

# Pike County Agriculture and Natural Resources



## A message from your local ANR agent:

Folks,


It's that time of year, when people start to forget about their gardens/lawns/etc. and worry about the Holidays. However, I beg to differ- this is the best time to add trees and shrubs and start planning for next year. As things slow down, it's a great time to research and start planning for next year. It's a great time to add fertilizer to a cool season grass or lime to an area that needs it.

If you haven't already done a soil test, now is the perfect time to do one. Simply take a trowel or shovel. Go to the depth of one shovel or trowel. Take a thin slice of your soil, without grass/weeds/etc. Take 8-10 samples and mix in a plastic bucket. Mix it together really well and bring me a sandwich baggie full. Then tell me what you would like to grow in that area. We will send the sample off and get it back in approximately 2 weeks. I tell everyone—1. If it looks different or 2. You know it's been treated differently—bring me more than one sample. Lots of times soil near the creek or river will test differently than soil from the base of the hill or on the slope. If it's an area that was grass last year and you want to make it into the garden, it will probably test differently than what your existing garden does. Also, if you have been gardening in that specific area for several years and adding lime and fertilizer every year, you are probably having trouble with too much fertilizer instead of too little. I like doing the tests this time of year, because if you have a pH problem, we can start working on it now and probably get a little change by late spring.

Beware of invaders. This is the time of year for insects & crawling invaders to be coming into your house. Bugs will try to find a warm spot to overwinter. Your house is their ideal spot. Also, this is the time of year snakes, along with mice and rats, like to find a warmer home. Be especially careful around piles of debris or piles of manure. They can be a warm spot especially for snakes. Your manure pile is decomposing and stays several degrees warmer than the outside temperature. I know on my farm—multiple times I have tried to get a shovel full of manure to move or add to a pot. Rammed my shovel into the pile and disturbed a snake. It's nice and warm there for them. It will get your attention really fast and if you live in an area like I do that is known for "Copperheads" can be dangerous. Be safe and be careful!

Be careful in finishing up the year and the next couple months are the best time of year to plan for next year.

Good luck in all your agricultural enterprises,



**Suzanne Stumbo**

Pike County ANR Agent

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# Proper Pesticide Storage Saves Money

Posted on October 3, 2023

With the outdoor growing season winding done, applicators are storing pesticides until next year. Storing these pesticides properly helps to protect your investment, as well as protect other persons and the environment. The amount of pesticides stored varies considerably from farm-to-farm, and the look of pesticide storage areas may also appear very different. However, basic elements used to store pesticides are universal. This article highlights the basics elements of good pesticide storage.

- **Store Pesticides in Their Original Containers.** Do not transfer pesticides to other containers. The original container is made of the appropriate material in which to store a pesticide for long periods. The container is resistant to the chemicals in the product. Take care to make sure the labels on containers remain intact and legible. The original labeling contains storage, disposal, and emergency information. Use transparent tape as needed to secure labels to their containers.
- **Check for Leaks and Make Sure Containers are Sealed.** Bags should be checked for tears or leaks. Bags that have been opened should be placed inside durable plastic bags that can be sealed to keep out moisture. Bottles and jugs should be checked for leaks; make sure caps are properly tightened.
- **Keep an Inventory.** At the end of the season, update your inventory of pesticides. With this inventory, I include the trade name of the pesticides, name of the active ingredient, formulation, year of purchase, and the amount of product remaining. Try to keep your pesticide inventory low; purchase only what you plan to use each year. In the fall, I check to make sure the date of purchase is written on each container with an indelible marker. This helps me to rotate the product so that I use up the older containers first. Shelf-life varies among pesticides; some have a relatively short shelf-life and do not carry over well from year to year. Clumping, poor suspension, abnormal coloration may be indications of degraded pesticides.
- **Dispose of Unneeded Materials.** Empty containers should be properly rinsed and discarded or recycled appropriately. The label has instructions on how to rinse and handle empty containers. If you have unusable agricultural pesticides, check with your county Extension office to learn about pesticide amnesty programs that may be available in your area.
- **Store Pesticides in a Locked Cabinet, Room, or Building.** This prevents children, animals, and other untrained people from having access to pesticides. Store insecticides, fungicides, and herbicides in separate groups. This can be on separate pallets, shelves, or tote boxes. Keep pesticide containers off the floor, with dry materials stored above the liquids.
- **Check Storage Requirements.** At the end of a pesticide label, there is a section for Storage and Disposal for each product. This section will indicate the conditions under which the product should be stored. You need to check labels for each of the different pesticides in storage. Many products need to be stored in heated buildings that stay above 32°F.
- **Use Pesticide-Warning Signs to Alert Others.** Durable, high-visibility signs are available commercially.
- **Keep Area Well Lit and Dry.** Water can ruin pesticides, their containers, and labelling. Do not store pesticides in areas prone to flooding. A well-lit area will help to reduce accidents.



*Figure 1. Pesticides are stored in a locked area with easy to read warning signs (Photo: Ric Bessin, UK).*



- **Keep Area Uncluttered.** This reduces tripping hazards when working with pesticides.
- **Storage Area with an Impervious Floor.** The area should be self-contained with no drains leading out of the area. Larger storage areas with more than 300 gallons of liquid pesticides are considered commercial facilities and need to have a curb around the floor that can contain a minimum of 110% of the volume of the largest container in storage. In these larger facilities, a sump will collect spills and pump them into a storage tank.
- **Keep Storage Area Well-Ventilated.** Without proper ventilation, pesticide storage areas will collect volatiles from opened containers.



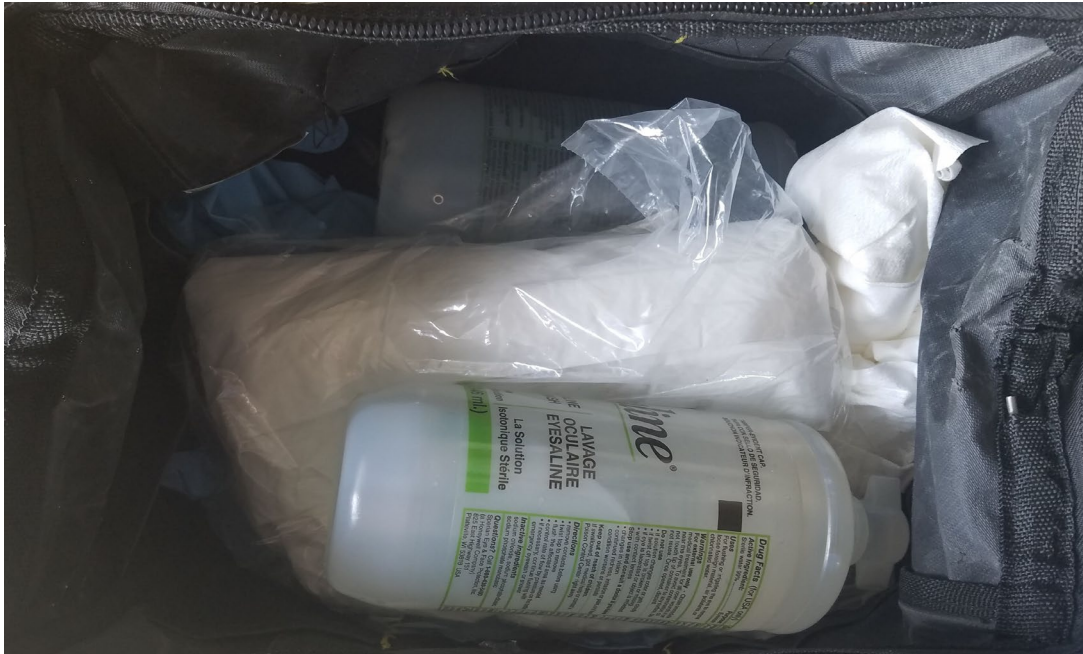
*Figure 2. Proper ventilation reduces pesticide exposure (Photo: Ric Bessin).*



