

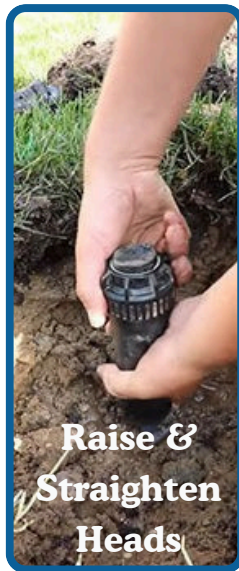
# Irrigation Upgrades



**Upgrade Controller**



**Install Rotary Nozzles**



**Raise & Straighten Heads**



**Install Check Valves**



**Upgrade to Drip**

## Irrigation Efficiency Upgrades

- Install a Smart Controller
- Use Flow Management Tools
- Convert to Drip
- Fix Leaks & Broken Heads
- Ensure Distribution Uniformity
- Same Zone, Same Sprinkler
- Matching Precipitation Rates
- Install Check Valves
- Install Rotary Nozzles
- Raise and Straighten Heads
- Correct Overspray
- Adjust Spray Pattern
- Prune Plant Obstructions
- Install a Rain Sensor
- Fix High or Low Pressure

# WBIC Smart Controllers



**Smart controllers offer significant advantages by providing tools for optimizing irrigation efficiencies.** When programmed properly, these devices can automatically adjust watering schedules based on weather conditions or soil moisture levels, reducing water waste and lowering utility bills. They also provide convenience and peace of mind by enabling remote and collaborative management capabilities through smartphone apps.



CLICK HERE



CLICK HERE



With today's newest technologies, **you can measure exactly how much water you need per day** and set your system in sync with those requirements.



Visit your local **CoAgMet (weather) Station** website, which measures evapotranspiration rates, **to inform daily watering recommendations.**



Many new controllers have mobile compatibility, so you can adjust on-the-go!



## Recommended Controllers

All EPA Watersense controllers are equipped to help manage water wisely, but selection will depend on the size of the system, and some are more user-friendly than others. We prefer:

- [Rachio 3](#)
- [Rainbird ESP ME3 with Wifi Module](#)

# Flow Management Tools



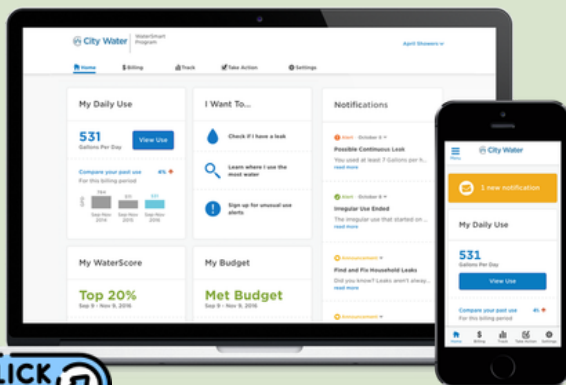
## Flow Sensors

Flow sensors can be instrumental in tracking residential water consumption patterns, detecting leaks early, and effectively managing overall water use by providing real-time data and insights.

These devices monitor the volume and rate of water flow through pipes, allowing homeowners to identify leaks, track consumption, and optimize water use. By integrating flow sensors with smart home systems, residents can receive alerts and detailed reports, empowering them to make informed decisions about their water habits, conserving water and reducing utility bills.



**EAGLE RIVER**  
WATER & SANITATION  
DISTRICT



## ERWSD MyWater Portal

MyWater is a platform that allows our customers to access their water use information and history, pay bills and view billing history, set leak alerts and high use notifications, and more.

Once enrolled, from the main page, navigate to Usage Insight > Understand Usage. You will be shown your hourly water use for the selected timeframe.

[Click here to enroll or access your account](#)

# Convert to Drip



**Drip irrigation is a highly efficient watering method that delivers water directly to the root zone of plants, minimizing water loss through evaporation and runoff.**



## Benefits of a Drip Irrigation System:

- **Water Efficiency:** Drip irrigation systems deliver water precisely where it's needed – at the root zone of plants.
- **Healthy Plants:** By supplying water directly to the roots, drip irrigation promotes healthier plant growth.
- **Weed Control:** Unlike overhead sprinklers that can inadvertently water surrounding areas where weeds can establish, drip irrigation systems focus water on the intended plant beds, minimizing weed growth.
- **Soil Conservation:** Drip irrigation reduces soil erosion by gently delivering water at a controlled rate, which is why it is especially suited for use on slopes.
- **Customization:** Drip irrigation systems offer flexibility in watering schedules, allowing you to tailor irrigation to the specific needs of different plant types.

## Ideal Locations for Drip Irrigation:

- Plant beds with perennials, shrubs, and trees
- Sloped or uneven terrain
- Narrow planting strips
- Container gardens and hanging baskets
- For watering in newly planted areas
- For watering in high-wind areas



# Common Drip Systems



- **Inline Emitter Irrigation:** Surface drip irrigation involves laying drip tubing or tape along the soil surface, directly above the root zone of the plants. Ideal for garden beds, scrub borders, and tree installations where plants are spaced apart and have consistent watering needs.
- **Drip Emitter Systems:** Drip emitter systems consist of individual emitters attached to drip tubing, delivering water directly to the base of each plant. These are suitable for landscapes with varying plant spacing and water requirements, allowing precise customization for each plant.
- **Micro-Sprinkler System:** Micro-sprinkler systems utilize small sprinkler heads or micro-sprayers to emit water in a fine mist or spray pattern. These are ideal for watering groundcovers, flower beds, and container gardens, providing gentle and uniform coverage over a wider area.



