CITY OF ASPEN

CARING FOR TREES DURING A DROUGHT

KEY TAKEAWAYS

As Aspen enters another dry growing season, questions often arise about how water use, tree health, and wildfire risk are connected. This brief provides guidance on how to care for trees during periods of drought, with an emphasis on using water thoughtfully while maintaining long-term forest health. Here are the key highlights:

- Place mulch under trees - not rocks.
- Pay attention to tree species needs.
- Keep tree irrigation separate from grass irrigation.
- Use drip or hand watering.
- Do deep, infreqent watering.

CURRENT CONDITIONS: WATER AND SOIL MOISTURE

As of April 2026, Colorado is experiencing below-average snowpack in many regions, including much of the Roaring Fork Valley. Snowpack is a primary source of soil moisture recharge in our area, and lower-than-normal accumulation this winter means soils may not fully recharge as we move into the growing season. In a typical year, melting snow gradually soaks into the ground, replenishing moisture throughout the soil profile, including deeper layers that trees rely on for sustained water access.

When snowpack is limited, this recharge may be incomplete, and trees and landscapes can begin the season with reduced available moisture, particularly in those deeper soil layers that support long-term root function. This early deficit can lead to increased stress as the growing season begins. As the season progresses, soil moisture is gradually depleted through plant use and evaporation, and water demand continues to increase as trees leaf out and become more active.

These conditions not only affect overall landscape health, but can also influence wildfire risk. Trees experiencing prolonged drought stress are more susceptible to pests, disease, and dieback, which can increase fuel loads over time. Maintaining healthy, well-managed vegetation is an important part of reducing risk and supporting long-term landscape resilience.

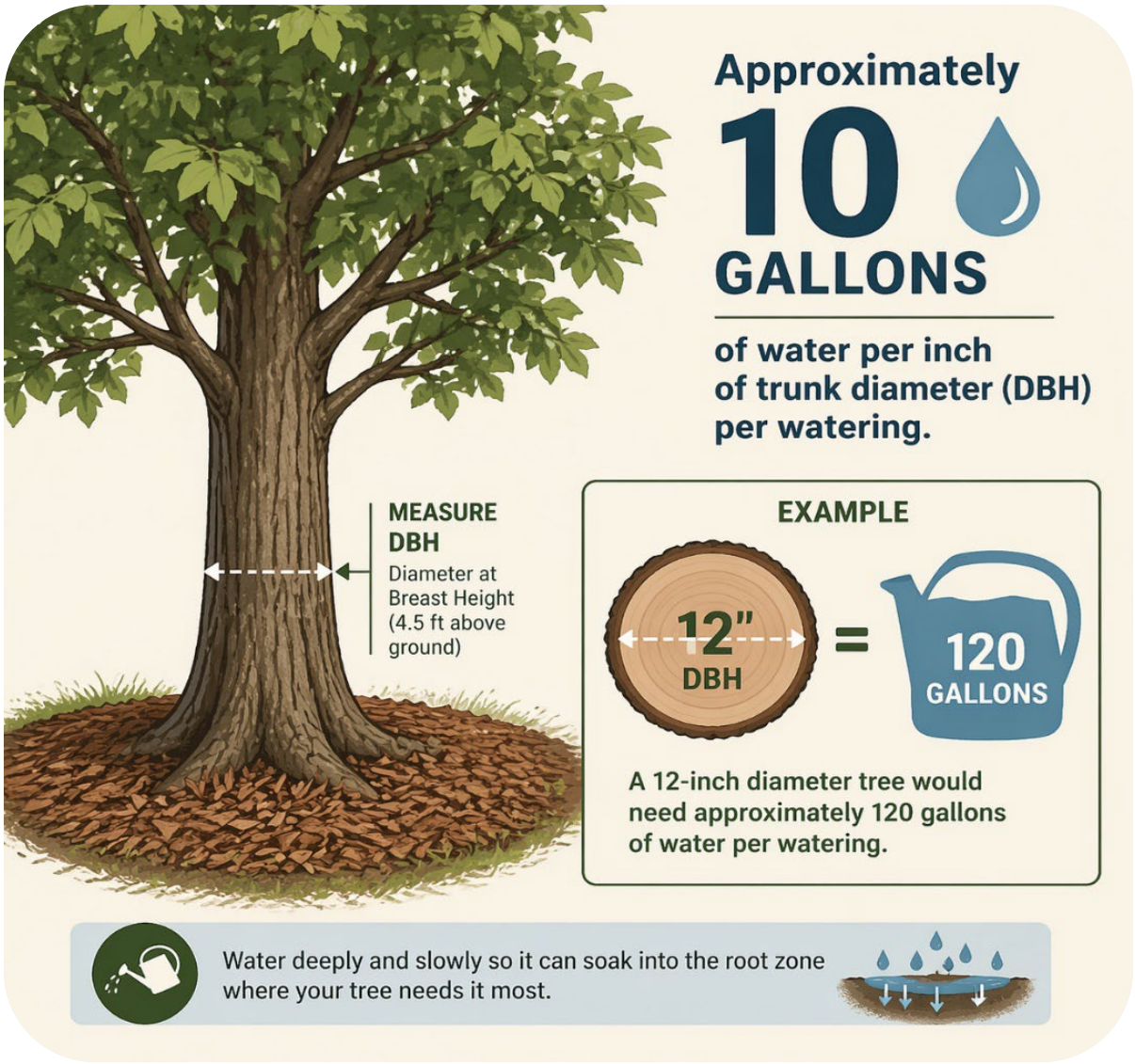
Because of this, how and when water is used becomes especially important. Maintaining consistent soil moisture over time, particularly during peak demand, is key to supporting tree health. At the same time, watering should be guided by the specific needs of each tree. Not all trees require the same amount of water, and more is not always better. In many cases, thoughtful, targeted watering is more effective than simply increasing water use when conditions allow.