*Figure 3. Have the spill kit readily available (Photo: Ric Bessin).*

- **Have Materials to Manage Spills and Leaks on Hand.** Spills and leaks will happen, so plan on them! Absorbent materials, like kitty litter, sawdust, or sweep compound, are used to clean up the spill. Use the 3 Cs to manage spills; Control, Contain, then Cleanup. Control means to stop the leak at the source. For example, if a container has a leak on the bottom, invert the container to stop the leak. Contain means to limit the spread of materials that have leaked by surrounding the spill with absorbent material. The final step is to clean up the spill. Be sure to use all necessary personal protective equipment as listed on the pesticide label.

- **Have Single-Use Towels, Soap, Eye-Wash Supplies, and Change of Clothes Available.** While larger facilities may have an eye-wash station, smaller storage areas may have bottles of eye wash solution.



*Figure 4. A personal cleanup kit will include single-use towels, soap, eye-wash supplies, and a clean change of clothes (Photo: Ric Bessin, UK).*

- **Place Smaller Containers in Plastic Totes.** While not required, using totes this way will limit pesticide spread if a container leaks.

*Figure 5. Placing liquid containers into plastic totes is a method to separate herbicides, fungicides, and insecticides (Photo: Ric Bessin, UK).*





# Kentucky Fencing Schools Showcase Basics and New Innovations

Both schools will begin at 7:30 a.m. local time

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*Kentucky producers and agricultural professionals will have two opportunities this fall to learn about farm fencing basics and new innovations, at the 2023 Fall Fencing School Nov. 7 at the Scott County Cooperative Extension office and Nov. 9 at the Kentucky Soybean Board office in Princeton. (Steve Patton, University of Kentucky)*

LEXINGTON, Ky. — Kentucky producers and agricultural professionals will have two opportunities this fall to learn about farm fencing basics and new innovations. The University of Kentucky Martin-Gatton College of Agriculture, Food and Environment, with the Kentucky Forage and Grassland Council, Kentucky Agricultural Development Fund, Kentucky State University and Kentucky Beef Network will offer the 2023 Fall Fencing School Nov. 7 at the Scott County Cooperative Extension office and Nov. 9 at the Kentucky Soybean Board office in Princeton.

“Fencing is vitally important on the farm,” said Chris Teutsch, associate professor for the UK Department of Plant and Soil Sciences, stationed at the UK Research and Education Center in Princeton. “Good fences keep our livestock safe and our animals from getting out and disturbing our neighbors.”

The schools will begin at 7:30 a.m. local time and address fencing types and costs, construction basics, electric fencing, innovations in technologies and an overview of Kentucky fence laws—all before lunch.

The afternoon session is a hands-on fence-building session where participants put their knowledge and skills to work.

The demonstration includes:

- Safety, layout and a post-driving demonstration
- H-brace construction
- Knot tying, splices and insulator installation
- Installing Stay-Tuff fixed-knot fencing
- Installing high-electrified tensile fencing

Events at both locations conclude with questions and a survey at 4:30 p.m. Participants should pre-register at least one week prior to the event. Advance registration is \$35 per person and includes notebook, safety glasses, hearing protection, refreshments and a catered lunch. Use the following links to register:

- Scott County – <https://tinyurl.com/ScottCoFencing>
- Caldwell County – <https://tinyurl.com/CaldwellCoFencing>
- Register by Email: [info@kfgc.org](mailto:info@kfgc.org)
- Register by mail: Christi Forsythe, PO Box 469, Princeton, KY 42445. Make Checks payable to KFGC.

For more information, contact Krista Lea at 270-625-0712.

# Fruit, Orchard, and Vineyard Sanitation: Cleaning Up Today May Keep Disease Away

Posted on October 10, 2023

Autumn has arrived in Kentucky, and it is time to focus on fruit, orchard, and vineyard sanitation. Good sanitation practices can help reduce disease-causing pathogens. These organisms can survive for months or years on dead plant material or in soil, causing infections in subsequent years. Elimination of disease-causing organisms reduces the need for fungicides and can improve the effectiveness of disease management practices. Following these sanitation practices both in autumn and throughout the growing season can reduce disease pressure in home and commercial fruit plantings.

## Sanitation Practices

- Remove diseased plant tissues from infected plants
  - Prune cankers (Figure 1) by making cuts well below visible symptoms. For plants with a history of bacterial infections, clean tools between each cut with a sanitizer, such as rubbing alcohol or household bleach. For plants with fungal infections, clean tools between rows or blocks.
  - Rake and remove fallen buds, flowers, fruit, twigs, and leaves (Figure 2).
- Collect all fruit from trees, bushes, and vines. Discard diseased fruit since it can serve as a source of inoculum in subsequent growing seasons (Figure 3).
- Above and below ground portions of severely infected trees, bushes, and vines should be completely removed and destroyed.
- All discarded plant material should be burned, buried, or removed with yard waste. Do not compost diseased plant material.
- Remove weeds, including roots, which may serve as alternative hosts for pathogens.
- When treating infected plants with fungicides, remove infected tissues prior to application.



*Figure 1. Cankers can provide an overwintering site for plant pathogens.  
(Photo: Nicole Gauthier, UK)*





**Figure 2.** Debris is a major source of infective propagules. Gather and discard fallen buds, flowers, fruit, twigs, and leaves.  
(Photo: Kim Leonberger, UK)



**Figure 3:** Diseased fruit, whether on the ground or attached to the tree, can serve as a source of inoculum during the current and future growing seasons.  
(Photo: Nicole Gauthier, UK)

# Soundness in Senior Horses

March 29, 2018 by Kentucky Equine Research Staff



Aged horses are susceptible to health problems, just as older humans are. Decreased mobility in the form of lameness is a predominant health concern of old horses. What specifically ails these horses?

The answer is likely degenerative joint disease (DJD) or osteoarthritis (OA).

“The end game of DJD and OA disease processes is clear: permanent changes to soft tissues and bones in affected joints that eventually lead to pain and inability to work,” said Laura Petroski, B.V.M.S., a veterinarian at Kentucky Equine Research.

The most obvious cause of DJD and OA in aged horses is cumulative use, whether it’s on the racetrack, in the show ring, at the riding academy, or on long trails. The concussive forces of working for years in harness or under saddle take their toll. These forces accumulate more quickly in elite-performance sports where horses are asked to perform frequently at high intensities.

“Other factors that lead to DJD and OA include genetic predisposition, cartilage abnormalities, developmental problems, poor farriery, and abnormal weight-bearing or loading,” said Petroski. At times, these predisposing factors can stack on top of one another, making a treatment plan more convoluted.

How can you take the sting out of an old horse’s step?

- Be sure your horse stands on well-trimmed or well-shod hooves, even if this means asking for an impartial opinion from a farrier different than the usual one or a veterinarian educated in farriery. Consistently poor hoof care, as an old horse might endure over multiple shoeing cycles, can contribute to joint stress and disease.
- Provide plenty of turnout for old horses and encourage them to move when they are turned out. Showing schedules often dictate that old campaigners remain stalled for much of their lives, but freedom to roam and graze is incredibly healthy for joints. Horses can be inspired to walk during turnout by placing feed and water stations far away from one another.



