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Irrigation Maintenance and Troubleshooting

The key to effective water management is budgeting the time and resources needed to run an efficient irrigation system. This chapter is designed to help you make the most of maintenance time. It covers the most common problems with high and low-pressure irrigation systems and provides a seasonal calendar for routine tasks.

Biggest Time Savers

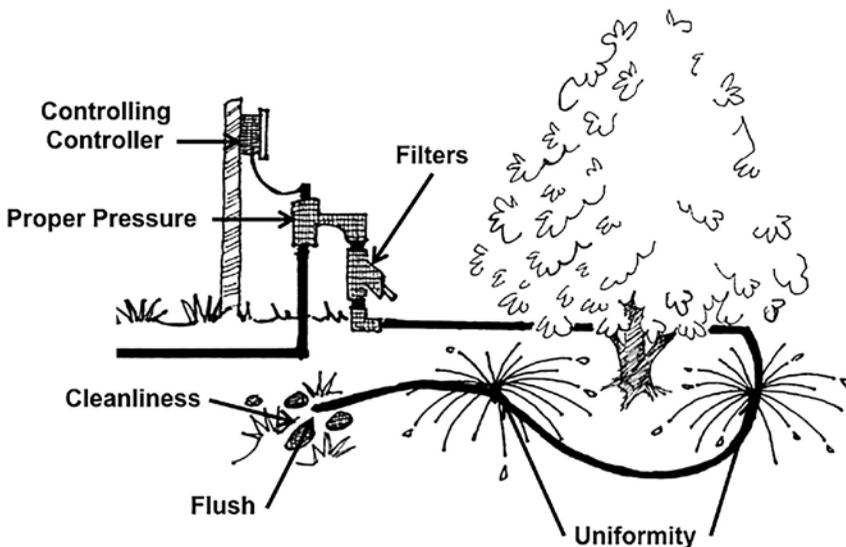
Uniformity: When you need to replace a water delivery device, always use one that matches the performance of the other devices on the line. Using devices with dissimilar rates of delivery will create wet/dry spots, reduce plant health, and increase frustration because the landscape is not performing as planned.

Cleanliness: Always flush a line after a repair is made. A clogged head will not only change the performance of that particular device, but will affect the entire line as well.

Pressure: Water pressure affects irrigation performance. Water pressure is managed at the manifold and along the entire line. Use too much pressure and sprinkler heads will mist (wasting a lot of water) and delivery devices and connectors will pop apart. Use too little pressure and water will be distributed unevenly which slows or stops mechanical devices, such as manifolds, impact heads, and rotor devices.

Control the Controller: An irrigation controller is only as good as the information it receives. A controller should be updated with new information at least four times a year; once a month would be preferable.

Flush and Filter: Low-pressure irrigation systems are especially prone to clogging. Filters should be checked and cleaned monthly and the system flushed no less than twice a year, preferably in late winter and



late summer. If the irrigation water has minerals and salts (leaving a white film or plating), then it may require an acid flushing. The most common acid flush is muriatic acid. Clogged heads can be soaked in vinegar to remove deposits. Maintaining the filters and flushing the system will increase the longevity of the system and save time in the long run.

Common Problems and Troubleshooting

This section lists the primary problems with high-pressure systems, low-pressure systems and the irrigation manifolds. The previous chapter, *Controlling Your Controller*, described common problems with controllers.

Awake and Aware

A busted sprinkler on a residential lot can gush between 3 and 5 gallons of water a minute; the larger diameter pipes on commercial properties can easily triple that. For instance, a busted head on a typical residential property that ran for 10 minutes twice a week would waste as much as 80 gallons a week; the loss on a commercial lot could be as much as 300 gallons a week.

One of the easiest strategies for minimizing the impact of broken heads is to have the irrigation go on when someone is around, awake and available to take prompt action. If this is not possible, the system must be run and examined at least once a month. Properly budgeting the time and expense of diagnostics is essential to water management.

High Pressure Problems

High-pressure irrigation systems are designed to distribute water over a large area in a short period of time. These systems use rotor heads, impact spray heads, regular spray heads and bubblers. The common problems that plague these types of systems are listed below, as is their best remedies.

Broken Heads, Leaky Seals and Fittings

Cause: Equipment ages, wears, or is poorly maintained.

Remedy: Replace faulty parts.