## Drip Irrigation and Hydrozones

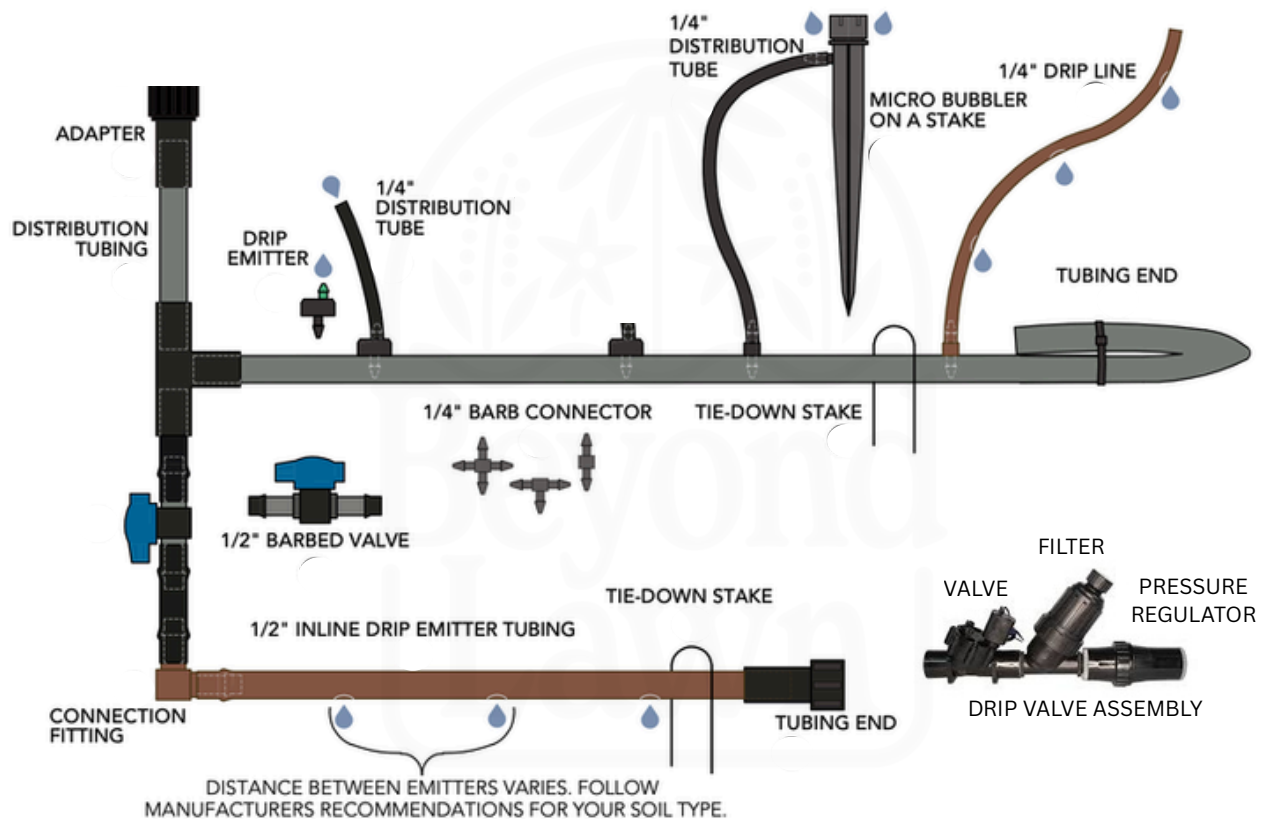
As with other forms of irrigation, each drip irrigation zone should correspond with its own hydrozone of plants of a similar water need. **Trees should always be in a zone of their own, as they have distinct watering needs from other plants, even if they are of a similar water requirement.** Annual containers and vegetable plots should also each be in their own zone, as their needs are also different than those of perennials, trees, turf, or shrubs.

## Additional Resources:



- [Drip Irrigation for Home Gardens - 4.702 - Extension](#)
- [Installing a Drip Irrigation System](#)
- [How to Install Drip Irrigation - The Home Depot](#)
- [Step By Step Drip Irrigation System Installation Guide | Sprinkler School](#)
- [Micro Sprays Planning and Installation Guide](#)

