Role of organic matter in soil-borne disease control

By: Shuresh Ghimire, Assistant Extension Educator, Commercial Vegetables

The addition of organic matter (OM) such as compost, cover crop, seed meals, and peats has been shown to decrease the incidence of plant diseases caused by soilborne pathogens. Several studies have shown that OM amendments can effectively suppress diseases caused by pathogens such as *Fusarium* spp., *Pythium* spp., *Rhizoctonia solani* and *Sclerotinia* spp. (Baysal-Gurel et al., 2012).

Bonnomi et al. (2007) reviewed 250 articles on the application of OM amendments, focusing on their capacity to control multiple soilborne pathogens. OM amendments suppressed diseases in 45% of the cases, were non-significant in 35% of the cases, and increased the disease incidence in 20% of the cases. In particular, compost (specifics not provided) suppressed diseases in more than 50% of cases, while peat suppressed diseases only in 4% of the cases. The ability of OM to suppress disease varied largely with different pathogens. More than 50% of the diseases caused by *Verticillium*, *Thielaviopsis*, *Fusarium* and *Phytophthora* were suppressed. In contrast, only 26% of the diseases caused by *Rhizoctonia solani* were controlled using OM amendments.

Continued on page 3
**IPM, Organic – What’s the Difference?**
By: Mary Concklin, UConn Visiting Associate Extension Educator, Fruit IPM & Production

I am contacted every year by folks wanting to get into the commercial fruit growing business. I ask many questions to better understand what they know and what I can do to help them. One of the many questions I ask is, are you planning to grow organically or non-organically. An interesting answer I have received more than once is, “I want to grow organic not IPM”. That statement indicates there are folks who believe the terms ‘non-organic growing’ and ‘IPM (Integrated Pest Management)’ are interchangeable terms or synonyms. They are not. So what is the difference between organic, non-organic and IPM?

To put it simply, think of IPM as the over-all arching umbrella and under that are cultural, mechanical/physical, biological, and chemical practices employed by fruit growers of both organic and non-organic persuasions to manage pest issues. Organic growing practices are a part of IPM, as are non-organic growing practices – almost all are identical with the exception of the pesticide and fertilizer choices available. For example, cultural practices in fruit growing include using cover crops to build soil health as part of crop rotation. When an orchard or small fruit planting is removed and before it is replanted to a fruit crop, cover crops are used for weed management, improving organic matter and nutrient content of the soil, and helping to rid the soil of pests. Proper site selection and preparation helps to minimize pest problems in the future. Non-organic growers use organic and synthetic fertilizers while organic growers use only organic fertilizers.

Other IPM tactics include using pest models based on weather and/or degree days to determine when and where to set out traps, when and where to monitor or scouting, and management strategies for insect and disease pests. Economic thresholds have been developed for many insect pests of fruit. These are used to determine timing of cultural practices (i.e. summer pruning of pears for psylla management), mechanical/physical practices (i.e. Surround as a barrier for many pests), as well as chemical control for both organic and non-organic materials.

Scouting fields is a critical component of IPM. Scouting for both our enemies and our friends - not all insects are bad so learning to identify our enemies as well as our friends is critical. Knowing the different stages of development of insect pests – which stage(s) cause the damage, and which stage(s) are easiest to control.

Biological control tactics include the use of our friends - beneficial insects and mites, parasitoids and biological pesticides (i.e. *Bacillus thuringiensis*, also known as Bt). It is important to be able to identify all stages of the beneficials when scouting the fields, to understand what they do (feed on the pest, lay eggs in the pest, etc.), then give them time to work before deciding you need to help them with a pesticide application. Beneficials play a key role in commercial fruit pest management whether you are organic or non-organic. I am a fan of picture guides and there are plenty out there as well as mobile apps to help with this.

Mating disruption is a method used to reduce, and in many cases eliminate, the need for chemical intervention for management of specific destructive pests. Mating disrupters for Dogwood borer, Codling moth and Oriental fruit moth are organic certified and are used by both non-organic growers and organic growers. Mating disrupters for Peach tree borer and Lesser peach tree borer are not organic certified. The disrupters release the female pheromone throughout the field, disorienting the males as they seek to mate with the females. No
mating occurs, the males die, no damage to trees or fruit occurs, and no pesticides were applied. (Pictured is the mating disrupter for Peach tree borer and Lesser peach tree borer, Isomate PTB Dual).