- Allow plenty of time for warmup and cooldown, especially for aged horses that live in stalls. Too often old horses are pulled from their stalls, tacked up, and immediately ridden off at a trot. At least 15-20 minutes of walking will help loosen stiff joints. This is especially important for horses in lesson programs. Likewise, allow plenty of time for old horses to cool after exercise before returning them to their stalls.



- Arrange for immediate care of horses that look creaky or stiff. Putting off veterinary intervention in unsound old horses might have long-lasting effects and cause more damage. Old horses can have longer recovery periods from lameness.
- Become educated about joint supplements and begin their use before signs of DJD and OA appear. Many young horses are given joint supplements, not because they have a problem, but to ward off the effects of an athletic life as they age.

Glucosamine, chondroitin sulfate, and hyaluronic acid are often given to horses diagnosed with joint disease. Research indicates that a combination of oral glucosamine and chondroitin sulfate provides more relief than giving just one of the preparations. When selecting joint supplements, choose those developed and manufactured by reputable companies, like these products from Kentucky Equine Research:

- KER-Flex, a palatable powdered formula that contains high-quality glucosamine hydrochloride and chondroitin sulfate, which minimizes wear and tear on joint cartilage;
- Synovate\_HA, a liquid product that delivers high molecular weight sodium hyaluronate, which contributes significantly to maintenance of cartilage health and elasticity, joint fluid integrity, and lubrication of the entire joint mechanism; and
- EO-3, a source of omega-3 fatty acids well known for their anti-inflammatory properties.

Australian horse owners should look for Glucos-A-Flex, in addition to Synovate HA and EO-3.

Work with your veterinarian and nutritionist to determine the best nutritional course for treating your old horse's creaks. Have a question for a nutritionist? Contact Kentucky Equine Research today!



# Building an Emergency Kit

By Jane Marie Wix - National Weather Service Jackson, KY



(Source: Ready.gov/kit)

After an emergency (whether it be natural or man-made), you may need to survive on your own for several days. Being prepared means having your own food, water, and other supplies to last during this amount of time. A disaster supplies kit is a collection of basic items your household may need in the event of an emergency.

Make sure your emergency kit is stocked with the items on the checklist below. Once you take a look at the basic items, consider what unique needs your family might have, such as supplies for pets or seniors.

## Basic Disaster Supplies Kit

To assemble your kit, store items in airtight plastic bags and put your entire disaster supplies kit in one or two easy-to-carry containers such as plastic bins or a duffel bag.

A basic emergency supply kit includes the following recommended items:

- Water (one gallon per person per day for several days, for drinking and sanitation)
- Food (at least a several-day supply of non-perishable food)
- Battery-powered or hand crank radio and a NOAA Weather Radio with tone alert
- Flashlight
- First aid kit
- Extra batteries
- Whistle (to signal for help)
- Dust mask (to help filter contaminated air)
- Plastic sheeting and duct tape (to shelter in place)
- Moist towelettes, garbage bags and plastic ties (for personal sanitation)
- Wrench or pliers (to turn off utilities)
- Manual can opener (for food)
- Local maps
- Cell phone with chargers and a backup battery



## Additional Emergency Supplies

Consider adding the following items to your emergency supply kit based on your individual needs:

- Soap, hand sanitizer and disinfecting wipes to disinfect surfaces
- Prescription Medications. An emergency can make it difficult for you to refill your prescription or to find an open pharmacy. Organize and protect your prescriptions, over-the-counter drugs, and vitamins to prepare for an emergency.



- Non-prescription medications such as pain relievers, allergy medication, antacids, etc.
- Prescription eyeglasses and contact lens solution
- Infant formula, bottles, diapers, wipes and diaper rash cream
- Pet food and extra water for your pet
- Cash
- Important family documents such as copies of insurance policies, identification and bank account records saved electronically or in a waterproof, portable container
- Sleeping bag or warm blanket for each person
- Complete change of clothing appropriate for your climate and sturdy shoes
- Fire extinguisher
- Matches in a waterproof container
- Feminine supplies and personal hygiene items
- Mess kits, paper cups, plates, paper towels and plastic utensils
- Paper and pencil
- Books, games, puzzles or other activities for children

## Maintaining Your Kit

After assembling your kit remember to maintain it so it's ready when needed:

- Keep canned food in a cool, dry place.
- Store boxed food in tightly closed plastic or metal containers.
- Replace expired items as needed.
- Re-think your needs every year and update your kit as your family's needs change.

## Kit Storage Locations

Since you do not know where you will be when an emergency occurs, prepare supplies for home, work and cars.

- **Home:** Keep this kit in a designated place and have it ready in case you have to leave your home quickly. Make sure all family members know where the kit is kept.
- **Work:** Be prepared to shelter at work for at least 24 hours. Your work kit should include food, water and other necessities like medicines, as well as comfortable walking shoes, stored in a "grab and go" case.
- **Car:** In case you are stranded, keep a kit of emergency supplies in your car.

## Finally...Make a Plan!!!

- Learn what hazards affect your area. Contact your local National Weather Service office, your local emergency management office, or a local Red Cross chapter to learn which hazards can affect you.
- Make sure you know what to do when severe weather strikes.
- If you get separated from family, make sure you have a place to meet, and a point to contact to let someone know you are ok.
- Involve children in the plan making process.
- Practice your plan.

# Growing Your Own

## A beginner's guide to gardening

# Preparing Your Garden

**G**ood soil is the backbone of a healthy garden. Soil supplies plants with nutrients for growth and support for the roots. Good soil helps produce healthy vegetables.

## Working the soil

Working the soil is easiest in the spring. If you are planting right into the soil (not in containers), test moisture by gathering a handful of soil. Squeeze it in your hand and release. If it crumbles, it is ready to be worked. If it stays in a clump shape, it is too wet. A good garden soil is loose but not so loose that it looks like powder or dust.

Use a shovel to loosen the soil. Try to dig down 10 to 12 inches. Put the shovel blade into the soil and turn the blade or pick up the shovel to turn the soil. Repeat throughout the garden space. Break up the clumps and clods with a rake or hoe. Remove large sticks and rocks.



Soil that is too wet for planting (left) and soil that is ready for planting—moist but not clumped (right).

*Organic matter* is a good addition to your soil. It adds nutrients and loosens heavy soil. It allows sandy soil to hold water better and makes the soil easier to work. The most common forms of organic matter are:

- **Plant material** such as fresh leaves, straw, or grass clippings. Work them into the soil several months before planting so they have time to break down properly.
- **Animal manure** from cows, chickens, or rabbits. Use older, composted manure if you are about to plant in spring. Lay a 1-inch layer of composted manure over the soil before planting, and mix it well into the soil.
- **Compost** from decayed plant material. Many cities and towns have compost available to residents. *Compost* is often mostly made of leaves or small pieces of wood collected from residential yards. Apply a 1-inch layer and work it into the soil.

## Testing the soil

A soil test will determine which nutrients are lacking in your soil and how much fertilizer to apply. The test should be done after you have worked the soil, but before making raised beds, fertilizing,



or planting. Your county extension agent can assist you with collecting a soil sample, mailing it in, and interpreting the results. Many counties offer free soil testing. If your county does not, a soil test through the University of Kentucky Regulatory Services is \$7.

