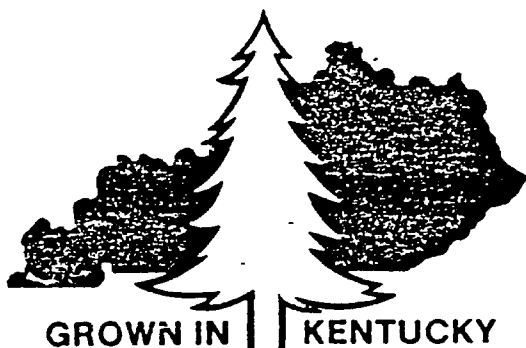


KENTUCKY CHRISTMAS TREE PRODUCTION WORKBOOK

FOR-22



PLANTING

Deborah B. Hill

Before delivery of seedlings, your land should be all ready for planting. The site should be prepared (plowed, disked, herbicides applied, and/or benign ground cover established) and the plantation should be laid out with markers indicating where each seedling will be placed.

Timing

It is essential to schedule delivery of seedlings when you will be free to plant them immediately. If you order stock from the Kentucky Division of Forestry (KDF) nurseries, you may be able to schedule direct pick-up from the nursery. If KDF personnel deliver the seedlings, be sure to open the wrapping to determine that the roots are still moist. If they aren't, refuse the shipment and request fresh plant material. Timing and condition are more difficult to control when you order from a commercial nursery, but the same rules generally apply. Please note that if you order seedlings from states considerably north of Kentucky (e.g. Michigan), the nurseries may not be able to lift their stock in time to ship seedlings to you during Kentucky's planting season (usually mid-March to mid-April). Late planting jeopardizes the success (survival) of your plantation.

Roots of delivered seedlings should be watered lightly at the time of arrival. If you cannot plant delivered seedlings within 24-48 hours, heel them in. This process involves digging a trench in the ground, laying out all the seedlings along the trench, covering the roots with soil and watering them thoroughly. Seedlings can remain heeled in safely for a week or more.

Seedlings can be planted in the spring or fall—there are advantages and disadvantages to either time. **Fall planting** is more common with broadleaf species than with conifers; spring is more common

for conifers. The advantage of fall planting (mid-November to mid-December) is that the seedlings probably can become established and may begin some root growth before the coldest part of winter sets in, enabling the seedlings to put more energy into growth during the following growing season. A disadvantage of fall planting is that the soil loosened and disturbed by the planting process may freeze more readily than undisturbed soil and may heave the seedlings right out. You can reduce the possibility of frost-heaving by mulching around each seedling (2-3 in deep and a minimum of a one-ft radius circle around the tree). Mulching with organic material (rotted sawdust, leaf mold, wood chips, etc.) insulates both soil and roots and usually provides some nutrients over time as an additional benefit.

Spring planting avoids the frost-heaving problem, but some of the seedling's energy goes to establish and initiate root growth as well as shoot growth. The major danger in spring is if you plant late in the season (late April, for example) and the weather turns hot and dry; then the seedlings are put under drought stress before they have a chance to become adequately established. If this situation is not fatal, it still reduces the tree's energy for shoot growth.

First Steps

Once you have your seedlings and are ready to plant, two or three things need to be done which, though time-consuming, will increase the probability of survival. First, sort the seedlings by size—small, medium, and large. The mediums are probably your best stock. You may want to keep some of the small ones and nurture them in pots for another year (or from spring to fall) until they achieve a respectable size. Large ones may be too difficult to plant.



Sorting seedlings for size and quality



A planting team in action

Methods

As you prepare to plant, carry seedlings in buckets or similar containers, or in over-the-shoulder planting bags. Containers should have water, moist sand, or wet peat moss in the bottom to keep the seedling's roots moist during the planting process. If at all possible, choose an overcast, cool day to plant. A misty rain is ideal for the seedlings, but isn't too comfortable for the planters! If spring

Second, prune the roots: cut off any really long roots and otherwise reduce the root mass by about a third. On really large seedlings, you may prune some of the top as well as the roots to get both parts in balance; trim sides of seedling rather than tip of leader. Remember that the hole for planting is not very large and the roots should fit easily and not be crammed in. **KEEP ROOTS MOIST AT ALL TIMES!**

Third, unless you have a heavy clay soil, you may want to use a hydrogel to conserve moisture in the roots and to draw moisture from the soil. Clayey soils tend to be wetter anyway, so hydrogels would not be helpful. Four kinds of hydrogels are being tested (Vi-terra[®], Hydreserve[®], Liguagel[®] and TerraSorb[®]) to see if there are measurable differences in growth or survival among trees dipped in these products. Results of these tests will be provided on an annual basis through the Christmas tree newsletter, *Pens and Needles*.

Depending on your soil analysis, you may wish to add fertilizer. Opinions differ concerning whether or not to add fertilizer at planting. Quick-release nitrogen fertilizers such as ammonium nitrate and urea are strong enough to burn the seedlings. However, slow-release nitrogen, and some of the "packaged" tree fertilizers (e.g. Woodace[®] briquets, Jobe's[®] stakes[®]) seem to have positive effects on tree growth. In general, soil should have NPK levels of 10 lbs N, 40 lbs P and 160 lbs K per acre for best results. If you are growing your trees on good soil, fertilizer may not be needed at all.

