# INTEGRATED PEST MANAGEMENT PROGRAM

## EANES INDEPENDENT SCHOOL DISTRICT

**2008 - 2009**
**INFORMATION AND TRAINING MANUAL**

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**Integrated Pest Management is a new look at pest control approaches including common sense practices and personal habits that have been used by the industry for many years. Formalization of these practices in our public schools is the new law that took effect September 1, 1995 and it is our responsibility to comply.**

## DEFINITIONS

**The following terms will be used frequently in this manual:**

1. **Integrated Pest Management (IPM) - The use of physical, mechanical, cultural, biological and chemical means for the control of pests. The U. S. Environmental Protection Agency (EPA) describes IPM as an effective and environmentally sensitive approach to pest management that relies on a combination of common sense practices.**

2. **Pesticide- A chemical, substance or device used to influence, control, eliminate, eradicate or mitigate, in any way, a pest.**

3. **Policy - The general principles by which an entity is guided in its management of certain public affairs.**

4. **IPM Coordinator- An employee designated by a school district, who has fulfilled the required training and oversees the pest control management plan that has been adopted by the district.**

## THE LAW

**Compliance with the Texas Structural Pest Control Act, Article 135B-6, Section 4J as well as, the regulations, Section 595.11 Schools, at this time is only required of independent school districts (K-12) within the state of Texas.**

**Texas Structural Pest Control Act, Section 4J**

***To whom does this apply - All Texas independent school districts**

***When is it effective - September 1, 1995**

***Who is the regulatory agency - Texas Department of Agriculture, Structural Pest Control**

***What are the main points - Each school district must adopt an Integrated Pest Management Program --that incorporates the standards developed by the Structural Pest Control Board -- to include the use of the least toxic method to control pests, rodents, insects and weeds and -- a list of products that a school district is currently using.**

## EISD POLICY

**The District's Integrated Pest Management Program (IPMP) developed in accordance with the requirements of the Texas Structural Pest Control Act and with the assistance of an advisory committee of knowledgeable persons, shall govern the District's use of pesticides, herbicide, and other chemical agents for the purpose of controlling pests, rodents, insects, and weeds in and around District facilities. CLB (LOCAL).**

## IPM COORDINATOR

As of September 1, 1996, the Integrated Pest Management Coordinator for the Eanes Independent School District is Norm Hopkins. EISD is complying with requirements for training.

## PEST CONTROL SERVICES

EISD either conducts pest control services with district employees licensed as certified noncommercial applicators or technicians or contracts with a business that has a structural pest control business license.

## PEST MANAGEMENT OBJECTIVES OF EISD

Eanes Independent School District has identified the following as the objectives for its IPM program:

(1) Notification, as required by the Structural Control Act, to students and parents to be included in each school's student handbook.

(2) Manage pests that may occur on school sites to prevent interference with the learning environment of the students.

(3) Eliminate injury to students, staff and other occupants.

(4) Preserve the integrity of the school buildings or structures.

(5) Provide the safest playing or athletic surfaces possible.

## INDOOR SPECIFIC STRATEGIES

EISD has identified indoor specific IPM strategies to be used as pest preventative measures for school sites and typical pests. These measures reduce the need for pesticide applications .

(Typical Pests: Mice, rats, cockroaches, ants, flies, wasps, hornets, yellow jackets, spiders, microorganisms, termites, carpenter ants, and other wood-destroying insects.)

Doorways (entryways, overhead doors, windows, holes in exterior walls, openings around pipes, electrical fixtures and ducts)

* Keep doors shut when not in use

* Place weather stripping on door

* Caulk and seal openings in walls

* Install or repair screens

* Install air curtains

* Keep vegetation, shrubs and wood mulch at least one foot away from structure

Classrooms and Offices (classrooms, laboratories, administrative offices, auditoriums, gymnasiums and hallways)

* Allow food and beverages only in designated areas

* If indoor plants are present, keep them healthy. When small insect infestations appear, remove them manually

* Keep areas as dry as possible by removing standing water and water damaged or wet materials

* In the science lab, store animal foods in tightly sealed containers and regularly clean cages. In all areas, remove dust and debris

* Routinely clean lockers and desks

* Frequently vacuum carpeted areas

* If students get head lice, send home until they have had a full lice treatment. Discourage students from exchanging hats or caps at school.

Food Preparation and Serving Areas - (dining room, main kitchen, teachers' lounge, home economics kitchen, snack area, vending machines and food storage rooms)

* Store food and waste in containers that are inaccessible to pests. Containers must have tight lids and be made of plastic, glass or metal. Waste should be removed at the end of each day

* Place screens on vents, windows and floordrains to prevent cockroaches and other pests from using unscreened ducts or vents as pathways.

* Create inhospitable living conditions for pests by reducing availability of food and water - remove food debris, sweep up all crumbs, fix dripping faucets and leaks and dry out wet areas.

* Improve cleaning practices, including promptly cleaning food preparation equipment after use and removing grease accumulation from vents, ovens and stoves. Use chalk or paint to seal cracks and crevices.

* Capture rodents by using mechanical or glue traps. (Note: Place traps in areas inaccessible to children. Mechanical traps, including glueboards, used in rodent control must be checked daily. Dispose of killed or trapped rodents within 24 hours)

Room and Areas with Extensive Plumbing - (bathrooms, rooms with sinks, locker rooms, dishwasher rooms, home economics classrooms, science laboratories)

* Promptly repair leaks and correct other plumbing problems making pests accessible to water.

* Routinely clean floor drains, strainers and grates. Seal pipe chases.

* Keep areas dry. Avoid conditions that allow formation of condensation. Areas that never dry out are conducive to molds and fungi. Increasing ventilation may be necessary.

