variables should PMPs performing GreenPro service always consider when choosing between similar effective pesticide products?
- a) Acute effects, chronic effects, allergic effects, odor
- b) Toxicity, potential environmental impact, potential for exposure, sensitivity of site
- c) Odor, staining potential, safety, efficacy
- d) Oral LD50, Dermal LD50, Inhalation LD50, carcinogenicity

114) What is the definition of an acute toxic effect from exposure to a chemical?
- a) An adverse effect that occurs immediately
- b) An adverse effect that occurs within 12 hours of exposure
- c) An adverse effect that occurs within one day of exposure
- d) An adverse effect that occurs within 14 days of exposure

115) Which potential health impacts are considered to be chronic effects from exposure to a chemical?
- a) Cancer
- b) Birth defects
- c) Endocrine disruption
- d) All of the above

116) Which statement is TRUE about allergic effects?
- a) Allergic reactions usually occur during a person's first exposure to a substance
- b) Allergic reactions can range from itchy, watery eyes to rashes, all the way to systemic effects such as asthma or life-threatening anaphylactic shock.
- c) Allergy is of special concern to middle-aged men and women
- d) All of the above

117) Which statement is TRUE about pesticide toxicity?
- a) The toxicity of the end-use product is often much less than the packaged pesticide product
- b) Two pesticide products with the same signal word always pose equal risks to people in the treated area
- c) The toxicity of a chemical to a rodent (such as Rat Oral LD50) typically bears little relation to it's toxicity to humans
- d) All of the above

118) Which person below will generally face the greatest risk of exposure to pesticides?
- a) Applicator
- b) Resident
- c) Staff member
- d) All face equal risks of exposure

119) Which statement below is TRUE about pesticide exposure?
a) Risk of exposure is increased by entering treatment areas directly after treatment
b) Pesticide on rugs, furniture, and food prep surfaces increase the risk of exposure
c) Small children are most often exposed by touching, licking, or eating pesticide residues
d) All of the above

120) Which statement below represents a likely impact from pesticide runoff?
a) Contamination of ground water
b) Contamination of surface water
c) Nontarget exposure
d) All of the above

121) Which present the most likely risk of contamination of a neighbor's property after an outdoor application of a pesticide?
a) Runoff
b) Direct misapplication
c) Spill
d) Drift

122) The potential for exposure during or after treatment varies with what two factors?
a) Product and application method
b) Hazard and exposure
c) Toxicity and hazard
d) Product and toxicity

123) Risks to human health or the environment are primarily driven by which factors?
a) Toxicity
b) Exposure and toxicity
c) Application method
d) Product and toxicity

124) How can a PMP using Green Service reduce the risk from pesticide application?
a) Choose application methods that reduce the risk of exposure to people, pets, and other nontargets
b) Apply the pesticide to inaccessible and hidden or protected areas whenever possible.
c) Apply pesticide products as needed rather than on a schedule
d) All of the above

125) Which statement properly lists treatment methods in order of increasing potential exposure (least to most)?
a) Crack and crevice, spot, general
b) General, crack and crevice, spot
c) Crack and crevice, general, spot
d) Spot, general, crack and crevice

126) Individual spot treatments cannot exceed what size?
a) 1 square foot
b) 2 square feet
c) 4 feet by 4 feet
d) 3 feet by 3 feet

127) The total for spot treatment cannot constitute more than what percent of the surface?
a) No limit
b) 10%
c) 20%
d) 50%

128) Which statement is TRUE about a perimeter barrier treatment?
a) A perimeter barrier treatment is the application of pesticides to thresholds and other entrances, the foundation, and the soil adjacent to the foundation
b) A barrier treatment is limited to residual sprays
c) Barrier treatments can be targeted to any outdoor pest
d) All of the above

129) Which statement is TRUE about insect baits indoors?
a) Baits are specific to certain pests
b) Baits have relatively low toxicity and hazard to people.
c) Baits do not easily vaporize to produce airborne residues
d) All of the above

130) What is one of the benefits of an injectable bait?
a) Cost
b) Can be placed inside cracks and voids
c) High vapor pressure
d) Effective against a wide range of pests

131) Which statement is TRUE about "sensitive sites"?
a) They require special consideration and a greater margin of safety
b) Choose only products and application methods having the very lowest risk potential
c) Sites can be sensitive for either health or environmental reasons
d) All of the above

132) EPA's pesticide registration process ensures that:
a) The product will cause no harm to people or environment
b) When used according to the label, the product will not harm to people or environment
c) When used according to the label, there is a reasonable certainty of no harm to human health or the environment
d) When used according to the label, the product will kill the listed pests effectively

133) Where can you find detail on how to handle and use a pesticide product?
a) Pesticide label
b) SDS
c) Either label or SDS
d) Some details from label, other details from SDS

134) The SDS is a guide to the _____ of a pesticide.
a) Use
b) Application
c) Hazards
d) All of the above

135) What document provides a customer with technical information related to the end use product (for example, the applied residue from the insecticide spray applied)?
a) Consumer information sheet
b) SDS
c) Label
d) Manufacturer advertising

136) What are three common "signal words"?
a) Toxic, nontoxic, highly toxic
b) Organic, green, caution
c) Danger, warning, caution
d) Warning, caution, nontoxic

137) If a product is labeled DANGER but not POISON what is the hazard?
a) Skin or eye irritation
b) Inhalation hazard
c) Acute oral risk
d) All of the above

138) If a concentrate labeled DANGER/POISON was swallowed, how much would it take to kill the average person?
a) A taste to a teaspoon
b) 1-3 teaspoons
c) 2 tablespoons
d) 3-5 ounces

139) Which statement is TRUE regarding a product labeled CAUTION?
a) It may cause acute illness from oral, dermal, or inhalation exposure, or it is likely to cause moderate skin or eye irritation
b) The fatal oral dose for the concentrate is estimated to be between one and three teaspoonfuls
c) The fatal oral dose for the concentrate is estimated to be between a taste and a teaspoonful
d) It is slightly toxic or relatively nontoxic and has only slight potential to cause illness or skin or eye irritation

140) The vast majority of pesticides used in Green Service carry which signal word?
a) Caution
b) Nontoxic
c) Warning
d) Danger

141) What is the minimum frequency for reading/ studying the pesticide label?
a) Before every use
b) In the morning of the day you plan on using the product
c) When you are trained on the product
d) In weekly training meetings

142) What key words are associated with "mandatory statements" on a pesticide label?
a) Should, may, recommended
b) Shall, will, use only
c) Shall, should, try
d) All of the above

143) If a statement on a pesticide label says "the applicator should apply into infested equipment, it means:
a) You must apply the product into infested equipment
b) You can treat infested equipment or not at your discretion
c) You can only treat equipment if it is infested
d) You must use another product if the equipment is not infested

144) What is the definition of rodenticide translocation?
a) Rodenticide absorbed into the body of the rodent
b) Secondary poisoning
c) Rodents moving rodenticide to a new area
d) Rodenticide evaporation or sublimation

145) Which is the best rodenticide formulation for use in bait stations?
a) Blocks
b) Pellets
c) Meal
d) Liquid

146) Which is the best rodenticide formulation for burrow baiting?
a) Blocks
b) Pellets
c) Meal
d) Liquid

