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Managing Pests in Childcare Facilities

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West Virginia Department of Agriculture. 1995. Integrated Pest Management in Schools and Other Public Institutions.

Vail, Karen. 1998. PB 1603, Suggested Guidelines for Managing Pests in Tennessee's Schools: Adopting Integrated Pest Management. University of Tennessee Extension

Koehler, P. G., T. R. Fasulo and C. W. Scherer. 2003. School IPM: Integrated Pest Management in Schools. http://schoolipm.ifas.ufl.edu/index.html

More information on IPM in child-serving facilities can be found at http://utyeah.utk.edu and http://eppserver.ag.utk.edu/sch_ipm.htm

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Managing Pests in Childcare Facilities

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Why Do We Need to Manage Pests in Childcare Centers?

Everyone agrees it is important to protect children and childcare workers from needless contact with products used to manage pests. It is equally as important to make sure children and workers are not harmed or made sick by coming in contact with pests. For example, many people do not know that cockroaches can make people sick. German cockroaches are the most common pests in kitchens. They, along with flies and other pests, can spread germs that can cause food poisoning. Cockroaches can even cause someone with asthma to have an attack. Mosquitoes, ticks, rodents and birds can transfer organisms that cause certain diseases, such as West Nile Virus, Rocky Mountain spotted fever, hantavirus and others. And, most pests are just a nuisance.

What Is IPM?

IPM stands for Integrated Pest Management and is a process for achieving long-term, environmentally sound pest suppression by using a variety of technologies and management practices. IPM controls pests while reducing the hazards of pests and pesticide exposure to humans. IPM recommends regular inspection of buildings and keeping up with the type and number of pests that are found. Instead of spraying pesticides at regular time intervals regardless of pest presence, IPM uses information known about the pest to help control it. Depending on the type of pest, a certain number must be present before any control measures are used. This is called a **threshold**. Once the threshold is exceeded, a combination of affordable techniques is used to reduce risk to human health, property and the environment. These techniques may include the reasonable use of pesticides. Most pests need food, water, air and shelter. By removing any of these basic elements and/or preventing the pests from getting into a building or other space, the number of pests can be lowered or even totally prevented. Keeping pests out may be as simple as:

- keeping doors closed;
- adding weatherstripping so doors close tightly;
- caulking and sealing openings in walls, especially where the wall meets the floor, in corners and around pipes;
- installing or repairing screens; and
- keeping plants, shrubs and wood mulch at least 12 to 18 inches away from exterior walls.

Four Points of IPM

1. Preventing pest populations using such non-chemical methods as sanitation and exclusion practices.
2. Applying pesticides only as needed to correct verified problems.
3. Selecting the least hazardous methods and materials effective for control of targeted pests.
4. Precision targeting of pesticides to areas not contacted by or accessible to the children and staff.

Other techniques include using traps or a vacuum to remove the pests. If pesticides are necessary, they should be used in such a manner that will not harm people in the building. Using baits, putting pesticidal dust inside walls and spraying in cracks and crevices are good ways to keep pesticides away from adults, children and pets. Also, by using pesticides only when really necessary, the pest is less likely to become resistant to the pesticide. By using IPM, pests can be controlled in cost-effective ways and pesticide use can be reduced.

IPM has been used successfully in school systems across the country. If your childcare center is located in a school building, ask how the school controls

its pests. If the school does not use IPM, encourage those who make the pest management decisions to adopt IPM practices. Currently, Tennessee law does not mandate schools or childcare centers to use IPM. There is, however, a law that may apply to your childcare facility. That law is 62-21-124 of the Tennessee Department of Agriculture (TDA) Division of Regulatory Services "Laws and Regulations Governing Pest-control Operators and Applicators of Restricted Use Pesticides."

62-21-124. Pesticides in buildings used for food preparation and service, or lodging.

Whether or not engaged in the business of applying pesticides, a person may not apply a pesticide within any of the following buildings, except under the direct supervision of a person licensed to apply pesticides in accordance with this chapter:

1. any building used for the preparation or serving of food;
2. any building used for the temporary or permanent lodging of others;
3. **any building used primarily for educational purposes**, except those buildings used primarily for religious instruction or for providing education to not more than10 persons; or
4. any commercial food processing facility.

Basically, the law states that no one may apply pesticides in one of these facilities if he or she is not under the direct supervision of a licensed operator. Childcare providers should not use aerosol cans of insect spray, leave rat bait or apply any type of pesticide within a childcare facility. There are other state, federal and sometimes local laws that cover how pesticides are carried from one site to another, how and where they are stored and how they are used.

Mishaps have occurred in schools in other parts of the country. Our goal is to prevent any type of event in Tennessee that would expose a child to pesticides. A mishap can even occur when using a licensed pest-control contractor. That is why it is important to find a responsible, qualified pest-management professional. To do this, you need to understand the basic concepts of IPM.

Other advantages of using IPM in your childcare facility include positive relationships between the childcare center's staff and parents and reduced liability for the childcare facility. Parents will be pleased to know the childcare center takes the health and safety of its children seriously. Using IPM can even be used as a marketing tool in recruiting new children. Also, the minimal record keeping that is a part of IPM reduces the liability of childcare centers, because these records document exactly which steps were taken at which time to control pests.

Establishing IPM Programs in Childcare Centers

The first step to using IPM in your childcare facility is to determine how decisions about pest management are to be made. Working with a responsible, qualified pest-management professional will make this process easier.

1. Develop an official IPM policy statement. This statement should be on file as a guide to defining the IPM program.
2. Define the pest-management roles for everyone involved in the childcare center (director, teachers, workers, kitchen staff, maintenance personnel, parents, etc.). Make sure there is good communication with everyone and educate and/or train everyone in his/her role in managing pests.
3. Set pest-management objectives. These may differ from one area of the facility to another, such as kitchens, classrooms and playgrounds. The pest-management plan for each area should be outlined.
4. Inspect the entire facility and grounds to identify and monitor pest populations for possible problems.
5. Set the number of pests that are acceptable and decide at which point action will be taken. Also determine any environmental conditions such as leaks, cracks in walls, etc. that will require action.
6. Apply IPM methods to control pests.
7. Evaluate the results of IPM methods to determine if they meet your IPM objectives. Keep written records of all aspects of the program.

Step 1: Develop an IPM Policy Statement

A policy statement should be written stating the childcare center's intent to use an IPM program for pest management. It should set the goals of the program briefly, state how it will be included into existing services and describe how everyone will be trained. An example of a childcare center policy statement is in Appendix I. This example can be modified to fit your childcare center.

Step 2: Define Everyone's Role

Good communication among all (teachers, staff, parents, etc.) is needed for a successful IPM program. Everyone has an effect on pest management. Even staff with no formal responsibility for pest management can determine if the IPM program is working. Anyone entering the facility has some impact on the childcare center environment. When everyone understands his/her job and communicates well with each other, an IPM program can effectively manage pests in the childcare facility and protect children and childcare providers from unnecessary exposure to pesticides. The roles and responsibilities shared by childcare providers, staff and parents are as follows:

IPM Coordinator

This person plays a major role in the IPM program. He or she is responsible for overseeing most of the day-to-day requirements of the program. The coordinator could be the childcare director, a maintenance person, a childcare worker or an individual under contract for the pest management of the childcare center. This coordinator should receive IPM training. Call the UT Extension office in your county for information on how and where to receive this training. The IPM coordinator will:

1. maintain and prioritize a list of needed structural and landscape improvements;
2. work with whoever is responsible for the actual pest-management practices;
3. make sure anyone applying pesticides is licensed and follows IPM recommendations;
4. handle and maintain records related to pest problems, IPM activities and pesticide-related complaints;
5. keep files of records of pesticide application, pesticide labels and Material Safety Data Sheets (MSDS);
6. educate childcare provider supervisors and other personnel about suggested IPM requirements (where logbook is kept, proper cleaning methods, pesticide storage, etc.); and
7. understand pesticide labels and their components (Appendix II).

Overseer of Pest-control Services Logbook

In addition to the IPM coordinator for the childcare center, someone should be appointed to oversee the logbook that contains the pest-control service records.

Custodial and Grounds Maintenance Staff

Custodians and grounds maintenance staff both have important roles to play in an IPM program. Custodial staff are responsible for recognizing and correcting conditions that may lead to pest problems, such as water leaks, places where pests might enter the building and flawed housecleaning practices. All cracks and crevices in walls and around pipes should be sealed to reduce shelter for and movement of cockroaches. Whoever cleans and performs maintenance tasks is most often exposed to the pests and should report the location and types of pests seen in the logbook and to the IPM coordinator.

Outdoors, good grounds maintenance can reduce many pest problems. With proper landscape design and care, pesticide use can often be avoided. Those who clean the inside of the childcare center as well as those who care for the outside areas should receive IPM training. The IPM coordinator might be the person to arrange for this training.

Kitchen Staff

Food handling and preparation areas are one of the most important parts of a facility for good pest management. It is very important that kitchen staff understand the importance of keeping a kitchen area clean and storing food properly. For example, lids should be kept on garbage cans, spills cleaned as soon as possible and food stored in pest-proof containers. A well-trained kitchen staff can assist in locating and eliminating areas where pests live. Kitchen staff should also receive IPM training.

