GROWERTALKS

Columns

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Chemical Phytotoxicity

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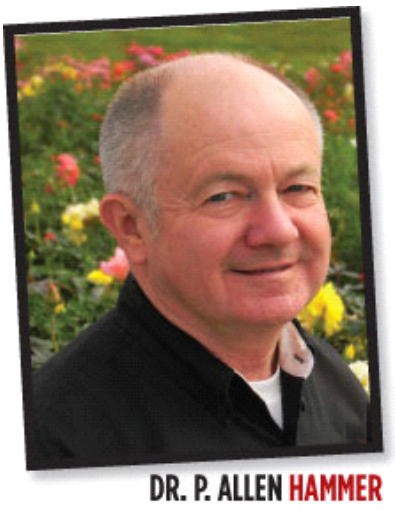

Of all the greenhouse plant problems I see, phytotoxicity to a chemical is often the most difficult to identify and diagnose. Suggesting chemical burn to a grower is also often met with great skepticism. I often get a blank look or rolling eyes. A chemical phytotoxicity diagnosis is never taken lightly or an “I really don’t know” answer. We most often get to a chemical phytotoxicity diagnosis from experience, pattern of damage and ruling out every other cause—which is usually the case because I cannot find anything else as a cause. In actual practice, we want to rule out other causes first before we diagnose unless the symptoms are clearly a chemical phytotoxicity.

Plant phytotoxicity from chemicals causes strange, unusual and often unpredictable symptoms. Probably the first and most frustrating issue most difficult to understand is how a chemical causes phytotoxicity to one cultivar and causes absolutely no phytotoxicity to a different cultivar on the same bench. That’s the most often-asked question from growers when I diagnose chemical phytotoxicity as the cause of the leaf symptoms. There are probably many explanations for differences among cultivars, but I think the biggest factor is dose of chemical. Often plant phytotoxicity from chemicals is caused from very low doses, which really exaggerates the response among cultivars. A higher dose would show damage on all cultivars, but at low doses, some cultivars seem to escape the damage. It’s important to remember the unaffected cultivar isn’t resistant to damage from the chemical—it just takes more of the chemical to cause the symptoms.

The second response to chemical phytotoxicity that becomes frustrating: “But I haven’t applied a chemical.” Plants in greenhouses are exposed to many chemicals each day and are often exposed to unintended chemicals. Who knows what chemical may be in the water on a specific irrigation? Was some part of the watering system used to apply a chemical and not thoroughly cleaned? What about spray drift? Applying chemicals to floors and benches can cause issues when plants are placed on those surfaces, along with chemicals in the air.

Poorly vented gas heaters and cracked heat exchangers are a continuing source of air pollution affecting plants in the greenhouse. And we cannot forget all the possible chemicals that can enter the greenhouse from

the outside environment. Chemical sources of phytotoxicity from outside the greenhouse may be the most difficult to diagnose. I can remember many years ago visiting a grower with periodic leaf damage on chrysanthemums. On the day I visited there was a strong chemical odor in the greenhouse. The grower told me the chemical smell came from a plant down the street that treated telephone poles with creosote, but don't worry about it because it only smells like that when the wind comes from the wrong direction, which isn't often. I remember this because of the strong odor and periodic damage, but I also wonder how many times does such phytotoxicity occur when we can't smell the pollutant?

The third response to chemical phytotoxicity is: "But I've applied the chemical multiple times before and have never seen phytotoxicity." This response also raises many uncomfortable questions. Are you sure you mixed the chemical correctly? Is your previous experience with the same plants and cultivars? Was the spray equipment clean? Was the weather the same as during previous applications? These questions are raised because past experience cannot be used to rule out chemical phytotoxicity. Each new chemical application must be viewed as a new possibility of chemical phytotoxicity because of mixing errors, interactions with the greenhouse environment, application equipment and even the people applying the chemical.

Detailed records of chemical applications can often help in diagnosing phytotoxicity from an applied chemical. Recording the exact amount of a chemical added to the exact amount of water can be used to recalculate the concentration of chemical applied, making sure a mistake wasn't made. A photo of the chemical container can also be an additional check on accuracy of the chemical applied.

Chemicals are very important in greenhouse production. Chemicals aren't used or applied to create plant phytotoxicity—I think it helps to remember that when you receive that chemical phytotoxicity diagnoses. Diagnosing greenhouse plant problems must focus on what caused the problem and not assigning blame. Diagnosing accuracy often suffers greatly when blame becomes part of the equation. **GT**

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