147) How may a pesticide contaminate ground water?
- a) Rain carries dissolved pesticide down through the soil
- b) Pesticide is back-siphoned from pesticide tanks
- c) Termiticides enter wells during termite treatment
- d) All of the above

148) Which material must be disposed of according to special pesticide regulations/instructions?
- a) Empty pesticide containers
- b) Rinsewater from cleaning pesticide equipment
- c) Unused pesticides
- d) All of the above

149) You have just cleaned out your sprayer with clean water. What do you do with the rinse water?
- a) There is no restriction on rinsewater, just dump it in a sewer or storm drain
- b) Pour it in an used field where it can evaporate
- c) Use it instead of fresh water in your sprayer when treating a similar site
- d) None of the above

150) What is the critical wind speed above which drift into nontarget areas is likely?
- a) 5 mph
- b) 10 mph
- c) 20 mph
- d) 25 mph

151) Which precaution will help reduce the risk of drift?
- a) Do not spray when it is windy
- b) Use the highest application pressure practicable
- c) Choose a nozzle that produces a fine spray
- d) All of the above

152) Which statement is TRUE about drift?
- a) Drift is most likely on windy days
- b) Drift can occur inside as well as outside
- c) Drift can occur days after application
- d) All of the above

153) Sending letters home to parents at a school about a future pesticide treatment is called what?
- a) Notification
- b) Posting
- c) Reporting
- d) Representation

154) What is the name of the process of putting up notices that pesticides are going to be applied or have been applied?
- a) Notification
- b) Posting
- c) Reporting
- d) Representation

Study Answers

1. CUSTOMER EDUCATION AND COMMUNICATION

1) Answer c) is correct. We are adopting tools and methods in green pest management service that reduce potential environmental impacts while still controlling pests. Answer a) is incorrect because simply using green colors without adopting tactics that reduce the impacts of pest management can be termed "greenwashing": misleading consumers regarding the environmental benefits of a product or service. Answer b) is incorrect because pesticides are permitted in green service as long as their negative impacts are minimized. Answer d) is incorrect because green service is not limited to lawn care or ornamental pest management, which can be anything but green if done without concern for the environment.

2) Answer b) is correct. The term "environment" when used in green pest management service means not only the outdoor environment around buildings, but the human environment inside buildings as well. Answer a) is incorrect because environment is not limited to outdoor areas. Answer c) is incorrect because it is far too restrictive.

3) Answer a) is correct. Monitoring for pests and conditions contributing to pests is of critical importance in green service. Answer b) is incorrect because it is reversed: far more time will be spent actually inspecting a facility rather than in killing pests. Answer c) is incorrect because technicians are decision-makers; they determine what to do and how to do it.

4) Answer c) is correct. Green service does NOT require that you never use a pesticide, but a pesticide is usually not your first choice when looking for a way to manage a pest.

5) Answer a) is correct. Integrated pest management (IPM) is the cornerstone of green service. Answer b) is incorrect, although toxicity is one of the characteristics to consider when choosing a pesticide. Answer c) is incorrect, although nonchemical pest management is an important component of IPM. Answer d) is incorrect, although customer education is an important component of IPM.

6) Answer d) is correct. Customer education and communications are critical jobs for a PMP who is providing green service because a) green service may be quite different from the pest control service that most customers have been used to, b) green service requires a higher level of customer cooperation through improving sanitation, pest proofing, making operational changes, etc., and c) some customers will have an incorrect view of the tools and tactics used in green pest management.

7) Answer c) is correct. Correcting structural problems that allow pest entry into the building or movement within the building (pest-proofing) is usually the customer's responsibility. Answer a) is incorrect, as a rule, although it is a technician's responsibility to identify such structural problems. Answer b) is incorrect, although the supervisor may be active in explaining to a customer why a particular structural problem requires correction.

8) Answer a) is correct. Answer b) is incorrect because it is you that must comprehend the label not the customer. Answer c) is incorrect because it is you that must be familiar with crack and crevice application, although there may occasionally be times when you need to explain your application methods more fully. Answer d) is incorrect because you are not providing recycling service.

9) Answer c) is correct. Green service communications include both verbal and written reports about conditions at the site. Answer a) is incorrect, although talking with people is one part of green service communications. Answer b) is incorrect, although writing reports is one part of green service communications. Answer d) is incorrect, although a service record is one part of green service communications.

10) Answer a) is correct. A critically important function of green recordkeeping is to gather information to be used on a regular basis to evaluate the success or failure of the green service. Answer b) is incorrect, although surveying residents or staff can help you determine whether or not your green service has been successful. Answer c) is incorrect, although speaking with your on-site contact can help you determine whether or not your green service has been successful. Answer d) is incorrect, although reviewing your green service with your supervisor can help you determine whether or not your green service has been successful.

11) Answer d) is correct. Before each service, you should a) review the records to see if there are any pest trends you should address, b) if there have been recommendations that have not been followed, and c) if the actions that you have taken have proved effective, etc.

2. PEST PREVENTION

12) Answer a) is correct. Replacing cockroach bait is part of your service, not of monitoring, and cockroach bait is not a monitoring tool (although in a certain sense you could use bait consumption as one way to determine if cockroaches were present). Monitoring includes many things, including b) identifying pests and their locations, c) identifying conducive conditions, and d) assessing customer satisfaction with service

13) Answer d) is correct. Proper identification of pests is essential because a) different pests have different habits and food requirements, and because b) what works to manage one pest may not work against another similar pest; for example, c) one pest may be attracted to a trap while another similar pest is not.

14) Answer a) is correct. Within a room not all sites are equally likely to be infested by pests so you should spend more time and effort in high risk sites. Answer b) is incorrect because you should emphasize highrisk areas in your inspection. Answer c) is incorrect because you should look for evidence of pests (frass, etc.) not just the pests themselves. Answer d) is incorrect because while some pests are found at floor level others are found in higher zones, some even inside drop ceilings.

15) Answer a) is correct. Equipment voids and structural voids are more likely to be infested than most areas. Answer b) is incorrect because pests are typically repelled by bright, well-lighted areas. Answer c) is incorrect because the center of a shelf or work area is typically too exposed for most pests.

16) Answer c) is correct. Many pests tend to follow straight lines so it is efficient to look for pests, droppings, and other signs along these lines. Answer a) is incorrect because, although most pests prefer warmth, the sites listed are no more likely to be warm than any other sites. Answer b) is incorrect because, although many pests prefer dark areas to light areas, the sites listed are no more likely to be dark than any other sites.

17) Answer d) is correct. Rodent droppings are commonly found a) inside drop ceilings, b) on counters, stoves, food prep surfaces, and c) In the base of stoves and refrigerators.

18) Answer a) is correct. A “conducive” condition is one that might lead to pest problems. Answer b) is incorrect because screens on windows are a tool/tactic to correct a conducive condition. Answer c) is incorrect because caulking/sealants around pipes and entry points are a tool/tactic to correct a conducive condition.

19) Answer d) is correct. There are many effective pest monitoring tools including a) sticky traps, b) tracking patches, and c) insect light traps (ILT).