Directors

The director sets the tone for the IPM program. His or her first responsibilities are to select a qualified individual as the IPM coordinator and establish a pest-management policy. In some childcare centers, the director may perform these duties. In any case, the director should have a general understanding of:

- IPM in the childcare center,
- possible legal penalties for improper pesticide use by in-house personnel, and
- pesticide-safety issues and decision-making about which pesticide products are appropriate.

Perhaps the most crucial role of the childcare director is deciding on the priorities for the building's maintenance that will help reduce pests. It is also important that the director make sure the center is properly cleaned and all personnel follow IPM-recommended practices.

Teachers, childcare providers and children

In addition to food-handling areas, classrooms, activity areas and lockers or "cubbies" are key sites for pest problems. The most important role for childcare providers and teachers is cleanliness. This includes cleaning up food leftovers, proper storage of pet food and snacks, keeping areas free of clutter and cleaning. Also, teachers and providers who can identify pests can be helpful to the IPM program. The more people who participate, the greater the possibility for success. Without teachers, providers and children reporting pests immediately and keeping the teaching and activity areas clean, it is unreasonable to expect a pest-free environment or to control pests without pesticides.

Parents

Parents want their children to learn and play in a pleasant environment without any undue risks from pesticides. For this reason, parents are usually among the first to express their concerns about what they believe to be unsafe conditions. These "unsafe" conditions can occur when pest problems are not managed properly, or when pesticides are overused or used incorrectly. Parents should be made aware of the childcare center's pest management practices. The childcare center can use parents' interest to encourage proper maintenance and housekeeping practices. Often, parents may even volunteer to perform certain maintenance chores, such as sealing cracks and crevices, to help the childcare center. Parents can be an invaluable resource to the childcare facility in implementing IPM.

Step 3: Set Pest-Management Objectives

It is important in the beginning to determine the factors that will require an action to prevent and/or solve any particular pest problem. These factors can vary from area to area. For example, for buildings or other structures, the main objective might be to control damage caused by termites. In the kitchen or other food-handling areas, the objective might be to control cockroaches. Facility directors should outline specific objectives in the pest-management plan. The director might seek advice from an IPM expert in determining these objectives.

Objectives of the pest-management plan might include:

1. pests should be managed to prevent interference with the learning or work environment;
2. the health of building occupants should be protected;
3. building occupants should be safe from injury on playing fields; or
4. the integrity of buildings or structures should be preserved.

Using IPM means that seeing a certain number of specific types of pests triggers action. Examples of some actions that could be taken might be to apply the appropriate pesticide in cracks and crevices, set bait and traps or install screens on floor drains. The specific number of pests sighted that will trigger an action is called a *threshold.* Pest thresholds should be included in the IPM objectives.

Step 4: Inspecting, Identifying and Monitoring

IPM includes identifying, monitoring, evaluating and choosing the appropriate method of control. Regular inspections and proper identification of pests are key components of IPM. This is the major difference between IPM and traditional pest-control programs.

Traditional programs rely on regularly scheduled pesticide sprays. IPM relies on regularly scheduled inspections and monitoring. Once the pest and its source of food, shelter and water are determined, often building modifications and occupant behaviors can be used to reduce or even eliminate the pests.

Monitoring consists of inspecting areas for evidence of pests, places where the pests enter the building, available food and water and places for the pests to shelter. Monitoring also determines the number of pests on site. If monitoring identifies a number of pests that reaches or exceeds the pre-selected threshold, then the appropriate action should be taken.

Monitoring should occur in the childcare facility on an ongoing basis. Sticky traps (sometimes referred to as glue boards and available at home and garden centers and elsewhere) are an important part of an indoor IPM program. Sticky traps are designed to catch cockroaches and other insects as well as rodents. They should be placed where two surfaces meet; such as where the wall and floor meet; behind or under appliances; in closets, cabinets and shelves; and other areas where insects have been seen. The following information and actions should be included in a monitoring program:

1. a floor plan of the site showing the number and location of each trap;
2. regular inspection of each trap and recording of the following information on a Pest Surveillance Sheet (aee Logbook at http://eppserver.ag.utk.edu/sch_ipm.htm)
   - date checked
   - trap number and location
   - trap condition (acceptable or needs replacing)
   - number and species of pests trapped
   - other evidence of pest presence (cast skins, feces, rub marks, etc.) or damage
   - need for pest management;
3. traps should be replaced at least every two months or when the trap is full or no longer sticky, whichever comes first; and
4. trapped pests should be removed and disposed of, after their type and numbers have been confirmed, to remove a good feeding source for other pests and to prevent counting pests more than once.

Step 5: Setting Action Thresholds

Pest-management action is initiated when pest numbers exceed the thresholds set by the IPM objectives. These numbers are set by deciding how many of a particular type of pest can be tolerated by the people in the building. Specific pest-management strategies should be determined for different numbers of pests.

Step 6: Applying Other IPM Strategies

Housekeeping, building maintenance and repair, ways to keep pests from entering the building and traps are examples of ways to prevent pests from exceeding the threshold levels determined by the center's IPM plan. IPM strategies are available for both indoor and outdoor sites and can be customized to address the different types and numbers of pests that each childcare center will experience.

IPM Strategies for Indoor Sites

Usual pests include ants, cockroaches, flies, hornets, wasps, yellowjackets, mice, rats, spiders, termites, carpenter ants and other wood-destroying organisms. Indoor sites and control strategies follow:

Entryways – Doorways, overhead doors, windows, holes in exterior walls and openings around pipes, electrical fixtures and ducts

1. Doors should be shut when not in use.
2. All doors should have weather stripping so doors close tightly.
3. Openings in walls should be caulked and sealed.
4. Screens should be installed or repaired.
5. Air curtains may be installed, but must be done properly to prevent flies from being pulled into the structure.
6. Vegetation, shrubs and wood mulch should be at least 12-18 inches away from the structure to discourage occasional invaders as well as carpenter ants, termites and other pests.

Classrooms and Offices – Classrooms, activity areas, offices, meeting rooms and hallways

1. Keep food and beverages only in designated areas.
2. Keep indoor plants healthy. Remove insect pests by hand or use insecticidal soaps if necessary. While treating, remove plants from spaces occupied by people.
3. Remove standing water, water-damaged or wet materials to keep areas as dry as possible. Some insects can live a long time without food, but water is critical.
4. Store animal food in tightly sealed containers and inspect regularly for pests. Clean animal cages regularly. Inspect animal cages for leaking water bottles.
5. Clean desks, play stations and lockers or "cubbies" on a regular basis.
6. Avoid the use of carpet whenever possible.
7. Vacuum carpeted areas as frequently as practical.
8. If students get head lice, have parents contact a doctor. Spraying the premises for head lice is NOT recommended or necessary because head lice only live off the host for a short period of time. Educate children and parents on how lice are spread and discourage sharing of hats, brushes and other items that come in close contact with the head. More information on managing head lice can be found at your local Extension office (http://www.utextension.utk.edu/publications/pests/default.asp), the local health department, or U.S. Department of Health and Human Services' Centers for Disease Control and Prevention (http://www.cdc.gov/).

Food Preparation and Serving Areas – Dining room, kitchen, lounges, lunchroom, snack areas, vending machines and food-storage rooms.

1. Keep stored foods in pest-proof containers. Store waste in plastic, glass or metal containers with tight-fitting lids. Remove waste at the end of each day.
2. Screen vents, windows and storm drains to prevent cockroaches and other pests from using them as pathways.
3. Reduce availability of food and water for pests. Remove crumbs and other food debris, repair dripping or leaky faucets and dry out wet spots.
4. Clean food-preparation equipment after each use and remove grease build-up from vents, ovens and stoves. Caulk or paint to seal cracks and crevices.
5. Trap rodents with glue boards or mechanical traps. Traps should be placed in areas inaccessible to children. Glue boards or mechanical traps should be checked daily and dead or trapped rodents should be disposed of within 24 hours.

Rooms and Areas with Extensive Plumbing – Bathrooms, dishwasher rooms, greenhouses, locker rooms, rooms with sinks and swimming pools

1. Repair leaks quickly and correct other plumbing problems to deny pests access to water.
2. Clean floor drains, strainers and grates. Pipe chases should be sealed.
3. Keep areas dry. Do not allow condensation to form. Areas that do not dry are conducive to molds, which support insect life, as well as producing allergens. It may be necessary to increase ventilation.
4. Store paper products or cardboard boxes away from moist areas. Do not store paper products or boxes directly on the floor or against a wall.

Maintenance Areas – Boiler room, custodial storage areas, mechanical room and pipe chases.

1. Clean mops and buckets and hang to dry after each use.
2. Allow eating only in designated areas.
3. Clean trash cans regularly, use plastic liners and be sure to close lids securely.
4. Keep areas as dry and clean as possible and void of clutter.

IPM Strategies for Outdoor Sites

Typical Pests: Many pests, such as rodents, ants and other insects, millipedes and other pests enter structures from the outdoors. Other outdoor pests include turf pests such as broad-leaf and grassy weeds, insects such as grubs or armyworms, diseases such as brown patch and vertebrates (animals with backbones) such as moles. Other pests that need attention outdoors include plant diseases and insects such as aphids, Japanese beetles, bagworms and others.

