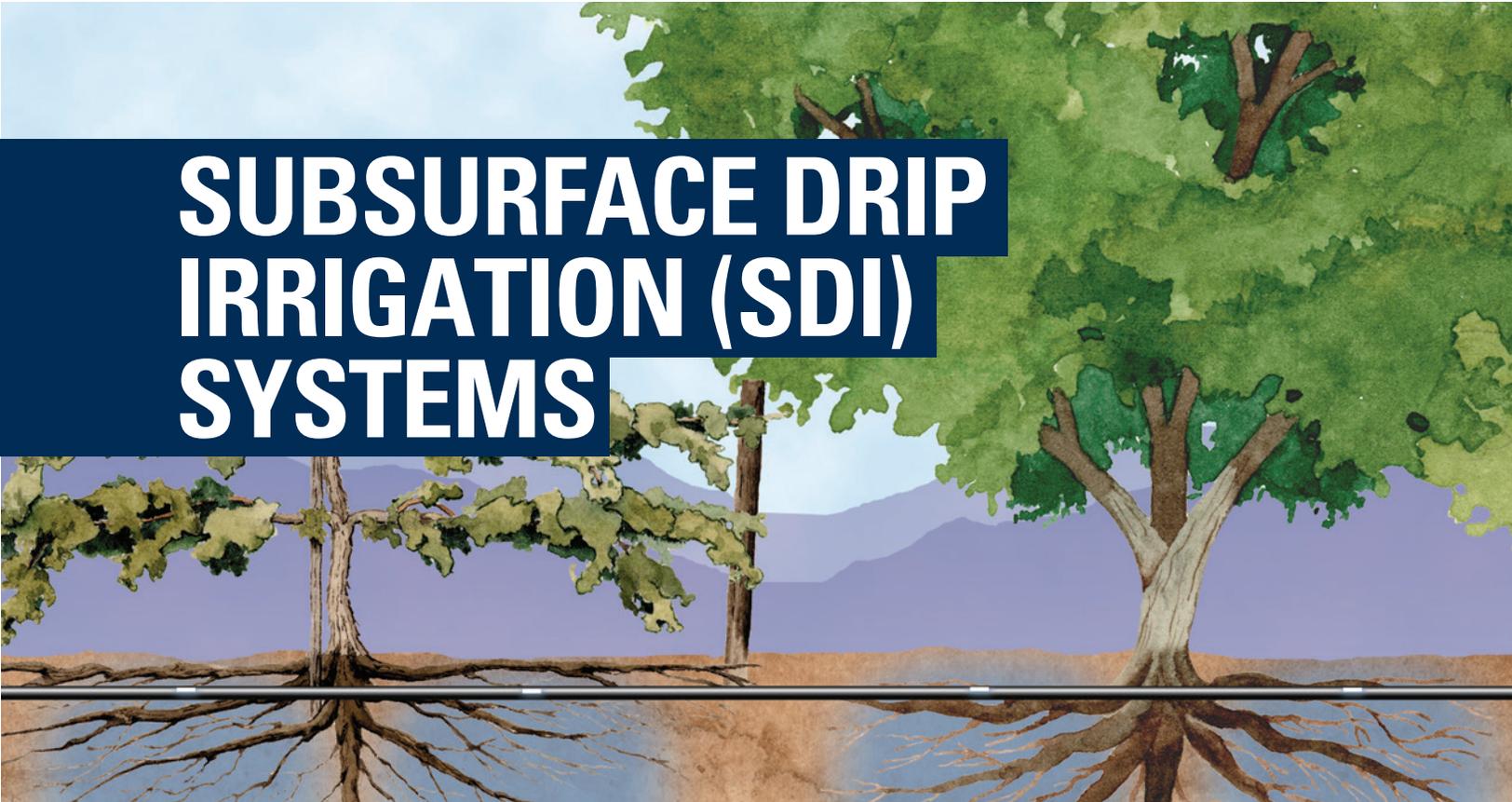


NETAFIM USA



SUBSURFACE DRIP IRRIGATION (SDI) SYSTEMS

ADVANCED DRIP/MICRO IRRIGATION TECHNOLOGIES

SUBSURFACE DRIP IRRIGATION

QUALITY AND DEPENDABILITY FROM THE LEADERS IN DRIP IRRIGATION

For over 50 years, growers world-wide have counted on Netafim for the most reliable, cost-effective and efficient ways to deliver water, nutrients and chemicals to their crops. This tradition continues with subsurface drip irrigation (SDI), the most advanced method for irrigating agricultural crops. With proper management of water and nutrients, a subsurface drip irrigation system can deliver maximum yields and optimal water use efficiencies.

