

The Case of the Scorched Cut Chrysanthemums



A greenhouse grower of cut chrysanthemum was experimenting with a new growing medium. There appeared to be some problems with early growth and development of the rooted cuttings after they were planted--foliage scorched during early stages of plant growth, as shown in the photo at left. Panic set in and he called you, a statewide extension specialist, for help and guidance.

The grower answered your questions below, over the phone, as follows:

Q: I received the photo of the damaged plant that you e-mailed to me. It's not a great picture, but I think that I can see the 'scorch' on some of the leaves that you discuss in the e-mail. Would you describe it more for me and tell me exactly what leaves you're seeing it on?

A: The leaf edges are brown and dead. Right around the tip of the cuttings, the young, expanding leaves are kind of brown and damaged. The lower leaves--the ones that have grown since we planted the cuttings--are brown and damaged, too. But the leaves that were on the rooted cutting when we transplanted it are not showing as much of the damage.

Q: Would you describe for me where the symptoms are showing up in the greenhouse? On all your cultivars, just on a bench or two, just a corner of the greenhouse?—where are you seeing the problem?

A: Well, I'm just seeing the damaged plants in the beds where I've used this new mix. And it's pretty uniform across the plants in those beds.

Q: What are the percentage constituents of the new mix that you're using?

A: The new soil mix is made of peat and--wait, I'll have to spell this for you—clinoptilolite [pronounced *kline-o-teel-o-lite*], and a little bark. The guy who sold it to me said that I could use less fertilizer with it, and it was inexpensive, so I thought I'd give it a try. It doesn't have a percentage breakdown on the bag. In the past, I've used Premier Pro-Mix BX and mixed some soil with it, about 15%. I didn't mix any soil with this batch because that clinoptilolite is supposed to act like soil.

Q: What pre-plant nutrient amendments are in the new mix that you're using—you know, what's the nutrient charge in the soil mix, etc.?

A: Well, there's lime and a starter nutrient charge in it, according to the bag, but it doesn't say how much or what makes up the starter charge. Superphosphate isn't listed on the bag, so I doubt if it's in there.

Q: What is your fertilization program?

A: I just use 20-10-20--a Peter's Peat-lite special, for about everything that I grow. I always fertilize my mums in really well after planting them, with about 250 to 300 ppm N. I usually apply fertilizer at each irrigation. I've been doing this for years and I've never seen a problem like this before.

Q: What type of irrigation system do you use?

A: I use irrigation tape in the cut flower beds. I have a Dosmatic proportioner that I siphon my feed through, so I can switch back and forth between plain water and fertilizer. We try to thoroughly soak the soil mix when we water, until we see water running out of the bottom of the bed.

Q: What chemicals have been applied, including fungicides, insecticides, and chemical growth regulators?

A: Well, the cuttings had only been planted a couple weeks when I started to see the scorched leaves, so I really hadn't done any spraying for this crop. I usually put some Marathon [imidicloprid] on the plants after the root system develops, but I hadn't done that yet when I saw the damage on the leaves. You know, though, my neighbor to the north grows corn and wheat, and he's always spraying this or that--I wouldn't be surprised if something he sprayed drifted into my greenhouse and burned my plants. I saw him out on his tractor right around the time I started seeing this damage...

Q: What is the source of the rooted cuttings?

A: We buy in all our cuttings through [Syngenta; used to be Yoder](#). Most of our shipments come out of South Carolina. We planted 8 different cultivars this time. The cuttings looked good when we unpacked them, and we planted them a couple days after receiving them. We syringed them with a mist nozzle for two days after planting to help them acclimate.

Q: Describe the beds in which the cut mums are being produced.

A: They're made of cement, 1" walls and are 2' deep. The bottom 8" is coarse gravel, then the new soil mix is on top of that. We just switched out the old mix, which we had used for 5 years, because it didn't drain too well anymore.

You asked the grower to take a root medium sample and have it analyzed, then fax you the results (which appear below in Table 1). You specifically ask the grower to have the sample extracted for analysis in two ways: one way using a saturated medium extract (SME), which is a water-based extraction commonly used on soilless root media, and a second way as a dilute acid extraction which is commonly used on soil samples.

Assignment:

Assume the role of the extension specialist to whom the grower spoke with on the phone and from whom he is seeking advice. Identify the cause of the problem, elaborate on why it is a problem, and state a short-term and long-term corrective strategy. Identify any information that was not provided to you that you would have found useful in solving this case and state why. Was the information provided enough to definitively provide the grower with an answer to his problem?

				Exchangeable				Saturated Medium Extract				
pH	Bray P	Salts (1:1)	CEC	K	Mg	Ca	Na	K	Mg	Ca	Na	Salts
	ppm	mmhos/cm	meq/100 g	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	mmhos/cm
7.5	60	0.2	40	1320	875	3590	2578	7	17	33	8	0.43
				% CEC								
				8.5	18.2	44.9	28					