PLANTING SITE FOR A 3" CALIPER TREE WITH ROOM TO GROW

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Note! The title of this diatribe is "Planting Site for, etc." not "Planting Hole for, etc." Roots should be encouraged to grow beyond the planting hole into the site as rapidly as possible if healthy growth of the tree is desired. There has been too much focus on the hole and not enough on the site as we plant trees. The result has been about the same as implied in the doughnut factory rhyme: "As you go through life; Brother, whatever be your goal; look upon the doughnut and not upon the hole." Both doughnut eaters and tree planters suffer when they place too much emphasis on the hole. The following prose focuses on the site and how to make trees grow bigger, better, faster.

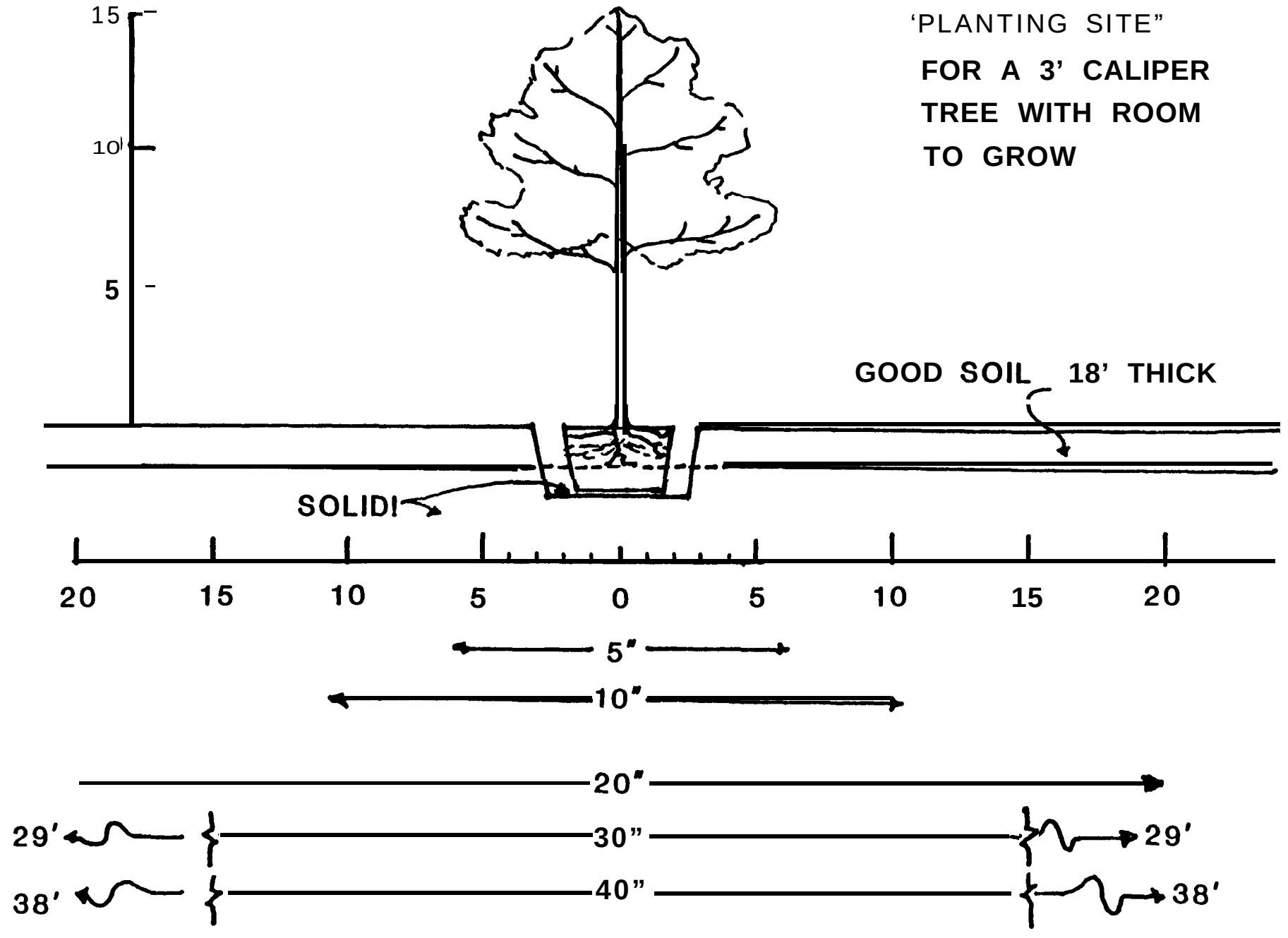
The accompanying drawing is to scale. The tree is to be seated in solidly packed soil for the bottom half of the root ball. The bottom of the ball should be seated solidly on undisturbed soil if possible. Ninety percent of roots will be in the upper layer of good soil.

Three-inch trees can be planted with smaller balls than indicated--see the specifications of the American Association of Nurserymen. However, small balls require heavy compensatory pruning. It is better to plant a smaller tree with a proper ball than to plant a stick which is short of roots and branches.

Carl Whitcomb has data showing that trees that are pruned to compensate for root loss do not grow as well as those that are allowed to die back and recover on their own. The disadvantage of this arrangement is that the branch that man may favor is likely to be different than the branches that survive through accident, chance, or the unpredictable physiological processes of the plant.