* Store paper products or cardboard boxes away from moist areas and direct contact with the floor or the walls. This practice also allows for ease in inspection.

Maintenance Areas - (boiler room, mechanical room, janitorial areas and pipechases)

* After use, promptly clean mops and mop buckets, dry mop buckets and hang mops vertically on rack above floor drain.

* Allow eating only in designated eating areas.

* Clean trash cans regularly , use plastic liners in trash cans and use secure lids.

* Keep areas clean and as dry as possible and remove debris.

## LANDSCAPE/OUTDOOR STRATEGIES

Exterior integrated pest management programs apply many of the same strategies used for indoor management. Prevention measures and good planning are particularly beneficial in landscape.

(Typical Pests include mice and rats. Turf pests include broadleaf and grassy weeds, insects such as beetle grubs or sod webworms, diseases such as brown patch and vertebrates such as moles. Ornamental plant pests include plant diseases and insects such as thrips, aphids, Japanese beetles and bag worms.)

Playgrounds, Parking Lots, Athletic Fields, Loading Docks and Refuse Dumpsters

* Regularly clean trash containers and gutters and remove all waste, especially food and paper debris

* Secure lids on trash containers

* Repair cracks in pavement and sidewalks

* Provide drainage away from structures and on grounds

Turf - (lawns, athletic fields and playgrounds)

* Maintain healthy turf by selecting a mixture of turf types best adapted for the area

* Raise mowing height for turf to enhance its competition with weeds, adjust cutting height of mower, depending on the grass type; sharpen mower blades; and vary mowing patterns to help reduce soil compaction

* Water turf infrequently but sufficiently during early morning hours to let turf dry out before nightfall; let soil dry slightly between waterings

* Provide good drainage and periodically inspect turf for evidence of pests or diseases

* Allow grass clippings to remain in the turf

* Have the soil tested to determine pH and fertilizer requirements

* Time fertilizer application appropriately, excessive fertilizer can cause additional problems, including weed and disease outbreaks

* Seed over existing turf in fall or early spring

Ornamental Shrubs and Trees

* Apply fertilizer and nutrients to annuals and perennials during active growth and to

shrubs and trees during early fall or early in the growing season

* If using fertilizer, use the correct one at the suitable time, water properly and reduce compaction

* Prune branches to improve plants and prevent access by pests to structures

* Use the appropriate pest resistant variety and properly prune

* Correctly identify the pest in question

* Use pheromone traps as a time saving technique for determining the presence and activity periods of certain pest species

* Select replacement plant material from among the disease resistant types being developed by plant breeders throughout the country

* Check with the Texas Agricultural Extension Service or a state university for information on plant types appropriate for you site

* Remove susceptible plants if a plant disease reoccurs and requires too many resources such as time, energy, personnel or money

## USE OF CHEMICAL PESTICIDES

While chemical pesticides are considered a part of an integrated pest management program, EISD recognizes that dependency on these pesticides for control of pests should be avoided. The goal of using the least toxic controls first and the most toxic controls last dictates that the use of chemical pesticides should be used in a very limited manner and always with a great deal of thought.

In an effort to minimize exposure to people and other non-target species , EISD takes the following recommendations from EPA in applying or considering the use of chemical pesticides.

1) Choose a pesticide that is labeled for the specific site and pest being controlled. Be as "target specific" as possible and avoid broad spectrum usage.

2) Treat only obviously infested areas that have been monitored to be above set tolerance levels.

3) Use bait, crack and crevice applications to reduce the use of sprays, foggers or volatile formulations.

4) All rodenticides should be stored in locked areas inaccessible to students, faculty, staff and non-target species.

5) Outdoors, place bait inside the entrance of an active rodent burrow and collapse the burrow entrance over the bait to prevent non-target species access.

6) Securely lock or fasten shut the lids of all bait boxes.

7) Be careful to observe any potential exposure and note the re-entry time limits listed on the label.

8) Thoroughly ventilate areas after application

9) Verify pesticide application notifications to students, staff and interested parents.

10) Keep copies of the most current pesticide labels, consumer information sheets, and Material Safety Data Sheets (MSDS) easily available.

## PREVENTION

Anticipation plus planning equals prevention. Anticipation requires the accumulation of data over a period of time in order to project into the future and anticipate a pest's appearance based on past history. This accumulation of data will be acquired through inspections performed by EISD's IPM Coordinator.

## BENEFITS OF AN IPM PROGRAM

* Understanding of the Ecology
* Lasting Environmental Impact
* Wide Participation
* Reduced Exposure to Chemicals
* Better Control of Pests
* Public Image
* Safer Environment
* Learning Opportunity

## PROCEDURE TO REQUEST PEST TREATMENT

1. Request for pest treatment must be communicated through the EISD Plant Maintenance and Operations work order procedure.

2. Please provide in the work order specific information including date, time, location and type of pest detected.

3. Principals/Directors may follow up with a trouble call to Plant Maintenance and Operations Dept. if needed.

Notification of pest control treatment will be posted at least 48 hours in advance unless treatment is an emergency. Consumer information sheet will be provided upon request.

## INDIVIDUAL IPM PLANS FOR SPECIFIC TARGET PESTS

The following integrated pest management plans for specific target pests is in accordance with the City of Austin Environmental Resource Management Division Integrated Pest Management Plan, 6/26/00.

