DROUGHT ADVISORY

EB1090

WATERING HOME GARDENS AND LANDSCAPE PLANTS

Watering home landscape and garden plants properly is one of the most misunderstood problems facing the average homeowner. Most homeowners are aware of the droughty conditions in eastern Washington, but much of western Washington also can be extremely dry during the summer months. In most areas of the state, there is not enough rainfall to support plant growth during the period when water is critically needed. If landscape plants are water stressed during the summer, they may experience severe problems during the rest of the year, such as increased insect and disease susceptibility and decreased winter hardiness.

Water Loss From the Soil

There are several ways in which water is lost from the soil. Rain, melted snow, or water applied by the homeowner may percolate down through the soil beyond the root zone. This water is useless to growing plants.

Water also may evaporate from the soil surface, leaving it dry. Water from lower layers in the soil is drawn to the surface by capillary action and also evaporates. This continual evaporation may deplete water from quite deep in the soil.

Transpiration is the process by which a plant loses water through its leaves. This is a necessary process for plant growth. A large tree may lose hundreds of gallons of water a day in the summer. Water lost from the soil by evaporation and transpiration must be replaced by precipitation or supplemental irrigation.

Soil-Water-Air Relationships

Establishing the correct water-air relationships in the soil is essential for the best growth of all plant types. Oxygen in the soil is necessary for plants to grow. Watering too often or too much is likely to exclude the necessary oxygen from the soil pore spaces. Without enough oxygen, plant roots suffocate and die, preventing water uptake. Plant parts aboveground exhibit symptoms of this stress; wilting, yellowing, and drying foliage, leaf drop and twig dieback may all occur. Constant overwatering kills most plants.

Too little water, on the other hand, does not allow the roots to replace water lost by the plant through transpiration. The roots may dry up and die, and the top growth begins to show abnormal symptoms. In both cases, either too much or too little water, the plant suffers from lack of moisture in its tissues.

Heavy clay soils are much more likely to be overwatered than light soils. Conversely, light sandy soils are droughty and tend not to be watered enough. Although light soils allow deeper and quicker water penetration, they dry out more rapidly because they hold less water. Heavy soils, on the other hand, are slower to allow penetration but also dry out much more slowly.

A good rule-of-thumb to follow in watering plants is to fill the entire root zone with water, and then allow the soil to dry out partially before the next irrigation. The amount of drying depends on the plant species and size. Large trees and shrubs can be allowed to dry several inches down in the soil before rewatering. A small or newly established plant will need watering before very much soil drying takes place.

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It is essential that gardeners become familiar with how long it takes the root zones of the various plants in their gardens to become completely moistened, and then, how deeply they can allow the soil to dry before the plants begin to show stress and need rewatering. It is also necessary to understand that quick, light sprinkling will not do the job of wetting the entire root zone.

Water Penetration

Soil type or texture is a major determining factor of how much water a soil will hold, or how quickly a soil can be irrigated. For example, one inch of water applied to a sandy soil will penetrate 12 inches. It will move anywhere from 6–10 inches into a good loam soil, and in a clay soil it will percolate down only 4–5 inches.

Time Required

Sandy soils allow water to penetrate more quickly than will heavy, dense soils. Wetting the entire root zone of plants growing in heavy soils takes much longer than wetting plants growing in lighter soils. Sandy loams will accept from 1/2–3 inches of water per hour. A clay-loam may absorb only 1/10–3/5 inch of water in the same amount of time. A very dry clay-loam soil could take as long as 120 hours to completely wet to a depth of 12 inches. A sandy loam, however, might take as little as 4 hours.

Organic Matter

Soils to which organic matter has been added will behave differently. For example, clay soils with added organic matter will accept water more quickly. Organically amended sandy soils hold water longer and, consequently, do not need to be irrigated as frequently.

