

The Coming of Spring (<https://www.youtube.com/watch?v=tP5DqtFUeYs>)

Will COVID-19 affect your produce sales? Hard to say how long all this will go on but see article on safety issues and procedures. Thanks to Chris Callahan of UVM Extension for allowing this article on dealing with COVID-19 to be shared all around.

HEY– a word of advice: Order your growing supplies NOW– don't wait, their could be more hold-ups in the future.

Just be careful with the weather, Don't be fooled. In early April of either 2017 or 2018, we had temperatures in the single digits... But: the American Elm behind the house is blooming. It can't help itself. We need some beauty in this grim time.

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

Considerations for Fruit and Vegetable Growers Related to Coronavirus & COVID-19

Chris Callahan, UVM Extension chris.callahan@uvm.edu; **LISTEN:** <http://go.uvm.edu/agengpodcast>

COVID-19 is the disease caused by the SARS-CoV-2 virus ("the novel coronavirus"). Symptoms include fever, cough, and shortness of breath, and may appear 2-14 days after exposure. While the majority of COVID-19 illnesses are mild, it can result in severe and fatal illness, particularly in the elderly and among those with severe underlying health conditions. Federal and State agencies are working hard to better understand the virus, how to control its spread, and how to treat those infected. One of the key things we can all do is to limit and slow the

spread of COVID-19 to provide time for this understanding to develop and to not overwhelm the medical system. Much more information is available at the CDC Situational Summary page.

What Should Growers Do?

Stay Away from Produce if Sick – If someone is sick, they should be nowhere near fruit and vegetables that others are going to eat. This is likely already part of your farm's food safety plan and policies, but this is a good reminder to emphasize and enforce the policy. Make sure employ-

ees stay home if they feel sick and send them home if they develop symptoms at work. Consider posting signs asking customers not to shop at your farm stand if they have symptoms.

Practice Social Distancing – By putting a bit more space between you and others you can reduce your chances of getting ill. This might mean limiting or prohibiting farm visitors



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or reducing the number of off-farm meetings you attend in person. Avoid shaking hands and other physical contact. This also reduces the risk of your produce coming into contact with someone who is ill before it heads to market.

Minimize the Number of Touches - Consider changes in your policies and operations that minimize the number of times produce is touched by different people. This may include workers, distributors, and customers. More examples are provided below in the Q&A section.

Wash Your Hands – Reinforce the importance of washing hands well when arriving at work, when changing tasks (e.g. moving from office work to wash/pack), before and after eating, after using the bathroom, before putting on gloves when working with produce, and after contact with animals. Soap + water + 20 seconds or more are needed to scrub all surfaces of your hands and fingers thoroughly. Then, dispose of paper towels in a covered, lined trash container.

Cleaning, Sanitizing, and Drying – *According to the FDA, there is no indication that this virus has spread via food.* But, we know viruses (including SARS-CoV-2) survive and spread via hard surfaces. Farms handle produce using tools and equipment with surfaces. We also know that produce has surfaces. Viruses, in general, can be relatively long-lasting in the environment, and have the potential to be transferred via food or food contact surfaces. So, there's no better time than the present to review, improve, and reinforce your standard operating procedures for cleaning, sanitizing, disinfecting, and drying any food contact surfaces, food handling equipment, bins, and tools. More info is provided below in the Q&A section. Remember, cleaning means using soap and water, sanitizing is using a product labeled for sanitizing, disinfecting typically involves higher concentrations of a product labeled for disinfection, and drying means allowing the surfaces to dry completely before use.

Plan for Change – Many produce farms are lean operations run by one or two managers and a minimal crew. Do you have a plan for if you become severely ill? How do things change if half your workforce is out sick? More business/labor planning guidance is available at the Cornell Agricultural Workforce Development site.

What Should Markets and Farmers Markets Do?

Everything Above – Growers, retail food market owners, and farmers market managers should do all the things above. Does your market have a hand washing station?

More guidance for food and lodging businesses is available from the RI Department of Health.

Communicate with Your Customers – Consider reaching out to your customers and recommend they stay home if they are ill. Have you informed your customers about any changes in your hours or policies?

Consider Alternative Delivery – Some markets are taking this opportunity to launch pre-ordering and electronic payment options to enable social distancing at market. Some markets are moving to a drive-through pickup option. More examples are provided below in the Q&A section.

