Mum Pests, IMF Guide, Methyl Bromide & Anaerobic Soil Disinfestation

Research and News on the latest pest management techniques

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PestTalks

COMING UP THIS WEEK:

Mum Pests
Mum Diseases
2027 IMF Guide
DPR on Methyl Bromide
Anaerobic Soil Disinfestation
ASD Adoption

A Rundown of Mum Pests

Folks are counting down to the weeks when mums will be shipped out. This isn't the time to take your eyes off the ball. Stay vigilant, find problems early and solve them immediately before they cause havoc in the crop.

Here are a few pests to keep an eye on:

When it's hot and dry, spider mites can ruin a mum crop quickly. While having less-severe foliar diseases, drip-irrigated plants seem to have more mite problems later in the season—well, at least in my observation. That's perhaps because the canopies are kept dry and favorable for spider mites.

There are multiple effective biological and chemical tools for reducing spider mite populations and preventing damage (stippling, chlorosis, etc.) At this stage in the game, y'all may have to increase the predatory mite release rates if you rely mainly on biological control or shorten the miticide re-application interval.

Caterpillars are occasional pests for outdoor mums. Beet armyworm is the most common species I'd found around my neck of the woods, but corn earworms, loopers and other species may also show up.

I find caterpillars to be a little more opportunistic. What I mean is that the adult moths are attracted by light or suitable plants (in this case mums) and just decide to lay eggs right there and then. Caterpillar infestations are easy to spot: The plants are either missing chunks of leaves or flower petals, and caterpillar poop is usually noticeable. During the day, look deep in the canopy and you might find the caterpillars.

Leafminers used to be major pests of mums, but not any more because of excellent insecticides and biological control options. This is one pest you don't have to worry about this season.

Several species of aphids can infest garden and potted mums. Honeydew, sooty mold and shed skins from aphids can be quite noticeable; they'll make the mums unsellable. Thrips, on the other hand, cause stippling on and distortion of foliage and flowers. I often think of aphids and thrips as being more problematic when the mums are younger (cause distortion on new growth) or in the later stage of production (cause damage to flowers or overall aesthetics).

Hopefully, y'all have done a good job of scouting and managing thrips, mites and aphids all along the season so you don't have severe infestation at this time. Quite a few biological and chemical control solutions are available for thrips, spider mites, aphids and caterpillars.

Check out *GrowerTalks*'s 2026 Biosolutions Guide for biological control options. For insecticides, *GrowerTalks*'s 2027 Insecticide, Miticide & Fungicide Guide or the Bug Poster I put together are the go-to resources. (I've updated the Bug Poster with newly launched products, such as Barracuda and Vykenda.) As always, the back side of the Bug Poster has rotation programs for your major pests.

Mum Diseases, Too

Okay, okay, I'll be fair and talk about diseases of mums, too.

One thing I want to mention before moving on to the diseases of mums is that y'all may have to do a bit more detective work, particularly in distinguishing symptoms of diseases, nutrient deficiency and environmental stresses (such as heat and water deficiency or excess). Remember that some root rot symptoms may look very similar to those of drought stress or nutritional deficiency because the root system and the efficiency in taking up water or nutrients have been compromised.

I don't trust my own judgment when diagnosing diseases, so I almost always send in samples for testing. That way, an expert can tell me with a high degree of confidence whether an issue is due to disease or not. If it's not disease, I might be able to find the nutritional and environmental causes of my problem through the process of elimination.

Among the root, crown and stem diseases, I pay most attention to Fusarium wilt, Pythium root rot and Rhizoctonia blight. The initial symptom of these diseases is often wilted canopies that don't recover from any amount of irrigation. Fusarium wilt often collapses one side of the canopy, whereas Pythium root rot causes a more general wilting of the entire canopy. Rhizoctonia causes stem canker, which progresses to an aerial blight. You might see Rhizoctonia mycelial growth in the canopy if you examine

close enough.

A mum that has one wilted side usually indicates Fusarium infection. But remember—send in samples for diagnosis and to confirm.

Foliar disease-wise, Botrytis is pretty common because airflow is greatly reduced, as the canopies close in on each other. Here is a good write-up on Botrytis on mums from Bill Calkins in his *Tech On Demand* newsletter a couple of weeks ago.

