UMass Extension
Vegetable Notes
For Vegetable Farmers in Massachusetts since 1975

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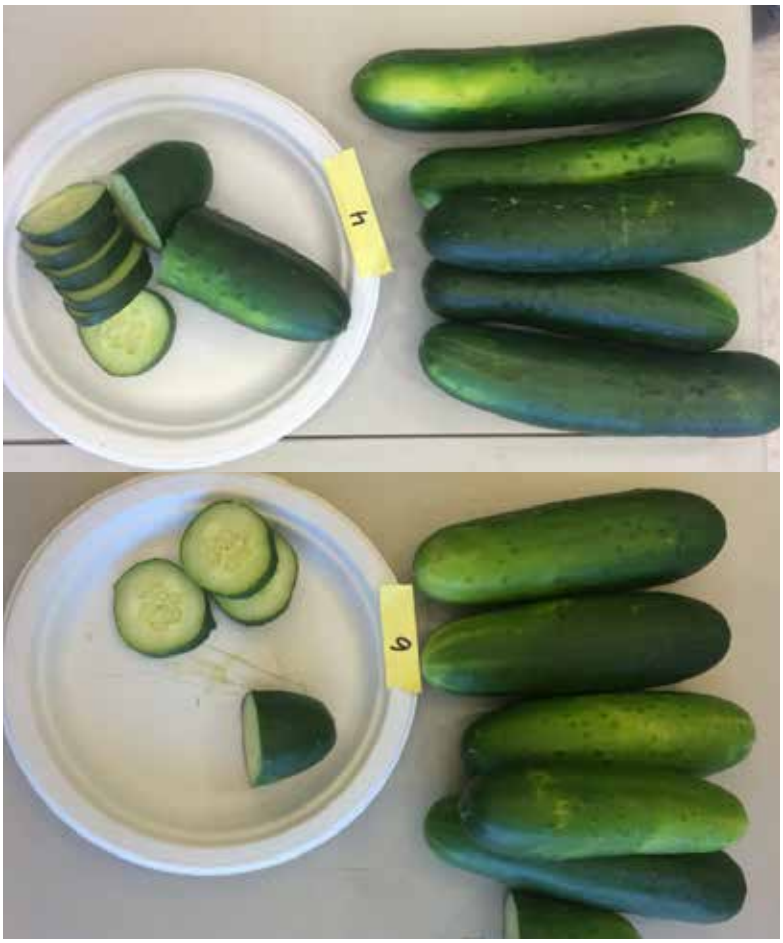
In this issue:

Crop conditions

Some were grateful for the pre-March mud season we had which gave them time to work on much needed infrastructure; moving high tunnels or putting up new ones, roofing, fencing, etc. That work is on hold this month with weekly snow storms and some still without power. As true spring approaches, growers are unloading the last of their winter crops. Move those beets! Hard to believe, but seeding for field crops began this week and many high tunnels are transitioning from winter greens to spring ones and preparations for summer crops as well. This winter in high tunnels we have found lettuce and spinach downy mildews (different pathogens), lettuce powdery mildew (can look like downy mildew), and foxglove aphid on lettuce. With 9 U.S. races of lettuce downy mildew and 16 races of spinach downy mildew (and growing), selecting multiple varieties with varying disease resistance is very important. Downy mildew was diagnosed on Gazelle *and* Kolibri spinach last week which have high resistances to races 1-13, 15 and 1-9, 12-15 respectively and intermediate resistance in Kolibri to races 10 and 11. As new races are developing, now is a good time to assess which of your varieties did well this season, and review those seed catalogs for new varieties with resistance. As high tunnel winter pests abound, Meg McGrath, plant pathologist of Cornell University, has put together a survey for all greens growers to help us get to the bottom of this. Fill out the survey if you grow winter greens by clicking HERE**.** At UMass, we continue the exploration of salt injury in high tunnels using spinach as a model crop. We would like to collect some Gazelle spinach from your high tunnels if you have any still growing (that's the variety we're using in our trials). If you have some, let us know: umassvegetable@umass.edu.