Parking lots, athletic fields, playgrounds, loading docks and refuse dumpsters

1. Clean trash containers and gutters, and remove all waste such as food and paper debris on a regular basis.
2. Secure lids on trash containers.
3. Repair cracks in pavement and sidewalks.
4. Provide adequate drainage away from the structure and on the grounds.

Turf – lawns, athletic fields and playgrounds

1. Maintain healthy turf by selecting a mixture of turf types best adapted to your area. Check with UT Extension for suggestions on types and how to care for your turf.
2. Set mowing height to encourage turf competition with weeds; adjust the cutting height of the mower for grass type; sharpen mower blades; and vary mowing patterns to help prevent the soil from compacting.
3. Do not water turf too often. When you do water, soak the ground well. Early morning is the best time to water. Allow the soil to dry slightly between waterings.
4. Allow good drainage and inspect turf regularly for evidence of pests.
5. Keep grass clippings in the turf to act as mulch, or compost the clippings with other organic matter.
6. Have soil tested through your local county UT Extension office and use the results to determine the need for fertilizer and lime.
7. Fertilize at the proper time of year. Excess fertilizer can cause additional problems, including weed and disease outbreaks.
8. Dethatch lawns in early fall or early spring. Thatch is the layer of organic matter between the soil and the green foliage of the grass. Do not allow the thatch layer of your lawn to become too thick. This can lead to disease problems, and prevent water, fertilizer and pesticides from reaching the soil. Thatch also houses insect pests such as sod webworms and cutworms.
9. Aerate to place soil on top of thatch so microbes can decompose the thatch.
10. Seed over existing turf in fall or spring.
11. You can obtain more information on turf from the numerous turf publications produced by UT Extension or from EPA's brochure entitled *Healthy Lawn, Healthy Environment: Caring for Your Lawn in an Environmentally Friendly Way.*

Trees, Shrubs and Other Ornamentals

1. Remove plants easily prone to disease or pests. These pests require too many resources, such as time, energy, personnel or money.
2. Remove dead, infected or infested parts of plants by pruning. Sterilize pruning equipment when removing diseased parts.
3. Use plants appropriate for the site.
4. Correctly identify insect pests and diseases. If in doubt, send several specimens or samples to the local county UT Extension office for identification.
5. Use pest-resistant varieties for new plantings. Contact your local UT Extension office for information.
6. Pheromone traps can be used to determine the presence and activity periods of pests. Pheromones are the chemicals released by organisms as a means of communicating with others of the same species, usually as a mating aid.
7. Prune branches to improve plant shape and to prevent branches or foliage from touching buildings. This removes one pathway for pests into the structure.
8. Follow UT Extension guidelines for fertilizing annuals, perennials, trees and shrubs. It is important to fertilize plants at the proper time and with proper amounts.
9. Maintain healthy plants by applying correct amounts of water as needed, especially during dry periods. Plants normally need from 1 to 1½ inches of water per week during the growing season.

Applying Pesticides Wisely

Many pesticides are registered for use against urban and structural pests. Before using a particular pesticide, one needs to know how toxic it is and how it should be applied in order to get the best results with the least risk. Pesticides should not be used in areas where people, pets, wildlife and other non-pest species may be exposed to them.

The United States Environmental Protection Agency (EPA) registers pesticides for use within the United States, but that does not necessarily mean that a particular pesticide is safe under all conditions. The pesticide label must be read and followed. A pesticide label is a legal document that provides information on how to properly mix, apply, store and dispose of the product. Failure to follow label directions is against federal law and anyone who does not follow the directions is subject to penalties and fines. The label also provides a signal word to help identify the relative hazard associated with the product. The signal words are listed in order of increasing hazard, from CAUTION, to WARNING to DANGER.

Minimizing Exposure from Pesticides

Following these general recommendations will minimize pesticide exposure to people, pets and other non-pest living organisms.

1. All pesticides used in Tennessee must be registered by EPA and the Tennessee Department of Agriculture.
2. All label instructions must be read and followed.
3. A pesticide should be labeled for the specific site. Use a product that is intended for the target pest rather than a pesticide intended for a lot of pests.
4. Limit the use of sprays, foggers and volatile formulations. Use baits or dusts in wall voids or cracks and crevices, or apply sprays directly to cracks and crevices. These treatments minimize exposure to the facility's occupants, while maximizing exposure to the pest.
5. Rodents can be controlled with snap traps, multiple catch traps and glue boards. The use of rodenticides (chemicals designed to poison rodents) is highly discouraged. Only if other control measures prove inadequate and a health risk is evident should rodenticides be used. Rodenticides, regardless of packaging, should be placed either in locations not accessible to children and other living organisms or in tamper-resistant bait boxes. Securely lock or fasten shut the lids of all bait boxes. Bait should be placed in the baffle-protected feeding chamber of the box, and not the runway of the bait box. Bait boxes are not considered tamper-resistant until they are anchored to a surface.
6. Apply pesticides when people, pets and other non-pest living organisms are not present or in areas where they will not be exposed to the pesticides. If aerosols or sprays are applied, the room should be ventilated as indicated on the product label or longer if stated by the IPM policy. Be aware that residues can remain long after they are applied. Note the time given on the label before anyone should reenter the area treated. This time interval can be extended by so stating in the IPM policy.
7. Make sure the proper protective clothing and equipment stated on the product label are used when the pesticide is applied.
8. Notify occupants according to the childcare center's IPM policy statement. Pay particular attention to individuals who may be at higher risk.
9. Copies of current pesticide labels, consumer information sheets and Material Safety Data Sheets (MSDS) should be accessible.

Pesticide Storage

Pesticides should preferably be stored off-site whenever possible. If stored on-site, pesticides should be kept in buildings that are locked and available only to authorized individuals. Signs should be posted on the storage area with warnings to keep out and with *danger* and *peligro* (and the equivalent term in any other predominantly used languages) in large type. Adequate ventilation is needed for the pesticide storage area. Do not store pesticides in places where flooding may occur or in open places where they might spill or leak. Store flammable liquids away from heat sources and open flames. Check label requirements and state recommendations for pesticide storage.

If pesticides are stored in occupied buildings, extra care must be taken to make sure air does not get contaminated. Again, a notice should be placed outside the storage area. Store all pesticides in their original containers and secure lids tightly. Childproof caps should be properly locked. Keep in mind, however, that even closed pesticide containers may leak or volatilize toxic chemicals into the air. Therefore, pesticides should only be stored in spaces that are physically separated and closed off from occupied spaces and where there is adequate ventilation (such as where the air is exhausted directly to the outside).

In addition, precautions are needed to ensure that the air in the storage area has no chance of mixing with the air in the central ventilation system.

The storage spaces should be checked regularly to determine if there are any leaks or other hazards. To reduce storage problems, buy only enough pesticides for one season. By mixing only the amount needed for the immediate application, pesticide waste can be reduced.

Equipment

Equipment used in an IPM program is effective if used by competent pesticide applicators. To use pesticides safely, efficiently and economically, applicators should be thoroughly trained to understand the uses of their equipment. The list of equipment provided below is not all-inclusive, but is just a sampling of the equipment available to the professional pesticide applicator. Other equipment is available, especially for crack-and-crevice treatments, and new equipment continues to be produced.

Traps, Bait Boxes and Monitoring Devices

Rodent-control traps include snap traps, boxes that use trap doors or spring-loaded, multiple-catch traps and small animal traps. Bait boxes or stations are containers that hold poisonous baits or glue boards. For safety reasons, they should be tamper-proof. Electric flytraps use an attracting light that lures flies to glue boards. **Sticky traps are the cornerstones of urban IPM.** These small glue boards are used to catch mice, rats, cockroaches, other insects and organisms. Sticky traps are also used to monitor pest populations, especially cockroaches, and to determine which types of pests are present.

Bait Stations and Bait Gels

Bait stations have a chamber that contains an attractant spiked with insecticide. Stations confine the insecticide to a small area and are tamper-resistant. Cockroaches feed on the bait and return to where they live, where they defecate and die. Other cockroaches pick up the poison through eating the feces and/or the dead or dying cockroach. The amount of insecticide needed to reduce a cockroach infestation is decreased, as are the chances of insecticide exposure to building occupants. Gels allow for placement of small quantities of insecticide directly into cracks and crevices where cockroaches rest or forage. Baits for ants contain slow-acting poisons that allow the ants to bring the poisoned bait back to the nest and transfer the poisoned food to all members of the colony, thereby killing the entire colony. Baits can be placed where sprays are not used, such as in electrical junction boxes and outlets. (Insects often use wires as guidelines or pathways to travel from one area to the next.) Bait stations and gels must be placed far from any pesticide sprays, above floor level so they will not be flushed with mop water, and be located where the insects will find them.

Sprayers and Dusters

In the past, the one- or two-gallon, stainless steel compressed air sprayer was the piece of equipment used most often for pest control. Current IPM practices, however, minimize the use of sprays whenever possible. If other pesticide applications have been exhausted, however, different spray patterns can be used, depending on the nozzle chosen. Spray pressure depends on the amount of pumping applied to the sprayer. Most nozzles are designed to deliver two flat-fan and two pin-stream patterns. In most cases, the pin stream is not fine enough to produce an ideal crack-and-crevice treatment unless the nozzle is fitted with a narrow plastic tube. The trained pest-control applicator inserts the tubing into the edge of a crack and can then deliver the correct amount of pesticide into the crack. This method provides the most effective spray pattern for cockroach control, with little or no exposure of building occupants to the insecticide.