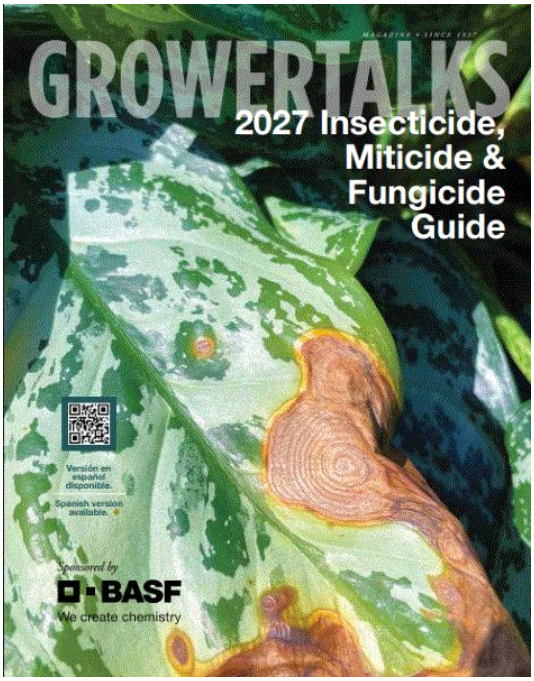
Then there are chrysanthemum rust and bacterial leaf spot and blight. Bacterial leaf spot is particularly problematic when it's warm and during periods of rain.

We all know that moisture is a key environmental factor in disease development, so manage the environmental conditions and irrigation (if you can do that), watch the weather and make preventive fungicide applications as needed.

GrowerTalks's 2026 Biosolutions Guide and the 2027 Insecticide, Miticide & Fungicide Guide have the solutions you need to deal with these diseases.

Did I Mention That the 2027 IMF Guide is Available Online?

I'm sure I didn't mention anything about the 2027 Insecticide, Miticide & Fungicide (IMF) Guide in any of the previous issues of the newsletter. Why? Because I only just found out that it's now available online!



I love the picture of Anthracnose on an aglaonema leaf on the cover! I don't see that often outside of the South.

The 2027 IMF Guide features a story on the plant health team at Willoway Nurseries in Ohio. (Way to go Mark Shelton, Camryn Pierson and Will Mihalega!) The team has found success with using beneficials, particularly nematodes, in managing some important pests, such as flea beetles.

Zee Ahmed of Clemson University and his students, Peilin Tan and Powlomee Mondal, contributed two scouting and management guides—one on mealybugs and one on two-spot cotton leafhoppers. The guides are full of colorful pictures of the critters and their life cycle, and will be very helpful in your effort to find and control these pests.

Kevin Chase of Bartlett Tree Research Laboratory talks about crapemyrtle bark scale in nurseries and landscapes. Kevin explains why this scale insect pest is very difficult to control and how to control it.

Jeremy Pickens of Auburn University laments the fact that roots are the most important, but the least-understood, part of a plant. Jeremy talks about how high root zone temperature can impact plant growth and health. But proper root zone temperature management can also present opportunities in producing better and healthier plants with less fertilizer and fungicide inputs.

Charis Marble contributed a list of preemergence herbicides for nursery weed management. And, as in the past, a fungicide chart, and an insecticide and miticide chart (by Ray Cloyd of Kansas State University) are also included in the new IMF Guide. Note that Terraguard and Sirocco are now replaced with BattleLine and Barracuda, respectively, and Decathlon, Discus, Preclude and Pycana may no longer be available.

CA DPR Found No Alternative to Methyl Bromide

Here's a piece of news that may be of interest to those growing flowers and vegetables in the fields in California and elsewhere. The California Department of Pesticide Regulation (CA DPR) released a report based on research conducted by the California Council on Science & Technology. The report, which examines the uses and alternatives to methyl bromide (as well as dazomet, metam-sodium and metal-potassium, collectively called the methyl isothiocyanate or MITC generators), has found that there's no 1:1 substitution for methyl bromide or other MITC generators.

Methyl bromide and MITC generators are restricted pesticides, including in California, that are used for sterilizing soil and media before crop planting. This technology is largely phased out in conventional agriculture, but it remains important to disease, pest and nematode quarantine and management in many field-grown specialty crops, such as vegetables, strawberries and cut flowers. Finding an

alternative to methyl bromide, which is highly toxic and an ozone depleter, has been a quest for as long as I can remember. There are some alternatives to methyl bromide, such as phosphine and chloropicrin. However, the ease of use, efficacy and cost of these alternatives have limited their deployment.

The findings of the report send the effort of replacing methyl bromide back to doing more nursery-, crop- and region-specific research on finding alternatives that perform well under commercial scale. As part of its Sustainable Pest Management Roadmap, CA DPR recently awarded a grant of $602,449 to the University of California Agriculture & Natural Resources to evaluate the efficacy of alternative soil fumigant combinations for nematode management in vegetable production.

