

Proper Planting Techniques

Kentucky GROW



The goals of this module are:

To demonstrate the proper methods for planting trees, shrubs, flowers, and bulbs. Selecting the site according to a plant's needs is important, but it is just as important to plant it properly. When properly planted, plants get off to a great start, grow better, and live longer. Techniques vary from bulbs to balled-and-burlapped trees.

What you need:

Bulbs

- Bulb planter (hand tool, drill-powered auger, or narrow trowel)
- Bulbs, hardy

Perennial and annual flowers

- Shovel, pointed tip
- Trowel
- Watering can or hose with sprayer end
- Soil amendment (compost, peat moss, etc.)
- Spade or other sod remover
- Garden gloves
- Knife or box cutter
- Mulch (optional)
- Perennial or annual flowers

Trees and shrubs

- Old loppers or wire cutter
- Watering can or hose with sprayer end
- Mulch (optional)
- Shovel, pointed tip
- Soil amendment (compost, peat moss, etc.)
- Spade or other sod remover
- Garden gloves
- Knife or box cutter
- Tree or shrub

Time needed:

Time needed to plant (does not include sod removal and soil preparation):

Bulbs: 5 minutes per bulb

Flowers: 10-15 minutes per potted plant or six-pack of annuals

Balled-and-Burlapped Trees and shrubs: 30 minutes per tree

How to prepare:

The area to be planted should be inspected beforehand to determine ease of access and appropriate planting locations. Preparing the planting area by removing sod or other coverings and amending the soil is important for participants to learn, but if time is limited, these tasks can be done beforehand. Some methods of removing sod can take less than 15 minutes per plant or many months for a large bed. If sod needs to be removed, the facilitator should decide on the method before scheduling planting. Installing plants other than bulbs should ideally be done on a cool (65 to 70 degrees F), cloudy day with no wind. However, this is not always practical for scheduling purposes. If necessary, planting during hotter weather can be done in the early morning or evening, provided the plants are shaded for a few days and kept well-watered. Trees, shrubs, and flowers can be planted in cooler weather, but consider the cold tolerance of the participants first.

The program:

Bulbs

Hardy bulbs are those that can withstand (and even need) low winter temperatures and bloom year after year. They include daffodils, tulips, crocuses, hyacinths, scilla, anemones, *Iris reticulata*, snow drops, winter aconite, lilies, and others. Generally, the best time to plant them is in the fall, from mid-August until the ground freezes.

Bulbs have different cultural needs, but all need soil with good drainage and aeration to prevent rot. If the soil is heavy clay, choose another spot or amend the soil first with one-half to one-third peat moss (wet it first!) or compost. Loosen the soil to about 12 inches to allow for good root development below the bulb. Newly planted bulbs do not require fertilizer, as all the nutrients the plant will need for the next flowering are contained in the bulb. However, in succeeding years, it is a good idea to fertilize bulbs with a complete fertilizer such as 10-10-10 after flowering and again as the foliage emerges from the soil in the late winter or early spring.

If bulbs are to be the only plants in a large bed, one way to prepare the bed is to scrape the soil off the bed to the required depth. “Fluff up” or loosen the soil a few inches deeper, and incorporate lots of compost. Set the bulbs on top of the soil in the desired spacing. Cover completely with the soil that was removed and tamp down lightly.

If bulbs are to be planted among other plants, there are various planting tools available just for bulbs. These generally remove a core of soil or part the soil so the bulb can be tucked in. The gardener needs a fair amount of hand and arm strength if adaptations to tools are not made. An auger attachment to a drill works in any kind of soil (buy an auger with the thickest shaft possible) and can cut through small roots easily. With two people planting (one to drill, and one to plant), about 200 bulbs can be planted per hour. The person drilling should have a good back, as one must bend fairly far over to get the required depth. It is also possible to rent a gasoline-powered auger that allows the driller to remain upright. They allow for speedy planting as well, but require a fair amount of upper body strength to maneuver.

The planting depth varies depending on the particular bulb, and a general rule of thumb is to plant the bulb twice as deep as its height (for example, a tulip bulb that is 3 inches high should be planted 6 inches deep). The recommended depths are measured from the bottom of the bulb to the top of the soil. The bottom of the bulb (the basal plate) is flatter and may have shriveled roots still clinging to it. The pointed end of the bulb goes up when placed in the hole.