Whether you want to grow fruit organically or non-organically, integrated pest management practices should be used beginning before you ever plant the fruit crop in the field. The key difference between organic and non-organic fruit growing is that non-organic growers utilize organic and synthetic pesticides and fertilizers. Organic growers are limited to organic pesticides and fertilizers. So it isn’t a choice between organic and IPM. The choice is organic or non-organic – both employ IPM practices.

**Role of organic matter in soil-borne disease control (continued)**

Though OM amendments have great potential, their correct management is necessary to achieve consistent results and to avoid phytotoxic effects. This can be achieved by optimizing application rates and proper timing between OM application and planting of the vegetable crop. In the early stages of OM decomposition, especially when the available oxygen is low, crop should not be planted to avoid phytotoxicity (Baysal-Gurel et al., 2012).

Knowing the mode of action of these OM amendments provides understanding on how to use these resources for the benefit of plant and soil health. OM improves soil structure and its ability to hold water and nutrients. OM also supports microorganisms that contribute to biological control. Organic amendments containing high nitrogen, such as poultry manure, meat and bone meal, and soymeal, significantly reduced populations of a wide spectrum of soil-borne plant pathogens (Lazarovits, 2001). Pathogen control was shown to arise from the ammonia and/or nitrous acid generated, the concentrations of which are controlled by pH, OM content, and soil buffering capacity (Lazarovits, 2001).

Due to the absence of adequate light in the soil, vast majority of soil organisms are heterotrophic. Thus, soil microbial diversity and its activity is mainly affected by nutrient availability to microbes primarily in form of soil OM. Other factors such as oxygen availability, moisture, temperature, pH, calcium levels, and soil disturbance also affect microbial activity (Brady and Weil, 2008). Therefore, abiotic soil parameters indirectly affect the potential for biological suppression of plant pathogens, as microbial activity is related to suppression of soil borne plant pathogens (Löbmann, 2015). In agricultural soils, the soil management directly influences soil nutrient availability, pH, and other abiotic properties of the soil as well as microbial populations and activity. Therefore, proper soil management increases suppressive potential of soils for soil-borne plant pathogens.

**References:**


Growing Vegetable Transplants and Vegetable Bedding Plants

By: Leanne Pundt, UConn Extension, Extension Educator, Greenhouse IPM

As many of you are getting ready for the upcoming field vegetable season and sowing your vegetable transplants for use in the field or for sale to home gardeners, please refer to the:

Online version of the *New England Vegetable Management Guide* at: [https://nevegetable.org/](https://nevegetable.org/)

There is a section on “vegetable transplants” with updated information on types and varieties, growing media and nutrition (including organic fertility), seeding and transplanting, plant culture and height management, plus insect, mite, disease and weed management.

There are updated tables listing:
- Scouting Guidelines and Biological Control Options
- Fungicides and Bactericides labeled for Vegetable Transplants and Bedding Plants
- Insecticides and Miticides labeled for Vegetable Transplants and Bedding Plants

Please note that the online version has been updated as of February 2019, but not the hard copy version. This will be available at the 2019 New England Vegetable and Fruit Conference.

Figure 1: Vegetable Transplants. Photo by L. Pundt

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**Last chance for Produce Safety Alliance Grower Training Course before 2019 season**

The last session of the Produce Safety Alliance Training Course will be held on March 13 and 14 (March 15, snow date). The course will be held at the Middlesex County Extension Center in Haddam.

To register, go to [http://www.cahnrconference.uconn.edu/](http://www.cahnrconference.uconn.edu/)

This course fulfills the training requirement for any farm that must comply with the Produce Safety Rule. While those who meet the Qualified Exemption criteria *are not required by regulation* to comply with the training requirement, we highly recommend that all produce farmers participate in the course. It is important for all growers to have an understanding of the standards for their industry.

