



Nora Catlin
nora.catlin@cornell.edu

Root Rot in Garden Mums

You may occasionally see some unthrifty looking plants within your mum field, plants that look smaller or off color (yellow or chlorotic) compared to the rest of the field. Sometimes this might be due to drip emitters that have veered off course, or irrigation lines that have been accidentally kicked off the pots by workers or animals. However, many times these small and/or off-color plants are a sign that something is amiss with the root system, and that a root rot has taken hold.

One of the common root rots affecting mums is Pythium root rot, caused by various species of *Pythium*. Or, to be more correct, I should say various species of what we knew as *Pythium* until relatively recently – some of the common *Pythium* species known to affect mums are now re-classified as *Globisporangium*. *Pythium aphanidermatum* and *Pythium myriotylum* remain the same, but *Pythium irregulare* and *Pythium ultimum* are now classified as *Globisporangium irregulare* and *Globisporangium ultimum*.



Scattered plants that are stunted, chlorotic, or wilted may be a sign of root rot.

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Keep an eye on plants and look for stunted, chlorotic, and/or wilted plants, which may be an indication of root rot. Seek identification and diagnosis to help with proper management.

Margery Daughtrey's and Carla Garzon's labs conducted studies that identified these root rot pathogens on commercial crops. The most commonly found in mum crops were *Globisporangium irregulare*, *Pythium aphanidermatum*, and *Pythium myriotylum*. Both *P. aphanidermatum* and *P. myriotylum* favor high temperatures (generally over 90°F), which is why these species are typically the ones found affecting mums in summer.

How can you prevent *Pythium* (and/or *Globisporangium*) root rot in the future? Pay attention (as you always should), to sanitation practices. Organic debris can harbor inoculum, so be sure to use clean trays and pots and keep growing areas tidy from spilled or discarded media or soil. Using fresh, high-quality growing media with good drainage is a must. Be wary of providing too much fertilizer or irrigation, as too high a rate of fertilizer or waterlogged media can provide opportunities for infection. Be watchful of low areas in your field where water may puddle, and investigate if there are ways to avoid pots sitting in water for periods of time.

In the study mentioned above, root rot pathogens were isolated from growing media from pots with plants that appeared healthy as well as from pots containing sickly looking plants. This is a good reminder of the important role environmental conditions can play in the development of disease, and that sometimes pathogens can be opportunistic in nature. Not only should your management focus on addressing the pathogen through eliminating sources of inoculum and using management products when necessary, but you also need to ensure that the conditions for plant growth are as ideal as possible (i.e., proper water and fertilizer management, good drainage, and so on).

When needed, there are various products, both biological and chemical, labeled for *Pythium* root rot management. Since it is difficult to visually discern the causes of different root rots, and since products labeled for management of one root rot may not control another, it is helpful to obtain a proper identification and diagnosis from a diagnostic lab.

Materials containing etridiazole (e.g., Terrazole, Truban; also found in Banrot) are typically the go-to products when dealing with outbreaks. Cyazofamid products (e.g., Segway, Ranman) can also be helpful. Mefenoxam products (e.g. Subdue MAXX) can also be effective, however you should be aware that mefenoxam resistant strains of these root rot pathogens are not uncommon.

Other labeled products that may provide some management include phosphonate fungicides (e.g., Aliette, Areca, Agri-Fos, Alude, KPhite, Fosphite, Rampart, etc.), fluopicolide (e.g., Adorn; must be tank mixed with another product), pyraclostrobin (e.g., Insignia, Empress; also in Orkestra), fenamidone (e.g., FenStop), and azoxystrobin (e.g., Heritage).

There are also numerous labeled biofungicides, which are best used preventatively. Some options include: *Bacillus* (e.g., Cease, Companion, Triathlon, Stargus), *Gliocladium* (e.g., Prestop, Pvent), *Pseudomonas* (e.g., Zio, Howler), *Streptomyces* (e.g. Actinovate, Mycostop, PreFence), and *Trichoderma* (e.g., Asperello, Obtego, RootShield).

Always read labels and pay attention to use instructions, and be sure to rotate between fungicides with different modes of action (or FRAC codes). Note that some products may not be labeled in all states, may have local use restrictions, or may not be labeled for use in both greenhouses and outdoor nursery production.



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CONTRIBUTORS

Dr. Nora Catlin
Floriculture Specialist
Cornell Cooperative Extension
Suffolk County
nora.catlin@cornell.edu

Dr. Chris Currey
Assistant Professor of Floriculture
Iowa State University
ccurrey@iastate.edu

Dr. Ryan Dickson
Greenhouse Horticulture and
Controlled-Environment Agriculture
University of Arkansas
ryand@uark.edu

Thomas Ford
Commercial Horticulture Educator
Penn State Extension
tf2@psu.edu

Dan Gilrein
Entomology Specialist
Cornell Cooperative Extension
Suffolk County
dog1@cornell.edu

Dr. Joyce Latimer
Floriculture Extension & Research
Virginia Tech
jlatime@vt.edu

Heidi Lindberg
Floriculture Extension Educator
Michigan State University
wolleage@anr.msu.edu

Dr. Roberto Lopez
Floriculture Extension & Research
Michigan State University
relopez@msu.edu

Dr. Neil Mattson
Greenhouse Research & Extension
Cornell University
neil.mattson@cornell.edu

Dr. W. Garrett Owen
Greenhouse Extension & Research
University of Kentucky
wgowen@ukv.edu

Dr. Rosa E. Raudales
Greenhouse Extension Specialist
University of Connecticut
rosa.raudales@uconn.edu

Dr. Beth Scheckelhoff
Extension Educator - Greenhouse Systems
The Ohio State University
scheckelhoff.11@osu.edu

Dr. Ariana Torres-Bravo
Horticulture/ Ag. Economics
Purdue University
torres2@purdue.edu

Dr. Brian Whipker
Floriculture Extension & Research
NC State University
bwhipker@ncsu.edu

Dr. Jean Williams-Woodward
Ornamental Extension Plant Pathologist
University of Georgia
jwoodwar@uga.edu

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