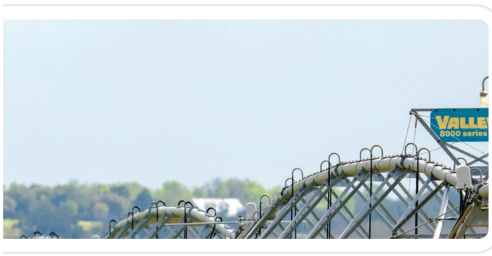

TEXAS A&M AGRILIFE EXTENSION

GENERALLY ACCEPTED AGRICULTURAL PRACTICES IN TEXAS

A manual prepared under provisions of H.B. 1750, Section 251.007 88th Texas legislature

ABOUT THIS MANUAL

Texas House Bill 1750 Section 251.007 stipulates the Texas A&M AgriLife Extension Service, an agriculture and natural resources education agency, shall develop a manual identifying generally accepted agricultural practices and indicating which of those practices do not pose a threat to public health, including a threat to public health posed by a danger listed in Section 251.0055(a)(1).

This manual has been prepared according to the generally accepted agricultural practices that would guide landowners, farmers, ranchers, managers, and workers on agricultural operations. It was written and peer reviewed by Texas A&M AgriLife Extension Service specialists and faculty with advanced academic expertise. This manual contains generally accepted agricultural practices as of January 1, 2024. It will be reviewed and updated as necessary.

The following is not an endorsement of practices, products, or regulatory mandates. Generally accepted agricultural practices may vary with site location, weather conditions, size of operation and species of flora or fauna. This manual describes accepted agricultural practices in Texas that generally do not pose a threat to public health, however circumstances may vary.

TABLE OF CONTENTS

General Use of Approved Chemical Applications in Agricultural Production

In Texas, like most other states in the United States, pesticides play a major role in the production of abundant and nutritious food, protection of the public's health, as well as the protection of the environment and property. Because these tools can also pose risks if not properly used, Texas Pesticide Laws and Regulations require strict adherence to pesticide labels by all end users.

Pesticides are a group of tightly regulated chemicals used by homeowners, agricultural producers, and others to manage nuisance organisms such as weeds, insects, diseases, and vertebrate pests. From the individual homeowner to the farmer, everyone is responsible for complying with the label and its directions. Penalties under federal and state law for failing to do so may be imposed.

The label is the main method of communication between the pesticide manufacturer and pesticide user. Pesticide labels include information such as signal words (DANGER, WARNING, or CAUTION), applicator safety requirements, environmental hazards, application rates and frequencies, application equipment specifications, restricted entry intervals, and other precautionary statements. Labels are specific and comprehensive and, when followed, allow applicators to accurately and efficiently apply pesticides with minimal risk to people or the environment.

In this manual, pesticides may be mentioned and used as part of an Integrated Pest Management (IPM) strategy, which has a scientific foundation centered on monitoring to determine the presence of pest organisms; assessment to determine the specific type and density of pests; action(s) to implement for eradicating, controlling, mitigating, repelling, destroying or killing the pest organism causing the problem; and reinspection or continued monitoring to facilitate profitable, sustainable agricultural enterprises.

Pesticides discussed in this manual will have the definitions described below:

- Herbicides are pesticides used to control or suppress unwanted vegetation.
- Insecticides are pesticides used to control or suppress unwanted insects.
- Fungicides are pesticides used to control or suppress unwanted fungal infections.
- Rodenticides are pesticides used to control or suppress unwanted rodent and vertebrate pest infestations.

The application of pesticides on agricultural establishments is a routine component of the production of agricultural commodities throughout the United States. Pesticides may be applied by hand sprayer, mechanized ground equipment, or aircraft, depending on the target pest and

other variables. In Texas, many producers apply their own pesticides. However, the commercial or for-hire application of pesticides by professional applicators comprises a significant portion of applications.

Pesticide applicators are not required to hold a pesticide license to purchase or apply a General Use, or over-the-counter pesticide. However, a license is required to purchase and apply federally Restricted Use Pesticides (RUP) or State-Limited-Use (SLU) pesticides. RUPs are designated by the U.S. Environmental Protection Agency (EPA), while SLU pesticides are designated by the Texas Department of Agriculture.

Each EPA registered pesticide bears a product label as required by the Federal Insecticide, Fungicide, and Rodenticide Act. Consequently, it is a violation of federal law to use any pesticide registered by EPA in a manner inconsistent with its labeling.

Individuals seeking a pesticide applicator license can contact their Texas A&M AgriLife Extension Service County Agent or the AgriLife Extension Agricultural and Environmental Safety Unit for information, including training and required study materials.

AQUACULTURE MANAGEMENT

Aquaculture includes finfish such as red drum, hybrid striped bass, channel and hybrid catfish, and tilapia, and others grown as food fish, baitfish, gamefish for pond and lake stocking, and aquarium ornamentals. Marine shrimp, giant river prawns, crawfish, and oysters are grown primarily as a human food source and are aquaculture products as well. The aquaculture systems vary from earthen ponds to indoor recirculating aquaculture systems (RAS). The following Generally Accepted Agricultural Practices will not create any imminent danger regarding the above referenced issues for persons who reside in the immediate vicinity or persons on public or private property of the aquacultural operation:

- Site selection includes thorough investigation and testing of the source water reliability, volume, and quality.
- Local city government officials may be contacted to have any plans reviewed, regulatory requirements determined, and permits issued.
- Treatment and disposal of wastewater is evaluated based on the system design and conforms to any local, state, or federal regulations for each site being considered.
- Ponds may be regularly dredged, dug out and reworked, drained, or dried and left fallow for up to a year.
- Levee mowing and repair are regularly practiced.
- Ponds may be regularly limed, fertilized, flushed with surface or well-water, treated with Environmental Protection Agency (EPA) registered algaecides or herbicides to manage algae and aquatic plant growth, or sealed with bentonite or another source of clay.

Aquatic Animal Health

The following generally accepted practices are common for aquatic animal health:

- Fish and shellfish are inspected for signs of disease, stress, abnormal behavior, and are quarantined prior to introduction.
- Fish and shellfish are quarantined in water from the production system to reduce stress prior to introduction into production units.
- Fish and shellfish are transported using industry-standard stocking densities and water quality parameters for the species being cultured.
- Health is routinely monitored visually for signs of disease, abnormal behavior, and changes to feeding behavior.

- Treatment with therapeutic drugs or chemicals are selected from the approved list provided by the U.S. Food and Drug Administration and administered in the amounts and techniques following the manufacturer's guidelines and label.
- Fish and shellfish mortalities are removed frequently and routinely. Fresh mortalities are used to diagnose any suspected diseases.
- Facilities use disinfection mats or shoe dips at the facility between production areas.
- Bird management at aquaculture facilities often includes methods such as frequent shooting with lethal and non-lethal ammunition, noise or scare devices such as propane canons, lasers, and strobe lights, or other non-lethal measures such as bird netting and string or fishing line run at regular intervals over the tops of ponds and tanks to prevent landing and take-off.

Biosecurity Generally Accepted Practices:

- Premises are maintained in a clean manner.
- Raceways, pools, screens, and hatchery areas are cleaned regularly.
- The facilities are fenced, and gates locked to prevent intruders or predators.
- The water supply is restricted or fenced to prevent contamination.
- The feed storage area is secure and protected from pests, excessive heat, and moisture. Spoiled or fungal-laden feed is removed and disposed of properly.
- Culture systems may be covered with bird netting to prevent predation stress and disease introduction.
- Disinfecting footbaths and hand sanitizers are provided at key entry points.
- Public access is controlled. The public and their vehicles are restricted to designated areas. Visitors are escorted through the facility and must follow biosecurity and disinfection procedures.

Transportation

Fish and shellfish are commonly transported to and from the aquaculture facility. Appropriate hauling tanks, water quality, and stocking densities are used to reduce stress and transport mortalities.

- Hauling equipment, including tanks and nets, are cleaned, disinfected, and rinsed before use. Vehicle traffic, frequent stops, and road restrictions are common on or near facilities.
- Backup aeration systems are used should a failure occur.

• Fish and shellfish are regularly sampled or harvested by seine (may be hand- or equipment-driven such as by tractors or boats), cast nets, dip nets, or by hook and line.

Equipment Maintenance and Wastewater Generally Accepted Practices:

- Routine on-site maintenance may include the repair or servicing of tractors and other large farm equipment and machinery, trucks and other vehicles, pumps and wells, aquaculture production systems including ponds and tanks, levees, ditches, water discharges, roads, buildings, and electrical components.
- Wastewater disposal is a common generally accepted agricultural practice. System designs include plans that adequately treat and properly dispose of all wastewaters generated throughout the system.
- With facilities located where municipal sewers are available, sewers can be used for the discharge of wastewater.
- The municipal authority helps determine if disinfection of the effluent is required if non-native species are being cultured to eliminate any pathogens escaping the facility.
- Texas Commission on Environmental Quality (TCEQ) regulations and requirements should be followed.

• Night operations are common, including checking dissolved oxygen and other water quality parameters, predation control, and feeding are commonplace at pond-based aquaculture facilities. This includes the use of vehicles and feed trucks, firearms and other scare tactics including lasers and strobe lights. Light or noise disturbances to houses or public functions located in close proximity to the aquaculture facility can occur.

• Water flow reduces nutrient load in the pond, increasing production capacity. Increased water flow can reduce water temperature in the summer and reduce ice formation in the winter so water drainage may occur frequently.

Marine Aquaculture

To date, non-land-based marine aquaculture in Texas has been mainly limited to shellfish, specifically oysters. Land-based marine aquaculture in Texas currently includes systems such as ponds and tanks with inlet pipes drawing marine waters on-shore into the systems. Species grown in these systems include but are not limited to red drum, hybrid striped bass, marine shrimp, and various species of bait.

System Design

• Local and state agencies may be consulted, and any applicable permits obtained prior to facility construction.

