UCONN
COLLEGE OF AGRICULTURE, HEALTH AND NATURAL RESOURCES
EXTENSION

Vegetable Pest Alert

August 11, 2023

Cucurbit downy mildew (CDM) was reported in Franklin County, MA, this week in the cucumber varieties Marketmore and Stronghold. Growers should continue applying a preventative fungicide regularly to cucumber and cantaloupes. These are listed in the New England Vegetable Management Guide.

Cucurbit downy mildew on upperside and underside of cucumber leaf

Preventative materials effective against CDM:

- Chlorothalonil
- Mancozeb
- Copper (less effective than chlorothalonil or mancozeb but OMRI-listed options available and also effective against bacterial diseases)

Effective CDM-targeted materials include:

- Orondis
- Omega
- Ranman
- Zampro
- Zing! or Gavel
- Ariston, Curzate, Tanos
- Previcur Flex

Presidio, Revus, and Forum are currently ***not*** recommended due to pathogen resistance.

Nutrient management in vegetable crops after excessive rainfall

During the month of July, the northern region of Connecticut was drenched with as much as 12 inches of rainfall, while the majority of the state received between 8 and 10 inches. In contrast, in July of the previous year, Connecticut only received under 4 inches of rain. With heavy rainfall events comes the concerns of leaching of nutrients out of the rooting zone. Nutrients most at risk to be lost are nitrogen, potassium, magnesium, and boron.

It is important to consider soil type when making decisions on applying additional nutrients. Leaching losses will be more severe on sandy soil types whereas less losses expected on clay loam textured soils.

Nitrogen is lost from soils as nitrate-N with leaching (water movement through soil) and denitrification (biological conversion to N gases with saturated soil).

Table 1. Potential loss of N via denitrification for soil temperature and time in anaerobic conditions.

Time (days)	Temperature (degrees F)	N Loss (%)
5	55 - 60	10
10	55 - 60	25
3	75 - 80	60

Source: Nebraska Extension publication, Nutrient Management for Agronomic Crops in Nebraska: Nitrogen (EC155)

Visual observation for signs of N deficiency (lower leaves yellowing, inverted V yellowing pattern of leaf tips) is one option, although yield potential may be reduced by the time N deficiency is visible. Over the last thirty years, research conducted in the Northeast has found the Pre-sidedress nitrate test (PSNT) useful for improving N management of several vegetable crops including sweet corn, peppers, pumpkin, winter squash, and cabbage. The PSNT is most suitable for use with annual crops, which accumulate N rapidly within a single growing season. See New England Vegetable Management Guide for the timing of PSNT and sidedress nitrogen needs of crops.

Being able to dry the soil and till it to get oxygen back into the soil improves microbial activity and the mineralization of nitrogen. While soil test can answer how much nutrients are exactly needed, general recommendation for nutrients for sidedress are -- Nitrogen: 20 – 40 lbs/acre; Potassium: up to 30 lbs K/acre (not as mobile as N, sidedress for longer season fruiting crops);

Magnesium: 15 lb/acre; and Boron: foliar spray with 0.25 lbs B/ acre (boron responsive crops include the root crops, celery, celeriac, broccoli, cauliflower and tomato. Chinese cabbage and pak choi are less responsive, but may also benefit from a boron spray).

Saturated soils can also lose soil biological activity because of lack of oxygen, in addition to nutrient losses. Growing cover crop(s) helps to revive the soil health as the living roots will help rebuild fungal networks and other microbial activity. More information on selecting cover crop species is available here: https://nevegetable.org/cultural-practices/cover-crops-and-green-manures.