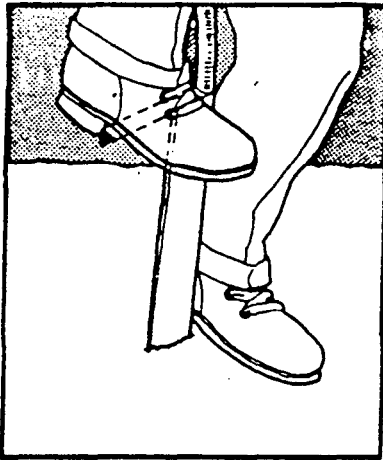


Variations of planting bars or dibbles

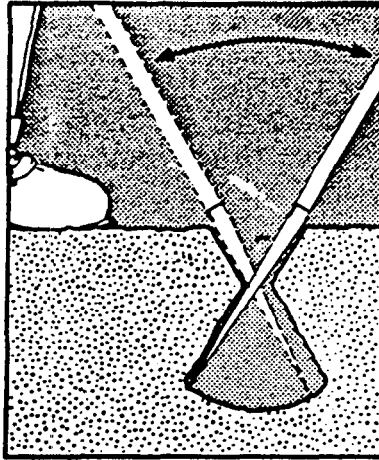
*Reference to a herbicide or insecticide, either by trade or common name in no way represents a recommendation or endorsement of that chemical.

weather turns warm, plant in early morning, late afternoon or evening. We have found that working in pairs (one making holes, one placing seedlings) saves everyone's back and makes the work go quickly. You swap off, so no one has to do all the planting or all the digging. Better yet, borrow extra

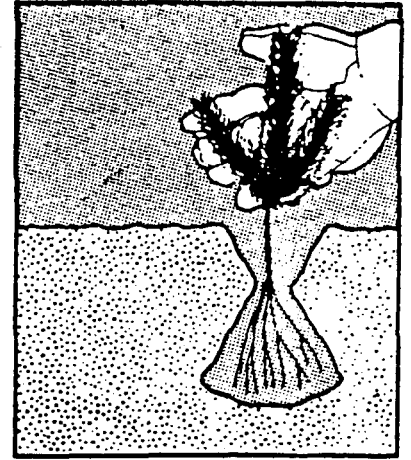
equipment from KDF and have a planting party! The mechanics of planting are straightforward. The following diagrams illustrate correct planting techniques using a standard dibble or planting bar. The sequence is approximately the same, whether you use a spade or other planting bar.



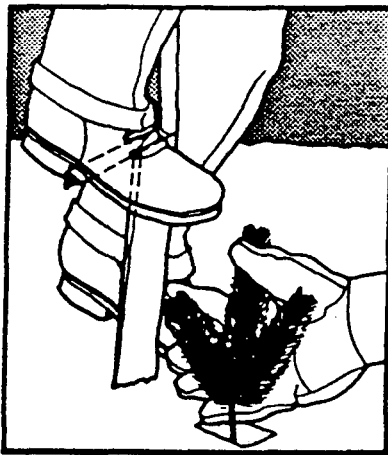
(1) Insert dibble straight down, as shown.



(2) Pull dibble back and forth to open hole.*



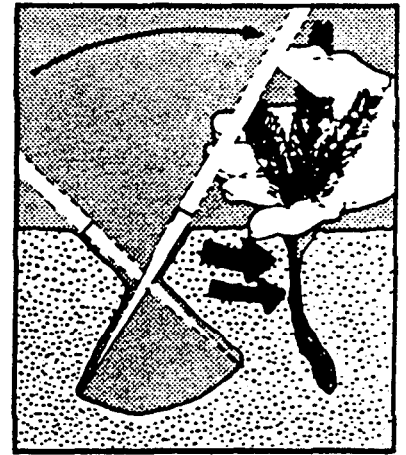
(3) Remove dibble and place seedling in hole at correct depth.



(4) Move dibble back 6 in. from first hole and re-insert.



(5) Pull handle of dibble toward you. The tip will push soil toward roots, firming soil at bottom of roots.



(6) Push handle of dibble away from you, firming soil at top of roots.

(7) When original hole is closed, fill in last hole by firming in with heel. Give seedling a firm tug, to insure that it is properly tamped in.



*The newer design of planting bar, which has a triangular head in cross section, opens a larger hole when driven into the ground and may not need to be rocked back and forth to open a planting hole.

Artwork and layout by Dennis Duross.



Closing the planting hole

It is possible to plant by machine. Some of the dangers are:

- Seedlings may be planted on a slant rather than upright and need to be corrected later.
- Earth is tamped insufficiently around the seedling and too much air is left in the root zone.
- In clayey soils, the coulter may smooth the sides of the cut so well that roots cannot penetrate and end up growing two-dimensionally along the cut.