Bristol (top) and NY264 (bottom). The best yielding cucurbit downy mildew resistant varieties two years in a row in UMass Extension Vegetable Program trials conducted by Sue Scheufele and gang.

UMass research: Growing Fall Cucumbers in the Downy Mildew Age

Many growers remember the "good ole days" when you could pick cucumbers into the fall and even until the first frost. Nowadays cucumber plants go down much earlier, around mid-August to early-September, when the leaves suddenly turn yellow, then brown, and shrivel up. These are telltale symptoms (along with a furry or crusty dark brown to gray sporulation on the undersides of the leaves) of cucurbit downy

mildew, a disease caused by the oomycecte *Pseudoperonospora cubensis*. The disease affects all cucurbit crops and can cause sudden and complete death of foliage, effectively ending the cucumber season. This pathogen is an obligate parasite, meaning it needs a living host to survive. Thus, the disease overwinters in Florida where cucumbers are grown throughout the winter, and works its way north as the growing season progresses. There are several strains that affect different crops, but all strains affect cucumber, making them the most susceptible crop to the disease. The disease was controlled for decades because all cucumbers carried a resistance gene, but in 2004 the pathogen evolved and overcame that resistance and now there is a great effort to breed new varieties with alternative sources of disease resistance. Here at UMass we have been evaluating some of these new varieties to see how they hold up in Massachusetts, and looking at the economics of using host resistance and/or spraying fungicides (organic or conventional). For these trials we focused on slicing cucumbers but hope to continue looking at other types in the future.

Evaluating Resistant Cucumber Varieties. We compared 6-8 varieties in 2016 and 2017 with four replications of each variety organized in randomized complete blocks so that we could determine significant differences between varieties. We planted four-week-old seedling into black plastic mulch with drip irrigation during the last week of June and started harvesting on August 5 in 2016 and on July 25 in 2017. The growing seasons of these two years were very different, with 2016 being very hot and dry with low downy mildew pressure and 2017 being relatively cool and wet with high disease pressure. Additionally, in 2017, the pathogen arrived on August 1, two weeks earlier than in 2016. In 2016 we had an unexpected outbreak of watermelon mosaic virus which drastically reduced marketable yield of the susceptible control 'Straight 8', while other varieties were unaffected. We measured disease severity and marketable yield every week and summed them up over the season. Figure 1 shows the area under the disease progress curve (AUDPC—a higher number means more disease over time) and marketable yield per acre. Bristol, DMR401, and NY264 had among the lowest disease severity and the highest yields in both years. Diamondback, Python, and SV4719CS performed better than the susceptible control but not as well as the other resistant varieties. Green Bowl had terrible yields and therefore won't be commercialized.

		Downy Mildew AUDPC[z]		**Total Marketable Yield (lb/A)[y]**		**Last Harvest Date**	
Cultivar	**Seed Supplier**	2016	2017	2016	2017	2016	2017
Straight Eight (Susceptible control)	Burpee	16.4 a	2418.8 a	18,391 d	8,826 cd	2-Sep	22-Aug
SV4719CS	Seminis	8.1 b	1345.0 b	28,826 c	15,522 abc	9-Sep	29-Aug
Green Bowl	Known-You	3.7 d	134.2 c	22,696 cd	5,522 d	13-Sep	22-Aug
Bristol	Seminis	7.1 bc	419.4 c	40,652 ab	17,348 ab	13-Sep	4-Sep
DMR401	Commonwealth Seeds	5.7 c	1249.4 b	32,435 bc	19,913 a	9-Sep	4-Sep
NY264	Commonwealth Seeds	0.6 e	175.9 c	53,217 a	17,261 ab	30-Sep	11-Sep
Diamondback	Seedway	na	1426.3 b	na	12,217 bcd	na	1-Sep
Python	Seedway	na	1391.3 b	na	14,957 abc	na	4-Sep
p-value		<0.0001	<0.0001	0.0005	0.0087	--	--

[z]Data were analyzed using a generalized linear model and means were separated using Tukey's HSD at alpha = 0.05. Numbers within each column which share the same letter are not significantly different from each other.