# Drip Irrigation Basics

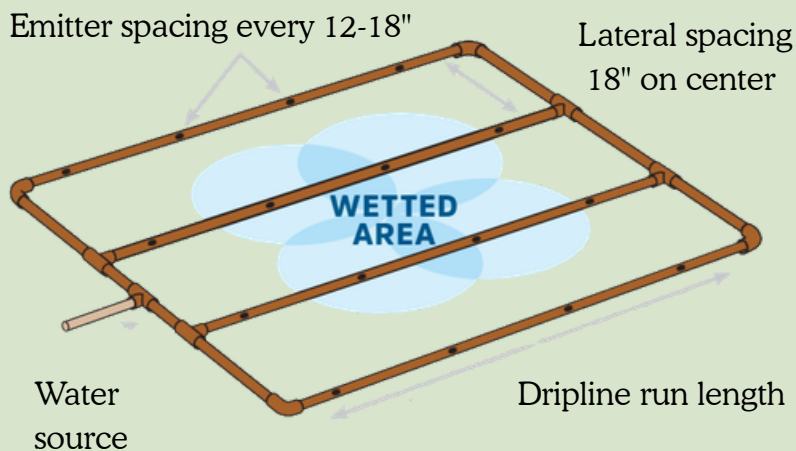


1. **The drip zone** is connected to the system via an **adaptor** or a **drip valve assembly**.  
Drip assemblies usually have a **filter** and/or **pressure regulator**.
2. **Poly distribution tubing** conducts the water through the system, usually 3/4"-1".
3. **Barbed valves** can be used to shut off specific lines or areas when not in use.
4. **Connection fittings** couple poly tubing to drip emitter tubing.
5. **Inline drip emitter tubing** has equally-spaced emitters to distribute water uniformly over a distance, usually a 1/2" brown poly commonly called **netafim**.
6. **Drip emitters** are punched into poly tubing at intervals for non-uniform distribution.  
Drip emitters come in a variety of outputs (from .5-4 gph).
7. **Spaghetti, or 1/4" distribution tubing** allows for more precise placement of drip.
8. **Barbed connections** allow for wider flexibility with 1/4" distribution tubing.
9. **Micro bubblers** are often used for increased flow in containers or raised beds.
10. **1/4" drip line** is another option for use in small areas, like containers.
11. **Tie-down stakes** ensure the poly and drip lines stay in their intended places.
12. **Tubing ends** can be folded as shown, but **cap and clamp** is a better method.
13. **The flush cap** goes on the low point of the system and allows for it to be purged.

# Inline Emitter Drip Systems

**Inline drip emitter systems offer a highly efficient and uniform method of irrigation.** By delivering water directly to the plant roots, they minimize evaporation and runoff, ensuring moisture levels are maintained. This precision not only conserves water but also promotes healthier plant growth by reducing the risk of diseases related to overhead watering. Inline drip systems also offer more flexibility to suit various soil types and topographies, making them versatile and adaptable for varied needs.

## Inline Emitter Grid Layout Spacing



Inline drip emitter systems can be used for areas big or small. Coverage depends on spacing, but recommended spacing for most systems is 18" on center, and 12" or 18" emitter spacing, depending on plant composition. Plants can be planted anywhere in the area, as the diffusion carries the water through the soil profile.



This image shows a project in-process. The sod was stripped, and the inline drip was laid in rows, tapped into the lateral irrigation line where the previous irrigation heads were. Next, the waterwise and native perennials and shrubs were planted, and 1/3" chipped rock was applied in a 4" layer to suppress weeds, insulate the roots, and stop the evaporation of water. This method is extremely efficient.



**Use sod staples to secure your lines!** Sod staples are especially important to use in inline emitter drip systems to ensure distribution works as it was originally intended. Without staples, lines are prone to moving around, being tripped over, or working their way up to the surface.

# Converting Spray to Drip

**Converting a spray zone into a drip zone is a relatively simple conversion, if done correctly.**

First, begin by shutting off the water supply to the area you plan to convert. This ensures a safe working environment and prevents any potential waste. Next, remove the existing spray heads at the base of the head and cap off any unnecessary outlets to prevent leaks.

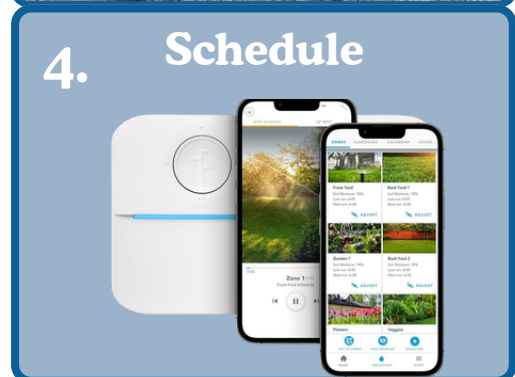
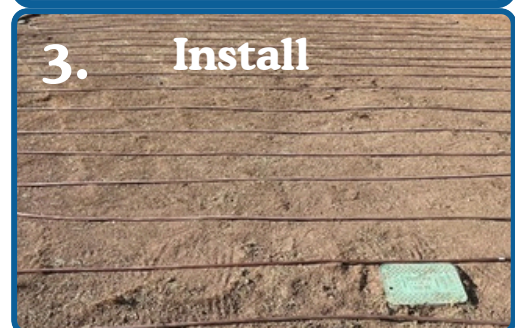
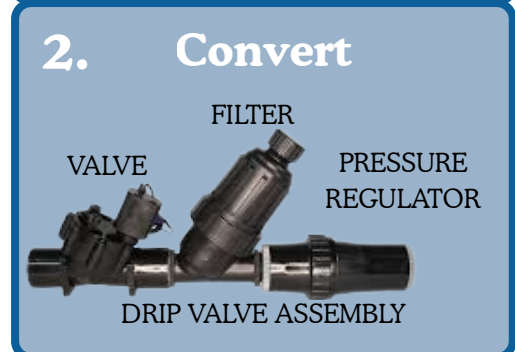
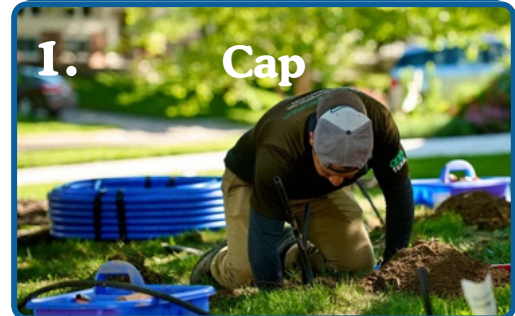
**Install a filter** to protect the drip emitters from debris and sediment, which can cause clogs. Following the filter, attach a pressure regulator to maintain an optimal pressure level for the drip system, ensuring efficient water delivery without damaging the components.

