Wise Watering Practices: Trees and Shrubs

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WATERING ESTABLISHED TREES AND SHRUBS
WATERING NEWLY PLANTED TREES AND SHRUBS

Where to water
How to water
When to water
How much water to apply
During periods of consistent rainfall, a well-established tree or shrub will need little supplemental irrigation.
During periods of drought, established trees and shrubs can decline or die without timely irrigation.

Longer periods of drought are predicted as Minnesota’s climate changes.

WHERE TO WATER ESTABLISHED TREES & SHRUBS

Where are the roots that absorb water from the soil?
- How deep are they in the soil?
- How far do they spread?
WHERE TO WATER ESTABLISHED TREES

Most water-absorbing roots are in the top 12-18" of soil.

WHERE TO WATER ESTABLISHED TREES

Trunk diameter or circumference (measured at 4.5’ above ground) are the most accurate tools for estimating root spread.
WHERE TO WATER ESTABLISHED TREES

Root systems are much wider than canopies, especially in young & middle-aged trees

<table>
<thead>
<tr>
<th>dbh = trunk diameter 4.5' above ground (inches)</th>
<th>Circumference of tree 4.5' above ground (inches)</th>
<th>Root spread diameter (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>6-7</td>
<td>12-14’</td>
</tr>
<tr>
<td>4</td>
<td>12-13</td>
<td>20-22’</td>
</tr>
<tr>
<td>6</td>
<td>18-19</td>
<td>26-28’</td>
</tr>
<tr>
<td>8</td>
<td>25-26</td>
<td>28-30’</td>
</tr>
<tr>
<td>10</td>
<td>31-32</td>
<td>30-32’</td>
</tr>
<tr>
<td>12</td>
<td>37-38</td>
<td>32-34’</td>
</tr>
<tr>
<td>14</td>
<td>44-45</td>
<td>32-34’</td>
</tr>
<tr>
<td>&gt;16</td>
<td>&gt;50-51</td>
<td>34-36’</td>
</tr>
</tbody>
</table>

Root systems are much wider than canopies, especially in young & middle-aged trees.


WHERE TO WATER ESTABLISHED SHRUBS

- Most roots responsible for water uptake are in the top 12-18” of soil
- The larger the shrub canopy, the larger the root system
- Root spread area is 1.5-3.5 times as wide as the plant canopy
HOW TO WATER ESTABLISHED TREES AND SHRUBS

- Overhead sprinklers easily apply a deep watering over the large root zones of woody plants
  - Water early in the morning to minimize water loss through evaporation and wind drift

WHEN TO WATER ESTABLISHED TREES & SHRUBS

Water when the top 6-9 inches of soil in the root zone are dry.
HOW MUCH WATER TO APPLY TO ESTABLISHED TREES & SHRUBS

Develop a watering schedule for your property

- A watering regime that provides the correct amount of water to trees and shrubs is unique to every landscape because of variability in soils, exposure, slope, etc.

1. Choose a time when the top 6-9 inches of soil is dry and there is no rain predicted for several days.
2. Set several shallow containers (cake pans, shallow cans, etc.) across the area to be watered to measure one inch of water.
HOW MUCH WATER TO APPLY TO ESTABLISHED TREES & SHRUBS

3. Apply water with a sprinkler over the area until there is an average of one inch of water in each container.

4. Record how long it took to apply this amount of water.

5. Wait two hours and then slice into the soil with a sharp spade or shovel so that you can feel the soil 6-9” below the ground. If the soil is cool and moist at this depth, the irrigation is appropriate.

6. If you need to apply more water, add another half inch and check again to see if the top 6-9 inches of soil are moist.
HOW MUCH WATER TO APPLY TO ESTABLISHED TREES & SHRUBS

7. Continue this process until the top 6-9 inches of soil have received water.

8. Record the total irrigation time for future reference. Water for this length of time during future irrigation events.

9. Over the next several days, check the moisture level of your soil 6-9 inches below the surface of the ground until the soil once again feels dry.

10. Record the number of days it took for the top 6-9 inches of soil to dry. This provides you with the number of days between future irrigation events in the absence of rain.
WATERING NEWLY PLANTED TREES AND SHRUBS

1” dbh established tree = 6-8’ root spread
2” dbh established tree = 14’ root spread
NEWLY PLANTED TREES AND SHRUBS HAVE SMALL ROOT SYSTEMS COMPARED TO ESTABLISHED PLANTS

WHEN TO WATER NEWLY PLANTED TREES & SHRUBS

Newly planted woody plants need regular irrigation until they are established

<table>
<thead>
<tr>
<th>Weeks After Planting:</th>
<th>Watering Frequency:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>Daily</td>
</tr>
<tr>
<td>3-12</td>
<td>Every 2-3 days</td>
</tr>
<tr>
<td>Until established</td>
<td>Weekly</td>
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WHEN TO WATER NEWLY PLANTED TREES & SHRUBS

- Establishment time for shrubs is 1-2 years
- Establishment time for trees depends on size of planting stock

<table>
<thead>
<tr>
<th>Caliper (inches)</th>
<th>Root establishment time for trees (years)</th>
<th>Water applied during each irrigation (gallons)</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>1.5</td>
<td>1-1.5</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>2-3</td>
</tr>
<tr>
<td>3</td>
<td>4.5</td>
<td>3-4.5</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>4-6</td>
</tr>
<tr>
<td>5</td>
<td>7.5</td>
<td>5-7.5</td>
</tr>
<tr>
<td>6</td>
<td>9</td>
<td>6-9</td>
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WHERE TO WATER NEWLY PLANTED TREES & SHRUBS

- Apply water directly over the root ball
- Keep the backfill soil in the planting hole moist
- Tree roots grow ≈18 inches/year so expand the area being watered over time
HOW TO WATER NEWLY PLANTED TREES & SHRUBS

Create a circular mound of earth 3-4 inches high around the edge of root ball to create a reservoir for water.

Treegator® bag provide a low delivery of water over root balls
HOW MUCH WATER TO APPLY TO NEWLY PLANTED TREES

Apply 1-1 ½ gallons per inch of stem caliper at each watering

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<td>6</td>
<td>4-6</td>
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<td>5-7.5</td>
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<td>9</td>
<td>6-9</td>
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Caliper:
- trunk diameter at 6” above the ground for diameters up to 4”
- If the caliper at 6” above ground exceeds 4”, measure caliper at 12” above ground.

HOW MUCH WATER TO APPLY TO NEWLY PLANTED SHRUBS

- Apply a volume of water that is ¼-⅓ of the volume of the container the shrub was purchased in
- As roots grow and spread, irrigation volume will need to be increased
THE VALUE OF MULCH
- Eliminates competition with turf root systems
- Helps to prevent runoff
- Decreases water evaporation from soil
- Minimizes weed germination and growth
- Buffers extreme summer and winter soil temperatures
- Reduces damage to trunks/stems & soil compaction from mowing equipment
- Improves soil health (increases microbial activity, nutrient- and water-holding capacity, soil pore spaces, and air penetration) as it decomposes

MULCH IMPROVES WOODY PLANT HEALTH
- Eliminate turf and weeds around plant.
- Start mulch 12-18” from trunks or stems.
- Place a 3” layer of organic mulch out to the edge of the tree or shrub canopy.
- Replace organic mulch every few years.
 Watering established trees and shrubs publication:
http://www.extension.umn.edu/garden/yard-garden/trees-shrubs/watering-established-trees-shrubs/index.html

 Watering newly planted trees and shrubs publication:

Questions?
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