Dusters apply a thin layer of a powdery mixture to a wall void or crack. Dusts accumulate on the insect's body. They may be abrasive and cut the insect's outer layer, causing the insect to dry up; or they contain poisons that are absorbed through the outer layer. Some of these poisons are ingested during grooming and act as a stomach poison. Boric acid products are often used in dusters. The three types of dusters commonly used by pest management technicians are bulb, bellows and plunger dusters.

Public Access to Pest-control Service

Building occupants should have access to information describing pesticide treatments. If pest-control services (monitoring and inspections as well as pesticide applications, etc.) are performed on the same

day of each month, concerned individuals can most easily find out if, when, where and which pesticides were applied before entering the school the next day. All pest-control services must be documented in a logbook in a central area. The IPM coordinator should be prepared and available to provide more specific information to concerned individuals. A voluntary register of individuals adversely affected by exposure to pesticides can be kept at the facility. Local poison control center and emergency personnel phone numbers should be kept accessible, preferably with the logbook.

Step 7: Evaluating Results and Record Keeping

Accurate record keeping is essential to a successful IPM program. It allows the childcare center to evaluate the results of practicing IPM and determine if pest management objectives have been met. Keeping accurate records leads to better decision-making and more efficient results. Accurate records of inspecting, identifying and monitoring can identify changes in the site environment (less available food, water or shelter for the pests), physical changes (sealing cracks and other building repairs), reduced numbers of pests or changes in the amount of damage or other loss to the facility. Each childcare center should keep a complete and accurate logbook of pest-control services. Pesticide-use records should also be maintained to meet any requirement of the Tennessee Department of Agriculture (TDA) and the childcare center's administrators. The logbook should contain the following items (see the Logbook at http://eppserver.ag.utk.edu/sch_ipm.htm for samples)

1. A copy of the facility's approved Integrated Pest Management (IPM) plan and service schedule for the facility (indoors and outdoors).
2. A copy of the current EPA-registered label and MSDS for each pesticide product used.
3. Pest surveillance data sheets that record, in an organized manner, the type and number of pests or other signs of pests found on the site. Examples are date, trap (type, number and location) and numbers and types of insects trapped. (See http://eppserver.ag.utk.edu/sch_ipm.htm)
4. A diagram of the facility (indoors and outdoors) showing the location of pest activity, including the location of traps and bait stations in and around the site.
5. A diagram noting the dates and locations of treated areas.
6. Other pesticide-use information required by TDA.

Evaluating the Costs

Long-term costs of IPM may be less than a conventional pest-control program that relies on the use of pesticides. Long-term labor costs, however, may be higher for IPM programs than conventional pesticide treatments. Labor costs may be balanced by fewer service calls for the IPM coordinator and reduced expenditures for materials.

Current housekeeping, maintenance and pest management operations will determine whether an IPM program raises or lowers costs. Also factoring into the costs of using IPM are whether the pest-management services are contracted, performed in-house or both. To fit the IPM program into the existing budgetary framework, facility directors should consider additional and redistributed resources. Insufficient resources will jeopardize the success of IPM.

Potential Added Costs

Starting an IPM program may require repair and maintenance to prevent pest entry and to stop access to food, water and shelter. Examples of one-time expenses that are likely to pay back with future budgetary savings include:

1. Improving waste management by moving trash or garbage containers away from buildings to reduce pest invasion. This cost is a one-time expense that could reduce pest problems and costs for pest-control methods.
2. Installing physical barriers such as air curtains over outside entrances to kitchens or light traps to reduce flying insect problems. There may be future maintenance costs associated with this equipment.
3. Quickly repairing leaky pipes and other structural problems reduces future maintenance problems and prevents pest problems. Caulking cracks and crevices in buildings and sealing pipe openings in walls may be added costs, but are effective in reducing cockroach shelter and their ability to spread throughout a building along the

pipes. These measures also add to the energy efficiency of the building.

4. Training staff in IPM may result in increased costs initially. Contact your county UT Extension office to see if training is available.
5. Re-landscaping the area next to buildings to discourage pests may cost in the short-term, but in the long run, repair and maintenance may reduce long-term costs. Childcare centers with an active maintenance and repair program may be better able to absorb these costs within their current budget. Childcare centers with active parent volunteers may also be able to use the parents as resources to improve the childcare center grounds.

How to Develop Contracts or Bid Invitations for Pest-control Services in Childcare Facilities

While it is conceivable a childcare center could successfully perform IPM using its own employees, if the facility served food or educated more than 10 children, this would require one of the employees to be a pest-control operator licensed by the Tennessee Department of Agriculture (TDA) and anyone applying pesticide would also have to be certified by TDA. This is highly unlikely, and unless the childcare center is housed in a school, church or other organization that takes care of the pest management, it is recommended that most childcare centers contract with a pest-control firm to provide the pest-control services.

Advantages of Using Contracted Pest-control Services

Professional pest-control personnel usually are more experienced with the techniques that safely and effectively control pests. Childcare center personnel are not required to maintain contracted individuals' licenses, nor are they required to train the pest-control technician. Potential liability could be reduced when using contracted services. The need for locating a special storage and disposal site for pesticides is eliminated.

Communication between contracted individuals and other childcare personnel, such as custodians, may not be developed as easily as an in-house program, but the contract can include regular consultation between the pest management professional and the IPM coordinator.

Unlike schools and other state-funded programs, most childcare centers do not have to bid for pest management services. It is important, however, to enter into a contract that assures the center is receiving the highest quality IPM approach it can afford. While most pest management professionals know and often use IPM for many of their clients, the contract needs to contain certain specifications. It is also critical to compare one company's bid to another. A good contract lays out all the pest management expectations of the childcare center.

IPM Contract Specifications Essential Items

Blank lines or words printed in italics may be modified to fit the situation of a particular childcare center. Sometimes suggestions are indicated in parentheses next to the blank.

Some suggested elements for IPM bid specifications are listed below:

1. The company must conduct a detailed on-site inspection before the contract is signed. This allows the company to view firsthand the facilities and pest problems, so the staff can make a realistic estimate of the services needed and the time required for these services.
2. Minimum service times (monthly monitoring and inspection, for example) are to be defined in the contract. Failure of the contractor to meet these minimum service times will be grounds for cancellation of the contract by the childcare center.
3. The use of least toxic materials necessary to provide satisfactory pest control, as defined by _____, should be understood and agreed to by the contractor.
4. The contractor should use appropriate monitoring tools and procedures on a regular basis to find pest infestations and assess the need for corrective treatment.
5. The childcare center should receive from the contractor copies of labels and Material Safety Data Sheets (MSDS) for all products to be used on the childcare property. The childcare center reserves the right to approve or disapprove any pesticide, device or type of application.

6. The use of bait stations, crack-and-crevice or void treatments are preferred over the use of aerosol, broadcast, spot and baseboard treatments. The childcare center should not allow the use of aerosol or machine-generated fogs, mists or space sprays without written permission from the IPM coordinator.

These and other provisions are specified in the following set of contract specifications. This is a suggested model for childcare centers that wish to implement an IPM program.

Contracting for Pest Management Services

Most childcare centers will enter into a contract with a pest management company to control the pests normally found in buildings in Tennessee. The following is an example of components to a contract that specifies Integrated Pest Management (IPM) for the preferred pest-control program. Unless the childcare center is a part of a school system, the contract will not usually have to go through a bid process. If a bidding process is required or desired for the acquisition of a pest management company, please refer to UT Extension publication PB1603, *Suggested Guidelines for Managing Pests in Tennessee's Schools: Adopting Integrated Pest Management,* for issuing an invitation for bid. Check the UT Extension School IPM Web site, http://eppserver.ag.utk.edu/sch_ipm.htm for updates to all of the school IPM forms. Even if the childcare center does not want to conduct a formal bid process, it is advisable to get quotes from three companies and compare.

If you decide to interview and select a pest management control company without bidding, there are still a few things that need to be done prior to signing a contract.

Pre-contract Work:

1. Acquire and follow-up with references. Have prospective contractors submit at least three references of customers who have similar services.

Company Name _____

Person to Contact _____

Company Address _____

City, State, Zip _____

Phone _____

2. Preference may be given to bidders with a trained entomologist on staff, or access to one as a consultant. A board-certified entomologist (BCE) is a person with formal training in entomology and an associate-certified entomologist (ACE) is one with more hands-on training and professional development. A BCE's and an ACE's expertise has been examined and certified by the Entomological Society of America. For more information about BCEs or ACEs in your area, contact the Entomological Society of America at 10001 Derekwood Lane, Suite 100, Lanham, MD 20706-4876; tel. (301) 731-4535; http://www.entsoc.org/.
3. A contractor shall be, in the judgment of the childcare center, regularly established in business; financially responsible; able to show evidence of satisfactory past performance; and ready, willing and able to render prompt and satisfactory services.
4. The contractor shall furnish documentation specifically stating:
   a. The company has been in business for at least ____ *(5)* years; and
   b. The company has available, under direct employment and supervision, the necessary personnel, organization and facilities to properly fulfill all the services and conditions required under these specifications. A copy of the Tennessee Department of Agriculture issued license and commercial pesticide applicator certification cards for all technicians who will service the account will be furnished to the childcare center.