Once the pressure is regulated, **connect a valve or a drip valve assembly** to control the water flow to your new drip system. This will allow you to easily turn the system on and off as needed. For most systems, the existing valve and wiring can be used after the addition of the filter and pressure regulator.

Next, **lay out the drip tubing** along your planting beds, secure it with stakes, and attach individual emitters to deliver water directly to the root zones of your plants if using a point-source system.

Finally, **adjust your irrigation schedule** to account for the new irrigation method. Use the water budget calculator and scheduling section earlier in this guide to help inform proper scheduling.

By following these steps, you'll have successfully transformed your spray zone into a more efficient drip irrigation system, promoting water conservation and healthier plant growth.



# Fix Leaks & Broken Heads

**Identifying and fixing broken heads and other leaks is crucial for maintaining an efficient irrigation system.** Begin by visually inspecting your system while it's running and shortly after it has finished, looking for clear ruptures, pooling water, or areas that aren't being adequately covered. Once identified, repairs typically involve replacing damaged components or tightening connections, ensuring your irrigation system operates smoothly and uses water effectively.

- **Visible Surface Leaks:** Water pooling on the surface, damp spots, or soggy areas around pipes, valves, or sprinkler heads.
- **Underground Leaks:** Areas of excessively wet or mushy soil, unexpected vegetation growth, or a noticeable increase in water usage without a corresponding increase in irrigation activity.
- **Valve Leaks:** Water seepage or dripping from the valve box. Check for signs of moisture, corrosion, or water accumulation inside the valve box.
- **Pipe Leaks:** Water seepage, dampness, or staining along the length of the pipes, especially at joints or connection points.
- **Sprinkler Head Leaks:** Leaks around the base, nozzle, or casing, leading to dripping, spraying in the wrong direction, or irregular water flow.
- **Fittings and Connections Leaks:** Water dripping, seepage, or staining.



## How to Fix a Broken Head



## How to Fix a Lateral Line Leak



# Ensure Distribution Uniformity

**Distribution uniformity (DU) is crucial in home irrigation systems as it ensures that water is applied evenly across the landscape, promoting healthier plant growth and preventing water waste.** High DU minimizes dry spots and overwatered areas, reducing the risk of plant stress and disease. Discrepancies in distribution can arise from various factors, such as using different head or nozzle types, improper spacing, or tilted or improperly spaced heads. Regular system checks and adjustments are essential to maintain optimal irrigation efficiency.

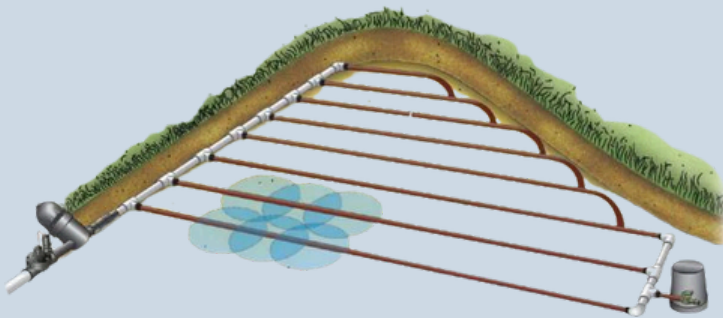
## Sprinkler Distribution Uniformity

TFS Rotary (MP) Impact Rotor



More Uniform

## Drip Coverage Uniformity



**Properly spacing drip tubing lines ensures uniform distribution of water.** Effective spacing depends on output rate, soil conditions, plant composition, and distance between emitters. Notice the drip is connected into the lateral line (white) in multiple places and connected into itself on the other end to ensure the whole system is uniformly pressurized. Use sod staples to secure drip tubing to minimize movement.

## Irrigation Auditing



**Irrigation auditing** is the process of evaluating the efficiency and effectiveness of an irrigation system, typically completed by assessing water distribution patterns, measuring flow rates, and identifying any areas of inefficiency or malfunction to ensure optimal water use.

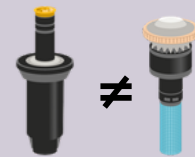
## Head-to-Head Coverage



**Head to-head spacing**, where the spray from one head reaches all the way to the next, is the gold standard for irrigation zone design and spacing.

