



IRRIGATION MANAGEMENT

BY DIANN ILKENHONS

Don't Treat Soil Like Dirt

Application, pattern for improved soil, water relationship

So much is depending on your soil. When it comes to irrigation, if you are like most people, you focus on the needs of the crop and may neglect to consider the specific needs of your soil.

Irrigation is the introduction of water to soil. The application should allow your water and soil to meet in such a way as to develop a deep, penetrating relationship between the two that will last.

The success of this relationship involves application intensity and pattern integrity.

APPLICATION INTENSITY

Application intensity is a term that refers specifically to "how" the water



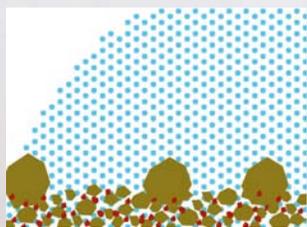
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meets your soil. It is the instantaneous contact moment that is so important.

Irrigation applicators vary in the way they deliver water. This may be harsh, gentle, or somewhere in between.

There are devices that send water to the soil in concentrated streams. Others offer a disbursed pattern. The differences are in the volume delivered and the total area of the instantaneous application.

Within the soil, there is a unique structure and composition of different-



Low application intensity allows slower infiltration into the soil.

sized particles. Different soil types have different porosities and thus infiltration capabilities.

Knowing your soil will help you give it the amount of water it needs and, more importantly, give it in the way it needs to receive it.

By matching those needs, you increase the soak time, allowing the water to penetrate the surface slowly.

High application intensity breaks down soil structure and disrupts the composition. Particles become segregated by size, with the smaller particles becoming suspended. As infiltration occurs, the smaller particles come to rest on top of the soil, creating a sealing effect.

This newly arranged soil composition impedes future water applications from penetrating properly. The result is surface water buildup and runoff that carries some of the soil away.

Think about a bucket of water and a watering can. If both contain the same amount of water and are poured onto your soil over the same period of time, which do you think would have the higher application intensity?

The watering can delivers the same amount of water, the same flow, over a larger area. Lowering the application intensity allows your soil to receive that water more effectively over time.

PATTERN INTEGRITY

A key component to preserving lower application intensity and irrigation efficiency for your soil is pattern integrity. Pattern integrity refers to the consistency of the distribution footprint from an applicator.

This consistency requires maintaining the size of the total coverage area and the uniformity within that area. This means that applicators must deliver the "right-sized" water droplets or, the largest droplets your soil and crops will allow.

Larger droplets will travel farther giving you a larger diameter of coverage. However, they cannot be too large so



as to harm your soil or plants. Conversely, droplets that are too small can become carried away by the wind,

arriving somewhere other than desired.

Smaller droplets can evaporate all together and never arrive at

the soil level at all. When either of these occurs, the overall pattern becomes distorted. Droplets that are consistently the “right size” will maintain the pattern integrity of your applicator.

Applicators are selected based on published performance data. This data

is used to determine spacing and height in order to deliver the desired footprint, uniformity, and application rate needed.

Environmental factors can cause applicators to perform very differently in field conditions. This creates discrepancies between designed performance and reality.

The result impacts the application

uniformity and efficiency, especially on applicators that deliver small droplets. They are especially susceptible to wind drift.

Imagine two different watering cans. One has holes that are large enough to dispense water droplets of average size. The second has very tiny holes, delivering more of a mist of water.

Now imagine that you are using these watering cans in front of a very large oscillating fan. Which one will create more of a consistent wetted footprint? The “right-sized” water droplets for maintaining pattern integrity are the largest droplets your soil and crops will allow. Pattern integrity, like lower application intensity, keeps your soil happy.

Typically, high pressures produce smaller droplets. There are other very real benefits to lowering operating pressures.

Lower pressure operation translates to reduced horsepower requirements and reduced energy consumption. It is imperative that applicators are specifically designed for low pressure operation in order to assure optimum performance.

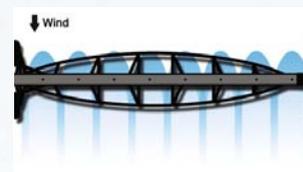
BOTTOM LINE

If you look at the relationship between water and your soil, lowering application intensity and maintaining pattern integrity just make sense. Lowering application intensity is just as important as “first impressions.”

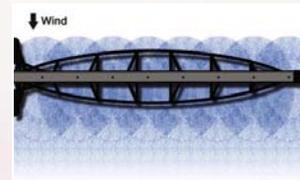
If the initial contact doesn’t go well, the relationship between water and soil will always be a struggle. Pattern

integrity is like the consistency of meeting needs.

The soil needs just the right amount of water at the right time or it gets hurt. If your soil receives too little, it will not be able to properly meet the need of the crops that depend on it. If your soil receives too much, it simply has to send the water away.



Small droplets are susceptible to wind drift and evaporation.



Larger droplets help maintain pattern integrity.

For more information about lowering application intensity and pattern integrity or

to ask about applicators that are designed to accomplish both, contact Senninger Irrigation at info@senninger.com.

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