Drip Goes Mainstream

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Regulations, innovations make SDI a management must-have

Major Manufacturers of SDI Products

DIG Corp., Vista, Calif., 800-322-9146, *www.digcorp.com* Hunter Irrigation, San Marcos, Calif., 760-744-5240, *www.hunterindustries.com* NDS, Inc., Lindsay, Calif., 559-562-9888, *www.ndspro.com* Netafim U.S.A., Fresno, Calif., 888-638-2346, *www.netafimusa.com* Rain Bird, Azusa, Calif., 800-724-6247, *www.rainbird.com* Toro Irrigation, Riverside, Calif., 877-345-8676, *www.toro.com*

Landscaped and maintained residential, commercial and public sites vary. No two are exactly alike. It's unlikely any single cultural practice could produce the best results on all of them. This is especially true for irrigation. In addition, recent advances in technology are compelling reasons to re-examine subsurface drip irrigation (SDI).

There are other reasons.

Water agencies in a growing number of regions are starting to restrict overhead irrigation. Texas now mandates that drip irrigation is the only watering allowed for parkways less than 40 inches in length or width. Since 2010, California has a similar provision. The only other practical option would be to replace plants and ornamentals in the parkways with stone and desert plants, an option that many people would consider unattractive and unacceptable.

California also requires landscapers to use "appropriate technology" for new single-family residences with gardens larger than 2,500 square feet, or to existing single-family homes where the landscaped area is more than 5,000 square feet and undergoing a changeover. Changes and regulations are

encouraging the use of SDI. Local water regulations can also be more restrictive than state laws.

“Drip irrigation is the fastest growing segment of the irrigation industry,” says Art Elmers, Northeast district sales manager for Netafim, a pioneer in drip irrigation. Elmers has been around almost as long as SDI for landscapes. He began cutting his teeth on irrigation at 14, helping his father who was a golf course superintendent—that was about 40 years ago. He now sells millions of feet of dripline annually in his territory.

“Drip is just one component of a functioning, well-designed irrigation system. A smart controller is another,” adds Elmers. While drip irrigation is considered to be the most-efficient way to irrigate, SDI can still waste water like any other system if not controlled (scheduled) properly. The industry accepts that SDI is more efficient than overhead irrigation. Just look at the number of manufacturere offering it since Netafim started in 1965, says Elmers.

While most contractors are familiar with using SDI on ornamental trees or flower beds, fewer irrigators have used it to water turf; that appears to be changing.

Significant cost savings

Elmers tells of a recent project on Martha’s Vineyard, Mass., where drip was installed on the landscape of a multimillion-dollar home. The homeowners opted for SDI because they’ll be watering with captured rainwater from a cistern. Using 40 to 60 percent less water on the property compared to rotors or spray heads allows them to significantly reduce the size of the cistern, says Elmers, which saved them thousands of dollars in rain catchement costs. The same thought process could as easily apply to irrigating a green roof, he adds.

Before designing your drip system, test the soil where you will be installing it. Since sandy, loam and clay soils all drain at different rates, you will have to account for this when installing dripper line, emitters and also when establishing run times. It may be necessary to “cycle” run times—scheduling the system to run intermittently to allow water to spread throughout the rootzone without pudding—in heavy soils. IMAGE COURTESY OF NETAFIM.

Irrigation suppliers are constantly tweeking and improving their products to be more efficient and easier to use, and this has been especially true of SDI. Exciting new products are starting to be used, and SDI is expected to become mainstream sooner than later.

Elmers points to advances made by manufacturers to eliminate plant root intrustion that clogs dripline emitters. Historically, this has been one of the concerns against the use of SDI. Different suppliers now offer different technologies to reduce the likelihood of this happening. Netafim uses a

“physical root barrier” to keep roots at bay, says Elmers. Rain Bird offers XFS Dripline with Copper Shield, while Toro promotes a seven-year guarantee against root blockage on its DL2000 Dripline. Other suppliers, such as Dig Corp., NDS and Hunter, offer their own solutions.

Another issue that challenged SDI in a previous generation was dripper emitters delivering water unevenly, with the emitters at the end of a run dispensing less water than on those on the front. This, too, has been addressed as manufacturers now offer pressure-compensating (PC) drippers, says Elmers. This has made the irrigation of uneven properties or slopes more efficient.

Emitters are also available with a check valve (CV) feature. Netafim’s CV inline tubing product family has built-in check valves, for example, which hold the water in the tubing after shutdown, preventing drainage at the low emitters.

Knowledge and adoption of SDI for turfgrass has, to this point, been mostly regional. The Southwest is the epicenter of SDI.