• System is designed based on the quality and volume of the water source, site features and limitations, production goals, and time available for operation and maintenance.

- Water flow rate adjustments, pond isolation, and bypass features are a part of the system design.
- Appropriate means of waste collection, treatment, and discharge are used and planned for and integrated into the system.
- Pond enclosures are constructed to deter predators and unwanted debris from entering the system.
- The system is designed to facilitate passive aeration and removal of concentrated solids.
- All waste outlets are screened to limit fish or shellfish escape or invasion by unwanted fish or shellfish into surrounding natural waterways and municipal/county water systems.
- Waste products are collected and removed by truck, tractor, or other type of vehicle.
- Sumps/waste collection areas are drained daily in culture tanks to remove settled solids.
- Water flow is regulated to meet industry standard water quality requirements.
- Water withdrawal and discharge is monitored in compliance with local, state, and federal regulations.

BEEKEEPING

Terms and definitions for beekeeping and beehive management are found under Texas Agriculture Code Title 6. Production, Processing, and Sale of Animal Products Subtitle A. Bees and Non-Livestock Animal Industry Chapter 131. Bees and Honey.

The following Generally Accepted Agricultural Practices will not create any imminent danger regarding the above referenced issues for persons who reside in the immediate vicinity or persons on public or private property in the immediate vicinity of the beekeeping operation:

1. Working Hives
   a. Hives may be opened and examined for any of the following reasons:
      - Feeding.
      - Determining health of queen.
      - Replacing old frames or hive materials.
      - Evaluating need for more space or reduction of space.
      - Monitoring for mites, other parasites, and disease.
      - Honey extraction, etc.
   b. When opening hives, hand-held smoking devices are often used to calm bees. Various substances can be burned to make smoke such as cotton, pine, paper, commercial smoke pellets, and wood.
   c. Beekeeping protective equipment is worn to avoid stings – equipment includes veils, jackets, full suits, and gloves.
   d. Opening hives may involve utilizing beekeeping tools to crack propolis, a protective layer of resin manufactured by bees, removing lids, removing frames, and boxes.

2. Honey Extraction – beekeepers may desire to extract honey from their hives. This often occurs in the summer months but may occur as early as spring and as late as fall.
   a. Extracting honey involves removing frames of honey from hives.
   b. Bees can be removed from frames by a variety of mechanisms: shaking frames, blowing air, using bee repellent, escape screens, or other devices.
   c. There are various means to extract honey from hives: dripping into pans, hand crank extractors, and motorized extractors.
   d. Honey frames can be reused back in the hives, stored for later use.

3. Pest Management
   a. Honeybees are subject to various pests and diseases.
   b. Pests and diseases can be detrimental to honeybee and hive viability and are not transmissible to non-bee species.

c. Pesticides may be used to combat these various pests, typically placed inside or directly near the hive and after close monitoring.
d. A veterinarian may be required to prescribe antibiotics.
e. The label is the law for pesticides and antibiotics (see Approved Chemical Applications section).

The following general beekeeping practices are commonly used for maintaining hives. The following generally accepted agricultural practices will not create any imminent danger regarding the above referenced issues for persons who reside in the immediate vicinity or persons on public or private property in the immediate vicinity of the agricultural operation:

Hive Density – The generally acceptable number of colonies/boxes depends on the size of the lot on which they are placed. Generally, no more than three colonies on any lot of one-quarter acre or less (not counting the nucleus colony or frames of combs removed from the established hives). Lot sizes of less than 1 acre generally limited to no more than three full-size colonies. Beekeepers generally limit hives to not fill over four boxes (of any size). This maintains a smaller population, which is more manageable as there are fewer bees per hive.

Hive Placement –

1. Hives are placed in areas that avoid human and animal traffic and are not placed adjacent to sidewalks, trails, or public right of ways. Hives are hidden from high traffic areas by fencing, brush, foliage, or another solid barrier. Examples include hives placed on rooftops, enclosed in solid, 6-foot fencing (not chain link), or hidden from view by brush.

2. Generally accepted setback distance from a property line is a minimum of 25 feet.

3. Hive entrances are oriented away from sidewalks, paths, trails, roads, etc. Bees need at least 10 feet of flight path before likely encountering humans or animals. Flight paths may be altered by placing fencing or other solid structures so that bees fly at least 8 feet high, which is above human height, to avoid interactions. Constructing flight barriers, installing fencing, and planting tall bushes in proximity to structures like garages or sheds encourage bees to fly up into the air and away from people.

4. Beekeepers provide bees with water on the same property, so they are less likely to seek out water sources on neighboring property. Sources of water are placed within 15 feet of hive(s) and maintained year-round, so that they orient on this source. This will help prevent scout bees from finding water sources elsewhere.

Nutrition – Honeybees require pollen (protein source), nectar (carbohydrate source), and water for survival. In times of nectar dearth, beekeepers may feed supplementals and provide a

supplement sugar syrup. In Texas, feeding is generally required in winter and summer months and often provided in early spring to build the hive's bee population.

Practices for Maintaining Gentle Hives –

1. Requeening – beekeepers requeen when hives become aggressive.
2. Nutrition – bees are provided adequate food by supplemental feeding when food stores are low in the hive and during nectar dearth.
3. Opening Hives – hives are opened in general during morning hours and on sunny days to avoid times when bees are agitated.
4. Reduce Disturbances – operators avoid using heavy or loud equipment around hives such as a mower and take all safety precautions including refraining from opening hives after mowing.
5. Swarms are prevented by following these practices:
    a. Providing additional hive bodies and supers in a timely manner as colonies grow or collect honey, giving each colony plenty of room to expand.
    b. Splitting strong hives.
    c. Expanding the brood nest by placing alternating frames of empty drawn comb between the existing frames of the brood nest.
6. Properly dispose of waste
    a. Beekeepers keep their yards clean and properly dispose of all beekeeping waste and hive by-products.
    b. Burr comb, broken equipment, and old wax is sealed in garbage bags (to prevent robbing) and placed in garbage bins.
    c. Hive feeders and syrup containers are rinsed out, so any sugar residue is washed away.
    d. It is important that the apiary is kept clean to ensure any pests like wasps, rodents, or skunks are not attracted to the area.

Disease and Parasite Management – Reduce stress to bees by monitoring regularly for Varroa mites and other signs of disease. Treat for Varroa mites when monitoring justifies treatment.

CROP PRODUCTION

The following Generally Accepted Agricultural Practices will not create any imminent danger regarding the above referenced issues for persons who reside in the immediate vicinity or persons on public or private property of the agricultural operation:

1. Seedbed Preparation
    a. Seedbed preparation is the act of preparing a site for successful crop establishment. Site preparation may include any of the following tillage practices:
        i. Full tillage – the entire field is completely plowed.
        ii. Some form of conservation tillage that maintains plant residues on at least 30% of the soil surface after planting. Conservation tillage methods include:
            (1) No tillage: Seeding directly into undisturbed soil.
            (2) Strip tillage: A tillage system where 30% or less of the soil is tilled in narrow bands.
            (3) Ridge tillage: A tillage system where ridges or raised beds are formed by cultivation. The crop is planted on the ridge.
            (4) Mulch tillage: A subsurface tillage system where at least 30% of the crop residue is left on the soil surface.
    b. It may take several trips across the field to complete the seedbed preparation for practices other than no-till. This is most often done using machinery.

2. Crop Establishment
    a. Crops are typically established using seed, although some forage crops are vegetatively propagated. Additionally, some crops are transplanted, where a plant is put in the ground, as opposed to seed being planted.
    b. Various types of seeders (planters) may be used to place the appropriate quantity of seed into the seedbed.
    c. There are annual crops, which complete their life cycle in one year, and perennial crops, which continue to live from year to year.
    d. Perennial crops include Coastal Bermuda grass, hay fields or pastures, vineyards and orchard crops like pecans, peaches, etc.

3. Pest Management
    a. Crops are subject to various pests during the life cycle. Pests may include weeds, insects, and diseases.
    b. Weeds (unwanted plants) intercept sunlight or take up soil moisture and essential nutrients that crops require to grow.
    c. Insects can destroy or severely damage growing crops or postharvest crops.

d. Fungal, bacterial, and viral diseases may also affect plant health and cause crop yield losses.
e. Pesticides may be used to combat these various pests, typically by application in different formulations as liquid, dust, granules, or gas.
    i. Herbicides are used to manage weeds.
    ii. Insecticides are used to manage insects.
    iii. Fungicides are used to manage fungal diseases.
f. Pesticides may be applied more than once during the growing season. They are only used to prevent or reduce economic damage to the crop based on the principles of Integrated Pest Management (IPM), including cultural, mechanical, physical, biological, and chemical control tactics. Pesticide label instructions should be followed, which are regulated in accordance with Texas Department of Agriculture (TDA) rules and regulations.
g. Pesticides are safe to use if the applicator follows the labeled directions, including the target crop and pests, application rate, specific timing of application, application method, and attention to environmental variables such as wind speed, direction, neighboring crops and vegetation, and soil conditions. Some, but not all, pesticides require a pesticide applicator license from TDA to be applied.
h. Users must comply with label instructions (see Approved Chemical Applications section).

4. Fertilizer
    a. Crops require certain levels of nutrients to grow and thrive, resist environmental pressures such as cold, heat, and drought, and produce the quantity and quality of crop desired.
    b. Fertilizer may be applied with machinery as either a liquid or dry granular product or injected in the irrigation water.
    c. Fertilizers are generally applied based on soil-test recommendations, thus reducing the potential for water pollution via overapplication or off-site movement via runoff, for instance.
    d. Fertilizer may be applied more than once during the growing season.
    e. Manure and other organic fertilizers are commonly used on crops.

