

# Maryland Licensed Tree Expert Exam Study Guide

## For Exam Domain:

### Selection, Installation and Establishment

#### Version 5.0

The most important part of tree selection is matching the tree with the site. We want to:

Plant the right tree ...

In the right place ...

For the right reason.

Consider the following when selecting a tree:

#### Site considerations

- Adaptability – tree’s genetic ability to adjust to different conditions;
- Acclimation – process by which a tree adapts to its environment;
- Climate – hardiness zone, moisture availability, light, winds;
- Soil - soil test, texture, pH, nutrients, compaction;
- Space - growing space – above and below, nearby signs, buildings, and utilities overhead and underground;
- Other plantings – turf, other shrubs and trees nearby;
- After planting maintenance needs – irrigation, watering.

#### Tree considerations

- Size- size, height and width at maturity;
- Growth rate - fast or slow growing;
- Fruit, litter - fruit problems, fall color, flowers, bark, wildlife food, litter, thorns;
- Water needs – enough water available for that species;
- Light needs – is tree shade tolerant or intolerant;
- Pest problems - insect and disease problems in the area;
- Hardiness - able to survive low or coldest temps in the area.

#### Planting purpose

- Aesthetics;
- Engineering;
- Architectural;
- Screening;
- Shading.

Try to select a tree to fit all three factors if possible – you may have to compromise.



### **Some other considerations**

- Functional uses of the tree;
- The tree's ability to adapt to the site;
- The amount of care the tree will need after planting.

If the site is underneath overhead utility lines, you should not plant a tall-growing tree in that location. Plant a small scale tree with decurrent branching pattern.

The term "plant hardiness" refers to the ability of a plant to tolerate the coldest temperatures experienced in a particular area.

All plant material should conform to American Standards for Nursery Stock ANSI (American National Standards Institute) Z60.1. Required general specifications include for bare root and field grown stock, specifications shall include plant size, by height or caliper, as appropriate to the plant type. For container grown stock and box-grown stock, specifications shall include plant size, by height or caliper, as appropriate to the plant type, and container class or box size.

ANSI Z60.1 gives definitions and standards for all types of trees. Types of trees include:

- Type 1 – shade trees;
- Type 2 – shade trees (slower growing than type 1);
- Type 3 – small upright trees;
- Type 4 – small spreading trees.

Types of coniferous evergreens include:

- Type 1 – creeping or prostrate;
- Type 2 – semi-spreading;
- Type 3 – broad spreading, globe, and compact upright;
- Type 4 – cone type (pyramidal);
- Type 5 – broad upright;
- Type 6 – columnar type.

For nursery stock less than four inches caliper size, caliper measurement of the trunk shall be taken 6 inches above the ground. For nursery stock greater than four inches caliper size, caliper measurement of the trunk shall be taken 12 inches above the ground. Bid specifications for trees for street plantings should specify the height to which the tree should be free from branching (branching height). Trees are generally available from nurseries in one of three forms:

- Bare-root - small, easy to plant, light weight, field grown, cheaper;
- Balled and burlapped - dug in nursery, may lose 95% of absorbing roots, cost more, heavier, wrapped in burlap;
- Containerized - plastic or natural pot with soil mix, bark, compost, peat, or sand.

Before accepting any planting stock, the soil level at the top of the root ball or container should be examined in order to determine if the root collar is at the proper level. Trees with soil

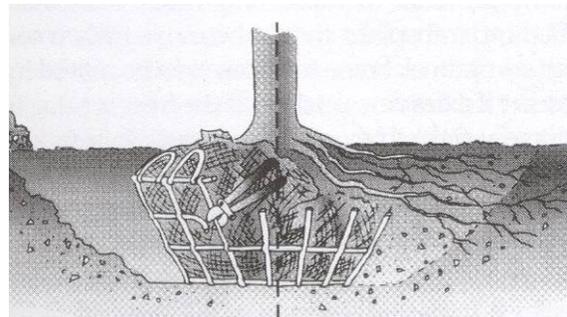
balls greater than 30 inches in diameter should be burlapped, followed by drum lacing with rope. Burlap shall be biodegradable and shall completely cover the root ball. Soil balls less than 18 inches diameter usually do not have to be reinforced with cord or rope unless soil is sandy and ball is apt to break apart.

When planting a bare root tree, dig the hole 2 to 5 times bigger than the diameter of the stem at the root collar. The side should be slanted and the depth the same or a little less than the root ball. The hole should then be domed in the middle and the tree set on the dome with the roots spread out around the dome. This will allow the roots loose soil to grow in. Do not expose roots to air as they will dry out. Because the tree as a limited root system, it might need staking.

Planting a tree with a tap root requires digging a hole deep enough to extend the root down straight beneath the stem. The hole should not be deeper than the extended tap root because the root collar will be covered by soil. Do not bend the tap root.

For balled and burlapped trees, remove the sod, loosen the soil, and slope the sides. Dig a hole a minimum of 1.5 times the diameter of the rootball, and slightly less than as deep, as the rootball. Make sure there are no glazed sides. Handle the trees carefully, not by the stem, to avoid root breakage. If drainage is problem, the root ball can be planted 1/3 the height of root ball above grade. To eliminate settling, the bottom of hole should remain undisturbed to give solid support to the root ball.

