

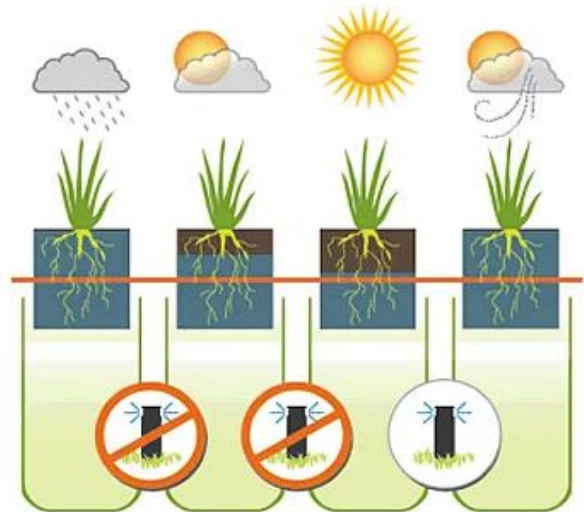
Inspiration Metro District Water-wise Irrigation Class Notes

Introduction: Aurora is situated in a semi-arid climate, where we receive an average of 15 inches of precipitation a year. Most water-wise plants can survive on this amount of water after establishment but may require supplemental irrigation in hotter times of the irrigation season (May-October). Supplemental water can be applied by hand watering, drip irrigation or a traditional in-ground irrigation system (sprays/rotors). Whichever method is being used to apply supplemental irrigation, efficiency should be the basis of the components involved and the irrigation schedule.

1. Why do we water?

Plants need water! Irrigation focuses on replenishing water in the soil to act like a reservoir plants can tap into as needed.

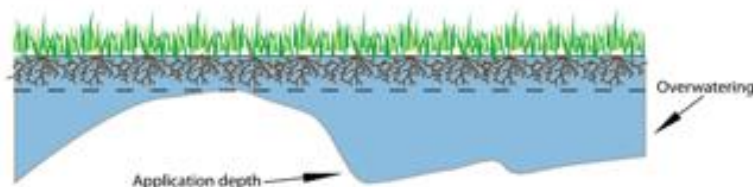
- The soil reservoir loses water through:
 - Plants drawing from it and using it for normal functions (transpiration)
 - Evaporation (sun, wind, low humidity etc).
 - As the soil reservoir is depleted, plants have less water available to them which can cause wilting, slow growth or general bad health.
- In nature, that reservoir gets filled by precipitation, BUT in a semi-arid climate like Aurora, natural precipitation generally doesn't fill the reservoir up enough for non-water wise plants (particularly grass) so we must supplement it with irrigation.
- It's easy to just refill the reservoir, however many Aurora homes use much more water than they need to when refilling the reservoir either because they fill it up too much or the water doesn't get distributed in the yard effectively.



Picture Credit: Hydropoint

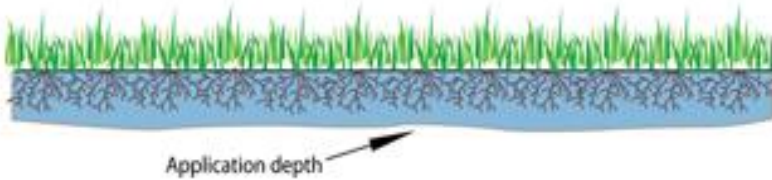
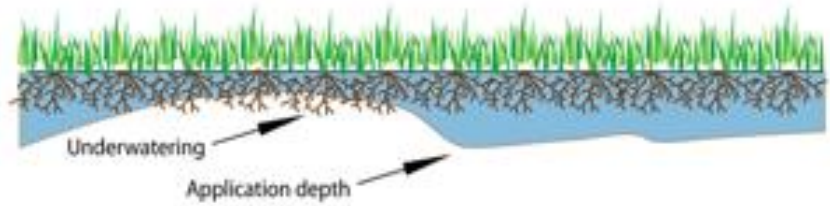
2. What is efficient irrigation/watering?

- Efficient irrigation is applying the right amount of water to refill the soil reservoir AND ensuring water is distributed evenly to avoid leaving some areas of the landscape with less water than needed.
- Proper application and distribution:



Left: an example of running your sprinklers too long and filling up the soil reservoir below the root zone. Anything penetrating below the root zone is wasted (at least regarding the homeowner).

Right: an example of decent scheduling, but the system is not distributing evenly and a section of the yard doesn't get its reservoir refilled. The result is stressed areas that make us think our grass just needs more water, leading to runtime increases, easily we move back into the previous picture and all the invisible waste that comes with it.