20) Answer c) is correct. Nontoxic rodent blocks are excellent tools for monitoring for rodents and even for other pests. Answer a) is incorrect because peanut butter should not be used in food accounts because of the risk of peanut allergy from contamination of other foods with small amounts of peanut residue. Answer b) is incorrect because tracking powder contains a rodenticide (it is not the same as a tracking patch) and should not be used as a monitoring tool in a food account.

21) Answer a) is correct. A pheromone trap uses a chemical attractant (a pheromone) to draw certain species of pests into the trap. Answer b) is incorrect because a tracking patch is typically talc or other nontoxic dust that does not attract pests but is simply placed in a likely path of pests. Answer c) is incorrect because and insect light trap (ILT) uses ultraviolet light, not chemicals, to attract flying pests.

22) Answer a) is correct. By placing traps in various locations, a technician can locate focus areas (sites of high pest populations) or pest entry points. Answer b) is incorrect because sticky traps work poorly against certain pests (for example, bed bugs and wasps). Answer c) is incorrect because empty sticky traps are not a guarantee that the area is pest-free— the traps could be in the wrong place, or the infestation could be in an unusual place.

23) Answer d) is correct. Monitoring tools a) work 24 hours per day, seven days a week, b) they pinpoint precise areas of activity for nighttime pests, and c) they help assess the size of the infestation and its level of development

24) Answer d) is correct. A bunch of cockroaches on one side of the trap tells you they are likely coming from that direction. Answer a) is incorrect because a large, long-standing population is usually indicated by all stages of cockroaches being trapped. Answer b) is incorrect because a new infestation from a nearby site is usually indicated by a trap with only adults or large nymphs. Answer c) is incorrect because a pocket of infestation within a few feet is usually indicated by mostly small nymphs.

25) Answer a) is correct. A large, long-standing population is usually indicated by all stages of cockroaches being trapped. Answer b) is incorrect because a new infestation from a nearby site is usually indicated by a trap with only adults or large nymphs. Answer c) is incorrect because a pocket of infestation within a few feet is usually indicated by mostly small nymphs. Answer d) is incorrect because cockroaches coming from only one direction is usually indicated by a bunch of cockroaches on one side of the trap.

26) Answer b) is correct. A trap with only adults and large nymphs indicates new infestation from a nearby site. Answer a) is incorrect because a large, long-standing population is usually indicated by all stages of cockroaches being trapped. Answer c) is incorrect because a pocket of infestation within a few feet is usually indicated by mostly small nymphs. Answer d) is incorrect because a bunch of cockroaches on one side of the trap usually indicates that cockroaches are coming from that direction.

27) Answer c) is correct. A trap with mostly small nymphs typically indicates a pocket of infestation within a few feet. Answer a) is incorrect because a large, long-standing population is usually indicated by all stages of cockroaches being trapped. Answer b) is incorrect because a new infestation from a nearby site is usually indicated by a trap with only adults or large nymphs. Answer d) is incorrect because a bunch of cockroaches on one side of the trap usually indicates that cockroaches are coming from that direction.

28) Answer b) is correct. Cockroaches are often found on back corners of food shelves because it is dark, protected, and with food nearby. Answer a) is incorrect because the middle of a cabinet door is not a common cockroach site—there are no edges or corners. Answer c) is incorrect because a stove top is an open area with the potential for fire or glue melt when the burners are on. Answer d) is incorrect because you should place traps close to spotting whenever possible.

29) Answer d) is correct. You should a) replace traps that have already captured a pest, b) record the capture information, and c) consider placing additional traps to identify the focus of the infestation.

30) Answer c) is correct. Three months is probably a maximum effective life for a sticky trap. Answers a) and b) are incorrect because traps will typically last significantly longer than a month except in dusty or wet conditions. Answer d) is incorrect because the glue on the traps will rarely remain effective for as long as a year.

31) Answer a) is correct. Some pheromone traps contain sex attractant pheromones that draw only the male insect. Answer b) is incorrect because at this time there are no traps that use pheromones that attract only female insects. Answers c) and d) are incorrect because aggregation pheromones attract both sexes.

32) Answer b) is correct. There are pheromone traps to locate infestations of fabric pests such as clothes moths and carpet beetles. Answer a) is incorrect because there are no pheromone traps available for ants. Answer c) is incorrect because there are no pheromone traps available for roof rats.

33) Answer b) is correct. As a general rule, never let a pheromone trap go unchecked for longer than a month. Answer a) is incorrect because 1 week is impractical as a minimum sampling frequency in many cases. Answers c) and d) are incorrect because the time frame is far too long given the effectiveness of pheromone traps as a monitoring tool.

34) Answer a) is correct. Pheromone traps will catch more moths near the ceiling and more beetles near the ground. Answer b) is incorrect because the pests are reversed—it should be moths near the ceiling, beetles near the ground. Answer c) is incorrect because pheromone traps near the doors, windows, vents, or loading docks would tend to draw pest in from outdoors.

35) Answer d) is correct. Rodent monitoring blocks look like rodenticide bait blocks but are nontoxic and a) they let you confirm rodent activity before toxic bait application, b) they can overcome a rat's hesitancy to enter a bait station, and c) they protect nontarget wildlife in a baiting area because they permit you to identify the species feeding (through gnaw marks and droppings) before you place a toxic bait.

36) Answer a) is correct. Tracks in a tracking patch can identify the species and the direction of movement. Answer b) is incorrect because a flashlight shined across the patch at a low angle gives the best view of the tracks. Answer c) is incorrect because a tracking patch should not be used where there is a risk of contamination of food, even though the patch material is nontoxic.

37) Answer d) is correct. The three goals to pest-proofing are exclusion, or keeping pests from entering a building, isolation, or keeping pests from moving from room to room within a building, and harborage elimination, or eliminating pest hiding places and breeding areas. Answer a) is incorrect because monitoring and control are not part of pest-proofing. Answer b) is incorrect because caulking and sealing are tools used for pest-proofing and control is the ultimate goal. Answer c) is incorrect because control is the ultimate goal, monitoring is not pest-proofing, and physical alteration can be a toll for pest-proofing not a goal.

38) Answer b) is correct. Old buildings have many opportunities for pest-proofing, and its use in such buildings can often have remarkable success. Answer a) is incorrect because new building are usually far more tightly sealed. Answers c) and d) are incorrect because, in general, there is no difference in their need for pest proofing based on the construction type.

39) Answer a) is correct. Caulking, stuffing, or sealing openings around pipes and conduits where they enter the building is an effective pest proofing tactic. Answer b) is incorrect because applying gel bait does not prevent pest entry. Answer c) is incorrect because steaming does not prevent pest entry.

40) Answer d) is correct. Physical alterations a) provide a permanent solution, b) can improve heat or cool air retention, and c) can compliment building maintenance programs.

41) Answer c) is correct. Pest exclusion is most effective against rodents, bats, flying insects, and the larger crawling arthropods such as large cockroaches, millipedes, and crickets. Answers a) and b) are incorrect because pest exclusion is less effective against smaller pests which require smaller openings to move through. Answer d) is incorrect because pest proofing is effective against a wide range of pests.