Compaction and Thatch

Water will not soak into compacted soils, or soils overlaid with a thatch accumulation, particularly if water is applied too quickly. For compacted or thatch-choked areas, the best treatment is to aerate the soil by removing plugs. Wetting agents can help water soak through dry organic layers, like thatch, so that it moves into the soil. Mulches placed over the root zone of trees and shrubs help restructure the surface layer of compacted soils to allow more efficient pentration of water. Compacted soils in which a vegetable or flower garden is to be planted should have organic matter incorporated into the top 6-8 inches. This allows easier water penetration after the garden is established.

Watering

Vegetables, bedding plants, and perennials are usually small when planted and have comparatively shallow roots. These plants may have to be watered more often to ensure a consistent water supply. Check the soil with a trowel or spade to the depth of the expected root zone. Moisten the entire root zone before the plants show signs of wilting. If the plants are allowed to wilt a few times, growth will be stunted and crop yields reduced. Be careful not to overwater. Porous-wall hose and drip irrigation systems can provide adequate water more efficiently to the vegetable garden than sprinkler systems can.

Plants in containers need special attention. Both volume of soil and total water available for plant use are limited. These plants have to be watered more often than plants growing in the ground. Check for soil moisture by sticking your finger into the potting soil. When it becomes dry below the surface, begin watering. Do not depend on the appearance of the surface of the potting soil. It may look dry, but feeling the soil can reveal that the mix below the surface is still moist. If you allow the potting soil to dry out completely, you may need to soak the pot in water to rewet the soil.

Frequency and amount of water depend on the potting mix, location, size, and type of the pot, size and type of plants, amount of exposure to sun and wind, and temperature. Plants in plastic pots or glazed ceramic containers will have to be watered less often than plants in clay pots or nonglazed, porous ceramic containers. A plant that uses a lot of water, such as fuchsia, or a potbound plant, may have to be watered daily or several times a day. But most container plants will need less frequent watering. When watering, water the plant thoroughly, allowing water to drain out of the bottom of the pot. Be careful not to keep the roots constantly wet. Root rot and other disease problems can result if the potting soil is waterlogged and air is excluded from the roots.

Trees, shrubs, and landscape plants should be watered just inside and outside the dripline, or outer edge of the plant. In foundation or border plantings, it may be more convenient to water the entire area. A hose, soaker hose, or various kinds of sprinklers are commonly used. For deep-rooted trees, a root needle or fertilizer feeding needle (minus the fertilizer) may be used for deep watering. This is a tedious process, but it works. Penetration is important.

For recently planted trees and shrubs a dished- or berm-enclosed area constructed around the base of a tree or shrub may be filled with water. This allows for slow percolation into the root zone. However, on heavier soils during the rainy season or in the winter, these basin rims are best removed to avoid concentrating too much water.

Shrubs and trees near house foundations, under eaves, or in southern, southwestern, or western exposures have to be watered more frequently. They may get little water from precipitation, and reflected heat from walls leads to increased water and heat stress.

Capillary action can cause dissolved salts to be carried from moist zones into the dry soil under eaves. A salt concentration is then left behind as the water evaporates. Thorough leaching of such areas may occasionally be necessary, particularly in the drier regions of the state, to remove salt buildup.

Mounds or berms in which landscape plants have been installed have much more soil surface exposed to evaporation than the natural soil profile. Therefore, these areas will have to be checked and watered more frequently.

Recently transplanted woody plants need special attention. The soils in which balled and burlapped and containerized plants have grown often are radically different from the soils into which they are planted in the home landscape. When this occurs, interfaces develop between the original nursery soil and the soil at the new site. Because of these interfaces, water does not move readily between the different media. Therefore, it is most important that water be applied to both the nursery soil and the surrounding soil during the critical establishment period. Roots grow only where there is moisture, and unless both media are moist the roots may never grow out of the original nursery soil. Plants in such a situation may ultimately girdle themselves and die.

Container soils, in particular, have a bad habit of drying out much faster than the surrounding or backfill soils. Both media should be adequately moistened to prevent newly installed plants from being injured or dying of drought. But be careful not to overwater.

Mulching newly established shrubs and trees helps prevent moisture loss. Moisture-demanding plants, such as rhododendrons, azaleas, and ferns, have to be irrigated more often during warm, sunny weather.