## Fertilizing

If you chose to add manure or compost to your soil during the preparation stage, you may not need to add much during the growing season.

If you did not add manure before planting, you should add some sort of fertilizer to your soil to provide enough nutrients for your plants. Commercial fertilizers are available at farm supply or home-improvement stores. The main three nutrients that most fertilizers provide are nitrogen (N), phosphorus (P), and potassium (K). They will be listed on the bag and always in that same order: N-P-K (nitrogen, phosphorus, potassium).

If you choose not to have your soil tested, apply about ½ pound of 33-0-0 fertilizer for every 100 square feet of soil. If you cannot find this fertilizer, urea (46-0-0) will also work. Both types come in the form of granules. Use a cup to spread the fertilizer as evenly as possible where you plan to plant. Incorporate the fertilizer into the soil using a shovel and rake. Wash your hands after handling fertilizer or wear gloves.



# Kentucky Beekeeping : A Guide for Beginners Thomas C.

Webster College of Agriculture, Food Science and Sustainable Systems Kentucky State University

## Bee Prep for Winter

The honey bee is the only insect in Kentucky that keeps warm all through the winter. This is done through a wonderful set of traits, including the habits of living together in a large colony and hoarding honey in the nest. Kentucky bees will survive our coldest winters with temperatures briefly down to -20°. This would seem to be difficult for the bees, but honey bee colonies will make it through the even longer winters in northern Canada.

However, the bees often need assistance by the beekeeper to make overwintering success routine.

Preparations for winter begin in August and September. Here is a five-point check list: 1. Are there enough bees in the hive? 2. Is there sufficient honey in the hive? 3. Are mites and diseases under control? 4. Is an entrance reducer installed and the hive reduced to one or two hive bodies? (page 76 indicates that it is necessary to have 10-12 deep frames of honey for overwintering and below it indicates that you should have 8-10 deep frames covered with bees. There isn't enough room in one deep super to overwinter and still have some brood...) 5. Has the queen excluder been removed? The remedies for the corresponding problems follow: Increasing the number of bees by uniting weak colonies By August or September the bees will be rearing less brood than earlier in the year, so little growth can be expected before winter. At this time, weak colonies should be united with each other or with stronger colonies. (See *Uniting hives*, p. 72.) The goal is to have a hive with at least eight to ten deep frames (most of one deep hive body or the equivalent) covered with bees. When estimating the population of bees in a hive, consider that the weather and time of day make a difference in the number of frames they cover. During cool weather the bees will cluster. The middle of a warm day, many field bees will be away from the hive. Either of these conditions can lead the beekeeper to underestimate the number of bees in a hive. Evaluating the hive for honey stores Your bees will have no opportunity to collect nectar for about five months in late fall and winter. During most of that time the weather will be too cold for them to accept sugar syrup from a feeder. Therefore the hive must have plenty of honey, about 50 pounds, to ensure that it will survive the winter. This amount of honey is equivalent to 10 to 12 deep frames full of honey. If the bees do not have this amount stored by late summer, you should feed them or add honey frames from another hive. Mite and disease control The most important pests in winter months are mites and nosema disease. Varroa mites weaken the bees, and encourage the spread of viruses. Nosema disease lingers and weakens the bees. No young, uninfested bees appear because brood rearing has stopped. Reducing the hive entrance The bees do well at warming themselves in their winter cluster. But a tightly sealed hive around them is essential. Hive bodies with holes should be patched or replaced before winter begins. In November, constrict the entrance by attaching an entrance reducer. This is a strip of wood which covers most of the opening. If you have chosen a hive location that is sheltered from the direct wind, your bees will benefit especially in winter and spring. Most entrance reducers are constructed to exclude mice also. If yours is not, staple 4-mesh screen across the hive entrance. Remember to remove the reducer when spring comes! Typically this will be in March depending on how quickly the hive population increases. The bees will eventually need the whole entrance to come and go. Also, as the spring temperatures rise and bee activity increases, the colony will need an open entrance for good hive ventilation. Removing queen excluders The queen excluder can easily kill a hive if it is left on over winter. This happens when the cluster of bees moves through the hive, consuming honey. If the honey is above the excluder, and the queen below it, the workers will have to choose between the honey and their queen. They will choose the honey, the queen will be left alone to die, and without the queen the rest of colony will die quickly. Remember that in winter the colony has no brood, no drones and hence no chance to make a new, fertile queen.



# Home Composting: A Guide to Managing Yard Waste

*William M. Fountain, Ph.D., Extension Horticulture Specialist;  
Candace Harker, former Fayette County Horticulture Extension Agent;  
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former Jessamine County Agriculture Extension Agent*

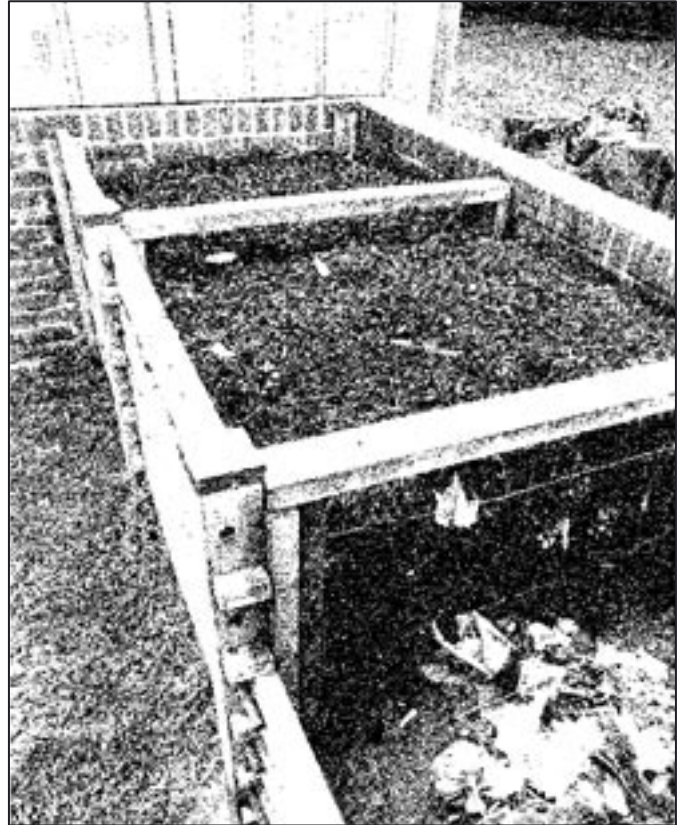
**B**ackyard composting is an extension of processes that have gone on in nature since the origin of life. Without decomposition, the earth would soon be covered with dead animals and plants. With nothing going back into the soil, the soil soon would lack sufficient nutrients for the continuation of life. Natural recycling of these nutrients improves the soil in your yard and makes it more productive while reducing the rate at which landfills reach capacity.

Discarding yard wastes with other garbage creates an unnecessary expense for municipalities. Disposal costs for state-of-the-art landfills range from \$30 to \$60 per ton. Landscape refuse such as leaves, grass clippings, and trimmings account for up to 20 percent of the wastes being placed in landfills. Bans on outdoor burning and laws that limit dumping of landscape refuse in landfills make home composting an easy, economical, and environmentally attractive alternative for many homeowners. The home compost pile is one way that you can improve the environment by turning yard wastes into a usable product—humus—while extending the life of landfills. This in turn maximizes the value received for the tax dollar.