Trees depend on steady access to moisture throughout the growing season. When soils start dry and conditions remain warm, stress can build quickly, making trees more vulnerable to pests, disease, and decline. This is why drought response strategies focus on:

- Maintaining minimum soil moisture needs during periods of highest demand.
- Prioritizing deep, effective watering over frequent shallow irrigation.
- Supporting overall tree health through proper care and management.

HOW MUCH WATER DO TREES NEED?

Effective watering is less about total volume and more about timing, method, and prioritization. Trees benefit most from water that reaches deeper into the soil profile, where roots can access it over longer periods.



Tree Watering Guidelines: Normal Climate Conditions

Shallow, frequent watering (such as what is often used for turf grass) is less effective and can lead to weaker, surface-level root systems. Instead, focus on slow, deep watering via drip emitters or a slow hose trickle that allows moisture to reach the full root zone.

General Approach

- Apply water slowly so it can infiltrate beyond the surface
- Focus on soaking the root zone rather than frequent, shallow watering
- Water closer to the drip zone, and avoid watering directly against the tree trunk
- Larger trees require more water, but less often

Newly planted trees, and trees that are already stressed or located near homes, streets, and other high-use areas, are more vulnerable and often require more consistent support. Established trees that are in good condition, particularly the species that are well-adapted to local conditions, may tolerate less frequent watering but can still experience stress during prolonged dry periods.

Start by monitoring trees for signs of stress (wilting, early leaf drop, dieback). Water needs vary based on species, size, health condition, and stage of life; but the following general guidelines will hopefully help narrow down your tree watering needs:

- **Drought-tolerant species** require less frequent watering once established.
    - *Example: Bur Oak → Approximately 80-120 gallons every 14-21 days*.
- **High water-use species** (e.g., *a riparian species such as cottonwood*) may show stress more quickly and benefit from more consistent moisture.
    - *Example: Cottonwood → Approximately 120-150 gallons every 7-10 days*.
- **Newly planted trees** require more frequent watering.
    - *Example: Approximately 10–20 gallons per watering, 1-3 times per week, depending on conditions*.
- **High value trees** that are not easily replaced (e.g., *a bristlecone pine that is 1000 years old*), are worth paying special attention to.

WATERING TREES DURING DROUGHT RESTRICTIONS

During drought restrictions, watering is limited, so it becomes especially important to use water efficiently and prioritize tree health. Trees have different needs than turf and can often be maintained within restrictions by adjusting how and where water is applied.

The guidance below outlines general watering approaches and recommended schedules based on drought conditions. These recommendations are intended to align with Aspen's drought response stages while helping residents prioritize tree care within allowable limits.

The table below provides general watering frequencies by species water needs and establishment stage.

		Recommended Watering Schedules by Tree Needs			
Drought Restriction Maximums		Established Trees: Low Water Needs (Drought-Tolerant)	Established Trees: Moderate Water Needs	Established Trees: High Water Needs	Newly Planted and High Value Trees
Normal (Watch)	**No restrictions.**	Every 2–3 weeks.	Every 10–14 days.	Every 10–14 days.	1–2x per week.
Stage 1 (Moderate)	**Up to 3 days/week.**	Every 2–3 weeks.	Every 1-2 weeks.	Every 10–14 days.	1–2x per week.
Stage 2 (Severe)	**Up to 2 days/week.** *Hand watering/drip anytime.*	Every 10–14 days.	Every 1-2 weeks.	Every 7–10 days.	1x per week.
Stage 3 (Extreme)	**1 day/week.** *Hand watering, drip, or subsurface only.*	Every 10–14 days.	Every 7–10 days.	1x per week.	1x per week.
Emergency (Exceptional)	**1 day/week max.** *Hand watering only.*	Every 10–14 days.	Every 7–10 days.	1x per week.	1x per week.

