

City of Denton

Integrated Pest Management Plan



Approved by City Council 6/2020

It is important for the City of Denton to be environmentally conscious in providing safe and well-maintained facilities and landscapes for all visitors. The Integrated Pest Management (IPM) plan provides a holistic approach to achieving the stated goals considering health, environmental, and financial risks. The intent of the IPM plan is to be a living document with continued evaluation and updates to meet current and future needs.

A special thank you to City of Denton staff in the Parks and Recreation Department (PAR), Park Maintenance Division, Environmental Services, and the Citizen Focus Group who committed their time and talent to the development of this document.

IPM Focus Group

<i>Nathan Hansard</i>	<i>University of North Texas / Field Specialist</i>
<i>Cynthia Maguire</i>	<i>Texas Womens University / Native Plant Society of Texas</i>
<i>Bob Harris</i>	<i>Denton County Master Gardeners</i>
<i>Adelaide Bodnar</i>	<i>Master Naturalist</i>
<i>Bill Hartley</i>	<i>Denton County Beekeepers Association</i>
<i>Cindy Hiegel</i>	<i>Master Gardener</i>
<i>Carol Soph</i>	<i>Denton Resident</i>
<i>Ed Soph</i>	<i>Denton Resident</i>
<i>Gene Kastens</i>	<i>Denton Youth Sports Association</i>
<i>Heather Massengale</i>	<i>Denton Youth Sports Association</i>



Table of Contents

GENERAL INFORMATION 3

Mission Statement 3

Goals 3

Asset Management 4

Evaluation and Reporting..... 4

Integrated Pest Management 4

Pesticide Use 6

Safety 8

Laws and Regulations..... 8

INTEGRATED PEST MANAGEMENT METHODOLOGY 10

Approved Pest Management Strategies..... 10

Criteria for Choosing a Pest Management Method 12

GENERAL INFORMATION

Integrated Pest Management (IPM) Plan is a decision-making process to determine pest levels and tolerance thresholds and combines **biological, cultural, physical, and chemical** tools to minimize health, environmental, and financial risks. This plan uses extensive knowledge about pests, such as infestation thresholds, life histories, environmental requirements, and natural enemies to complement and facilitate biological and other natural control of pests. It coordinates the use of pest biology, environmental information, and available technology to prevent unacceptable levels of pest damage by the most economical means, while posing the least possible risk to people, property, resources, and the environment.

Mission Statement

The mission of the City of Denton's Integrated Pest Management Plan is to manage pests that are harmful to the health, function or aesthetic value of City landscapes and public health in a manner that is efficient, effective, environmentally-responsible, and with careful attention to the safety of the public and department employees.

To accomplish this, the principles of Integrated Pest Management are endorsed. This approach uses multi-faceted strategies that minimizes economic, health, and environmental risks.

Goals

The goal and intent of this plan is to produce an evolving and living document that provides a method and approach to guide the maintenance of public property and land. The focus and goals are:

- Strive to better connect communities to nature and enhance sustainability through conservation practices. Areas of focus include promoting sustainable practices and strategies that address the effects of climate change, preserving wildlife, growing a next generation of environmental stewards, and supporting programs and policies that encourage a commitment to conservation.
- Minimize the use of EPA level pesticides by applying in a targeted manner and only if deemed necessary when pests cannot be managed by other methods.
- Create and maintain a safe environment for visitors and staff that protects and preserves natural resources, park facilities, and amenities through design, operations, and education.
- Ensure stewardship of the public's resources through fiscal accountability, responsible planning, and effective management.
- Educate and promote natural areas and cultural practices through programing such as organic community gardening, community tree plantings, and litter abatement.
- Create an active learning environment using design such as interpretative signage with a focus on natural and historical education.
- Provide a natural, healthy, educational, and social environment and ensure all people have access and are meaningfully involved in the development and use of park and recreation programs and spaces.
- Facilitate a sustainable IPM plan and program that endures leadership and staff transitions through thorough documentation of the policy, plan, actions, and results.