Reinforce the Health Benefits of Fruits and Vegetables – We're fortunate to have so many growers who do a great job with storage crops and winter production. This means our community has access to fresh fruits and vegetables that are important to their immune systems at this time of need. Be sure to promote the nutritional value of your products! But, keep in mind that promotion of your products should be within reason. Avoid making overly broad or unsupported health claims. Fresh produce contains many minerals and nutrients important for immune health which may reduce the severity and duration of an illness. Fun Fact: Pound for pound, that storage cabbage in your cooler has as nearly as much vitamin C as oranges.

Questions and Answers

1. What is the difference between cleaning, sanitizing, and disinfection? The CDC provides more detail on their cleaning website, but the take-homes are:
“**Cleaning** removes germs, dirt, and impurities from surfaces and objects...using soap (or detergent) and water to physically remove [them].”
“**Disinfecting** kills germs on surfaces or objects. Disinfecting works by using chemicals to kill germs on surfaces or objects. This process does not necessarily clean dirty surfaces or remove germs, but by killing germs on a surface after cleaning, it can further lower the risk of spreading infection.”
“**Sanitizing** lowers the number of germs on surfaces or objects to a safe level, as judged by public health standards or requirements.”

EXAMPLE 1: Reviewing the label for Sanidate 5.0 (p.12, “General Disinfection”), a 5.3% peroxyacetic acid and 23.0% hydrogen peroxide product, we note that the concentration used for disinfection is 0.5-2.2 fl. oz. per gallon of water (230-1000 ppm of peroxyacetic acid in water) compared to the lower rate used for sanitizing (p.10,

Will the fertilizers I applied be there when my crops need them?

This age-old question is worthy of our consideration every year. Growers that keep good records can make adjustments based on performance in previous years. It is possible, however, that for some crops, you may not have ever reached what might be considered “good” yields. Perhaps you are satisfied with what you produce and aren’t interested in “fixing what ain’t broke.” Very, well then, don’t read on.

As a grower for 10 years, every season a couple of crops performed magnificently and I tried very hard to figure out what the heck went right. (I never minded having the extra produce to sell. I was pretty good at moving product...). Sometimes, it was perfectly obvious: a section along a stretch of bed where the broccoli plants were huge and so were the heads. Likely it was that a big glug of N-rich fertilizer poured out. But sometimes it was much less disease. Some years the rains were timed perfectly and that happened to interact with the right amount of nutrients applied.

As to the big glug of N fertilizer, you may wonder: why don’t I fertilize more? In some cases, that’s worth thinking about. Sometimes, the potentials of the varieties we are growing do not show themselves unless we have a fertilizer accident. Many varieties respond very strongly to fertilizer. Does that mean we should simply dump on a lot more? Not necessarily. But if you’ve had happy accidents like this, you may have the realization that you’re not supplying nutrients, particularly N, at critical growth stages.

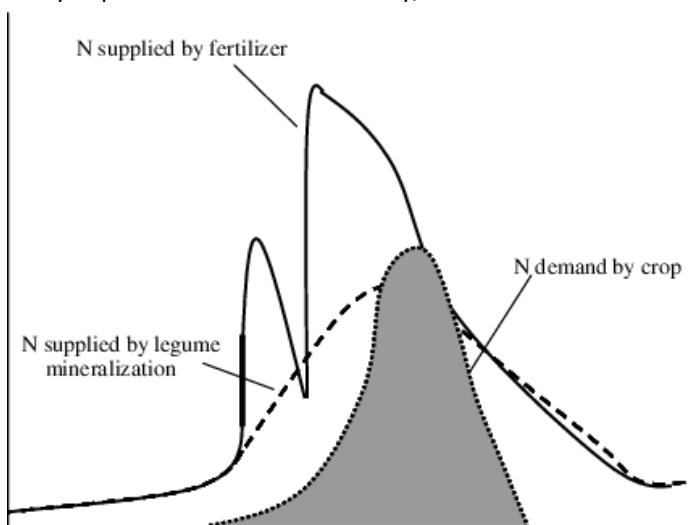
Don’t forget that applying more N means that you are risking more leaching, which is a) a waste of money and b) contributing to nutrient pollution. This goes for both synthetic and organic N sources. Organic N sources are “slow release” when conditions aren’t conducive to rapid mineralization. The rate at which it happens is dependent on soil temperature and soil moisture status. If there has been sufficient rain, and your soil has good water holding capacity (silt loams and fine sandy loams), and the soil temperature has really come up, there will be abundant “available” N. Will your crops need abundant N at that time? Some may, others may not. This is a problem of asynchrony. What happens if your crops aren’t (yet) demanding a lot of N but mineralization rate is high and it’s raining a lot? Leaching. Or if you have weed problems... really big, healthy weeds. Leaching is much more of a risk if you grow in a sandy loam or more coarsely textured soil. But our silt loams in RI are only a couple of feet thick on top of very sandy subsoil, which is very prone to leaching. Therefore, if you do want to experiment with upping your N fertilization, the safest approach is multiple applications of smaller amounts, even if you are using organic N sources.