**IPM FOR FIRE ANTS**
**IPM FOR FLEAS**
**IPM FOR MOSQUITOS**
**IPM FOR POISON IVY**
**IPM FOR ROACHES**
**IPM FOR RODENTS**
**IPM FOR TERMITES**
**IPM FOR TURF GRASSES**

**Note: Products listed in the following IPM plans for specific target pests are chemicals used specifically by Eanes ISD and not City of Austin.**

IPM PLAN for
FIRE ANTS
(COA -6/26/00)

1. Pest to be controlled: red imported fire ants

2. Biology of the red imported fire ant, Solenopsis invicta:

   The red imported fire ant is a tropical insect that was accidentally introduced into the United States in the 1930s and has spread unchecked across the Southeast and into Texas. Fire ants disperse naturally through mating flights that usually occur in the spring and fall, but may occur anytime warm humid conditions exist, even during the winter. Fire ant queens are also dispersed by the movement of infested nursery stock and turf sod, and even by vehicles. Fire ant colonies are known to raft to higher ground during floods. The most visible indication of the presence of fire ants is their characteristic cone-shaped mounds.

   The only way to effectively control or suppress fire ants is to use a method that will stop egg production by the queen(s). Killing workers will have no lasting effect on the fire ant colony. Therefore the use of granular insecticides, which frequently do not come in contact with the queen, is not a long-term solution. The ineffective use of pesticides, especially in environmentally sensitive areas, should be avoided.

3. Control tactics:

   a. Physical control tactics will include the use of hot water to drench individual fire ant mounds. Mounds will be drenched mid-morning with at least a gallon of hot water on the sun-side of the mound in an attempt to kill queen(s). Drenched mounds will be rebuilt by surviving workers, but the colony will soon disperse if the queen is killed. If mounds persist, it will prompt the use of the next control tactic.

   b. There are no mechanical control tactics available to control fire ants.

   c. Biological control tactics include the use of nematodes, which are slender, microscopic, unsegmented worms. This nematode has been cultured to hunt, seek, and destroy soil-boring fire ants by invading ant colonies.

| Active Ingredient | Product Name |
|---|---|
| ***Neopleotana Carpocapsai (nematode)*** | ***ANTidote*** |

   d. Non-toxic and less persistent control tactics include the broadcast of fire ant baits. Fire ant baits are designed to be attractive to foraging fire ants and eventually become passed to the queen(s). The effect of the bait will be to neutralize the queen by stopping egg production. Because fire ants will not forage when ground temperature is below 70° or above 95°, and because the baits will not remain attractive if wet, care shall be taken to apply the baits when the soil and vegetation are warm and dry. Apply baits when no rain is expected for at least 8 hours. In summer, apply baits in

the evening, since ants do not forage during extreme heat. As fire ant baits require several weeks or more to affect colonies, the next control tactic will only be prompted by the persistence of active mounds over a long period.

| Active Ingredient | Product Name |
|---|---|
| ***Fenoxycarb*** | ***Award*** |

More persistent chemical control tactics will include the use of liquid drenches or dusts that kill ants on contact. These products are appropriate for individual mound treatments only.

| Active Ingredients | Product Name |
|---|---|
| ***Pyrethins*** | ***CS101*** |

4. This IPM plan is a dynamic document. If other control tactics are found effective, then this plan will be amended to include those tactics. No regularly scheduled pesticide applications are planned.

IPM PLAN for
FLEAS
(COA-6/26/00)

1. Pest(s) to be controlled: fleas.

2. Biology of the cat flea, Ctenocephalides felis:

   Fleas are associated with warm-blooded animals and pass through four life stages: egg, larva, pupa, and adult. Optimal flea development is at 65 to 80 degrees F. with a relative humidity of 70%. Hot dry summers reduce flea populations while cool rainy weather increases populations. When adult fleas emerge from pupae, they immediately seek a blood meal from warm-blooded animals. After mating, females lay eggs on hosts or on their sleeping areas. Eggs hatch into larvae within 12 days and usually feed on organic debris for 8-24 days. Pupae usually emerge into adults in 5-7 days. If conditions for development are unfavorable, larvae can live for up to 200 days and pupae for up to one year. An effective control strategy is to arrest flea development before the pupal stage to prevent explosive population growth when optimal conditions occur.

3. Control tactics:

   a. Physical control tactics will include combing and bathing of pets, and vacuuming or washing of rugs, carpets, furniture and pet sleeping areas. The number of fleas captured in combs is to be used as an indicator of the overall flea population and should be monitored. When fleas reach annoying levels, an increase in fleas captured in combs prompts the next control tactic.

   b. Mechanical control tactics will include the screening of pets from areas where fleas congregate or where vacuuming or washing would be difficult. If flea monitoring indicates mechanical controls have not decreased the flea population, then next control tactic is prompted. Note: Some non-toxic control products work mechanically, but are included in the non-toxic category.

   c. Biological control tactics include the use of nematodes, which are slender, microscopic, unsegmented worms. This nematode has been cultured to hunt, seek, and destroy specific soil-borne insects.

| Active Ingredient | Product Name |
|---|---|
| ***Neopleotana Carpocapsae (nematode)*** | ***ANTidote*** |

   d. Non-toxic and less persistent control tactics will include dusting pets, and the places they inhabit, with products containing pyrethrum, silica aerogel, or diatomaceous earth. Yards or other outdoor areas inhabited by pets will be sprayed with products containing insecticidal soap, pyrethrum, or rotenone. Higher concentrations of fleas may occur in the shady areas versus the dry sunny areas. An insect growth regulator will be added to the spray before application.

| Active Ingredient | Product Name |
|---|---|

| | |
|---|---|
| ***Fenoxycarb*** | ***Award*** |

e. More persistent chemical control tactics will include using pet collars containing organophosphates, and the use of pyrethroids to control fleas outside.

