GROWERTALKS

Columns

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Growers Talk Production—Grower's Toolbox: Chelated Iron

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As growers, we've all seen that perfect specimen of a marigold or petunia or some other plant that resulted from a cast-off seed or cutting that dropped from a table and landed under the bench, where it thrived on its own with no guidance or help from us. It's enough to make you scratch your head. As for the plants on the benches, it's up to us to manipulate and adjust a seemingly endless combination of inputs to achieve the perfect crop. We add lime to the media, acidify the water, tweak the fertilizer, adjust the temperatures, apply growth regulator and then apply another growth regulator to counteract the effects of the first growth regulator, and so on. If the weather is cooperative and we do everything just right, we end up with a product that we can be proud of and that sells.

It's all about the tools and techniques and knowing how to use them to achieve the desired results. One tool we use occasionally here at our greenhouse is chelated iron in the EDDHA form. I'd like to briefly outline the available forms of chelated iron, their effective pH ranges and a specific example of how we use one of them.

First off, a chelate is a negatively charged organic compound surrounding a positively charged inorganic elemental nutrient. In this case, we're talking about iron, however other minor elements can be chelated. The chelating agent neutralizes the electrical charge of the elemental nutrient, allowing it to stay in solution over a wider range of pHs and therefore being available for uptake by the plant even when the media pH is less than ideal. Following are the chelating agents most used in horticulture, listed in order of least stable and least expensive to most stable and most expensive.

EDTA: common chelating agent found in many bagged fertilizer formulations. Stable up to a pH of about 6.5.

DTPA: Sprint 330, Sequestrene 330 or Dissolvine D-FE-11. Stable up to a pH of about 7.0.

EDDHA: Sprint 138, Sequestrene 138 or Dissolvine Q-FE-6. Stable up to a pH of about 10.0.

Our primary source of irrigation water here at our greenhouse is rainwater, which we collect off the roof and

store in large silos. We also have a backup well for the times when rain is scarce. The alkalinity of the rainwater is near zero, while the alkalinity of our well water is around 180. Our media is limed to stabilize around pH 5.5, and we use either basic fertilizer or acidic fertilizer to maintain a growing pH between 5.5 and 6.0. Our problem arises when we're forced to use well water for extended periods during dry weather when rainwater is in short supply. We don't acidify our well water, and using acidic fertilizer alone isn't enough to overcome the effects of the well water, so our media pH can start creeping up to 7.0 or above. Of course, this will cause symptoms of iron chlorosis on a number of our crops.

At this point we have a couple options: We could acidify the media with an iron sulfate drench and add a corrective dose of iron using Sprint 330 or 138. But this is more time consuming and also risky because you must thoroughly rinse the crop right away afterward, and even then you can get some burn from the iron sulfate. It's also risky from the standpoint of lowering the pH too much; this along with the corrective dose of very soluble iron could end up causing iron toxicity. What we choose to do here is a one-time corrective application of iron in the form of EDDHA (Sprint 138) at a rate of 5-10 ppm, depending on how high the pH is and the severity of the chlorosis. If the EC is low, we'll combine the iron with a fertilizer, usually 20-10-20, at a rate of 250 ppm. Re-greening occurs within four to five days. If you're unfamiliar with the EDDHA form of iron, give it a try. It's expensive, but a little bit goes a long way and it is worth every penny.

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