[y]Total yield was recorded twice weekly and is here summed across the whole season.

Economics of Integrated Disease Management. In the second set of experiments, we investigated the economics of different management strategies, and compared one resistant and one susceptible variety under two fungicide spray programs, one organic and one conventional. We setup plots of susceptible (Straight8) or resistant (SV4719CS) cucumbers in randomized complete blocks and then applied one of the following spray treatments in a 5-7 day spray schedule once disease was confirmed in the area:

- **Unsprayed**
- **Conventional Spray:** Included a fungicide effective for powdery mildew (Torino, Procure, or Inspire Super) and a fungicide effective for downy mildew (Ranman or Tanos) in rotation and mixed with Bravo Weatherstick
- **Organic Spray:** Oxidate alone for powdery mildew before the arrival of downy mildew, and copper (NuCop HB) alone once downy mildew arrived.

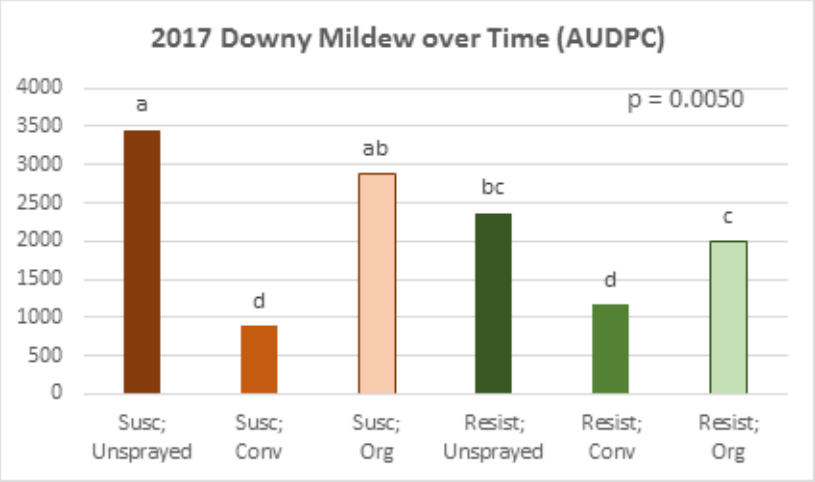


Figure 1.

In 2016, we sprayed 6 times before the plants went down. In 2017, because of the earlier arrival of downy mildew, we sprayed 9 times. We rated disease severity and marketable yield. Our disease severity results were very consistent between the two years (2017 results in Figure 1) and show that the conventional fungicides are the most effective tool in controlling downy mildew all season long, if you can spray every 5-7 days and have a good spray program with the right materials in rotation. Our data also shows that the resistant variety has significantly less disease than the susceptible variety, and that spraying copper does slow disease spread, especially in a drier year like 2016 when downy mildew came late.

When we look at the marketable yield data (Figures 3 and 4), the two years were not as consistent. In 2016, the resistant variety treatments yielded significantly higher than the susceptible varieties. This was due to a virus that affected the susceptible variety, Straight 8, and not the resistant variety, SV4719CS, drastically reducing marketable yield of Straight 8, and because the downy mildew pressure was low, so the fungicides didn't give much of an advantage to the sprayed plants. In 2017, under very high disease pressure, the conventional fungicides were very effective at controlling disease; the highest marketable yield was achieved by spraying the susceptible variety with a conventional program. The susceptible and resistant varieties had very different yield potentials – the susceptible Straight 8 had a very high yield potential compared to the resistant SV4719CS, which was not a prolific producer even under the best conditions. Looking at the yield of the resistant variety, it was fairly consistent year to year despite the very different conditions, and the fungicide treatments made no statistical difference in yield compared to the unsprayed treatment.