**Note: Eanes ISD does not own pets, thus pet collars are not used as part of the IPM program.**

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IPM PLAN for
MOSQUITOES
(COA-6/26/00)

1. Pest(s) to be controlled: mosquitoes

2. Biology of the mosquito, Order Diptera, Family Culicidae:

Adult mosquitoes are small, slender, long-legged flies with a long piercing mouthpart called the proboscis. Mosquitoes develop through four distinct stages: egg, larva, pupa, and adult. Adult females feed on animal blood for the protein needed to produce eggs. Eggs are laid singly or in clumps on still or slow-moving water. Some mosquitoes lay eggs in temporary water basins such as tree holes or at the edges of flood prone areas.

Mosquito eggs may lie dormant for months before hatching, but under most circumstances hatch within 2 to 6 days. The aquatic larva and pupa stages each take from 4 to 10 days to develop and represent the most vulnerable stages. Adults can live up to 2 months after emergence. Most mosquitoes die within yards of where they emerged.

The most effective method of controlling mosquitoes is to limit the number of water basins where eggs can hatch. Examples of temporary basins include cans and jars, clogged roof gutters, used tires, plant saucers, plastic sheeting, and wheelbarrows. Larger, more permanent water basins can be drained or filled in. However, not all water basins can or should be altered for environmental reasons. In addition, the excessive use of fertilizers should be discouraged as fertilizers in water will promote algae blooms that protects the mosquitoes from predation by fish.

3. Control tactics:

   a. Physical control tactics will include the use of screens on windows and doors. Electric "bug zappers" will not be used, as they are not effective at reducing mosquito populations since they target only adults, and affect non-target insect populations as well.

   b. Mechanical control tactics will include the use of suffocating surface film where practical. This will include those basins not subject to runoff. The films to be used are highly refined and biodegradable, with no effect on human or non-target species.

   c. Biological control tactics will include the use of native mosquito-eating fish (Gambusia) in permanent pools, where a viable fish population can be maintained.

   d. Least toxic and less persistent chemical control tactics will include the use of Bacillus thuringiensis israelensis or pyrethrum larvicides. These products will be applied to water basins where mosquito larvae develop.

| Active Ingredient | Product Name |
|---|---|
| ***Bacillus thuringiensis israelensis*** | ***Mosquito Dunks*** |

4. This IPM plan is a dynamic document. If other control tactics are found effective, then this plan will be amended to include those tactics. No regularly scheduled pesticide applications are planned.

IPM PLAN for
POISON IVY
(COA-6/19/01)

1. Overview of poison ivy, Rhus radicans:

   Poison ivy can be a nuisance and, in some cases, a definite hazard to passers-by. However, it is a valuable plant for wildlife, especially for songbirds that eat the berries when other food is scarce. For this reason, management of poison ivy should only be conducted when the plant represents a safety or health threat to the public. All parts of this plant contain poisonous oil that can cause a severe rash on allergic individuals. The oil content appears to vary with the season, but the poisonous qualities are active both when the plant is in leaf and when dormant. When the oil comes in contact with the skin it produces blisters and eruptions, followed by intense itching. Care must be taken not to burn parts of the plant, since the smoke is equally dangerous to breathe.

2. Identification and biology of poison ivy:

   Poison ivy is often confused with other plants, therefore positive identification of the plant is necessary. Knowing how to identify it is your best defense against accidental contact. The best way to identify poison ivy is by its characteristic compound leaf consisting of three leaflets ("Leaves of three, let it be"). The leaflets are two to four inches long, dull or glossy green, with pointed tips. In contrast, Virginia Creeper, a non-poisonous vine often mistaken for poison ivy, has five leaflets radiating from one point of attachment. The margins of the leaflet are variable, usually appearing irregularly toothed, but sometimes smooth or lobed.

   Its habit of growth can be found in one of three forms; as an erect woody shrub, a trailing shrub running along the ground, or a woody vine. It is prevalent throughout central Texas, normally occurring as an understory species, especially in moist places. Plants often attach to tree trunks and other surfaces by aerial rootlets, and can easily spread by suckers and seeds.

3. Control tactics:

   a. The least toxic control, especially appropriate for small infestations, includes the physical removal of the foliage, stems, and roots by hand or mechanical means. Hand pulling is most successful when the ground is moist. Care should be taken to remove the entire root because the plant can re-sprout from sections of root left in the ground. Vines growing on trees can be difficult to pull out of the ground because their roots may be entangled with the tree's roots.

   b. Biological control includes the use of herbivorous livestock such as sheep and goats, which will eat poison ivy. Spanish and Angora goats prefer woody vegetation over grasses and herbaceous plants. Tether them in areas near the plant(s), or in the case of large infestations, use lightweight, flexible fencing reinforced with electrical wire to contain a herd. Not all municipalities or neighbors will welcome this control technique.

c. Large infestations of poison ivy can be controlled through an integrated method of mechanical removal followed by a spot treatment with a translocating herbicide. The ideal time for the first step (mechanical removal) in this method is during the cool winter months when the plants have shed their leaves. Without leaves, there is less surface area from which the workers might be in contact with the toxic oil. Also, the woody structure of the plants is quite visible at that time, enabling the crew to see what they are cutting. The woody stems should be chopped and severed using power hedge shears or a mechanical clearing saw. The woody debris should then be hauled away from the site and disposed of properly. In early spring, stumps left in the ground after the winter cutting process will put out a flush of leaf growth. After the foliage has fully expanded it should be spot-treated once or twice with a systemic herbicide (see Table this section). For best results, apply Roundup to leaves and stems in mid-growth season when the poison ivy is actively growing, but at least one month before the first killing frost. Spray until foliage is evenly wet. Rainfall within 6 hours may reduce effectiveness, and could transport the chemical in stormwater runoff. On large plants, complete control is rarely achieved from a single application, and repeat applications on regrowth may be necessary.

| Active Ingredient | Product Name |
|---|---|
| ***Glyphosate*** | ***Roundup*** |

d. Removal of the aboveground portion of the plants during the warm season is an acceptable alternative, if it cannot be achieved during the cool season. In this case, immediately after the woody stem of the plants are cut, spray or paint the herbicide (see Table below) to the freshly cut stumps and stubs. The cambium area next to the bark is the most vital area to wet. Dispose of the woody debris in a safe manner offsite.

| Active Ingredient | Product Name |
|---|---|
| ***Glyphosate*** | ***Roundup*** |

4. Broadcast spraying of herbicides on poison ivy should be avoided. By limiting herbicide applications to spot treatments, exposure of the herbicide to the workers, nearby vegetation, and to adjacent water resources is minimized. Always read and follow the directions on the product label. It is a violation of federal law to use a pesticide contrary to label directions. Once control is achieved, to help prevent regrowth the treated area should be mulched heavily with a material that is unlikely to wash away.