Why Trees Are Managed Differently During Drought

During drought, it may seem counterintuitive that trees continue to receive water while other landscaping is reduced. However, trees are long-term infrastructure that provide critical benefits to the community and environment, many of which take decades to establish and cannot be quickly replaced. Aspen's urban forest, particularly its larger and more mature trees, provides essential ecosystem services, including:

- Shade and cooling that reduce urban heat
- Improved air quality
- Stormwater interception and soil stabilization
- Contributions to overall wildfire resilience when properly maintained

Many of these benefits are directly tied to tree size**. Larger, established trees provide exponentially greater value than smaller or newly planted trees**, and are also much harder to replace if lost.

Unlike natural forest systems, much of Aspen's urban canopy depends on some level of irrigation to remain healthy, especially during extended dry periods. When water is limited, these trees can experience rapid stress, making them more vulnerable to pests, disease, and long-term decline.

Because of this, drought response strategies prioritize maintaining the health of trees, particularly newly planted trees and high-value, established trees, while reducing water use in less critical areas such as turf and annual plantings. This approach helps preserve Aspen's urban forest, maintain critical ecosystem services, and avoid long-term losses that would be far more costly and time-intensive to replace.

Soil Moisture Retention

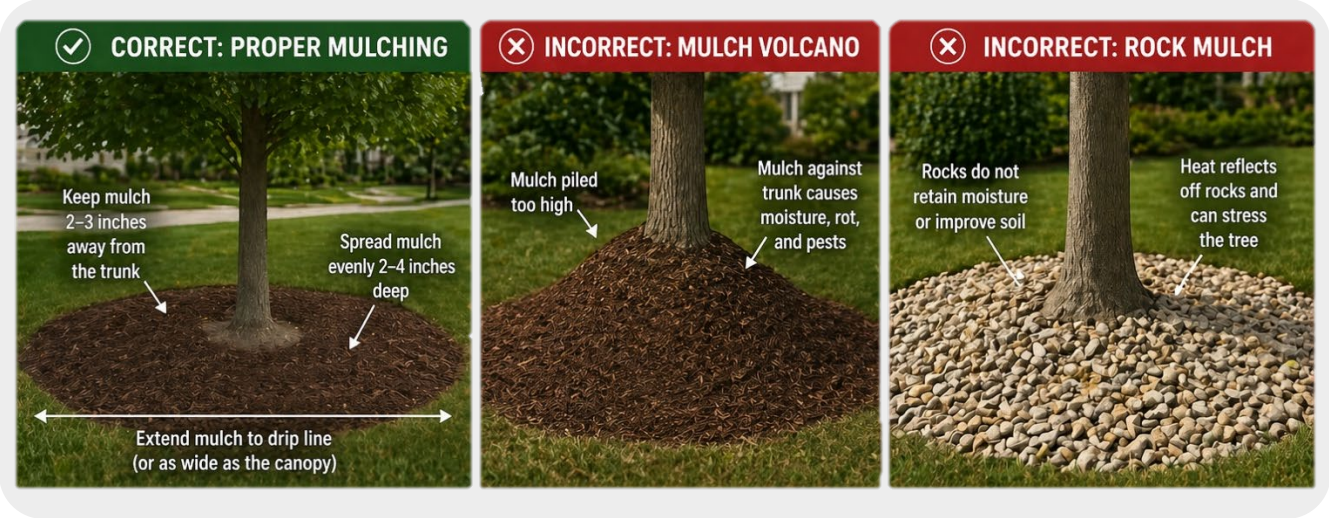
Maintaining soil moisture is critical for supporting tree health during drought. A layer of mulch helps retain moisture, moderates soil temperatures, reduces evaporation, and supports long-term soil health.

Tree resilience is also influenced by soil quality, species selection, spacing, and protection of the root zone. Avoiding soil compaction and minimizing disturbance around trees can significantly improve their ability to withstand drought conditions.

A layer (2-4 inch deep) of wood-based mulch helps:

- Retains moisture and reduces evaporation
- Keeps soil temperatures more stable
- Supports soil biology over time

Note: Keep mulch pulled back from the trunk to avoid moisture buildup against the bark.