Asset Management

The City of Denton (COD) is a municipal government and is the steward of over 3,000 acres of land containing public buildings, operational facilities, electrical substations, parks, waterways, drainage, easements, and right-of-ways. Park properties make up approximately 2,000 acres of the municipal property. Park Maintenance is charged with taking the lead in operating and maintaining the diverse selection of property and landscapes in a safe, attractive, healthy, and useful condition.

City owned properties represent a major component of the city's capital assets and the City recognizes its responsibility to protect and preserve this public and economic investment to the best of its abilities. The City also recognizes its responsibilities to its employees and the general public and seeks to employ the highest professional standards in the performance of its duties. To manage pests on City owned land, COD personnel shall utilize the principles of Integrated Pest Management.

Evaluation and Reporting

The IPM plan is meant to be a living document that evolves with organizational, environmental, and technological changes. The plan will be evaluated in full every 3 years by group of stakeholders identified by the Director of PARD or designee. Stakeholders would include but are not limited to representatives from gardening groups, local educators, governmental agencies, partner organizations, field experts, and engaged citizens at a minimum of 8 serving members.

It is PARD's goal to meet with the stakeholder group on an annual basis to keep the group updated on IPM activities and receive feedback on recommended and proposed changes. Legal, regulatory, procedural, and administrative changes can be made in the interim review period. All changes must be documented on Appendix 10: Revisions of the plan.

PARD will assess the effectiveness of the plan and the progress of stated goals by developing relevant, meaningful, and measurable performance indicators. Goals and measures will include pesticide risk reduction and reducing pesticide use through the tracking of chemical and non-chemical interventions. The indicators will be drafted on an annual basis during the budget process and reported quarterly.

Integrated Pest Management

Integrated Pest Management (IPM) is one of the major strategies used by PARD in the maintenance of public lands. There are many definitions of IPM, the following is from the U.S. Environmental Protection Agency for its publication, "EPA Integrated Pest Management for Turfgrass and Ornamentals¹:"

"IPM is the coordinated use of pest and environmental information with available pest control methods to prevent unacceptable levels of pest damage by the most economical means with the least possible hazard to people, property, and the environment. The goal of IPM is to manage pests and the environment so as to balance costs, benefits, public health, and environmental quality. IPM systems use all available technical information on the pest and its interactions with the environment. Because IPM programs apply a holistic approach to pest management decision-making, they take

¹ EPA Integrated Pest Management for Turfgrass and Ornamentals. Page 315 and <http://nepis.epa.gov/Exe/ZyPDF.cgi/9101AIKB.PDF?Dockey=9101AIKB.PDF>

advantage of all appropriate pest management options, including, but not limited to pesticides. Thus, IPM is:

- A system using multiple methods;
- A decision-making process;
- A risk reduction system;
- Information intensive;
- Cost-effective; and
- Site specific.”

IPM makes use of cultural practices, environmental factors, pest growth patterns and life cycles, ecological interaction, human contact, mechanical removal and, finally, pesticides to control harmful organisms.

The COD defines Integrated Pest Management as the coordinated use of pest and environmental information along with available pest control methods, including biological, cultural, physical, and chemical methods, to prevent unacceptable levels of pest damage by the most economical means and with the least possible hazard to people, property, and the environment.

- **Integrated** means that all feasible types of control strategies are considered and combined as appropriate to solve a pest problem.
- **Pests** are unwanted organisms that are a nuisance to man or domestic animals, and can cause injury to humans, animals, plants, and property, and have a significant economic impact. Pests reduce yield and/or quality in vegetation ranging from flower beds, to lawns, trees, and sports fields.
- **Management** is the process of making decisions in a systematic way to keep pests from reaching intolerable levels. Small populations of pests can often be tolerated; total eradication is often not necessary, or feasible.