5. This IPM plan is a dynamic document. If other control tactics are found effective, then this plan will be amended to include those tactics. No regularly scheduled pesticide applications are planned.

IPM PLAN for
ROACHES
(COA-6/26/00)

1. Pest(s) to be controlled: cockroaches

2. Biology of the German cockroach, Blattella germanica:

   There are five species of cockroaches that commonly infest houses, with the German cockroach being one of the most widely distributed. Roaches are tropical insects that have adapted to living with man by seeking areas where they can get warmth and moisture, such as bathrooms and kitchens. Female roaches glue egg cases, called ootheca, to the surfaces of any dark place. The average development time for the German cockroach from egg to adult is 55-68 days. Adults can live more than 200 days. They are active at night.

3. Control tactics:

   a. Physical control tactics will include the sealing of cracks and crevices and the screening of windows and vents to limit access from the outside. Roach traps will be used to monitor to pest population.

   b. Cultural control tactics will include good sanitation, including the proper storage of food and regular cleaning.

   c. There are currently no biological control tactics available for control of cockroaches.

   d. Non-toxic and less persistent control tactics will insecticidal dusts and baits, and insect growth regulators.

| Active Ingredient | Product Name |
|---|---|
| ***Boric Acid Powder*** | ***Borid Turbo*** |
| ***Hydroprene*** | ***Gentrol*** |

4. This IPM plan is a dynamic document. If other control tactics are found to be effective, then this plan will be amended to include those tactics. No regularly scheduled pesticide applications are planned.

IPM PLAN for
RODENTS
(COA-6/26/00)

1. Pest(s) to be controlled: rodents.

2. Biology of the common house mouse, Mus musculus, roof rat, Rattus rattus and Norway rat, Rattus norvegicus:

   The house mouse, roof and Norway rats are rodents intimately associated with people, and are found almost everywhere humans live or work. While wild mice and rats will invade houses when weather changes, these pests are dependent on man for shelter and food. The reproductive rate of rodents in general and mice in particular is very high. Female mice produce 10 litters a year, 6-7 young per litter. Rats are almost as productive, but suffer high mortality. All rodents respond to trapping or other declines in their population by producing more litters.

   Strategies to control rodents involve primarily preventative steps to limit access to shelter and food, trapping to reduce small populations, and poisoning.

3. Control tactics:

   a. Physical control tactics will include the filling of access holes, making food storage rodent-proof, and the use of barriers. These measures will include the inspection of sewer lines into dwellings and cracks in foundations.

   b. Mechanical control tactics will include the trapping of rodent populations in snap traps or glue boards. A large number of traps will be placed to have the desired effect on the population.

   c. The use of domestic cats will be considered as a biological control tactic, if they will not become pests themselves.

   e. Non-toxic and less persistent control tactics will include the use of cholecalciferol, which will not lead to secondary poisoning.

| Active Ingredient | Product Name |
|---|---|
| ***Glue, Non-Poisonous*** | ***Trapper or Pest Catcher*** |

   f. More persistent chemical control tactics will include the use of anticoagulants placed in bait boxes to prevent secondary poisoning.

| Active Ingredient | Protection Method | Product Name |
|---|---|---|
| ***Fipronil*** | ***Chemical Bait*** | ***Termidor SC*** |

4. This IPM plan is a dynamic document. If other control tactics are found effective, then this plan will be amended to include those tactics. No regularly scheduled pesticide applications are planned.

IPM PLAN for
TERMITES
(COA-6/26/00)

1. Pest(s) to be controlled: termites.

2. Biology of the eastern subterranean termite, Reticulitermes flavipes:

Subterranean termites are social insects that live in colonies of winged reproductives, sterile workers and soldiers. Overcrowded conditions prompt reproductives to swarm, usually during the first warm humid days of spring. Winged termites are often confused with ants but their equal-sized pair of wings can identify them. It is important that a positive identification be made of suspected termite infestations. Subterranean termites are different from other termites in that they must have regular contact with moisture. This is generally accomplished by building earthen tubes to the soil. Water leaks in structures provide a good environment from which termites can build tubes. In most structures, these tubes are visible on exterior walls, but they may be present on interior walls as well if termites have gained access through cracks in slabs.

The important first step in a termite control program is the elimination of conditions that favor termite survival. These steps include the removal of wood debris around structures, eliminating areas of earth-to-wood contact and constructing barriers to termite entry. It is also important to regularly monitor structures for signs of moisture, damaged wood, or earthen termite tunnels and to act only if these signs are present. The most vulnerable stages of the termite colony are the eggs and immatures.