AVOID ROCK AROUND TREE BASES

Inorganic materials such as rock can create harsher conditions for trees when placed directly over the root zone. Rock absorbs and radiates heat, increases soil temperatures, and does not retain moisture. Over time, this can contribute to drier, more compacted soils that are less supportive of root growth. That being said, rock and other inorganic materials can be appropriate in drought-tolerant landscapes when used in the right locations. The key is placement:

- Avoid placing rock directly beneath the tree canopy (within the dripline), where roots are most active
- Use organic mulch in these areas to help retain moisture and moderate soil conditions
- Rock may be used outside of the root zone or in areas planted with species adapted to drier, more exposed conditions

Most trees rely on fine, fibrous roots near the soil surface to absorb water and nutrients. Covering these areas with rock can limit their ability to access the moisture they need, especially during drought conditions.

LOOKING AHEAD

As drought conditions become more frequent and variable, long-term tree health in Aspen will depend on more than short-term watering adjustments. It will require changes in how landscapes are designed, irrigated, and maintained across the community.

One of the most important steps is **hydrozoning,** which means grouping plants with similar water needs and managing them accordingly. **Trees should be in their own hydrozone, or within zones of other plants needing deep slow waterings,** rather than being grouped with turf or high-water-use plantings. When trees are watered using the same shallow, frequent irrigation designed for lawns, they often do not receive the deep soil moisture they need to remain healthy. Looking ahead, improving irrigation practices will be key. We should:

- Separate trees from turf and other high-frequency irrigation zones. This is also required by the City of Aspen's Water Efficient Landscaping Standards (WELS).
- Use drip systems, hand watering, or other deep watering methods that allow water to reach the full root zone.
- Avoid relying on overhead irrigation as the primary water source for trees.
- Design landscapes with species that are appropriate for site conditions and long-term water availability.

CONCLUSION

If we want our urban forest to continue to thrive for generations, tree care should be more intentional and site-specific. Water needs vary widely depending on species, size, age, soil conditions, and location. Paying attention to these factors, and adjusting care accordingly, will become increasingly important as conditions become more variable.

Strengthening Aspen's urban forest will require a shift toward more thoughtful, efficient, and resilient landscape practices. By planning ahead and making targeted improvements now, we can better protect our trees, reduce long-term costs, and maintain the environmental and community benefits they provide.

RESOURCES AND ASSISTANCE

A variety of resources are available to support tree care and drought preparedness, including guidance from Colorado State University Extension, the Colorado State Forest Service, the USDA Forest Service, and the National Fire Protection Association's Firewise USA® program. Additional information and local guidance can also be found on the City of Aspen Forestry webpage.

- **City of Aspen Forestry**
  Forestry Webpage
  https://www.aspenrecreation.com/parks-trails/natural-resources-division/forestry

- **Colorado State Forest Service**
  Creating Defensible Space
  https://csfs.colostate.edu/wildfire-mitigation/creating-defensible-space/

- **Colorado State University Extension**
  Firewise Landscaping in Colorado
  https://extension.colostate.edu/topic-areas/natural-resources/firewise-landscaping-6-303/

- **Colorado Water Conservation Board**
  Colorado Drought Mitigation and Response Plan
  https://cwcb.colorado.gov/colorado-drought-mitigation-and-response-plan

- **EPA WaterSense**
  Water-Smart Landscaping
  https://www.epa.gov/watersense/outdoors

- **How Trees Respond to Drought**
  https://www.fs.usda.gov/rmrs/science-spotlights/how-trees-respond-drought

- **International Society of Arboriculture**
  Find an Arborist
  https://www.treesaregood.org/findanarborist

- **National Fire Protection Association**
  Firewise USA® Program
  https://www.nfpa.org/education-and-research/wildfire/firewise-usa

- **Roaring Fork Wildfire Collaborative**
  Community Resources & Grants
  https://www.rfwildfire.org/

- **Tree Care for Colorado Landscapes**
  https://csfs.colostate.edu/wp-content/uploads/2014/02/TreeCare.pdf

- **University of California Agriculture and Natural Resources**
  Managing Landscape Irrigation in a Drought
  https://ucanr.edu/sites/UrbanHort/files/80243.pdf

- **University of Minnesota Extension**
  Watering Newly Planted Trees and Shrubs
  https://extension.umn.edu/planting-and-growing-guides/watering-newly-planted-trees-and-shrubs

- **USDA Natural Resources Conservation Service**
  Soil Water Concepts
  https://www.nrcs.usda.gov/resources/guides-and-instructions/soil-quality-indicators-soil-water

- **U.S. Bureau of Reclamation**
  WaterSMART Program
  https://www.usbr.gov/waterSMART/

- **Watering Established Trees and Shrubs**
  https://extension.colostate.edu/topic-areas/yard-garden/watering-established-trees-and-shrubs-7-240/

- **Xeriscaping: Creative Landscaping**
  https://extension.colostate.edu/topic-areas/yard-garden/xeriscaping-creative-landscaping-7-228/