Drip irrigation, whether surface or subsurface, often results in increased production and yields as well as increased quality and uniformity. It provides more efficient use of the applied water resulting in substantial water savings. The flexibility of drip irrigation increases a grower's ability to farm marginal land.

WHAT IS SUBSURFACE DRIP IRRIGATION (SDI)?

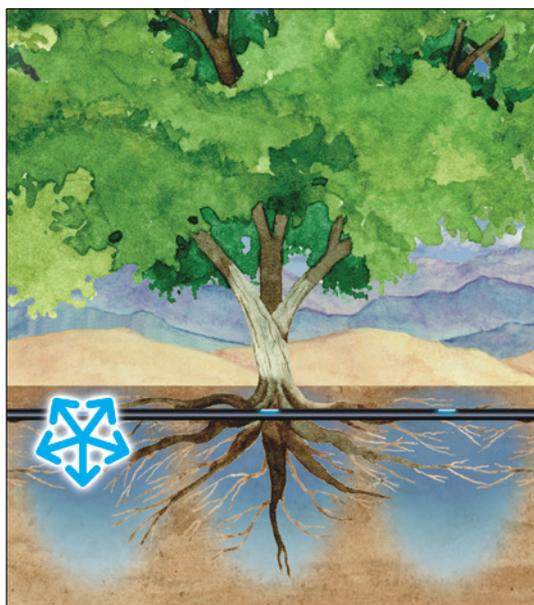
Subsurface drip irrigation is a variation on traditional drip irrigation where the dripline (tubing and drippers) is buried beneath the soil surface, rather than laid on the ground, supplying water directly to the roots. The depth and distance the dripline is placed depends on the soil type and the plant's root structure. SDI is more than an irrigation system, it is a root zone management tool. Fertilizer can be applied to the root zone in a quantity when it will be most beneficial - resulting in greater use efficiencies and better crop performance.

SUBSURFACE DRIP IRRIGATION (SDI) ADVANTAGES

The key benefit of a surface micro-irrigation system is to apply low volumes of water and nutrients uniformly to every plant across the entire field. SDI delivers many advantages beyond surface irrigation.

SDI ADVANTAGES

- Eliminates surface evaporation
- Reduces crop stress
- Extends life of irrigation system
- Prevents weed germination
- Eliminates herbicide wash-out
- Less salts from efficient irrigation
- Reduces labor requirements
- Reduces maintenance costs
- Safe and efficient delivery of fertilizers and chemicals
- Reduces animal, human or mechanical damage



WATER MOVEMENT IN SDI SYSTEMS

When applied slowly to the soil at a single point, water moves through the soil in two ways: 1) downward pulled by gravity and 2) outward and upward, pulled by capillary action.

THE NETAFIM ADVANTAGE

Netafim USA offers the widest selection of subsurface drip irrigation products and superior system accessories available in the industry. Designed to work together, a complete system from Netafim USA is made of top-quality products, ensuring a successful SDI system.



STEP 1

SITE EVALUATION - SELECTING THE BEST EMISSION DEVICE FOR YOUR APPLICATION

Site evaluation is the first step in developing a successful SDI system - it requires assessments of the water quality and availability, soil and topography. Listed below are some general guidelines to help in the selection of an emission device for your specific application.

WATER QUALITY AND AVAILABILITY

Properly addressing water quality issues often solves most problems associated with the successful operation of the SDI system:

- Physical - suspended particles and filtration
- Chemical - pH, iron, bicarbonates, carbonates
- Biological - bacteria and filtration/chemical treatment

TOPOGRAPHY

Field slope will determine whether a designer selects a pressure compensating or non-pressure compensating dripper. Netafim offers heavywall driplines with both pressure compensating and non-pressure compensating drippers. Heavywall driplines are recommended for permanent crop subsurface applications.

