

Agricultural News

Serving Suffolk County Agricultural and Horticultural Industries

Volume 105 • Number 12 • December 2021



Agricultural News

ISSN 1089-4411

The Agricultural News (USPS No. 524-840) is published monthly by Cornell Cooperative Extension - Suffolk County, 423 Griffing Avenue, Suite 100, Riverhead, NY 11901-3071. Second-class postage paid at Riverhead, NY. POSTMASTER: Send address changes to *Agricultural News*, 423 Griffing Avenue, Suite 100, Riverhead, NY 11901-3071.

Subscription price is \$20 per year.

The Cornell Cooperative Extension - Suffolk County Education Center is located at 423 Griffing Avenue, Suite 100, Riverhead, New York 11901-3071. Office hours: 8:30 AM to 4:30 PM, Monday through Friday.

Telephone: (631) 727-7850 • Fax: (631) 852-3205
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"Every effort has been made to provide correct, complete, and up-to-date pesticide recommendations. Nevertheless, changes in pesticide regulations occur constantly, and human errors are still possible. These recommendations are not a substitute for pesticide labeling. Please read the label before applying any pesticide."

Cornell Cooperative Extension is funded in part by Suffolk County through the office of the County Executive and the County Legislature.

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A pumpkin in the snow. Photo by Andy Senesac

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Viticulture on Long Island: Mulling Over Issues in the Forefront

Alice Wise, Viticulture Specialist, Cornell Cooperative Extension of Suffolk County

What's new in local grape research for 2022? We will be continuing experiments with berry-cuticle enhancing products. These proprietary oil and wax formulations may help to reduce late season cluster rot. Experiments are taking place in Pinot Noir, Chardonnay and Sauvignon Blanc. In the LIHREC vineyard, first crops will be taken from Rkatsiteli, Mencía, Fleurtaí and Soreli. The last two are hybrids with Tocai Friulano as a parent. TF is notoriously low yielding, thus the hope is that these varieties will offer premium quality along with economic yields.

Any unusual events in the vineyard in 2021? Downy mildew cluster infections are becoming more common. Infections occur when the berries are young, infecting through the stomata (pores for gas exchange). Berries suddenly turn brown and easily detach from the cluster rachis. By the time symptoms are evident (about pea-sized berries or larger), the berries have lost functional stomata, preventing sporulation from occurring. Infections should not be confused with black rot (BR) berry infections. With BR, the berries are initially brown, then they harden and persist on the cluster. Sporulation may also be evident. BR symptoms on berries can manifest well after the initial infection, as much as a month later. With both of these fungal diseases, cluster infections can occur in the complete absence of leaf infections. Both tend to occur when the weather is rainy in June and early July.

Another unusual event this season was the prevalence of bunch stem necrosis (BSN). We saw BSN mostly in Cabernet Sauvignon in the LIHREC vineyard. This is a poorly understood physiological disorder. Though the fruit makes it through veraison, ripening and berry development then stall. The rachis (cluster stem) withers and the unripe berries shrivel. Often the distal end (bottom) of clusters will fall off well before harvest. We saw BSN in Merlot and Saperavi as well, though in far lesser amounts.

Can I replant a site that previously had virus infected vines? This question was recently posed by a local grower. A Cornell virologist weighs in on this matter: "In NY, replanting a previously leafroll affected site is at no risk with regards to the new vines becoming infected by mealybugs feeding on infected remnant roots. This is because the grape mealybug, the only mealybug species that spreads leafroll viruses in NY vineyards, neither overwinters on roots, nor does it complete a phase of its development cycle underground. Therefore, new vines can be safely established on a vineyard site previously affected with leafroll. In other words, a fallow period between removal of an old block and the establishment of new vines is not justified in NY for protecting the new vines from leafroll infection. This situation is different in other grape growing regions of the US, for example in CA, where they deal with mealybug species that can live on roots."

Do winegrowers have to worry about spotted lanternfly in 2022? The short answer – maybe. This fall, established populations were found in the Bohemia area. To our knowledge, there have been no established populations on the East End. Our colleagues in PA tell us that even if SLF shows up, it typically takes a year or so for populations to build and that populations will not be uniformly high in all vineyards. Rest assured that this topic is a priority for those of us in Extension. CCE-Suffolk County Entomologist Dan Gilrein further adds: "We expect spotted lanternfly will gradually become more common around eastern Long Island in the next few years. Early detection and reporting can help slow the spread. The NY Dept. of Agriculture and Markets is asking residents outside NY City to report sightings through their website. A link to the web reporting tool can be found at <https://agriculture.ny.gov/news/state-departmentagriculture-asking-residents-help-combat-spotted-lanternfly>. Emails can be sent to spottedlanternfly@agriculture.ny.gov. Anyone seeing a spotted lanternfly or suspect might also collect the insect or send a clear photo for confirmation. Cornell Cooperative Extension of Suffolk County also has information and links posted to <http://ccesuffolk.org/agriculture/spotted-lanternfly-the-next-worst-thing>. Although the insects are very susceptible to some insecticides, work is underway to find natural enemies that can be released to control them biologically. Birds, spiders, and some insects will feed on them though not in sufficient numbers to keep the populations low. There is some recent good news, however, such as this report in the *Reading Eagle* (<https://www.readingeagle.com/2021/09/20/spotted-lanternflies-gone-berks/>) finding lanternfly populations have declined in some areas where they were previously high." ●

Long Island Farm to School Regional Coordinator Program

Sandra Menasha, Long Island Farm to School Co-Coordinator, CCE- Suffolk County

Amy Bly, Long Island Farm to School Co-Coordinator, CCE- Suffolk County

Cheryl Bilinski, Regional Farm to School Lead, Harvest New York

With the support from NYS Ag and Markets, Cornell Cooperative Extension Harvest New York was able to expand their Regional Farm to School Coordinator Program to now include Long Island which means boots-on-the-ground efforts to support this initiative. Sandy Menasha and Amy Bly were hired as Co-Coordinator to fill the role and provide support to Nassau and Suffolk County stakeholders.

Through this program we will provide coordinated and comprehensive support to Farm to School stakeholders which includes farmers, distributors, processors, food hubs, School Food Authorities (SFAs), and educators. We aim to increase the volume and variety of local and/or NY food products purchased by SFAs for use in child nutrition programs. Some of the support efforts will include working directly with supply chain partners on logistics, including delivery; working with SFAs on bid development that favors local food through geographic preference; assisting schools with promoting farm-to-school campaigns through programs such as Harvest of the Month and NY Thursdays; promote business-to-business relationships by connecting farmers, schools and distributors; provide support for the 30% NY initiative by assisting SFAs with tracking and documentation requirements; and offer training opportunities for farmers and SFAs. We will also be working collaboratively with partners that are already doing farm-to-school work at the local level to support and supplement existing efforts.

The benefits of Farm-to-School are numerous for our youth, our communities, and our local farmers and economy. For farmers, selling to local schools provides new market opportunities and the ability to have a direct impact on the health and wellness of school kids by providing them with fresh, local, and nutritious produce. Farmers can sell directly to schools or sell to local distributors, but both require planning, possibly some scaling up, and maybe even some delivery and transport considerations. The opportunity for Long Island schools to participate in the 30% NY Initiative, which provides School Food Authorities additional reimbursement for each school lunch served (up to \$0.25) if they spend 30% of their school food lunch costs on NY products,

will mean more LI schools will be looking to procure more NY products to meet the 30% criteria. This opens up a substantial market opportunity for farmers to cash in on. We want to work directly with any farmers considering selling Farm to School and can provide one-on-one consulting, grower trainings, organize "meet and greets" between farmers, school food authorities, and even distributors, assist with bidding and contracts, and help make connections. Please reach out to either Sandy or Amy for more information.

Sandy is currently the Vegetable and Potato Specialist with the Agriculture Program at Cornell Cooperative Extension of Suffolk County. She has worked with the local growers on Long Island for the past 15 years providing educational programming, consulting, supportive services and conducting applied research in areas of production, marketing, and regulation. Sandy can be reached at srm45@cornell.edu.

Amy has previously and continues to work as a SNAP-Ed Senior Nutrition Educator for the Long Island Region providing workshops and resources to the community to promote healthy eating and physical activity. She can be reached at ab2353@cornell.edu.

We are both excited to bring our experience as we work with all our stakeholders on increasing farm-to-school efforts in the Long Island Region and encourage you to reach out! ●



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Interseeding Summer Cover Crops Between Vegetable Beds – Trial Results Year 2

*Deborah Aller, Agricultural Stewardship Specialist, and
Erin Myers, Agricultural Stewardship Technician, Cornell Cooperative Extension of Suffolk County*

Managing weeds between vegetable beds remains an on-going issue for vegetable growers, both organic and conventional. It is common practice for vegetable growers to transplant crops into beds covered with black plastic mulch. This strategy provides excellent weed control in the planted row but leaves soil between beds exposed and vulnerable to erosion, compaction, and weed growth. Conventional growers often use herbicides for weed control, but herbicides applied at crop establishment do not provide season long control. Organic growers can mow or use tillage to control weeds, but this can be difficult between beds with plastic mulch and the soil is continuously disturbed decreasing soil health over time. Planting cover crops to protect and improve soil health is not new and the potential benefits of cover crops are well known. Cover crops planted between plastic-covered, vegetable beds have similar potential to reduce tillage and erosion, build soil health, minimize pesticide use, and suppress weeds if the appropriate species and management strategies are implemented.