Left: an example of proper scheduling and even coverage that refilled the soil reservoir the right amount evenly across the lawn.

3. Sprinkler Heads - What is right for your landscape?

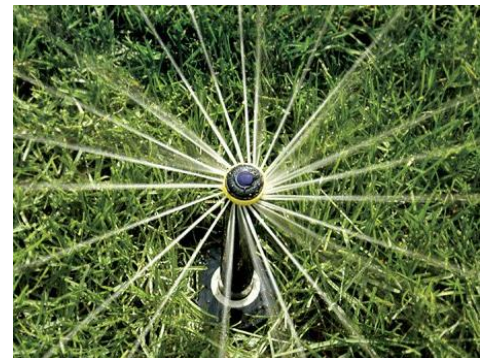
Primarily used for turfgrass:

- **Pop-up Sprays**- Pop-ups are the most common and spray water in a "fan" pattern. They're best used in smaller areas – 15' or narrower. Their precipitation rate is typically the highest of all heads delivering about 1.5 or more inches per hour (in./hr.) and do not need to run very long to put out the right amount of water.



- **Rotors**- Rotors distribute water in a single stream that rotates back and forth. Rotors are meant for larger areas, at least 16' wide. Unless you have a LARGE yard, you should not have rotors, although some newer developments have used them extensively. Precipitation rate is typically half the output of pop-up sprays, 07-1.5 in./hr., leading to run times about twice as long to deliver same amount of water.

- **Rotary or Rotator**- A rotator (also known as rotary) is a nozzle that you can install on spray head bodies. They are not designed to spray shorter than 12', ideal for areas large than 15' with precipitation rates between 0.5-0.8 in./hr. Apply water at a rate slow enough for most soils to absorb without runoff. They have a large droplet size which reduces wind drift and thereby apply water where intended. Distributes water evenly through the varying height streams that rotate around.



Drip irrigation is primarily used for water-wise landscapes. It's a high efficiency alternative to above ground sprinkler heads most appropriate for trees, shrubs, perennials and vegetable gardens. Drip systems deliver water very slowly (gallons per hour/GPH) to avoid runoff, delivering water directly to the soil and plant root zone, also preventing extensive evaporation or loss to wind. Compared to conventional sprinkler systems, drip irrigation systems are simple to design, inexpensive, and easy to install.



Drip is great for water-wise landscapes:

- Delivers water to the roots of the plant
- Reduces loss of water from evaporation and wind drift
- Won't be obstructed by growing plants
- Delivers water at a slower rate, allowing water to sink into root zone
- Great for slopes

Point Source vs. Inline Emitters

- Point source emitters are individual emitters that deliver water slowly and directly to the plant's root zone
- Inline emitters are uniformly built into the dripline tubing and distribute water over a broader area



Pressure-compensated emitters

- Maintains same output of water regardless of changes in pressure, length of tubing or terrain

4. Scheduling Your Irrigation System

The city of Aurora has permanent rules for outdoor watering that take effect each year from **May 1 to September 30**.

- No watering more than 3 days per week
- No watering between 10 am and 6 pm
- Between 10 a.m. and 6 p.m., watering vegetable or flower gardens by hand is allowed.
- Hand watering (hose or manual sprinkler attachment) of grass lawns follows the same guidelines as an automatic sprinkler system. The three days a week and watering time conservation measures apply.
- For more information, check out our website here:

<https://www.auroragov.org/cms/One.aspx?portalId=16242704&pageId=16599691>.

To receive weekly watering recommendations for your lawn based on local weather conditions, sign up for **Know Your Flow**: https://www.auroragov.org/residents/water/water_conservation/know_your_flow

AURORA'S RULES FOR OUTDOOR WATER USE

WATERING MONTHS	POP-UPS	ROTOR HEADS	ROTARY
	MINUTES PER ZONE/ 3 TIMES PER DAY		
MAY <small>2 days per week</small>	4	8	13
JUNE <small>2 days per week</small>	8	14	23
JULY <small>3 days per week</small>	5	10	15
AUGUST <small>3 days per week</small>	5	9	15
SEPTEMBER <small>2 days per week</small>	6	11	17

LAWN WATERING RECOMMENDATIONS

These runtimes are meant to be used as part of the cycle-and-soak method, which helps water seep into the soil where you want it and encourages healthy root systems. Here's an example of how to reset your controller for May:

- 🔧 Adjust the number of days per week.
May example: Two days
- 🔧 Set the runtime for each zone based on the month and sprinkler type.
May example: Four minutes for pop-ups.
- 🔧 Schedule the start times an hour apart.
May example: Start times at 4 a.m., 5 a.m. and 6 a.m.