42) Answer b) is correct. In general, openings larger than 1/4 inch will allow mice to squeeze through. Answer a) is incorrect because it is too small for a minimum. Answers c) and d) are incorrect because mice can squeeze through smaller openings.

43) Answer a) is correct. Foam sealants are usually not appropriate for rodents because they can easily chew through them. Answer b) is incorrect because, while ineffective against rodents, foam sealants can be effective against other pests. Answer c) is incorrect because foam sealants are only one of many exclusion tools. Answer d) is incorrect because foam sealants are inexpensive.

44) Answer d) is correct. Door sealers not only a) keep out pests, but they b) reduce heating and air conditioning costs, and c) result in less sound and light infiltration.

45) Answer a) is correct. Doors that must be kept open, such as loading dock doors, or that are constantly used, can be protected by air curtains (air doors). Answer b) is incorrect because loading dock doors can't always be closed (unless protected with a bellows system). Answer c) is incorrect because pheromone traps placed at loading docks will only attract insects from outside.

46) Answer c) is correct. You can install porcupine wire, pin and wire, or similar commercial products to keep birds from roosting on window ledges and other building surfaces. Answer a) is incorrect because air curtains are generally used to prevent insects from entering through doors. Answer b) is incorrect because an avicide is a control tool not a pestproofing tool and, besides, a pesticide, such as an avicide, should be a last resort in green service. Answer d) is incorrect because screens will keep birds from entering the building but not stop them from roosting on a ledge.

47) Answer a) is correct. Caulk, stuff, or seal openings around pipes and conduits where they enter the building using appropriate sealants. Answer b) is incorrect because foam sealants are usually not appropriate for rodents because they can easily chew through them. Answer c) is incorrect because copper mesh, which is conductive, is probably not the best choice to use around electrical utilities. Answer d) is incorrect because tracking powder is a control tool, not a pest-proofing tool.

48) Answer d) is correct. Installing caulk, mesh, and other sealants around pipes, utility lines, and other entries into the voids between rooms can isolate infestations in one area. Answers a), b), and c) are incorrect because they prevent pests from entering the building but does not isolate them in areas |within the building ("pest isolation").

49) Answer a) is correct. It is the customer's responsibility to upgrade housekeeping services. Answers b), c) and d) are incorrect because it IS a technician's responsibility to reporting clutter in a storage area, provide recommendations to remove grease around cooking surfaces, and document whether or not a customer has corrected a sanitation problem

50) Answer b) is correct. Food preparation surfaces should be cleaned promptly after use, and should never be allowed to remain dirty overnight. Answer a) is incorrect because food preparation surfaces should never be allowed to remain dirty overnight. Answer c) is incorrect because floors must be cleaned daily, preferably in the evening.

51) Answer b) is correct. Mop buckets should be emptied after use and wet mops and rags cleaned and hung to dry in order to prevent fruit flies from breeding in the residue. Answer a) is incorrect because, while clean and rinsed mops may reduce odor problems in some circumstances and to some small degree, that issue is secondary to the fruit fly issue. Answer c) is incorrect because house flies do not breed in sour mops. Answer d) is incorrect because mice are not associated with mops and buckets.

52) Answer d) is correct. Catch trays in insect light traps should be emptied regularly to a) prevent dermestids and similar pests, b) so the trays do not overflow or the glue trap get overloaded, and c) to track insect problems by identifying new pests and pest trends.

53) Answer d) is correct. There need to be sanitation and inspection aisles in food processing and storage areas that are unobstructed and 18-24 inches wide. Answers a), b), and c) are incorrect because the aisles would be too narrow for adequate access.

54) Answer c) is correct. Stored packaged foods should be stacked on industrial grade, steel wire shelves that allow spilled foods to fall to the floor and make clean-up easier. Answer a) is incorrect because it is the policy of FIFO or "first in, first out" (not FILO) that ensures that foods do not remain in storage for too long. Answer b) is incorrect because customers should be advised not to store old cardboard boxes or paper bags but to recycle or dispose of them quickly.

55) Answer c) is correct. The inside of the trash can underneath the plastic liner should not be allowed to accumulate spilled trash and should be inspected and cleaned regularly. Answer a) is incorrect because all garbage cans should include plastic bag liners. Answer b) is incorrect because the bags should be taken out regularly to be stored in closed containers outside until trash pickup.

56) Answer d) is correct because a) flies inside a building are often traced to flies attracted to and breeding around dumpsters outside, b) dumpsters should be located 50 feet or more from outside doors; 75 feet if at a food facility, and c) dumpsters should be situated on a thick concrete pad that has foundation toes on the outside to keep rodents from burrowing under the pad.

57) Answer b) is correct because the statement is FALSE. Dumpsters should be checked by staff twice daily (not weekly) and any trash picked up that didn't end up inside the dumpster. The other statements are TRUE: a) drain holes should never be left open (except during cleaning), c) customers should limit the use of shrubbery around dumpster enclosures, and d) staff should police the area immediately after the dumpster has been emptied.

58) Answer b) is correct. Wineglass shaped plants are open at the base and tend to be well-lit and provide no hiding places for rodents. Answer a) is incorrect because customers should try and avoid moundshaped, ground-hugging shrubs that provide rodent cover. Answer c) is incorrect because low-growing ground covers such as juniper hide burrows and provide ideal rodent hiding places and runways. Answer d) is incorrect because espaliered bushes or other plants against walls should be avoided because ants, rodents, and other pests use them to find entry into buildings.

59) Answer d) is correct. Thorny shrubs should be avoided as they a) provide protected hiding places for rodents, b) are difficult to inspect and c) prone to capturing wind-blown trash.

60) Answer a) is correct. Ants, rodents, and certain other pests can used tree branches to gain access to a building if the branches are touching the building or its roof. Answer b) is incorrect because while shade may help attract certain pests it is not the main pest management issue. Answer c) is incorrect because while leaf accumulation may attract certain moisture loving pests it is not the main pest management issue. Answer d) is incorrect because root intrusion only rare pest management impact.

61) Answer a) is correct. Blooming plants should not be located near the building in order to minimize bee and wasp activity. Answer b) is incorrect because the presence of blooming plants plays no role in the presence of rodents. Answer c) is incorrect because blooming plants do not compete with baits. Answer d) is incorrect because the presence or absence of blooming plants has no effect on pest birds.

62) Answer d) is correct because a) you should make sure that there are no weedy areas that are being ignored by your customer (rodent breeding sites), b) weeds along fence lines or around abandoned equipment or debris are particularly attractive to rodents, and c) string trimmers should be used to mechanically manage weeds on a regular basis to minimize potential rodent breeding areas.

63) Answer b) is correct. A heavy layer of organic mulch that is right up against the building can enable subterranean termites to travel through the protective mulch above ground and enter the building through foundation cracks, conduits, or weep holes in brick. Answer a) is incorrect because organic mulch near a building can be the source of many different pest problems. Answer c) is incorrect because organic mulches are made of plant material that gradually decomposes, they attract millipedes, sowbugs or pillbugs, cockroaches, slugs, earwigs, and crickets and other pests that feed on decaying material. Answer d) is incorrect because organic mulch usually increases moisture around the foundation.