5. Irrigation
    a. Crops may require supplemental water to grow and produce, especially in arid regions of the state and during periods of insufficient rainfall and amount and frequency may vary depending on local conditions.

b. Applications may include surface irrigation (furrow or surface flooding); sprinkler irrigation (which may include portable, permanent, or automated movable systems); and/or microirrigation (surface or subsurface drip irrigation, micro spray irrigation, etc.).
c. The goal is to provide sufficient water to meet the crop requirements while minimizing runoff. Timely and adequate water is essential to crop yield and quality.
d. Systems may be in place to capture and reuse rainwater to minimize reliance on municipal water sources.

6. Harvest and Harvest Aids
   a. At the appropriate stage of maturity, most crops will be harvested using specialized equipment (some specialty crops may be hand-harvested, requiring field labor and adequate safety and sanitary accommodations). There may be a small amount of crop residue and dust in the air during the process, but this is short-lived and ends with harvest.
   b. Crop residue is the biomass remaining after the crop has been harvested and includes stalks and stubble. Crop residues may be left in the field to minimize erosion or harvested for fodder.
   c. Specific harvest activities, such as swathing (cutting) hay, may be conducted more than once during the growing season, depending on growing conditions and/or the quantity of crop desired. Harvest timing of a grass/forage crop is dependent on the forage type, the livestock species and class for which the forage is intended, environmental factors (ex. weather and water availability), and the desires of a potential customer. Depending on the forage species, harvested hay is either stored uncovered in the field or in hay barns.
   d. Ensiled forages are harvested directly and immediately transported using trucks/trailers.
   e. Grain crops are harvested using combines once the grain reaches physiological maturity and the desired grain moisture. Grain crops are transported to off-site grain elevators or centralized on-farm grain storage facilities that are owned and operated by the farmer.
   f. Cotton is harvested once the cotton bolls are open. After the cotton bolls have matured, a harvest aid may be used to speed up the harvest process and minimize the cotton crops exposure to rainfall that could negatively reduce yield and fiber quality. Once the harvest aids have been applied and bolls are fully open, the cotton is harvested and transported to a cotton gin. Cotton may be stored in the field in the shape of round bales or module.
   g. Harvest aids are chemicals that are broadcast across an entire field to prepare a crop for harvest. Harvest aids can be used in grain, soybean, and cotton crops although they are most frequently used in cotton. In grain and soybean crops, harvest aids will stop plant growth and desiccate leaf material. In cotton, harvest aids are used to increase the rate of leaf abscission (defoliation) and/or boll opening. Applications may be ground or aerial using airplanes or helicopters, and in some cases, drones, as stipulated on the product

label. These products have product label directions and restrictions that are to be followed, similarly to pesticides.

h. Trucks, trailers, and farm equipment (including forage harvesting equipment, combines, and cotton pickers or strippers) are often stored on premises.

7. Other Practices
   a. Once the crop is harvested, then the land can be tilled, shredded, fertilized and re-watered to grow another crop.
   b. Often land is double cropped, starting with a spring crop followed by a fall crop.
   c. Often after harvest, livestock may be placed on the land for the purpose of grazing the crop residue that is left on the property.
   d. The planting of a cover crop may be utilized for the purpose of preventing soil erosion and/or restoring nutrients to the soil between annual crops. Typically, cover crops are destroyed prior to preparations for the next season's crop. These cover crops may also be grazed by livestock.
   e. It is common for crops to be grown in rotation (a different crop each year). Sometimes the rotation may include a fallow year where the land is left idle, then returned to production the following year.
   f. Some agricultural land to be enrolled in the federal Conservation Reserve Program (CRP) in which the land is taken out of production for a contracted period of time. CRP land is planted in a mixture of grasses and is not harvested or grazed. Under certain emergency conditions as determined by local, state, and federal agencies, allowances can be made for either grazing or harvesting.

8. Personal grain warehouses or public grain warehouse operation or grain processing facilities are a common occurrence in crop production to store and process crops.

HORTICULTURE AND FRUIT AND NUT ORCHARDS

Horticulture includes vegetables, fruit, grapes, and ornamental crops. Ornamental, landscape, and bedding plants are part of the green industry. Such crops can either be grown in the ground, hydroponically, or in containers. The following Generally Accepted Agricultural Practices will not create any imminent danger regarding the above referenced issues for persons who reside in the immediate vicinity or persons on public or private property of the agricultural operation:

1. Land Preparation
   a. If growing in the ground, soil prepared for crop production typically involves some sort of tillage.
   b. Containers or pots use natural and artificial media such as peat moss, sand, and vermiculite.
   c. Hydroponically, or soilless culture, would be used in a greenhouse setting.
   d. Grapes are normally grown on a trellis, i.e., posts and wire system.

2. Crop Establishment
   a. Crops can be directly seeded, transplants can be grown for vegetables and fruit trees, and grapes are established with either bare root or container plants. Ornamental plants are typically grown in containers.
   b. Fruit trees are perennial long-term crops, vegetables are short term, and ornamentals can range from six weeks to two or more years.

3. Pest Management
   a. Crops are subject to various pests during the life cycle.
   b. These pests may be unwanted plants (weeds) intercepting sunlight or taking up precious soil moisture and nutrients.
   c. Insects can destroy or severely damage growing crops.
   d. Fungal and bacterial diseases may also be present.
   e. Pesticides are used to combat these various pests, typically by post-establishment spray treatments or by broadcasting certain granular products.
      i. Herbicides are used to treat weeds.
      ii. Insecticides are used to treat insects.
      iii. Fungicides are used to treat fungal diseases.
   f. These products may be applied more than once during the growing season. They are applied based on the principles of Integrated Pest Management, including cultural, mechanical, physical, biological, and chemical control tactics, and only used when there is potential for economic damage to the crop. When the IPM process determines an economic threshold has been met, the product will be used in strict accordance with the

label directions.

4. Fertilizer
    a. Crops require certain levels of nutrients to grow and thrive and produce the quantity and quality of crop desired.
    b. Fertilizers may be applied as a liquid or dry granular product or injected in the irrigation water.
    c. Fertilizers are generally applied based on soil-test recommendations, thus reducing the potential for water quality contamination.
    d. Fertilizer may be applied more than once during the growing season.
    e. Slow-release fertilizers are often used in containers.

5. Irrigation
    a. Horticultural crops require supplemental water to grow and produce.
    b. Irrigation systems include sprinkler and drip irrigation systems. Some watering will be done with a hose and flood irrigation as needed.
    c. The goal is to provide sufficient water for the crop with little to no runoff. Product quality is typically determined by adequate rainfall and irrigation.
    d. Systems may be in place to capture and reuse rainwater to minimize reliance on municipal water sources.

6. Harvest
    a. At the appropriate stage of maturity, crops will be harvested, most often with hand labor.
    b. Vegetable and fruit crops require multiple harvests.
    c. Grapes grown for wine are usually single harvested; fresh eating grapes can be multiple harvests.
    d. Ornamental plants are sold when either the transplants are ready to plant, or the crop has reached sufficient size for something like a shrub, or the plant is blooming.
    e. Nursery licenses are needed to sell ornamental plants to the public. Check with the Texas Department of Agriculture to learn more about nursery floral licensing.
7. Post-harvest Operations
    a. Once the vegetable crop is harvested, then the land can be tilled, shredded, fertilized, and re-watered to grow another crop.
    b. Often times land is double cropped, starting with a spring crop followed by a fall crop.
    c. Fruit trees can remain productive and stay in place for many years.
    d. Ornamental plants may need to be put in larger containers if they have not been sold.
    e. Grapes can be fermented to make wine.

Orchards

The following are generally accepted agricultural practices when growing fruit and nut crops:

1. Site Selection and Preparation
    a. Not located in areas that are more prone to frost.
    b. Protection from herbivores (if present) and theft/vandalism.
    c. Access to a viable market/distribution point.
    d. Removal of existing vegetation such as perennial grasses/weeds is done prior to planting.
    e. Creation of berms/raised beds may be necessary for sites with marginal drainage.

2. Orchard Design and Establishment
    a. Tree spacing generally will accommodate final size of the crop for efficient management.
    b. Planting layout will facilitate pollination, pest/disease/weed control, and harvest.
    c. Equipment needs may include those used for mowing, crop-spraying, weed-spraying, and harvesting/shaking (nuts).
    d. Acquisition of trees from a reputable source and installation using proper planting technique are important.
    e. Young trees require appropriate irrigation, weed-control, fertility, and training during establishment.

3. Fruit/Nut Tree Irrigation
    a. Judicious water use for irrigation is used to minimize runoff and risk of groundwater contamination.
    b. Volume of irrigation is low for young trees and will usually need to be adjusted to accommodate needs of mature trees in the absence of rainfall.
    c. Delivery to the young/active roots and avoiding wetting fruit/foliage promotes good tree health and reduces disease problems.
    d. Timing/frequency may vary based on weather, soil, tree size, and developmental stage.

4. Fertility Management
    a. Fertilizer application is necessary and results in minimal risk of groundwater and surface water contamination, yet optimizes plant health, yield, and fruit/nut quality when labels are followed.
    b. Use of soil testing, leaf tissue analysis (as needed), and inspection for visual symptoms are commonly used.

5. Pruning and Training
    a. Begins at planting time.

b. Training systems vary by crop and include open-center, central leader, modified central leader, and hedgerow.
c. Proper training and careful use of tools minimizes risk of injury and damage to trees and personnel.

6. Weed Control
   a. Weeds consume water and nutrients, reduce yields, and may harbor pests and are therefore removed.
   b. Management techniques include cultivation, herbicide application, hand-weeding, and mulching:
      i. Herbicides include contact/burn-down, systemic, and preemergent products.
      ii. Elimination of weeds/turf within 5+ feet (10 feet-wide strip) of mature trees and maintaining a strip of mowed grass between rows.
      iii. Use of mulch prevents weeds and improves soil but may not be feasible for larger plantings.
      iv. During inclimate weather, steps such as shade in hot months and covering, heaters and watering may be used to protect plants during freezes and cold weather months.

