

ESTABLISHMENT OF CONTAINER GROWN PLANTS – THE IMPORTANCE OF WATER

By

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Water is critical to all life forms and especially so in the establishment of plants in the landscape or field nursery. **The common practice is to plant, water once by hand and ASSUME that mother nature or the irrigation system will provide sufficient water thereafter. Wrong!!!** The principals noted here apply both to establishment in the landscape and in field nurseries.

Moderate, but FREQUENT watering is needed for a period from 3 to 6 weeks for plants grown with good nutrition and in RootMaker® containers with air-root-pruning to extend fibrous roots into the surrounding soil far enough to be ‘established’. By contrast, it may require 12 to 24 weeks or longer for plants grown in conventional plastic containers to reach a similar level of establishment.

WHY? Because once a soilless mix is removed from a container it goes from holding adequate to excessive water in the container, abruptly, to holding very little water. Water is pulled away from the container growth medium and into the surrounding soil very rapidly due to the greater capillary attraction of the small pores in the soil compared to the large pores in the container growth medium. A thorough soaking / watering by hand to assure contact between the soilless mix and the surrounding soil is a must.

Plants with leaves present require much more water during establishment compared to plants that are deciduous. The most challenging situation is managing water on plants grown in containers where either new growth was present at time of planting or where new growth is produced shortly after planting and before the plants are established. Also, keep in mind that with fall planting of deciduous trees and shrubs, considerable root growth can occur even though the leaves have dropped. Do not underestimate the importance of maintaining proper moisture to support this root activity.

The ONLY way to sustain adequate moisture in the container growth medium – following planting into the landscape or field nursery – is with light but frequent watering until roots grow out into the surrounding soil. How long is this period? It depends on how the plant was grown, time of year and soil conditions and whether the plant has leaves present or is fully dormant and deciduous. In my studies with plants grown with good nutrition and other cultural conditions and with optimum air-root-pruning containers and optimum watering following transplanting, roots have extended as much as 11 inches in 9 days during the middle of summer. With conventional containers and copper coated containers, root growth out into the surrounding soil may be as little as a fraction of an inch or less in 9 days following planting under the same conditions.

Also keep in mind that EXCESS moisture reduces oxygen in the soil and can SUPPRESS root development. In order for roots to produce new cells and grow, respiration (the utilization of energy from the leaves) must occur and respiration REQUIRES oxygen and releases carbon dioxide. If water is in excess, both oxygen diffusion into the soil and carbon dioxide release out of the soil is impaired.

Adding soil amendments to small backfill areas during planting only makes the water management problem WORSE and SLOWS root development into the surrounding soil. The reason is due to a fundamental principal of soil physics: ***water moves from a coarse textured material (the container growth medium) to a fine textured material (any soil) readily, but does***

not move from a fine textured material to a coarse textured material until the soil becomes saturated.

On the other hand, amending soil throughout the entire field, such as with a green manure crop, is very beneficial. Why? Because there are no abrupt interfaces where soil is amended vs not amended as occurs in small backfill areas during landscape planting. If a green manure crop is worked into the field soil prior to planting, the entire field is amended and there are no interfaces and therefore no complications of moisture movement.

Adding slow release fertilizer at time of planting also accelerates root growth. Remember, the same resin coated slow release fertilizer placed in landscape soils release nutrients over a far longer time compared to when used in above ground containers. Why? Because the temperature in above ground containers is so much higher and temperature is the major factor that controls the release of nutrients from all resin coated slow release fertilizers. For example, Osmocote 19-6-12 is listed on the bag as 3 to 4 month release. However, most of the nutrients are released in two to three months or less in above ground containers during the growing season when root zone temperatures can reach as high as 120 degrees F. or more. This same fertilizer will release nutrients over a period of 6 to 9 months in landscape soils where temperatures rarely exceed 70 degrees. Add mulch and soil temperatures are even lower.

Contrary to the much publicized recommendation to NOT fertilize landscape plants at time of planting or for the first year, my research has consistently shown that fertilizing at planting is VERY beneficial to root growth and establishment. The key is using the correct fertilizer and at the correct rate and allowing for the much greater VOLUME around the plant in the landscape. The concept of adding fertilizer proportionate to the volume of the container growth medium is routinely practiced. However, adding fertilizer proportionate to the volume of soil in the landscape-planting site is almost never considered. A tree or shrub grows in a volume of soil in the landscape, just as in a container. I strongly suspect the reason that most studies on fertilizing landscape trees and shrubs show little or no growth response is because poor root systems on the test plants and of inadequate consideration of the volume of soil involved. Plants grown with superior root systems that provide rapid root extension into the surrounding soil following transplanting show a far greater response to fertilizers. Why? More root surface area for absorption. Excess fertilizer, especially nitrogen and phosphorus is as detrimental as a deficiency. The only way to know what the soil on a specific site needs to assist plant growth is to soil test. Anything else is simply a shot in the dark. If phosphorus is already high, adding more is detrimental to root growth and establishment.

This same recommendation to fertilize is true when planting stock in field nurseries. ALWAYS soil test and add deficient nutrients prior to planting. AND, always have roughly 25 to 50 pounds of nitrogen per acre present in the soil, even when planting in September, October or November.

The faster roots extend from the container growth medium and into the surrounding soil, the better off the plant and the fewer the problems. Water management is one of the most difficult factors to teach. Do not fall into the trap that newly planted plants can wait another day or two or five before getting additional water. The benefits from monitoring water carefully are substantial. The results of your efforts may be subtle and go more or less unnoticed if you do your job well. On the other hand, if you manage water poorly the results can be profound and dramatic. You do not get second chances. You only get to replant.