

Three Things Hydroponics Growers Should be Doing

These few considerations can make a significant impact on the quality and efficiency of your hydroponic production.

BY TAMI VAN GAAL

Hydroponic production, in which crop nutrition is provided solely through solution, dominates the controlled environment agriculture realm. Lettuce and leafy greens produced under cover are nearly always grown in traditional hydroponic float beds or nutrient film technique (NFT) channels. Greenhouse strawberries are often grown in coir slabs, which is another great example of a hydroponic system (the media only provides support; it holds little fertility). High-wire veggie production is dominated by slab-and-bucket systems. Even medicinal crops are getting into the hydroponic act. While each crop system has specific needs, a few common considerations apply to all crop categories and can make the difference between struggle and success.

1. TEST THE WATER

Water quality is a primary concern for all growers, but it's even more critical in hydroponics because the inert media provides no buffering. This means that the pH of the water is the pH of the growing media. Therefore, the incoming water quality must be understood so that an appropriate fertility program can be constructed.

All hydroponic operations should have a full horticultural laboratory analysis of their incoming water performed at least once a year. State extension services or private labs can do this work in a cost-effective and timely manner. The results should include pH, alkalinity, EC, the levels of horticulturally important macro and micronutrients, along with chlorine, sodium and key metals. Your supplier should be able to help you understand these results as needed, and use them to build an appropriate fertility program for your specific crop(s).

The lab test will serve as the starting point, but it's also important to conduct ongoing in-house testing to monitor both the incoming water and the fertilizer solution. Every operation should have a handheld meter to test pH and EC. Many options are available, including simple, effective pen meters and multi-function combo meters.

Use the pen or combo meters to monitor the inbound water (especially if water comes from a well) and to troubleshoot crop problems. Frequent monitoring of recirculating and injection systems is also wise. To minimize labor, consider investing in an in-line system that will provide a continuous reading of the solution's pH and EC, and will alarm when values fall out of range. Some injection systems have this functionality built-in. If not, monitors can be set up to work with the system and can even be set up to record the data.

2. PROTECT AGAINST PLANT DAMAGE

Nothing stings more than preventable physical crop damage that reduces yield. In both high-wire veggies and medicinal crops, the weight of the harvestable product can cause stems to bend and break. Minimizing this damage is approached in different ways for these crops, with some tools serving both crops.

The primary support for high-wire tomatoes is the trellising twine. This major structure does little to support the cluster stem, which can break



with the weight of the fruit. J-hooks are one solution. The top of the hook attaches to the twine, while the smooth hook supports the weight by hooking within the cluster to reduce the stress on the cluster stem.

Truss supports also can protect against cluster stem breaks. These plastic pieces are placed over the cluster stem at the union with the vine before the fruit forms. As the fruit matures, the plastic piece supports the cluster stem, with no additional cluster support needed. We like the newer flexible truss supports, which can be placed without bending the stem. If you've



Monitoring the water quality for NFT systems will ensure a healthy crop.



Truss supports are a staple for tomato growers to prevent damage to the cluster stems.

experienced damaged cluster stems in the past, give the flexible truss supports or traditional J-hooks a try and increase your yield.

The primary support for medicinal crops is trellis netting, generally used in several layers. While the trellis netting often provides enough structure to support the stems, some extra support may be needed. Enter the stem holder and J-hook from the veggie world. Either can be used to attach crop stems to the trellis netting to minimize movement and provide additional support.

3. MOVE THE AIR

All hydroponic production areas benefit from good airflow around the crop. For both greenhouses and warehouse production spaces, horizontal airflow (HAF) fans are the standard tool to improve environmental uniformity in a production space, which is the first step toward producing a uniform crop. Through gentle, laminar flow around the crop, HAFs can greatly reduce temperature gradients that naturally exist in production spaces that have directional heating and cooling. This same linear movement can also help to prevent microclimates of humid, stagnant air. The key to success with HAF fans is a professional plan for fan placement. In small production spaces, this plan may call for a small number of fans to drive a circular flow. In larger spaces, the fans are used to create more complex flow patterns.

Good airflow is also important to reduce incidence of disease. Growers recognize that foliar diseases are often encouraged by humidity. With improper airflow, a production space can develop microclimates of stagnant, high-humidity air. HAF fans generally do a great job of eliminating these microclimates, but sometimes the crops benefit from a different airflow pattern. This is when vertical fans can be helpful. These types of fans will draw air from the crop, pulling it up, then pushing it out to return down to crop level in a wide circular pattern. HAF and V-Flo fans are generally not used together. Consult with your supplier partner to

determine which tool is best for your specific operation.

With very few exceptions, directing fans onto the crop is avoided. While a little airflow is a good thing, turbulent airflow over a crop resulting in visible movement of the crop can have a

detrimental impact on crop growth. When airflow over a leaf surface is high, the stomates close to balance transpiration and reduce excessive moisture loss. Stomatal closure reduces photosynthesis, the process that drives growth.

While each hydroponic crop has

special needs, some needs are universal. Let these be the first steps you take to improve the yields and profits in your next crop. gpn

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