Based on the above, the IPM plan consists of the following steps:

1. **Identification of the issue.** Identification of the pest, level of infestation, and an evaluation of the site will determine what action is needed, if any.
2. **Consultation.** This involves defining the roles of the people involved in the pest management equation (i.e. Certified Pesticide Applicator, Park Manager, Urban Forester, Park Supervisor, Superintendent, and Department Director) to assure understanding and communication between them.
3. **Management objectives.** Staff must determine the management objectives for a given site in order to solve the pest problem(s). This can be done by establishing maintenance classifications and standards with an outlined schedule to meet maintenance needs. Project and property priorities relevant at the time must also be considered. A Strategy review includes determining if a species is native or exotic, locating the management zone, and evaluating the chances of successful management.
4. **Set the action thresholds.** These are points when pest populations or environmental conditions indicate that action must be taken in order to prevent the pest population from crossing a pre-determined injury threshold; no action is taken until the threshold is reached unless it is

determined that conditions pose a threat to health and safety or the infestation is detrimental to plant material / vegetation.

5. **Non-chemical control.** In this step, action is taken to modify the pest habitat to reduce the carrying capacity of the site, exclude the pest, or otherwise make the site's environment incompatible with the needs of the pest. This step, which involves applied ecology with support from cultural and biological methods.
6. **Pesticide action.** If no-pesticide actions are not available or insufficient, the appropriate pesticide action is taken. All efforts should be made to (a) use the least toxic, most effective, most efficient application technique that provides the longest dwell time in contact with the pest, (b) apply when the pest is in its most vulnerable stage, and (c) carry the least possible hazard to people, property, and the environment.
7. **Evaluate.** This means checking the post-treatment results of the habitat modification or pesticide treatment actions by periodically monitoring the site and pest populations.
8. **Records.** For each site, records should be kept of pest management objectives, monitoring methods and data collected, actions taken, results obtained, and pesticides used. Records of actions taken will be documented in the appropriate record management system.

IPM is a decision-making process to determine if, where, when, and how pest control practices should be applied. And, in the short term, modification of direct pest control practices (such as reducing pesticide use through spot spraying strategies and replacing undesirable chemicals with more environmentally friendly materials) can provide valuable benefits in reducing the use of pesticides.

The IPM process first determines if a pest needs to be managed, and if so, how best to do it. Key elements are information gathering, well-informed decision making and monitoring of results. The IPM process promotes effective, low-risk management strategies to manage pests. The controls used in this plan include biological, cultural, physical, and chemical methods and materials; often a combination of methods is used. Methods selected to manage specific pest populations are evaluated by licensed and trained professionals. The methods employed conform to recognized standards established and endorsed by state and federal regulatory agencies, state educational institutions and organizations.

Key elements of an IPM program are information gathering and informed decision-making. Horticulturists, botanical specialists, park technicians, foresters, and arborists are skilled in identifying and evaluating pest problems. When pest problems occur that are unusual or beyond the scope of in-house experts, advice is obtained from other qualified sources such as state universities, Texas Department of Agriculture, and Texas A&M AgriLife Extension Service experts. Texas Pesticide Applicators License continuing education courses reinforce employee skills and provide current information concerning laws, safety, pests, and current IPM methods.

COD employees monitor levels of pests to arrive at the best solution for managing a pest problem. When pest management methods are implemented by trained IPM personnel, the results are solutions that are economically and environmentally responsible. This provides the public with safe, healthy, and aesthetically pleasing park areas.

Pesticide Use

Pesticide is a general term for any substance intended for preventing, destroying, repelling, or mitigating any pest. Park pests consist primarily of unwanted vegetation and invasive weeds, but can also include insects, disease organisms, rodents, and other organisms. To manage these pests, COD personnel select

the best methods available. When it is necessary to use pesticides as part of an IPM approach, risk is minimized by careful product selection and application. When developing and updating the IPM program, the best expert scientific opinion is relied upon on to inform staff about potential materials and methods. Assessments from regulatory agencies, state university departments in Texas, scientists and other experts in the field provide much useful specific information. The City turns to these recognized experts for credible science-based information. Staff also stays current with the latest pertinent studies as part of our process. By basing decisions on these authoritative sources best solutions can be obtained within the IPM framework.

Pesticide applicators are required to comply with all pesticide label directions, federal, state, and local pesticide regulations, applicable safety laws, and City policies. Misuse of pesticides will not be tolerated. Pesticides not labeled or listed (refer to Appendices 1-4) will not be covered in detail within this document, but pesticide applicators are required to use additional precaution and label directions, if present, for all applications.