Drip Pros and Cons

First the Pros:

- Water conservation
- Eliminates water runoff and overspray
- Eliminates staining and damage to hardscapes, buildings and trees
- Allows safe use of recycled water
- Average reduction of water usage by 40 percent
- High water application efficiency
- No blockage of water by growing plants
- Good for slopes and odd-shaped areas
- Moisture within the rootzone can be maintained at optimum capacity
- Allows safe use of recycled water
- Minimizes soil erosion
- Minimizes weed growth
- Highly uniform distribution of water by controlling output at each emitter
- Lower labor cost
- Supply can be regulated by adjusting valves and by the placement of drippers
- Fertigation can be included with minimal waste of fertilizers
- Foliage remains dry, reducing the risk of plant diseases
- Operated at lower pressure with reduced energy costs compared to other types of pressurized irrigation

Now the cons:

- Initial cost can be more than overhead systems
- Clogging: if water is not properly filtered and the equipment not properly maintained clogging can result

- Difficult to activate topdressed fertilizers or herbicides that require moisture
- Waste of water and time if not installed properly
- May not wet soil enough for seed germination in lighter soils. Requires careful consideration of the installation depth
- Salinity could become an issue because there will be little to no leaching; without sufficient leaching, salts applied with irrigation water may build up on the rootzone, usually at the edge of wetting patterns. Conversely, drip avoids the high capillary potential of traditional surface-applied irrigation that can draw salt deposits up from deposits below. (Primarily a problem in the West where there is limited rainfall.)
- Customers' perceptions that the system is not operating because they can't see the water being sprayed.

Drip saves water

California, with its 37-million-plus people and the dry climate in all but the nothern part of the state, remains on the forefront of drip use for landscapes. And for good reason. Finding enough fresh water to supply the state's agriculture, to generate power, and to meet the needs of its growing population has forced the state to make hard decisions about who gets the water and how much. The landscape and turfgrass industry was long ago singled out as a sector required to reduce its water use.

Kurt Heitmeyer and Jose Angulo, owners of JKT Associates, Sonoma, Calif., installed Eco-Mat almost two years ago, a relatively new drip product from Hunter Irrigation, to irrigate turfgrass on a residential property in Napa, Calif. He used it to water about 2,000 square feet of newly laid Bonzai dwarf tall fescue sod at a Napa, Calif., residence. The irrigation supplier describes the product as an "engineered combination of inline tubing and fleece."

Says Heitmeyer, "The clients didn't want to use spray irrigation because they felt it would stain the bluestone near their pool. The possibility of getting overspray on the pool cover was a consideration, too."

The contractor prepared with a gravel base 18 inches below grade, and added topsoil to receive the 24-inch-wide strips of Eco-Mat. He then added another layer of soil over the drip material. He tested the SDI product to make sure it was dispensing water evenly before laying the sod.

Subsurface drip irrigation is an excellent option for irrigating small, irrigularly shaped or other difficult-to-water areas on a landscape. IMAGE COURTESY NETAFIM.

"We put it down in the middle of last August and we had a successful establishment even in the heat," he says. He used "some" overhead watering initially and an application of liquid fertilizer to get the grass off to a strong start. From then until now, the system has performed excellently on its own, he says.

Patrick Crais, owner of Blue Watchdog Systems near San Diego, has used the Eco-Mat on two projects, one under turfgrass and the other to water shrubs. More than a year ago he used Eco-Mat with a Cal Sense controller to irrigate approximately 500 square feet of tall fescue turfgrass surrounding a speciman Blue Atlas tree on an estate property.

“It’s a very public area on the property. It gets a lot of traffic,” says Crais. “So far, it’s worked very well.”

Crais, who describes himself as a “soils guy,” says the the consistent nature of soils on the site made installation of SDI there easy. Indeed, the types of soil on a site determines how the system should be designed and installed.

Know the soil

“You must know your soil type,” stresses Elmers. “Drip relies on capillary action to be effective. Capillary action varies depending upon soil type. You need to know soils to know how much water should come out of the emitters. A heavy clay soils drains slower than a sandy soil, so you would apply water at different rates on the two. For clay soils, you would apply less water at one time to allow the water to slowly soak in.”

Apart from the practical and horticultural reasons for considering drip irrigation (See “Drip Pros and Cons”), there’s the environmental side, says Mike Garcia, who has been in the green industry for more than 30 years and is founder and owner of Enviroscapes, Redondo Beach, Calif.

“I’m a hard-core environmentalist. I’ve always been an environmentalist,” says Garcia. “The drought in Southern California is not over. It’s never been over because we’ve never had enough water to begin with. The best source of water is conservation.”

SDI Terms You Need to Know

Branch line: Polyethylene tubing that attaches to the mainline to bring water to a plant or to an area of a zone. Branch tubing is generally .25-inch or .5-inch tubing.