64) Answer b) is correct. Food facilities should have a 2-3 foot wide inspection strip around the perimeter of the structure. Answer a) is incorrect because while most buildings can get by with a bare strip 6-12 inches wide at the foundation, food facilities need a wider strip. Answer c) is incorrect because such a mulch band favors pests. Answer d) is incorrect because a ground cover at the foundation favors rodents and other pests.

65) Answer d) is correct. Outdoor lights attract insects of many types, both flying and crawling and a) even a small light can be seen for miles, b) bright security lights often become beacons that attract insects in large numbers, and c) insects attracted to lights at the building perimeter often find their way inside.

66) Answer c) is correct. There is a lot of variability: An insect may be attracted to a particular wavelength of light, but may only be attracted at a certain time of the night or at a certain time of the year or at a certain temperature. Answer a) is incorrect because a 200 watt bulb will attract more insects from a longer distance than a 100 watt bulb. Answer b) is incorrect because both male and female insects are typically attracted to lights.

67) Answer b) is correct. Sodium vapor lamps have low UV output and are less attractive to insects than mercury vapor lamps and fluorescent lamps. Answer a) is incorrect. Mercury vapor lights are highly attractive to insects because of their high UV output. Answer c) is incorrect because high heat bulbs are usually more attractive than low heat lights. Answer d) is incorrect because the higher the wattage the more attractive to insects, all other things being equal.

68) Answer a) is correct. Flood lights shining on a white wall will attract large numbers of insects over a great distance. Answer b) is incorrect because shining lights away from a building is a good way to reduce pest problems associated with lights. Answer c) is incorrect because lights that turn on two hours after sunset will reduce pest problems associated with lights by avoiding midges and other insects that fly only at dusk. Answer d) is incorrect because decoy lights draw insects away from the building.

69) Answer d) is correct. For green service, a) you need to explain to your customer the connection between moisture and pests, b) most pests need free water to survive and such water acts as a pest attractant, and c) leaks and condensation can provide conducive conditions for moisture-loving pests.

70) Answer a) is correct. A moisture meter can identify areas of high moisture that are not obvious during a visual inspection of wood, drywall, roofing, plaster, and brick. Answer b) is incorrect because thermal imaging equipment identifies warm or cold areas. Answer c) is incorrect because while maintenance records may help you identify areas where leaks and other moisture issues have occurred, you will still need to confirm actual moisture problem areas with the meter. Answer d) is incorrect because while maintenance workers can advise you of past problems or suspicions of current moisture problems, you will still need to confirm actual moisture problem areas with the meter.

71) Answer b) is correct. Splash blocks should be in place and downspouts should extend beyond the perimeter of the foundation. Answer a) is incorrect because there should not be standing water in a crawlspace and soil in the crawl should be partially covered with a moisture barrier in areas with high soil moisture. Answer c) is incorrect because stagnant water should be emptied and the condition causing it corrected.

3. PHYSICAL PEST MANAGEMENT

72) Answer d) is correct. Traps are especially suited for green service because, among other things, a) they are a nontoxic substitute for pesticide application, b) they work to both control and to detect pests, and c) they generate data (numbers) that can be used to identify pest trends.

73) Answer a) is correct. The most common traps used to catch mice and rats are glue traps, snap traps, and multiple-catch mouse traps (repeating mouse traps). Answer b) is incorrect because while live traps can be used to capture rodents, they are typically only so used in special and rare situations. Answer c) is incorrect because bait stations are not traps (although traps can be placed inside them). Answer d) is incorrect because ILTs are insect light traps.

74) Answer b) is correct. Concentrate snap traps in areas where you see or suspect rodent activity and place more traps in areas of high activity and fewer traps in other areas. Answer a) is incorrect because trapping is far more effective if you concentrate traps in rodent activity areas. Answer c) is incorrect because traps can be very effective when placed on pipes or beams which are often used as rodent runs.

75) Answer c) is correct. Mouse droppings in five different areas suggest either a large population or multiple populations and in either case a large number of traps are needed to be effective. Answers a) and b) are incorrect because 5 traps or less are too few to be effective. Answer d) is incorrect because traps are almost always preferred for mouse control in green service.

76) Answer b) is correct. Neophobic means fearing (phobic) new (neo) objects. Answer a) is incorrect because neophobic has nothing to do with light. Answer c) is incorrect and it is mice, not rats, that investigate new objects. Answer d) is incorrect because the term neophobic has nothing to do with aggregation.

77) Answer a) is correct. Because rats are neophobic (fear new objects), snap traps should be placed baited but unset for a few days or a week until the rats get used to them. Answer b) is incorrect because for rats you should not set traps directly on rat runs or in front of rat holes, offset them six inches to prevent rats from being spooked by a new object on their normal travel route. Answer c) is incorrect because for rats, you should place snap traps perpendicular to the wall or object with the trigger 4-6 inches away from the wall.

78) Answer a) is correct. Outdoor traps should be set only from dusk to dawn to avoid trapping nontarget animals like birds and squirrels. Answer b) is incorrect because animal repellent will also repel rodents. Answer c) is incorrect because if you place traps under branches they will not trap roof rats. Answer d) is incorrect because meat or fish will also attract some birds (crows for example) and sometimes squirrels.

79) Answer d) is correct because a) mice will investigate such changes in their territory so moving things will improve trapping success, b) because of this curiosity a mouse trapping program can be very successful very early, and c) for mice, as opposed to rats, you should place snap traps perpendicular to the wall or object with the trigger next to the wall.

80) Answer b) is correct. Multiple-catch traps (also called "curiosity traps") work because mice are curious and will investigate new things in their territories. Answer a) is incorrect because multiple-catch traps are for mice not for rats. Answer c) is incorrect because mouse smell on a trap often make it more effective. Answer d) is incorrect because mice will usually enter the trap with or without a food attractant.

81) Answer a) is correct. Place them flush against walls with the opening parallel to the runway. Answer b) is incorrect because if the opening is placed perpendicular to the wall the trap should be about 1.5 inches away from the wall. Answer c) is incorrect because traps should be placed in dark areas when possible.

82) Answer b) is correct. When servicing multi-catch traps, first make sure there are no live mice inside that could escape. Answer a) is incorrect because multi-catch traps do not have to be secured to the floor. Answer c) is incorrect because it is not your first task. Answer d) is incorrect because, when disinfection is required, it is a later task not a first task.

83) Answer c) is correct. In dusty, greasy, or damp areas, place glue traps inside rodent bait stations. Answers a) and b) are incorrect because, while these tactics can help with trap effectiveness in dusty areas, placing the sticky traps in a bait station is a better and more effective solution. Answer d) is incorrect because not using sticky traps in no way "improves their effectiveness."

84) Answer a) is correct. Place glue traps lengthwise, parallel to the wall or other object that lines a runway. Answer b) is incorrect because mice slow down to explore corners and their whiskers may touch the glue warning them away. Answer c) is incorrect because setting two or three glue traps side by side, about an inch apart, will increase their effectiveness since a rodent leaping over one will be caught in the second or third (this also works for snap traps).

