



# Tree Water Management Fact Sheet

Applicable to conservation practices containing trees and/or shrubs

USDA Natural Resources Conservation Service - North Dakota

April 2006



Water management for trees is the management of available water, competing vegetation, and supplemental water to reduce moisture stress on trees or shrubs. This fact sheet describes water management methods on new and established plantings.

Throughout the Great Plains the most limiting factor to tree health and vigor is the lack of quality water in sufficient quantities at the proper time. Complicating the issue in many parts of the Great Plains is the fact that often the water available for irrigation is of poor quality (high in dissolved salts) with respect to plant needs.

**Proper Planting Design, Essential First Step:**  
Successful water management assumes the correct tree or shrub for the site was selected, the site was properly prepared and the tree was planted correctly.

Detailed information can be found in various Extension pamphlets, arborist publications, or at the following link:

[http://efotg.nrcc.usda.gov/references/public/ND/Tree\\_Care\\_and\\_Management.pdf](http://efotg.nrcc.usda.gov/references/public/ND/Tree_Care_and_Management.pdf)

**Water the Tree or Waste the Water?** The most effective moisture management begins with weed control. All weeds must be controlled within, and for a short distance beyond, the tree root zone on newly planted stock and should be controlled for the life of the tree or shrub planting for maximum benefits. The above link gives details. Note: On most soils and for most species, tree roots extend from the trunk for a distance equal to the tree height.

**Stress Management:** Reducing wind and sun stress on the tree or shrub, especially when young, yields substantial benefits. Shingles, manufactured sun and wind screens, tree shelters, standing stubble, rows of corn, flax, or wheat grass planted close by, etc. all reduce the transpiration demand through the leaves caused by wind and sun. On new plants with reduced root systems on harsh sites, this protection is the difference between life and death. (See Figure 1)

**Increase Available Water by Harvesting Snow:** Installing snow fences or rows of tall standing crop can add 3-4 feet of snow to the planting which translates to a 3-4 inch addition of water (20% increase in water for western North Dakota). Especially on small stock the potential damage (limb breakage) from deep snows is less than the benefit of protecting the plants from winter winds and adding additional water. (See Figure 1)



Figure 2

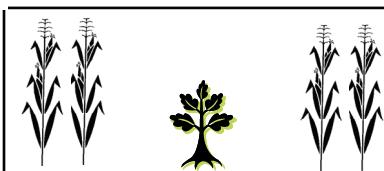


Figure 1. Sweet corn rows protecting young tree row.

**Mulch:** Organic mulch such as wood chips (See Figure 2) conserves water by reducing evaporation, moderating soil temperatures, and controlling weeds. After several years, mulched areas allow irrigation water and summer thunderstorm water to soak in faster through increased soil percolation rates. Avoid using fine sawdust or packing the mulch deep against the trunk of the tree. Coarser, ragged chips will resist high winds better than fine chips.

**Supplemental water (irrigation)** - Water demand increases as trees grow. In the absence of timely rains, newly planted seedlings should receive 5 gallons of water per week during the growing season. For the following two years, trees should receive 10 gallons of water every other week. Water can be applied by bucket, hose, or drip irrigation systems. It is important that water be applied slowly enough to fully soak in and not run off. Five gallon buckets with a 1/8" hole in the side can be placed by the tree and used to speed up watering. I.e.: They can be filled quickly while allowing water to soak into the soil slowly. Place 1-2 bricks in each bucket to prevent blowing away when empty. (See Figure 3)

Avoid shallow, frequent watering. Without weed control shallow watering only waters the weeds (grass).

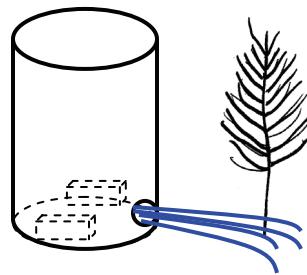


Figure 3: 5 gallon bucket with 1/8 watering hole.

#### **How Much Water for Older Trees and Shrubs? (Older than 3 years)**

Ideally, each watering should moisten the soil to a depth of 1 foot. For most trees, this is an area with a radius from the trunk equal to the height. When using sprinklers, several shallow pans scattered about the tree can be used to measure the amount of water applied. Two inches of water collected in a pan will indicate enough water has been applied to wet most soils to a 1-foot depth.

If that amount of water is impractical to apply, then apply 10 gallons of water for every trunk diameter inch measured 1-foot off the ground. Double that amount if growing grass rather than mulch or bare soil will also be irrigated. Apply the water within an area from half the drip line distance from the trunk to 1.5 times the drip line distance from the trunk. (See figure 3) Adding this amount of water is only practical for ornamental or orchard trees. Keeping conservation plantings alive through dry times usually depends upon proper initial design and effective weed control.

**Watering Frequency:** Once a month for adapted trees. Twice a month for less adapted trees.

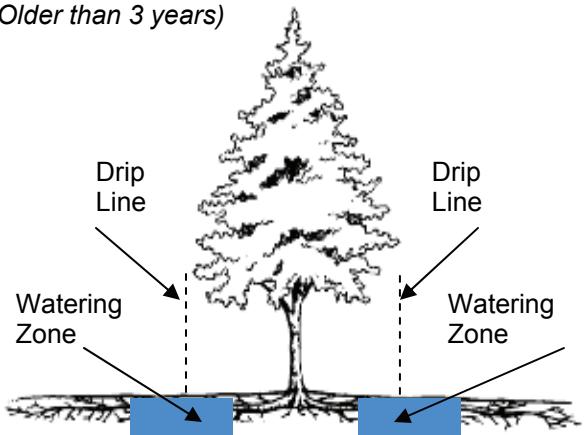


Figure 3

**Drip irrigation:** Drip irrigation is a very effective way of supplying needed water at the appropriate time. These systems are intended to aid in establishment of trees and shrubs. They do not enable inappropriate species to perform well on the wrong sites. Drip systems cost \$2-3 per plant for larger plantings. The following web site provides many details needed to design a drip irrigation system.

[http://efotg.nrcs.usda.gov/references/public/WY/Irrigation\\_System,\\_Microirrigation\\_\(NO\\_&\\_AC\)\\_441\\_Standard.pdf](http://efotg.nrcs.usda.gov/references/public/WY/Irrigation_System,_Microirrigation_(NO_&_AC)_441_Standard.pdf)

The Colorado Cooperative Extension document "Caring for Trees in a Dry Climate" explains, in detail, ways of managing moisture on tree plantings. It can be accessed at:

[www.colostate.edu/Depts/CoopExt/4DMG/Trees/caring.htm](http://www.colostate.edu/Depts/CoopExt/4DMG/Trees/caring.htm)

**Where to get help:** Local NRCS, North Dakota Forest Service, or Cooperative Extension Service.

#### **References:**

[www.colostate.edu/Depts/CoopExt/4DMG/Trees/caring.htm](http://www.colostate.edu/Depts/CoopExt/4DMG/Trees/caring.htm)

Roy Laframboise, Nursery Manager, Towner State Nursery, personal communication

Rich Straight, Agroforester, National Agroforestry Center, personal communication

Greg Sundstrum, Forester, Colorado NRCS