Landscaping:
Irrigation for Homeowners

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Landscapes and gardens in Wyoming need supplemental watering. The arid climate simply does not provide enough precipitation for most landscape and garden plants. To give residents some guidelines for managing watering, information on several different methods follows. Choose the system that's right for the situation, keeping in mind that a combination of hand watering along with one of the automated systems may be appropriate for the home landscape.

Fan sprinkler head for hand watering.

Hand watering

The least expensive of the options, this is the most difficult method to regulate. The amount of water applied to plants may be too much, not enough, or just right. But the only necessities are hoses and some sort of breaker or nozzle or a watering can. Breakers are sprinklers with many holes in them, which redistribute the water into gentle sprays. The breaker or nozzle will dissipate the water into smaller particles, which won't damage tender foliage or disturb the soil.

Hoses should be good quality and not prone to kinks, which can be major aggravations. Many manufacturers produce excellent hoses meant to last many growing seasons. The old green standbys are still available, but bright colors are now on the market, too. Colored hoses are easier to see, which can reduce accidental damage to them. Black hoses are also available, but water inside them will heat up very quickly. This may be dangerous as the hot water can burn plants or people.

Breakers should be used on the end of the hose to minimize plant damage, especially with higher water pressure. Extension handles are also available, usually made of aluminum.

Breakers on extension handles work well for hard-to-reach areas.

Sprinklers can be attached in series to hose sections.

Oscillating sprinklers are excellent for large areas of lawn or garden.

These allow longer reaches into the garden. Quick connect couplers can be used to swap out various sprinklers and nozzles. Also, make sure to check and replace washers annually.

Advantages of hand watering are many. For those who enjoy one-on-one contact with their garden plants, this method provides a time and a great excuse for checking each plant individually as it is watered. Problems such as insects, diseases, broken branches, weeds, etc., can be noted while watering and can then be taken care of quickly. Many commercial growers of horticultural crops, particularly in greenhouses, rely on hand watering as a means of monitoring crop progress.

Problems associated with hand watering are also many. First, the amount of water applied cannot be easily monitored, and some areas may get too much water, some not enough, while a few may get the proper amount. Also, many plant disease-causing organisms are spread by splashing water. Disease problems may also be aggravated by water left standing on plant foliage. Water runoff may also contribute to root disease spread along with leaching of nutrients. Lastly, since water amounts can't be regulated using hand watering, water may be wasted by over-irrigating.

Manual watering using sprinklers

This type of watering uses a sprinkler head on the end of a hose. The sprinkler is then positioned on the ground in the area to be irrigated, and then the water is turned on. This method may allow for better regulation of water amounts, but, often, the set-and-forget mentality steps in: the water is turned on, but then is forgotten.

Sprinkler types are numerous ranging from oscillators, to miniature tractors that use the hose as a road, to stationary heads with varying spray patterns. They are made of plastic or metal. Many plastic ones may be so lightweight they may not stay in place very well. Metal sprinklers are heavier and tend to stay in place. Avoid sprinklers that deliver mist rather than larger water droplets. Smaller water particles evaporate very quickly.

Set a timer so the sprinkler is not forgotten. To determine how long to leave the sprinkler in one place, set out several identical, tall, straight-sided cans (soup cans work well) in the area to be watered. Turn on the water and time how long it takes until about ½-inch or so of water collects in each can. This is how long it takes to apply ½-inch of water to the area. Adjust your sprinkler timing accordingly. Try to follow ET (evapotranspiration) ratings. ET is the amount of water evaporated from soil and transpired by plants. ET rates are often available in newspapers or on the Internet. Avoid exceeding ET rates when watering.

Consider manual watering in the winter every three to four weeks, unless snow is present. Make sure to disconnect

hoses after winter watering to avoid frozen water in the hose and potential burst pipes in the house.

One advantage of using manually placed sprinklers is time. As long as a timer is set so the sprinkler can be moved after applying the right amount of water, the gardener can be doing other things instead of standing in the yard with a hose. Also, this method is inexpensive and can be effective, provided the sprinkler head matches the shape of the area being watered.