85) Answer d) is correct. In commercial food accounts, hospitals, and schools, ILTs can be a "first line of defense" control tool since ILTs kill flies and other flying pests that have entered the building from outside or that have emerged from infested materials. Answer a) is incorrect because fly paper, while a tool useful against flying insects, is not an effective early defensive measure since it is quite limited in effective range. Answer b) is incorrect because standard sticky traps are not used against flies. Answer c) is incorrect because pheromone traps are not available for flies other than the fruit fly.

86) Answer a) is correct. ILTs installed within five feet of the floor will capture many more flies than ceilinghung traps. Answer b) is incorrect because moths tend to fly high and flies low. Answer c) is incorrect because a light that can be seen from outside will attract insects into the facility. Answer d) is incorrect because a narrow hallway is one of the best sites for a trap.

87) Answer c) is correct. The effective life of the average ILT bulb is about 12 months. Answer a) is incorrect because you can't tell by looking at a glowing UV bulb whether it's working at full strength. Answers b) and d) are incorrect because the bulb remains effective at 3 and 6 months.

88) Answer c) is correct. Most flying insects, such as moths, won't respond to lights more than 100 feet away, and flies rarely respond if the light is more than 25 feet away. Answer a) is incorrect because the pests are reversed (see above). Answers b) and d) are incorrect because there are significant difference between the response distance of moths and flies (see above).

89) Answer b) is correct. Fly trapping should be viewed as a supplement to finding and eliminating the source of the flies or to preventing them from entering the building. Answer a) is incorrect because you should never place fly traps over food preparation surfaces because fly parts may fall down and contaminate the surface. Answer c) is incorrect because some traps use chemical attractants but many do not.

90) Answer d) is correct. Yellowjacket traps a) have been used successfully to reduce yellowjacket activity in the fall when yellowjackets are foraging around human food, drinks, and garbage, b) for a serious fall yellowjacket problem around a large school and its grounds, or a recreation/picnic area you might need to trap ten or twenty thousand yellowjackets to significantly reduce the activity, and c) sunny locations are the best trapping sites.

91) Answer a) is correct. When used to suppress a pest population in a commercial food account, pheromone traps should be placed in a grid pattern, 20 to 60 feet apart. Answer b) is incorrect because the density of traps will be too low for effective suppression. Answer c) is incorrect because perimeter pheromone trapping is not effective for suppression. Answer d) is incorrect because you should place traps to avoid air currents.

92) Answer d) is correct because a) pheromone traps will catch more moths near the ceiling (where they fly) and more beetles near the ground, b) you should use hanging traps only for flying insects because crawling insects have no way to enter them!), and c) cockroach pheromone traps should be placed as you would cockroach sticky traps.

93) Answer b) is correct. Know and follow local regulations regarding release or euthanasia. Answer a) is incorrect because you should keep a trapped animal calm by keeping it in the dark; cover the cage with a tarp, sheet, burlap, box, etc. Answer c) is incorrect because animals that are to be released should be transported 5-7 miles away.

94) Answer d) is correct. Never release sick or lethargic animals because they may have a serious disease such as rabies; contact the health department, local animal control, or the humane society. Answers a), b) and c) are incorrect because you need to contact the health department, local animal control, or the humane society so experts can determine if a human or animal health issue exists.

95) Answer d) is correct because a) vacuuming is the quickest way to quickly knock down populations of aggregating pests such as boxelder bugs, cluster flies, and clover mites, b) vacuuming with a crevice tool can remove pockets of cockroaches and bed bugs in heavy infestations, and c) vacuuming may be the only acceptable control method in some situations such as ants or cockroaches living inside an oven.

96) Answer d) is correct because a) vacuums can become infested with certain pests such as bed bugs and fleas, b) vacuums can spread these pests, and c) vacuums can spread allergens if not equipped with a proper filter (100-series high efficiency filters).

97) Answer b) is correct. Holding a specimen at a temperature of 130° F. for three hours will kill any insect. Answer a) is incorrect because the time is too short to ensure kill. Answers c) and d) are incorrect because the temperature is too low to ensure kill of all stages and species.

98) Answer d) is correct. Bed bugs are more susceptible to heat than most insect species and so all stages of bed bugs will die if exposed to a) 130° F for 1 hour, b) 113° F for 1 hour, or c) twenty minutes in a clothes dryer set on high.

99) Answer b) is correct. Sprinklers and other fire suppression systems have to be modified to prevent them from going off during heat treatment of a room or building. Answer a) is incorrect because, depending on the temperatures reached, there can be risks to materials, wood floors or heat sensitive equipment. Answer c) is incorrect because all insect eggs can be killed if the proper temperature is reached for a long enough period.

100) Answer d) is correct. Most pests can be killed by freezing infested materials in a large commercial freezer that can reach temperatures of 0° F or lower for at least 48 hours, although four to six days is preferable. Answers a), b), and c) are incorrect because the temperatures are too high or duration period too low to ensure kill of all insects and stages.

101) Answer b) is correct. Mattress and box spring encasements can be used to help control bed bugs and dust mites by trapping them inside reducing the potential exposure to insecticides by eliminating treatment of mattresses and box springs. Answer a) is incorrect because encasements reduce the potential exposure to insecticides by eliminating treatment of mattresses and box springs. Answer c) is incorrect because most encasements do not contain insecticide and those that do should not be used in green service. Answer d) is incorrect because encasements do not reduce moisture in mattresses or box springs.

102) Answer c) is correct. Moisture reduction can prevent and sometimes even suppress or eliminate certain insect and mite populations such as millipedes, springtails, and psocids, which require relatively high levels of moisture to survive. Answers a) and b) are incorrect because, while moisture can be a conducive condition for these pests in some instances, simply reducing moisture will not be enough to suppress them.

4. PESTICIDES IN GREEN SERVICE

103) Answer d) is correct. If nonchemical strategies are unavailable, impractical, unsatisfactory, or not economically viable, pesticides may need to be used in green service, but they are only applied according to need and not by predetermined schedule. Answer a) is incorrect because if nonchemical strategies are unavailable, impractical, unsatisfactory, or not economically viable, pesticides may be used in green service. Answers b) and c) are incorrect because you make the decision based on conditions at the site and an analysis of potential exposure and damage risks.

104) Answer d) is correct because all the statements are true: a) pesticides protect health by controlling disease-causing pests and stinging insects, b) people exposed to excessive levels of a pesticide may suffer short-term or long-term health effects, and c) children are especially susceptible to certain pesticides

105) Answer a) is correct. When used as part of green service, pesticides shall be applied only in such a way as to minimize the risk to non-target organisms and the environment, including water quality. Answer b) is incorrect because other application methods are acceptable, including spot treatment and contained in a bait station. Answer c) is incorrect because other application methods are acceptable, including spot and void treatment.

106) Answer b) is correct. An action threshold is the point at which a technician takes action to reduce a pest's numbers. Answers a), c) and d) are incorrect because an action threshold is strictly defined in IPM as the point at which a technician takes action to reduce a pest's numbers.

107) Answer d) is correct. When a pesticide is necessary, it shall be applied a) with a precise application technique, b) in the smallest area to be effective, and c) using the minimum quantity of pesticide necessary to achieve control all of which will minimize the potential exposure of people and the environment to the pesticide.

108) Answer b) is correct. In green service, a spot treatment to a wall is a permitted application method. Answers a) and c) are incorrect because general treatments are generally not acceptable in green service.