Emitter: Also called a dripper, this is a product used in drip irrigation to regulate the flow from the mainline or branch line tubing to the area to be irrigated. Emitters can be placed in the mainline or branch line, at the end of .25-inch branch line, or preinstalled inside emitter tubing.

Filter: A filter removes particles from the water that might otherwise plug up emitters. The size of the filter screen is expressed as mesh, with larger numbers denoting smaller openings in the screen. In drip irrigation, Netafim 120, 155 and 200 mesh are common sizes.

Fitting: A part such as an elbow, tee, hose beginning, hose end, coupler or other piece used to connect tubing.

Flow (GPH or GPM): The amount of water available for the system. It’s

expressed as either GPH (gallons per hour) or GPM (gallons per minute).

Friction Loss: As water moves through tubing, pressure is lost due to friction in the line. In tubing runs of more than 200 feet, there can be a significant drop in pressure that can lower the output of some (non-pressure compensating) emitters or sprayers at the end of the line. Friction loss can increase if the tubing goes up hill or decrease if it goes down hill. To decrease friction, a larger size of tubing can be used.

Hydro-zone: A hydro-zone describes a group of plants that need watering at a similar frequency. For example, if you have shrubs and trees, you may want to water the shrubs every other day and the trees once every two weeks. This would not be possible within a single hydro-zone. Establishing two hydro-zones, one for the trees and one for the shrubs, would allow you to water the two groups to their individual needs. Within a hydro-zone, if one plant needs more water than another it can be given an additional emitter or an emitter with a larger flow.

Los Angeles-area landscaper Mike Garcia, founder and owner of Enviroscapes, has been installing drip irrigation systems for years, even for lawns. He says that drip generally decreases his clients' landscape water bills by as much as 60 percent.

Mainline: Polyethylene tubing used to carry the water from your water supply to your system. There are two commonly used sizes: .5-inch with a capacity of around 240 GPH, and .75-inch with a capacity of around 480 GPH.

Manifold: A collection of valves and associated parts used to distribute water to multiple zones.

Pressure (PSI): Pressure is the force pushing the water flow. This is expressed in pounds per square inch, or PSI. A pressure regulator can be used to reduce pressure to a range that works well with the particular products you are using. Most of our products operate best between 20 and 40 pounds of pressure. If your water pressure falls within this range you may not need a pressure regulator on your system. If you are using pressure-compensating emitter tubing, emitters or sprayers, the range of pressure can usually be between 10 and 50 PSI.

Pressure Compensating: A pressure-compensating emitter delivers a consistent amount of water over a specified range of pressures. This is useful in situations where tubing runs are long or the tubing runs over hilly terrain. Pressure-compensating emitter tubing typically operates in a range of 10 to 50 PSI.

Soil: With drip, the density of the soil affects how far the water flows from the emitter. Light, sandy soils require a higher rate of water application. Heavy clay and clay loams generally benefit from a lower water application rate

Supply: This is a non-standard use of the term, but it is used to indicate how you connect to the water system.

Valve: In drip, there are two types of valves, manual valves and automatic valves, used with an electric controller or within a battery timer to automate the watering with the system.

Water Pressure (PSI): Water pressure describes the force behind the water in a line and is expressed in pounds per square inch (PSI). In drip systems, the pressure is commonly limited to 30 PSI with a pressure regulator. With non-pressure compensating emitters and sprayers, the higher the pressure, the more water will be put out in a given period of time.

Water Source: The water source can be a municipal system, a well, a rainwater catchment system, or wherever your water comes from. Usually city and well water are easy to filter for drip irrigation systems. Some well water has special filtering needs. The quality of the water source will dictate the type of filter necessary for your system. Sand, silt, minerals, organic matter and rust bacteria are specific concerns.

Glossary courtesy of www.dripworks.com.

While Garcia says he doesn't "push" SDI on his clients, it's attractive to some of them anyway because they want their turfgrass, but they're conservation minded, too. Of course, the prospect of reducing their water bills by using as much as 60 percent less water on their landscapes is appealing, as well.

Garcia has been using Rain Bird's XFS Dripline with Copper Shield on his clients' properties, and both he and his clients have been pleased with the results. "They make their money back with water savings in six months to a year," he says.

View SDI as just another another tool to use on your clients' properties. Depending upon too many factors to list here (climate, water use regulations, plant material, soil conditions, etc.) it may be the most appropriate tool. You will almost certainly encounter landscape challenges where it's a better option to overhead spray. Remember the saying: "If your only tool is a hammer, every problem looks like a nail."

For more information, check out "Great Sources of Information about Drip Irrigation" at http://bit.ly/PpFJQG.

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