Once planted, backfill the hole with half the soil, then water. Replace the rest of the soil and water again. Do not mulch until the ground has frozen one or two inches.

Here in Kentucky, tulip bulbs are often considered annuals because they do not flower consistently from year to year (they need a certain period of chilling before they will form flower buds). Try planting them deeper than the recommended six inches – plant eight to ten inches instead. Also, the Darwin type of tulips are the best repeaters.

Squirrels, chipmunks, and mice like to eat tulip, crocus, and lily bulbs. A cage made of ½ -inch-square hardware cloth works well, as does laying a piece of hardware cloth across the top of the planting hole before replacing the last of the soil.

Perennial and Annual Flowers

Annual flowers come from tropical areas of the world and cannot survive the cold weather of this region. However, to make up for their short lives, they bloom almost constantly once reaching maturity. Typical annual plants are impatiens, geraniums, and marigolds. Herbaceous perennial plants come back year after year, but they die back to the ground after a frost. Popular flowers such as daisies, phlox, and peonies are examples of perennials.

As with the bulbs, soil and bed preparation is very important to the success of an annual or perennial planting. A well-prepared bed will give better foliage and flowers, faster growth, and longer life. The plants will also have greater disease resistance and will be better able to withstand drought and other environmental stresses.

The first step is to test the soil (see the Soil Module) for pH, phosphorus, potassium, organic matter, and soil type. The Perennial Plant Association suggests the following standards for a happy plant: pH of 5.5 to 6.5, organic matter of at least 5% (by weight), 50 pounds per acre phosphate, and 120 pounds per acre potassium or potash.

The next step (if preparing a new bed) is to eliminate weeds or grass that is already present. Grass sod can be removed by several different methods. Using a spade (flat-edged shovel), cut out small sections of sod. Using the spade or a sod shovel, peel up the sod, being sure to get underneath all the roots. The sod can be transplanted to other spots, turned over and left in place to serve as mulch (best for shrub and tree beds), or composted. A motorized lawn edger works well as a sod cutter, and there are gas-powered sod cutters that will cut and peel up sod. One method that requires less physical exertion and more time is to smother the grass by covering it in thick layers of compost, newspaper, or mulch, and waiting for the grass to die. It can take up to 6 months, but one can plant directly in the area once the grass has died.

Grass and weeds can also be killed with chemicals such as glyphosate (brand names Round-Up or Finale). Glyphosate is a non-selective herbicide, meaning anything it touches will die or be severely affected. It is sprayed on actively growing tissue (so it works best at temperatures above 50 degrees), where it is absorbed and travels to the roots. Take care not to spray on windy days or walk over freshly-sprayed areas. Glyphosate can stick to the bottoms of shoes or on fingertips and be transferred to non-target plants. Glyphosate takes about 7 to 14 days to completely kill most plants. Some may need several rounds to completely die, and then the dead plants can simply be rototilled or dug into the soil. Glyphosate is a non-organic herbicide, but it is not very toxic to humans and breaks down in the soil completely. Organic herbicides kill the top growth only, and when used repeatedly, starve the roots of the plant and it eventually dies. A gardener interested in using an organic method may be better off using the physical removal or smothering techniques discussed above when planting large new beds.

Most soils are not the typical fertile loam that perennials and annuals prefer. Most are low in organic matter and can benefit physically, chemically, and biologically from the addition of a mixture of composted leaves, manure, peat moss, and bark mulch (see the Composting Module). Fresh or non-composted organic matter at best will rob the new plants of nitrogen and at worst burn them with too much nitrogen. Work in enough organic matter into the beds so that about a third of the volume is organic matter. A good rule of thumb is to add about 4 inches of organic matter per 12 inches of soil depth. A soil with an ideal amount of organic matter can be worked with just the hands and will have lots of earthworms. Test the soil again after amendment and add fertilizer if necessary.

Once the soil is prepared, planting can begin, provided the weather is conducive and the soil is not too wet. Planting of perennials can be done in the spring or fall, usually from mid-April through May, and then in early September through October. Planting on cool or overcast days in the spring stresses the plants the least and gives them a head start before the hot summer weather settles in. After a good rain, wait a bit to allow the soil to dry so as not to compact the soil when working in it. To test the soil, pick up a fistful of soil and squeeze into a ball. Open your hand – if the ball falls apart, the soil is dry enough. If not, wait a few days and try again.