# Same Zone, Same Sprinkler

**Mixing different irrigation heads within the same zone is an inefficient irrigation strategy due to the varying output rates of each type of head.** When different heads operate together, they deliver water at inconsistent rates, leading to uneven water distribution across the area. This lack of uniformity can result in overwatering in some sections while leaving others inadequately watered. **To achieve optimal distribution uniformity (DU), use the same type of irrigation heads within a single zone to ensure consistent watering.**

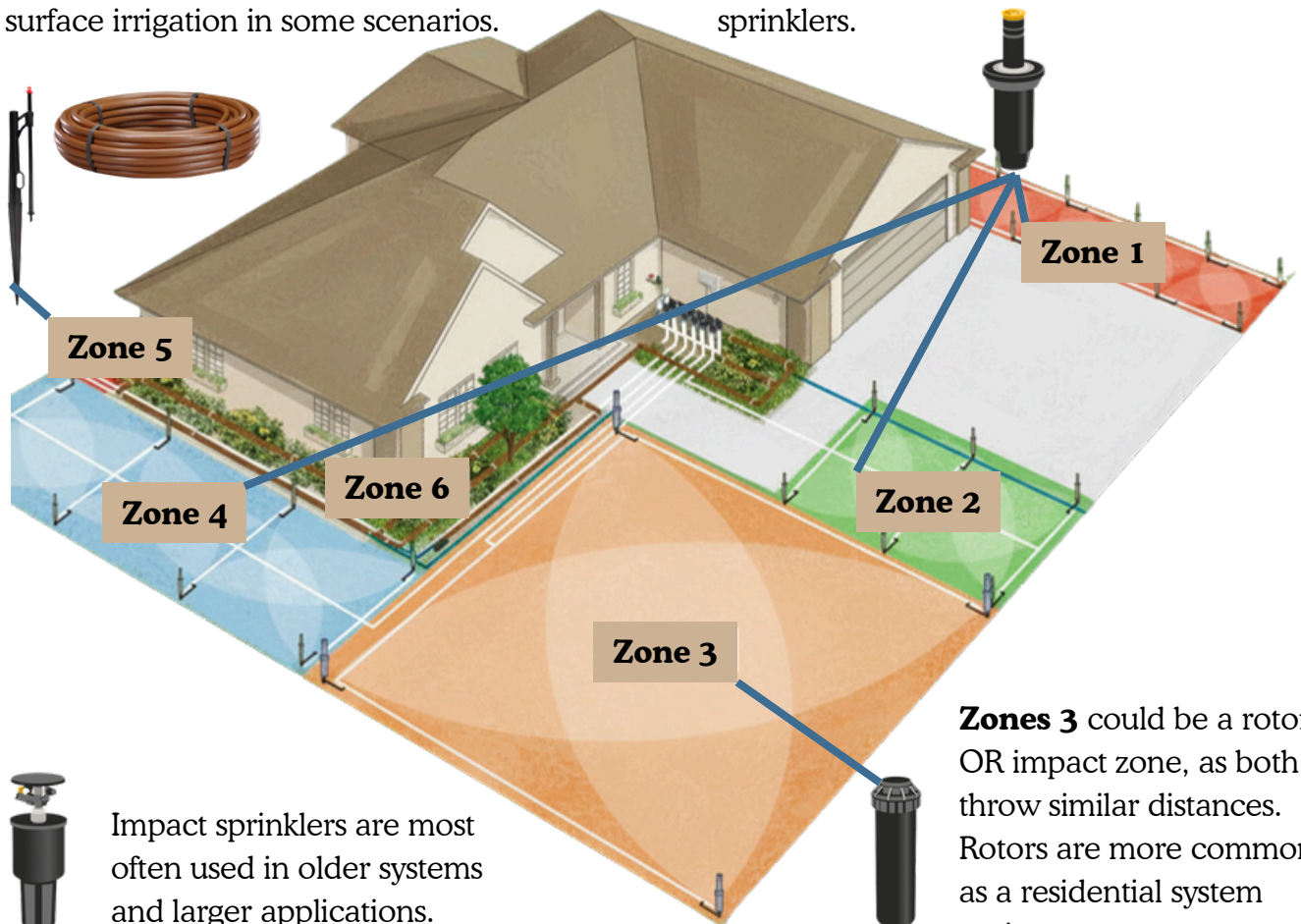


Even if the heads are the same, the nozzle precipitation rates should also be matched.

## Avoid Using the Different Sprinkler Heads in the Same Zone

**Zones 5 (behind house) and 6** are on a drip zone. Drip zone may sometimes have micros attached for surface irrigation in some scenarios.

**Zones 1, 2, and 4** are all appropriate zone sizes for pop-up sprinkler heads, which do not throw as far as rotors or impact sprinklers.



**Zones 3** could be a rotor OR impact zone, as both throw similar distances. Rotors are more common as a residential system option.



Impact sprinklers are most often used in older systems and larger applications.