In addition, if you plan to participate in the Connecticut State Department of Agriculture CGAP program for market access (whether you are exempt from the Rule or not), you must have taken this course as well. For more information regarding this program, please contact the DoAg at ProduceSafety@ct.gov or 860.713.2522

For more information about the PSA Grower Course, contact Diane Hirsch at diane.hirsch@uconn.edu or 203.407.3163.
JOIN THE BRASSICA PEST COLLABORATIVE!!!

What is it?
A NE-SARE-funded project conducted by UMass, UNH, UConn, and Cornell Cooperative Extension of Suffolk County bringing together Extension educators, researchers and growers who are dedicated to finding and sharing new ways to combat brassica pests. A coordinated new approach to outreach and education focused on managing perennial insect pests. An Extensive research program focusing on ecological, multi-faceted, cost effective control strategies.

Our goals
Increase farm revenue by reducing crop damage and increasing marketable yield as growers adopt effective, ecological pest management practices. Increase understanding of pest biology and confidence in implementing best management practices and getting control of brassica insect pests.

What does it include?
- **Website:** A clearinghouse of information on pest biology, scouting, management, record keeping
- **Short videos and online workshops:** Short, pest-specific videos and presentations to dig deeper on the most troublesome pests and learn new, effective management tactics
- **Email forum:** Regional, timely discussions among Extension educators, researchers and interested brassica growers including pest alerts, observations, questions, and research updates
- **Facebook Group:** Open to commercial growers and educators in the Northeast to share and discuss relevant pest alerts, observations, research findings, useful resources
- **Field days:** Come out to see our extensive research program on brassica pest management. Field days will be hosted in NY, CT, MA, and NH to showcase and see demonstration plots
- **Grower Collaborators:** Work with the research team to implement a new pest control strategy on your farm and share your results like an on-farm trial—contribute to a regional effort to understand the cost efficiency of various practices

How to get involved?
- Send us your questions! We will use them to prioritize topics for making videos and other resources, just follow this link: [http://bit.ly/growerneeds](http://bit.ly/growerneeds)
- Become a grower collaborator: email brassicapest@umass.edu

Please include farm name, brassica acreage, and crop-pest-control strategy of interest

This material is based upon work supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, through the Northeast Sustainable Agriculture Research and Education program under subaward number LNE18-365.
One on One Advising Sessions

COMING SOON

2019 Sessions

March
Thursday March 7, 2019
9am-3:30pm
Middlesex County Extension Center
1066 Saybrook Road, Haddam, CT

Friday March 22, 2019
4:30pm-9:00pm
CT Farm Bureau Office
78 Beaver Road, Wethersfield, CT

April
Monday April 1, 2019
9am-3:30pm
Windham County Extension Center
139 Wolf Den Road, Brooklyn, CT

Tuesday, April 16, 2019
9am-3:30pm
Wamogo Agri-Science Center
98 Wamogo Road, Litchfield, CT

This spring take the bull by the horns, meet with one of our qualified advisors and make the changes needed to your farm business to elevate it to the next level!

Sign up for the One-on-One Sessions today!

When signing up for session(s) please keep the following in mind:
• The agenda for discussion with the professional is yours.
• Sessions will be filled on a first come first serve basis. So don’t wait - call today!
• You may sign-up for multiple sessions and/or multiple locations.
• To sign up for sessions(s) or cancel a session contact MacKenzie White at 860-875-3331 or email her at mackenzie.white@uconn.edu

2019 Sessions

Farm to School 101  NEW
Demystify Farm to School so you can get a market share of this growing demand...The opportunity to scale up your business to include schools as a buyer is a great way to introduce wholesale into your business plan. Learn how to: incorporate Farm to School in your marketing plan, identify products your farm is best suited to market to schools and find out what schools are really looking for!

Are You Covered? Managing Your Agritourism Risks
Have you or are you considering opening up your farm for agritourism? Learn about how managing the liability and risks associated with inviting the public onto your farm.

Top Ten Tips for New & Beginning Farmers  NEW
Set your farm up for success! Considerations when purchasing farmland. Navigate land use regulations and avoid unexpected taxes with proper planning.

