Landscape Irrigation Equipment
Part 3: Microsprayers & Microsprinklers

Microsprayers (and microsprinklers) are tiny, plastic sprayers (or sprinklers) typically mounted on some type of plastic stake. The microsprayer is connected to drip tubing with a barbed coupling and a length of spaghetti tubing. Microsprayers are something of a compromise between drip irrigation and normal sprinkler irrigation – they are less efficient than drip emitters but more efficient than sprinklers.

Figure 1. A microsprayer on a stake and a greenhouse microsprinkler with a drip-control device.
(Photo credit: Bryan Smith)

Flow rates for microsprayers range from 5 gallons per hour up to 60 gallons per hour or more. Microsprayers are sold in a variety of styles, patterns, and diameters of throw. They are used extensively in greenhouse and orchard applications.

Microsprayers are especially useful in areas with coarse, sandy soils. We have already discovered that sandy soils are well-drained see (HGIC 1805, Landscape Irrigation Management Part 6: Soil Type & Irrigation Frequency). Water applied to a sandy soil moves downward through the soil quite quickly. The application rate of a drip emitter is quite slow - so slow, in fact, that in a sandy soil the water applied by the emitter will move downward into the soil with little lateral movement away from the emitter. In some coarse sands the water may only move 4 to 6 inches horizontally in the ground from the emitter. This small lateral movement may not provide water to an adequate amount of plant roots for proper growth (there is some discussion on this, but providing water to 50% of the plant’s rooting area is generally considered adequate).

The microsprayer sprays water out over a large area, providing water to a much larger rooting area in sandy soils. Citrus groves in sandy areas rely almost exclusively on microsprayer systems for this reason. This also regrettably provides some water to vacant areas that weeds may use.

In finer soils (such as loams and clays) the water moves downward more slowly, which allows more lateral water movement from the emitter in the soil. Movements of 2 feet or more from the emitter are not uncommon in clays and clay loam soils. In this case microsprayers would not be required.
**Spray Stakes**
The potting media used in many pots is quite porous and well-drained. In some instances water provided by a drip emitter to these pots will move directly downward through the media with almost no lateral movement. Very few plant roots receive the water provided due to this problem.

Spray stakes are a specialized type of microsprayer used for this application. The spray stake is placed in one edge of the pot and attached to drip tubing with a short piece of spaghetti tube. When the system is turned on the spray stake sprays a very small pattern of water that covers the entire potting media surface – and very little else. The entire rooting area in the pot is irrigated using the spray stake.

![Spray stakes](image)

**Figure 2. Spray stakes used for pots and containers. (Photo credit: Bryan Smith)**

**Filtration & Pressure Regulation**
All microsprayer systems require some type of filtration and pressure regulation. These systems operate quite well with a water pressure of 20 to 30 psi, but water pressures higher than 40 psi can cause ruptures in the tubing or connections to “pop” out. Pressure regulators maintain the optimum pressure for the system, regardless of fluctuations in the irrigation system pressure.

Filters are also required for microsprayer systems due to the tiny openings in the microsprayers. More information on pressure regulators and filters is provided in brochure HGIC 1814, *Landscape Irrigation Equipment Part 5: Filters & Pressure Regulators*.

**Problems for Microsprayer Systems**
There are three special problems that may cause difficulty for a microsprayer system regardless of the filtration system used. The first is pond or surface water. Surface water naturally contains a large amount of sediment and organic matter. The high load of sediment can plug a normally-sized screen filter in a short time. Usually some type of self-cleaning screen filter or a sand media filter (similar to a pool filter) is used to prevent frequent plugging.

Surface water will also contain algae that may grow on the filter screen, causing frequent plugging problems. Usually a small but continuous injection of chlorine into the irrigation water will prevent algae problems. Chemical injection of any type requires certain safeguards to be installed in the irrigation system to prevent backflow into the water body. For a small drip system in a landscape it will be less expensive (and much more convenient) to use well or municipal water for the drip system and surface water for the sprinkler system.

The second potential problem for a drip system is iron in well water. The iron will remain in a liquid form and flow through the filter regardless of the filter mesh size. When the iron leaves the drip emitter or microsprayer and contacts the air, it will oxidize into iron oxide, which is a solid. In a normal sprinkler system with large nozzle openings this is not a problem, but iron oxide deposits will plug an emitter or microsprayer in a very short time.

If the homeowner suspects that iron is present in the well water to be used with a drip system, the first course of action is to have the water tested for iron. If the iron content is less than 0.1 parts per million there will not be a plugging problem. If the iron content is 0.3 parts per million or more there will definitely be a plugging problem. Test the water before installing a drip system if there are reddish-brown stains in the sink or tub.

The third problem is limited to microsprinklers with moving parts. In some cases, landscapes with high populations of spider mites may notice that some mites spin their webs on the microsprinkler - and in doing so prevent the microsprinkler from spinning.
Water will still exit from the microsprinkler, but if the spinner does not move, there will be a single thin area being irrigated. In these circumstances care must be taken to either correct the spider mite problem or utilize microsprayers instead.

**Summary**

Microsprayers are an excellent tool to use in well-drained soils to help enhance irrigation of more of the plant rooting area.

Excerpted from the 2007 *South Carolina Master Gardener Training Manual*. 

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