



METER
ENVIRONMENT

SNAPDRAGONS AND SOIL MOISTURE SENSORS

Charles Bauers has been a hydroponic snapdragon grower for 17 years. He knows—in detail—how to produce a good snap. But five years ago, he needed a better way to measure water.

“We had no quantitative way to measure water. That was the limiting factor for me,” he explains. Other inputs, like fertilizer, were quantifiable, but Bauers still depended on “gut feel” for watering, and no matter how quickly he reacted to changes in the crop, he couldn’t consistently produce grade-one snapdragons.

He wanted a scale, a “recipe of numbers” that would let him produce a good crop all the time in all sections of the greenhouse.

“There are always areas that seem to produce good quality flowers, and then there are areas that are a bit more of a challenge. I installed METER [soil moisture sensors](#) in the good areas and the stressed areas and compared the two. Then I worked my stressed areas up to the same numbers.”

Snapdragons are very sensitive to moisture stress. “It’s a ten-week crop. If you don’t get the moisture right in the first two weeks, you can compromise that crop.”

The [soil moisture sensors](#) made a huge difference in Bauers’s ability to get the moisture right. “They give me, targeted set points that I can shoot for all the time, and if I hit the targeted set point, I know I’m going to have good quality snaps, barring any other type of stress.



TEROS 12 soil moisture sensor

Grade-one snapdragons are worth 40% more than grade twos, and the difference between the two is created by “incipient stress—water stress that you can’t measure with your fingers. You can’t see it, you can’t feel it, it’s stress at the root. There’s a difference between a 28% vwc [volumetric water content] and a 23% vwc. It’s only 5%, but one produces grade ones and one produces grade twos.”

Moisture sensors gave Bauers real-time information that helped him get the watering right in every part of the greenhouse. “I became more consistent because I had a number to go at. Because we’re a hydroponic crop, we see the effects real quick, and I’d say ‘I just have to add a little more water here.’ But [before the sensors,] invariably we had areas that were stressed because you really never knew when you had enough water on that crop. With sensors, you can consistently put the right amount of water on all the time.”

Bauers quickly became adept at using sensors to address his irrigation challenges. The sensors showed him where his irrigation system was broken or underperforming, helped him identify problems like a root growing into a drip tube, or an unplugged dripper. But as the sensors became part of his routine, he was surprised to discover a new opportunity.

“Besides giving me the [real-time information](#), the sensors gave me the ability to look at trends...over a week or a month and be proactive if we started moving away from our set point. We could add more water, set shorter run times, or just make some changes in the irrigation system to get more in line with the set points. That was one of my biggest surprises, how well we were able to be proactive toward environmental changes using the trending of the charts. That was a bonus.”

After five years of daily monitoring, Bauers is now ready to go to an even higher level. “The next huge area we see sensors in is as big, or bigger, than the actual growing of the plant itself. We’re going to use these sensors to guide us as we strip out all excess production costs, and that’s happening today. As an example, over the next five months we’ll be trimming our substrate use by 85%. Not only do we save on materials, but if you have 85% less substrate to work with or move, you reduce labor costs.”

In fact, the sensors have become an integral part of how Bauers does business. I asked him how he would feel if he lost them. “My gosh,” he said, “It would be like going back ten years. It would be like trying to measure the temperature in a room without a thermometer. We are totally dependent on them.”

Discover METER [soil moisture sensors](#)