Problems arise when the sprinkler hits unintended areas like sidewalks, driveways, and porches. These areas do not need watering, and water is wasted. Overhead sprinklers are typically about 50- to 60-percent efficient. Also, just like with hand watering, splashing water can aggravate disease problems on susceptible plants, so overhead sprinklers should be avoided in vegetable gardens. And overwatering can be an issue if the sprinkler is forgotten. High wind days can reduce effectiveness of this type of watering method even further, putting more water in one location and less in another. Hardscapes (such as sidewalks, decks, etc.) may degrade over time with additional moisture and runoff from over-irrigation.

Drip irrigation

Equipment needed for drip irrigation is more costly than hose-end sprinklers and also requires a bit of know-how to properly set up. The type of garden to be watered is important, too. It is easier to set up straight line drip systems in vegetable gardens, for example, than to zig-zag drip lines around annual and perennial garden plants.

Numerous types of hoses are available, ranging from soaker hose or drip tape, which oozes water through its entire length, to ¾-inch polyethylene pipe used to insert individual drip emitters. Some drip tubing has holes at set various spacings, from 3 inches apart on up. Some types will last longer than others and may need to be replaced annually. Poly pipe will last many years, unless it is cut or breaks open, while flexible plastic drip tape typically will last only one growing season but is appropriate for vegetable gardens.

Emitter types also vary. Individual emitters are available that may water only one plant or one container. Usually, these are fed from a poly pipe into which thin spaghetti tubing is inserted with an emitter on the other end. Some emitters are circular, made to ring a plant and apply water to the entire root system. Some emit localized sprays. Others drip in a localized spot. Tapes and emitters with very small holes will clog easily, especially if the water source contains particulates or is high in dissolved salts.

Drip systems can be regulated using timers and solenoid valves or can be turned on manually. If the latter is chosen, set a timer so the system is not forgotten.

Use frog-eye sprinklers for corners or smaller sections of lawn or garden.

Where to put drip irrigation lines

Place the drip tape, soaker hose, or emitters over plant roots. Additional emitters or lines may need to be added as large plants' root systems grow beyond the reach of the emitters. Soil type is also important. Closer emitter spacing will be needed in sandy soil, but they can be farther apart in heavier clay soil. The rules of thumb are to locate emitters about 12 inches apart in sandy soil, 18 inches apart in loamy soil, and 24 inches apart in clay soil. Also, if only one or two emitters are needed for loamy or clay soil, two or three may be needed for the same area of sandy soil.

Small fruits and vegetables in rows are great spots for drip tubing.

Permanent or temporary drip irrigation systems?

The system can be connected to any water supply, whether from a well, pond, or faucet. Temporary systems are designed so they can be easily moved from one spot to another.

Permanent systems require equipment placed in the following order from the water source: backflow preventer, control valve, filter, and pressure regulator. If the system is attached to an outside faucet, the faucet valve will generally be placed before the backflow device. Water can be turned on manually or using an electric solenoid valve and timer.

A 150 or 200 mesh filter can be used for most city water supplies and will be essential if the water is from a well or pond. Using Y or T types makes cleaning the filters easier than in-line filters.

Pressure regulators are important to meeting irrigation supply manufacturer specifications. Slope is important so add about 5 pounds per square inch (psi) to the operating pressure for every 10-foot rise in elevation above the point of connection to the water source. Adjust the pressure regulator by adding 5 psi for every 10-foot rise to the desired psi for the lines. Use separate zones for drip irrigation versus overhead sprinklers.

Water is distributed on a gallon-per-hour (gph) basis. Individual emitters often supply one to two gph. Fifty 2-gph emitters would require 100 gallons per hour of flow rate.

Rows of drip tubing can be attached to a main header leading from the water spigot.

There are many advantages to using drip irrigation systems. The largest advantage is the water is placed right where the plant needs it and little or none is wasted. Drip irrigation typically exceeds 90-percent efficiency. Also, foliage is kept dry and there is no splashing, helping to minimize disease problems in the garden.

No irrigation system is without problems, and drip is no exception. The system must be checked routinely to make sure no clogs develop, which can lead to dry spots and plant death. Also, drip systems are more costly to set up, requiring considerable lengths of polyethylene pipe and spaghetti tubing or long sections of drip tape or tubing. A filter and pressure regulator are must-haves with this type of system to prevent clogs and ruptures. Also, some types of plastic or rubber tubing or tape will need to be replaced annually. Drip systems may also need to be modified after plants become established and root systems expand and grow outside the emitter supply area.