“Splitting” your N applications can be managed using a pre-ordained schedule which you can mark on your calendar. [This means you are supposed to regularly check your calendar!] Commonly, growers can apply 50% of N “up front”, which

means at initial planting time, and follow with two more applications of 25% each, timed at intervals that make the best sense for the particular crop being grown. So for example, if the crop calls for 120 lbs N/acre, 60 lbs goes into the soil at planting, another 30 lbs at 4 weeks after planting, and another 30 lbs at 8 weeks.

Is this perfect timing for this crop’s needs? Without a very well designed experiment, that’s unknown. It’s even “less unknown” if you are using an organic source of N because there is a lag time from the time of application to when mineralization rate is significant enough to provide available N. This lag time is because while bacteria immediately go to work on consuming the applied material, microbial populations skyrocket, temporarily immobilizing the mineralized N as soon as it is available. As mineralized N becomes too abundant for bacteria to keep up with consuming, and as bacterial cells begin dying off, excess N becomes available for plant uptake. Depending on soil temperature, soil moisture status, and soil texture, availability could begin within a few days or a few weeks.

If applying solid organic fertilizers to established plantings, it is essential that the material gets completely covered by soil; otherwise, minimal contact with soil microbes will result in minimal decomposition. If applying controlled release synthetics, which really improve fertilizer use efficiency, these also need to be



A hypothetical asynchrony issue with growing crops in our climate. Shaded area represents demand for N; the other lines show N availability from legume cover crop and fertilizer.

under the soil because they too, rely on bacteria to break down the coating that inhibits dissolution in the soil water. You can also split out applications by fertigating if you have installed drip tapes in your plantings. This is easy to do using a venturi-type injector. Synthetic fertilizers are water soluble and so, are immediately available. It therefore makes more sense to apply these in small amounts, frequently. In fact, it’s a very efficient method for applying fertilizer. If you are using approved

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“Sanitization of Food Contact Surfaces”) of 1.6-5.4 fl. oz. to 5 gallons water (147-500 ppm). Later in the label, we find the postharvest water application to control cross contamination that we’re most familiar with (p. 20, “Treatment of Fruit and Vegetable Processing Waters”) where the rate of use is 59.1-209.5 fl. Oz. per 1000 gallons of water (27-96 ppm).

EXAMPLE 2: Reviewing the label for Ultra Clorox(R) Brand Regular Bleach (alternate name, “Clorox Germicidal Bleach”), a 6.0% sodium hypochlorite product, we note that this product is labeled as effective against human coronavirus (p.35 revised). We also note that the concentration used for disinfection of hard, nonporous surfaces (p. 14 and 22 of PDF) is 2700 ppm (¾ cup per gallon of water) available chlorine compared to the lower rate used for sanitizing (p. 14 of PDF) of 200 ppm (1 tbsp per 1 gallon of water). The effectiveness of chlorine depends on the pH of water.

What Should I Use for Disinfection and Sanitizing? The EPA has provided a list of disinfectants for use against SARS-CoV-2, the virus causing COVID-19. Very few of these products are common on the farm and may be hard to find. If you are currently using a sanitizer as part of a standard cleaning and sanitizing procedure for hard surfaces on your farm, continue doing so. Consider reviewing the label for that product and using it for disinfection of specific high-touch surfaces if applicable. You can also follow the CDC guidance and use a mixture of bleach and water (5 tbsp / gallon or 4 tsp / quart).

Should I be disinfecting my produce? As noted above, there is no indication that COVID-19 has spread via pro-

duce. The virus is thought to be spread mainly from person to person according to the CDC. For most farms the level of operational change and amount of disinfectant needed to disinfect produce is unrealistic.

What about using gloves? Gloves can provide a barrier between hands and produce preventing transmission of pathogens from hands to produce and from produce to hands. They aren’t a perfect solution, and require attention to detail when using as a Penn State Extension summary highlights.

What are farmers’ markets and CSAs doing? Some farmers markets have changed the way they do business to implement some of the best practices listed above.

Carrboro, NC Farmer’s Market Case Study - NC State Extension has posted a summary of what the Carrboro Farmers’ Market has done. This has included communication with market customers, social distancing by rearranging the market layout, rounding prices for limited use of coins, running a “tab” for customers to minimize cash transactions, no samples, no tablecloths to ease sanitation, and the addition of a hand washing station among other things.