Trials conducted in 2020 at the Long Island Horticultural Research and Extension Center (LIHREC) in Riverhead, NY and on-farm identified buckwheat and teff as the most promising cover crop options for weed control between vegetable beds (*Agricultural News*, November 2020). We hypothesized that abnormally dry weather at planting in 2020 was at least one reason for the reduced germination and poor establishment of some of the cover crops. However, with a changing climate, spring is predicted to be cooler and wetter and summers hotter and drier in the Northeast. Therefore, determining the best date for seeding summer cover crops to improve germination rates and the likelihood of good establishment is critical. If summer cover crops can be seeded earlier, at field preparation (in May) instead of at transplanting (in June), the likelihood of capturing spring soil moisture to improve germination may be higher. Also, there is growing interest in more heat-tolerant cover crops such as teff. Additionally, due to equipment availability and time, many growers decide to broadcast fertilizer to the entire field being planted prior to laying the plastic instead of targeting the fertilizer to only the planting row under the plastic and the roots of the cash crop. Fertilizing the entire field means

fertilizing weeds, but this practice may also provide the opportunity for cover crops to capture the added nutrients and establish before the weeds.

Thanks to another year of support from the Friends of Long Island Horticulture, we expanded the 2020 trial to evaluate cover crop species (teff, buckwheat), seeding date (early, mid, at transplanting), and fertilization method (in-row vs. broadcast) on weed suppression, cover crop biomass production, soil properties, and crop yield.

Materials and Methods:

A replicated research trial was conducted at LIHREC using a randomized complete block design with four replications per treatment. Three in-between row treatments, two cover crops (teff and buckwheat) plus control (straw mulch), were established between plastic mulch beds (Image 1). Buckwheat is a quick growing short-season summer cover crop, good for weed suppression and attracting pollinators and beneficial insects. Teff is a heat and drought tolerant, warm-season grass useful for suppressing weeds, and requires little maintenance. Jalapeno peppers, Jedi variety, were grown on raised beds covered with black-plastic mulch with drip tape for irrigation. Pre- and post-trial soil samples were collected and analyzed to evaluate differences in soil properties between treatments. Fertilizer was broadcast applied to half of each block and applied only within the planting row on the other half prior to laying the plastic. The cover crops were drill seeded, using a Jang 5-row push seeder, on three different dates: early (at field prep, 5/26/2021), mid (2 weeks later, 6/8/2021), and late (at transplanting mid-June, 6/22/2021).

Cover crop and weed height, determined as the average of six random measurements per plot, weed species present, and percent weed biomass using the Canopeo App, were determined weekly. Aboveground cover crop biomass weight, determined using a 1x1-ft sampling grid with three samples per plot, was collected twice during the growing season (mid and end season). End-of-season biomass was analyzed for carbon and nitrogen content. Harvest data was collected weekly on the middle six plants per plot to assess any treatment effect on pepper yield and quality. Statisti-



Image 1. Overview photo of trial after all treatments had been planted on July 6th, 2021. Photo credit: Erin Myers

cal analysis was conducted using analysis of variance (ANOVA) for a balanced, completely randomized, full factorial experiment in JMP. Statistical significance was assessed at the 5% alpha level.

Results and Discussion:

Average cover crop and weed height were significantly affected by cover crop species, fertilization type, and planting date ($p < 0.0001$). For the early planting date, teff produced the tallest biomass compared to buckwheat and the control treatments, but for the middle and late planting dates buckwheat was the tallest followed by teff then the control. Weed height was comparable to cover crop height across all treatments. Weed species present included purslane, pigweed, lambs quarter, grasses, chickweed, nightshade, knotweed, sedges, and ragweed. Weed height was surprising considering the percent cover crop coverage, except for the early buckwheat seeding which failed to germinate due to old seed (Figure 1).

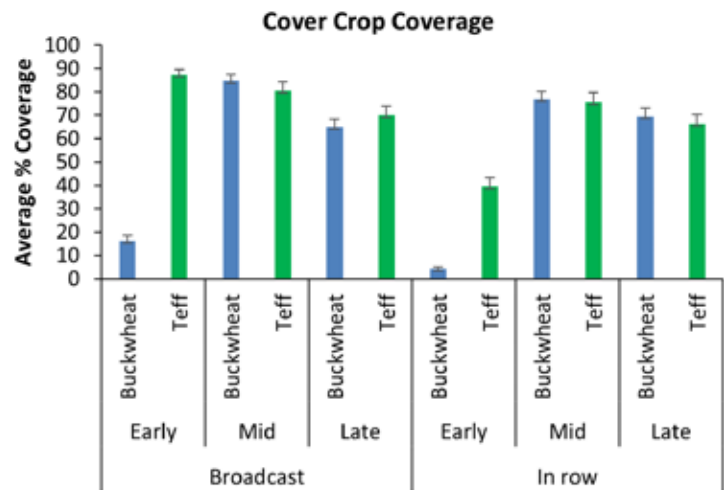


Figure 1. Percent cover crop coverage across all treatments. Average of three random samples per plot with standard error bars.

Pepper yield, determined as the number and weight (lbs) of peppers harvested from the center six plants per plot, was significantly impacted by planting date, cover crop species, and fertilization type ($p < 0.0001$). For all three planting dates, there was a strong interactive effect of cover crop species and fertilization method. Overall, the mid and late plantings yielded more peppers, and the control in-between bed treatment had the smallest adverse impact on pepper yield ($p < 0.05$). Management of the cover crop likely impacted pepper yield, as the cover crops were not mowed or trampled until the end of the experiment so cover crop growth was high or in some cases above the pepper crop. This resulted in the pepper plants growing vertically.

Aboveground cover crop biomass was harvested after four weeks of growth for each respective planting date and at the end of the experiment. Cover crop carbon and nitrogen content differed between species, but this was impacted by fertilization type and planting time. Mid-planting date resulted in significantly higher C/N in the cover crop compared to the early and late plantings ($p < 0.0001$), but no difference between cover crop species was found ($p < 0.05$).

End-of-season soil samples showed no effect on organic matter content, potential nitrogen release, and some micronutrients (Fe, Mn, Cu, Zn). Soil pH was impacted by planting date, cover crop species, and fertilization type ($p < 0.0001$), and several other soil nutrients were affected by the different treatments (P, K, S, Ca, Mg, K, Na, B, Al). No clear effect of an individual treatment accounted for these differences.

(continued on page 8)

Interseeding Summer Cover Crops Between Vegetable Beds – Trial Results Year 2

(continued from page 7)

Overall, cover crop biomass production was greater than in 2020, which we attribute largely to weather. The summer of 2020 was a drought year with conditions abnormally dry from mid-June through July and then becoming a moderate drought the entire month of August. Meanwhile, there was adequate rainfall throughout summer 2021 and no abnormally dry or drought period was observed (US Drought Monitor, 2021). Sufficient rainfall and high temperatures likely contributed to the prolific growth, particularly of the teff cover crop. Additionally, this research suggests that if buckwheat or teff are used between beds, they should be seeded at least 2 weeks after the crop is transplanted because of rapid growth particularly under optimum growing condition and may require mowing or trampling.

Not all details and results of this study are included here, for the full report please contact da352@cornell.edu.

Thank you to the Friends of Long Island Horticulture for funding this research!

References and Further Reading

Aller, D., and Myers, E. 2020. *Evaluating Summer Cover Crops for Weed Control In-between Vegetable Beds*. Suffolk County Agricultural News. November, 104 (11): pg. 12-14.

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U.S. Drought Monitor - National Drought Mitigation Center, University of Nebraska-Lincoln. 2021. Map Archives. Available from: <https://droughtmonitor.unl.edu/Maps/MapArchive.aspx> ●



Image 2. Teff cover crop produced significantly more biomass than in 2020. Growing on average 36 inches, which was unexpected. Photo credit: Lousie Koepele



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TUESDAY, JANUARY 18, 2022

GENERAL SESSION

8:00 – 10:00 AM

Introduction and Welcome Address

County Executive Steve Bellone, invited

State and Federal Policy Updates

NY Farm Bureau

Policy and legislation changes have the potential to greatly impact your businesses. This presentation will cover updates on the local, state, and federal level.

NY Farm Labor – Updates and Tips

Richard Stup, PhD, Agricultural Workforce Specialist,
Cornell Cooperative Extension

Learn more about what's new in farm labor laws, what you need to know about farmworker unions, tips on retaining your labor force, and other important updates.