3. Control tactics:

a. Physical control tactics will include the plugging of cracks and crevices in structures that may provide access. Any exterior feature that leaks water such as guttering and water pipes will be repaired. Physical controls also include the use of a stainless steel wire mesh perimeter barrier around the building. Installers should be trained and accredited for quality control.

| Material | Product Name |
|---|---|
| ***316 marine grade stainless steel w/appropriately-sized aperture*** | ***Termi-Mesh™*** |

b. There are no mechanical control tactics currently available to control termites. However, sand barriers have been tested as a deterrent to tunneling and may soon be recommended as a control alternative.

c. There are no biological control tactics currently available to control termites.

d. Least-toxic chemical control tactics will involve the use of insect growth regulators (used as baits) and/or chemical barriers that are undetectable by termites.

| Active Ingredient | Protection Method | Product Name |
|---|---|---|
| ***Fenvalerate*** | ***Chemical barrier*** | ***Termidor*** |
| ***Imidacloprid*** | ***Chemical barrier*** | ***Premise®*** |
| ***Hexaflumuron*** | ***Insect growth regulator*** | ***Sentricon™*** |

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IPM PLAN for
TURFGRASS
(COA-6/26/00)

1. Pests to be controlled: turfgrass weeds, diseases, and insects

2. Integrated Pest Management (IPM) of turfgrass involves the use of multiple control tactics to keep selected pests below an acceptable injury level. IPM has a series of responsibilities, the primary one being the proper identification and understanding of the pest. Selected pests are only those which pose a threat to turf quality. Common turfgrass pests are weeds (including crabgrass, and dallisgrass), diseases (including brown patch, dollar spot, and pythium blight), and insects (including fire ants, mole crickets, sod webworms, and armyworms).

   **The tactics included in this IPM plan are: a.) physical, b.) cultural, c.) biological, and d.) chemical. The goal of the IPM plan is to emphasize the physical, cultural and biological tactics and minimize chemical use, thereby lessening the effects on the hydrologic system.**

3. Life cycle of pests:

   a. Crabgrass (Digitaria spp.): Crabgrass is an annual grass spread primarily by seed and to a minor extent by rooting from lower nodes. Crabgrass is a short, bunching, leafy grass, light green in color. It is frequently found in over-watered turf and/or compacted soils.
   b. Dallisgrass (Paspalum dilatatum): Dallisgrass is a warm-season annual grass. It is a coarse-textured, bunch-type grass that spreads primarily by seed. Lower leaves may be hairy, while all are noticeably shiny. The seed stalks of dallisgrass are sparsely branched on long stems, and contrast dramatically in desired turf.
   c. Brown Patch (Rhizoctonia spp.): Brown patch is a fungal disease most likely to damage bermudagrass and St. Augustinegrass in the spring or fall. Areas of turf affected with brown patch consist of irregular brown areas that range from a few inches to many feet in diameter. Environmental conditions that favor disease development are day temperatures above 85°F, high relative humidity, and prolonged overcast wet periods. Excessive nitrogen fertilization and frequent irrigation also favor development.
   d. Dollar spot (Sclerotinia homoeocarpa): Dollar spot in turf consists of small circular areas about 2 inches in diameter, which are brown or straw in color. Moderate temperatures (60° to 80° F), excess moisture and excess thatch lead to development of this disease, especially on closely cut turf.
   e. Pythium blight (Pythium spp.): Pythium blight kills turf in small irregular spots. The fungi produce spores that survive for long periods in the soil, but develop rapidly with excessive moisture. Blackened leaves of affected grasses wither rapidly and turn reddish brown. At high temperatures, severe damage can occur in low areas of consistently wet turf.
   f. Fire ants (Solenopsis invicta): The red imported fire ant is a tropical insect that was accidentally introduced into the United States in the 1930's. Fire ants disperse naturally through mating flights, which usually occur in the spring and fall. Fire ants are often moved in soil, sod, and containerized plants. Fire ants do not attack turf, but cause problems when they build earthen mounds for warming their eggs, larvae, and pupae. Mounds may be built in any turf situation. Established colonies produce new queens and workers that, if left uncontrolled, will eventually lead to large populations and additional mounds. Refer to the individual IPM plan on fire ants for specific control measures.
   g. Mole crickets (Scapteriscus acletus): Mole crickets have grayish brown, velvety bodies with broad spade-like front legs adapted for digging. Adults spend the winter in deep burrows.

When the soil warms, they move up to dig in grass and feed on turf insects. In the late spring and early summer, mole crickets fly and mate. Females lay eggs in chambers beneath the soil. The eggs hatch in May and June, with any tunneling caused by the young nymphs obvious by late July. The most vulnerable stage of the mole cricket is the nymphal stage with earlier treatments ineffective. Treatment will be made only if damage is noticeable and verified by a soap flush. A proposed injury level is 3 nymphs per square feet.

h. Sod webworms (Crambus spp.): Sod webworms are the larval form of lawn moths. Larvae are slender grayish, black-spotted caterpillars about ¾ inch long. Adults are small and vary in color from white to gray. Moths hide during the day, but after mating, drop their eggs over grass at dusk. Eggs hatch in a few days and larvae begin to fee. They pupate in silken tunnels found in the soil/thatch layer. There are 2-4 generations a year with the last spending the winter in the larval stage. Grasses are most susceptible July through September. The presence of larvae is verified by a soap flush with a proposed injury level set at 15 or more per square yard.

i. Armyworms (Psuedaletia spp.): Armyworms are the larval form of moths and thus have complete life cycles with eggs, larvae, pupae, and adults. They are dull brown, tinged with red, and thick-bodied. Adults fly at night and lay eggs at the base of grasses or nearby plants. Armyworms feed at night, hiding in thatch during the day. Generations overlap, with as many as six generations a year. The presence of armyworms is verified by soap flush with a proposed injury level set at 5 per square feet.