Model Contract for Childcare Centers

The wording and content of these specifications are provided only as a guide for childcare centers wishing contractors to use Integrated Pest Management (IPM). Childcare centers are not legally required to use all or any portion of this model contract. The following pests or pest populations are excluded from this contract: termites, carpenter ants and other wood-destroying organisms; extensive brown recluse spider populations; mosquitoes; birds, bats, snakes and all other vertebrates other than commensal ("living with or in close association with humans") rodents; pests that primarily feed on outdoor vegetation; and large outdoor populations of fire ants. A separate contract can be used for these pests.

Blank lines or words and numbers printed in italics may be modified to fit the situation of a particular childcare center. Sometimes a suggested wording, number or example is indicated in parentheses next to the blank.

Description of Services
The purpose of this contract is to provide _____ childcare center with a source to provide pest management services at the prices offered herein, for the terms of the agreement and any renewal periods. It is the policy of the _____ childcare center to use Integrated Pest Management (IPM) as the strategy for control of pests in and around the childcare facilities. The following description details the _____ childcare center's understanding of the scope and type of IPM services to be rendered.

The specifications should be read carefully and understood by the pest management company. Failure to comply with the specifications may provide grounds for termination of the contractual agreement. Costs should reflect not only the expected costs to the contractor providing basic pest-control services, but also the costs of providing supplementary services such as reporting, emergency treatment, inservice training and quality control activities.

Standard contract clauses and requirements may be inserted here. Contracts typically include clauses on prices, price escalation, contract extensions, cancellation, insurance requirements, workers' compensation, subcontracting, bid bonds, payment policy and conditions for acceptance of contractors, etc. The following clauses are relevant specifically to pest-control contracts and are included to assist the childcare center in developing pest-control specifications.

Site Visits
The contractor is required to inspect all premises to be covered in the contract prior to the signing of the contract.

Scope of Services –
Description of Services
The contractor shall provide a comprehensive Integrated Pest Management (IPM) plan for the buildings and other areas specified herein. This plan shall be in accordance with the childcare center's IPM policy. IPM is a process for achieving long-term, environmentally sound pest suppression through the use of a variety of technological and management practices. Control strategies in an IPM plan should extend beyond the application of pesticides to include structural and procedural modifications that reduce food, water, shelter and access used by pests.

The contractor shall furnish all supervision, labor, materials and equipment to accomplish the surveillance, trapping and pesticide application components of the IPM plan. The contractor shall also provide detailed, site-specific recommendations for structural and procedural modifications necessary to achieve pest prevention.

Pests Included and Excluded
The contractor shall adequately suppress the following pests:
1. Indoor populations of commensal rodents (e.g. Norway and roof rats, house mice), cockroaches, ants (including, but not limited to, fire ants and Pharaoh ants*), flies, spiders and any other arthropod pests not specifically excluded from the contract.
2. Populations of the above pests that are located outside of the specified buildings, but within areas immediately adjacent to buildings.
3. Winged termite swarms emerging indoors.
4. Severe brown recluse infestations may require a separate contract.

*The childcare center may be charged for the additional cost of Pharaoh ant bait materials.

Populations of the following pests are excluded from this contract:

1. Termites, carpenter ants and other wood-destroying organisms
2. Mosquitoes
3. Birds, bats, snakes and all other vertebrates other than commensal rodents
4. Pests that primarily feed on outdoor vegetation and large outdoor populations of fire ants

General Contractor Responsibilities –
Initial Inspection of Facilities

The contractors shall conduct a thorough initial inspection of each building or site within ____*(e.g. 10)* days of the initiation of the contract. The purpose of the initial inspection is for the contractor to evaluate the pest-control needs of all premises and to identify problem areas and any equipment, structural features or management practices that are contributing to pest infestation. Access to building space shall be coordinated with the IPM coordinator. The IPM coordinator will inform the contractor of any restrictions or areas requiring special scheduling.

Pest-control Plan

Before rendering service, within ____ *(e.g. 10)* days after the initial inspection, the contractor shall submit to the IPM coordinator a Pest-control Plan for each building site. Within ____ *(e.g. five)* working days of receiving the Pest-control Plan, the IPM coordinator will decide if the plan is acceptable. If aspects of the Pest-control Plan are incomplete or disapproved, the contractor shall have ____ *(e.g. two)* working days to submit revisions. The contractor should be on-site to initiate service within ____ *(e.g. five)* working days following notice of approval.

The Pest-control Plan shall consist of five parts as follows:

1. Proposed methods and equipment for service: The contractor shall provide a summary of proposed control methods including current labels and Material Safety Data Sheets (MSDS) of all pesticides to be used, brand names of pesticide application equipment, rodent bait boxes, insect- and rodent-trapping devices, pest-monitoring devices, pest surveillance and detection equipment, and any other pest-control devices or equipment that may be used to provide service.
2. Proposed methods for monitoring and surveillance: The contractor shall describe methods and procedures to be used for identifying sites of pest harborage and access and for making objective assessment of pest population levels throughout the term of the contract. In addition, the contractor will work with the IPM coordinator to establish population levels that constitute unacceptable levels of pest presence in childcare facilities.
3. Service schedule for each building site: The contractor shall provide complete service schedules that include planned frequency of contractor visits, specified day(s) of the week for contractor visits and approximate duration of each visit.
4. Description of any structural or operational change that would facilitate the pest-control effort: The contractor shall describe site-specific solutions for observed food sources of pest food, water, harborage and access.
5. Commercial applicator or technical license: The contractor shall provide a current list of names along with the photocopies of the commercial applicator license and the technicians' certification card for every contractor employee who will be performing on-site services under this contract.

Record Keeping

The contractor shall be responsible for maintaining a pest-control logbook or file for each building or site specified in this contract. These records shall be kept on the childcare facility property (normally in the director's office or some other convenient site) and maintained on each visit by the contractor. Each logbook shall contain the following items:

1. Pest-control Plan: A copy of the contractor's approved Pest-control Plan for the facility, including labels and MSDS sheets for all pesticides used in the building, brand names for all pest-control devices and equipment used in the building and the contractor's service schedule for the building.

2. Service and Complaint Logs: A logbook for recording service visit activities, including complaints from staff concerning pest sightings, pesticide applications, sanitation/environmental status, building maintenance needs and other information must be maintained and located in a central area of each building (*director's office*). A floor plan of the site must also be recorded showing the number and location of monitoring traps and results of trap inspection such as:
   a. date checked,
   b. trap number and location,
   c. trap condition (either acceptable or replace),
   d. number and species of pests trapped,
   e. other evidence of pests (cast skins, feces, rub marks, etc.) or damage, and
   f. need for pest management.

All services must be recorded in the logbook before the childcare center opens the next day or before the childcare center is occupied, whichever comes first. Forms should show times in and out and should be signed by the contractor at each site visit.

Public Access to Records of Pest-control Services
The contractor shall fulfill all obligations with regard to public access to pest-control service records as indicated in the childcare center's *Official IPM Policy Statement*. All information may be kept in the logbook and access allowed to interested individuals.

Times of Service
The contractor shall perform routine pest-control services only during times when students are not expected to be present for at least _____ (*e.g. 12 hours or as indicated in the childcare center's Official IPM Policy Statement*) after the application. *The minimum re-entry time stated on the pesticide label must be adhered to.* In the event of an emergency treatment, the contractor shall work with the IPM coordinator to determine whether an emergency situation exists before applying any pesticides. In such cases, pesticides may be applied only to the local area of infestation if students are present or if less than _____ (*e.g., 12 hours or as indicated in the childcare center's Official IPM Policy Statement*) will elapse before children are expected to be present. *Again, the minimum re-entry time stated on the pesticide label must be adhered to.* In the event of such an emergency treatment, the contractor will maintain records of the reasons for such treatments.

Safety and Health
The contractor shall observe all safety precautions throughout the performance of this contract and shall assume full responsibility and liability for compliance with all applicable regulations pertaining to the health and safety of personnel during the execution of work and shall hold the childcare center harmless for any action on its part or that of its employees that results in illness, injury or death.

Uniforms and Protective Clothing
All contractor personnel working in or around buildings designated under this contract shall wear distinctive uniform clothing. The contractor shall determine and provide additional personal protective equipment required for the safe performance of work. Protective clothing, equipment and devices shall, as a minimum, conform to Occupational Safety and Health Administration (OSHA) standards for the products used.

Vehicles
Vehicles used by the contractor shall be identified in accordance with state and local regulations and shall be operated in a safe manner on childcare center property. Vehicles must meet Tennessee Department of Transportation requirements. Sides of company vehicles must be labeled with the name of the company and the charter number. The size of the lettering shall not be less than 2 inches tall.

Licensing
Throughout the term of this contract, the contractor shall maintain a current license issued by the Tennessee Department of Agriculture Division of Regulatory Services. In addition, all contractor personnel providing on-site pest-control services must be under the direct supervision of a person licensed to apply pesticides.

Complaints
Should at any time the childcare center become dissatisfied with pest-control service, the contractor shall be notified in writing by the IPM coordinator regarding problems that occurred. The notice will detail the problem and site(s) experiencing the problems. The contractor will be required to contact the IPM coordinator to discuss possible solutions and the contractor will be given a date by which response with the proposed solutions must be submitted.