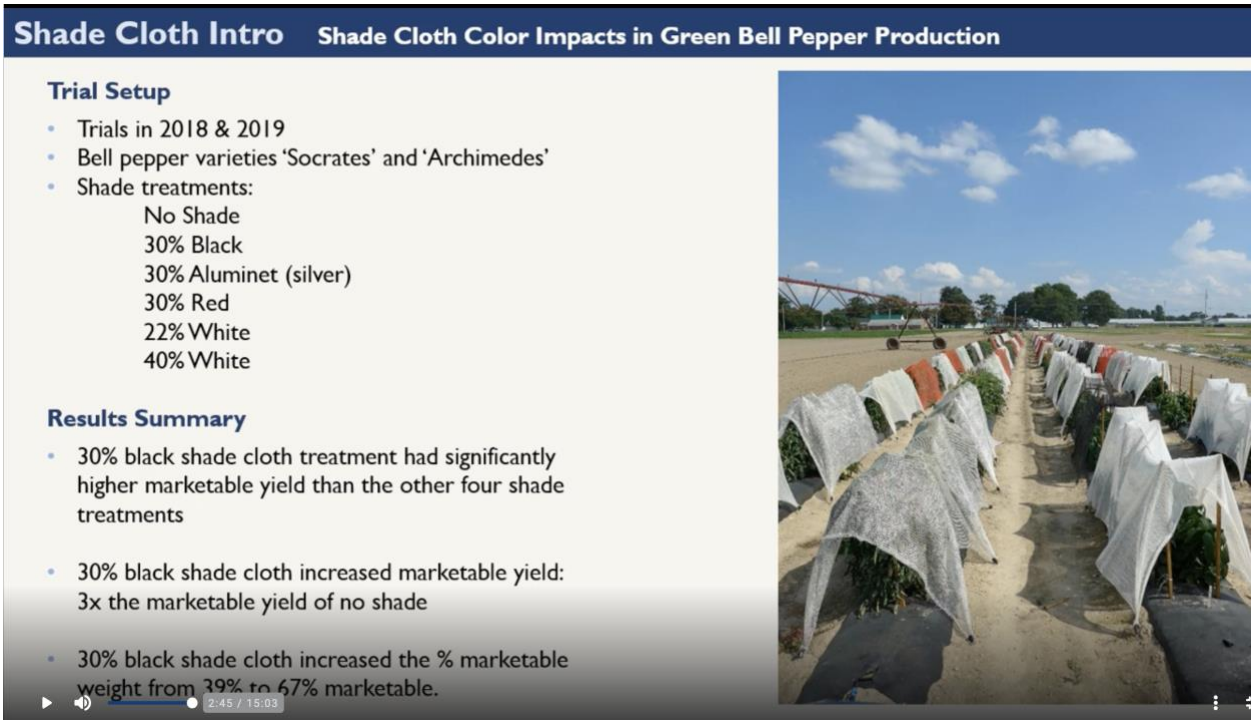
Some research highlights from the 2023 American Society for Horticultural Science conference in Florida

Use of Shade Cloth Increases Marketable Yield and Fruit Size in Bell Peppers Grown on Black Plastic Mulch

Emmalea G Ernest and Gordon C Johnson, University of Delaware

Sweet peppers produced on black plastic are subject to heat stress induced yield and quality loss. Recently transplanted seedlings establish poorly in hot conditions and later in the season, high temperatures cause sunscald in pepper fruit. In some areas, farmers use shade cloth to reduce impacts of high temperatures on pepper yield and quality. We established trials in Delaware to develop recommended practices for shade cloth use in the coastal plain of the Mid-Atlantic region. Trials in 2018 and 2019 tested the effect of shade cloth color on yield and quality in two bell pepper varieties ('Socrates' and 'Archimedes') harvested at the mature green stage. A trial in 2022 tested the effect of shading with 30% black shade cloth at different times in the growing season in colored peppers ('Aristotle', 'Abay', 'Milena', 'Carmen').

In the shade cloth color trials, five shade cloth treatments were compared to no shade. Peppers were transplanted in early June. Shade cloth was applied over the trellis stakes in early July. Shade was left in place through mid-August. **All shade cloth treatments produced significantly higher total yield, higher marketable yield and larger fruit than the unshaded treatment. The 30% black shade treatment produced significantly higher marketable yield than the other four shade treatments (30% aluminized, 40% white, 22% white, 30% red).** There was not significant interaction between variety and shade treatment.



In the shade cloth timing trial, four shade timings were compared to no shade in a split plot design with variety subplots. Shade treatments were: shade only in June (Jun), shade only in July (Jul), shade in June and July (Jun/Jul) and shade from June to mid-August (Jun-Aug). Peppers were transplanted in early June and shade was applied to the June shaded treatments the day of planting. In the bell pepper varieties, all shade treatments produced significantly higher total and marketable yields than the no shade treatment. For the variety 'Carmen', **The Jun and Jun/Jul treatments had significantly higher total and marketable yields than the unshaded treatment,** but the Jul and Jun-Aug treatments were not significantly different than the control. Treatments with shade in June had significantly higher transplant survival rates. Treatments with shade in July and August had significantly higher percent marketable fruit, but later season shading was more beneficial in the bell pepper varieties than in 'Carmen'.