Drip systems don't work very well on turf as it is very hard to evenly irrigate a large expanse of grass this way. For woody plants, their roots will reach beyond the extent of most drip systems after a few years, thus limiting the effectiveness of drip for large shrubs and trees. Soil composition can make a difference, too. In sandy soils, drip systems may need to be run more frequently since water will not spread laterally but will run downward instead. In heavier clay soils, however, drip works well as the smaller soil particles allow for more lateral movement of the water, so less frequent watering is needed.

Drip emitters: Pressure sensitive or pressure compensating?

Pressure sensitive types provide high water flow rate at higher water pressures. Pressure compensating types deliver more even flow rate at varying water pressures. Most types are pressure compensating.

Automatic sprinkler systems

Too often, these are set and forgotten, since most of the time they are on clocks. These are the most sophisticated, and most costly, systems used for irrigating landscapes. They require specialized equipment for installation, and large expenditures for pipe and heads. For large areas of turfgrass, this is probably one of the better options. Time clocks need to be changed according to weather patterns and seasons for this system to work most efficiently.

Equipment needed includes a reliable water source, time clock, solenoid valves, electricity supply, flexible black poly pipe, risers, and appropriate-sized sprinkler heads for the area to be watered. Often, these systems are complex and should be designed and installed by professionals. Each installation

will vary in the flexible pipe needed, sprinkler head types to be used, timing devices, and other equipment.

Advantages of automatic systems include even and consistent water application (but only if the system is designed and installed properly) and ease of timing using irrigation clocks. Rain sensors are also available that detect precipitation and will shut the system off during showers. Depending on the time clock used, automatic systems can be set up in separate zones allowing for different settings for plants with differing irrigation needs. They can be set to come on early in the morning so water is available for landscape plants the rest of the day. A well-designed and working system can enhance property values, too.

Problems can occur. Since water delivery pipes are buried underground, fixing leaks and breaks is messy. They can also be hard to find. Sprinkler heads can be damaged by mowing equipment or even normal yard activity if they are not installed correctly. Pop-up sprinkler heads should be flush with the soil line. If a system is set up without a rain sensor, it will operate even in a downpour, wasting considerable water. Rain sensors are easy to install and save water and money over time. Since automatic systems spray water overhead, the spread of disease problems, especially on shrubs and herbaceous plants, can also be exacerbated. Unless the pipes are designed to automatically drain, they will all need to be blown out with air each fall before freezing weather sets in. This requires an air compressor to push out water remaining in the system. Major pipe and head damage can result if this step is not taken. Be sure to check the irrigation system periodically during the growing system to make sure heads are working properly and there are no leaks. Solenoid valves should also be checked frequently for leakage.

Resources available – Web sites, bulletins from other cooperative extension services, etc.

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Bubblers are useful in narrow garden areas.

Sprinkler head types for automatic systems

Pop-ups are those that automatically rise when the water is turned on; they do not rotate. Best suited for moderate-sized lawns and irregular or curved areas, these are available in 10, 12, and 15 feet radius and quarter, half, and full circle configurations. These should pop up higher than the grass is tall, so at least 4 inch types should be used. Pop-ups work best at 30 to 40 psi and will deliver 1 to 2 ½ inches of water per hour. Pop-ups are less susceptible to above ground breakage.

Rotor heads rotate either by gears or impact. These are better for large lawn areas, bigger than 30 feet wide. Spray patterns vary. Some are adjustable from about 15 degrees to a full circle. Some are adjustable at 15-degree increments, while still others are pre-set at quarter, half, or full circles. Rotors provide better uniformity and do not apply as much water as pop-ups, supplying about ¼- to ¾-inch of water per hour. Because rotor or impact heads are generally above ground, they are more susceptible to damage from mower and normal yard activity. More care is needed in their placement. Avoid misting, which can lead to high evapotranspiration (ET) losses.

Pop-up impact sprinklers are commonly used in automated lawn irrigation systems.

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