Pest-control Responsibilities –
Structural Modifications and Recommendations
The contractor shall be responsible for advising the IPM coordinator about any structural, sanitary or procedural modifications that would reduce pest food, water, harborage or access. The childcare center will not hold the contractor responsible for carrying out structural modifications as part of the pest-control effort. However, minor applications of caulk and other sealing materials by the contractor to eliminate pest harborage may be approved by the childcare center on a case-by-case basis. The contractor shall obtain the approval of the IPM coordinator prior to any application of sealing materials or other structural modification.

Training. The contractor will familiarize the appropriate childcare center personnel, i.e., food service, custodian and maintenance personnel, IPM coordinator and other appropriate individuals, with IPM during in-service trainings provided within __months of accepting the contract.

Contractor entomology and/or IPM educational presentations made to the students will be encouraged. The contractor will be paid $__/hour for the presentation.

Use of Pesticides
The contractor shall be responsible for application of pesticides according to the label. All pesticides used by the contractor must be registered with or otherwise allowable by the U.S. Environmental Protection Agency (EPA) and by the state of Tennessee. Transport, handling and use of all pesticides shall be in strict accordance with the manufacturer's label instructions and all applicable federal, state and local laws and regulations.

The contractor shall adhere to the following rules for pesticide selection and use:
1. ***Non-pesticide Products and Their Use***
   The contractor shall use non-pesticidal methods of control wherever possible. For example: Allergen-filtering portable vacuums rather than pesticide sprays shall be used for initial clean-outs of cockroach infestations, for swarming (winged) ants and termites and for control of spiders in webs wherever appropriate. Trapping devices rather than pesticidal sprays shall be used for indoor fly control wherever appropriate.
2. ***Application by Need***
   Pesticide application shall be according to need and not by schedule. As a general rule, applications of pesticides in any inside or outside area shall not occur unless visual inspections or monitoring devices indicate the presence of pests in that specified area. Preventive pesticide treatment of areas where surveillance indicates a potential insect or rodent infestation is acceptable on a case-by-case basis, as approved by the IPM coordinator.
3. ***Pesticide Products and Their Use***
   When it is determined that a pesticide must be used to obtain adequate control, the contractor shall employ the least hazardous material, most precise application technique and minimum quantity of pesticide

necessary to achieve control. When selecting pesticide products, **highest priority should be given to pesticides with a signal word of caution or category III and IV classification.**

Containerized and other types of crack-and-crevice-applied bait formulations, rather than sprays, shall be used for cockroach control and ant control wherever appropriate. As a general rule, liquid aerosol or dust formulations shall be applied only as crack-and-crevice treatments, with application devices specifically designed or modified for this purpose. "Crack-and-crevice treatment" is defined in this contract as an application of small amounts of insecticides into cracks and crevices in which insects hide or through which they may enter a building.

Application of pesticide liquid, aerosol or dust to exposed surfaces and pesticide space sprays (including fogs, mists and ultra low-volume applications), shall be restricted to unique situations where no alternative measures are practical.

The contractor shall obtain the approval of the IPM coordinator prior to any application of pesticide liquid, aerosol or dust to exposed surfaces or any space spray treatment. The contractor shall take all necessary precautions to ensure children and staff safety and all necessary steps to ensure the containment of the pesticide to the site of application.

4. ***Pesticide Storage/Disposal***
   The contractor shall not store or dispose of, any pesticide product on childcare center property.
5. ***Pesticide Sales and Distribution***
   The contractor shall not sell, share or make available any pesticide products to any non-licensed childcare center employee.

Rodent Control

As a general rule, rodent control inside occupied buildings shall be accomplished by trapping devices. All such devices shall be concealed out of the general view and in protected areas so as not to be affected by routine cleaning and other operations. Trapping devices shall be checked on a schedule approved by the IPM coordinator. Trapping shall not be performed during periods when maintenance will be delayed by holidays, weekend, etc. The contractor or IPM coordinator shall be responsible for disposing of all trapped rodents and all rodent carcasses in an appropriate and timely manner.

In circumstances when rodenticides are deemed essential for adequate rodent control inside occupied buildings, the contractor shall obtain the approval of the IPM coordinator prior to making any interior rodenticide treatment. All rodenticides, regardless of packaging, shall be placed in EPA-approved, tamper-resistant bait boxes to be inaccessible to children, pets, wildlife and domestic animals.

Frequency of bait box servicing shall depend upon the level of rodent infestation. All bait boxes shall be maintained in accordance with EPA regulations, with an emphasis on the safety of non-target organisms. The contractor shall adhere to the following rules:

1. All bait boxes shall be placed out of the general view, in locations where they will not be disturbed by routine operations.
2. The lids of all bait boxes shall be securely locked or fastened shut.
3. All bait boxes shall be attached or anchored to the floor, ground, wall or other surface, so the box cannot be picked up or moved.
4. Bait shall always be placed in the baffle-protected feeding chamber of the box and never in the runway of the box.
5. All bait boxes shall be labeled with the contractor's business name and address and dated by the contractor's technician at the time of installation and at each servicing.

Program Evaluation
The childcare center will continually evaluate the progress of this contract in terms of effectiveness and safety and will require such changes as are necessary. The contractor shall take prompt action to correct all identified deficiencies.

Quality Control Program
The contractor shall establish a complete quality control program to assure the requirements of the contract are provided as specified. Within _____ (*e.g. five*) days after the start of the contract, the contractor shall submit a copy of his/her program to the childcare center.

Attachments should include a copy of the childcare center's IPM policy.

Weighted Factor Rating System for Evaluating Pest-control Proposals or Bids

Price should not be the sole factor upon which a contract is awarded. Many childcare centers, schools and businesses address this problem by using a weighted factor rating system. Suggested weights and factors are listed if childcare centers wish to use a weighted factor rating system. The factors and weights can be modified by each childcare center according to the center's own priorities and preferences.

Below is a sample of a completed weighted factor rating form. In this example, supplier B has the highest rating and would be awarded the contract, even though overall price was higher than that for supplier A.

Ratings within the various categories can be based on the childcare center director's subjective assessment of a pest management professional's qualifications or might be based on a predetermined objective set of scoring criteria, such as giving a point for each desired component of a program that a potential contractor demonstrates.

For example, companies A, B and C submitted $5,000, $5,800 and $6,000, respectively, for a one-year contract. The $5,000 serves as a benchmark because it was the lowest quote. Therefore, company A receives the highest rating, in this case, of 35; company B quote was 16 percent higher and therefore this company is given a rating of 16 percent lower than the top rating ([35 - [35 x .16= 5.6]]= 29.4); and the company C quote was 20 percent higher, hence a 20 percent lower rating (28).

Sample Weighted Factor Rating Form for Evaluating Pest-control Proposals

FACTORS	MAXIMUM RATING	SUPPLIER (Weights) A	B	C
Technical Factors				
IPM plan	25	22	25	22
Technician experience/ IPM training	15	12	15	12
Previous experience in educational institutions or other public facilities	15	13	15	5
Price Factors				
Price	35	35	29	28
Other Factors				
Managerial, financial capabilities	5	3	5	3
Quality control program	5	4	5	4
TOTAL SCORE	**100**	**89**	**94**	**74**

Price should not be the only factor when judging proposals from competing pest-control firms. This weighted factor rating form can be used to help evaluate each proposal on several criteria. The above factors and weights can be modified by each childcare center according to its individual priorities.

Appendix I
Developing an IPM Policy Statement

The first step in developing your childcare center's IPM program is to draft an IPM policy. It is important to distinguish between an IPM policy and an IPM plan. A policy is a generalized guide to help childcare center personnel develop a more detailed plan for action. An IPM plan includes the more specific instructions on how to implement the policy at various childcare center facilities.

The IPM policy should state the intent of the childcare center administration to implement an IPM plan; however, the policy need not include the plan. The policy should succinctly state the childcare center's goals and expectations of staff and contractors.

The policy should be based on generally accepted tenets of integrated pest management, including:

1. strategies that rely on the best combinations of pest management tactics that are compatible with human health and environmental protection;
2. proper identification of pest problems;
3. monitoring programs to determine when pests are present or when pest problems are severe enough to justify corrective action;
4. use of non-chemical management strategies whenever practical; and
5. preferential use of least-toxic chemical controls when pesticides are needed.

To help develop a childcare center IPM policy statement, the following model is provided to adopt or modify as needed.

Integrated Pest Management Policy Statement

_____ childcare center
Approved _____

Structural and landscape pests can pose significant problems to people, property and the environment. Pesticides can also pose risks to people, property and the environment. It is therefore the policy of the _____ childcare center to incorporate integrated pest management (IPM) procedures into the maintenance program conducted by this childcare center for control of indoor and outdoor pest problems.

Definitions
Pests are populations of living organisms (animals, plants or microorganisms) that interfere with use of childcare center facilities for human purposes. Strategies for managing pest populations will be influenced by the pest species and whether that species poses a threat to people, property or the environment.

Integrated pest management, or IPM, is a strategy that focuses on long-term prevention or suppression of pest populations using a combination of tactics that minimize the impact of control activities on human health or other non-target organisms.

An IPM plan is a set of procedures detailing how particular pest problems will be handled by childcare center IPM staff. The IPM plan for a particular facility will include descriptions of planned activities to reduce pest presence or maintain a pest-free environment. Details within such plans may include needed facilities or landscape improvements, pest-proofing modifications, approved non-chemical and chemical control activities, a pest monitoring plan, educational plans and criteria for evaluating the need for control and the success of control efforts.