4. Control tactics:

a. Physical control tactics include simply removing the pests by hand, trapping, or mowing the pests. Weeds can be physically removed with the help of hand-tools.

b. Cultural control tactics are those that maintain the quality of turfgrass by providing the best possible growing conditions. These practices are constantly monitored, evaluated, and adjusted for their direct effect on turf quality and the reduction of pest populations. To achieve quality turf grass, and minimize the need for synthetic fertilizer and pesticides, the following practices will be used:

1.) Irrigation: The goal with turfgrass irrigation should be to maximize the efficient use of water and minimize any irrigation runoff. If an automatic irrigation system is used, it should be visually monitored while in use on a regular basis. Spray heads should be adjusted to prevent over-spray onto pavement, and any broken heads should be fixed promptly. Over-watering can lead to turfgrass disease; therefore the watering schedule should be adjusted regularly to fit the prevailing weather conditions. Irrigation at dawn allows for drying of the leaf surface before nighttime, thus minimizing the opportunity for disease.

2.) Mowing: Mowing should occur on a regular basis, and no more than one-third of the leaf blade should be removed at a time. Grass clippings should not be bagged, and any grass clods resulting from mowing should be scattered. Clippings will return nitrogen back to the soil as they decompose, minimizing the need for fertilization. To minimize the opportunity for plant disease, avoid mowing wet foliage, keep mowers adjusted and blades sharp. Maintain a high mowing height within a species' adapted range. Raise the mowing height during periods of environmental stress or disease outbreaks. Weeds should always be mown before seed is produced.

3.) Top dressing: Top dressing (spreading a thin layer of compost or other organic matter on the turf) is an effective way to fertilize the soil and control thatch. Control of thatch will reduce the chance for disease and improve water filtration. Thatch is a layer of dead leaves and stems held together by grass roots and stolons. Though a thin layer of thatch seems to be beneficial to the growth of turf, thick layers can cause the turf to grow aboveground and can contribute to disease and insect problems. Thatch can severely

restrict the movement of pesticides. Top-dressing with compost may reduce the severity of certain plant diseases.

4.) Aerification: Aerification is the process of de-compacting the top few inches of soil by removing soil cores or simply punching holes into the soil. This practice increases water infiltration, relieves soil compaction, and accelerates decomposition of the thatch layer.

5.) Fertilization: The nutrient requirements of turf grass vary with the amount of organic matter in the soil and the amount of water received. The amount and frequency of fertilizer use will be dependent on an analysis of the soil. A 3-1-2 ratio of macronutrients (N-P-K) is usually best. Granular fertilizers will be slow-release (a.k.a. timed-release). Top-dressing with organic fertilizer is ideal. Slow-release and organic fertilizers shall be lightly irrigated to incorporate the nutrients into the soil and make them less available for runoff. Fertilizers shall not be applied during wet weather or when rainfall is imminent. Fertilizers shall not be applied within any environmentally sensitive areas, or within 50' of a waterway.

6.) Overseeding: Overseeding of turfgrass with a cool-season grass while the warm-season grass is dormant may inhibit weed germination.

7.) Disease-resistant species: Plant disease-resistant species and cultivars whenever possible. Recommendations for regionally adapted cultivars can be obtained from most Cooperative Extension Service offices.

8.) Night lighting: Since the adults (moths) of sod webworms and armyworms are attracted to lights at night and they oviposit nearby, place lights away form sensitive turf areas. Lights with the yellow range are also much less attractive to night flying insects.

c. Biological control tactics for fire ants will include the use of nematodes. Nematodes (Neopleotana Carpocapsae), which are slender, microscopic, unsegmented worms, may be applied over the turf during the warm season to control soil dwelling insect pests. Best results are obtained by applying the nematodes in the late afternoon, just before sunset.

| Insect | Active Ingredient(s) | Product Name |
|---|---|---|
| ***Fire Ants*** | ***Neopleotana Carpocapsae*** | ***Award*** |

d. Chemical control tactics may include the use of herbicides, fungicides, and/or insecticides. The user shall be a qualified applicator, shall read the product label, and shall strictly follow manufacturer's directions. Chemical control of weeds will be limited to spot treatment with the use of a non-selective post-emergence herbicide. Pre-emergence herbicides will not be used. The use of each chemical will be re-evaluated every year so that the most effective and most environmentally sensitive products will be used.

1.) Herbicide List:

| Weeds | Active Ingredient | Product Name |
|---|---|---|
| ***Crabgrass*** | ***Glyphosate*** | ***Roundup®*** |
| ***Dallisgrass*** | ***Glyphosate*** | ***Roundup®*** |

2.) Fungicide List:

| Disease | Active Ingredient | Product Name |
|---|---|---|

| | | |
|---|---|---|
| ***Brown Patch*** | ***Propiconazole*** | ***Banner®*** |
| ***Dollar Spot*** | ***Propiconazole*** | ***Banner®*** |
| ***Pythium Blight*** | ***Metalaxyl*** | ***Subdue®*** |

3.) Insecticide List:

| Insect | Active Ingredient(s) | Product Name |
|---|---|---|
| ***Mole Crickets*** | ***Fluvalinate*** | ***Mavrik®*** |
| ***Sod Webworms*** | ***Bacillus thuringiensis (BT)*** | ***Dipel®*** |
| ***Armyworms*** | ***Azadirachtin*** | ***Turplex®*** |

5. This IPM plan is a dynamic document. If other control tactics are found effective, then this plan will be amended to include those tactics. No regularly scheduled pesticide applications are planned. Please note that no endorsement of named products is intended, nor is criticism implied for products that are not mentioned.

## THIS SCHOOL PERIODICALLY APPLIES PESTICIDES

Information concerning these applications may be obtained from Norm Hopkins at 601 Camp Craft Road, Austin, Texas.