Ag Census – It Counts!

Donnie Fike, State Statistician, USDA National Agricultural Statistics Service

Get prepared for the 2022 Ag Census. Learn more about the Ag Census, why it is important, and why you should take the time to complete the forms.

LIHREC – Supporting Stakeholders Since 1922

Mark Bridgen, PhD, Director, Long Island Horticultural
Research and Extension Center, Cornell University

Cornell's Long Island Horticultural Research and Extension Center (LIHREC) will be turning 100 in 2022. Learn more about LIHREC and how this milestone will be celebrated.

VEGETABLE SESSION

10:30 – 12:30 PM (DEC Check-in: 10:00 – 10:30 PM)

Biochar's Effects on Vegetable Production

Marion Murray, IPM Specialist, Utah State University Extension

Biochar is a carbon-rich material similar to charcoal, produced by super-heating plant biomass in an enclosed system. It has little nutrient value on its own but is said to improve soil structure, increase nutrient retention, and provide habitat for biological activity. It has been researched worldwide as a potential soil amendment in vegetable production. Learn about the pros and cons of biochar, including evidence from a few research studies conducted in the Western U.S.

Management and Economics of Three Common Foliar Diseases on Cucumber and Leafy Greens

Anthony P. Keinath, PhD, Professor of Plant Pathology, Clemson University

Managing foliar diseases on vegetables often requires applications of fungicides and biofungicides. Conventional fungicides used to manage downy mildew on slicing cucumber increased profits by 262%. When the disease occurs on the edible portion of a vegetable, however, a high level of disease control is required to increase yields. Applications of conventional or organic fungicides to kale and beet greens may not be effective enough to justify the cost.

Compact Bed Plasticulture for Reducing Risks and Enhancing Profits and Environmental Sustainability

Sanjay Shukla, PhD, Professor, Agricultural and
Biological Engineering, University of Florida

Compact beds are an innovative production system that is being adopted on farms across North America to reduce water and environmental footprints and production costs and risks. Compact beds (CB) improve wetted coverage through taller and narrower bed geometry. Results show maintained/increased yields and reduced production costs, water usage, runoff, plastics, pesticide, carbon footprint, nutrient leaching, and pests and diseases.

Recent Research on Managing Diseases of Cucurbits and Basil

Margaret McGrath, PhD, Associate Professor, Plant Pathology, Cornell University

Results will be presented from research conducted at LIHREC that evaluated biopesticides, conventional fungicides, and resistant varieties for powdery mildew and downy mildew of cucurbits and basil downy mildew, and determined the occurrence of fungicide resistance in the cucurbit mildew pathogens.

BEGINNING FARMER SESSION

1:30 – 3:30 PM (DEC Check-in: 1:00 – 1:30 PM)

Cultivating a Community of Support for Organic Farmers

Whitney Beaman, Long Island Organic Transition Coordinator, NOFA-NY

The NOFA-NY Organic Transition Program, now in its second year, offers on-farm education, farmer-to-farmer mentorship, application support, and financial assistance to farmers seeking organic certification. Learn how this unique Long Island program lowers the barriers to organic certification and bolsters the farming community.

Getting Your Farm Started on Long Island

Amanda Merrow, Co-Owner, Amber Waves Farm

Amanda Merrow, Co-Founder and Director of Farm Operations at Amber Waves Farm in Amangansett, discusses the steps taken, and the lessons learned, while establishing a successful farm on Long Island.

The CSA Farm Model – Benefits and Challenges: A Farmer's Perspective

Maryellen Sheehan, Farmer at Hartwood Farm, Chittenango, NY

Maryellen and her husband started Hartwood Farm, now a 200 member "traditional" boxed CSA outside of Syracuse, NY, in 2012. She will share some of the practices and strategies that help make the CSA farm model work for their situation, the challenges they've seen in CSA-ing over the years and how to assess and work around them, and some of the potential future CSA adaptations they are considering going forward to address the increasingly crazy weather, supply chain challenges, and farm labor.

If You Build It, Will They Come – Recruiting Pollinators and Natural Enemies

Jonathan L. Larson, PhD, Extension Entomologist, University of Kentucky

In this session, we will discuss how growers can implement pollinator and natural enemy attraction strips. What trials and tribulations should you expect and what sorts of natural enemies or pollinators may appear?

GREENHOUSE/FLORICULTURE SESSION

3:30 – 5:30 PM (DEC Check-in: 3:00 – 3:30 PM)

Strategies to Cut Greenhouse Energy Costs

Neil Mattson, PhD, Professor, Horticulture, Cornell University

This presentation will take a look at current energy prices and projections, discuss ways to identify your biggest energy users through energy audits and benchmarks, update on where we are at with LED energy efficiency, and other tips to save on energy.

Nature vs. Nurture: Quick Reviews of Pest Management Issues from 2021

Dan Gilrein, Extension Entomologist, Cornell Cooperative Extension of Suffolk County

This presentation will review management of thrips, broad mite, aphids, and other pests that were issues in production this past year. An update changes in product registrations and uses for NY will also be covered.

Whodunit 2021—The Reasons for the Symptoms in Your Crops

Margery Daughtrey, Senior Extension Associate, Plant Pathology, Cornell University

This presentation will discuss the diseases seen this past season on greenhouse and potted crops, with a focus on teaching attendees how to recognize symptoms in the future and how to best manage the problem. Cultural management as well as pesticide management will be covered.

WEDNESDAY, JANUARY 19, 2022

GENERAL SESSION

8:00 – 10:00 AM (DEC Check-in: 7:30 – 8:00 AM)

Herbicide Resistant Weeds in NY, the US, and Globally

Lynn Sosnoskie, PhD, Assistant Professor, Horticulture, Cornell University

Currently, there are 505 unique cases of herbicide resistant weeds globally. The US has 122 cases of reported resistance. Current research at Cornell University has identified resistance to the glyphosate and some ALS inhibiting herbicides in horseweed/marestail, Palmer amaranth, and waterhemp. This presentation will describe the evolution of herbicide resistance, describe ongoing screening efforts, discuss best management practices to mitigate resistance development, and introduce participants to novel technology for controlling weeds with fewer or no herbicides.

Edge-of-Field Practices: Keeping Nutrients on Farms

Tyler Groh, PhD, Assistant Research Professor, Watershed Management Specialist, Penn State University

This presentation will cover conservation practices designed to protect water quality that agricultural producers can install on their land without significantly impacting their production practices. Specifically, this material will focus on what can be done with “edge-of-field” practices, which are those practices placed alongside agricultural fields. Strategic placement of these practices is key to success, especially when land area is limited and every acre counts towards earning a living for a producer.

Roles of Soil Organisms in Maintaining Healthy Soils

Janice Thies, PhD, Associate Professor, Crop Sciences, Cornell University

In addition to controlling nutrient availability, soil microbial populations interacting with plant roots have many other beneficial attributes including the ability to suppress pathogens and pests, increase root exploration to increase nutrient uptake, stimulate plant resistance to pathogens, fix atmospheric nitrogen, and detoxify harmful chemicals. There is considerable interest now in isolating organisms with specific traits that can then be used in inoculation programs to address key issues arising in production systems. Benefits are easily demonstrated in greenhouse culture, but it has been difficult to translate these to measurable outcomes under field conditions. Other approaches rely on changes in cultivation techniques. Both approaches will be discussed and the importance of soil organisms to successful outcomes in production and environmental protection will be reemphasized.

VITICULTURE SESSION

10:30 AM – 12:30 PM (DEC Check-in: 10:00 – 10:30 AM)

Grape Entomology Program Update

Greg Loeb, PhD, Professor, Entomology, Cornell Agri-Tech

Dr. Loeb will discuss research results involving fruit flies and their relationship to sour rot of clusters and new results on the connection between grape mealybugs and leafroll virus.

Spotted Lanternfly Update

Brian Eschenaur, Senior Extension Associate, NYS IPM Program

Mr. Eschenaur will discuss the general life cycle of spotted lanternfly, its impact on grapevines and distribution in NY, with special emphasis on Long Island.

Grower Experiences with Spotted Lanternfly

Zach Waltz, Director of Operations, Waltz Vineyards Estate Winery, Manheim, PA

Pennsylvania grower and Cornell Viticulture and Enology graduate Zach Waltz will discuss their experiences with spotted lanternfly, effects on vines in-season and long-term, and the efficacy of control methods.

SUSTAINABLE AG SESSION

1:30 – 3:30 PM (DEC Check-in: 1:00 – 1:30 PM)

Long Term Fertility for High Tunnel Vegetables

Judson Reid, Extension Vegetable Specialist, Cornell Vegetable Program

High tunnels are profit centers for fresh market vegetable growers due to their high yields. However, this often means soil health is neglected in pursuit of profit. In this session data from multi-year cover crop trials will be presented, along with ideas on crop rotation and nutrient management. Participants will be encouraged to share their cropping plans for group discussion on long term fertile soils in high tunnels.

