

## **FOR ALFALFA GROWERS, STAYING AHEAD OF SOIL MOISTURE LEVELS DURING SUMMER IS CRITICAL TO IMPROVED YIELD**

By Todd Rinkenberger

To guarantee an alfalfa crop has adequate soil moisture during the hot season, growers need to start monitoring well before summer begins.

One of the challenges of using drip irrigation in alfalfa fields is keeping soil moisture levels stable during the hot, dry months. However, with planning and keeping track of deep moisture requirements, growers will appreciate the extra time they put in during the season to reap the profits at harvest from yield increases.

Dennis Hannaford works with growers on alfalfa production as Netafim's Product Application Support Specialist and he says, "It's critical to minimize moisture stress. Once a grower gets a little behind, they have less ability to catch up." Hannaford explains that it's a plant physiology issue that short-circuits the plant's ability to recover. "When it gets hot and humid, the plant essentially shuts down and it tends to not bring up enough moisture to protect itself," he said.

When that happens, Hannaford added, the plant ends up closing down cells and doesn't transpire. "What we want to do as growers," he says, "is when going into summer, we take care of any moisture stress and make sure the deep moisture in the soil profile is adequate. That's what carries the crop through from one curing event to another so it's vital to protect that deep moisture which is what the crop pulls from when we do cuts."

After that number one priority is safeguarded, Hannaford outlines other stresses that could compromise yield and quality. Growers, he says, need to scout for pests, including gophers, and take appropriate steps to control any that might affect the crop.

Plants can also become stressed and react negatively from nutrient deficiencies that hinder growth. Developing a tissue-sampling program is a beneficial method to ensure the crop's productivity. The 'Irrigated Alfalfa Management for Mediterranean and Desert Zones' book published in 2008 by the University of California Alfalfa Workgroup has a chapter on how to irrigate alfalfa in arid regions. This section is written by UC Davis Irrigation Specialist Blaine Hanson and UC Cooperative Extension Farm Advisors, Khaled Bali from Holtville, CA and Blake Sanden from Bakersfield, CA.

They write that the water used by crops, known by the technical term evapotranspiration (ET), is a two-part system of transpiration and evaporation. The former refers to the water taken up by the plant that evaporates from leaves and the latter is moisture that evaporates from the soil. The ET process is affected by a number of factors including the type of crop, climatic conditions, plant health, stage of growth, salinity, and soil moisture content. High temperatures and sunlight stimulate ET and after an alfalfa harvest there's much more evaporation occurring in flood irrigation due to a greater amount of soil exposed to the sun.

As the crop grows and the canopy fills and less soil is exposed, ET switches to more transpiration. This is a critical period for growers to monitor against soil moisture deficiencies, which will negatively impact the ET process and affect yields. Sub-surface drip irrigation minimizes soil surface wetting and therefore minimizes the evaporation component of ET.

"Seasonal alfalfa yield is directly related to seasonal ET," according to the authors. "Alfalfa yield increases as ET increases, with maximum yield occurring at maximum seasonal ET (determined by climatic conditions). Insufficient soil moisture, the result of insufficient applied water, is usually the reason that ET is less than maximum, which results in reduced yield."

Russ Schafer knows all too well the importance of keeping an eye on the alfalfa crop's soil moisture during dry conditions. Now a vice president of a pest control industry, Schafer previously managed alfalfa acreage at a farm in Buttonwillow, CA with a Netafim subsurface drip system.

"If the plants looked stressed, we were already too late," he says as cautionary advice.

With field-to-field variables, Schafer said they used a number of tools to make decisions, including an ET chart provided by the University of California, moisture probes that checked deep moisture between three and five feet, plus digging down five to 10 inches to get an additional soil sample to check moisture levels throughout the profile then water accordingly.

He said it's important to not just rely on the ET chart to correctly determine a field's moisture. Schafer added that without a doubt he found irrigating with drip gave him the extra control he needed to manage soil moisture during hot summer months while maintaining the crop's needs right up to a cutting.

"With subsurface drip you can irrigate close to harvest and get a more uniform crop," he said.



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