109) Answer d) is correct. An applicator, prior to and while applying a pesticide outdoors, shall first evaluate current conditions including b) meteorological conditions (including predicted rainfall), b) the property to be treated (including irrigation and sprinkler systems), c) the surrounding properties to determine the likelihood of harm or damage to non-target species.

110) Answer a) is correct. Fogging with pesticides in the interior of structures where humans live or work shall not be used unless all other methods of control have been exhausted. Answers b) and c) are incorrect because point source application of IGRs and perimeter treatments are both acceptable in green service.

111) Answer c) is correct. Bait station are currently not necessary when used for baiting in secure or locked areas (note: this may change in the future: always check the label). Answer a) is incorrect because bait can be applied without bait stations into sewers, voids, and burrows or in secure and locked areas. Answer b) is incorrect because bait blocks can be hung on wires in sewers. Answer d) is incorrect because rodenticides may be placed into inaccessible voids.

112) Answer c) is correct. Green technicians should choose products whose end-use material poses the lowest risk to people, nontarget animals and plants, and the environment. Answer a) is incorrect because there is no the GreenPro List. Answer b) is incorrect because the choice of products is not limited to FIFRA 25(b) "exempt products," although these products may be a reasonable choice in many instances.

113) Answer b) is correct. When choosing between similar effective pesticide products, PMPs performing GreenPro service choose the best product after conducting a "risk assessment" and evaluating four risk variables: a) toxicity, b) potential environmental impact, c) potential for exposure, and d) the sensitivity of the site. Answers a), c), and d) are wrong because each is missing at least one variable that is part of the four risk variables that must be used when evaluating products for use in green service.

114) Answer d) is correct. To be described as acute, the adverse effects should occur within 14 days of the administration of the substance. Answer a) is incorrect because the adverse effect does not have to occur immediately to be considered acute. Answer b) is incorrect because an adverse effect can occur up to 14 days after exposure to the substance. Answer c) is incorrect because an adverse effect can occur up to 14 days after exposure to the substance.

115) Answer d) is correct. Chronic effects are harmful effects over an extended period usually after repeated or continuous exposure and include a) cancer, b) birth defects, and c) endocrine disruption.

116) Answer b) is correct. Allergic reactions can range from itchy, watery eyes to rashes, all the way to systemic effects such as asthma or life-threatening anaphylactic shock. Answer a) is incorrect because allergic reactions are not thought to occur during a person's first exposure, but may occur after subsequent exposures. Answer c) is incorrect because allergy is of special concern around |ill or elderly residents or very young children.

117) Answer a) is correct. The toxicity of the end-use product (for example, the spray applied to a |surface after being diluted) is often much less than the packaged pesticide product. Answer b) is incorrect because two pesticide products with the same signal word may pose different risks to people in the treated area if, say, one is designed to be used full strength and the other to be mixed with water and diluted to a 1 per cent solution. Answer c) is incorrect because rat toxicity and human toxicity are often closely related, which is one reason rats are used in toxicity tests.

118) Answer a) is correct. Applicators face the greatest risk of exposure, especially during mixing and application. Answers b), c), and d) are incorrect because applicators generally face the greatest risk of exposure. (Note: small children often pose increased risk of exposure because they may crawl in treated areas, put treated items in their mouth, or lick treated surfaces.

119) Answer d) is correct. Regarding pesticide exposure, a) risk of exposure is increased by entering treatment areas directly after treatment, b) pesticide on rugs, furniture, and food prep surfaces increase the risk of exposure, and c) small children are most often exposed by touching, licking, or eating pesticide residues.

120) Answer d) is correct. Runoff of pesticide can contaminate a) ground water (for drinking or irrigation) or b) surface water (streams, ponds, estuaries, etc.), where it can also c) impact nontarget aquatic organisms.

121) Answer d) is correct. Drift can carry airborne residues into nontarget areas such as a neighbor's property, fish pond, vegetable garden, pet water bowl, play areas, or into a ventilation system. Answer a) is incorrect because runoff is more likely to impact ground water or surface water. Answer b) is incorrect because direct misapplication of a neighbors property is not very common, although it may occur during power spraying or using a mist blower for mosquito control. Answer c) is incorrect because spills, while posing some risk to neighboring properties, are far more likely to impact your customer's property.

122) Answer a) is correct. The potential for exposure during or after treatment varies with both the product and the application method used at the site. Answer b) is incorrect because the potential for exposure can't depend on exposure. Answers c) and d) are incorrect because toxicity has nothing to do with the potential for exposure.

123) Answer b) is correct. Risks to human health or the environment are the result of both the toxicity of and exposure to a product (risk = exposure + toxicity). Answer a) is incorrect because toxicity by itself does not determine risk with the factor of potential exposure. Answer c) is incorrect because the application method alone does not determine risk without the additional factor of toxicity. Answer d) is incorrect because product and toxicity do not determine risk without the factor of the potential exposure.

124) Answer d) is correct. Reducing risk from pesticides used in green service is achieved by, among other things, a) choosing application methods that reduce the risk of exposure to people, pets, and other nontargets, b) applying the pesticide to inaccessible and hidden or protected areas whenever possible, c) applying products as needed rather than on a schedule.

125) Answer a) is correct. Treatment methods in order of increasing potential exposure are crack and crevice, spot, general. Answer b) is incorrect because general treatments have a higher potential exposure than the others. Answer c) is incorrect because general treatment pose a higher risk of exposure |than do spot treatments. Answer d) is incorrect because crack and crevice poses the lowest potential for exposure rather than the highest as listed.

126) Answer b) is correct. Individual spot treatments cannot exceed two (2) square feet and spot treatments should not constitute more than 20% of the surface. Answer a) is incorrect because 1 square foot is much smaller than the actual minimum size of 2 square feet. Answer c) is incorrect because 4 feet by 4 feet equals 4 square feet, which is much larger than the actual minimum size of 2 square feet. Answer d) is incorrect because 3 feet by 3 feet equals 3 square feet, which is larger than the 2 square feet permitted.

127) Answer c) is correct. Individual spot treatments cannot exceed two (2) square feet and spot t reatments should not constitute more than 20% of the surface. Answer a) is incorrect because there is a defined limit. Answer b) is incorrect because 10% is less than the actual limit of 20 % of the surface. Answer d) is incorrect because 50% is more than the actual limit of 20 % of the surface.

128) Answer a) is correct. A perimeter barrier treatment is the application of pesticides to thresholds and other entrances, the foundation, and the soil adjacent to the foundation. Answer b) is incorrect because a barrier treatment may be made with residual sprays, dusts, or granules. Answer c) is incorrect because barrier treatments are primarily targeted to outdoor pests that may become invaders or nuisances when their populations build up.

129) Answer d) is correct. Insecticide baits are often the best choice if an insecticide is considered necessary because a) baits are specific to certain pests and are very effective against those pests, b) compared to many other insecticide formulations, baits have relatively low toxicity |and hazard to people, and c) baits do not easily vaporize to produce airborne residues.

