High and Dry

Growing Vegetables in Northern New England High Tunnels

THE UNIVERSITY OF VERMONT EXTENSION

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WELCOME to the first issue of "High and Dry: Growing Vegetables in Northern New England High Tunnels," a quarterly newsletter linking growers, researchers and agricultural service providers to enhance protected crop production! This is a collaborative effort between the University of Vermont, University of New Hampshire and others to support high tunnel growers — especially new ones who are still learning the ropes of this technology. This work is funded by the Northeast Sustainable Agriculture Research and Education (NE-SARE) program.

This newsletter is intended to help growers keep their high tunnel crops thriving. Our Northeastern climate is changing, characterized by more extreme, unpredictable weather. Growing vegetables under plastic is critical to ensuring a stable supply of locally grown produce year-round and for the sustainability and economic viability of diversified agriculture. An estimated 18,000 high tunnels cover more than 36 million square feet in the region and more are popping up every year. High-tunnel crop revenues are greater than those for field-grown crops, which is essential to keep our small farms in business.

Through this SARE grant we are consolidating information on best practices for high tunnel production and disseminating it widely to all. This issue features seasonal pest and disease concerns as well as upcoming events of interest to growers.

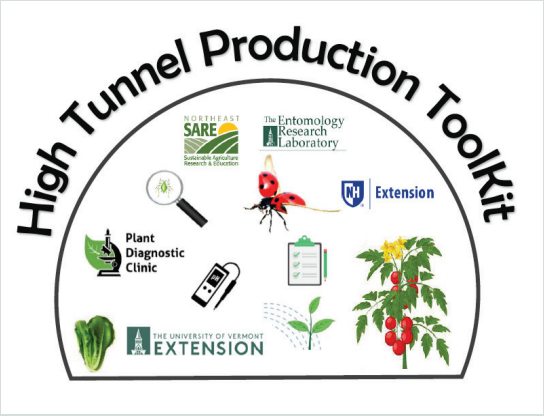
This project draws on experts (see PAGE 4) throughout Northern New England. Please contact them and the high tunnel project team with any questions.

The High Tunnel Production Toolkit

Visit the High Tunnel Production Toolkit online! The website is geared for new high tunnel producers across the Vermont, New Hampshire and Maine, tri-state region, but growers of all experience levels will benefit from these resources.

The project is funded by Northeast SARE and led by the University of Vermont in collaboration with the University of New Hampshire.

The toolkit has factsheets and presentations; lists workshops, seminars and events; and provides a list of resources from other institutions and agencies.



https://go.uvm.edu/high-tunnel

Upcoming Events

Biological Control of Wintertime Aphids webinar

October 23, 12 p.m.

Join this discussion with Dr. Laura Ingwell (Assistant Professor, Purdue University) and Dr. Samantha Willden (Postdoctoral Research Associate, Purdue University) who have been leading a team of researchers to find the best approaches to biocontrol through the fall and winter.

More information online.

2023 High Tunnel Production Conference "Revitalizing Your Tunnel Vision"

December 6 & 7, 2023
Fireside Inn and Suites, West Lebanon, N.H.

This conference is for high tunnel vegetable growers and agricultural service providers of all experience levels. Take advantage of this opportunity to fine-tune your high tunnel crop production skills and visit the trade show. Registration is $100 for first farm attendee, $75 for each additional registrant from the same farm. Check out the conference agenda and register online.

Consider Nighttime Scouting for Extended Season Tunnel Crops

Anna Wallingford, UNH

This summer felt like a standout year for caterpillars in high tunnels. I heard many reports that this was a bad year for hornworms and we found many tomato tunnels affected by fall armyworm *(Spodoptera frugiperda)* and corn earworm (aka tomato fruitworm, *Helicoverpa zea)* boring into developing tomato fruits. This may indicate that this fall and winter may be hard years for caterpillars because those larvae are a result of egg laying by moths through the summer and fall.

It may be worth a trip out to the high tunnel with your headlamp to scout in order to identify what might be causing chewing damage to extended season crops. We've been seeing plenty of yellowstriped armyworm *(Spodoptera ornithogalli)* and variegated cutworm *(Peridroma saucia saucia),* which will soon enter a quiescent period and won't be causing much more damage. However, we're also seeing plenty of slugs and we're just starting to see winter cutworm, which will continue to feed and cause damage throughout the winter.

Winter Diseases in High Tunnels

Ann Hazelrigg, UVM Extension

Just because winter greens are indoors and protected from the elements in high tunnels, does not mean they are free of diseases. Managing moisture is tricky in high tunnels and diseases often appear any time you have high moisture and condensation. The first disease complex to worry about in high tunnels is damping off. Damping off can cause a rot either before the seed emerges or after emergence. This disease is caused by several different soilborne fungi that all like cool, wet conditions. Anything you can

do to promote rapid germination will help avoid this destructive disease. This includes using clean seedling trays, planting into warm soils by using heating mats, choosing planting media with the optimum amount of organic matter (impacts water holding capacity), and avoiding overwatering during cloudy cool weather. Some growers may choose to use soil amendments in the planting media to decrease attack by soilborne pathogens, but this should be done in addition to following good cultural practices.