7. Pest and Disease Management
   a. Orchard Integrated Pest Management (IPM)
      i. Focuses on regular monitoring for problems and careful control measures.
      ii. Includes cultural, biological, mechanical/physical, and chemical approaches.
      iii. Results in efficient management of the pest/pathogen and the least risk to the environment, applicator, and consumer.
      iv. Some crops may require a regular spray schedule, while others need little to no spraying.
      v. Usage of chemical pesticides includes:
         1. Careful selection and usage when warranted.
         2. Thoroughly adhering to label requirements and restrictions, including:
            a. Observing re-entry and pre-harvest intervals.
            b. Making applications only during favorable conditions.
   b. Insects and Other Pests
      i. Cause damage to the plant and/or directly to the fruit/nut product itself.
      ii. May require use of insecticides, miticides, or rodenticides adhering to label requirements and restrictions.
   c. Diseases
      i. Infect fruit/nut products and/or other parts of the tree.
      ii. Include fungi, bacteria, viruses, nematodes, and other microorganisms.

iii. May require use of fungicides, ⁄ bactericides, viricides, and nematicides often in a preventative fashion and as specified on the product label.

8. Harvest and Post-harvest
   a. Fruit and nut products must be harvested at the proper stage of maturity for that crop, based on specific maturity indicators.
   b. Most fruit crops for the fresh market are harvested by hand.
   c. Also, some crops may be harvested mechanically, in the case of nuts and other fruit for processing and particularly for larger plantings.

GREENHOUSE MANAGEMENT

The following Generally Accepted Agricultural Practices will not create any imminent danger regarding the above referenced issues for persons who reside in the immediate vicinity or persons on public or private property in the immediate vicinity of the agricultural operation:

Site Selection and Design:

- A location with adequate sunlight exposure and minimal shading from surrounding buildings is required.
- Greenhouses are structures that protect plants from environmental factors. They are constructed from many different materials and are constructed in different shapes and sizes.

Energy Efficiency:

- Greenhouses may be built from energy-efficient materials, such as double-pane glass or polycarbonate panels with good insulation properties.
- Also, plastic or shade fabric material may be used to protect plants from the environment.
- Shading systems may be implemented to reduce overheating during peak sunlight hours.
- Energy-efficient heating, cooling, and lighting systems to minimize energy consumption may be installed.

Water Management:

- Irrigation systems are often used in greenhouse units.
- Irrigation systems with sensors are commonly used to monitor soil moisture levels and deliver water. A drip irrigation system will deliver water directly to the roots and conserve water. Other irrigations methods are also commonly used.
- Systems may be in place to capture and reuse rainwater to minimize reliance on municipal water sources.

Light Management:

- For many greenhouse crops, lighting at the right time and for the needed duration is vital.
- Supplemental lighting: Lighting technologies appropriate for plant growth stage may be utilized. Light shields or reflective surfaces may be used to direct light onto plants and prevent light spillage into surrounding areas.

Water Use:

- Systems are commonly in place to protect potable water against backflow to ensure contaminated water is not mixed with that used for human consumption. Backflow preventers are installed when chemicals are injected into the irrigation water regardless of source.
- Rainwater may be collected on premises for future plant water needs.

Pesticides and fertilizers are mixed and stored away from the water source to reduce the chance of contamination. Backflow prevention devices are tested annually.

Integrated Pest Management (IPM):

- A proactive Integrated Pest Management (IPM) strategy may be used to prevent and control pests.
- Plants are regularly monitored for signs and symptoms for early detection of pests.
- Biological control agents, such as biopesticides, to reduce the need for synthetic chemical pesticides may be used.
- IPM does include, at times, chemical control of pests only when needed and in combination with other alternative methods. The pesticide label is the law and must be thoroughly followed (see Approved Chemical Applications section).

Crop Selection and Rotation:

- Crops that are generally adapted and well-suited for the local climate and market demand may be selected.
- Crop rotation plans to prevent accumulation of pest inoculum and maintain soil fertility are common.

Waste Management:

- A composting system for plant waste and organic materials may be set up to reduce waste sent to landfills.
- It is a common practice to use compost and organic fertilizers on these crops.
  Plastic pots, trays, and other materials used in the greenhouse may be recycled.

Climate Control:

- Mechanical devices may be used for both climate control and ventilation systems.
-

Nutrient Management:

- A balanced fertilization program based on soil testing is generally implemented to provide plants with essential nutrients.

High Tunnels

High tunnels use similar practices to open field production, but specialty crops are grown in soil and maintained under plastic protective covers, like greenhouses. Typical high tunnels range in size from 20-30 feet wide and 72-96 feet long. High tunnels provide an environment that increases plant growth and protects them from adverse weather and can extend crop production seasons.

Seedbed preparation is the act of preparing a site for successful crop establishment. In high tunnels, site preparation may include any of the following tillage practices:

- Full tillage – the entire tunnel area is completely plowed.
- It may take several passes with a tractor or rototiller to create appropriate soil conditions.
- Bed preparation with bed shaping equipment – with certain crops, raised beds may be formed to allow for improved drainage of excess soil moisture.
- Polyethylene plastic mulch (film) coupled with drip tape can be used to reduce weed pressure, decrease soil moisture losses, and warm up soil during cold weather.
- Conservation practices in high tunnels include crop rotation to reduce potential economic disease and insect pressure.

1) Crop Establishment
    a. Vegetable and small fruit crops are established using seeds, transplants, or root/stem cuttings.
    b. Various types of seeders (planters) may be used to place the desired seed into the seedbed, but mostly by single-row, hand-pushed seeders.
    c. Both annual (complete life cycle in one season) and perennial crops (which continue to live from year to year) may be planted.
    d. Trellises (either wooden stakes or T-posts) can be used for taller plants including brambles, tomatoes, cucumbers, etc.
    e. Annual crops include, but not limited to, tomatoes, peppers, eggplant, cucumbers, lettuce, spinach, root crops, and strawberries. Perennial crops include blackberries, raspberries, etc.

2) Pest Management
    a. High tunnel crops are subject to various pests during their life cycle. Pests include weeds, insects, nematodes, and/or diseases.
    b. Weeds compete with the crop's sunlight and moisture and nutrient uptake.

c. Insects destroy or severely damage growing crops by feeding on leaves, stems, roots, or the plant part to be eaten or sold.
d. Fungal and bacterial diseases may be present and can be yield limiting.
e. Pesticides may be used to combat various pests, including during crop establishment or post-establishment spray treatments or by broadcasting granular products.
i) Herbicides are used to manage weeds.
ii) Insecticides are used to manage insects.
iii) Fungicides are used to manage fungal and bacterial diseases.
iv) Some pesticides may also be used to manage varmint and bird issues, etc., though exclusion using netting is available.

Pesticide products are generally used and may be applied more than once during the growing season. They are applied based upon the principles of Integrated Pest Management, including cultural, mechanical, physical, biological, and chemical control tactics. and applied in strict accordance with the product label and labeled restrictions, as well as TDA regulations.

Pesticides are safe to use when applicators are properly trained and follow the instructions on labeled products. Pesticide instructions include the target crop and pests, application rate, specific timing of application, application method, and attention to environmental variables such as wind speed and direction, time of day, air temperature, neighboring crops, bee activity and soil conditions, etc. (see Approved Chemical Applications section).

3) Fertilizer
   a. Crop production requires minimum levels of nutrients for plants to grow and thrive, resist adverse conditions such as cold, heat, and drought, and produce the quantity and quality of crop desired.
   b. Fertilizers may be applied as liquid or dry granular products or injected in the irrigation water.
   c. Fertilizers are generally applied based on soil test and crop recommendations, thus reducing the potential for over-application.
   d. Fertilizer may be applied more than once during the growing season.
4) Irrigation
   a. Crops produced in high tunnels require supplemental water to grow quality yield.
   b. Irrigation applications generally include drip irrigation using drip tape placed just below the plastic mulch, surface irrigation (furrows) and overhead sprinkler irrigation.
   c. The goal of drip irrigation is to provide sufficient water and nutrients to meet the crop requirements while minimizing runoff. Timely irrigation and adequate water are essential to crop yield and quality.

5) Harvest
    a. At the appropriate stage of maturity, high tunnel crops are hand-harvested, and this requires field laborers to be trained with adequate safety and sanitary methods to reduce potential foodborne diseases.
    b. Harvest activities are usually conducted more than once during the growing season, depending on the crop, and may extend for four to five months.
    c. Temporary on-site storage of the crop in refrigerated coolers may be necessary, and trucks/trailers used to transport the harvested products to market may be needed.

6) Post-harvest operations
    a. Following the final harvest, plant residue in high tunnels is either removed or shredded, and the soil is tilled again to enhance crop residue degradation. Crops may be replanted immediately or, depending on climate, may be planted at later dates.
    b. Often the land inside high tunnels is double or even triple cropped, depending on the vegetable or small fruits grown.

LIVESTOCK PRODUCTION

The following Generally Accepted Agricultural Practices will not create any imminent danger regarding the above referenced issues for persons who reside in the immediate vicinity or persons on public property in the immediate vicinity of the agricultural operation.

Generally accepted management practices:

1. Livestock according to the Texas Agricultural Code section 1.003 livestock "Livestock" means cattle, horses, mules, asses, sheep, goats, llamas, alpacas, exotic livestock, including elk and elk hybrids, and hogs, unless otherwise defined. Grazing pasture or crop land:
    a) Livestock are ruminants and nonruminants, and capable of digesting grass and other forages and as such will graze these feedstuffs from pastures and/or be fed from products harvested from pastures or cropped pastureland.
    b) Methods of grazing may include rotational grazing, continuous grazing, or seasonal grazing of native plants, improved forages, or crop residue.

    c) Water for livestock can be provided by several sources including:
        1. Collection of surface runoff water (ponds).
        2. Drilling for well water and instillation of submergible pumps using various means to power the pump:
            - Windmills.
            - Solar pump.
            - Electric pumps.
        3. Connecting to existing rural or municipal water systems to provide water.
        4. Water provided from water systems or water wells may be contained in troughs adequate to supply water for the livestock in residence.