Management of Foliar Diseases of Tomato

Inga Meadows, PhD, Extension Plant Pathologist, North Carolina State University

Tomato production is often challenged by several foliar diseases including Septoria leaf spot, gray leaf spot, and bacterial leaf diseases. Management requires an integrated approach and organic and conventional strategies to a successful crop will be discussed.

Brussels Sprouts: Tips for Success with a Finicky Crop

Rebecca Sideman, PhD, Sustainable Horticulture Specialist, University of New Hampshire

This presentation will discuss Brussels sprout variety selection considerations, including results from recent NH variety evaluation experiments. Topping and what is known about managing common Brussels sprout pest and disease issues including cabbage aphid and Alternaria will also be discussed.

Using Slow-Motion Cultivation Videos to Improve Effectiveness

Bryan Brown, PhD, Integrated Weed Management Specialist, NYS IPM Program

Dr. Brown has conducted several years of research to improve the weed control of between-row and in-row cultivators, including “stacking” more than one cultivation tool together, which can have a synergistic effect. In his research, slow-motion video has been helpful to see the movement of tools through the soil and their effects on weeds and crops. He will present an overview of this research and a compilation of slow-motion videos of various cultivators from across NY.

TREE FRUIT SESSION

3:30 – 5:40 PM (DEC Check-in: 3:00 – 3:30 PM)

Managing Weeds in Tree Fruit Plantings on Long Island

Andrew Senesac, PhD, Weed Science Specialist, Cornell Cooperative Extension of Suffolk County

There will be a discussion of several aspects of weed management in established tree fruit plantings. Information on the characteristics of different options for in-row weed control as well as the permanent ground covering between rows

will be discussed. This will range from conventional herbicide choices to alternative methods of non-chemical weed management.

Tips for Addressing Disease Challenges of Tree Fruit on Long Island

Kerik Cox, PhD, Associate Professor, Plant Pathology, Cornell University

This talk will highlight strategies for addressing fungal and bacterial diseases affecting production on Long Island under its unique production, environmental and regulatory climate. Specific topics will include information on managing epidemics of Marssonina blotch and apple scab with a focus on early season disease management to delay epidemics that can explode in rainy summer months. Additional information will be provided on the management of bacterial spot on susceptible stone fruit crops and fire blight on apples.

The Diversity, Effectiveness, and Overall Importance of Wild Bees in NY Apple Orchards

Bryan N. Danforth, PhD, Professor, Entomology, Cornell University

The presentation will focus on the role of wild (native) bees in apple pollination and will discuss what we have learned over the past 13 years about the diversity, effectiveness, and importance of wild bees as apple pollinators. The talk will also cover additional topics, such as how to monitor native and managed bee abundance using a smartphone app, and how forest habitats surrounding orchards can provide refuges for early spring pollinators.

The Practical Impact of Apple Virus Infections

Dan Donahue, Tree Fruit Specialist, Cornell Cooperative Extension ENY Commercial Horticulture Program

Apple virus, both latent and otherwise, have returned to our high-density apple systems in recent years. Latent virus, the Tomato Ringspot Virus, and the recently identified Apple Luteovirus 1 are now easily found. This presentation will review the biology and consequences of virus infection as it relates to tree health and rootstock selection.

THURSDAY, JANUARY 20, 2022

GENERAL SESSION

8:00 – 10:00 AM (DEC Check-in: 7:30 – 8:00 AM)

Licensing Requirements for Food Processing and Food Service

David Lepkofker and Angela Montalbano, Division of Food Safety and Inspection, NYS Department of Agriculture and Markets

This presentation will review food service and food processing and preparation license programs including 20-C license requirements, regulations, and exemptions.

What Businesses Need to Know About NYS Workers' Compensation, Disability & Paid Family Leave

Neil Gilberg, Advocate for Business, NYS Workers' Compensation Board

The Advocate for Business, Neil Gilberg, will provide an informative overview of Workers' Compensation, Disability & Paid Family Leave benefits, related CO-VID-19 information, specialized one-on-one customer service, and the responsibilities of small to large businesses, corporations, and non-profit enterprises.

Spotted Lanternfly – A NYS Update

Frank Buccello, Supervisor, Plant Industry Regional Inspector, NYS Department of Agriculture and Markets

Spotted Lanternfly has the potential to be a serious pest of some crops as well as a terrible nuisance pest for landscapes. Hear updates on this insect, its distribution, what to do if you see it, and what to expect when it becomes established on Long Island.

Water Withdrawal and Permits – A Review

Jennifer Pilewski, Engineering Geologist, NYSDEC

Hear updates about the Long Island well permit program, changes to water withdrawal reporting, permits, and necessary paperwork. This presentation will clear up recent confusion and give a review to what you need to be in compliance.

News and Updates from the NYSDEC

Scott Menrath, P.E., Director, Bureau of Pesticides Management, NYSDEC

General updates on topics such as pesticide bans, LI Pesticide Pollution Prevention Strategy, WPS, and pesticide regulations will be covered. Other general announcements will be shared.

SHELLFISH AQUACULTURE SESSION

8:30 AM – 12:00 PM

Welcome and Introduction

Gregg Rivara, Aquaculture Specialist, and Steve Schott, Marine Botany/Habitat Restoration Specialist, Cornell Cooperative Extension of Suffolk County

Shellfish Health in a Changing Environment: Can They/We Adapt?

Bassem Allam, PhD, Marine Animal Disease Laboratory, Stony Brook University

Dr. Allam will summarize how climate change and warming trends affect shellfish health in the region and will provide an overview of possible mitigation strategies that could be implemented to support shellfish farmers.

Bay Scallops in the Northeast: Insights on Aquaculture Methods and the Restoration Efforts to Promote Wild Harvest.

Harrison Tobi, Aquaculture Specialist, and Steve Tettelbach, PhD, Shellfish Ecologist, Cornell Cooperative Extension of Suffolk County

Mr. Harrison Tobi will discuss his research and experience in bay scallop aquaculture in the Northeastern United States and will provide insight on past and current restoration efforts and what these efforts mean for the persistence of the wild bay scallop fishery.

Building Oyster Reefs in New York – Successes, Failures and Challenges

Gregg Rivara, Aquaculture Specialist, Cornell Cooperative Extension of Suffolk County

In over a decade, CCE-Suffolk staff have created oyster reefs from New York City to Montauk. We will take a look at some of these projects, the issues faced and how to move forward to increase the number and size of oyster reefs in New York.

General Questions and Discussion

NURSERY SESSION

10:30 – 12:30 (DEC Check-in: 10:00 – 10:30 AM)

Managing Some Difficult Weeds

Andy Senesac, PhD, Weed Science Specialist, Cornell Cooperative Extension of Suffolk County

The presentation will cover several weed problems. Focus will be on identifying the most vulnerable period in the weed life cycle in order to optimize control. There will be a discussion of the control options that are available for Long Island growers: both cultural and chemical.

Detecting, Identifying, and Managing Box Tree Moth

Jen Llewellyn, Nursery and Landscape Specialist, OMAFRA

This presentation will provide an in-depth training for professional horticulturalists on the detection, identification and management for this new invasive insect pest of boxwood. Attendees will come away from this webinar with the ability to more confidently scout for this moth pest as part of the larger local detection and surveillance efforts in your region.

Biostimulants: A Tool to Improve Growth and Plant Health

Muhammad Shahid, PhD, Greenhouse and Nursery Production State Specialist, University of New Hampshire

The use of biostimulants in potted plant production is a relatively new research area. In addition to their use to increase nutrient uptake and promote plant cell division, these substances show promise as part of a root disease prevention strategy by stimulating plant defenses and immobilizing pathogen enzymes. This talk will cover: what are biostimulants, their different categories, beneficial effects

and research examples from recent ongoing projects on ornamentals and hydroponic vegetable production.

Improved Water Use Efficiency and Reduced Water Footprint in Nursery Crop Production

Raul I. Cabrera, Extension Specialist, Rutgers University

The efficiency of water utilization by crops is often described by the term water use efficiency, WUE, the unit or amount of biomass, or harvested product, produced per volume of water applied or used by evapotranspiration. Water footprint (WF), is a more recent concept that provides a more comprehensive indication of the total water volumes consumed and polluted by source, used to produce a crop measured over its entire supply chain in a specific region and time scale. The increasing scarcity of fresh water and environmental pollution concerns in some nursery growing regions requires we become familiar with these concepts and their application to nursery irrigation management programs.

GREENHOUSE/FLORICULTURE SESSION

1:00-3:00 PM (DEC Check-in: 12:30 – 1:00 PM)

Plant Growth Regulators in Herbaceous Perennials

Joyce Latimer, PhD, Professor and Extension Specialist, Plant and Environmental Sciences, Virginia Tech

Plant growth regulators are simply another production tool that you can use to improve the quality, habit, and salability of your herbaceous perennials. Learn more on how growth retardants as well as growth enhancers can fit into your production practices.