Many native woody plants should not receive summer watering. Once they are established, they are drought tolerant in the summer, and some may be damaged by moisture at this time. It is especially important to keep water away from the crowns and larger roots of madronas and western dogwood in western Washington. They often succumb to root rot problems with summer watering. Avoid planting moisture-demanding plants underneath them.

Other drought tolerant shrubs and trees also do not need to be watered. For lists of drought tolerant shrubs and trees, consult a good reference work. Many plants in the following genera have proven themselves drought resistant; Caragana, Ceanothus, Cotoneaster, Cytisus, Eleagnus, Genista, Juniperus, Koelreuteria, Pinus, Quercus, and Robinia. There are many more.

Lawns are best watered by overhead sprinklers. The deeper the wetting, the deeper the roots will grow. Deep-rooted grass plants are much healthier and better able to withstand drought stress. Water grass when the soil begins to dry out, but before the plants actually begin to wilt, and certainly before they begin to desiccate. Grass requires irrigation when it begins to be less resilient and springy and does not bounce back up after being walked on. The amount of water to wet the root zone is determined by soil type, amount of thatch accumulation, and several other variables.

To determine when a sprinkler has put out an inch of water, or any specific quantity, simply use several coffee cans or jars spaced at intervals from the sprinkler itself to the edge of the watering pattern.

Conservation of Water

Water is a scarce commodity and will continue to become more scarce in the United States. Washington state is no exception. With a little care and prior planning, water can be conserved when used for home plantings. Anything that can be done to reduce downward percolation, run-off, evaporation from the soil surface, or transpiration will conserve water.

Organic matter. Deep incorporation of some sort of organic matter such as well-rotted compost or peat moss, will help reduce downward drainage (percolation) if done before planting. This may not be feasible for shade and ornamental trees, but can be done for vegetable gardens, flower beds, and foundation plantings. Organic matter absorbs many times its own weight in water, which is then available for plant growth.

Mulching materials placed over the soil reduce evaporation from the soil surface, may also reduce some of the water run-off, allow better water penetration into the root mass, and limit weed growth. Mulches may be organic (shredded leaves, bark, sawdust) or inorganic (gravel, etc.).

Spraying. Little can be done to stop plants from transpiring. However, newly planted plants (woody, bedding, vegetable) will benefit by occasional spraying of the foliage during the day, and by shading.

Trickle or drip irrigation systems allow slow water penetration into the root zone with minimum surface wetting. Such installations may be worthwhile, particularly if large areas are to be irrigated. A variety of kits and parts to make up such a system is readily available. Plastic tubing, emitters, filters, and pressure reducers are included in these systems. They are easily attached to an existing outdoor water supply.

Drip or trickle irrigation allows a steady supply of water to be delivered slowly to the soil around the plant roots. Often a 60% or more savings in water usage may be realized using such a system. When using drip irrigation for watering trees and shrubs, consider the use of the newer mini-sprinkler emitters that wet the soil in a larger area and provide more even watering for plants. Simple drip emitters restrict the soil wetting patterns and are primarily suitable for establishing young trees and shrubs, but do not meet the needs of plant root systems as they grow larger.

Important Facts to Remember

- Most plants in most areas in Washington need water in the summer.
- Frequent, shallow waterings lead to shallow roots. Shallow roots lead to more rapid stress under drought or hot conditions.
- Theoretically, outside watering can be accomplished any time of day, but it is more efficient to water at night or in the very early morning, when evaporation is low. During a drought, watering may be restricted to specific times on scheduled days.
- Too much water is as bad as, or worse than, too little. Rate of water application should be no more rapid than the rate at which the soil can absorb it.
- Fertilizer spread around plants (including lawns) does absolutely no good at all unless it is dissolved in water. Therefore, fertilizers have to be watered in, and soils have to be moist to get the full effect of the fertilizer application.
- Conserve water where possible. It is a valuable resource that is becoming scarce.

Drought advisories and other Washington State University Cooperative Extension Bulletins are available online at http://pubs.wsu.edu

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