Anaerobic Soil Disinfestation in Floriculture

A biological alternative to methyl bromide that's attracted quite a bit of attention is anaerobic soil disinfestation (ASD). In fact, when successfully implemented, ASD can also reduce pesticide inputs against any pest, whether it's an insect, pathogen, weed or nematode.

The idea of ASD sounds pretty simple. First, you incorporate a carbon source into the soil. Carbon sources that have been used are usually crop waste or by-product, so hopefully they're relatively cheap. Then you saturate the carbon source and soil mixture with irrigation. And, finally, you put a tarp over the wet mixture to cut off oxygen supply and let it incubate for several weeks. Aerobic microbes are starved off during incubation, and anaerobic microbes thrive and produce organic acids that kill the target pathogens or pests. ASD not only benefits pest management, but it also improves soil fertility and other chemical, physical and biological properties.

Now, as I mentioned, ASD sounds simple, but it's nothing but simple when put into practice. You need to know what are the best carbon source, temperature and tarping duration that will favor the anaerobic microbes or disadvantage the target pests in the soil type in your area. There are lots of moving pieces, so there's no one-size-fits-all recipe for all production systems or areas.

But somebody has to start the research somewhere.

Here's an example in the floricultural industry: The American Floral Endowment (AFE) supported a research project, led by Francesca Hand of The Ohio State University, examining the potential of using ASD as a management tool against soil-borne diseases in cut flower production. Go HERE for a summary of the research.

Zinnia plants grown in media inoculated with Rhizoctonia and treated (right) or not treated with ASD (left). (Photo from AFE.)

Francesca and her colleagues also published the research in the scientific journal *Plant Disease*. Francesca and her team looked at the efficacy of ASD against Rhizoctonia in zinnia and Phytophthora in gerbera daisy. Soil and soilless media were first inoculated with pathogens, then amended with wheat bran, tomato pomace or soybean meal as carbon sources in the ASD treatment. (Not amended with a carbon source in the control treatment.) After incubation at 77F for four weeks, the media were used to

grow plants and disease development was observed for up to five weeks.

Results show that ASD wasn't effective in reducing Phytophthora crown rot in gerbera daisies, but effective against Rhizoctonia root rot in zinnias, suggesting that ASD isn't equally effective against all pathogens. Carbon sources raised the pH and reduced soluble salts, calcium, magnesium and nitrate-nitrogen, and the effects largely didn't differ among carbon sources.

ASD successfully reduced Rhizoctonia incidence in both soilless and soil-based media, with the efficacy in soil-based media just a tad bit greater than soilless media. The three carbon sources were equally effective in soil-based media, but soilless media amended with wheat bran and pomace had lower disease incidence than those amended with soybean meal.

This study demonstrates that ASD has potential as a disease management tool against certain pathogens, such as Rhizoctonia. But, again, the efficacy will depend on soil types, carbon sources, target diseases and crops. What do we need to do next? More research, of course!

What Do Folks Think About ASD?

Sure, ASD has potential in floriculture and other horticultural crop production systems. Some studies suggested that ASD can control some important pathogens and nematodes at the fraction of the cost of conventional management methods. With all of these benefits, it may be puzzling why very few folks adopt ASD as part of their overall plant health program.

Claudia Schmidt and Francesco Di Gioia of Penn State, Dinglin Duan and Zhifeng Gao of the University of Florida, and Eric Rosskopf of USDA-ARS published a survey in the journal *HortTechnology* last month with the goal of solving the puzzle of low ASD adoption.

A total of 230 people responded to the survey, with 206 of them providing farm sizes (so most of the survey participants are likely farmers). The major crops grown by the survey participants were tomatoes, corn or sweet corn, and apples.

Of the participants who responded to the survey gauging their understanding of ASD, 75% selected the correct definition. Despite that seemingly high understanding, only 5% self-identified as well informed and 43% felt that they weren't informed at all. Fifty-nine percent of respondents wanted to learn more about ASD, but 41% didn't seem to have any interest in learning more.

It seems to me that many folks are interested in ASD, so what's stopping them from adopting it? Barriers to adoption (participants can choose multiple options) identified by the survey include a lack of knowledge or training (58%), challenges in application or other aspects of ASD (48%), equipment availability (43%), increased labor cost (38%), concerns over effectiveness (35%), environmental concerns (plastic use) (32%) and others.

This is a short survey, but it tells a good story of what's stopping folks from adopting ASD. It seems like ASD evangelists may need to spread the words farther and wider through extension-lead programs, webinars and demonstrations. More work needs to be done!

See y'all later!

JC Chong
Editor-at-Large
PestTalks

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