How Nutritional Monitoring Can Help Keep Your Crops on Track

W. Garrett Owen, PhD, Assistant Professor and Extension Specialist, Horticulture, University of Kentucky

This presentation will discuss why nutritional monitoring is important, the methods used, and how to interpret the results. Hear tips on how to keep your crops healthy and what resources are available to help you.

DEC Recertification Credits Available:

For those interested in DEC recertification credits, you must be pre-registered no later than January 14, 2022 and follow the instructions provided.

TUESDAY, JANUARY 18

Vegetable Session: 2.00 credits in 1A, 23; 1.50 credits in 10; 0.50 credits in 21, 22, 25

Beginning Farmer Session: 0.50 credit in 1A, 10, 21, 22, 23, 25

Greenhouse/Floriculture Session: 1.50 credits in 1A, 3A, 24, 25; 0.50 credit in 22, 23

WEDNESDAY, JANUARY 19

General Session: 2.00 credits in CORE

Viticulture Session: 2.00 credits in 1A, 9, 22, 25; 1.25 credits in 10

Sustainable Ag Session: 2.00 credits in 1A, 10, 23; 0.50 credit in 21, 22, 25

Tree Fruit Session: 2.00 credits in 1A, 22, 25

THURSDAY, JANUARY 20

General Session: 0.50 credit in CORE; 0.25 credit in 1A, 3A, 9, 21, 22, 23, 24, 25

Nursery Session: 1.50 credits in 1A, 3A, 24, 25; 1.00 credit in 10; 0.50 credit in 21, 22, 23

Greenhouse/Floriculture Session: 2.00 credits in 1A, 3A, 24, 25; 1.00 credit in 21, 22, 23

SEAWEED AQUACULTURE SESSION

1:30 – 4:00 PM

Regulatory/Permitting of Seaweed Aquaculture in New York *NYSDEC*

This presentation will be a discussion of the current process for applying for seaweed aquaculture permits in NY waters.

Seafood Regulatory Guidance in New York

Michael Ciamarella, PhD, Seafood Safety and Technology Specialist, NY Sea Grant

Dr. Ciamarella will present the current seafood handling guidance documents for finfish, shellfish, and seaweeds applicable for growers in New York.

Seaweed Aquaculture Research on Long Island

David Berg, Technical Consultant, Lazy Point Farms

Presenter will provide an overview of the seaweed aquaculture work that has been and is currently being conducted on Long Island in support of developing the industry.

Now That We Grow It, What Do We Do With It? End-Use for Seaweed

Sean Barrett, Founder, Montauk Seaweed Supply Company

Sean will discuss the current use of seaweed as fertilizer and the potential expansion of seaweed grown/harvested on Long Island into other markets, such as food, chemical extraction, and other areas.

General Questions and Discussion

REGISTRATION • \$45 per person

Pre-registration is required for Zoom and in-person viewing - January 14, 2022.

You can **register online** through the links/web addresses below. After you register, you will receive an email confirmation that includes the Zoom links and other information you need to attend the webinars. Session Recordings will be available after the conference to all registered individuals for viewing at a later date. This year we will be offering an **in-person viewing option (limited to 35 participants per session)**. The in-person viewings will be at Cornell Cooperative Extension Building, 423 Griffing Ave, Riverhead, NY 11901. In-person viewings of the Aquaculture Sessions will be at will be at Suffolk County Marine Environmental Learning Center, 3690 Cedar Beach Road, Southold 11971. *Masks are required regardless of vaccine status. In-person viewing will be subject to last-minute cancellations due to Covid-19 CDC guidelines and CCE-Suffolk Covid-19 policy.*

To register please visit www.ccesuffolk.org/events or visit <http://weblink.donorperfect.com/AGforum2022>

If interested in attending the in-person viewings please RSVP to liagforum@cornell.edu or call 631-603-4332.

For questions, or for persons needing special accommodations, call 631-603-4332 or email liagforum@cornell.edu.

Spray Safe, Spray Well – Reducing Pesticide Use Risks for Organic and Beginning Vegetable Farmers

Bilingual Online Workshop Series

A free, bilingual, winter workshop series will be offered that is focused on the basics of when and how to use OMRI-listed pesticides on your vegetable farm. Beginning and organic farmers are often disinterested in discussing pesticide use on the farm. However, investing time in improving your spray programs and equipment can help you to spray more safely, more effectively, and spray less overall. All workshops will be held remotely via Zoom from 12pm—1:05pm EST

Sessions will include:

An Introduction to Integrated Pest Management for Vegetable Growers

Wednesday, December 8, 2021

Selecting Appropriate Sprayers and Nozzles

Wednesday, January 12, 2022

Applying Pesticides Safely and Legally

Wednesday, January 26, 2022

Safe and Effective Sanitizer Use in the Wash and Pack

Wednesday, February 9, 2022

Is There a Place for Biological Fungicides on my Farm?

Wednesday, February 23, 2022

Water Quality Considerations and Adjuvants to Optimize Pesticide Applications

Wednesday, March 9, 2022

Understanding How and Which OMRI-listed Insecticides Work

Wednesday, March 23, 2022

Tips to Preserve and Enhance Beneficial Insects on Farm

Wednesday, March 30, 2022

Register Here: <https://bit.ly/3oG2wyp>

Focus Group Participants Needed

Researchers from Cornell University and the University of Maryland are organizing a focus group meeting with landowners in NYS to gather information on their views and actions related to large-scale, solar leases in NYS. We would like to invite you to participate in a 1.5-hour virtual meeting with other landowners around the state. The information we gather will help us develop new resources and tools to support landowners and communities in their efforts to adapt to changing land use. Your participation is voluntary and confidential, but is very important to us! This is an opportunity to share your opinion about the benefits or challenges of leases for large-scale solar installations around the state. Any landowner that participates in a focus group discussion will receive a Visa gift card for \$15 in appreciation of your time.

If you're interested in participating, please visit this website for a form to let us know your availability: <https://forms.gle/ixTPDh4c1YBXy1U8>

For more information, contact Allison Chatrchyan (amc256@cornell.edu) or David Kay (dlk2@cornell.edu). ●

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Gov. Hochul Announces \$25M Initiative to Improve Housing for Farmworkers

Program will fund the rehabilitation and replacement of existing substandard farmworker housing

Governor Kathy Hochul announced a new \$25 million package in grants and loans to improve housing conditions for farmworkers and to protect the health and safety of this critical workforce. The Farmworker Safety Housing Grant Program will fund the rehabilitation and replacement of existing substandard farmworker housing. Grants are available from NYS Homes and Community Renewal (HCR) through Federal Community Development Block Grant CARES Act funding, which provides resources to municipalities to improve housing and community facilities in response to COVID-19. In addition, the State oversees a \$15 million Farmworker Housing Program, a revolving loan program designed to improve farmworker housing, through which farmers can apply for up to \$200,000 per farm.

"The New Yorkers who work hard to keep our farms operating deserve housing that is safe, secure, and does not jeopardize their health or wellbeing," Governor Hochul said. "Many of these individuals often reside in congregate housing already in need of rehabilitation, and with the risks still posed by COVID-19, it's critical we get this work underway as soon as possible. Thanks to this funding, we can make that a reality and ensure these hardworking New Yorkers have a suitable place to call home."

For the Farmworker Safety Housing Grant Program, municipalities may apply for grants of up to \$1 million to support a farm or group of farms with 5-10 housing units in need of rehabilitation or replacement to address issues such as environmental hazards, outdated air filtration systems, and to provide essential personal protective equipment such as masks and hand sanitizer.

Grants must benefit low- to moderate-income individuals with incomes at or below 80% of the Area Median Income and work must be completed within 12-18 months of award.

Applications are available online: <https://hcr.ny.gov/cdbg-cares>

The Farmworker Safety Housing Grant Program complements the New York State Farmworker Housing Program, which was created more than 20 years ago to help farms provide safe and appropriate housing for their employees. The program is administered by Farm

Credit East in partnership with New York State Homes and Community Renewal and provides no-interest loans to finance improvement of existing housing or the construction or purchase of new housing for farmworkers. New York agricultural producers, including fruit, vegetable, greenhouse and nursery, equine, and dairy operations are eligible to apply.

For more information on the Farmworker Safety Housing Grant Program go to: <https://hcr.ny.gov/cdbg-cares#farmworker-housing-grants>.

For more information on the Farmworker Housing Program go to: <https://hcr.ny.gov/farmworker-housing-program-fwh>. ●

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Experiential Learning Fund Established at Cornell University's LIHREC

Cornell University's College of Agriculture and Life Sciences announces that the Mark Bridgen LIHREC Director's Fund has been established to support experiential learning at the Long Island Horticultural Research & Extension Center (LIHREC) in Riverhead, NY.