As indicated in the accompanying text, there are problems of water movement between soils of different structure and texture and corresponding problems of root growth and development. Whenever possible, the soil of the root ball, back fill, and site should be as similar as possible. Use the same soil for the backfill as the native soil. The backfill soil should not contain more than about 2 to 3% organic matter by weight (I am giving specifications not explanations here).

The arrows and lines below the basic sketch indicate the distances to which soil should be deep plowed and tilled if the tree is to grow to the size indicated and have a healthy vigorous crown. For example, if the owner desires his 3" tree to grow quickly into a 10" tree, he should prepare the soil well in an area approximately 20 x 20 feet.


'PLANTING SITE"
FOR A 3' CALIPER
TREE WITH ROOM
TO GROW
15
10
5
GOOD SOIL 18' THICK
SOLIDI
20 15 10 5 0 5 10 15 20
5"
10"
20"
29'
30"
29'
38'
40"
38'

Note: THERE ARE NO SAUCERS TO RETAIN WATER ON TOP OF THE ROOT BALL AND BACKFILL AREA. This is deliberate. Water beyond the root ball and the planting hole if you want the roots to grow beyond the ball as quickly as possible. Don't be stingy with maintenance! It costs a lot of money to have a 3" tree planted.

"Girdling roots" are a phenomenon of the saucer and planting hole mentality of today's landscape architects. They are a rare phenomenon in nature. Roots grow in circles within the rootball and the backfill of the planting hole when the surrounding soil is too compact, too dry, too stony or just generally nasty.

For healthy plant growth make sure the soil is prepared in the entire area which is required to support the size of plant you desire. Make sure the soil is well broken up to a depth of at least 10" if you want growth to be rapid. Trees planted in the compact soils of building sites and parking lots will not grow until the soil is prepared well beyond the planting hole.

Mulch if you want. However mulch is no substitute for breaking up the soil and having good soil in the entire area where you want the plant to grow. The mulch should not be over 3" thick -- otherwise fermentation and low oxygen is a hazard to the tree or shrub in the hole. Use green mulch if you want. However, extra fertilizer will be required to compensate for the minerals bound by the microorganisms. Twigs and chips are superior to bark mulch.

Do not put mulch within 6" to 8" of the tree trunk. Mice like to nest in mulch during the winter and will gnaw on the bark of young trees and kill them.

The following are things required for a proper planting site:

1. Room and opportunity to grow. Adequate root space, crown space, and overhead and lateral clearance.

2. Adequate light.

3. From the soil and of equal importance:

   - Water: The quantity and quality of water must be carefully regulated. Precipitation must exceed evaporation and excess salts and noxious substances must leach away. Too much water, even briefly, produces anoxia and root death. Plants will wilt both when there is too much and too little water. Nearly all urban planting sites will require drainage for removal of excess water and for flushing of excess salts.

- Oxygen: No oxygen, no plant roots, except for plants genetically adapted to riverbottoms and swamps. These exceptional plants have special anatomies and biochemistries.

- Support: Too many trees fall over when they are planted in urban situations that do not allow normal support by radial extension of tree roots.

- Warmth: Tree roots die when soil temperatures fall below about -6 degrees C (24 degrees F). Forest soils are covered with an insulating blanket of leaves and rarely freeze even in northern Maine and Minnesota. Unlike roots, tree tops can survive temperatures as low as -30 degrees C (-22 degrees F) when dormant.

- Nutrients: The relative concentrations must be appropriate and the pH must be right for the species in question. Excess of one ion can block the proper uptake of another.

- Stability: Do not dig tree roots to plant shrubs and annuals! No sudden changes in temperature, moisture availability or concentrations of nutrients. This means that the site must be large relative to the size of the plant.

- Freedom from toxicants: Deicing salts, herbicides, old paint residues, scraps of sheet rock, cement, etc; and pathogens.

4. Protection from scuffling feet, leaning bicycles, weed eaters, automobiles, bumps from loading and offloading goods to local shops, and general vandalism.

   Protection from soil compaction by people and vehicles.

   Protection from excess populations of squirrels, pigeons, insects, and other pests.

5. Shelter from focused winds, reflector ovens, and building exhausts.

6. Clean air! If the air is not good for humans, it is not good for plants.

7. Provision for routine maintenance and inspection: repair and inspection of irrigation, soil sampling, removal of trash, unplugging of drains, provision of winter mulch, replenishing of depleted organic matter.

8. Avoidance of heaving pavement by roots.

9. Design for thinning.

10. Design for replacement of either plants or soil, or both.

11. Money for maintenance, thinning and replacement.

Urban planting sites are usually small and unavoidably harsh. The smaller the site, the shorter will be the life of the plants therein and the more expensive will be the maintenance costs.

Typical trees in open farm yards and sheltered corners of college campuses live 40 to 80 years. Typical trees in heavily used city parks live 25 to 30 years (Central Park, Grant Park, The Boston Common, The mall in Washington D. C.). Typical trees along suburban street right-of-way live 12 to 18 years. Trees in the small planting holes of New York City, New Orleans and elsewhere are replaced every 3 to 4 years.

For many planting sites in downtown business districts, we are really dealing with large Bonsai plants. All designers and managers of urban tree planting sites will do well to read and memorize books on care of Bonsai plants. Note the frequency with which the Bonsai specialist must dig up their plant, prune the roots, and replace the salt contaminated and depleted soil. We are presently unable to design small planting sites that do not require comparable care.