

Subsurface Drip Irrigation for Your Lawn

If you are replacing or putting in a new lawn or perennial bed, subsurface drip irrigation has many advantages over sprinklers in certain situations and may be right for your needs. It's a robust technology that has proven reliable even in the harshest conditions. To avoid damage to the underground lines from replanting, use subsurface drip only in turf and perennial areas that are going to be left alone.

Buried drip watering has many advantages over sprinkler irrigation:

- no water loss from evaporation
- no overspray even in small or irregular areas or on nearby windows
- the system is not subject to damage from foot and vehicle traffic or vandalism
- no runoff on slopes, and no water on sidewalks or fences
- the number of valves can be reduced—more area can be watered with less available flow
- emitter line spacing, and thus precipitation rate, can be adjusted to account for berms, slopes and flat areas
- grass roots grow deeper to seek the water, making the lawn more drought resistant, and reducing thatch build-up

Layout

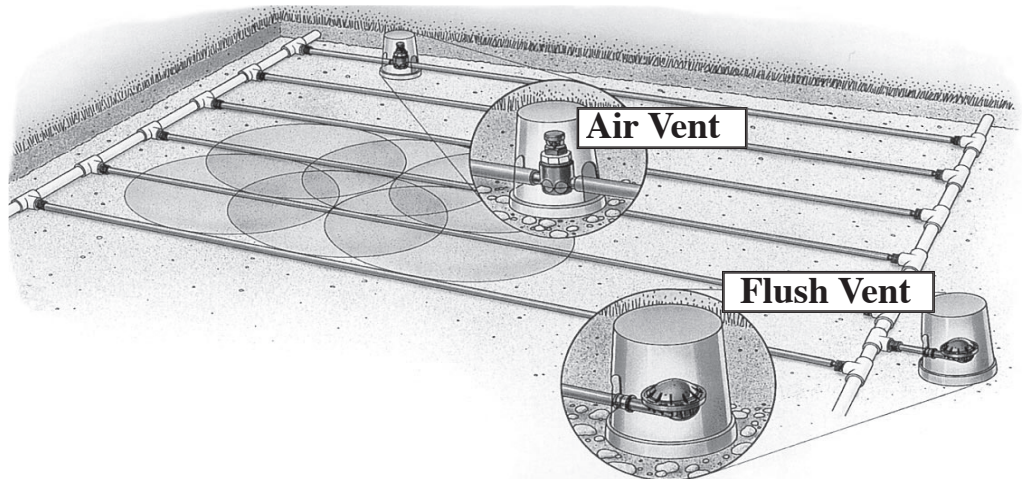
A subsurface irrigation system for turf is a simple grid of drippers formed by parallel emitter lines. Emitter lines consist of polyethylene tubing with drip emitters installed by the factory at specific intervals. Subsurface emitter lines do best when buried 4-6" below the surface and installed with air vents and automatic flushing ends. Maximum spacing, for use in heavy clay soils, is 18" spacing of lines with emitters 18" apart on the lines. In lighter soils, the lateral water spread is not as great and tighter spacing is needed. The closest

spacing ever needed is 12" spacing of lines with emitters 12" apart on the lines.

The emitter lines are placed 4 to 6 inches below the soil. Laterals are connected by headers on both ends. The second header provides a method for flushing the lines by an automatic flush valve, which should be located in a valve box

flat areas should have normal spacing and the sloped areas should have a greater distance between laterals. Laterals next to hardscapes should be located no further than 4" from the edge to prevent dry strips.

Once drip emitters are buried, root intrusion into emitter paths becomes a concern. One approach to this problem



at the low end of the system.

The valve flushes any sediment from the tubing each time the system starts up, and then closes down to allow normal system operation. An air vent should be installed for each zone at the high point to minimize suction of sediment into the line when the water drains. The air vent can be in a buried valve box with adequate drainage. **If an antisiphon valve is used, an additional air vent is not needed.**

Emitter lines are placed under the soil in one of three ways. The first is hand trenching, the second is a mechanical trencher that cuts a narrow slot, and the third is with a pipe pulling vibratory plow. There is no best method, but usually site conditions suggest the most economical approach.

If berms, slopes, and flat areas of turf exist on the same valve, the berms should have laterals closer together, the

is produced by Toro®, manufacturer of DL2000Rootguard® emitter line with Treflan® (a herbicide) fused into the plastic of the emitter path. When buried, Treflan is slowly released over fifteen to thirty years to prevent root growth into the emitter.

Another solution comes from Netafim®, manufacturer of TechLine®. Their answer to root intrusion is pulse irrigation (shorter more frequent cycles), and each emitter has a cavity that drains fully between the internal flow path and the emitter opening.

Precipitation rate can be calculated for a subsurface irrigation using the following formula:

$$\frac{230.1 \times \text{GPH of emitters (eg 1/2 or 1 gph)}}{\text{spacing along line} \times \text{lateral line spacing (both in inches)}}$$

Note: The answer to the equation will be in *inches per hour*.



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