Dr. Bridgen, a Professor of Horticulture and Plant Breeding, and Director of LIHREC since 2002, formed a plan with friends of LIHREC to establish an endowment to fund student internships in 2008. After establishing the initial principal to start the fund, Dr. Bridgen continued to help maintain and grow the fund with further personal and friends-of-LIHREC contributions until the fund reached maturity this year.

Dr. Bridgen is quick to celebrate and thank the stakeholders from several local garden clubs, volunteers and individuals who contributed toward the \$100,000 endowment level goal. Dr. Bridgen wants to especially recognize Nancy and Tom Gleason, Maryann and Robert ('71) Anderson (Emerald Flora), Christine Killorin, Jane Foster, William ('71) and Lynda Nastyn, John and Ginny Condzella (Condzella Farms), Remsenburg Garden Club, Lillie Brown, Lin and David Schlyer, Pat and Trish Voges, the

Nassau Suffolk Landscape Grounds Association, Ken and Jane Mohring, Anita Baldari, Bay Shore Garden Club, Cornell Gardeners, and others.

Bridgen said, "I am so happy to finally achieve our goal of \$100,000! I have always been very grateful to be able to work at Cornell University, and wanted to give something back to the University, especially to LIHREC."

LIHREC research and extension programs are a valued, local resource to assist Long Island growers, gardeners and plant enthusiasts worldwide. The Mark Bridgen LIHREC Director's Fund, Founder's Fund, and the Bell Nursery Research Fund are three new endowments established as the Center's 100th anniversary approaches in 2022. Dr. Bridgen along with all stakeholders feel that these endowments will help to guarantee the future of LIHREC as a local crop and plant science resource that discovers and preserves applied knowledge for generations to come.

Questions about contributing to the Long Island Horticultural Research & Extension Center in Riverhead, NY, or to the College of Agriculture and Life Sciences can contact: Ron Van Ormer at rwv33@cornell.edu; Ph. (607) 592-1361.

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Does Your Pesticide Need a Dating App?

Tamson Yeh, Pest Management/Turf Specialist, Cornell Cooperative Extension of Suffolk County

Emotionally fragile, emulsifiable concentrate seeks strong, compatible adjuvant....

Well, you get the picture. It's all about compatibility, whether we are talking romance or mixing and matching pesticides. So let's look at some general rules and then we will talk specifics. Slick back that cowlick, straighten your tie, and polish up your pumps (hee hee) and give "tanks" when compatibility occurs....

General Compatibility

It is tempting to try to put everything in the same tank, but the sad truth is that the more components you add the greater the chance for an oopsie. Many times the pesticide label may have some information on what are the best tank partners or things that really can't be used with a particular product, but sometimes the information is sparse or has to be hunted through the contents of a very long label.

Sometimes something as simple as the pH of the water used can change compatibility as well as how effectively a tank mix works. You need to know your starting pH of mixing water, and that can be adjusted with additives, but again you have to hunt for information about that in the label.

Like a "what was I thinking" in a relationship, problems can arise from physical and chemical incompatibility. While physical incompatibility for a dating app may be a thing of the past, it is present and accounted for in the interaction of various pesticides. Physical incompatibility may manifest in a number of ways including:

- excessive foaming (great in your Guinness, awful in your spray tank),
- separation into layers (first date salad dressing like this can be fixed, sprays not so much),
- you can't get your product to suspend, or it does not completely dissolve (into your arms if you are hoping for a bodice buster romance),
- it clumps, or there are oil residues in the tank (or on your tie if we are back to the dating app).

All of these are strong signs of physical incompatibility. Now if we look at the upshot of physical incompatibility, the mixing problems inherent in this situation can block spray delivery and disrupt your application. Fail. Phooey, back to square one.

What about chemical incompatibility? Mixing may not be a problem at all. (You might even begin to think about that all-important, second date.) However, just

like when your dream date turns out to be one of the Lizard People, upon application, your pesticide mix may either have reduced efficacy or may even cause injury to whatever plants it is applied to. The solution may *look* fine and still produce disastrous results, or the chemical interactions can backfire and produce physical incompatibility. (It's not you, it's me....)

Now let's get these incompatibilities an office appointment and a box of tissues and examine them a little more thoroughly.

Separation into layers of oil and water (ah, yes, that old relationship chestnut): Solids may settle out more quickly than normal, or, if severe, gels may form or solids clump together. Sob, sob, sob. Yep! You will need to remove and clean nozzles, filters, screens for cleaning and then you will have to drain and flush your tank. Gah!

Failure to suspend or disperse (even when you stop returning their texts or answering the phone, or start wearing a false nose and a wig): this joyful situation can result in a pancake layer on the bottom of tank or a particulate clog on screens and nozzles. Your liquids may curdle or thicken into a pasty substance or a gel that is next to impossible to clean out of your components and your tank.

But wait, lagoon!!! There is often an unacknowledged or unrecognized third party in the failure of the dating game in the form of a jealous or manipulative friend or relative and it is the same for chemical incompatibility of pesticides!!! Hark!! The aha! moment: chemical compatibilities are mostly from surfactants in the tank mix that are not compatible in mixtures. (Gasp!) A great example of this would be using an oil-based adjuvant with your herbicide to make the cuticle more penetrable. Unfortunately, this addition can also cause unexpected impact on plants that are not supposed to be susceptible to the herbicide's active ingredient through the action of the oil adjuvant. Oil adjuvants are notorious for this kind of activity. Dang it!!!

There are other weird things that can happen chemically. For example, hard water (the jar test can check for this, and we will go over that in a minute) can really, *really* put a cramp in your style. Glyphosate can bind to minerals in hard water and as such is no longer available as an herbicide. Fortunately, the jar test reveals this in cloudiness of the mixture, but this can happen with no observable signs for some mixtures.

Jar Test Recipe

Now, how about a recipe for a jar test for incompatibility (wouldn't it be great if dating apps worked this way?):

You will need a quart jar with a re-sealable lid.

Add one pint of your carrier which will be either water (same source as the water added to your spray tank please!!!) or liquid fertilizer.

Now what else do you want to add to your "love potion"? Well it depends on what you are trying to do, but there is a definite sequence in which things should be added, and your potion should be shaken after each addition.

If you are using water soluble pouches, begin with one tablespoon from that category. Then, if you are using wettable powder that goes next (1 tablespoon), followed by 1 tablespoon of dry flowables (if you are using them) (obligatory witch's cackle), then 1 teaspoon of emulsifiable concentrates (if you are using them), soluble liquids—if you are using them (1 teaspoon), and the final two ingredients (if you are using them) soluble powder (1 teaspoon) and 1 teaspoon of surfactant(s). See? Easier than whipping up a secret-recipe cappuccino. Now, with another obligatory cackle loud enough

to get the neighbor's dog involved, seal up your jar and as the B-52's would cajole, "shake it 'til the butter melts, oh yeeeeaaaaaaahhhh," one last time.

Like any good recipe, you need to let your potion stand for fifteen minutes after the last shake-shake-shake. Then shake it one last time. Now you are ready for the reveal. What are you looking for?

If the jar is warm or hot to the touch, not a good sign for the magic. Likewise, if there is separation, clumping or emulsions, layering or sludge, clumps or grains you may have just lost your magic wand and wizard's hat. You have two options if any of this has occurred: either use a different grouping of products and re-do your compatibility test or you can re-do a compatibility test on the same group you just tested and include a *compatibility agent* to see if that will make everyone play nicely together.

If everything is hearts and flowers with the compatibility, you can add your mini-spray mix to your tank and then triple rinse your testing jar and pop the rinsate into your spray tanks as well.

Yeah, yeah, yeah you say, but I have used this mix dozens of times no sweat! I do not need to do a compatibility test. Yeah, yeah, yeah you do because formulation change on a fickle dime and so can water pH. So why take a chance with either your dating app or your tank mix? Go ahead and check for compatibility. It beats cleaning out the tank on a lonely Saturday night or sleeping on a piece of someone else's wedding cake....

Other things that can lead to incompatibility:

- Mixing in the wrong sequence (I saw that...).
- Adding products when there is not enough water in your tank (I saw that too...).
- Not being patient and adding the next item before the previous item has had time to disperse and or dissolve (No one likes chewing up Alka Seltzer...).
- Getting too enthusiastic with the agitation (Guilty, your honor), which can cause excess foaming especially with liquid flowables.
- Getting not enthusiastic enough with the agitation (get off your cell phone, you lout, Candy Crush can wait), which can result in dry formulations not completely dissolving.
- Not considering the slowing impact of cold water on mixing times.
- Not considering the impact on incompatibility when changing from water carrier to fertilizer carrier or visa versa.

(continued on page 18)

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Does Your Pesticide Need a Dating App?

(continued from page 17)

A Little List of Oopsies and Their Fixes

Oopsie: Suspension concentrates, oil dispersions, suspo-emulsions, and capsule suspensions tend to separate into layers (especially if the stuff has sat awhile) and they will not combine well in the tank. **Fix:** Mix these products up before adding to spray tank.

