GROWERTALKS

Columns

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# When Water Molds Get Wet Feet

*Albert Grimm*


Do you work with a schedule of regular fungicide drenches on your crops to prevent water molds, such as Pythium? I used to be quite proud of my very smart drench program and, of course, I applied it religiously. The roots of my crops never looked all that great, but I always blamed super-resistant pathogens, which escaped the barrage of chemical ammunition. It was by mere chance that I had an opportunity to make a direct comparison between treated and untreated root systems in the same crop. I was genuinely shocked when I discovered how much healthier the roots looked on plants that I had never treated with fungicides.

I started to question many of my assumptions about Pythium. Common wisdom tells us that this disease is caused by overwatering and by not allowing substrates to dry adequately before watering. So what about those crops that we grow in nutrient solutions? If it was merely too much water that caused Pythium, any hydroponic system should be a grower's nightmare. Yet, we're able to grow sensitive succulents, such as kalanchoe, very successfully in rockwool slabs, where the roots are submersed in a thin film of water. The only times that I've ever experienced problems with watermolds in hydroponics were those instances when the substrate had been too dry. Could it be that "water mold" is a misnomer? Might "drought mold" be more accurate?

Here's my take on the cause of the majority of all root rot problems in greenhouse crops: Growers have learned a long time ago that we ought to "let the substrate dry thoroughly between watering," so as to avoid root disease. Growers are very practical people and we read this as: "Water as infrequently as possible." Then we translate into: "When you water, do it thoroughly, so that you can wait longer before you have to water again." This is where the problem starts. We wait until the soil is too dry out of fear that watering too early will bring on root rot.

I would like you to picture one of those cloudy weeks when your plants just did not want to dry down. This week is followed by a warm, sunny weekend. On Sunday morning, the poor growers on duty are running their legs off, trying to get water to all the crops before anything wilts. By this time, roots are under severe stress. When the grower arrives with water, the root zone gets flooded instantly. The plants must feel like someone who is

thrown into a raging river in order to be saved from dehydration.

At this point, let's look at some of the dry roots under a microscope: When water arrives, it rushes into the root hairs pulled in by the immense force, which the root uses to extract water from dry soil. The pressure that builds in those root hairs damages the cells. Then our "thorough" watering displaces most of the air and oxygen from the root zone and the already damaged root tips begin to suffocate. We end up with dead tissue and not enough oxygen to heal the wounded root. Pythium merely needs to take advantage of the food that we offer.

How can we prevent such damage?

Avoid cycling the crop from extreme dry to extreme wet. There is no benefit from extreme drought or from very "thorough watering."

Water more frequently and use much smaller quantities of water. Don't wait until the plant is under stress, and when you water, limit the volume to a gentle sprinkle. This minimizes root stress because you have a better chance to "catch" plants before they wilt and you avoid flooding the substrate. If you water with the hose, it saves time, too. When you water quickly and repeatedly, less of the water that runs out of your hose will drain away and more will be available for the crop.

Accidents happen. So, if you do find wilted plants, resist the impulse for grower's panic and don't flood the crop. Give a gentle sprinkle of water, then wait 20 minutes. Keep repeating these "sprinkles" until the crop is turgid. If you can bring back wilted crops over the course of an hour or so, there is often no permanent damage. Soaking wilted plants won't bring them back any faster. **GT**

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