FLAT TERRAIN

- Aries Heavywall Dripline: economical non-compensating dripline for all flat terrain
- Ideal for large fields with quarter mile runs and multi-season use
- Wall Thickness Options: 45, 48 and 60 mil
- Flow Rate Options: 0.26 up to 1.0 GPH

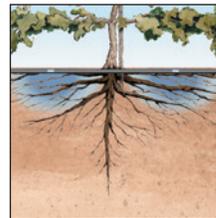
ROLLING TERRAIN

- UniRam or DripNet PC Heavywall Dripline: pressure compensating dripline for rolling terrain
- Ideal for long runs and applications demanding high uniformity
- Wall Thickness Options: 45, 48 and 60 mil
- Flow Rate Options: 0.26 up to 1.0 GPH

SOIL TYPE

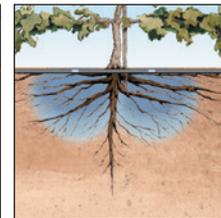
Soil type and absorption play an important role in determining dripper application. Maintaining a dry soil surface is essential. When water migrates to the surface, weeds germinate and compete with the crop for water and nutrients.

SOIL TYPES



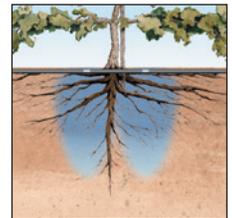
HEAVY CLAY

Low flow drippers are recommended. Water moves to the soil's surface easily when the dripline is installed too shallow or if a high flow dripper exceeds the soil's ability to absorb water - resulting in channeling.



MEDIUM TEXTURED

Requires closer dripper spacings (compared to clay soil). Lower flow drippers are recommended.



LIGHT TEXTURED

Closer dripper spacing is required in order to uniformly wet the soil profile. High frequency irrigation can be used to achieve similar results.



UNIRAM PRESSURE COMPENSATING DRIPPER

- Anti-Siphon Feature prevents suction of dirt into the dripline
- CNL Mechanism prevents system drainage when pressure is turned off
- Root Intrusion Barrier prevents roots from entering the dripper
- Self-Cleaning action flushes debris continuously ensuring uninterrupted operation



STEP 2

GETTING THE BEST RETURN ON YOUR INVESTMENT

The goal is to get the best return on your investment. A well-designed system quickly pays for itself and adds to your bottom line. SDI systems allow growers to cut labor expenses and more efficiently manage water and nutrients.

PRODUCT SELECTION - MAKE THE RIGHT DECISION

Heavywall driplines are available in many different configurations to meet your unique crop and soil conditions. The options you choose will determine the overall cost of the system:

- Wall thickness - consider planned length of use
- Tubing size and dripper spacing
- Dripper type - pressure compensating or non-pressure compensating
- Dripper performance - consider product history, physical characteristics of the flow path and hydraulic parameters

As described on the previous page, Netafim offers several Heavywall driplines manufactured to fit your specific crop and soil requirements.

SYSTEM COMPONENTS

Other factors to consider when planning your system are air/vacuum relief, filtration and root intrusion protection.

AIR AND VACUUM RELIEF AIR VENTS

Air/Vacuum Relief Air Vents are an inexpensive protection against soil ingestion and can extend the life of the drippers in an SDI system. If the system is not properly vented, when the dripline drains during shutdown, fine soil particles can be ingested into the dripper - potentially plugging the dripper. Other system design considerations include:

- Submain positioning - should be placed in the highest location
- Rolling terrain - requires strategic placement of pressure regulation, vacuum relief and check valves

Netafim offers several types of Air Vents for air and vacuum relief.



VACUUM RELIEF AND CONTINUOUS ACTING

For release of large volumes of air at pump and filter stations and at high elevations in the piping network



CONTINUOUS ACTING

For high spots where air accumulates



AIR/VACUUM VENT

For downstream of valves and at manifolds to break vacuum caused by system draining

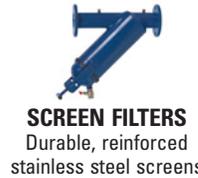
FILTRATION - DISC, SAND AND SCREEN

Many factors should be considered when selecting a filter system including: flow rate, quality of incoming and discharged water and the type of dripper - the smaller the flow path, the more critical the required filtration. Netafim offers disc, sand and screen filters to fit all applications.



APOLLO DISC FILTER

Discs provide depth filtration for high flow water systems



SCREEN FILTERS
Durable, reinforced stainless steel screens



AGF SAND MEDIA

Reliable, corrosion proof, trouble-free sand media filtration

WATER METERS

Reliable and accurate Water Meters are specifically designed for irrigation systems to provide the most accurate and reliable flow readings. Water meters can be the most accurate and easiest method for measuring water flow in the pipelines and improving efficiency. Netafim offers Water Meters with and without straightening vanes and in multiple sizes.



OCTAVE WATER METER

Double-beam ultrasonic sensors for highly accurate flow data



WST WATER METER

Low wear, long-life impeller shaft and bearings



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