Oopsie: Has the active ingredient in oil- or solvent-based formulations like emulsifiable concentrates or microemulsions dissolved in solvent? They tend to separate out in layers. **Fix:** Add emulsifying agents or buy a product with emulsifying agents already added to reduce the oil-on-water emulsion separation. Keeping an emulsified soluble liquid formulation means less settling if the spray tanks is in an unagitated spray tank.

Oopsie: Solid dispersed active ingredient means tiny particles are suspended in water-based liquid (suspension concentrate SC) or tiny particles are clumped to make water-dispersible granules (WG). These are not very soluble in general and really need proper agitation or they settle out. Solid active ingredient formulations are the same. **Fix:** Keep up constant shaking! If you stop, and the longer you stop, the more likely particles will settle and the more difficult it will be to re-suspend them.

Oopsie: Your water-dispersible granules (WDG) and wettable powders (WP) are not dispersing and won't pass through spray equipment. **Fix:** Because each bit needs to break into smaller bits that will then pass through screens and spray nozzles, you will need to mix first in water with moderate agitation, causing water-soluble surfactants holding the larger bits together to dissolve and release.

Oopsie: Oh, no, more problems for the WDG and WP crowd: when you add oil-based products or adjuvants to the spray mix before adding the solid-formulation products, oil stays on the liquid surface because crop oil is less dense than water. Ergo, if you then put the dry formulation in your spray tank, it encounters the oil, coating the dry formulation and preventing water from reaching the clumps and thus preventing them from dissolving. Clogorama drama. **Fix:** Ugh. This is one of my least favorite oopsies. Try mixing WDG or WP in a thick slurry prior to adding if you are using oil-based products or adjuvants. If it works in cooking.... think roux.

Oopsie: Too little water in the tank (short oopsie, long answer and ultimately totally avoidable). **Fix:** The answer is obvious, but how low can you go in the pesticide limbo? If you have only 5 to 20 percent of the

water volume (in spray tank, vat, or inductor cone) when you add products (especially the first ones you add), you may create a super concentrate that results in saturation of the water and consequently no more will dissolve in it (the sugar-dissolved-in-water principle). This is an extremely common problem, especially when mixing certain formulations of glyphosate and 2,4-D where you need at least 50% water in the tank to prevent a clumping disaster.

Remember: more carrier, less potential for problems and the slower a problem will tend to develop. The label often even says the tank must be half full of water. The label is the law.

Remember, if you are using liquid fertilizer as a carrier, use 50-75% of the required volume of water in the tank.

Water soluble bags are particularly likely to malfunction if there is insufficient water in the tank, and if they don't dissolve correctly they are very likely to gum up the works! Worst case scenario: cold water (that also slows down dissolution of the bags), plus insufficient water.

Oopsie: Impatience is not a virtue... **Fix:** Agitation does not mean two minutes or less before adding another product because this is the high road to incompatibility and with improper dispersion and mixing. This is especially true when your active ingredients are just not the best at dissolving in water. Just because a product looks like it has dispersed doesn't mean the Kool-Aid is ready (yuck, remember getting a mouthful of Kool-Aid powder when you were really thirsty as a kid and did not wait?). And, your products will not dissolve and mix in two minutes or less, especially in cold water. See below.

Oopsie: C-c-c-c-old water, especially less than 42 degrees F, slows down everything. **Fix:** Remember, your products will not dissolve and mix in two minutes or less, especially in cold water. A dedicated thermometer is cheap insurance. Agitate for longer than two minutes after each addition. Cold enhances incompatibility clumping.

When water is less than 42 degrees F, liquid flowables and dry formulations will take more time to disperse. If mixing water is cold, you will need at least three to five minutes for each tank-mix ingredient to fully dissolve and disperse before adding the next product. Try preparing a slurry in warm water, and then adding the slurry to the cold tank water.

Cold water may also be problematic with emulsifiable concentrates, crop oils, and seed oils because of the surfactants in the formulation which may form gels when exposed to cold water. Not only will your active ingredient be unevenly dispersed, but the gels may clog up the spray tank and its components. Likewise,

water soluble packets do not dissolve as quickly or sometimes at all in cold water and this can lead to clogging of nozzles, pumps, and to other misery.

Oopsie: Agitation agida. (Again a long answer to a short oopsie.) Fix: You gotta shake, rattle and roll by agitating tank mixtures before and during spraying. The key is to start agitation before you add the first product! However, as we mentioned before, you can have excessive agitation and “meh” agitation. Excess agitation can often occur with mechanical (paddles) and hydraulic (high capacity pumps) agitation, leaving behind a trail that looks like baristas drag racing with turbo hand blenders. The foam that results messes up WDG, WP and WG products because the dry stuff sits on top of the foam (think about cinnamon on top of that cappuccino and you will know where the nutty barista analogy comes into play). Partially-hydrated dry on top of foam results in swollen globs that either do not disperse or sink like the Titanic (I was tempted to use the eponymous Gilbert and Sullivan line “scuttling a Cunarder” but was afraid to).

Excessive agitation can also shake the teeth of the surfactant attached to the bits of active ingredients causing them to let go and then the clumping drama begins. This can create something that looks like the quart of milk in the back of the fridge from last Easter, a phenomenon known as clabbering (yech). Excess agitation reduces efficiency, in some instances, of anti-drift agents made of polyacrylate or polyacrylamide, which is the reason anti-drift agents should be added last to the mixing tank and thus avoiding perilous agitation.

Best practice: Moderation in all things; moderate agitation plus adding an antifoaming agent early on in your mixing sequence will help all additions to disperse without the dreaded foam. Moderate agitation should make the top layer of the tank mix look like it is moving. Basically, no bubble, bubble, toil and trouble: if the spray tank contents look like boiling water, you have over done it.

Oopsie: Carrier conniptions. Fix: Carrier type can make a huge difference to incompatibility issues. Liquid fertilizers used as carriers generally have a fertilizer analysis of 32-0-0 or 28-0-0 with the other common carrier being water. Water is better for tank mixes because most products are designed to be used with water!!! If you are using water as a carrier, be aware of pH, hard water, and water temperature. It is super important to do the compatibility test if you are using liquid fertilizer because liquid fertilizers are chemically concentrated salt solutions, meaning less free water and ergo less water to do the work of dispersing dry formulations and other products. Thus the more products you are mixing

with liquid fertilizers the more likely you are to have a problem. Jar test, stat!!!

If using liquid fertilizer as a carrier, mix dry products with water to make a slurry, then add to tank. If using water as a carrier, wait three to five minutes after adding a dry ingredient before adding the next ingredient. Wait until you have added all ingredients before you check pH and water hardness of the solution.

Oopsie: Additive agony. Fix: pH adjusters should only be added at the end of the mixing process so your final spray solution reflects the correct pH but also you should always know what the actual pH of the tank mix is before adding the pH adjuster (always test this each time rather than assuming). pH adjusters that acidify can cause incompatibility by lowering the pH too much so that certain active ingredients either volatilize or precipitate out. Extras like defoamers, pH adjusters, and compatibility agents are not added in the typical mixing order for pesticide products. Read the label closely; many times these additional products are supposed to be added before you add the pesticide products but antifoaming agents are different! The best practice is to split the addition of antifoaming agents into two or three parts, adding some at the beginning, the middle

(continued on page 20)



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Does Your Pesticide Need a Dating App?

(continued from page 19)

and at the end when the tank is almost full. This way there is foam suppression throughout the additions of products and the entire mixing process.

Whew, now what?

So we got through the oopsie list and the fixes, but one additional helpful thing may be to review the mixing order with a few additional items and additives based on carrier. Think WALES. The WALES acronym refers to the order in which pesticide formulations should be added to the tank after water has been added. W is for Wettable powders (all dry ingredients) which are added first. A is for Agitate to ensure thorough mixing. L is for Liquid Flowables. E is for the Emulsifiers and concentrate formulations, and finally S is for the Surfactant solutions, which are added last. I am Welsh so I love the WALES sequence.

If you are using water as a carrier, then the sequence is as follows (and, obviously, you are not likely to be using all of these): water soluble packets, dry formulations like copper products, WDG, WG, WP, and SG, then ammonium sulfate, then dry or solid anti-drift products, then compatibility agents and anti-foam products,

then dispersed liquid formulations such as SC, F, FL, SE, EW, and CS, then liquid drift retardants, particularly polymer-based drift retardants prior to adding EC formulations in order to reduce clumping, then remaining liquid formulations such as EC, OD, S, and SL formulations, followed by adjuvants such as crop oil concentrates (COC), High surfactant oil concentrates, methylated seed oils, nonionic surfactants, spreader-stickers and water conditioning agents (with or without NIS or oil), and finally micronutrients and liquid fertilizers including zinc, boron, manganese, fertilizer, copper, and acidifying agents (if needed).