Biostimulants Can Improve Onion Seedling and Early Bulb Growth: Cultivar and Microorganism Specific Positive Effects

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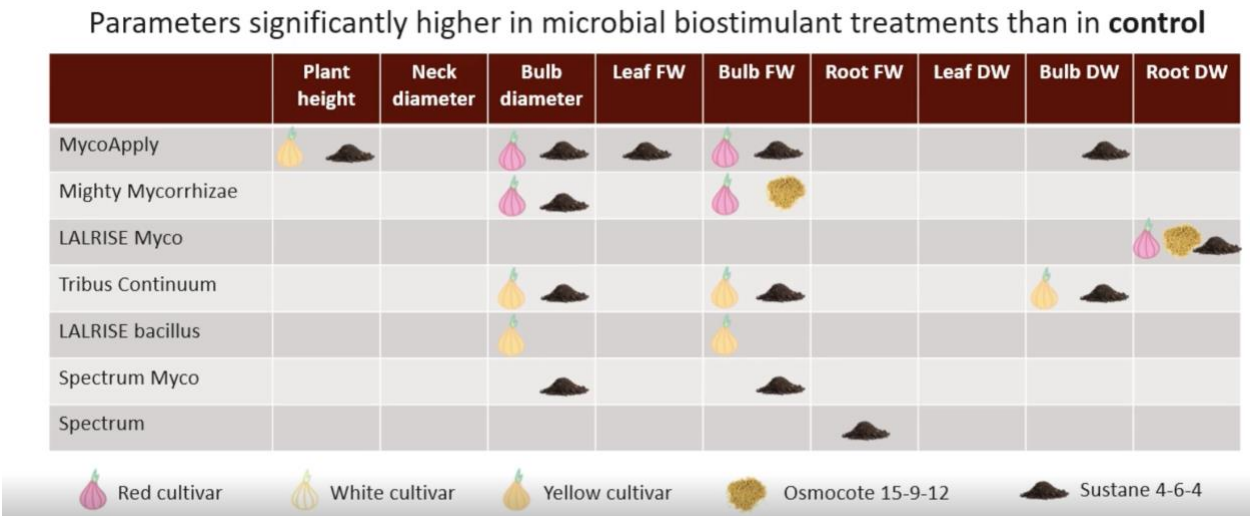
Onion (*Allium cepa* L.) is a major vegetable crop grown worldwide, utilized for both culinary and medicinal purposes. The use of biostimulants has the potential to improve onion seedling growth and quality.

This study investigated the effects of nine microbial biostimulants (Spectrum, Spectrum DS, Spectrum Myco, MycoApply, Tribus original, Tribus Continuum, Mighty Mycorrhizae, Lalrise Mycorrhizae, Lalrise Bacillus) and one non-microbial biostimulant (Kelpak seaweed extract) on

plant growth of three onion cultivars (Carta Blanca-white, Don Victoro-yellow, Sofire-red) at both the seedling and mini-bulb stage.

During the seedling stage microbial biostimulants did not result in significant positive effects on shoot and root morphology or biomass, except for a higher root to shoot dry weight ratio compared to the control. On the other hand, the non-microbial biostimulant Kelpak was found to increase plant height, leaf area, shoot biomass, and average root diameter, but decreased the root to shoot dry weight ratio and root length. Notably, the onion cultivars used in the study exhibited significant differences in morphology and biomass at both the seedling and mini-bulb stages.

At the mini-bulb stage, we observed that the non-microbial biostimulant Kelpak did not have a significant effect on either morphology or biomass. However, the microbial biostimulants **MycoApply, Mighty Mycorrhizae, and Lalrise Bacillus increased plant height, while MycoApply, Mighty Mycorrhizae, and Tribus Continuum increased bulb diameter and bulb fresh weight when compared to the control**. These findings suggest that the positive effects of biostimulants may not be reflected in the early stage of onion seedlings, particularly in the case of microbial biostimulants, which require time to colonize in the rhizome of the plant. Also, the effects of biostimulants on onion growth were dependent on cultivar and specific microorganisms. More research is needed to optimize the application rates and timing of MycoApply, Mighty Mycorrhizae, and foliar spray of Kelpak to enhance onion seedling production.



Continue to be on the lookout for the following pests that were covered in the previous pest alerts (2023):

- Tomato hornworm
- Phytophthora blight, root rot and crown rot
- Bacterial canker of tomatoes
- Verticillium wilt on eggplant
- Powdery mildew of cucurbits
- European corn borers and fall army worm.
- Corn earworm
- Striped and spotted cucumber beetles

This report is prepared by Shuresh Ghimire, UConn Extension. All photos in this publication are credited to Shuresh Ghimire unless otherwise noted.