Minimize the Number of Touches (CSA) - One CSA has decided to change how they distribute to an urban market. They have previously trucked larger bins of produce to a distribution site where customers would select their own produce to fill their share. They have decided to pack the shares to order at the farm prior to distribution to minimize the number of people touching the produce. Another alternative would be packing shares to order at the market. What are other CSAs doing? Send Chris an email: chris.callahan@uvm.edu, he’ll compile the results.

Minimize the Number of Touches (Farmers’ Market) - The Bennington Farmers’ Market has shifted to online ordering and pre-bagged orders from each farm that are combined into larger collective orders delivered to each customer via a drive-up system. The biggest decision was deciding that they’d actually continue to have the market. The new approach required the addition of an on-line ordering system (Google Forms for now), coordination among farms and some serious organization at the market. Orders are organized alphabetically; pickups are scheduled with a quarter of

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Fertilizers, continued

organic liquid fertilizers, remember that these are not actually “soluble.” They are suspensions of very fine particles. Materials like these need to be mineralized, like solid fertilizers. However, they are typically very low in N and are pretty expensive on a per-pound of N basis. Also, be aware that you should regularly flush out your drip tapes when using these materials because a buildup of residues will occur, and emitter pores will clog and there will be microbial growth.

Please consult the New England Vegetable Management Guide for crop specific fertilizer nutrient recommendations. And one key thing about those recommendations: they are easier to use if you get your soil tested at one of New England’s state university labs (UConn, UMass, UMaine). Soil test results from those labs are made to be used with guide recommendations for phosphorus and potassium. You can find the Guide on line, or you can buy a paper copy from us at URI. Let us know if you need one. And if you act now, you also get the beautiful Pest ID Guide- the two together go for \$30. Don’t delay, operators are standing by...

Pre-Field Season Thoughts...

We at URI are about to embark on a three-year study on nutrients applied to high tunnel tomato soils. Specifically, we want to find out if you are applying enough, too much, or exactly the right amounts. An important question we are asking: do the nutrients applied (in any form) to high tunnel soils stay pretty much in place or do they drift underground, out from under the footprint of the tunnel? Or do some of these nutrients build up in very high concentrations, making it unnecessary to apply the typical quantities that growers put on, year after year? AND: we are looking for 2 or 3 collaborators. If you are interested, a requirement is that you have been growing tomatoes in a tunnel for several years, and preferably, this would be an entire tunnel full of tomatoes, not a mixed planting. For our part, we would stay out of your way except at the beginning of the season when we need to install sensors into the soil. We would also have to return periodically to collect data and also to find out what amendments you have applied. So: we would need a very small effort from you in keeping good records of your amendment applications and documenting your practices. What we offer in return is a slow and careful gathering of information in order to help you and everyone grow better tomatoes in your tunnels. Contact me at 401-256-7393 if interested.

As to the coming season for tomatoes: if you putting in some extra-early determinate varieties that will be row-covered for cold protection, then now is about the time to start seeding. It is too early to start any other tomatoes unless you like stressed, leggy, hungry, woody plants. If you are growing for plant sales,

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the alphabet every 30 minutes. People won’t get out of their cars. What are other markets doing? Send email: chris.callahan@uvm.edu, He’ll compile the results.

What are other farms doing? Some farms have written and implemented specific response plans or taken other measures to mitigate the risk of COVID-19.

Two Farmers Farm in Scarborough, Maine have developed a detailed, yet agile farm plan available online. What are other markets doing? Email chris.callahan@uvm.edu, he’ll compile the results.

This document is also available at <http://go.uvm.edu/covid19produce> and as a podcast at <http://go.uvm.edu/agengpodcast>



that doesn’t mean you have a good reason to start them earlier. Ideally, home gardeners should be buying tomato plants from at the time of the season when they can transplant within no more than a week of bringing the home. Your sale packs should not be more than a foot tall. And if they are shorter and your customers think they are immature, educate them: it’s better to plant unstressed plants that are a little bit young than hungry, tall, woody giants.

But peppers and eggplants grow more slowly, so now is the time to seed, \pm a week. Growing spring broccoli? Don’t set them out too early or risk buttoning up. So that means, don’t SEED them too early and wind up with wiry, hungry plants that can’t go in the ground because the nights are often in the 40s.

If you trying to get some early cucurbits out under cover, it still doesn’t pay to rush it unless you’ve really got a jump on warming the soil up. It can be done on sandy soils covered in black plastic, particularly if you are near the water. But don’t forget that it really only takes 3 weeks from seed to transplanting (unless your greenhouse is cold).