To receive weekly schedules adjusted to recent weather, sign up for Know Your Flow at AuroraGov.org/KnowYourFlow.

This is a monthly recommended watering guide that is issued at the beginning of the irrigation season. It is subject to change based on weather conditions.

An irrigation controller controls when and how long valves open and release water out into your landscape. They all have the same basic functions:

- **Programs** – Groups zones together based on plant type that need watering at the same frequency (e.g. grass on program A; trees, shrubs and perennials on program B). All zones on a program will run on the same day and start at the same time of day.
- **Watering days** – Specific days of the week to water or at different intervals (every other, every 4 days, etc.). These are 24-hr calendar days so you should be careful scheduling around midnight.
- **Start times** – The time of day you want the system to run. The start time indicates what time the first zone will run. Remaining zones on that program will run in sequence as a cycle. Even if the next start time is accidentally programmed to run before all zones have completed their cycle, they will still finish each full runtime before starting the next cycle.
- **Run times** – How long to run each zone. Which head type you have in each zone will determine what the runtimes should be for grass lawns.

The Cycle and Soak technique for grass lawns helps avoid runoff and achieves a deeper soak, which encourages deep root growth and drought resilience.

- Grass grows its roots where the water is.
- Watering all at once in clay soil means water will permeate the top two inches of soil and then get saturated and run off, resulting in grass with shallow roots (shallow reservoir = shallow roots). That top bit of soil is exposed to the elements and dries up quickest which means you must water more frequently to refill the reservoir.
- Cycle and soak divides your recommended watering time into three cycles. You run the first cycle, let it soak for an hour, run the second cycle, soak for another hour, and then run the final cycle. By applying a smaller amount at a time and letting it soak in for an hour before adding more, the water goes deeper into the soil where it can be retained. Letting the top bit of soil dry out regularly (through spacing the days you water) will signal to your grass that it must grow a deeper root system to find water. Over time

this means your grass can be more resilient and not stress as easily when we get stretches of hot, dry weather.

- **Cycle and soak program example:** If I want to my pop-up sprinklers to run for 12 minutes total, I divide that by 3 to get 4 minutes of runtime for each zone. I'll program each pop-up zone to run for 4 minutes. I'll schedule the start times at 4 am, 5 am, and 6 am.

Tips for Drip Irrigation Scheduling

- Scheduling will depend on the emitter flow rate, the type of plant material, and soil type. Your hands-on experience in scheduling your drip irrigation will set you up for success.
- Water-wise plants will need daily watering for the first 3-4 weeks after planting, then every other day during weeks 4-6 depending on the plant material and weather conditions. Continue to taper the watering throughout the first full growing season depending on weather and plant needs. Your plants will be established within one to two growing seasons.
- While some water-wise plants need little to no supplemental water after establishment, some require more. Research your plant material to determine the right amount for them. For the plants that will need weekly watering, schedule the system 1-2 times per week.
- If plants with higher watering requirements are on the same zone (likely shrubs and trees), add additional emitters.
- You want to saturate the root zone without excessive run off, so check the soil moisture at the rooting depth after watering and adjust your schedule accordingly.
- Because drip irrigation distributes a low flow of water under low pressure, be sure to have a filter and pressure regulation device to prevent debris clogs and maintain consistent pressure.
- For tips on watering trees, refer to the City of Aurora's [Forestry Department resources](#).

5. Irrigation System Maintenance

- Regular inspections of your system will keep you on top of any issues that will occur over its lifetime:
 - Broken or cracked heads
 - Leaks
 - Clogged nozzles
 - Lack of head to head coverage in zones
 - Sunken heads
 - Tilted heads
- Inspect your drip system, too! Run your drip zone(s) and look/listen for the following issues:
 - Breaks in drip tubing
 - Leaks
 - Clogged emitters
 - Kinked or bent drip tubing
 - Clogged filter
- Aurora Water Conservation provides free irrigation assessments for Aurora Water customers. We also have a DIY assessment guide if you are interested in learning how to do this yourself. [Learn more and sign up here.](#)
- Upgrade your existing irrigation system with efficient equipment, including. These upgrades may be rebate eligible, visit our website for details: [Aurora Water Conservation Rebates](#)
 - Rain sensor
 - Soil moisture sensor
 - High efficiency nozzles
 - Drip irrigation conversion
 - Smart irrigation controller