2. Many livestock are fed through grazing pastures and rangeland. Grazing systems may allow for accumulation of plant material in ungrazed/rested areas in excess of 12 inches for the purpose of stockpiling forage for future consumption by livestock.

3. Supplemental feed can be provided in periods of nutrient deficiencies and could include:
    a) Hay.
    b) Molasses-based supplement tubs.
    c) Molasses-based lick tanks.
    d) Blocks.
    e) Cubes.
    f) Pellets or formulated feed.

4. Supplemental feed can be provided in feeders matching the supplement type.
    a) Hay can be provided with or without rings, feeders, or racks.
    b) Supplement tubs will utilize plastic or rubber tubs placed in the pasture area.
    c) Molasses-lick tanks are larger plastic containers in which liquid molasses is pumped in, and animals consume free choice as a supplement.
    d) Blocks can be provided with or without packaging. Larger blocks will normally be contained in a cardboard type of container that is consumed by livestock ad libitum.
    e) Cubes are normally hand fed by the owner/manager on a daily or alternate day basis.
    f) Pellets or textured feed is usually provided in bulk feeders, which can contain a few hundred pounds to several tons of feed. Animals can consume feed in a free-choice manner through these bulk or creep feeders placed in the pastures or corrals.

5. Reproductive services
    a) Livestock operations that exist for the purpose of raising livestock will have herds consisting primarily of female animals but will utilize male breeding stock such as bulls, rams, bucks, or stallions.
    b) Males may be with females on a year-round basis on some operations while they may be utilized for breeding purposes during a specified period during the year, called a breeding season.
    c) These males will be in pastures with the females for varying times throughout the year based on the breeding program.
    d) Outside of a breeding season, the males may be housed or pastured in areas designed to contain only the males.
    e) Some operations will utilize artificial insemination (AI) to breed all or a portion of the females on a livestock operation. Embryo transfer and other reproductive technologies are also a generally accepted practices in livestock production.
    f) Artificial Insemination (AI) protocols will utilize various techniques to determine the appropriate timing of insemination, which will be done by AI technicians.
        1. Estrus detection aids may be used such as patches, tail paint, or chin-ball markers. Adhesive patches used on females will change in color to determine estrus detection. Tail paint is a chalk material that will be rubbed off during estrus, while a chin-ball marker is a ball-paint marker used as a visual aid for cycling detection.
        2. These aids are used to determine time of estrus in the female, which in turn determines the time of ovulation in that species of livestock.

6. Livestock working dogs (stock dogs)
    a) Livestock operations may use dogs to help gather, move, or corral livestock so that management procedures, or grazing programs can be more effectively implemented.
    b) Not all operations will utilize dogs but those that do will use dogs trained to handle a particular specie(s) of animal.

c) Working stock dogs are not on a leash, tether, or restraint as they cannot perform the tasks they are trained to do while tethered.
d) While working, stock dogs are under the supervision of the handler and under no circumstance should someone who is not their handler try to interact with or interfere with the performance of their tasks. Interference is very confusing to the dog and can lead to serious issues with herd movement and control and safety to the dog, livestock, and persons.
e) Working dogs are routinely transported in vehicles and may be seen riding in the cab or bed of these vehicles or in trailers as they are transported to and from different locations.
f) Dogs are usually not tethered or restrained while riding on the back of farm vehicles.
g) Stock dogs will routinely be kenneled when not being used to work stock.

7. Livestock working or handling facilities can be constructed on the property as permanent or portable facilities.
    a) Permanent facilities are defined as ones where corral material is physically connected to the ground.
    b) Portable facilities can be constructed of individual panels that sit on top of the ground or can be systems commonly called portable corrals that can be towed from one location to another.
    c) Facilities will be needed to carry out routine health, production, and care processes and procedures such as:
        1. Corralling cattle for transport to another location or to market.
        2. Conducting routine veterinary care such as vaccinations, deworming, branding, and treatment of injuries.

8. Weaning of livestock offspring will occur at various times throughout the year. Weaning creates an increased level of vocalization by the young, weaned animals and the females from which they are weaned. This normally lasts from three to seven days but is important and necessary for livestock operations.
9. On some operations there may be a need to further train livestock to be haltered and to stand tied or be led by the halter. This practice will be common on operations with purebred livestock, horses, and operations with youth livestock projects for 4-H and FFA programs housed on the premises.
    a) Halter "breaking" may utilize several different techniques. Some common examples are listed below but this is not an exhaustive list.
        1. Wearing a halter unrestrained in a pen or a pasture while dragging the lead rope
        2. Haltered and being tied to a fence for a period of time. Show animals and horses may be tied for extended periods of time for their training and safety.

3. Being haltered and paired with a donkey to help teach the animal to respond to pressure on the lead rope.
4. Being led by a person either in a corral or in a pasture setting

10. Routine care and husbandry will require vehicles to enter and leave the property throughout the year. This can vary from once a week to multiple trips per day to check on feed, or transport feed or livestock in and out of the premises and check water and nutrient availability.
    a) Entry into property may involve the movement of trucks, trailers, feeders, tractors, and other equipment and implements on to the property.

11. Hay production can be a normal and routine part of livestock management. To accomplish hay production this will involve movement of:
    a) Fertilizer buggies for spread of commercial fertilizers or animal manure or municipal biosolids.
        1. Farmers/ranchers generally apply fertilizer materials to fields at a recommended agronomic rate.
    b) Sprayers – (both self-propelled or towed).
    c) Tractor(s).
    d) Swathing machines for cutting forage down to be baled.
    e) Hay rakes to make windrows for baling.
    f) Hay balers.
    g) Hay trailers for transporting hay off the premise.
    h) Hay production may require tractors or other farm equipment running at all times of the day or night depending on outdoor temperature and humidity.
    i) Weather conditions, forage type, species of animal the hay will be fed to, and the desires of hay customers all can alter when hay is cut, as well as the curing and baling process.
    j) Hay is often stored in the field in different size and shape of bales or mounds.

12. Some livestock operations may need to utilize guardian animals to keep livestock from being killed or harassed by predators.
    a) Predators include:
        1. Domestic or feral dogs.
        2. Coyotes.
        3. Foxes
        4. Bobcats.
        5. Feral swine.
        6. Vultures.
        7. Eagles.
    b) Guardian animals can be:
        1. Donkeys.

2. Mules.
3. Guardian dogs.
4. Llamas.
5. These animals are contained on the property containing the livestock and are usually alongside the livestock.

c) There are times when guardian dogs may leave the property they are protecting for short periods of time. Guardian dogs seen off property are left alone as they will return to the livestock group it is guarding.
    1. Notification of the person managing the livestock is the standard response to seeing a guardian animal off property. They are not like other dogs and are not socialized to people other than their handlers.

13. Installation or maintenance of fencing
    a) Perimeter fencing is normally adequate to prevent the livestock, guardian dogs, and working dogs from exiting the property.
    b) Installation of fencing could be done with a variety of fencing materials. All the following are generally accepted fencing materials used for livestock:
        1. Barbed wire.
        2. Woven wire.
        3. Fixed knot wire.
        4. Combinations of the above.
        5. Fencing could also be constructed of pipe, wood, or vinyl.
        6. Temporary electric fencing could also be constructed using high tensile wire and solar or electric chargers to provide current.

14. On occasion a farm animal may become severely injured or terminally ill or become non-ambulatory. For humane reasons, severely injured, terminally ill, or non-ambulatory animals will need to be euthanized on site and in a timely fashion. Euthanasia may be carried out according to American Veterinary Medical Association guidelines: https://www.avma.org/sites/default/files/2020-02/Guidelines-on-Euthanasia-2020.pdf.
    a) Animal carcasses will be disposed of in an environmentally appropriate method as approved by Texas Commission on Environmental Quality and Texas Animal Health Commission, such as decomposition, burial, composting, incineration, landfill: https://www.tceq.texas.gov/downloads/publications/rg/disposal-of-livestock-carcasses-rg-419.pdf.

    b) Any disposal/disposition of dead animals is done in a manner that consistent with TCEQ guidelines.

15. Weeds, brush, insects, rodents, predators, and non-native species may be managed by cultural, biological, and chemical controls as allowed by EPA and/or TDA and according to label directions.

a) Chemical control of weeds, brush, and non-native plant species insects, and rodents will require the use of:
    1. Chemical distribution equipment such as sprayers or spreaders.
    2. The use of livestock or pasture herbicides or other pesticides may require TDA pesticide licenses for use of restricted use products. Individuals seeking pesticide licensure must contact TDA and participate in the appropriate certification activities to become licensed (see Approved Chemical Applications section).

b) If livestock predation becomes an issue the use of lethal control may be required. Lethal means may include the use of:
    1. Firearms to eliminate an immediate threat or ongoing predation event.
    2. Predacides are chemical controls used to kill predatory mammals such as coyotes or wolves, that may harm livestock. The use of livestock predacides will require TDA predacide licenses. Individuals seeking predacide licensure must contact TDA and participate in the appropriate certification activities to become licensed.
    3. Predacides, as with other pesticides, must be applied using the EPA and TDA label directions, requirements, and restriction (see Approved Chemical Applications section).

16. Shelter structures are often put in place to protect livestock from the environmental stresses of heat, cold or wind chill. Additionally, Shelter belts (linear plantings of multiple rows of trees or shrubs) may be established for protecting livestock from environmental stresses.