In executing the IPM methodology, pesticides are to be utilized in a prioritized approach on City properties as follows:

Parks and Playgrounds

1. Organic pesticides and / or Organic Materials Review Institute (OMRI) listed substances; and
2. EPA Level III “caution” labeled pesticides only when deemed necessary to protect public health and economic impact.

Facilities / Buildings Landscaping

1. Organic pesticides and / or Organic Materials Review Institute (OMRI) listed substances;
2. EPA Level III “caution” labeled pesticides only when deemed necessary to protect public health and economic impact when other methods do not adequately control the pest;
3. EPA Level II “warning” label pesticides, only if deemed necessary to protect public health an economic loss when other methods do not adequately control the pest;
4. EPA Level I “danger” label pesticides, only if deemed necessary to protect public health an economic loss when other methods do not adequately control the pest.

Rights of Way (Street medians / parkways)

1. Organic pesticides and / or Organic Materials Review Institute (OMRI) listed substances;
2. EPA Level III “caution” labeled pesticides only when deemed necessary to protect public health and economic impact when other methods do not adequately control the pest;
3. EPA Level II “warning” label pesticides, only if deemed necessary to protect public health an economic loss when other methods do not adequately control the pest;
4. EPA Level I “danger” label pesticides, only if deemed necessary to protect public health an economic loss when other methods do not adequately control the pest.

Other City Property

1. Organic pesticides and / or Organic Materials Review Institute (OMRI) listed substances;
2. EPA Level III “caution” labeled pesticides only when deemed necessary to protect public health and economic impact when other methods do not adequately control the pest;
3. EPA Level II “warning” label pesticides, only if deemed necessary to protect public health an economic loss when other methods do not adequately control the pest;

4. EPA Level I “danger” label pesticides, only if deemed necessary to protect public health and economic loss when other methods do not adequately control the pest.

Safety

When pesticides are being applied in on City property by City personnel, notification signs are posted at points of entry to the treated areas. When pest management equipment is being used and materials are being applied by COD employees, all appropriate worker personal protective equipment is provided for use. Use of such equipment is an important part of safely applying pesticides as well as using mechanical equipment. COD employees work with the Watershed Protection Division to protect the city’s water supply from all types of contamination. When pesticides are contemplated to be used near waterways and drainage areas, the Watershed Protection Division will be notified. When necessary, application of pesticides downstream of stream banks or within waterways would be done using aquatic-labeled pesticides, following the IPM process and label directions, and with the approval of the field supervisor.

Laws and Regulations

Several Federal and State agencies regulate the use of pesticides. The City conforms to all pesticide laws and regulations and allows only Texas State Licensed Pesticide Applicators to apply pesticides of any kind on city property. In this way COD exceeds the standards established within Texas state law. To obtain a Noncommercial Pesticide Applicator's License, applicators must pass a series of tests given by the Texas Department of Agriculture. The Texas Department of Agriculture does allow non-licensed staff to apply pesticides when it is incidental to their primary duties.

Once licensed, applicators must renew their license, annually for noncommercial applicators, and take the required amount of continuing education units needed for the type of Pesticide Applicator’s License held. Applicators are required by law to record specific information when applying pesticides and keep records for a minimum of 2 years. The Texas Department of Agriculture’s designated forms are utilized for these purposes.

Decontamination Sites

Employers must provide sites so that workers and handlers can wash pesticides and residues from their hands and body. Decontamination supplies must include:

- Enough water for routine and emergency whole-body washing and for eye flushing;
- Soap;
- Single-use towels

Decontamination materials are also available in each applicator’s vehicle. It is the responsibility of the applicator to ensure adequate supplies are maintained in the vehicle.

The decontamination materials may not be located in an area under restricted entry unless they serve handlers working in that area. In this case, all materials must be protected from contamination.

Emergency Assistance

If there is reason to believe that a handler or worker may have been poisoned or injured by pesticides, an employer must promptly make transportation to an appropriate medical facility available to that person. Be prepared to provide the victim and medical personnel with:

- The product name, EPA registration number, and active ingredient(s);

- All first aid and medical information from the label;
- A description of how the pesticide was used; and
- Information about the victim's exposure.