# Match Precipitation Rates



**Unmatched precipitation rates in a zone or system is one of the most frequent errors in irrigation, even among professionals.**

Matching precipitation rates will ensure all areas of a hydrozone or irrigation zone are watered similarly and not wastefully. [Learn how to match precipitation rates here.](#)

## Precipitation Rate Ranges

	Irrigation Type	Precipitation Rate (In/Hr)
	Drip/Micros	Depends on emitter
	Inline Emitter Drip	.1-2.0
	Rotary Nozzle	.4-.9
	Rotor Head	.25-1.0
	Impact Head	.25-1.25
	High Efficiency Fixed Spray	1.0-2.0
	Traditional Fixed Spray	1.0-2.0

## Matching Precipitation Rates

Arc	Flow (GPM)	Precip. Rate (In/Hr)
90°	.21	.41
180°	.42	.41
270°	.63	.41
360°	.84	.41

**Matched precipitation rates** ensure that the flow is adjusted for the angle, so a 90° nozzle has half the water coming out of it than a 180° nozzle because it is watering half of the area of a 180° nozzle.

Arc	Flow (GPM)	Precip. Rate (In/Hr)
90°	.21	1.64
180°	.21	1.23
270°	.21	.82
360°	.21	.41

**Unmatched precipitation rates** output the same amount of water regardless of the nozzle angle. This means an area covered by a 90° nozzle with the same flow as a 360° nozzle receives 4x as much water.

# Install Check Valves



Check valves are helpful tools for water conservation in home landscapes as they prevent low-head drainage. This is particularly relevant in the mountains, where most irrigation zones are sloped, with some heads lower in the landscape than others. **Without check valves, each time an irrigation cycle is finished, the water left in the line drains out of the lowest head in the zone, effectively wasted.** Heads with check valves may be more expensive up front, but the water savings quickly make up the difference and then some!



Without SAM



With SAM

## Built-In Check Valves

Every major irrigation parts brand makes spray heads with check valves built in.

- In RainBird sprinkler heads, SAM stands for Seal-A-Matic, which identifies that the head has a check valve.
- In Hunter sprinkler heads, the head itself says “check valve”, so you know you’re good-to-go!



## Inline Check Valves

**Inline check valves** are another type of check valve. They are mainly used to prevent backflow rather than for low-head drainage.



**Low head drainage is often a non-apparent water loss**, as most of the time the water dribbles out of the head and saturates the surrounding area. If the area immediately around your irrigation heads is growing faster or appears greener, then you might have a low head drainage issue!

# Install Rotary (MP) Nozzles



**High-efficiency sprinkler nozzles, also commonly called MP or rotary nozzles, deliver multiple rotating streams of water at a lower precipitation rate** (amount of water sprayed in inches per hour) requiring them to run longer, but the way in which water is applied is more efficient and reduces water loss. **Paired with cycle-and-soak scheduling, they are one of the most efficient ways to overhead water.**



Like fixed spray, rotary nozzles come in many angle and spray distance configurations.

## Rotary Nozzle Benefits

- **Reduced Runoff:** Minimizes runoff on slopes and clay soils due to the slower distribution of water, helping prevent runoff and erosion.
- **Wind Resistance:** Larger water droplets are less susceptible to wind disruption, optimizing water usage.
- **Increased Coverage:** Delivers water more evenly, promoting healthier landscapes.
- **Easy Installation:** Simple retrofit onto existing pop-up irrigation systems, making this a cost-effective solution.

## How to install a rotary nozzles



1. Raise the head and remove old nozzle
2. Select an appropriate rotary nozzle
3. Screw in rotary nozzle
4. Repeat for other heads
5. Test the zone and troubleshoot as necessary

## COMMON MODELS

- [Hunter MP Rotator®](#)
- [Rain Bird® Rotary Nozzles](#)
- [Toro® Precision™ Nozzles](#)
- [K-Rain® Rotary Nozzles](#)

**Rotary nozzles have a lower output rate**, so they will need to run longer than traditional nozzles to water the same amount. **Adjust your scheduling accordingly.**

**Rotary nozzles mechanisms sometimes stop rotating due to clogging or calcification of components.** Most of the time, they just need to be "booped" by pressing the nozzle down like a button to start functioning again. **Check each zone once a month to ensure proper function.**

# Raise & Straighten Heads



Over time, soil settling, lawn compaction, or landscaping changes may cause sprinkler heads to sink below the soil surface or become tilted, resulting in uneven watering and potential damage to the irrigation system. Raising and leveling sprinkler heads ensures efficient water distribution, reducing water loss and promoting conservation efforts.

## When to Raise or Realign Sprinkler Heads

- If you notice that sprinkler heads are submerged below the soil surface or are obstructed by grass or other landscaping features, raise them to grade.
- Realign any tilted heads that are spraying too high in the air, or are tilted downwards and are hitting nearby vegetation.



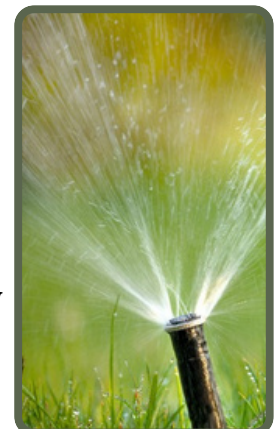
## Fixing Low or Sunken Sprinkler Heads



- **Turn Off Water Supply:** Shut off the water supply at the main valve.
- **Dig Around Sprinkler Head:** Carefully excavate soil around the head.
- **Detach Sprinkler Head:** Unscrew the head from the riser or pop-up assembly.
- **Add Riser Extension:** Use an extension to raise the head to the desired height.
- **Reattach Sprinkler Head:** Screw the head back onto the riser, using Teflon tape to prevent leaks.
- **Test Sprinkler Operation:** Turn on water supply and adjust the spray pattern if needed.
- **Backfill and Compact Soil:** Fill the area around the head with soil and compact gently.