Development of IPM Plans

The childcare center should appoint an IPM coordinator whose duties will include approving IPM plans for indoor and outdoor childcare center facilities. IPM plans will be designed to accomplish the following:

- Reduce any potential human health hazards and protect against a significant threat to the safety of students, staff or the public.
- Prevent loss or damage to childcare center structures or property.
- Prevent pests from spreading into and adversely affecting the community or to plant and animal populations beyond the site.
- Enhance the quality of life for students, staff and the public.

Essential IPM Plan Components

The childcare center's pest management plans should include the following components:

- All activities designed to reduce pest populations will be based on an accurate determination of the pest's identity and on knowledge of the pest's biology and life cycle.
- Significant, recurring pest problems will be observed and recorded by IPM staff using monitoring methods so pest populations can be detected and control measures applied to the appropriate sites.
- Predetermined action thresholds for important pest problems will be determined by IPM staff, so results of inspections and monitoring programs can be used to help staff objectively determine when control actions are justified.
- The full range of control options, including physical controls, mechanical controls, biological controls and chemical controls (including the option of "no action"), will be considered when deciding on a pest management action.
- Educational activities will be conducted to gain cooperation and understanding among childcare center staff, students and the public.

Pesticide Use in Childcare Center Facilities

The decision concerning whether or not to apply a pesticide will be based on a review of all other available options and a determination that these options are not acceptable or are not feasible. Cost or staffing considerations alone should not be adequate justification for use of chemical control agents. Efforts will be made to avoid the use of pesticides by adequately pest-proofing facilities, good sanitation practices, selection of pest-resistant plant materials and good horticultural practices.

When it is determined that a pesticide must be used to meet important management goals, the least-hazardous material adequate for the job will be chosen.

Cooperation with IPM Coordinator

The childcare center will provide administrative support to the IPM coordinator for developing an IPM program that relies on minimal pesticide use. Such support will include efforts to address in a timely fashion, as budgets permit, any structural, horticultural and sanitation modifications recommended by the coordinator to reduce or prevent pest problems. Furthermore, the childcare center should assist the coordinator in developing and delivering materials and programs for staff, students, parents and the public to educate them about the importance of sanitation and pest control.

Contractual Agreements with IPM Providers

All outside contractors providing pest-control services will be required to follow the same IPM standards required for in-house staff. All contracted pest-control activities will follow IPM plans based on the IPM components outlined above. The childcare center will take steps to ensure that selection of a contractor includes consideration of the contractor's ability to provide satisfactory IPM services in addition to price.

Facilities Planning

The childcare center shall include pest management considerations in facilities planning. Such considerations include, but are not limited to, the planting of well-adapted and pest-tolerant plant varieties outdoors; landscape designs that require minimal fertilizer and pesticide inputs; proper placement and types of lighting to reduce pest entry into buildings; placement of dumpsters; storage of pesticide products; and pest-proof design of doors and ventilation intakes.

Cooperation with Regulatory Agencies
All pesticide storage, transportation and application will be conducted in accordance with the requirements of the:

- Federal Insecticide, Fungicide and Rodenticide Act (7 United States Code 136 et seq.)
- Environmental Protection Agency regulations in 40 CFR
- Occupational Safety and Health Administration regulations
- Laws and regulations governing pest-control operators and applicators of restricted use pesticides, Tennessee Department of Agriculture, Division of Regulatory Services
- Department of Human Services and Department of Education, and
- Any additional childcare center policies and procedures.

Any person applying pesticides on childcare center property, if the center serves food or educates more than 10 students, must have a pesticide applicator's license or be under the direct supervision of a person licensed to apply pesticides. Therefore, teachers or other occupants should not bring or use pesticides inside childcare centers unless they are licensed and specifically granted permission by the officially designated IPM coordinator to do so.
The following is strongly suggested:

- Students, staff and parents should have access to a logbook that contains pesticide application records and other pest-control services and information, including copies of labels and Material Safety Data Sheets (MSDS) used at the childcare center;
- Parents, staff, students and other occupants should be made aware of the logbook and overseer through childcare center policies/procedures, and included with other information parents receive at the beginning of the childcare center year.
- A registry of individuals sensitive to chemicals will be kept at each childcare center. These individuals will be informed before products containing these chemicals are used.
- Pest-control services, including pesticide applications, should be recorded in a logbook prior to the next occupation of the building (before childcare starts the next day).
- This logbook should be kept in a central area that is easily accessible in each childcare center.
- An overseer of the logbook should be appointed in each childcare center.
- A _____ (*e.g. 12-hour*) waiting interval (or longer if indicated by the label) between pesticide application and student occupation of treated facilities should be adhered to.
- Pesticide applicators should be educated and trained in the principles and practices of IPM and the use of pesticides approved for use in the childcare center.
- All applicators must comply with this IPM policy and follow appropriate regulations and label precautions when using pesticides in or around childcare center facilities.

Appendix II
PESTICIDE LABELS AND LABELING

Understanding a pesticide label is important for an IPM coordinator. This section explains the various components of an EPA-registered pesticide label. Labels are legal documents that provide directions on how to mix, apply, store and dispose of the pesticide product. Failure to adhere to label directions is a violation of federal law and is subject to penalties and fines. It is critical to read and understand the label.

The label also provides information to help the IPM coordinator determine a classification for the product under the pesticide approval process. To help you better understand labels, each of the label components is explained in the upcoming pages. **The following was produced by Gene Burgess, Professor, Entomology and Plant Pathology as E&PP Info #300 (3/4/97).** Pesticide labels and labeling are among the most important documents that pesticide applicators see. The label refers to the information printed on the product container. Labeling refers to any information printed on, attached to or accompanying the purchase. The pesticide user is legally responsible to follow all label directions.

Under the "Directions for Use" section of the label is usually a statement that reads as follows: "It is a violation of Federal law to use this product in a manner

inconsistent with its labeling." The user is personally liable if a pesticide application results in unwanted damage. Chemical companies are very careful to include disclaimers on their products' labels, which transfers all risks to the buyers of their products.

A LABEL – Refers only to information printed on the product container. All labels, which are essentially the manufacturer's license to sell, provide the important facts about distribution, storage, sale, use, disposal and safety measures required for the pesticide.

LABELING – Refers to any information printed on, attached to or accompanying the purchase. This may include such things as brochures, leaflets and information handed out by the dealer.

What Is a Pesticide?

A pesticide, as defined by the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), is "...any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any insect, rodent, nematode, fungus, weed, or any other forms of life declared to be pests; and any substance or mixture of substances intended for use as a plant regulator, defoliant or desiccant."

Pesticide Registration

Registration of pesticides is designed to protect people and the environment from abuse of pesticide use. FIFRA, passed in 1947, was primarily a labeling law and was originally administered by the U.S. Department of Agriculture. It has been amended several times to increase and expand the protection of users of pesticides, our food and the environment.

Amendments made in 1972 require that pesticides be classified for either general or restricted use. Further, people who apply restricted-use pesticides, either commercially or privately, are required to be certified by their respective states.

Data Requirements for Registration

As specified in the amended FIFRA, all pesticides must be registered. This includes all pesticides used in and around the home, swimming pools, businesses, public buildings and in agriculture. Before any registration is issued, however, the manufacturer (applicant) must submit data to the Pesticide Registration Division of the Environmental Protection Agency (EPA) showing that the product, when used as directed:

- is effective against the pest(s) listed on the label,
- will not injure humans, animals or crops or damage the environment,
- will not result in illegal residues on feed and food.

Parts of the Label

(1) BRAND or TRADE NAME – Appears on the label. It is the name by which the product is advertised. Different manufacturers may use different brand names for the same pesticide active ingredient.

Common name – The same chemical may appear on the shelf under several brand names, but the common name, or chemical name, may be the same.

Chemical name – These names may be complicated, so common names may be used. Chemical names identify the chemical components and structure of the pesticide. An example is carbaryl for 1-naphthyl N-methylcarbamate.

Ingredient statement – Two kinds of ingredients form pesticides: active ingredients and inert ingredients.

(2) ACTIVE INGREDIENTS – Listed by either chemical name or common name. Must be stated as a percentage by weight or pounds per gallon of concentrate.

(3) INERT INGREDIENTS – Need not be listed, but percent of their content must be. Inert ingredients are currently placed into four categories by the EPA. They include:

- inerts of toxicological concern,
- potentially toxic inerts (high priority),
- inerts of unknown toxicity,
- inerts of minimal concern.

Types of Formulations – Pesticides come in different forms: liquids, wettable powders, dusts, etc. Each form is handled differently, and the label identifies the formulation. An example is 4E, which means it is an emulsifiable concentrate (E) with 4 pounds of active ingredient per gallon. Emulsifiable concentrates can also be represented by EC. Other common types of formulations include:

F, L, or FL	-	Flowables
ULV	-	Ultra Low Volume
D	-	Dusts
B	-	Baits
G	-	Granulars
P or PS	-	Pellets
W or WP	-	Wettable Powders
S or SP	-	Soluble Powders
DF	-	Dry Flowables
WDG	-	Water Dispersible Granules
WDL	-	Water Dispersible Liquids
SC	-	Suspension Concentrates

Other less common formulations include:

AF	-	Aqueous Flowables
AS	-	Aqueous Suspensions
ES	-	Emulsifiable Solutions
MTF	-	Multiple Temperatures Formulation
OL	-	Oil-soluble Liquids
SL	-	Slurrys
ME	-	Microencapsulation

Liquid or dry pesticide particles may be surrounded by a plastic coating to produce a microencapsulated formulation.