Personal Protective Equipment (PPE)

Employers must provide handlers with the PPE as listed on the pesticide label. The employer must:

- Maintain PPE in a clean and operational condition;
- Make sure it fits correctly;
- Make sure handler wears and uses the PPE correctly;
- Provide a clean place to put on and remove PPE, and store personal clothing;
- Not allow worker to wear or take-home PPE;
- Take action to prevent heat-related illness while PPE is worn.

Cleaning and Maintaining PPE

Employers must make sure:

- PPE is cleaned according to manufacturer's instructions, inspected, and repaired before each use;
- PPE that is non-reusable or cannot be cleaned, must be disposed of properly;
- Clothing drenched with pesticide labeled DANGER or WARNING are discarded;
- PPE must be washed and dried properly, and stored separately from personal clothing;
- Respirator filters, cartridges and canisters are replaced as often as required. The handler employer must make sure anyone cleaning PPE is informed of possible pesticide residues on PPE, of the potentially harmful effects of pesticides, and of the correct ways to handle and clean PPE.

Equipment Safety

Handler employers must make sure that equipment used for mixing, loading, transferring, or applying pesticides is inspected and repaired or replaced as needed. Only appropriately trained and equipped handlers may repair, clean, or adjust pesticide handling equipment that contains pesticides or pesticide residues.

Environmental Protection

The City of Denton operates under the Pesticides General Permit (PGP, TXG870000) administered by the TCEQ. The purpose of this permit is to regulate the discharge of pesticides to the waters of the United States. Within the City, reporting for PGP compliance is coordinated through the Watershed Protection Division. Any potential adverse incidents involving pesticides should be immediately reported to Watershed Protection and/or PARD. Pesticide use within the City is also tracked to maintain compliance with the PGP.

INTEGRATED PEST MANAGEMENT METHODOLOGY

Approved Pest Management Strategies

Examples of possible and available management strategies among the many methods are listed in the prevention of pest problems.

- Strategy and planning;
- Cultural practices, avoidance measures, and physical means to manage pest problems; and
- Mechanical practices, trapping, biological controls, and use of natural and synthetic pesticides.

All the IPM measures are evaluated and considered together to select the best overall solution to a pest problem.

Strategy

Management of pests through adoption of Strategy can be highly effective and low in cost. Such policies can often eliminate problems before they begin. Some examples are:

- Prioritization of parks for control measures may be considered. Different park areas may have varying standards of acceptable care and appearance. Determining whether a particular park area requires control of pests and the level of that control must take these differences into account. Careful attention to public desires and public needs must be part of this prioritization process.
- Establishment of thresholds for action and the tolerance level for different pests are part of the IPM process. These thresholds vary according to plant, pest, site, and park classification. Determinations of action thresholds are made on a case-by-case basis.

Design

Proper park design is a major way that pest problems can be avoided. While no landscape can be designed to be free of pest management needs, such considerations need to be part of the planning process. Examples are:

- Elimination or modification of problematical areas;
- Avoiding the use of potentially invasive species;
- Proper and adequate spacing of plant material to reduce the incidence of pest problems;
- Maintenance of species diversity and elimination of monocultures in plantings where possible;
- Elimination of alternate hosts for diseases; and
- Establishment of overstory, thick groundcovers and other design techniques benefiting both the establishment of plants and the reduction of weed problems.

Plant selection

Plant selection is critical in minimizing pest management needs both short- and long-term. Criteria for plant selection include:

- Right plant, right place.
- Use of disease or pest resistant or tolerant plant species or varieties; and
- Removal of invasive or pest-susceptible plants and replacement with varieties of native or adapted pest resistant plants.
- Consideration will be given to native plants under favorable conditions and design goals.