Foliar leafspot diseases can be difficult to avoid in high tunnels, especially in fall and late winter when you are taking off and putting on row covers. Condensation can build up under the covers, resulting in a lot of leaf wetness. Anytime you have 6 to 8 hours of leaf wetness, plants are susceptible to a wide variety of leafspot diseases such as Cladosporium on spinach. Once infected with a leafspot disease, it is tough to rescue with fungicides. An important consideration is to never put row covers back on wet leaves, since this often leads to infections. Starting with clean disease-free seeds is also critical so consider purchasing hot water treated seeds. Read more at:

https://ag.umass.edu/vegetable/fact-sheets/spinach-cladosporium-leaf-spot

Downy mildews can also present problems in high tunnel spinach and lettuce under cool, cloudy, wet conditions. We have noticed a rise in the pathogen in spinach due to the "green bridge" with late-season field spinach overlapping with high tunnel fall spinach. The best management practice for this disease is to use cultivars which are resistant to the pathogen. There are several races of downy mildew and breeders are always trying to develop new cultivars that resist new races that emerge. Selecting and growing a few cultivars that bridge all the races present in New England is a good strategy.

Iadosporium leafspot on spinach. (Photo: G. Higgins, UMASS Vegetable Program)

Diagnosing diseases can be tricky. Each state has a Plant Diagnostic Clinic which can look at photos or physical samples to help you figure out what is causing your crop problems.

Upper leaf surface of spinach with downy mildew. (Photo: M. McGrath, Cornell University)

Spinach leaf undersides showing downy mildew. (Photo: M. McGrath, Cornell University)

Avoiding Aphid FALLout

Cheryl Frank Sullivan and Margaret Skinner, University of Vermont Entomology Research Laboratory

As fall arrives, many high tunnel growers are either transitioning to cool season crops or preparing for a fallow period over winter. This is a reminder that NOW is a critical time to be on the lookout for aphids (Aphididae) to avoid an apocalypse next spring.

If tunnels will be fallow, removal of crop debris and weeds is paramount to reduce aphid overwintering sites. If crops are being established, routine scouting is essential to find and manage early-season hotspots. On our High Tunnel Production Toolkit website, there are several resources to assist with scouting. These include a scouting checklist, several datasheet types and some tips and critical questions to consider if pests are becoming a persistent problem. If aphids are found, it's important to have them identified because some of their natural enemies tend to be aphid-species specific. Send specimens to your Diagnostic Clinic for id, either UVM or UNH, or contact your local University Extension specialist.

Aphids (winged and non-winged) on kale.

For more specific identification and management information, please visit the following resources:

- Aphid and Disease Management for Winter Greens in Tunnels (2020 Vermont Vegetable and Berry Grower Webinar Series), Cheryl Sullivan and Ann Hazelrigg (UVM), slides and video recording
- Winter Aphid Management Fact Sheet (Cordelia Hall and Justin Reid — Cornell)
- Specific crop management recommendations (i.e., pesticides) are found in the New England Vegetable Management Guide

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Controlling Rodent Problems in Winter Growing

Chris Callahan and Andy Chamberlin, UVM Extension Agricultural Engineering

Rodents can be a significant problem with winter tunnel production. Chris Callahan and Andy Chamberlin, UVM Extension's Agricultural Engineering Program, have the "Rats and other rodents" tips and factsheet. Consider implementing these practices:

- Reduce Protection — Minimize "cover" — anything that provides protection from being seen by predators near growing areas. Mow regularly around growing areas and trim against high tunnel / greenhouse baseboards, avoid having piles of building material, row cover, etc. Ideally make them cross "open" ground to get to your crop. That makes them uncomfortable because it exposes them to predation and removes their preferred method of navigation. Rodents navigate well in tunnel-like enclosed spaces by keeping their whiskers in contact with the surroundings, so open things up.
- Reduce Access — Use rodent exclusion practices like solid, sealed baseboards, hardware cloth, and curbs to limit easy access to the inside.
- Reduce Populations — Trapping and killing are unlikely to be effective in the long-term without the other measures above. The populations are often large when conditions are comfortable. Trapping and killing is most important and effective when there is a very acute problem in a more contained space (market, storage, etc.). There are lots of options including commercial traps, bait stations, air rifles and birth control. Control options will depend on your specific ethos and management approach.

A well-cleared baseboard/ground interface reduces harborage space

Excessive weed growth allowing ample cover and harborage

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