Any school personnel that make application on a routine basis of any pesticides, insecticides or herbicides at a school or on school property must be either a licensed noncommercial applicator or a technician. The Texas Department of Agriculture will be reviewing and setting standards in the near future for the technician category in noncommercial certified applicator.

A notification of pest control treatment must be posted at least 48 hours in advance. The purpose of the notice is to inform employees and faculty that a pest control treatment will be done. Also, a consumer information sheet must be provided to any employee upon request. Students may not re-enter a treated area for a least 12 hours following application. Outside application areas cannot be used by students for 12 hours following treatment. These re-entry restrictions apply to normal academic and extracurricular activities.

All pest control use records shall be maintained on the employer's premises for two years. The records must include the name and address of customer (supervisor), name of pesticide or devices used, amounts of pesticides or devices used, percent in solution of pesticides used, purpose for which the pesticide or devices were used (target pest), date pesticides or devices were used (school campus). The records must be made available to an employee of the Texas Department of Agriculture upon request.

The Structural Pest Control Services would like to thank you for your support of the Integrated Pest Management program. Please contact our office with any questions or suggestions for the IPM committee. Please call (512) 305-8250 or write the Texas Department of Agriculture, Structural Pest Control Services, P.O. Box 12847, Austin, Texas 78711-2847.

# EISD PEST CONTROL
# MSDS LIST
# 2008 - 2008

## INDOOR PEST PRODUCTS

1. CS 101 Roach and Ant Spray
   Quest Chemical Corporation

2. Misty Wasp & Hornet Killer
   Amrep, Inc.

3. Advance Dual Choice Ant Bait Stations
   Whitmire Micro-Gen

4. MAXFORCE Ant Killer Bait Stations
   MAXFORCE Professional Insect Control

5. Borid Turbo Insecticide
   Waterbury Companies, Inc.

6. Gentrol Point Source Roach Control
   Sandoz Agro, Inc.

7. MAXFORCE Roach Killer Bait Gel
   MAXFORCE Professional Insect Control

8. Contrac Super-Size Blox Rat Killer
   Bell Labratories, Inc.

9. Drione Insecticide
   Fairfield American Corporation

10. TalstarOne Multi-Insecticide
    FMC Corporation

11. DrainGel
    American Bio-Systems, Inc.

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# EISD PEST CONTROL
# MSDS LIST
# 2008 - 2009

## OUTDOOR PEST PRODUCTS

1. CS 101 Roach and Ant Spray
   Quest Chemical Corporation

2. Award Fire Ant Bait
   Syngenta Crop Protection, Inc.

3. Extinguish Fire Ant Bait
   Wellmark International

4. TalstarOne Multi-Insecticide
   FMC Corporation

5. Round-Up Pro Herbicide
   Monsanto Company

6. ERASER AQ Herbicide
   Control Solutions, Inc.

7. SPEED ZONE Southern Herbicide
   PBI/Gordon Corporation

8. SedgeHammer Herbicide
   Gowan Company

9. MSMA 6 Plus Herbicide
   Drexel Chemical Company

10. Barricade Pre-Emergent Herbicide
    Syngenta

11. Revolver Herbicide
    Bayer Environmental Science

12. LF 70 Organic Activator
    Alliance Manufacturing Group

13. SURF AC 620 Surfactant
    Drexel Chemical Co.

14. NUTRA-SOL Tank Cleaner
    Becker Underwood, Inc.

15. Mark-It Spray Indicator
    Alliance Manufacturing Group

# EISD
# CONTRACTED SERVICE PEST CONTROL
# MSDS LIST
# 2008 - 2009

## CAFETERIA & CONCESSION STAND

1. MAXFORCE Granule Insect Bait
   MAXFORCE Professional Insect Control

2. MAXFORCE Roach Killer Bait Gel
   MAXFORCE Professional Insect Control

3. Gourmet Ant Bait Gel
   Innovative Pest Control Products

4. Advance Dual Choice Ant Bait Stations
   Whitmire Micro-Gen

5. SPECKOZ EVERCIDE Residual Insecticide
   Mclaughlin Gormley King Company

6. SUSPEND SC Insecticide
   Bayer Environmental Science

7. NYGUARD IGR
   Mclaughlin Gormley King Company

8. InTice Sweet Ant Gel
   Rockwell Labs Ltd

9. InTice Ant Granules
   Rockwell Labs Ltd

10. TEMPO SC Ultra Insecticide
    Bayer Corporation

11. TalstarOne Multi-Insecticide
    FMC Corporation

12. Prentox Larva Lur
    Prentiss Incorporated

13. Terro-PCO Liquid Ant Bait
    Nisus Corporation

14. Speckoz Bifenthrin Insecticide
    SPECKoZ Inc.

Updated 08/08

# NOTICE OF PEST CONTROL TREATMENT

Date(s) of planned treatment_____

Extenuating circumstances may require unplanned treatments. To confirm treatment dates, please call the contact listed below.

For more information call or contact:

Norm Hopkins
732-9040

National Pesticides Telecommunications Network

1-800-858-7378

A Consumer Information Sheet may be obtained from the management.

Pest Control applicators are licensed by

Texas Department of Agriculture
Structural Pest Control Services
P.O. Box 12847
Austin, Texas 78711-2847
(512) 305-8250
Fax (512) 888-232-25567

## Selected References

City of Austin Watershed Protection and Development Review Department, Environmental Resource Management Division. IPM for Fire Ants, Fleas, Mosquitos, Poison Ivy, Roaches, Rodents, Termites and Turf Grasses. 6/26/00.

Texas Structural Pest Control Board. IPM in Schools. www.spcbtx.ort/ipm/ipmindex.html.

U.S. Environmental Protection Agency (EPA): Pest Control in the School Environment: Adopting Integrated Pest Management. EPA 735-F-93-012. August 1993.