Precautionary Statement

(4) HAZARDS TO HUMANS AND DOMESTIC ANIMALS – These statements warn of possible poisoning to humans and animals. Special precautions, including necessary protective equipment, appear here. If the product carries serious risk, proper poison treatment is listed.

Acute effects statements contain statements that indicate which route of entry (mouth, skin, eyes, lungs) must be particularly protected and what specific action needs to be taken to avoid acute effects from exposure. These precautionary statements tell which parts of the body will need the most protection.

Delayed effects statements tell whether the product has been shown to cause problems, such as tumors or reproductive problems in laboratory animals.

Allergic effects statement tells if tests or other data indicate that the pesticide product has the potential to cause allergic effects, such as skin irritation or asthma, the product labeling must state that fact. Sometimes the labeling refers to allergic effects as "sensitization."

Personal protective equipment statements
Immediately following the statements about acute, delayed and allergic effects, the labeling usually lists personal protective equipment requirements. These statements tell the minimum personal protective equipment that must be worn when using the pesticide.

Personal Protective Equipment Includes:

- coveralls over long-sleeved shirt and long-legged pants
- chemical-resistant gloves such as butyl or nitrile
- chemical-resistant footwear plus socks
- eye protection
- respirator with an organic vapor-removing cartridge and a pre-filter approved for pesticides –MSHA/NIOSH approval prefix (23C) or canister approved for pesticides – MSHA/NIOSH approval number (14G)
- overhead applications: add chemical-resistant, wide-brimmed hat or hood
- mixers/loaders and cleaners of equipment: add chemical-resistant apron

(5) ENVIRONMENTAL HAZARDS – Warnings here may include general statements about birds, fish and wildlife or include statements concerning toxicity to honey bees, surface and groundwater contamination and endangered species. Label information on groundwater contamination warns against applying pesticides in situations that may lead to contamination of groundwater.

(6) PHYSICAL AND CHEMICAL HAZARDS – Warnings appear here about potential fire, explosion or chemical hazards. These statements are not located in the same place on all pesticide labeling. Some are in a box headed "Physical or Chemical Hazards," others list them beneath the signal word and some are under headings such as "Note" or "Important."

(7) DIRECTIONS FOR USE – Explanation of correct use of the product. Also tells you which pests the product is registered to control, where the product can be used, when it should be used, how much to use and in which form to use it. This section also says whether the product is for general or restricted use.

Misuse statement – This warns that failure to follow label directions exactly is violating federal law.

Directions for use by reference – Some directions for use that pesticide users must obey are contained in documents that are only referred to on the product labeling. Such instructions include EPA or other government agency regulations or requirements concerning the safe use of the pesticide product.

(8) REENTRY STATEMENT – Some products require that a person without protective clothing not enter the treated area until a certain time has passed. Consult local authorities for special rules that may apply.

(9) CATEGORY OF APPLICATOR – If required for this product, this section will limit use to certain categories of commercial applicators.

(10) STORAGE AND DISPOSAL DIRECTIONS – Pesticide labels will have some basic guidelines for pesticide storage, usually recommending that they be stored in a cool, dry, well-ventilated area away from feed and foodstuffs. Different types of pesticides should be stored separately: herbicides separately from insecticides, as an example. The pesticide storage area should be well-marked with warning signs and be locked to prevent unauthorized entry. Pesticide labeling also contains some general information about how to dispose of excess pesticide and the pesticide container in ways that are acceptable under federal regulations. State and local laws vary, however, so the labeling usually does not give exact disposal instructions. Storage and disposal statements usually appear in a special section of the labeling titled "Storage and Disposal." Improper disposal of excess pesticide, spray mixture, rinsate or the container is a violation of federal law. If these wastes cannot be disposed of according to label directions, contact the Tennessee Department of Environment and Conservation (615) 532-0109, or the National Pesticide Telecommunication Network (800) 858-7378 (24-hour), for guidance.

NOTE: Burning pesticide containers is illegal in Tennessee.

(11) STATEMENT OF USE CLASSIFICATION – The label must show whether the pesticide is for general or restricted use. Use is based on the hazard of poisoning, the way the pesticide is used and its effect on the environment. When a pesticide is classified as restricted, the label will state "Restricted-use Pesticide" in a box at the top of the front panel. Below this heading may be a statement describing the reason for the restricted-use classification.

General use – According to FIFRA, a general-use pesticide is one that, when applied according to its directions, will not generally cause unreasonable adverse effects on the environment.

Restricted use – Restricted-use pesticides have a statement at the top of the label's front panel saying "Restricted-use pesticide for retail sale to and application only by certified applicators or persons under their direct supervision." According to FIFRA, a pesticide is classified as restricted-use if its use might result in an unreasonable adverse effect on human health and/or the environment; however, application by trained persons according to label directions would protect against such an effect.

(12) SIGNAL WORDS – Signal words, standard by law in the industry, tell you how severely toxic a pesticide is. The signal word is immediately below the statement, "Keep out of reach of children," which also must appear on the label. The signal word reflects the hazard of any active ingredients, carriers, solvents or inert ingredients. The signal word indicates the risk of acute effects from the four routes of exposure to a pesticide product (oral, dermal, inhala-

tion and eye) and is based on the one that is greatest. The three signal words used on pesticide labels are: DANGER, WARNING and CAUTION. Pesticides with the signal word DANGER are most toxic or hazardous and their use is normally restricted. They will usually have the word "Poison" and skull and crossbones on the label.

Less toxic pesticides may be given the signal word WARNING if there is a specific hazard, such as severe skin or eye injury, or a particular danger to the environment. For these, the word "Poison" or the skull and crossbones are not on the label. Pesticides with the signal word CAUTION are least toxic to people and are generally less hazardous. Every product label must have "Keep Out of the Reach of Children" and carry one of the signal words:

Signal Word	Toxicity	Approximate Amount Needed to Kill the Average Person
DANGER	Highly Toxic	A taste to a teaspoonful of a pesticide in this category could possibly cause death if taken orally.
WARNING	Moderately Toxic	A teaspoonful to a tablespoonful would probably kill an adult.
CAUTION	Slightly Toxic	An ounce to more than a pint would probably be required to cause death in an adult.

(13) SYMBOL – The skull-and-crossbones symbol attracts attention to highly toxic materials. The symbol is accompanied by the signal word DANGER and the word POISON.

(14) STATEMENT OF PRACTICAL TREATMENT – Emergency first aid is spelled out in this section. In addition, you are told which exposure requires medical attention, such as swallowing or inhaling the product or getting it in your eyes or on your skin. In the case of a possible poisoning, it is important to take the pesticide label to the attending physician.

(15) NAME AND ADDRESS OF MANUFACTURER – The law requires the manufacturer to identify itself by name and address.

(16) REGISTRATION AND ESTABLISHMENT NUMBERS – The registration number shows that the product is properly registered with the federal government (Environmental Protection Agency). The establishment number identifies the factory and appears on the container but may not be on the label.

(17) NET CONTENTS – The net contents tells you the amount in the container. This can be expressed as pounds or ounces for dry formulations and as gallons, quarts, pints or fluid ounces for liquids.

Appendix III

Forms and other information can be found at the UT Web sites at http://utyeah.utk.edu and http://eppserver.ag.utk.edu/sch_ipm.htm :

- Logbook Sections – Download modifiable Microsoft Word versions of each section

  - Example Childcare Policies

  - Example Bid Specs

  - Example Inspection Form

  - Example Pest Sighting Log

  - Example Monitoring Station Log

  - Example Pesticide Application Records Form

  - Example Time Log

- Take a survey through your local county Extension agent that will rate your facility as using no, low, medium or high levels of IPM and receive a certificate stating your IPM status. Those facilities using IPM will be listed on the above Web sites.

- National IPM "star" certification can be obtained through the National IPM Institute http://www.ipminstitute.org/school.htm

We thank the following UT Extension personnel for reviewing an earlier draft of this publication:

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Wanda Russell, Marketing and Communications

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Precautionary Statement

To protect people and the environment, pesticides should be used safely. This is everyone's responsibility, especially the user. Read and follow label directions carefully before you buy, mix, apply, store or dispose of a pesticide. According to laws regulating pesticides, they must be used only as directed by the label.

Disclaimer

This publication contains pesticide recommendations that are subject to change at any time. The recommendations in this publication are provided only as a guide. It is always the pesticide applicator's responsibility, by law, to read and follow all current label directions for the specific pesticide being used. The label always takes precedence over the recommendations found in this publication.

Use of trade or brand names in this publication is for clarity and information; it does not imply approval of the product to the exclusion of others that may be of similar, suitable composition, nor does it guarantee or warrant the standard of the product. The author(s), the University of Tennessee Institute of Agriculture and University of Tennessee Extension assume no liability resulting from the use of these recommendations.

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Visit the UT Extension Web site at http://www.utextension.utk.edu/

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