

Sprinkler Types Used for Lawn Irrigation

Different types of sprinklers are most effective to water different planting areas of the home grounds. For grass, pop-up and rotor sprinkler heads are generally used. Other types include drip emitters and micro-spray heads for shrub areas, flowerbeds, and vegetable gardens. Because each type of sprinkler delivers water at a different rate, do not mix sprinkler types in a zone.

Pop-Up Heads

This type of head is used for general watering, like the lawn area, and is a generic name for sprinklers that automatically “pop up” and do not rotate when running. In plastic pop-up heads, retraction is caused by a spring.

Delivery pattern – Pop-ups are best suited for moderate size home lawn areas (larger than seven to ten feet wide up to 30 to 45 feet wide) and irregular or curvilinear areas.

Pop-up spray nozzles are most common in 10, 12, and 15 feet radius and in quarter-circle, half-circle and full circle. A pop-up spray nozzle can usually be adjusted down about 30 percent, using the nozzle’s adjustment screw. Therefore, a commonly available ten-foot nozzle can be reasonably adjusted down to seven feet. Any greater adjustment would significantly distort the pattern, resulting in poor application efficiency



The spray pattern of a pop-up head depends on choosing nozzles to water quarter-circles, half-circles, or full circles. A few manufacturers offer a variable arch nozzle. However, do not use adjustable nozzles where a fixed nozzle would work, as the pattern predictability of the adjustable nozzles is not as good as that of fixed nozzles. Some specialty patterns to handle narrow rectangular turf areas are available, (often called “end-strip”, “center-strip”, or “side-strip” nozzles). However, nozzle performance is not as predictable or as uniform compared to quarter-circle, half-circle, or full-circle nozzles.

Pop-up height – For uniform distribution, the sprinkler heads should rise above the grass height, making the 4” pop-up style most popular. High pop-up head, with a 12-inch rise, are suitable for ground cover area and lower flower and shrubs beds.



Pressure – Pop-ups work best with water pressure at 30-40 psi. The water pressure at some homes can be significantly higher and an in-line pressure regulator will be needed. A sprinkler producing a “mist cloud” around the head is a common symptom of excessive pressure. This not only wastes water but also can give a distorted distribution pattern and lead to increased maintenance problems. Some heads come with built-in pressure regulators that ensure sprinkler heads distribute water at the manufacturer’s recommended rate. In addition, a grade change of more than eight vertical feet on a single zone will result in significantly higher pressure at the lower end, creating distribution problems.

Precipitation rate – Pop-ups have a high water delivery rate (**precipitation rate**) at 1 to 2½ inches per hour. At the typical rate of 1½ inches per hour, the pop-up head would apply ¼ inch of water in just 10 minutes.

Rotor Heads

Rotor heads mechanically rotate to distribute the spray of water. Impact, gear-driven, and stream rotors are the three types of rotors used in home lawns. Rotor heads are excellent for use in larger lawn areas because of their larger throw distances – from 30 feet up to 90 feet in some commercial-line heads. The spray pattern depends on the head. Many can be set at any angle from 15° up to full circle. Some are adjusted at 15° increments. Others are designed for quarter-circle, half-circle, or full-circle. Rotor heads typically operate at 40 to 50 psi, although stream rotors can operate well at lower pressures.

Rotors can provide more uniform water distribution than pop-up heads and have much lower precipitation rates – so they take much longer to apply the same amount of water as a spray head. As a rule of thumb, rotor heads deliver water at a rate of ¼ to ¾ inch per hour. The slower precipitation rate can be an advantage on clayey or compacted soils where water can be slower to infiltrate.

Impact or impulse heads rotate as the water stream coming from the nozzle hits a spring-loaded arm. Impact heads tend to experience fewer problems (plugging) with marginal (dirty) water quality.



Gear-drive heads use the flowing water to turn a series of gears that rotate the head. Compared to the impact heads, gear-drive heads are quiet to operate.



Stream rotor heads throw rotating streams of water. The precipitation rates of these heads are lower than that of pop-up spray heads, making them ideal for



use on slopes and on soils that are slow to absorb water. Their application pattern is less likely to be disturbed by wind. Their adjustable throw distances make them ideal for use in small lawns and on smaller strips of turf where conventional rotors don't work well. These heads are somewhat prone to plugging when used with "dirty" water that is not filtered properly. Most better pop-up spray head bodies will accept stream rotor nozzles; changing from pop-up sprays to stream rotors can turn a marginal irrigation system into one that performs much more efficiently. If changing from pop-up sprays, remember to adjust run times appropriately (must run for a total of 40-50 minutes to apply sufficient water).