## Fixing Tilted Sprinkler Heads

- **Turn Off Water Supply:** Shut off water flow at the main valve.
- **Dig Around Sprinkler Head:** Excavate soil around the tilted head.
- **Adjust Sprinkler Head:** Use hands or a wrench to level the head.
- **Check Alignment:** Verify alignment and adjust if necessary.
- **Secure Head:** Tighten adjustment screws to secure the head.
- **Test Sprinkler Operation:** Turn on water supply and observe spray pattern.
- **Backfill and Compact Soil:** Fill the area around the head with soil and compact gently.



# Correct Overspray



**Overspray in an irrigation system occurs when water extends beyond the intended target area, leading to water waste and uneven watering.**

## Recognizing Overspray

- Water pooling or runoff in non-targeted areas.
- Visible misting or fogging during operation.
- Uneven coverage patterns and oversaturation.
- Wet surfaces on adjacent buildings, sidewalks, or driveways.

## Causes of Overspray

- Incorrect nozzle selection or adjustment.
- Improper positioning or alignment of sprinkler heads.
- Excessive system water pressure.
- Wind or environmental conditions.
- System design flaws or inadequate coverage planning.



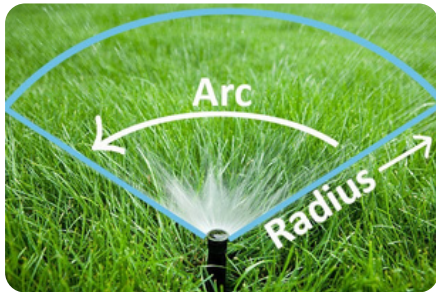
## CORRECTING OVERSPRAY

- **Adjust Sprinkler Heads:** Ensure proper adjustment to deliver water only to the desired area without overspray. Modify arc, angle, and distance of spray.
- **Replace Nozzles:** Consider low-pressure, high-efficiency nozzles to minimize overspray and misting. These produce larger water droplets for more even distribution and less disturbance from wind.
- **Reduce Water Pressure:** Install pressure regulators or PRVs to maintain optimal pressure levels and prevent misting or excessive flow rates.
- **Implement Windbreaks:** Install barriers like fences or shrubs to reduce wind impact on water distribution and minimize overspray.
- **Monitor Weather Conditions:** Adjust irrigation schedules based on wind speed, humidity, and temperature to minimize water loss due to environmental factors.

# Adjust Spray Pattern



**Adjusting the spray pattern of overhead sprinklers is a fairly simple but effective way to reduce water waste.** By ensuring that the sprinklers are set to target only the areas that need watering without unnecessary overlap, you can prevent overspray onto sidewalks and driveways and redundant watering of turf or flower beds. Properly adjusting the spray arc and rotation angles can help distribute water evenly, reducing runoff and ensuring that each section of your landscape receives the right amount of moisture.



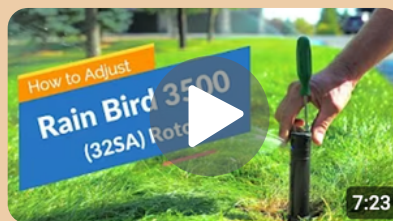
**Radius (or throw distance) and arc (or angle) are the two ways that most sprinkler heads can be adjusted.** Different heads have varying attributes and limitations on how much they can be adjusted. A 25' rotor cannot be effectively adjusted to throw 5', for instance, so knowing those limitations is important when attempting any adjustment.

## Traditional Fixed

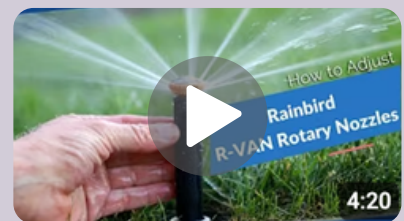
### RainBird



## Rotor



## Rotary



### Hunter



## Head & Nozzle Selection, & Tools

**Selecting the most appropriate sprinkler head and nozzles for the space is the best way to ensure proper throw distance and arc,** but calibration after install and regular adjustments throughout the season, especially after startup in the spring, are necessary to have an optimally functioning irrigation system. Using the adjustment tools made for your brand of sprinkler head will minimize frustration—they are very specific!