## What Is Composting?

Composting is a controlled natural biological process where bacteria, fungi (microbes), and other organisms decompose organic materials like leaves, grass clippings, and food wastes. The end product is called compost, or humus. During composting, microbes utilize the decomposable matter both as an energy source and for making additional microbes. The word “controlled” distinguishes composting from other natural processes such as rotting or putrefaction, which are less desirable.

The practice of placing materials like compost on the surface of the soil to moderate temperature, conserve moisture, and control weeds and erosion is called mulching. Adding uncomposted materials directly to the soil



may produce some undesirable effects. The microbes that break down the organic wastes will compete with the plant roots for nitrogen. This will result in nitrogen deficiency and poor plant growth. Composted materials are also easier to handle and incorporate into the soil.

## How Decomposition Happens

Decomposition of organic material in the compost pile is dependent on maintained microbial activity. If any of the following four factors are not optimal, the process of decomposition will slow or stop (Table 1).

Oxygen	>5%
Moisture	40 - 60%
Carbon:Nitrogen	30:1
Temperature	90° - 140°F

## **Aeration**

Composting can happen either aerobically (in the presence of oxygen) or anaerobically (without oxygen). Oxygen is essential for microbes to efficiently break down organic wastes. Decomposition will occur under anaerobic conditions, but the process is slow and produces foul odors. If the compost pile is too large or is turned infrequently, the interior of the compost pile can become anaerobic while the exterior is aerobic. Your goal should be 100 percent aerobic decomposition.

Oxygen is added to a compost pile by turning with a garden fork. Compost may be turned by transferring it from one bin into the next or by turning it from one side to another. A well-mixed compost pile can reach temperatures in excess of 150°F, but the ideal range is between 90° and 140°F. This heat will help destroy undesirable weed seeds and diseases. Even so, avoid composting weeds heavily laden with seeds. The interior temperature can be checked with a thermometer or by feeling it with your hand. Compost at 90°F will feel comfortably warm; at 140°F, it will be too hot to touch for longer than 10 seconds.

Anaerobic decomposition involves different microbes from aerobic decomposition. Both processes use carbon, water, and nitrogen, but aerobic microbes do not require free oxygen to break down the organic matter. Anaerobic decomposition releases methane, carbon dioxide, water, hydrogen sulfide (rotten egg smell), mercaptans (skunk smell), formaldehyde, acetic acid (vinegar), and ammonia. Some of these chemicals are also toxic to living plants, and the odors are offensive. Anaerobic decomposition is a slow process that can take months to years and may leave live weed seeds and diseases in the compost.

Turning a compost pile at fairly frequent intervals during the first 10 to 15 days will achieve approximately the same degree of biodegradation as making the same number of turns over a longer period. Greater aeration during the initial stages of decomposition intensifies the activity of the microbes and subsequently reduces the time and space required for composting.

Compost that has become anaerobic can be salvaged by turning it on a daily basis until the foul odors have been replaced by a pleasant earthy smell. The compost is then safe to use around tender plants in the landscape.

## **Moisture**

Most organic matter added to a compost pile will contain some moisture. However, more water is generally needed in the beginning and during dry periods if the microbial activity is to remain high. This may come from rainfall or irrigation.

Water the layers as you add them, and cover the pile with plastic during very wet or dry periods. If you are in doubt of the moisture content, squeeze a handful of the material being composted. About two drops of moisture will form if the organic material is adequately moist.

Excessive moisture displaces air from the compost pile, allowing the pile to become anaerobic. Avoid poorly drained locations and the addition of large volumes of soil to ensure that problems do not develop as a result of excessive moisture.

## **Particle Size**

The smaller the particle size, the faster it will be turned into compost. Smaller particles have a larger surface area that can be attacked by microbes. Nothing added to the compost pile should be over 2 inches in size. A shredder is essential for reducing the size of woody material added to the compost pile. Tree leaves should also be shredded to prevent them from forming layers. This task can be handled easily and efficiently by picking up fallen leaves with a mower equipped with a bagger. Shredding will not only speed up the process of decomposition, but it will also reduce the initial volume of the compost pile.

## **Fertilizer**

Carbon serves as both a cell building block and an energy source for microbes. Nitrogen is also required for the growth and metabolism of the microbes. The ideal carbon-to-nitrogen ratio (C:N) in a compost pile is 30 parts carbon to 1 part nitrogen (30:1).

Materials like sawdust and straw are high in carbon and decompose very slowly. Conversely, materials like manure are very high in nitrogen. An ideal C:N ratio is achieved by mixing high nitrogen material with high carbon material (Table 2). Manure or blood meal can be used as organic sources of nitrogen. Otherwise, use a commercial fertilizer with a high nitrogen content. Other nutrients such as phosphorus and potash are usually present in adequate amounts for decomposition.

**Table 2.** C:N ratios of organic matter usable in

composting. Food scraps	15:1
Grass clippings	19:1
Rotted manure	20:1
Oak leaves	26:1
Leaves in general	35:1 to 85:1
Straw	80:1
Pine needles	60:1 to 110:1
Newspaper	170:1
Sawdust	625:1



During the initial stages of decomposition, organic acids are produced and the pH drops.\* However, microorganisms will generally break down these organic acids to other materials fairly rapidly so that the drop in pH is not significant. However, if the compost pile is anaerobic, the pH will initially drop much lower.

The addition of lime to the compost pile will convert ammonium nitrogen to ammonia gas, which leads to the loss of nitrogen. Finished compost is usually slightly alkaline without the addition of lime.

## Materials for Composting

Any organic material can be composted. However, many are more desirable and easier to work with than others. Yard wastes such as leaves, grass clippings, straw, and nonwoody plant clippings produce high-quality compost with relative ease (Table 3).

**Table 3.** Suggested mixes (by weight):

3 parts tree leaves to 1 part grass clippings
2 parts farm manure to 1 part straw
5 parts farm manure to 1 part newspaper

## Grass Clippings and Woody Materials

Grass clippings need not be removed from the lawn. However, if they are collected, they should be mixed in with other materials such as leaves. This will prevent them from becoming matted down and anaerobic. Clippings treated with herbicides are allowable if added in small quantities and allowed to thoroughly decompose.

Woody materials such as branches, logs, and twigs may be used if they are chipped to ¼ inch or less.

## Other Acceptable Materials

**Kitchen wastes:** Kitchen wastes such as coffee grounds, egg shells, and vegetable scraps may be added.

**Sawdust:** Sawdust may be added if nitrogen is supplied at the rate of one pound of actual nitrogen (6 cups of ammonium nitrate) per 100 pounds of dry sawdust.

**Wood ash:** Wood ash acts like lime and should not be added at more than one cup per bushel of organic matter.

**Newspaper:** Newspaper may be added to compost piles, although paper is very high in carbon and will slow down the rate of decomposition. Slick paper with colored inks should not be used. It is recommended that newspaper be recycled through appropriate community paper recycling centers rather than backyard composting.

\* pH is the measure of how acidic (sour) or alkaline (sweet) something is. The scale ranges from 1 to 14 with neutral being 7. The lower the number, the more acidic. The higher the number, the more alkaline. Sulphur is often used to make soil more acidic, while lime is used to make it more alkaline.

## Unacceptable Materials

**Materials that should NOT be added to compost piles** include human and pet feces, which can transmit diseases. Meat, bones, whole eggs, or dairy products should not be added as they may attract rodents.