Cut the burlap and twine. Remove the burlap from the top and sides of the root ball. This will allow the roots to grow out the top and sides of the root ball. Fold the burlap down to avoid wicking. Remove completely if it is synthetic burlap. Remove the twine. The same is true of wire baskets. Completely remove or cut away as much of the wire as possible.



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Backfill with the same soil, unless it is very poor soil. In most cases, amending the soil with organic material will not be of any particular benefit. Make sure there are no air pockets and the trunk is vertical. Firm up the soil and water.

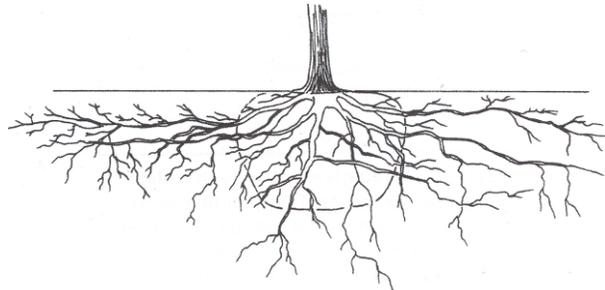
Under normal conditions, root growth is best encouraged by planting even with the surrounding terrain. In wet conditions where drainage is a problem, raising about 1/3 of the root ball above ground will aid the spread of lateral roots. In arid conditions, a basin can be used to collect water.

Make a berm to collect water, turn the grass upside down. Avoid concentrating water at the root ball to encourage root growth out into the surrounding soil. Remove the tags, labels, and tree guards.

A containerized tree may be root bound when delivered. Separate and cut the roots, especially any kinked or circling roots. This will encourage the roots to grow out into soil instead of continuing to grow in a circle around the tree. Circling roots are common in trees which were started in containers. Kinked and circling roots could reduce the growth of a tree, or even kill it. Remove the container before planting, unless it is biodegradable. The container shall not be removed by pulling or leveraging the trunk of the tree. Appropriate removal methods include, but are not limited to, bending, wiggling, and/or cutting the container.

When is the best time to transplant trees? For deciduous trees it is generally best to plant after leaf drop or abscission in the fall and before leaf out in the spring. If deciduous trees that have leafed out must be moved, the use of antitranspirants may be warranted to reduce the possibility that plants will reach the permanent wilting point before, during, or after transplanting. For evergreen trees, it is earlier in the fall and later into the spring than for deciduous. However, time to transplant can be species specific. Check first.

Root pruning helps before transplanting. Pruning should be done with sharp tools to make clean cuts. When a tree is harvested for transplanting, as much as 95% of the absorbing roots may be lost.



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When digging a tree for transport, a rule of thumb for the width of the root ball is a minimum of 10 inches root ball diameter for every one inch of trunk diameter. Make clean cuts and wrap with burlap if the root ball is greater than 18 inches. Balled and burlapped trees with large soil balls should be drumlaced with rope for additional support. Extra care must be given to trees with large tap root systems as they are harder to transplant than systems with fibrous root systems.

Anticipate the height and spread of the tree at maturity. Check the proximity of the tree's location to hardscape features and utilities. Check the shade tolerance of the tree compared to the photoperiod (the amount of time per day that a tree is exposed to light) on site.

Very large trees can be dug and transplanted by a mechanical device known as a tree spade. When using a tree spade, no attempt should be made to move trees that exceed the size limitations of the machine being used.

Staking is not always necessary. Staked trees often have smaller caliper, less trunk taper, and are more susceptible to tipping after the stakes are removed. Stake if the site is windy, has sandy soil, if it is a tall tree with a large canopy, or if there is a lot of pedestrian or equipment traffic in the area. If a single stake is used, place it on the upwind side.

Trees greater than four inches in diameter often require guying. Trees are guyed with three or four wires anchored to the ground. If installing trees over 8 inches in diameter, support the tree with four guy wires of 1/4", 7-strand cable, 3/8" lag hooks, turnbuckles and deadmen. If using metal stakes, wooden stakes, or eye screws with turn buckles as devices for staking and guying, check several times a year to make sure that the tree is not being girdled and that the system is still intact.

Remove wires and tags to prevent girdling. Tree staking and wraps should not be left on for more than one year. If trunk wrap and staking materials are left on indefinitely, trunk girdling and constriction may occur.

Mulches are materials placed on the soil surface around the tree trunk to reduce moisture evaporation and improve soil conditions. Other benefits include minimizing turf and weed competition, reducing soil erosion, improving soil aeration, moderating soil temperature, and protecting against mechanical damage. The mulch layer should not exceed two to four inches in depth and should not be placed against the trunk, as collar rot can occur. It should be a minimum of three feet in diameter around the tree and can be as large as you wish.

Immediately after planting or transplanting, how should the young tree be pruned? According to ANSI standards, prune only dead or broken branches. If an evergreen, do not prune because there are no latent buds present. Do NOT prune the crown to balance it with the remaining root stock.

The rate of recovery and re-establishment after planting and transplanting varies with species. The general rule of thumb for re-establishment in temperate climates is one year for each inch of caliper.