

PEST ALERTS: Peak flight of **CABBAGE Maggot** Flies is NOW (<http://newa.cornell.edu/index.php?page=cabbage-magot>); Cover your rows or start scouting for eggs, which were sighted in North Kingstown. **Flea beetles** and **beet leafminers** also sighted in North Kingstown. See **Grower's Notes from the Field** on Page 3. **YOU** are invited to submit your Notes from the Field. Or leave a verbal report on the URI number below.

Thanks to those who donated on the URI Day of Giving!

--> **Need to discuss? Got something you need looked at?** URI Extension: 401-874-2967/andy_radin@uri.edu, hfaubert@uri.edu

Slo-Mo Spring



Sugar Maple in Full Bloom

Frustration is building... Yet another soaking rain Friday night into Saturday. More clouds. Highs in the low 50s. And another five-day forecast of unsettled weather. But... cool season greens are doing well in tunnels and under covers. Hope we don't get slammed with instant summer.

Greenhouse Weirdness

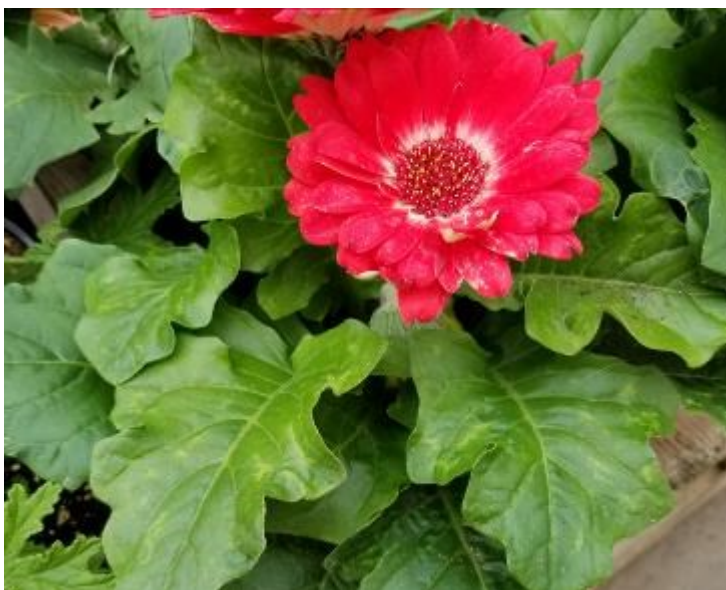
Cool cloudy weather is causing strange reactions in the leaves of plants whose roots are stuck in growing media that won't dry. There are disorders that can resemble each other, may take on several different forms, and go by a whole bunch of names: Intumescence, Edema (or Oedema, if you are feeling like a Classicist), Oedemata, Neoplasm, Enation, Excrescence (yuck), leaf lesion, genetic tumor, or gall. On the following page is a gallery of weird things seen in the last two weeks. The exact set of conditions that cause all of these is still not sorted out in the scientific community. But: assuming that roots are not rotting, plants will grow out of most of these when the weather changes. But unfortunately, this is not a solution if you are selling plants now.

Remember, also, that constantly moist media is conducive to fungus gnats, the larvae of which feed on roots, and shore flies, which leave black flecks on leaf surfaces.

Are Biofungicides in your plans?

Growers of all stripes are making use of these tools with good results

These materials usually (but not always) contain microorganisms. There are quite a few products on the market now, and many are allowable in organic production systems. All organisms associated with these products are naturally occurring in soil or on plant surfaces. Applying concentrated preparations containing known organisms tremendously augments their populations, causing several different reactions that protect plants. **Continued page 4...**



No feeding damage of any kind on the tomato (upper left); younger tomato seedlings were seen in other farms' greenhouses with similar symptoms. The raised yellow discolorations on the basil (upper right) and eggplant (middle left) had no signs of feeding underneath, and young growth had no symptoms. The petunias (middle right) had lots of irregular leaf surface, making this lovely arrangement a little less than perfect. These big strong plants will eventually grow through this. Same with the *Gerbera* on the lower left. Just looking a little weird at the moment. Inform your customers that the growing conditions haven't been great.

Report from Middletown

Greetings from Garman Family Farm in Middletown, where as of May 4th we are limping along at 44 Growing Degree Days (Base 50 degrees F). Soil temperature here has flat-lined at 50 degrees F and we continue to wait for some sunshine and warmth. On the positive side, (we are ever optimists), we have had to irrigate very little so far this season.

Our pest pressure has been low. We have scouted for seedcorn maggot and not seen any yet. In terms of the calendar we should be seeing beet leafminer, but we are still about 250 GDD from its appearance. No flea beetles yet, but all our Brassicas are under

row covers just in case. We saw one lonely cabbage butterfly wandering across the field yesterday. She looked lost, poor thing.

Everything is late this year; asparagus is just coming up, dandelions made their appearance last week, and we are just now seeing some ragweed germinating in warmer patches of the field. The remnants of last year's bok choy just bolted over the last few days. Hard to believe we will be setting out cukes and squash in a couple weeks!

We hope everyone's off to a good start, and we look forward to hearing reports for your corner of this vast state!

Other sightings...



URI Asparagus above; Matt's "Bug Lock" below. This



tunnel is ready to keep out cucumber beetles!



Beet leafminer, above, a pair of flea beetles, below.



Biofungicides: How they work

There are several modes of action of a number of these products, which may explain why they actually work at all. Common to all these mechanisms is the biofungicide's interaction with the Rhizosphere: the micro-space immediately surrounding all roots. It is a hotly researched area. This zone is where complex, interactive relationships play out between a diverse assemblage of microorganisms and plant roots.

Roots secrete many energy- and nutrient-rich compounds that feed and attract the microbes, which in turn, perform many services. The result is a mutually beneficial coevolution of many organisms. Most are familiar with mycorrhizae, which are fungi which colonize plant roots, and *Rhizobia* species of bacteria, which live in nodules of legume roots. But the organisms in biofungicide products are both beneficial to plants and detrimental to pathogenic organisms.

Mechanisms

- Mycoparasitism: introduced organisms directly attacks the pathogenic organisms
- Antibiosis: Introduced organisms produce a compound that is toxic to the pathogenic organisms
- Competition for nutrients or space: Introduced organisms outcompete pathogens
- Tolerance to stress through enhanced root and

plant development: Introduced organisms produce compounds that enhance plant health or growth

- Solubilization and sequestration of inorganic nutrients: Introduced organisms make nutrients available for plant to take up
- Induced resistance: Introduced organisms stimulate plant immune responses , preventing pathogenicity
- Inactivation of the pathogen's enzymes

Products

A handful of easily available products are now being used by several Rhode Island growers. You might find use for them in your production system. Several products can be used on foliar pathogens but the most sure-fire products are root ball/soil treatments. Marinating your seedlings prior to transplanting is a good way to get them in close to the roots. They can also be applied to field soil, but remember: it's a jungle down there. The most commonly used organisms are *Trichoderma* fungus species, and several species and strains of *Bacillus* bacteria species. Among disease known to be controlled to some degree are *Fusarium*, *Rhizoctonia*, *Pythium*, *Pseudomonas*, *Xanthomonas*, and Powdery Mildew. The following link leads you to a very useful list of biological and other organic fungicides that have been efficacy tested, compiled by Meg McGrath of Cornell University: https://rvpadmin.cce.cornell.edu/uploads/doc_582.pdf