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# Trickle Irrigation - Don't Forget the Basics

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**T**rickle irrigation can provide superior water efficiency and nutrient uptake for crop production provided that the entire irrigation system works properly. It is easy to concentrate on the hardware requirements for a complete trickle irrigation system worrying about drip tape, water mains, filters, injectors, storage tanks and so on. But what about the other side of this system the water quality, the soil itself, and the nutrient sources? Many of the problems encountered when a trickle system is first introduced are seldom deficiencies in the equipment itself but rather a result of deficiencies in the remainder of the system.

## Water quality should be tested prior to setup for a variety of reasons

The water moving through your irrigation system has the potential to clog the system rendering it useless and for introducing toxicity to the plants. A water sample should be taken from the intended water source and analyzed for electrical conductivity (EC)(salts), pH, cations (Ca, Mg, Na), anions (Cl,SO<sub>4</sub>,CO<sub>3</sub>), Fe, Mn, nitrate nitrogen, and suspended solids. High levels of suspended solids, pH, manganese or iron can result in clogging. High levels of nitrates, boron, chlorides or EC can result in crop injury. The water test results could save you tremendous expense and grief by providing you the option to seek alternative water sources,

introduce acid treatments, review filter requirements or to adjust fertility programs to prevent the potential problems identified.

## The soil itself can present many challenges not identified in an engineering plan

Many trickle systems are utilized on coarse to moderately coarse soils i.e. sand and gravel soils. These soils typically are very porous and have a low water holding capacity. If these soils are allowed to dry they become very loose and soft which can reduce the amount of capillary moisture (the primary source of water for plants) found in the soil. It is important that when forming raised beds for drip tape and plastic row cover, to ensure that the soil is initially packed firmly and contains adequate moisture. If this soil is allowed to dry due to evaporation under the plastic and becomes loose you will have a very difficult time ever regaining moisture throughout the entire width of your raised bed. Mathematically you will be applying the correct levels of water and nutrient, but realistically the plant may not receive all that it requires as the water moves vertically with little horizontal movement. Similarly it is important that the soil beneath the raised bed portion not experience any compaction, as this will interfere with moisture movement and root penetration.

When selecting nutrient

sources for the system it is important to recognize the importance of product compatibility. Often many products are mixed simultaneously in order to save time. However, mixing two or more incompatible products can result in clogged lines, emitters, or stock tanks. Always check with the fertilizer supplier or product label to determine if the products can be mixed.

## Once you have your crop growing and your irrigation system operating review the basics

Perform a periodic water check using a portable pH/EC meter to test raw and treated water to confirm that you are on target. Obtain weekly or bi-weekly plant tissue samples to determine if the crop is receiving a balanced nutrition program. The use of fertigation allows you to adjust your fertility levels very easily and very specifically compared to conventional production practices. Check the soil moisture by feeling the soil with your hand checking the entire soil profile for dry zones. You may wish to dig a hole once just to see what your water distribution pattern and root system look like; you may be surprised at what you see!

The system approach, which combines the best of science, engineering and basic production practices, will enable you to maximize your trickle irrigation and crop production system.

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