Estate Planning & Farm Transfer
Take this opportunity for FREE legal advice to update your understanding of planning options for farmers and large tract land owners, including the proper use of wills and trusts. Also learn about the current gift and real estate tax laws as well as the implications and options for planning for incapacity, long-term healthcare and Medicaid costs.

Farm Marketing via Communication & Social Media
Every farm has a story; explore engaging ways to share your story and utilize high-speed modern communications and social media to help you stay relevant to your consumer base.

I-9's, Handbooks & Employee Records - OH MY!
Employee and compliance documentation can seem overwhelming and impossible to manage. This session can help you understand what is needed, why it is needed, how to put it in place and how to keep it under control.

Protecting Financial Investments with Crop Insurance
How valuable are your crops? Find out how to use crop insurance as a financial risk management tool to protect your investment!

Strategic Planning for a Prosperous Future  NEW
Focus is the key to success! Develop strategic direction for your business, as a start-up business or even if you have the reins of a multi-generational family legacy. Develop a clear vision and see how empowering strategy is!

Unleashing the Management Power of Your Records
Discuss how you can simplify your numbers and get the most out of financial records for making strategic business decisions that will maximize your potential for success!
4th Annual Creating and Improving Pollinator Habitat Conference

Thursday, March 14, 2019
(snow date--Friday, March 15, 2019)
8:30 a.m. – 4:30 p.m.

The Connecticut Agricultural Experiment Station
123 Huntington Street, New Haven, CT 06511

Schedule:

8:30 a.m. SIGN-IN and settle in. Separate sign in for those who need pesticide credits or other program credits

9:00 a.m. Dr. Kimberly Stoner, The Connecticut Agricultural Experiment Station -- Pollinator Habitats: What Can Recent Science Tell Us?

9:30 a.m. Emily May, Xerces Society for Invertebrate Conservation -- Creating Pollinator Habitat: Site Preparation, Design, Establishment, and Maintenance

10:30 a.m. BREAK

10:45 a.m. Nancy Ferlow, Natural Resources Conservation Service -- Natural Resource Conservation Service (NRCS) Programs to Promote Pollinator Habitat

11:15 a.m. Mary Ellen Lemay, Hudson to Housatonic Regional Conservation Partnership -- Pollinator Pathway Initiatives from the Hudson to the Housatonic

12:15 LUNCH

1:15 p.m. Joan Milam, Dept. of Environmental Conservation, University of Massachusetts -- Pollinator Diversity and Abundance in New England Habitats

2:15 p.m. Zara Dowling, Dept. of Environmental Conservation, University of Massachusetts -- Pollinator Habitat Under Solar Arrays

2:45 p.m. BREAK

3:00 p.m. Questions and Answers with the speakers

3:30 p.m. Dina Brewster, CT NOFA and The Hickories – Roundtable on Producing Native Plants for Pollinators

Continuing Education Credits Offered: 4.75 Pesticide Recertification Credits (All Categories), 5.00 NOFA Organic Land Care Credits

Online registration: https://squareup.com/store/connecticut-agricultural-experiment-station

For those who prefer to pay by check, please make checks payable to CAES. Please include your name, phone number, and email address and mail to The Connecticut Agricultural Experiment Station, Attention: Ms. Tracy Zarrillo, P.O. Box 1106, New Haven, CT 06504-1106.

For more Information: contact Ms. Tracy Zarrillo at Tracy.Zarrillo@ct.gov
Supported by a Specialty Crop Block Grant from the CT Dept. of Agriculture
Summary of Vegetable Grower Listening Sessions

By: Shuress Ghimire, Assistant Extension Educator, Commercial Vegetables

Three listening sessions were conducted in Jan and Feb of 2019 in Vernon, Torrington, and Haddam, CT, where I met with 35 Connecticut vegetable growers, talked about their major vegetable production issues, and discussed some strategies for solution and potential research topics. Thank you all who attended, or participated in the discussion via email or phone. For those vegetable growers, who were unable to attend the listening session, I am providing a summary of the sessions to keep you informed.