POULTRY PRODUCTION

The following Generally Accepted Agricultural Practices will not create any imminent danger regarding the above referenced issues for persons who reside in the immediate vicinity or persons on public and private property in the immediate vicinity of the agricultural operation:

1. Poultry farms may use the following practices to protect their birds from biosecurity hazards such as diseases and food safety contaminants:
    a. Signage and gates to restrict access.
    b. Foot baths containing liquid or powdered disinfectants.
    c. Tire wash/vehicle disinfection stations.
    d. A viable pest control program for the mitigation of predators, insects, and rodents. Poultry are raised according to management guides and practices sometimes provided by the primary breeder (genetics companies).
2. Poultry and Egg Generally Accepted Practices

    a. Land requirements: Land areas required per bird are dependent on the type of poultry, the age of the poultry, weather, and other factors.
    b. Building design: Housing designs should be generally aligned with the bird needs in terms of promoting bird health, egg production, and protection against environmental conditions and predators. Surrounding large trees may provide shade whereas shrubs and small trees provide little shade and decrease air flow and provide harborage for pests and wild birds. Mobile/moveable housing (chicken tractors) also may be used.
    c. Ventilation: Ventilation assists with removal of moisture, excess heat, waste gases such as carbon dioxide and ammonia, and to provide oxygen. Birds may be cooled by evaporation of water (cool cells, swamp coolers, foggers, sprinklers) and wind chill (air speed).
    d. Lighting: Artificial lighting is commonly used. For egg production, lighting is crucial for stimulation of sexual maturity and egg production. Fifteen to sixteen hours of constant light is normal, with 12 hours being the minimum threshold.
    e. Chick production: reproduction roosters**:** Roosters are used to produce fertile eggs.
    f. Water: Water is available for the birds. Water quality and temperature is commonly monitored to maintain the health of the poultry.
    g. Manure and wastewater treatment: Manure is typically aged, composted, or disposed of properly. These materials provide organic matter to improve the soil structure and productivity. Nutrients may be removed from the property by selling to farmers for placement on hay, grass sod, crops, and other residues fields.
3. Euthanasia: Farmers commonly follow the American Veterinary Medical Association (AVMA) Guidelines for Euthanasia of Animals to select a method depending on age, breed,

species, and individual ability. Dead birds are typically disposed of by incineration, freezing, rendering, dehydration, or composting.

a. Pest Management: Pests may include insects, rodents, wild birds, and predators. These issues may be mitigated with pest control measures. Pest control may be accomplished by cultural, biological, and chemical control measures such as removal of habitat (grass/trash), use of natural predators/disease agents (fungi to control mosquito larvae), and EPA/TDA approved pesticides (see Approved Chemical Applications section).

b. Vegetative Buffers/Shelter Belts: Grass, crops, shrubs, and trees may be planted around poultry houses to disperse dust and odors and to create a visual screen.

RANGELAND MANAGEMENT

Rangeland consists of land dominated by native grasses, forbs, grass-like plants, and woody plants that are managed as a natural ecosystem and cover over 50% of the land surface in Texas. The following Generally Accepted Agricultural Practices will not create any imminent danger regarding the above referenced issues for persons who reside in the immediate vicinity or persons on public property in the immediate vicinity of the agricultural operation. Though introduced plant species may be found on these lands, rangeland management differs from cultivated properties, such as hay fields and farmland. These rangeland ecosystems are often managed to maintain production for livestock and/or habitat for wildlife species, in accordance with the management goals of the property.

There are many guiding principles in rangeland management, but some of the Generally Accepted Practices include:

Rangeland Management Tools

The following common rangeland management practices will not create any imminent danger to persons who reside in the immediate vicinity or persons on public or private property in the immediate vicinity. The most common categories of management tools include an IPM approach, including but not limited to:

1. Biological Management. Using livestock as a management tool through grazing vegetation to maintain plant diversity and structure is one of the oldest tools used in rangeland management and is a vital component of proper rangeland management.
    a. The use of cattle, sheep, or goats for use and management of rangelands is common.
    b. Maintaining proper stocking rates ensures the long-term viability of the operation and health of the plants and soil.

2. Prescribed Fire. Natural fires served as a consistent disturbance on rangelands long before settlement. The return of fire through prescribed burning, under certain weather and fuel conditions, allows for some of the benefits natural fires once contributed.
    a. Prescribed fire can not only set back plant succession, but it can also reduce the likelihood or intensity of wildfire on rangeland.
    b. Proper installation of fire guards around the burn perimeter (including existing roads) will help to contain the fire. New lines may be created by disking or plowing.
    c. The use of prescribed burn associations (landowner groups with shared resources) or certified prescribed burn managers (through the Texas Prescribed Burn Board) can help to implement prescribed burns.
    d. Notification of intended prescribed burns to appropriate emergency responders can help with coordination and communication.

3. Mechanical Management. With the development of tractors and large implements, mechanical management has moved beyond simple axes and shovels to remove or reduce unwanted plants on the land.
    a. Some situations may require intensive restoration using implements such as tree grubbers, root plows, discs, chippers, and shredders.

4. Chemical Management. The development of herbicides for the control of unwanted brush and weeds has allowed a different tool for combating undesirable plant issues. Through individual plant treatments (leaf, stem, cut stump) or broadcast application by ground or air, new technologies are allowing for the removal of many unwanted plants without harm to productive, native plant species.
    a. Herbicide applicators must follow the label directions, as the label is the law.
    b. State-limited-use pesticides or restricted-use herbicides must be applied, and if stipulated by the label of federal and state regulations, stewardship followed by a licensed pesticide applicator. There are many herbicides used in rangelands that do not require a pesticide applicator license (see Approved Chemical Applications section).

5. Reseeding. Recent efforts in developing native plant seed sources have increased the success and ability of replanting disturbed rangeland with species that historically occurred there.
    a. Seedbed preparation may require the use of grazing, prescribed fire, mechanical management, or chemical management to increase the probability of successful native seed germination and establishment.

Water resources

Water is a vital component for both livestock and wildlife use on rangelands to maintain their health and wellbeing. Most animal species require open water sources, such as ponds, rivers, tanks, and water troughs to provide for their needs. Additionally, the placement or distance from one water source to another may be important for proper livestock grazing distribution and to provide adequate resources throughout wildlife home ranges. A variety of practices may be implemented to provide for these needs while still maintaining the health of any riparian areas.

- Water holding tanks are commonly plotted, developed, and maintained where surface water runoff typically occurs.
- Riparian areas may be fenced to control access by livestock.
- Rainwater catchment systems may be used to provide additional water sources in areas where pipe or other sources are not available.

Fencing

a) Installation and maintenance of fencing is adequate to prevent the livestock from exiting the property.
b) Installation of fencing could be made with a variety of fencing materials. All the following are generally accepted fencing materials used for livestock:
    1. Barbed wire.
    2. Woven wire.
    3. Fixed knot wire.
    4. Combinations of the above.
    5. Fencing could also be constructed of pipe, wood, or vinyl.
    6. Temporary electric fencing could also be constructed using high tensile wire and solar or electric chargers to provide current.

SILVICULTURE

The following Generally Accepted Agricultural Practices in forest management and silviculture will not create any imminent danger regarding the above-referenced issues for persons who reside in the nearby vicinity or persons on public or private property in the nearby vicinity.

1. General Property Maintenance Activities, including but not limited to the following:
    a. Boundary maintenance – clearing new, or maintaining existing, clearly delineated, well-marked property boundary lines.
    b. Daylight forest roads – removing the majority of trees and brush on both sides of forest roads and trails to increase light environment, promote grass growth, and reduce road maintenance costs.
    c. Feral hog control – using lawful and effective trapping and removal strategies and other remediation techniques to reduce feral hog populations is a generally accepted practice.
    d. Firewise – clearing and/or reducing vegetation density, debris, and other types of combustible fuel around buildings and other infrastructures. This is most often done using machinery.
    e. Forest road and trail maintenance – establish new and/or maintain existing forest roads to provide access necessary to conduct forest management activities including culvert and bridge installation, maintenance, and replacement.
    f. Fire lanes – removing trees and brush and promoting grasses to establish new, or maintain existing, corridors/fuel breaks that reduce the spread and intensity of wildfire and increase the ability of firefighters to control the fire.
    g. Nuisance wildlife control – using an effective strategy of trapping and other Texas Department of Agriculture approved techniques to reduce nuisance wildlife populations and their damage to forest stands.
    h. Fruit and nut orchards – establishment and management of orchards, using generally accepted practices, to produce fruit and/or nuts.
    i. Wildlife food orchards – planting a variety of hard and soft mast trees to augment wildlife habitat and provide game species a preferred food source.
    j. Wildlife food plots – establish warm-season and cool-season food plots to augment wildlife habitat and provide game species preferred food sources.
    k. Mulching – using a heavy vehicle equipped with a large, front-mounted spinning drum with large hammer-like teeth used to shred and minimize downed and standing unwanted woody vegetation.
    l. Forest Stand Improvement – the manipulation of species composition, stand structure, or stand density by cutting or killing selected trees and/or understory vegetation to achieve desired forest conditions or obtain ecosystem services.