If you are using liquid fertilizer as a carrier, then the sequence is as follows: pre-slurries mixed in water of WSP, WDG, WG, SG and copper products before adding to fertilizer carrier, followed by pre-slurries in water of dry anti-drift agents before adding to fertilizer carrier, then compatibility and antifoaming agents, then dispersed liquid formulations such as SC, F, FL, SE, EW, and CS, then liquid drift retardants, particularly polymer-based drift retardants prior to adding EC formulations in order to reduce clumping, and remaining liquid formulations such as EC, OD, S, and SL formulations, then adjuvants such as crop oil concentrates (COC), high-surfactant oil concentrates, methylated seed oils, nonionic surfactants, spreader-stickers and water conditioning agents (with or without NIS or oil), and finally micronutrients and liquid fertilizers including zinc, boron, manganese, fertilizer, copper, and acidifying agents (if needed).

Final Thoughts

Just as the diary of a Donner Party survivor exhorts the wise to, "hurry right along, and don't take no short cuts," a cardinal rule of thumb is never, ever pre-mix pesticides in an inductor. Inductor cones are particularly likely to begin the cascade or incompatibility problems when you only have 5-20% of the water volume in the spray tank that you should. Other inductor intelligence: some products cannot be added directly to liquid fertilizer, so they need to be pre-mixed with water first and then added to the tank mix. And save the garlic sauce for a video first date.

Resources (Print these and keep them in the spray shed!)

Purdue Extension . 2018. *Avoid Tank Mixing Errors: A Guide to Applying the Principles of Compatibility and Mixing Sequence*. <https://ppp.purdue.edu/wp-content/uploads/files/PPP-122.pdf>

Funderburg, E. 2016. *Jar Test Helps to Determine Compatible Chemical Mixes*. Noble Research Institute. <https://www.noble.org/news/publications/ag-news-and-views/2016/july/jar-test/> ●

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New Listserv for Cut-flower Growers



Commercial Cut flower growers now have a way to connect with the larger cut flower community in New York State. Thanks to the efforts of Cornell Cooperative Extension (CCE), a new listserv has been developed for this community. Cut flower growers can sign-up for the listserve by filling out this form: <https://tinyurl.com/cutflowerlistserv>.

After talking with members of the NYS commercial cut flower community and learning about their lack of access to:

- Cornell CALS & CCE experts,
- community-based knowledge and networking opportunities, and
- knowledge of new trends, research, workshops, events, etc., relevant to NYS commercial cut flower growers,

Dana Havas, Agriculture Team Leader with CCE Cortland County, and Elizabeth Lamb, Ornamentals IPM Coordinator with NYS IPM, teamed up to develop this listserv, and an upcoming blog/archive, to help fill this gap. Dana Havas feels that the listserv is a perfect response to this community's need. Hearing the needs of cut flower growers in NYS and appreciating how well the Cornell sheep and goat management listserv serves the small ruminant community, she felt that a listserv would be a great response to fill in the gaps of the cut flower community. "So much knowledge is stored in experience, this listserv will help NYS cut flower growers put that knowledge to use and at the same time strengthen the NYS cut flower community."

Listserv members include NYS commercial cut flower growers of all experience levels as well as Cornell faculty and CCE experts. Havas & Lamb identified specific Cor-

nell faculty and experienced cut flower growers who have agreed to play a vital role in making the listserv valuable and successful by sharing their experiences and knowledge. Elizabeth (Betsy) Lamb is pleased to see the willingness of these experts to provide input for grower questions on the listserv and blog/archive. "This project helps us create a community to foster two-way communication to make sure that cut flower growers are successful."

To learn more about the cut flower listserv contact Betsy Lamb at eml38@cornell.edu or Dana Havas at dmh353@cornell.edu.

To sign-up for the listserv visit <https://tinyurl.com/cutflowerlistserv>. ●

What is nFORM? NYSDEC's new online form tool

Many of DEC's Programs have forms that can be completed online using their new online form tool, nForm. Developed by Windsor Solutions, Inc., this new online reporting tool is part of the NY.gov Online Services and was developed to streamline DEC's online reporting and data acquisition.

Users must have an NY.gov account in order to use nForm.

Using nFORM, pesticide applicators can now:

- Apply online to renew applicator certification
- Update address and contact information
- Request a replacement certification identification card
- Enroll to take pesticide certification exams

Users can access nFORM through NY.gov Online Services by first creating an NY.gov account. This new tool will streamline the reporting and response process by providing a convenient way for users to submit information and hear back from the NYSDEC.

Ready to begin using nFORM? Create an account now. nFORM requires using either Chrome, Firefox, or Microsoft Edge browsers. New forms and applications are published periodically, so check back for updates.

For more information, go to the NYSDEC's nFORM Portal at <https://www.dec.ny.gov/pubs/95925.html>.

Effective January 1, 2022: Expanded Polystyrene Foam Container and Polystyrene Loose Fill Packaging Ban

In 2020, New York State adopted the nation's strongest statewide ban of expanded polystyrene, single-use foam food and beverage containers, and polystyrene loose fill packaging materials, commonly known as packing peanuts.

Polystyrene foam is a concern for people and the environment. Foam packaging is one of the top contributors of environmental litter, causing negative impacts to wildlife, waterways, and other natural resources, as well as littering our communities and natural areas. It is lightweight, breaks apart easily, and does not readily biodegrade. When polystyrene foam ends up as litter in the environment, it can persist for a long time and may also become microplastic pollution. In addition, foam containers and loose fill packaging, such as packing peanuts, are not accepted in most recycling programs in New York State because the foam is difficult to recycle and has a low value. For these reasons, certain expanded polystyrene foam products will be banned in New York to protect the environment, our communities, and to support sustainable materials management.

Foam Ban

Under the Expanded Polystyrene Foam Container and Polystyrene Loose Fill Packaging Ban, effective January 1, 2022, no covered food service provider or store (retail or wholesale) will be allowed to sell, offer for sale, or distribute disposable food service containers that contain expanded polystyrene foam in New York. In addition, no manufacturer or store will be allowed to sell, offer for sale, or distribute polystyrene loose fill packaging (commonly referred to as packing peanuts) in the state.

- Environmental Conservation Law (ECL), Article 27, Title 30: Expanded Polystyrene Foam Container and Loose Fill Packaging Ban (https://www.dec.ny.gov/docs/materials_minerals_pdf/epslaw.pdf, PDF, 145 KB)

Covered Food Service Providers

A covered food service provider is any person engaged in the business of selling or distributing prepared food or beverages for on-premises or off-premises consumption.

Examples of covered food service providers include:

- Food service establishments, caterers, temporary food service establishments, mobile food

service establishments and pushcarts as defined in the New York State Sanitary Code (<https://regs.health.ny.gov/volume-title-10/967401200/part-14-food-service-establishments>);

- Retail food stores as defined in article 28 of the Agriculture and Markets Law (<https://www.nysenate.gov/legislation/laws/AGM/500>);
- Delis;
- Grocery stores;
- Restaurants;
- Cafeterias;
- Coffee shops;
- Hospitals, adult care facilities, and nursing homes; and
- Elementary and secondary schools, colleges, and universities.

Stores and Distributors

In addition to covered food service providers, no store (retail or wholesale) will be allowed to sell, offer for sale, or distribute disposable food service containers or loose fill packaging that contains expanded polystyrene foam, in New York state. This includes any non-food retail or wholesale establishment.

Manufacturers

No person, firm, or corporation that produces or imports expanded polystyrene loose fill packaging will be allowed to sell, offer for sale, or distribute expanded polystyrene loose fill packaging in New York state.

Containers and Packaging Affected Under the Ban

Disposable food service containers made of expanded polystyrene that will be banned under the law include bowls, cartons, hinged "clamshell" containers, cups, lids, plates, trays, or any other product designed or used to temporarily store or transport prepared foods or beverages, and includes any container generally recognized as designed for single use. Polystyrene loose fill packaging (commonly referred to as packing peanuts) will also be banned under the law.

Exemptions

This law does NOT apply to:

- Raw meat, pork, seafood, poultry, or fish sold for the purpose of cooking or preparing off-premises by the customer;

- Prepackaged food filled or sealed prior to receipt at a covered food service provider;
- Food service containers made from rigid polystyrene resin that has not been expanded, extruded, or foamed (e.g., clear plastic containers marked with a #6 resin identifier);
- A city with a population of one million or more which has a local polystyrene ban in place, including New York City (link leaves DEC's website); and
- Any county that enacts a polystyrene ban by local law, ordinance, or regulation that provides environmental protection equal to or greater than the state law and the county files a written declaration with DEC. All other local laws are preempted by state law.

Please e-mail foamban@dec.ny.gov with questions about how the statewide ban may affect local laws, ordinances, and regulations or for information about filing a written declaration with DEC.

Visit the NYSDEC website for more information: <https://www.dec.ny.gov/chemical/120762.html> ●

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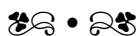
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