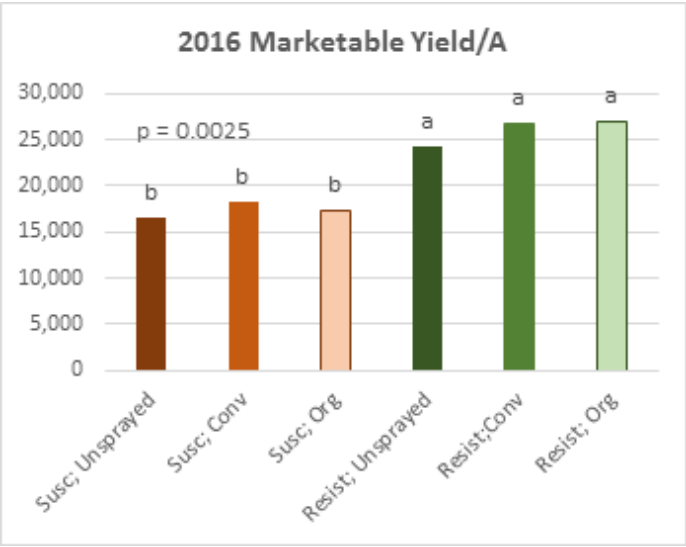


Figure 3.

Figure 4.

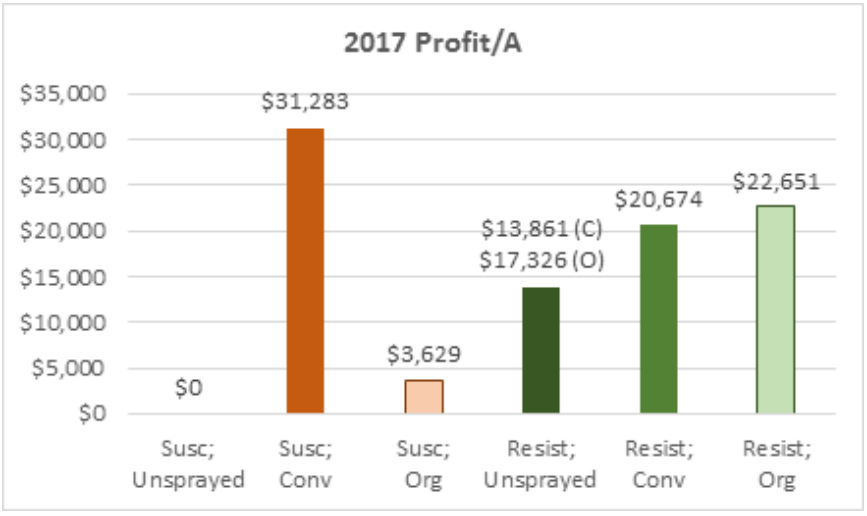


Figure 5. Profits are based on a conventional cucumber (C) price of $2/pound and organic cucumber (O) price of $2.50/pound.

When we looked at the profitability of the different management approaches, we found that some growers might find it is worthwhile to spray and get higher yields. If you don't have spray equipment, growing a resistant variety meant a profit margin of $13,861 for conventional cucumbers or $17, 326 for organic cucumbers. The profit margin was greatest on the resistant variety with an organic spray program, and with a conventional spray program on the susceptible variety (Fig. 5). We calculated the cost for the entire season of the materials we sprayed for each treatment ($400-$700 for the conventional sprays and $40 for organic), the labor ($24/hr), and the sprayer tractor time ($20/A) then subtracted that from the total sales assuming conventional cucumbers could be sold for $2/pound and organic cucumbers could be sold for $2.50/pound.

Some conclusions about different disease management approaches learned from this study are:

- **If you plan to use conventional fungicides, have a good rotation program for downy and powdery mildew, and can spray every 5-7 days, then you should pick a high-yielding variety, regardless of susceptibility.** Under these circumstances, we were able to harvest cucumbers until October 2nd.
- However, **if you can't spray diligently, resistant varieties offer a very consistent and economical alternative that you may not need to spray at all.** We picked our unsprayed resistant variety, SV4719CS, until September 15th—I wonder how late we could have harvested if instead we'd chosen NY264 or Bristol, knowing now that those have better resistance and yields?

This research was funded by a Specialty Crops grant from the MA Dept of Agricultural Resources.

