



Bottom Heat Your Seed Flats for Less Disease

*by Dr. Stephen G.P. Nameth
Dept. of Plant Pathology
The Ohio State University*

With all of the concerns as to the high costs associated with heating the greenhouse it is hard to believe that I would be trying to convince growers to use more heat. Well, I'm not. I am telling you if you use the heated air you have more efficiently you can cut down on the amount of disease you see, particularly in the early stages of production.

Many of the diseases associated with seeds and seedlings are enhanced by cool temperatures. In many cases the pathogens that cause disease are more active at cool temperatures and in cool temperatures the seeds and seedlings are less active. This scenario has the potential to be a real problem. One of the most common mistakes a grower makes is to put seed or seeding flats on an unheated floor. The unheated the floor of the greenhouse is the coolest place in the greenhouse. This is particularly the case when if the floor is concrete or bare soil. The temperature of this type of floor can be 40 or 60 F. Under these conditions most seeds will take longer to germinate than they should and they will be exposed to pathogenic fungi such as *Pythium sp.* and *Fusarium sp.* [Figure 1A](#) [Figure 1B](#). If the surface under the seed flats were heated to the ideal temperature for seed germination the seed would germinate sooner and be less likely to be affected by disease ([Figure 2](#) and [Figure 3](#)). Even after the seeds germinate and emerge from the medium bottom heat is a good idea. Seedlings can be affected by post-emergence diseases caused by *Pythium sp.*, *Rhizoctonia sp.* and *Botrytis sp.* ([Figure 4](#) and [Figure 5](#)).

What can a grower do besides cranking up the heat or installing heated floors? Don't jack-up the heat, just get the flats up off the floor. If you can put them on a bench. That would be best. That way the flats are up in the heat zone of the greenhouse and warm air in circulating under the flats. If a bench is out of the question then at least remove the flats from direct contact with the floor. Use pressure treated 4x4s, old wood pallets or some other inexpensive way to elevate the flats. Six inches off the floor will make a world of difference. This will allow some of the warm air in the greenhouse to circulate under the flat and heat the media. The warmer the media the less likely you'll see pre- and post-emergence diseases.

Return to
ohiofloriculture.osu.edu

Fig. 1A. Seedling flats on the unheated floor of the greenhouse.



Fig. 1A. Seedling flats on the unheated floor of the greenhouse. Note the poor stand.

Fig. 1B. Seedling flats on the unheated floor of the greenhouse.



Fig. 1B. Seedling flats on the unheated floor of the greenhouse. Note the poor stand.

Fig. 2. Heated seed flat with a thermometer to monitor temperature.

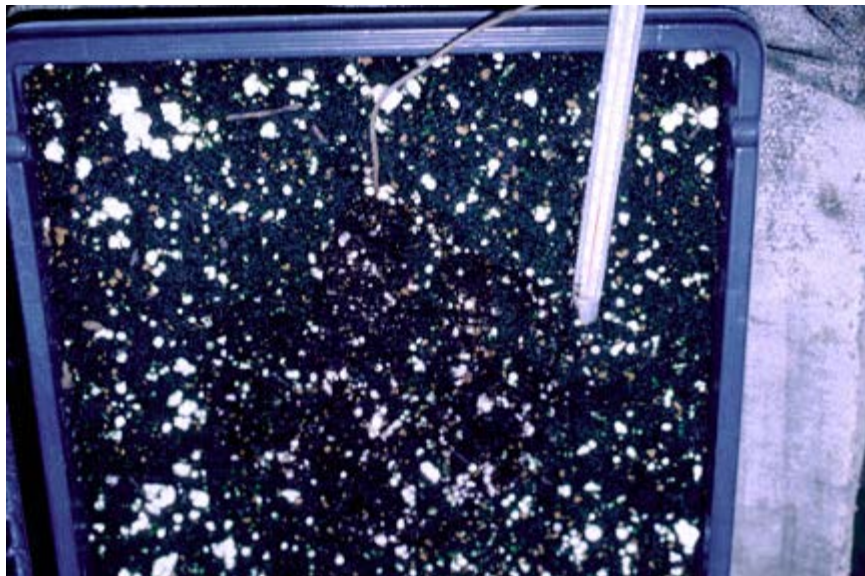


Fig. 2. Heated seed flat with a thermometer to monitor temperature.

Fig. 3. Seed flats on benches with bottom heat.



Fig. 3. Seed flats on benches with bottom heat. There will be no disease here!

Fig. 4. Post-emergence damping-off in snapdragon caused by *Pythium* sp.



Fig. 4. Post-emergence damping-off in snapdragon caused by *Pythium* sp.

Fig. 5. Severe leaf blight and rot in Shasta Daisy seedlings caused by *Botrytis* sp.



**Fig. 5. Severe leaf blight and rot in Shasta Daisy seedlings caused by *Botrytis* sp.
Pots were located on an unheated floor.**