The main purpose of organizing these events were to meet with CT vegetable growers in person and get a deeper sense of the issues faced by the growers, and use that information for Vegetable Extension Program planning in order to better assist the growers with overall vegetable production decisions, which include crop/cultivar selection, pest management, soil health, and many more.

The participants were very diverse including commercial vegetable growers with <1 acre to >100 acres, home gardeners, new to the business and experienced folks, and organic and non-organic growers. Thus, major issues for each of those groups were unique. Growers who were relatively new to vegetable production and new home gardeners wanted to know more about the educational resources available to them regarding production techniques (e.g. how to grow tomato from seed to harvest and marketing). Home gardeners should consult with UConn’s Home and Garden Center [http://www.ladybug.uconn.edu/] as an excellent resource. Also, opportunities for training and workshops targeted mainly for new farmers are posted at [https://newfarms.uconn.edu/].

Most small- to large-scale commercial growers in New England find the New England Vegetable Management Guide [https://nevegetable.org/] very helpful for getting recommendation on cultivar selection, cultural practices, pest management, and many more aspects of vegetables. Besides, factsheets, pest message, newsletter, and upcoming events are posted on our UConn IPM website [http://ipm.uconn.edu]. We have also created a private Facebook group for Connecticut Vegetable growers, specifically commercial producers, to use it as an interactive and useful resource. You can share photos (insects/diseases) along with a brief description, questions, ideas, etc. that may be helpful for not only yourself, but other growers! I will be checking the group regularly to answer questions and interact with all of you. You can join this private Facebook group here [https://www.facebook.com/groups/386166095470741/?epa=SEARCH_BOX], or type “UConn Extension-Vegetable IPM” in the search bar on Facebook.
Through these three listening sessions, we identified the following major issues for CT vegetable growers, and recognized some programs that will be helpful in responding the issues. We also identified some potential research topics.

**Major issues or information needed**

- Organic methods of vegetable pest control (specifically, cutworm, squash vine borer, early blight of tomato, white mold of carrot, downy and powdery mildews in cucurbits, galinsoga weed)
- Overall vegetable disease and insect management
- Dealing with unpredictable weather events impacting vegetable crops
- Wildlife control in vegetable production
- Building soil organic matter and improve soil health
- Weed seed bank in fresh manure; composting techniques for raw manure
- Information on hot water seed treatment and shelf-life of treated seeds
- Information on new products (pesticides, cultivars) as they are available
- Aging of customer base: people in their late 20's and 30's seem less interested in local foods and farms
- Sprayer calibration (especially backpack)
- Production techniques to harvest sweet corn by the 4th of July
- Information on structure, organization and operation of a cooperative farm

**Programs in response to the identified issues (stay tuned for more information on the following programs)**

- One-on-one onsite training on a weekly or biweekly basis
- Training on vegetable scouting for major pests (preferably in spring to early summer)
- Training on vegetable weed management (organic and conventional)
- Twilight meetings (to share results from innovative trials conducted by growers)
- Weekly pest update during summer - fall growing season

**Potential research topics**

- Alternative to winter rye cover crop
- Black vs. clear tarps for weed management: pre- or post-tillage tarp application
- Cover crops, weed control, and erosion control in between plastic rows
- Field trials on biodegradable plastic mulches and black/white/silver plastic mulches
- Investigate the efficacy of biological-botanical spray materials for pest control
- Managing slugs in cover crops
- Most productive and economical tomato pruning system
- Organic and conventional fungicide/herbicide/insecticide efficacy trials
- Planting dates to minimize pest damage (especially with tomato)
- Production and quality of fall brassicas in relation to soil fertility in organic system
- Research on companion planting
- Variety trials including hybrid and heirloom tomatoes, with different genes targeting to avoid yellow shoulders in high tunnel and open field
It is time to go green!

Our goal is for the Crop Talk Newsletter to be completely online or sent out via email only by 2020!

Help us out by opting out of the hard copy!

Send an email today to MacKenzie White mackenzie.white@uconn.edu to opt out of the hard copy and be placed on the email list if you’re not already on it!

THANK YOU!

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