Machine Planting

Even some of the larger growers have said it is worth the extra time to plant the seedlings by hand. Both hand and machine planting equipment are available from KDF. Directions for making your own planting bar (either type) are on the following page.

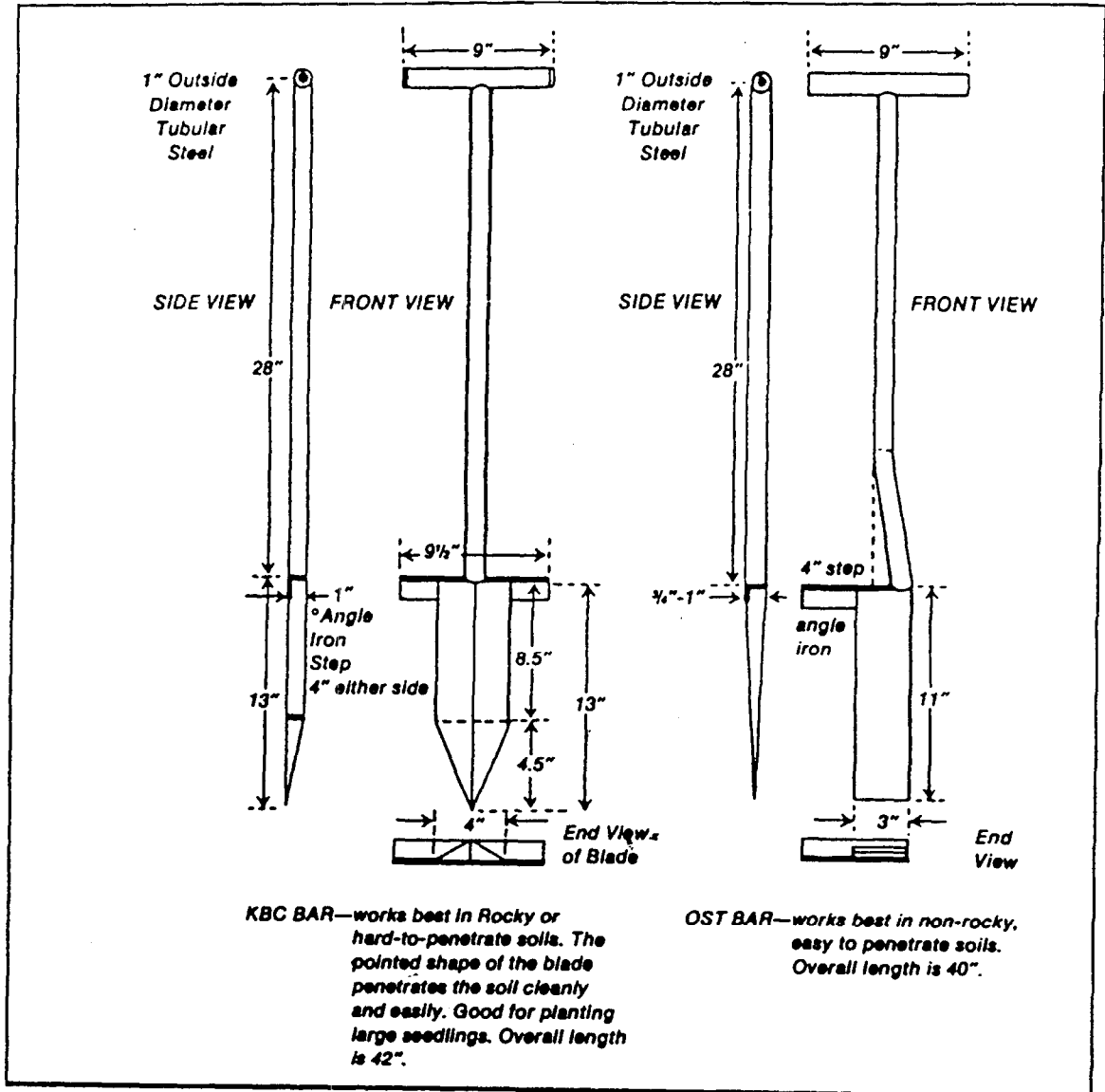
A final possibility, particularly for people who want to grow some stock for landscape plantings or for live trees, is to grow trees in in-the-ground containers known as root-control containers. These containers are made from a porous man-made fabric which allows free passage of water and nutrients, but will not allow the roots to penetrate



Auguring holes for in-the-ground containers

and enlarge. Since the fabric effectively prunes the roots, the fibrous feeder roots proliferate inside the bag. When ready to harvest, slide a spade around the outside of the bag and pull the whole tree out, bag and all. Unlike burlap, this bag is nonbiodegradable and must be removed before re-planting the tree. Also, it is probably advisable to prepare for planting this way by auguring holes large enough to accommodate the bags (usually 12 in. or 14 in. diameter). The loose soil removed by the auger is then back filled and the seedling planted in the center of the bag. See FOR-34 for more detailed information.

PLANTING BAR SPECIFICATIONS



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