In a prepared bed, dig a hole the same size as the container. If adding plants to an existing bed, dig the hole twice as wide and twice as deep. Mix in organic matter and any necessary fertilizer to the original soil from the hole. Return the amended soil to the planting hole, leaving enough room for the root ball.





Remove the plant from the container by placing your hand on the top of the pot and inverting it. If the plant does not slide out easily, rap the bottom of the pot a few times to dislodge it. Sometimes plants that have been growing in containers too long have roots growing out of the bottom holes, and it may be necessary to cut these off to get the plant out of the pot. The pot may also be sliced down the side with a box cutter and peeled away. Never pull a plant out by pulling its leaves or stems.

Roots that have coiled tightly together around the inside of the pot should be teased out. In extreme cases, make three longitudinal cuts vertically on the outside of the root ball. Set the plant in the hole at the same depth it was growing in the pot. Backfill with amended soil and firm in with your hand. Water well. Make sure the plant has at least an inch of water per week (from rain or from you). A good goal is to apply enough water to wet the soil to a depth of 6-8 inches. This is approximately equivalent to a 1 inch rain. Shallow watering is best for about a month, then reduce the frequency and increase the depth until the plant is well-established.



Generally, bed preparation and planting techniques are the same for transplanted perennials. Water the transplant the night before, and when digging it up, get as much soil with the plant as possible. The best transplanting times are in early spring, as new growth begins, or in early fall. Wait until after flowering (unless they are the tough-as-nails daylilies or hostas), and if they are mature, cut them back by one-half to two-thirds before transplanting. Again, transplant on cloudy and windless days, and water in well.

Mulch after the soil warms up in the spring, and do not mulch more than two inches. Keep the mulch away from the crowns of the plant or it will rot. It is also recommended that a little heavier application of nitrogen be given to mulched plantings, as non-composted woody mulches will actually rob the soil of nitrogen as it breaks down.

Trees and shrubs

This section discusses the planting of trees and shrubs whose roots and the surrounding soil are held together with burlap. They are referred to as “B & B” or “balled-and-burlapped.” For trees or shrubs planted in containers, follow the method for annual and perennial flowers.

Remove sod as directed in the section above. If the soil is a good loam, the width of the hole does not need to be much wider than the root ball. For poorer soils, dig the hole two to three times as large as the root ball. For very compacted soils, choose another site, or dig trenches about six inches wide and deep radially around the planting hole. This allows the tree roots to more easily penetrate the surrounding soil.



The depth of the hole should be the same as the depth of the root ball. Before digging, cut any twine around the trunk and peel back the burlap from the trunk. Notice where the dirt used to be – the trunk will be darker where the soil was, but this doesn't necessarily mean this is how deeply the tree was planted in the nursery. When trees are dug in the nursery, dirt oftentimes gets piled up around the trunk. Thus the planter may think he or she is planting at the correct depth but is actually planting too

deeply. Planting too deeply encourages root girdling (which will eventually strangle and kill the tree) and leads to bark problems. Over time, the tree will decline and will fail to get through stressful times.

To plant at the correct depth, remove the dirt on the top of the ball until the root flair (where the first set of roots meets the trunk) is exposed. If the tree has been balled and burlapped for a long time, it may have grown fine roots in that extra soil, and if so, pull those roots off. Measure from the bottom of the root ball to just above the primary roots to determine how deep to dig the hole.



Mix amendment into the removed dirt, up to about 10 percent of the total. Tree and shrub roots grow far beyond the diameter of the hole, so they must “learn” to cope with non-amended soil. A little bit of amendment in the hole gives them a strong start but doesn't make the roots reluctant to expand beyond the hole.

To plant the tree, lift it by the root ball and set it gently in the hole. Never lift a tree by the trunk! Root balls of larger trees are very heavy, and care should be taken to avoid back and arm injuries.

After putting the plant in place, slice the burlap vertically every 6 to 8 inches with a box cutter or knife to speed breakdown of the burlap and to ease the entry of water into the root ball. Synthetic burlap must be removed. The wire basket should be left on, with the top row removed with an old pair of loppers or wire cutters. Most of the time, the wire basket will rust away, but in case it doesn't, removing the top row will allow roots to expand.

Fill in the hole with the amended soil about halfway, tamping the soil down with the feet. Add a few inches of water, let it drain, and fill in the rest of the hole with soil, tamping down again. Make a ring of soil around the perimeter of the hole a few inches high so that water will pool there and drain directly down to the root ball. Water the tree again and repeat once more.