# Remove Obstructions



**Obstructions in an irrigation system can impede water distribution, leading to uneven watering, reduced efficiency, and potential damage to both plants and system components.**

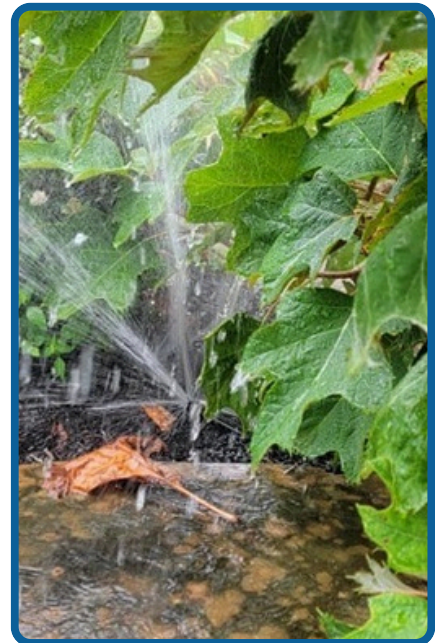


## Common Types of Obstructions

- **Overgrown Vegetation:** Tall grass, shrubs, trees, or ground cover obstruct water flow from sprinkler heads.
- **Placement of Boulders or Lawn Ornaments**
- **Plant Roots:** Tree or shrub roots infiltrate irrigation lines, leading to blockages and disruptions.
- **Debris:** Fallen leaves, branches, mulch, or organic matter accumulate around sprinkler heads or in lines.

## Addressing Plant Obstructions

- **Prune Vegetation:** Regularly trim and prune overgrown vegetation to prevent obstruction of sprinkler heads. Maintain clearance around components for proper operation.
- **Clear Debris:** Remove accumulated debris from around sprinkler heads and along lines to prevent blockages. Use tools like rakes, brooms, or blowers for clearing.
- **Inspect and Clean:** Regularly inspect components for signs of blockages caused by plant roots or debris. Clean or unclog obstructed parts to restore water flow.
- **Adjust Irrigation Layout:** Consider repositioning sprinkler heads to avoid direct obstruction by tall plants. Install risers to elevate heads above foliage.



## Head Extenders



## Preventing Plant Obstructions

- **Proper Plant Selection:** Choose landscaping plants with consideration for mature size and proximity to irrigation components.
- **Use Extenders:** Add head extenders as plants grow.
- **Regular Maintenance:** Implement a schedule to prevent debris accumulation around sprinkler heads and lines.
- **Mulch Application:** Apply mulch to landscape beds to suppress weed growth and reduce debris accumulation.

# Install a Rain Sensor



**Installing a rain sensor to your irrigation system is a simple yet effective way to conserve water, save money on utility bills, and promote waterwise irrigation practices.** A rain sensor automatically shuts off your irrigation system when it detects rainfall, preventing unnecessary watering during wet weather conditions. Installing a rain sensor is an easy water savings retrofit that can be done to most modern irrigation systems.

## Benefits of Installing a Rain Sensor

- **Prevents overwatering:** By automatically interrupting irrigation cycles during rain events, a rain sensor helps prevent overwatering and reduces water waste.
- **Saves money:** By conserving water and reducing irrigation usage, a rain sensor can lead to significant savings on water bills over time.
- **Promotes healthy landscapes:** Avoiding excessive moisture from overwatering helps maintain healthy soil conditions and prevents issues such as root rot, fungal diseases, and weed growth.

## Choosing a Rain Sensor

- Select a rain sensor model that is compatible with your irrigation controller or system. Consider factors such as sensor type (wired or wireless), installation method, and sensitivity settings.
- Look for features such as adjustable rainfall settings, override options, and battery backup for reliable operation.



## Rain Sensors & Annual Containers

**Annual containers offer a particular challenge when installing rain sensors, as they require frequent (sometimes daily) watering and are often located under eaves, decks, or other cover.** Unfortunately, even the most advanced controllers don't have the option to leave a zone or zones on if the rain delay is triggered. To circumvent this, a small, separate controller can be installed without a rain sensor. This simplifies programming and can save thousands of gallons of water when rain is plentiful.



## Additional Resources:

- [How to Install a Rain Sensor - Video](#)
- [How to Install a Rain Sensor For Your Sprinkler System](#)
- [How to Install an Automatic Rain Sensor](#)
- [How to Install a Wireless Rain Sensor](#)

# Fix Low or High Pressure



Operating a sprinkler system at pressure levels higher or lower than recommended (typically between 30-45 psi for most spray sprinklers) can result in significant water waste, misting, fogging, uneven coverage, and damage to pipes, valves, and sprinkler heads.

## Signs of Low Pressure

- Uneven or inconsistent/variable water distribution
- Reduced sprinkler head height/ not fully popping up
- Weak or dribbling water flow
- Delayed system start-up
- Inconsistent spray patterns

## Signs of High Pressure

- Soil erosion around sprinkler heads.
- Misting or fine droplets indicating overspray.
- Uneven coverage patterns and oversaturation.
- Noises like banging or rattling pipes.
- Premature wear or damage to system components.

## Options for Reducing High or Low Pressure

- **Install Pressure Regulating Valves:** Place in the main water line to automatically adjust pressure.
- **Adjust Main Shut-off Valve:** Partially close to reduce flow and pressure.
- **Use Flow Control Valves:** Regulate flow in specific zones to control pressure.
- **Switch Nozzles:** Use pressure-reducing spray nozzles designed for lower pressures.
- **Add Pressure Regulating Devices:** Install inline regulators for consistent pressure.
- **Check for Leaks and Blockages:** Regularly inspect and repair leaks or obstructions.



## Additional Resources

- [Checking Irrigation System Pressure](#)
- [Relieve Pressure and Reduce Water Waste From Spray Sprinklers](#)
- [Water Pressure Regulators Simplified for Homeowners](#)