Erratic and Irregular Spray Patterns

Cause: Spray heads become clogged with particles and mineral deposits. This often occurs after work has been done on the line.

Remedy: Clean or replace filters and clean sprinkler head with a soft bristle brush or pipe cleaner (never with metal scarring devices, such as screwdrivers or wires), or replace head. If there is a lot of debris in the line, remove the last sprinkler, reduce line pressure at the valve and flush the debris by running the irrigation for several minutes.

Irregular Distribution of Water

Areas that are either too wet or too dry along a single line can occur for a number of reasons. The three listed below are the most common.

Cause: A sprinkler head was not replaced with one that matches the performance of the existing heads.

Remedy: Make sure that all new heads match the performance of the existing system.

Cause: The distance between the sprinkler heads is irregular, causing dryness in some areas and pooling in others.

Remedy: Dig up irrigation and re-install sprinkler heads, ensuring that both rate and distance are constant.

Cause: The environment has changed along one line due to factors such as change in amount of sun the area receives or the addition or substitution of different plants with different watering needs.

Remedies: Identify hydrozones and run new lines to them, or change individual heads to meet the performance needs of the immediate area (such as low-pressure in the shade and high-pressure in the sun), or try altering the environment (such as removing or pruning plants to reduce water needs).

Irregular Distribution of Water on Slopes

Cause: The pressure is always greater downhill.

Remedy: Replace lower heads with pressure regulating heads.

Misting

Cause: Heads are turned down too low or there is too much pressure (up to 50% of the irrigation can be lost to evaporation and wind drift in misting conditions).

Remedies: Install a pressure regulator just past the manifold, or replace sprinkler head with one rated for the psi.



The street and driveway are noticeably wet. The mist produced from these sprinkler heads has been caught by the wind. The water pressure needs to be reduced and/or the heads replaced.

Pooling Water Due to Slow Rotor Heads or Impact Sprinklers

Cause: Mechanically driven devices need a minimum amount of water pressure to operate properly; low pressure can stall a device.

Remedies: Check to make sure the pressure is up at the valve, replace head with one requiring less pressure, or remove one or two heads from the line to increase overall pressure.

Pooling Water Around Low Heads

Cause: Water always pools around the lowest lying sprinkler as the system drains to that point.

Remedies: Raise the heads, install heads with check-valves, or create a lower point in the line.



The sprinkler head pictured continues to dribble water long after the valve has been shut off. The ruts in the soil as a result are obvious. The remedies are to install a sprinkler head with a check valve, raise the head, or shore up the slope around the head with large drain rock.

Run Off

Cause: Sprinkler-caused runoff occurs either because the spray pattern is watering impermeable surfaces or the soil has reached its saturation point.

Remedies: Test spray pattern and fix overspray, or use pulse irrigation to irrigate areas prone to pooling and runoff. See the previous chapter *Controlling Your Controller* for a description of Pulse Irrigation.

Spray Deflection

Cause: Vegetation grows around sprinklers and obstructs and deflects spray.

Remedies: Prune vegetation, substitute lower-growing plants, change to drip irrigation, or change location of sprinkler.

Spray Distance is Weak

Cause: Weak flow occurs because of an undetected leak, a clogged manifold, or a drop in the water pressure.

Remedies: Look for a leak, ensure flow at the manifold, and clean the sprinklers, or remove some sprinklers from the line to increase line pressure.

Sunken Sprinklers

Cause: Healthy landscapes produce topsoil and over time it builds up and around a sprinkler, causing obstruction and deflection.

Remedies: Raise sprinklers, or lower grade of landscape.

Low Pressure Problems

Designed to reduce inefficiencies and water loss, low-pressure irrigation delivers water directly to where the plant needs it. These systems use drip (micro-sprayers, bubblers, emitters), inline emitter tubing, and soaker hose. The common problems that plague these types of systems are listed below, as is their best remedies.

Connectors, Fittings and/or Delivery Devices Pop Off

Cause: The pressure is too high in the system.

Remedy: Install a pressure regulator just before the manifold.

Cracking in Hose or Soaker Tube

Cause: Age, wear, exposure to sun, and temperature changes can all cause a hose to crack and open under pressure.

Remedies: Replace fractured, brittle sections of the hose and mulch regularly or bury hose.

Drippers, Emitters or Misters are Clogged

Cause: Systems without filters and/or self-cleaning heads are naturally prone to clogging.