2. Site Preparation

   Site preparation is the act of using silvicultural treatments to improve the conditions of a site for the purpose of establishing a forest either through artificial or natural means. Site preparation may include any of the following silvicultural practices.

   a. Mechanical Site Preparation - uses heavy equipment including, but not limited to, bulldozers, skidders, and tractors often with specialized implements attached for the purposes of reducing competing vegetation, removing logging debris and/or correcting soil problems. Appropriate mechanical site preparation methods include, but not limited to:
      1) Shearing – using a bulldozer equipped with a V-shaped blade to shear down standing trees and push the resulting debris out of the planting rows.
      2) Piling – pushing harvest and sheared debris into piles scattered about the site to ease planting.
      3) Bedding – bedding is used primarily on wetter soils to disk, mound, and pack down soil in long, continuous strips.
      4) 3-in-1 combination plow – using a shear blade, colter wheel, and subsoiler on a large bulldozer to reduce debris and ameliorate soil problems in a single-pass operation.
      5) Subsoiling/Ripping – pulling a long shank under the soil's surface to break apart the hard clay layer and facilitate root growth and tree vigor.
      6) Drum chopping – using a heavy track vehicle (dozer) pulling one or two large metal cylinders (drums) with longitudinal cutting blades that chop or flatten vegetation to facilitate hand planting.
      7) Mowing – using a large mowing deck, commonly pulled behind a rubber-tired farm tractor, or front mounted to a skid-steer, to maintain grasses and small brush.
      8) Disking – using a heavy track vehicle or rubber-tired tractor to pull a more robust version of the agricultural disk to fracture compacted soils, improve root growth and development, and allow for better aeration and moisture infiltration into the soil.
      9) Scalping – mechanically removing the top layer of sod in long narrow bands.
      10) Mulching – using a heavy vehicle equipped with a large, front-mounted spinning drum with large hammer-like teeth used to shred and minimize downed and standing unwanted woody vegetation.

   b. Chemical Competition Control – application of chemical herbicides prior to the planting of a tree crop to reduce competition for limited resources by undesirable vegetation. Applied as aerial or ground broadcast, band, directed, or individual plant treatment using aviation, heavy or light ground equipment and/or backpack sprayers. Herbicides are considered safe to use if applicators lawfully follow the Safety Data Sheet (SDS) and product label instructions.

c. Prescribed Burn – the application of fire to minimize logging debris and crop competition on the site to promote the quality and success of planting of the next stand, or to prepare the seedbed for natural regeneration. Prescribed burning is a suitable silvicultural practice provided that the applicator follows the state regulations.

3. Tree Establishment
   New forests are often established by planting forest tree seedlings. Forests may also be re-established (regenerated) using natural methods (e.g., seeding from surrounding trees, sprouts from the stumps of recently cut trees). Forest tree seedlings are purchased from forest tree nurseries in which various heavy equipment, pesticides, fertilization, and irrigation methods are used to grow, lift, and package forest tree seedlings. In the field, forest tree seedlings are planted either by hand or by machine.
   a. Hand planting – the process in which skilled individuals traverse the property in a uniform pattern and plant seedlings with a dibble bar, hoe dad, or planting shovel.
   b. Open-land machine planting – machine planting of seedlings usually in open fields and pastures using relatively small and lightweight planters pulled behind a rubber-tired tractor.
   c. Wildland machine planting – machine planting of seedlings usually on cutover sites using a heavy-weight planter pulled behind a bulldozer.

4. Pest Management
   All parts of a tree are vulnerable to attack by pests at all times of a tree's life. Pest damage can range from slight damage that has little effect on the vigor and health of a tree to severe damage that stunts or kills the trees and reduces their market value. Tree pests are numerous and include insects, mites, diseases, weeds, vertebrates, and nematodes. Common silvicultural treatments include, but are not limited to:
   a. Gopher control – the sub-soil application of rodenticide along the stand perimeter and throughout the site to minimize the loss of newly planted seedlings from gopher damage.
   b. Texas leafcutter ant control – the proper and preventative application of an insecticide, preferably prior to planting to reduce losses to newly planted seedlings.
   c. Nantucket pine tip moth control – the application of an insecticide onto forest tree seedlings at the nursery or at the planting site to minimize tree losses.
   d. Regeneration weevil control – the application of an insecticide onto forest tree seedlings at the nursery or at the planting site to minimize the loss of newly planted seedlings.

e. Unwanted, competing, and invasive plants – using mechanical and chemical methods to reduce grasses, herbaceous weeds, and forest brush (brambles, sprouts, clumps, shrubs, trees, and vines) that compete with desired crop trees.
f. Tree Injection – targeting a precise application of nutrients or pesticides into the vascular system of trees for translocation and distribution throughout the tree.
g. Trenching - mechanically severing inter-connected tree roots to prevent the spread of pathogens.
h. Salvage harvest – emergency tree-cutting operations to control bark beetle infestations and salvage beetle-killed logs for processing.

These practices are commonly used to prevent or reduce economic damage to the crop based on the principles of Integrated Pest Management (IPM). Pesticide label instructions should be followed, which are regulated in accordance with TDA rules and regulations (see Approved Chemical Applications section).

Pesticides are safe to use if the applicator follows the labeled directions, including the target crop and pests, application rate, specific timing of application, application method, and attention to environmental variables such as wind speed, direction, neighboring crops and vegetation, and soil conditions. Users should comply with the instructions on the manufacturer's pesticide product label.

5. Harvest

Manual and mechanical methods of harvesting, skidding, processing, and loading are commonly used industry standards. Temporary on-site storage of the crop may be necessary, and trucks/trailers are needed to transport the harvested products to market or a processing facility and must follow appropriate state and federal laws and regulations (special permits apply).

a. Thinning

Cultural treatments that reduce the density of trees in overly crowded stands, improve growth, reduce stress, and enhance forest health, enhance wildlife habitat, and recover early economic value from trees that would potentially be lost to naturally occurring mortality, insect, or disease. Thinning methods, and their common variants, include the following.

1) Low – (synonyms: Thinning from Below, Operator-Select, Ordinary) - the removal of the smaller trees in a stand while leaving the larger trees in the upper crown classes.
2) Crown – (synonyms: Thinning from Above, High Thinning) – the removal of the poor-quality trees from the dominant and codominant crown classes in favor of the trees of those same crown classes.

3) Selection – The removal of trees in the dominant crown class to stimulate the growth of trees in the lower crown class.
4) Geometric – (synonyms: Row Thinning, Mechanical Thinning) – the removal of trees in either plantations or natural stands using a fixed spacing interval (e.g., every third, fourth or fifth row) or by strips of some fixed distances, regardless of the form of each tree.
5) Free – the removal of trees to control the spacing between desired crop trees using a combination of thinning criteria without regard to crown position.
6) Combination Row and Low – the removal of all trees in designated "down" rows as well as defective, small, and poorly formed trees between the down rows.
7) Precommercial – thinning of trees in a stand before they are large enough to be merchandised.

b. Regeneration Cutting

Forest trees can be regenerated both naturally (seeding in or stump sprouts) or artificially (direct seeding or planting seedlings). Most regeneration cutting practices are used to promote the next crop of trees in situations where natural regeneration is preferred.

1) Patch – removing all merchantable trees in small block patches, or narrow strips when there is an available seed source from adjacent stands.
2) Single Tree Selection – the removal of individual trees of all size classes for the purpose of regenerating a new stand.
3) Group Selection – removing groups of trees of all size classes to establish small openings in which to regenerate shade-intolerant species.
4) Seed tree – cutting all but four to 20 trees per acre to provide seed for the next crop of trees.
5) Shelterwood – similar to the seed tree method except that 30 to 50 trees per acre are retained to regenerate the area.
6) Selection – periodically cutting selected trees from all merchantable diameter classes.
7) Clearcut – a harvesting activity in which most, or all, of the standing trees in an area are cut down at the same time. When Texas BMPs are followed including leaving forested buffers around streams and lakes, clearcutting has little impact on persons, public property, soil health, or water quality in the immediate vicinity. The area is usually replanted with a new crop of trees within two years of harvest.
8) Salvage harvest – the practice of logging trees in forest areas that have been damaged by wildfire, flood, severe wind, disease, insect infestation, or other natural disturbance in order to recover economic value that would otherwise be lost.

c. Wildlife Openings
   Create dispersed, small openings in mature forests to provide additional sunlight to the forest floor and promote wildlife-beneficial understory plants.
d. Pruning
   The removal of live, dead, diseased branches from standing trees in order to decrease the spread of fungal diseases and/or improve the quality of the future log by increasing the volume of clear (knot-free) wood produced.

6. Forest Nutrition (Fertilization)
   a. Proper soil management and forest nutrition are key components to maintaining the productivity of planted or natural forests. However, few forest soils provide an optimum supply of the nutrient elements essential for the growth potential of trees. Foliar tests (preferred) or soil tests can identify the deficient elements necessary to produce optimum growth for a site.
   b. Fertilizers may be applied as liquid or dry granular products.
   c. Fertilizers are applied during site preparation or planting, at crown closure, and/or after a mid-rotation thinning operation.

7. Prescribed Fire
   A prescribed burn is a planned, low-intensity fire used to remove competing shrubs, trees, and hazardous fuels and prevent uncontrolled wildfires from overwhelming a forest landscape. Prescribed burning is an important silvicultural practice. Applicator must follow state rules and regulations including special provisions for Certified and Insured Prescribed Burn Managers and guidelines provided by the Texas A&M Forest Service for those prescribed burns conducted in forests. The Texas A&M Forest Service provides annual prescribed burn manager training each spring.

VETERINARY SERVICES

The following Generally Accepted Agricultural Practices will not create any imminent danger regarding the above referenced issues for persons who reside in the immediate vicinity or persons on public or private property of the agricultural operation:

1. Generally Accepted Practice (GAP) for veterinarians would be to rope the animal, tie it to a post or tree, or cast (restrain with ropes) it to treat or handle a calving emergency or other livestock illness or injury. Equine castrations are frequently conducted on the farm. The animal is anesthetized and laid down in a soft area where the procedure is conducted.
2. Veterinary practices that provide large animal services have some problems with flies in warmer months and GAP includes the use of fly bait sprays. Etc., to control flies. This may result in the presence of fly issues and chemical odor from control measures.
3. Veterinary practices may handle manure by spreading it on fields or pastures. This operation is performed to minimize odor, flies, or water runoff issues. Stall bedding and manure may be stockpiled for short periods before removal from the facility or composted on site.
4. Veterinary facilities require adequate water to clean facilities, provide livestock water, etc. This wastewater, captured in septic systems (private or city), is a generally accepted practice for veterinary facilities. Runoff water originating in livestock pens often collects on the property for brief periods.
5. Veterinary facilities often require 24-hours of continual activity. The activity and noise associated with unloading, treating, and loading livestock occur daily in veterinary facilities. Noise from livestock includes cattle, horses, and other livestock, as well as, barking from dogs in outside kennels is a common.
6. Occasionally, livestock can escape from the veterinary facilities. Loose livestock can be a hazard to individuals, vehicles, and must be captured, often with personnel not involved in livestock operations such as spectators, law enforcement, etc.
7. Animals may die while under veterinary care, and carcass disposal processes include the owner to remove the carcass or for the carcass to be taken to a cooperating landfill — some veterinary facilities compost or incinerate carcasses, which must be done as required by TCEQ regulations.
8. Increased traffic is common at veterinary facilities. Often resulting in long lines of trailers loaded with vocalizing livestock.
9. Bright lighting for security reasons, human and animal safety, and observation of livestock is a common to veterinary facilities.
10. Stray dogs and cats discarded or left at veterinary facilities. Veterinary facilities often cooperate with animal control agencies and rescue groups resulting in some animals being housed at the facility. These animals may be in extremely poor body condition with skin lesions, injuries, etc. and are undergoing treatment. This is often concerning to the uninformed public who may see these animals in outside paddocks.