Cultural practices

Proper cultural practices are essential in establishing healthy landscapes and can often help to maintain their resistance to pest problems. Examples are:

- Knowledge of the cultural requirements of plants to best provide proper conditions for optimum plant health and resistance to pests.
- Soil testing and amendment as indicated by test results to promote plant health and prevent/avoid pest issues that can result from or be exacerbated by nutritional imbalance.
- Adequate site preparation before landscape installation. This can include soil improvements, pruning of surrounding vegetation, grade adjustments, drainage improvements, and installation of irrigation systems.
- Use of disease resistant grafting rootstock or scion wood.
- Proper timing and use of water to reduce over or under watering.
- Proper timing and use of fertilization to eliminate over and under-fertilization.
- Use of cover crops to improve soil structure and reduce soil erosion.
- Rotation of plant species in nursery areas to reduce the buildup of pests.
- Aeration, over-seeding, and top-dressing to improve turf health and suppress weeds.
- Raking and debris removal to remove pest sources.
- Pruning and plant removal to promote air circulation and light penetration for plant health.
- Removal of diseased, infested, damaged, or dead wood.
- Mulching for weed reduction, water retention, winter protection and root zone improvement.
- Fan placement for improved greenhouse air circulation.

Mechanical and physical controls

Mechanical and physical methods are often employed to manage pests. Examples are:

- Mechanical edging of turf.
- Mechanical clearing of weeds in rough areas.
- Hand weeding in shrub beds.
- Weed wrenching or loping, or chain sawing invasive trees.
- Mowing of rough turf areas for vegetation control.
- Traps such as yellow sticky boards for greenhouse insects and traps for mammalian pests.
- String trimming to control unwanted vegetation.
- Disinfecting materials or equipment to prevent spread of pests.

Biological controls

Where applicable, biological control is useful to manage pests. This is the use of living organisms to reduce pest populations. These organisms are often also referred to as beneficials, natural enemies or biocontrols. They act to keep pest populations low enough to prevent significant environmental and economic damage. Examples are:

- Introducing insect or disease parasitoids, predators, and microbial products to control pests.
- Minimizing the use of disruptive techniques and materials in landscapes that may destroy natural pest control organisms.

Naturally derived and synthetically derived pesticides

Pesticides are derived from many sources. They vary widely in their characteristics and must be examined individually to determine their suitability within the IPM approach. Examples are:

- Placement of pheromone traps.
- Disinfecting materials or equipment to prevent spread of pests.
- Application of naturally and synthetically derived pesticides.

Criteria for Choosing a Pest Management Method

When choosing a pest management method or pesticide material from the approved lists located in Appendix 1-4, all personnel should consider the following factors and any additional factors relevant to the selection.

Nature of the site

- Erosion susceptibility and potential movement of soil through runoff;
- The intended use and function of the landscape;
- The feasibility of the method given the area and scope of the problem;
- The relative importance and public expectation of a site or plantings; and
- Site conditions such as soil type, grade, drainage patterns, and presence of surface water.

Possible health and safety effects

- Consider both short- and long-term toxicological properties and any other related potential health effects of the materials or methods, both to the applicator and the public;
- Equipment operation safety issues for both the operator and the public; and
- Worker safety and worker injury issues involved with carrying out the method.

Possible environmental effects

- Consider both acute and chronic toxicity and any other related potential effects of the material or method to non-target organisms including mammals, birds, amphibians, fish, invertebrates and other organisms;
- Environmental effects from potential bioaccumulation;
- Potential impacts to non-target plants and other organisms from materials or methods;
- Potential impacts to federally listed, threatened or endangered species; and
- Possible introduction or establishment of invasive plants.

Costs

- Costs of the material or method;
- Application and labor costs;
- Length and quality of pest control;
- Feasibility of using a particular method or product; and
- Indirect cost from aforementioned health, safety, and environmental effects.

Characteristics of the product

- Target pests and target sites of the product being used;
- Possible residual effect, decomposition pathways, rates, and breakdown products;
- Volatility and flammability;
- Product formulation and package size;
- Leachability, solubility, and surface and soil bonding characteristics of the product;
- Ease of cleaning equipment after use; and
- Positive and negative synergistic effects of pesticide combinations.

Special considerations

- Application equipment availability;
- Method of delivery;
- Current and anticipated weather conditions;
- Previous pesticide applications to the site and the interval between treatments; and
- Possible development of pest resistance to a particular management method or material.