Once the tree is planted, add 2 to 3 inches of mulch, pulling it away a few inches from the trunk. Too much mulch is as bad as planting too deeply for the same reasons. Sprinkle a bit of 10-10-10 fertilizer over the mulch to compensate for nitrogen that the mulch steals from the tree as it

breaks down. Do not stake unless absolutely necessary, as even the softest tie-downs will girdle and kill a tree. Plus, a young tree needs stimulus from the wind to develop strong roots.

Other activities:

- Planting of all but the largest trees can be done in containers as well, where soil preparation is minimal and the project can be kept small (See the Container Gardening Module).

Accommodations for this program:

As with all Kentucky GROW programs, providing needed accommodations is an individualized process. Below are some ideas to get you started, but the best route to take is to listen to the person, as he or she will usually have the best ideas of all! There are several methods available to use when planting trees or shrubs that minimize the physical exertion associated with this strenuous activity.

1- Tarp method: Roll the tree onto a tarp or old blanket. At least two people grab a corner and gently drag the tree into the hole, while one person holds the tree upright. Roll the tree from side-to-side until the tarp can be pulled out from under the tree ball.

2- Ramp method: If the tree has been transported to the planting site by pickup truck, back the truck up to the hole. Attach a wide, flat board to the tailgate with a connector (these are generally used to make a ramp to get lawnmowers on and off trailers), and set the other end of the board at the edge of the hole. Gripping the wrapping twine or wire basket handles, pull the tree off the truck, onto the ramp, and into the hole.

3- Carrier method: For smaller trees and shrubs, use a carrier to pick up and carry the plant. Carriers look like mini-stretchers, but are made of tubular steel or aluminum. They cost about \$35 and can be purchased at landscape supply stores.

4- Plant lift sling method: When using Bobcat-type machinery, slings are available as an attachment. They can pick up very large balls that may be impossible to move by hand. There are also slings available that have gripper loops for moving trees by hand.



For those with mobility impairments, consider working as teams. If the person uses a wheelchair or walker, ergonomic, long handled tools and leverage aids will be very helpful. Some barbecue tools are a perfect length and weight to work with. Wrap fabric and tape around handles to make them easier to grip. A cup with a handle can also be used as a digging tool. In short, work with the individual to assess his or her needs. For those who may have difficulty bending or kneeling, a bathtub bench can provide an adjustable height option and keep the person from having to sit on the ground while providing closer access. In addition, some wheelchairs and walkers have room to carry a tote or gardening bag for easy access to tools and supplies.



For those who have cognitive impairments, consider working as a team for this module. Use photos or pictures to demonstrate each step. Ensure that everyone is able to participate at a level they are comfortable with. Provide choices as to what is available to plant.



For those with learning disabilities, provide the information in a variety of methods. Some individuals learn best by hearing the instructions, others will prefer to see the step by step procedure in writing with pictures or photos, or have the instructions on tape. Written instructions will also be helpful for those with hearing impairments.



For individuals with visual impairments, review placement of the needed materials. Don't move items without informing the person. Provide any written instructions in large print. Ensure that no tools are left in the path of a person with a visual impairment, as they present unforeseen obstacles. Handles on all tools should be brightly colored to avoid grasping sharp edges, tines, or blades. A magnifying glass can make small plants and roots easier to see. In addition, if planting rows, a string with equally spaced knots can help the person maintain equal planting distances.

Where to go from here:

“Plant Trees for Keeps,” by Ken Twombly, *Fine Gardening*, March-April 1997, No.54, pages 46-49.

“Planting a Balled-and-Burlapped Tree,” *Horticulture*, September/October 2001, pages 64-65.

The Well –Tended Perennial Garden, by Tracy DiSabato-Aust, Timber Press, 1998, pages 25-52.

“Growing Hardy Bulbs,” Ohio State University Extension Fact Sheet HYG-1237-98, by Jane Martin. Online at <http://ohioline.osu.edu/hyg-fact/1000/1237.html>.

“Planting Perennials,” Michigan State University Extension. Online at <http://www.msue.edu/msue/imp/modop/00001586.html>.

“Planting Perennial and Annual Plants in the Garden,” by the Garden Helper. Online at <http://www.thegardenhelper.com/plantinghole.html>.

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