Commercial microbial preparations (compost starters) that claim to enhance composting are unnecessary. Microbes necessary for the decomposition of organic matter are everywhere. You can get a faster startup of microbes by mixing a small amount of soil or finished compost in with the material to be composted.

## Composting Structures

Composting can be done in a pile, a bin, or a pit, depending on what is convenient. To save space, hasten decomposition, and keep the yard looking neat, contain the compost pile in some type of structure.

Ideally, the smallest size for a compost pile is 3 feet by 3 feet by 3 feet (1 cubic yard). This allows for moisture retention and insulation of the pile against changes in the external environment. Very large piles become anaerobic if not turned frequently.

Large plastic garbage bags may be used to form compost anaerobically. Fill a 30- to 40-gallon bag with organic wastes. Add one tablespoon of high nitrogen fertilizer and one cup of lime. Mix. Add one quart of water. Seal the bag. You will have compost in six months to a year.

A barrel or drum composter (Figure 1) will generate compost in a shorter period of time. You need a 55-gallon plastic or metal barrel with lid. Make sure the drum has not been used for toxic chemicals. Drill six to nine rows of ½-inch holes around the barrel. Fill the barrel two-thirds full with organic matter. Add ¼ cup of high nitrogen fertilizer. Add water if necessary. Every few days, secure the lid, turn the barrel on its side, and roll around the yard to mix and aerate the compost. Compost should be ready in two to four months.

Bin-type structures handle larger volumes and can be made from

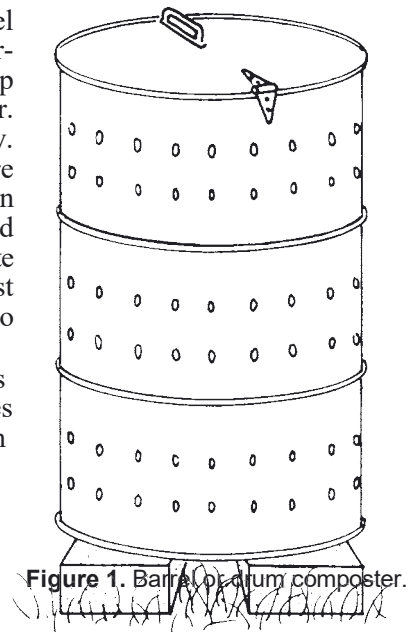


Figure 1. Barrel or drum composter.

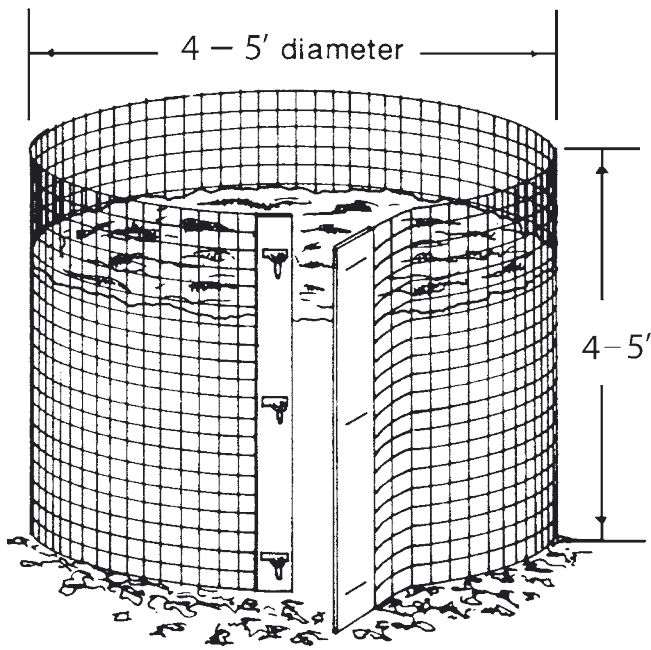


Figure 2. Bin composter.

woven wire without much expense (Figure 2). Woven wire should be 4 to 5 feet wide and 18 to 20 feet long. Bind the two ends together, and fill with compost. When it is time

to turn the compost, lift the wire frame, move over a few feet, and turn the compost back into it.

A three-chambered bin will be efficient and durable (Figure 3). It works like an assembly line with compost turned back and forth in the first two bins and stored for future use in the third bin. Wire, wood, masonry material,

or a combination may be used. All wood should be pressure treated to ensure that it will last for more than a year or two.

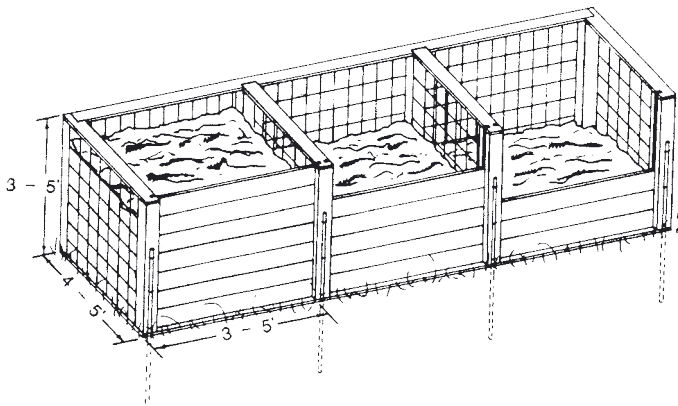


Figure 3. Bin composter with three chambers.

## Uses for Compost

Finished compost will have about half its original volume. It should be dark brown or black and crumbly and have an earthy smell. The pH will be neutral to slightly alkaline.

Compost may be used as a soil conditioner. As a soil amendment, it improves the soil's physical condition and fertility. Compost makes heavy clay soils easier to work and, as a result, improves aeration, root penetration, and water infiltration. Addition of compost to sandy soils helps retain water and nutrients.

Although compost contains some nutrients, it should not be considered a fertilizer. In most cases, additional fertilization will be necessary to achieve maximum plant growth and production. Nevertheless, the humus in compost will increase the efficiency of fertilizer used.

Compost makes a good mulching material. It can be used around both garden and landscape plants. It can also be used as a growing medium for house plants or, once pasteurized, for starting seeds.

### Compost Troubleshooting

Symptoms	Problem	Solution
Has bad odor	Not enough air	Turn the pile daily until the odor is gone
Center of pile while is dry	Not enough water	Moisten materials turning the pile
Compost is damp and warm	Pile too small	Collect more material and mix the pile in the middle but nowhere else
The pile will not heat up	Lack of nitrogen	Mix in a nitrogen source such as grass clippings, fresh manure, or fertilizer

## References

- Bem, Robyn. 1978. *Everyone's Guide to Home Composting*. Van Nostrand Reinhold Co., New York.
- Campbell, Stu. 1990. *Let It Rot: The Gardener's Guide to Composting*. Storey Communications, Pownal, VT.
- Catton, Chris. 1984. *The Incredible Heap: A Guide to Compost Gardening*. St. Martin's Press, New York.
- Golueke, Clarence G. 1973. *Composting: A Study of the Process and Its Principles*. Rodale Press, Emmaus, PA.
- Home Composting, Master Composter Training Manual*. Washington State University, Whatcom County Cooperative Extension. Courthouse Annex, 1000 N. Forest Street, Bellingham, WA 98225-5594.
- Rodale, J. I. 1971. *The Complete Book of Composting*. Rodale Books, Emmaus, PA.
- Rosen, Carl J., Nancy Schumacher, Robert Mugaas, and Suzanne Proudfoot. 1988. *Composting and Mulching: A Guide to Managing Organic Yard Wastes*. Minnesota Extension Service.
- Shewell-Cooper, W. E. 1975. *Compost Gardening*. Hafner Press, New York.