VITICULTURE: VINEYARDS AND GRAPE PRODUCTION

The following Generally Accepted Agricultural Practices will not create any imminent danger regarding the above referenced issues for persons who reside in the immediate vicinity or persons on public property in the immediate vicinity of the agricultural operation. Viticulture is the cultivation of grapes, which is both an art and a science. The following are General Agriculture practices:

Texas is home to many of the native species of grapes, so vines are often seen climbing on trees along roads. Grapes can be and often are harvested from the wild to make jelly, juice and even wine. The culture of grapes, where vines are planted in the field, i.e., a vineyard, has become common place in many areas of Texas. Not only are vines planted in rows, but then a trellis system is built to hold the vines off the ground in order to produce quality fruit. Vineyards can range in size. Harvest of the grapes is often by hand, but there are mechanical harvesters being used as well. If used for wine, the grapes are crushed and destemmed at the winery to produce juice which is then fermented to produce wine. Grapes used for fresh consumption are carefully washed and taken to the market or processed into juice, jams, or jellies.

1. Site Selection and Preparation

   a. Topsoil may be added to the plant bed to build the proper soil conditions for growing grapes and allowing for good internal drainage combined with some water-holding capacity.
   b. Sites are normally elevated to facilitate air drainage in order to reduce risk of spring frost.
   c. Site may be evaluated for risk of Pierce's disease to inform decisions on variety and rootstock selection.
   d. It is recommended that size of vineyard usually determined by water availability with no more than one acre planted per 5 gallons per minute (gpm) of well capacity.
   e. Weeds are normally controlled during the season prior to planting.

2. Crop establishment
   a. Spacing between vines will be determined by scion vigor and rootstock selection.
   b. Row spacing is a function of equipment with a practical maximum of 10 ft and a minimum of 6 ft.
   c. Grapevines are a perennial crop with a productive life expectancy of 20 years.

a. Pest Management
   a. Grapevines are subject to numerous pests during the life cycle.
   b. Weed control is vital to the productivity and longevity of the vineyard.
   c. Insects can destroy or severely damage fruit, foliage, or roots of grapevines.
   d. Management of fungal pathogens is imperative for successful production of high-quality fruit.

e. Pesticides are used to combat these various pests, typically by post-establishment spray treatments or by injecting materials through the irrigation system.
    i. Herbicides are used to treat weeds.
    ii. Insecticides are used to treat insects.
    iii. Fungicides are used to treat fungal diseases.
f. These products are usually applied numerous times during the growing season. They are applied based on the principles of Integrated Pest Management, including cultural, mechanical, physical, biological, and chemical control tactics, and only used when there is potential for economic damage to the crop. Pesticides are to be used according to label requirements and restrictions (see Approved Chemical Applications section).

b. Fertilizer

a. Crops require certain levels of nutrients to grow and thrive and produce the quantity and quality of crop desired.
b. Fertilizers may be applied as a liquid or dry granular products broadcasted or banded on the ground or injected in the irrigation water.
c. Fertilizers are commonly applied based on soil and tissue test recommendations.
d. Fertilizer may be applied more than once during the growing season.

c. Irrigation
a. Vineyards require supplemental water to grow and produce high quality fruit.
b. Supplemental water is usually delivered through drip irrigation systems, but other types of irrigation may be used.
c. The goal is to provide sufficient water for canopy and fruit development without creating either insufficient or excessive foliage.
d. Systems may be in place to capture and reuse rainwater to minimize reliance on municipal water sources.

d. Harvest
e. At the appropriate stage of maturity, vineyards will be harvested by varietal blocks based on specific fruit chemical profiles dictated by the winery.
f. Table grapes may be harvested over a two-week period while wine grapes are harvested by whole blocks.
g. Coverings such as netting and plastic may be used to protect the plant and fruit.

6. Post harvest operations

a. After harvest, every effort is made to maintain canopy health until first frost.

b. Supplemental water, fertilizer and weed control is continued through the fall and winter period.
c. Grapevines are pruned once vines have become fully dormant and before buds begin to swell in the spring

WILDLIFE MANAGEMENT

The following Generally Accepted Agricultural Practices will not create any imminent danger regarding the above referenced issues for persons who reside in the immediate vicinity or persons on public or private property in the immediate vicinity of the agricultural operation.

1. Farming for Wildlife Food Plots

a) Seedbed preparation is the act of preparing a site for successful crop establishment.
b) Fertilizer: Crops require certain levels of nutrients to grow and thrive and produce the quantity and quality of crop desired.
c) Irrigation: Crops may require supplemental water to grow and produce, especially in arid regions of the state and during periods of insufficient rainfall.
d) Harvest:
    i. See AgriLife Extension reference: Normal Agricultural Operations and Dove Hunting in Texas
    ii. For wildlife, most crops are left standing in the field to serve as forage or cover for a variety of species. A difference does occur for waterfowl (see below).
        - Baiting (distributing seed) is not allowed for dove or waterfowl; however, in a farming situation under common agricultural practices, crops may be manipulated.
            - As defined by federal law, manipulation is "The alteration of natural vegetation or agricultural crops by activities that include but are not limited to mowing, shredding, disking, rolling, chopping, trampling, flattening, burning, or herbicide treatments. The term manipulation does not include the distributing or scattering of grain, seed, or other feed after removal from or storage on the field where grown. [Title 50, Code of Federal Regulations, Part 20.11 9(l)]

2. Farming as Part of Wetland Management; reference Extension publication Techniques for Wetland Construction and Management and Restrictions on Waterfowl Hunting and Baiting

a) Suitable Crops for Waterfowl
    i. Various crops such as corn, milo, soybeans, and rice are food sources for waterfowl.
    ii. In moist soil management, unit cultivation of millet is allowed, but it is a non-native species and manipulated millet may not be hunted over the first year of establishment. However, any millet that naturally reseeds (volunteers) the year following planting can be considered natural vegetation and may be used for hunting.

iii. Regulations differ between dove and waterfowl, where crops planted and left standing is fine for dove, that is not the case for waterfowl. Crops must be harvested, allowing legal hunting.

b) Levee construction and maintenance
   i. The purpose of levees is to impound shallow water so it can be manipulated to stimulate growth of wetland vegetation, or crops such as rice.
   ii. Levees are normally >4–5 feet tall and constructed to withstand over-topping by floodwater.
   iii. A freeboard (the distance from the water level to the top of the levee) of about 18 inches above the normal water level is desirable.
   iv. Levee crown widths can be narrow unless vehicle traffic is expected.
   v. Levee side slopes should be as gradual as possible. The traditional side slope ratio of 3:1 can be extended to as much as 10:1 where situations permit.
   vi. Levee crowns are constructed so that their elevations are uniform throughout the length of the levee. This prevents excessive erosion at sections lower than the remainder of the crown when floodwaters overtop the levee.
   vii. Exposed soil of levees and burrow areas are normally vegetated immediately after construction. A sod-forming grass is typical.
   viii. Woody vegetation is commonly removed from levees to prevent their roots from compromising its structural integrity.

3. Farming and Green Space Development; reference Restoring Native Grasslands

a) Adjacent farmlands to communities may be included in green space planning to connect land parcels.
b) Practices inside and outside of the city limits could include:
   i. Tree plantings, to provide thermal cover for birds and other animals.
   ii. Pocket prairies represent vestiges of grasslands, so re-establishment may occur.
   iii. Herbicide applications are common to kill established non-native grasses, such as Bermuda grass.
c) Feral swine, also known as wild pigs, are problematic on farms and suburban areas of townships, causing millions of dollars in damage annually. Reducing pig numbers reduces costs associated with their rooting behavior, while searching for food. Practices like trapping can be helpful mitigating this damage and is a generally accepted agricultural practice.
d) Trapping and Removal
   i. Various forms of traps are commonly used to capture wild pigs like box traps and corral traps and can be used year around.

ii. Corral traps triggered by pigs and those human-triggered doors are both effective.
iii. Traps are baited using shelled field corn and checked daily while in use.
iv. Once trapped, wild pigs are trailered to an approved holding facility. All pigs, regardless of size or age, are removed from the premises.

4. Farming and Wildlife Damage Management:

The following are generally accepted practices to remove threats to livestock, wildlife, and crops:

i. The removal of predators threatening livestock using traps or snares is common, consistent with State laws.
ii. The removal of nutria, beavers, and beaver dams threatening agricultural crops or infrastructure.
iii. The non-lethal hazing of crop depredating birds using lasers or other sound emitting devices.

References: Farming and Feral Swine Management, Box Traps for Feral Hogs, Corral Traps for Feral Hogs, Baiting and Placing Feral Hog Traps,

About the Texas A&M AgriLife Extension Service

The Texas A&M AgriLife Extension Service is a unique education agency, within the Texas A&M University System, that provides programs, tools and resources on a local and statewide level that teach people how to improve agriculture and food production, advance health practices, protect the environment, strengthen the economy, and enrich youth. With 250 county offices serving Texans in all 254 counties, county agents serve families, youth, communities, and businesses throughout the state.