Remedies: Clean filter or install filter just below the manifold, remove end-caps and flush the system, and clear obstruction or replace device.

Note: *Switching water supply, such as to reclaimed or well water, will increase particles in water and without a filter the system will become more prone to blockage.* ■

Dry Soil and Signs of Plant Stress Along Entire Line

Cause: The line may not be running long enough, the heads may be clogged, or there could be an undetected break in the line.

Remedies: Look for a leak, and double check the valve's run time and interval between watering. Then run the system and check performance of heads.

Leaks that are Reoccurring in Lateral Lines

Cause: Animals bite into tubing seeking water and damage it. This problem is especially common in summer and fall.

Remedies: Repair leaks, bury hose under 2" of soil and 3" to 4" of woody mulch.

Uneven Distribution of Water

Cause: Emitter hose, micro-sprays and soaker tubing will produce an uneven flow of water if the line's pressure is too low, the ground is too uneven, or the hose takes too many bends and curves.

Remedies: To increase the pressure in the line check the flow control screw, straighten the path of the hose, run the hose across a slope instead of down it, or remove some of the water devices to increase pressure.

Weeds Right Along the Hose

Cause: In dry landscapes weeds grow where the water is, which is typically right along the hose.

Remedies: Maintain a 2" to 4" layer of wood chips or woody mulch. Also avoid walking in the area because it compacts the mulch and sets the seeds.

Manifold / Valve Problems

The manifold is a device that controls the flow of water from its source to the irrigation line. Manifolds can fail and their most common problems, along with the best remedies, are listed below.

Automatic Manifold Will Not Shut Off

Cause: There are a slew of reasons why a manifold may not shut off and three of them are below.

1. The flow control screw may be tightened too far, which is common when a conventional system has been converted to low-flow. Manifolds need a certain level of pressure to operate properly.

Remedy: Install a pressure regulator immediately after the manifold and turn the valve's pressure back up.

2. The controller is producing a constant charge. This is identifiable by a warm solenoid.

Remedy: Fix or replace the irrigation controller.

3. The solenoid is damaged. This is identifiable by a small but constant flow of water through the manifold.

Remedy: Replace the solenoid plunger and its seat.

Automatic Manifold Will Not Turn On

Cause: There are two reasons why a manifold may not turn on.

1. The flow control screw may be tightened all way.

Remedy: Loosen flow control screw.

2. The solenoid is not receiving a charge.

Cause: There is a cut in the irrigation wire, the wires have rusted in the wirenuts, the solenoid is broken, or the controller is not sending a signal (the least likely cause).

Remedy: Run an electrical diagnostic and repair damage.

Seasonal Maintenance Calendar

Every type of irrigation system benefits from routine, preventive maintenance. The seasonal tasks listed below will not only improve the efficiency of your irrigation system, but extend its life too.

Spring

- Turn On / Adjust controllers.
- Replace batteries in controllers.

High Pressure Systems

- Adjust spray patterns and unclog heads.

Low Pressure Systems

- Unscrew end-caps and flush debris.

Note: *It is important to avoid working on wet soil. Soils compaction leads to all types of problems: low oxygen, changing levels of pH, noxious weeds, and poor plant health.* ■

Summer

- Adjust controllers to warming conditions.
- Modify, upgrade or fix the system after soil has dried.

High Pressure Systems

- Prune or replace plants that block spray.
- Repair or replace broken heads.

Low Pressure Systems

- Mulch for sun protection.

Note: *Southern California gets summer rains and periods of intense humidity; it is important to turn off automatic controllers during these times to avoid fungus and rot.* ■

Fall

- Adjust controllers: many Mediterranean plants go dormant this time of year and syncing irrigation to plant needs is essential.

High Pressure Systems

- Repair or replace broken heads.
- Adjust spray patterns and unclog heads.
- Run and check all axillary motors, valves and emergency devices.

Low Pressure Systems

- Bury and protect lines from rodents.
- Unscrew end-caps and flush of debris.

Winter

- Turn off or adjust controllers for minimal water needs.

Both Systems

- Winterize: In areas of freeze drain pipes and hoses of water, and insulate manifolds and any above-ground mainlines.

Low Pressure Systems

- If irrigating with hard water, flush system with an acid based solution. The acid will help dissolve deposits and improve systems performance and longevity.
- Remove clogged spray heads and emitters and soak them in vinegar to clean.