# Fertilizing Your Lawn

Gregg Munshaw, Plant and Soil Sciences

Lawns require fertilizer to remain healthy. Proper fertilization practices will lead to a thick, dark green, uniform lawn that is competitive against weed and disease invasions. The nutrients contained in fertilizers are necessary to support many processes occurring within the plants. If any essential nutrient is limiting, the plants will not perform at their highest level.

## What your Lawn Needs

Soils and soil fertility levels vary across Kentucky. Nutrients that may be naturally abundant in the central region of the state may be limiting in Eastern or Western Kentucky. Soils under lawns have often been modified by the removal of topsoil or the addition of fill during construction, so even knowing the natural fertility of the area may be of little value. The only way to specifically know the fertility needs of your lawn is to perform a soil test. A basic soil test is very inexpensive and will provide you information about certain nutrient levels and the pH of the soil. This information is critical to determine which fertilizer you should purchase, how much to apply, and whether lime needs to be applied.

## Getting the Soil Tested

Soil sampling is easily accomplished with some very simple tools. All that is required to take a soil sample is a clean bucket and either a soil probe, a shovel, or a trowel. Many county extension offices have soil probes available for use. Take soil from 10 to 15 random spots throughout the lawn. The goal in collecting soil is to get a comprehensive sample, which represents the entire lawn. Be sure to test flower beds or areas of known soil variations separately as to not skew the test results. Take samples to a depth of 1 to 2 inches (4-6 inches on newly tilled soils) and remove the plant material. Break the samples up in the bucket and thoroughly mix the soil together. Your

**Table 1.** The sixteen essential elements needed for plant growth.

Macronutrients	Micronutrients
Carbon (C)	Zinc (Zn)
Hydrogen (H)	Iron (Fe)
Oxygen (O)	Copper (Cu)
Nitrogen (N)	Manganese (Mn)
Potassium (K)	Chlorine (Cl)
Phosphorous (P)	Molybdenum (Mo)
Sulfur (S)	Boron (B)
Calcium (Ca)	
Magnesium (Mg)	

county extension office will supply you with bags free of charge in which to place the soil. You can then return the samples to the extension office and the results will be returned to you within a few weeks. Soil tests should be taken every three to 5 years on established lawns and may be taken at any point during the year. For recommendations, see AGR-214: *Liming Kentucky Lawns*.

## The Essential Elements

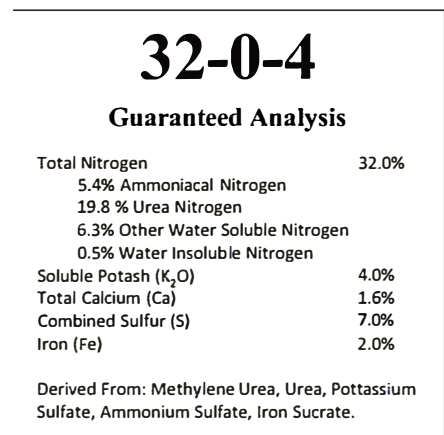
The basic composition for any grass plant is 85 percent water, 8 percent to 13 percent carbon, and 2 percent to 7 percent other essential elements. There are sixteen elements that are considered essential for plant growth (Table 1). Plants must have all of these essential elements in their proper proportions to grow and remain healthy.

Carbon, hydrogen and oxygen are obtained by the plant from air and water. These elements are building blocks for making sugars during photosynthesis. The remaining nutrients are taken up from the soil and are required in many different pathways and products in plants. Macronutrients are found in higher concentrations within the plant than micronutrients. However, this does not mean that micronutrients are not important. Deficiencies of any nutrients will result in less than optimal plant growth. Macronutrients may be further broken down into primary and secondary mac-

ronutrients. The primary macronutrients include nitrogen, phosphorus, and potassium. These are considered primary due to the larger quantities required by plants. These nutrients can often be deficient in the soil resulting in the need to fertilize. Whereas, the secondary macronutrients, as well as micronutrients, are needed in lesser amounts by plants, so natural soil levels are often adequate and these nutrients are not always necessary.

## Buying Fertilizer

Once you know what nutrients your lawn needs, how do you know which fertilizer to buy? The analysis on the fertilizer bag tells you the percent nitrogen (N), phosphate (P<sub>2</sub>O<sub>5</sub>) and potash (K<sub>2</sub>O) in the fertilizer, in that order. For example, a fertilizer with a 32-0-4 analysis contains 32 percent N, 0 percent available P<sub>2</sub>O<sub>5</sub>, and 4 percent soluble K<sub>2</sub>O (Figure 1). The fertilizer label will often break the N sources into slow release (water-insoluble nitrogen, WIN), and quick release (water-soluble nitrogen—often includes ammoniacal or urea) sources. Slow release nitrogen sources will only release a small amount of fertilizer at a time. The benefits of slow release fertilizers include less nitrogen losses from leaching and volatilization, reduced burn potential on the turf, and



**Figure 1.** An example fertilizer label.

fewer applications required to maintain soil fertility. However, the amount of the slow-release nitrogen is usually a quarter to half of the total amount of nitrogen in the bag. So although slow-release nitrogen makes applications safer, such a small amount would not provide noticeable availability of nitrogen over the long term. Most specialty fertilizers can be applied and measured exactly the same as you would a farm fertilizer. The same is true with specialty organic fertilizers, with the exception that they would need to be applied earlier in the fall as warm conditions are required for release of these materials. Most of these fertilizers have a low percentage of nitrogen or are fortified with urea, a quick-release source of nitrogen. Fertilizers with greater than 50 percent WIN (water insoluble nitrogen) can be considered true slow release sources. These sources can be applied at slightly higher rates than soluble fertilizers. There will not be a rapid greening of the lawn with these products as is common with quick release fertilizers. Cost will be 3 to 5 times higher per pound of nutrients for slow release fertilizers.

The recommended rates of nutrients can be applied with single nutrient fertilizers containing only nitrogen (e.g., urea 46-0-0), only phosphate (e.g., triple superphosphate 0-46-0), or only potash (e.g., muriate of potash 0-0-60). Or, you can use a complete fertilizer such as 10-10-10, 19-19-19, 10-20-10, etc. Complete fertilizers allow the job to be finished with fewer passes, but rarely have nutrients in the ratios needed for a specific situation. Recent summaries of Kentucky soil test results have revealed that more than 50 percent of homeowner turf soil samples test high or above for phosphorus and potassium. If the soil test results reveal that phosphorus and potassium are adequate, there is no need to apply more of these nutrients. Over-applying or misapplying phosphorus can lead to surface water contamination. Most phosphorus contamination occurs due to runoff, therefore you should always be diligent to avoid throwing fertilizers on hard surfaces such as sidewalks.

## Specialty vs. Farm Fertilizer Products

Lawns can be fertilized with specialty turf fertilizers (normally available at local garden centers) or with many farm fertilizers. The main advantages to the specialty fertilizers are:

- Normally good nutrient ratios for turf (turfgrasses often require a ratio of 4:1:2 N:P:K).
- Uniform and small particle size.
- Low burn potential.
- Calibration and application rate information for applying to small areas printed on the bag.

Most farm fertilizers do not have these advantages, but farm fertilizers are usually three to five times less expensive.