130) Answer b) is correct. Injectable baits are designed to be placed in voids, cracks and crevices, further reducing hazard. Answer a) is incorrect because baits, as a rule, are no less expensive than other formulations and tactics. Answer c) is incorrect because baits have comparatively low vapor pressures. Answer d) is incorrect because injectable baits tend to be labeled for a narrow range of pests, often limited to just one type of pest such as cockroaches.

131) Answer d) is correct. Sensitive sites a) require special consideration and a greater margin of safety, b) require that you choose only products and application methods having the very lowest risk potential, and c) can be sensitive for either health or environmental reasons.

132) Answer c) is correct. The U.S. Environmental Protection Agency and state pesticide registration processes are designed to ensure that when a product is used in accordance with its labeling, there is a "reasonable certainty of no harm to human health or the environment." Answer a) is incorrect because misuse may cause harm. Answer b) is incorrect because EPA does not guarantee the product will not harm people or the environment. Answer d) is incorrect because, except in the case of termiticides, EPA does not evaluate the effectiveness of pesticide products.

133) Answer a) is correct. The pesticide label provides instructions telling how to correctly use the product. Answer b), c), and d) are incorrect because the SDS addresses the hazards of the product not its use.

134) Answer c) is correct. The safety data sheet, called an SDS for short, is a guide to the hazards of a pesticide. Answers a) and b) are incorrect because use information comes from the label.

135) Answer a) is correct. For some products there are consumer information sheets that provide technical information related to the end use product which is more suitable for your customer. Answer b) and c) are incorrect because the SDS and the label provide information primarily designed for the applicator. Answer d) is incorrect because advertising is primarily designed to sell the product to the user.

136) Answer c) is correct. The special identifying words — called "signal words" — that are printed in large letters on every pesticide label are DANGER, WARNING, and CAUTION. Answers a), b) and d) are incorrect because each includes at least one word that is not classified by EPA as a signal word.

137) Answer a) is correct. Products that have the signal word DANGER due to skin and eye irritation potential will not carry the word POISON or the skull and crossbones symbol. Answers b) and c) are incorrect because all highly toxic pesticides that are very likely to cause acute illness through oral, dermal, or inhalation exposure, also will carry the word POISON printed in red and the skull and crossbones symbol.

138) Answer a) is correct. If a concentrate labeled DANGER/POISON was swallowed, as little as a taste to a teaspoonful could kill the average person. Answers b), c), and d) are incorrect because significantly less than the amounts mentioned could kill an average person.

139) Answer d) is correct. Pesticide products labeled CAUTION are slightly toxic or relatively nontoxic and have only slight potential to cause illness or skin or eye irritation. Answer a) and b) are incorrect because these statements refer to products labeled WARNING. Answer c) is incorrect because the statement refers to products labeled DANGER/POISON.

140) Answer a) is correct. The vast majority of pesticides used by pest management professionals in our industry carry CAUTION labels and so are classified as slightly toxic or relatively nontoxic. Answer b) is incorrect because only a few exempt products used by PMPs performing GreenPro service are labeled nontoxic. Answers c) and d) are incorrect because PMPs performing GreenPro service avoid using products with WARNING and DANGER labels when effective products are available that have CAUTION labels.

141) Answer a) is correct. Always read label instructions before every application. Answers b), c), and d) are incorrect because they are not frequent enough since memory can be faulty and since pesticide labels differ for very similar products and even for different containers of the same product.

142) Answer b) is correct. A mandatory statement will contain such key words as "must," "shall," and "will," or it will use an expression such as "do not," "use only," or "for use only by." Answers a) and c) are incorrect because statements containing words like "should," "may," and "it is recommended that" are suggestions only and you may depart from them.

143) Answer b) is correct. Statements containing words like "should," "may," and "it is recommended that" are suggestions only and you may depart from them. Answers a), c), and d) are incorrect because the statement is a suggestion only and not a mandate that must be followed.

144) Answer c) is correct. Bait translocation is when rodents (or other animals) carry bait out of the treatment site into a new area. Answer a) is incorrect because translocation has nothing to do with absorption. Answer b) is incorrect because secondary poisoning occurs when a predator or scavenger eats an animal that has been poisoned and becomes poisoned itself from the toxicant in the tissues of the dead animal. Answer d) is incorrect because evaporation and sublimation are separate physical processes.

145) Answer a) is correct. Blocks are the best bait formulation to use inside a bait station because they are easily secured on rods to prevent the rats from moving the bait out of the station. Answers b), c), and d) are incorrect because these formulations can be more easily translocated or spilled out of the station.

146) Answer b) is correct. Loose pellets are usually the best choice when burrow baiting since they are not as easy to kick out of a burrow as other baits. Answer a) is incorrect because blocks are easy for rodents to kick or carry out of their burrows. Answer c) is incorrect because meal tends to be damaged by the moisture inside burrows. Answer d) is incorrect because the liquid bait simply is absorbed by the soil.

147) Answer d) is correct. Ground water contamination can occur when a) rain carries dissolved pesticide down through the soil (a process called leaching), b) pesticide is back-siphoned from pesticide tanks, c) termiticides enter wells during termite treatment.

148) Answer d) is correct. Pesticide applicators are legally responsible for "properly" disposing of their leftover pesticides including a) empty containers—containers that retain pesticide residues, b) rinsewater—solutions used to rinse application equipment and product containers, c) unused pesticides—old pesticides, unusable, diluted pesticides, or unidentifiable materials.

149) Answer c) is correct. When you clean a sprayer or other application equipment, handle the rinsate just as you do rinsate from triple-rinsed containers—use it in a sprayer as a diluent or an end-use dilution. Answer a) is incorrect and dumping rinsate in a sewer or storm drain is a Federal offence. Answer b) is incorrect and is considered a misuse of the pesticide.

150) Answer b) is correct. Drift is most likely during outdoor application with wind 10 mph and higher. Answer a) is incorrect because wind speeds of 5-10 mph are still considered low risk for drift. Answers c) and d) are incorrect because wind speeds this high present an unacceptable risk for drift into nontarget areas.

151) Answer a) is correct. Drift is most likely during outdoor application with wind 10 mph and higher so avoid spraying when the wind is that high. Answer b) is incorrect because high pressures tend to increase drift. Answer c) is incorrect because a fine spray is more likely to drift.

152) Answer d) is correct because all the statements are TRUE: a) drift is most likely during outdoor application with wind 10 mph and higher, b) drift can happen during indoor applications, as well, such as when fans, air conditioners, and blowers create indoor wind that moves pesticide where it is not wanted, and c) pesticide drift can, on rare occasions, occur even hours or days after an application such as when, the day after a perimeter treatment of a home, a storm blow piles of treated leaves into a nearby fish pond.

153) Answer a) is correct. Some facilities, especially schools, require advanced notification before pesticides are applied and this is called "notification." Answer b) is incorrect because posting is the process of putting up notices of treatment. Answer c) is incorrect because reporting is what the technician does with service records, sanitation reports, etc. Answer d) is incorrect because "representation" has nothing to do with future pesticide treatments.

154) Answer b) is correct. Posting is the process of putting up notices of treatment. Answer a) is incorrect because notification is advanced |notification before pesticides are applied through letters, email, or other communication methods. Answer c) is incorrect because reporting is what the technician does with service records, sanitation reports, etc. Answer d) is incorrect because "representation" has nothing to do with notices.