Farm fertilizers such as urea and 10-10-10 must be used with caution. Because of their potential to burn foliage, you should not apply them during extremely hot weather or when moisture is on the grass leaves. However, if these fertilizers are applied during cooler times of the year, burn is seldom a concern. It is critical that correct rates of farm fertilizers are applied to avoid burning.

## When to Fertilize

Without question, the best time to fertilize cool-season lawns (Kentucky bluegrass, tall fescue, perennial ryegrass, fine fescue) in Kentucky is during the autumn. These grasses all grow optimally during cooler weather and can best utilize nutrients at this time of year. The turf develops a better root system, becomes very dense, and has much better late fall and early spring color if nitrogen is applied in the fall.

During mild winters, good color may be maintained all winter following a fall application of nitrogen. By eliminating or minimizing spring fertilization you:

- Prevent the heavy flush of growth that occurs with spring fertilization.
- Reduce frequency of mowing during spring.
- Develop a better root system and promote better drought tolerance in summer.
- Reduce disease.
- Develop a more heat-tolerant, weed-free turf.

If the window to apply nitrogen in the fall is missed, an application during the following spring will improve greenup. Even if some fall nitrogen was applied, applying a half rate of nitrogen in late May or early June in years with heavy spring rainfall may help improve or maintain color.

If color is not a major concern, it is best to not fertilize in the spring because crabgrass, goosegrass, dallisgrass, bermudagrass, etc. respond to the nitrogen much more than do cool-season grasses. If you increase nitrogen fertilization of cool-season grasses in spring and summer, the need for irrigation, thatch control, and chemicals for weed control also increases. A lush summer lawn may not be worth these potential problems.

Weed and feed products (fertilizers and herbicides in the same product) are usually not recommended as the optimum time to use a herbicide for controlling weeds, may not match up to the optimum time or applying fertilizer. For instance, grassy weeds such as crabgrass and goosegrass are normally controlled with a pre-emergent application applied in April. If a weed and feed product is used to apply the herbicide, the fertilizer applied can lead to the problems mentioned above.

Late spring into summer is the best time to fertilize warm-season grasses such as bermudagrass and zoysiagrass, since they perform best during hot summer months.

The number of times you should apply nitrogen depends upon the lawn quality you desire. Low and medium maintenance levels are best for general lawns that get little or no summer irrigation—this includes most Kentucky home lawns. High maintenance levels usually require some irrigation, high mowing frequency, and often more pest control. Timing of fertilizer applications for various maintenance levels are shown in Table 2.



**Table 2.** Timing and amounts of nitrogen applications for various levels of maintenance on cool-season lawns.

Maintenance Level	September	October	November	December	Late May/early June
	Pounds N/1,000 sq ft				
Low*	--	1	--	--	--
Medium†	--	1	1	--	--
High‡	--	1	1	1	0-0.5
Very high	1	1	1	1	0-0.5

\* Mainly non-irrigated, non-trafficked, large acreage lawns, church or schoolyards, etc.

† Mainly includes commercial lawns, apartments, home lawns, and high traffic areas. Requires no irrigation except during severe heat and drought.

‡ Mainly for formal lawns, requiring maximum uniformity and color. Irrigation is required during summer for this level of nitrogen. Will require frequent and consistent mowing, even into winter months if growth continues. Never let a lawn go into winter higher than 2.5 to 3 inches tall.

**Table 3.** Examples of fertilizers and rates needed to provide 1 pound of nitrogen per 1,000 square feet of lawn.

Farm Fertilizer	Pounds Product Needed/1,000 ft <sup>2</sup>
Urea (46-0-0)	2.2
10-10-10	10
19-19-19	5.3
Specialty Fertilizer*	
25-5-10	4
29-3-4	3.5
32-4-8	3.1

\* Specialty fertilizers generally contain high nitrogen and low phosphate. They also contain a portion of slow-release nitrogen.

### How Much Fertilizer Should I Apply?

The soil test measures several important elements, however, it does not adequately measure nitrogen. Nitrogen changes forms in the soil very rapidly so it is difficult to predict its availability to plants with a soil test. Turf growth is highly dependent on nitrogen fertilization, but applying nitrogen at the wrong time or in heavy amounts may severely damage your lawn. A general recommendation is to apply 1 pound actual nitrogen per 1,000 square feet at any given application (Table 3).

The examples listed in Table 3 show many fertilizers that can be used to maintain turf. Because the fertilizer analysis tag indicates only the percent of nutrients, you must calculate the pounds of nutrients in a bag.

**For example,** a 50-pound bag of 10-6-4 contains:

5 pounds ( $50 \times 0.10 = 5$ ) of actual nitrogen (N).

3 pounds ( $50 \times 0.06 = 3$ ) of phosphate ( $P_2O_5$ ).

2 pounds ( $50 \times 0.04 = 2$ ) of potash ( $K_2O$ ).

The rest of the material in the bag [ $50 - (5+3+2)$ ] = 40 (i.e., 40 pounds) is called the carrier which does not contribute to the nutrient needs of plants.

**Another example:** to apply 1 pound N per 1,000 square feet (using the same 10-6-4 fertilizer), you would need to apply 10 pounds of the 10-6-4 fertilizer per 1,000 square feet.

$$1 \text{ pound N} \div 10\% \text{ N}$$

$$= 1 \text{ pound N} \div 0.10$$

$$= 10 \text{ pounds of 10-6-4 fertilizer.}$$

Ten pounds of 10-6-4 per 1,000 square feet would also supply 0.6 pounds of  $P_2O_5$  (phosphate) and 0.4 pounds of  $K_2O$  (potash).

Phosphorus and potassium rates will be dictated by the soil test report. As was stated above, if levels of these two nutrients are already sufficient, additional amounts should not be applied to the lawn. If clippings are recycled and not removed, almost no additional phosphate

or potash will ever be needed. However, grasses have a yearly nitrogen requirement to keep the lawn healthy and thick. Although these rates can vary based on soil types and environmental conditions, the rates listed in Table 4 can be used as guidelines.

**Table 4.** Recommended fertilizer rates for various lawn grasses in Kentucky.

	Pounds N/1,000 sq ft/year†	Fertilizer Timing
Cool-season grasses		
Fine fescues*	1-2	Autumn
Kentucky bluegrass	2-4	Autumn
Perennial ryegrass	2-4	Autumn
Tall fescue	2-4	Autumn
Warm-season grasses		
Bermudagrass	3-4	Summer
Zoysiagrass	1-2	Summer

\* Includes sheep, hard, and red fescues.

† See Table 2 for fertilizer amount and timing recommendations based on low, medium, and high maintenance lawns. The low numbers in the above table would be considered part of the low maintenance regime, while the high numbers are associated with the high maintenance regime.

## Applying Lime

Soil pH should ideally be in a range of 6.0 to 6.5. If the pH gets much higher or lower than this range, various macro- and micronutrients can become tied up in the soil and will be unavailable to

plants. The only way to know whether lime should be applied or not, is to have the soil tested. The soil test results will give specific recommendations on how much lime is needed in the soil. Often as much as 100 to 200 pounds of lime will be required per 1,000 square feet of

lawn. However, it is usually suggested that only 50-100 pounds be applied in a single application. If more than 100 pounds per 1,000 square feet is required, the rest of the recommended lime can be applied three to six months after the initial application. For more information on lime see [AGR-214, Liming Kentucky Lawns](#).

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