-- by Susan B. Scheufele, UMass Extension Vegetable Program

WHOLE FARM WATER USE: A SURVEY OF NORTHEASTERN VEGETABLE PRODUCERS

Introduction: Over this winter, the UVM Extension vegetable and berry team, working with UMass Extension, conducted a water use survey of you (our farmers and readers) to develop research and education to help you manage on-farm water use. Currently, little is known about the quality and quantity of water that specialty crop farms use in the Northeast, the relative importance of different sources of water, and the reliability of these sources under drought or flooding conditions. To address this, we used Extension vegetable grower publications in two Northeast states (Vermont and Massachusetts) to ask vegetable producers about their water use practices, including irrigation, vegetable wash water, and water discharge. Below are the results of this survey.

Key Findings

Irrigation

- The majority of respondents to our survey reported using water for irrigation at least one time in 2017. The predominant irrigation approach among respondents is drip/trickle irrigation, with some respondents reporting use of overhead sprinklers (stationary or traveling).

- The majority of respondents draw from more than one type of water source for irrigation. Deep wells, rivers, and municipal water sources were the most commonly reported.
- The majority of those respondents who irrigate decided to do so by monitoring crop conditions and/or the feel of the soil.
- Less than half of respondents report testing the quality of water used for irrigation water. The majority of those who do test report testing one time per year. The majority of tests are performed to monitor E. coli presence in irrigation water.

Wash Water

- Most survey respondents wash produce. Respondents use a variety of washing/cooling systems including single, double, and triple wash systems, barrel washers, hydro coolers, and spray systems. There was no single dominant washing system reported by respondents.
- Most respondents who reported washing produce use water drawn from deep wells or municipal systems.
- Most respondents did not report using a sanitizer in their wash water. The majority of those who do use a sanitizer use peroxyacetic acid. The majority of these respondents do not check sanitizer concentration after the initial application.
- The primary method of wash water disposal described by respondents is discharge onto bare ground, often covered by vegetation.

Methods: We collected responses from 155 individuals representing a response rate of 10% from Vermont Vegetable and Berry Grower Association members and 1% for Vegetable Notes subscribers. Because of low response rates, the results that we report from this survey should be interpreted with caution; they are indicative of survey respondents only, and should not be generalized to the greater population of vegetable producers in the Northeast.

Results: The majority of survey respondents reported growing vegetables (80% of respondents), berries (50%), cover crops (50%), ornamentals (16%), tree fruit (9%), and livestock feed (9%). Seventy-six percent of respondents reported producing products in two or more of the categories listed. Seventy-six percent of respondents were farm owners, while 39% were farm managers and 6% were farm staff. On average, respondents had 19 years of experience working on their current farm, with a standard deviation of 15 years. The majority of respondents were from Vermont (60%) and Massachusetts (24%), the rest of responses came in from CT, ME, NH, NY and RI.

Our sample of respondents reported acreage in production (mean = 26 acres, median = 8 acres) and square feet in high tunnel production (mean = 7,287 sq. ft., median = 2,940 sq. ft.). We asked respondents to report the number of acres irrigated in 2017, (mean = 15 acres, median = 4 acres). All production areas covered by high tunnels were irrigated.

Irrigation

The majority of respondents (90%) reported irrigating either field acres or high tunnels/greenhouses in 2017. Sources of irrigation water were very diverse and included deep wells more than 25 ft. (57% of respondents reported using this source), ponds (33%), municipal sources (25%), shallow wells less than 25 ft. (20%), rivers (20%), streams or creeks (18%), springs (10%), and cisterns (2%). The majority (54%) of respondents reported using two or more water source types for irrigation purposes, while 33% reported using a single type of source. When asked if they discontinued irrigation because of an insufficient water supply at any point in 2017, the overwhelming majority of respondents (98%) reported that they had not. It should be noted that rainfall totals in 2017 were near or above average in most states in the Northeast, while in the previous year much of the region received well-below average levels. The overall response to this question may have been different if this survey were conducted after the drought of 2016.

The majority of respondents who reported irrigating (94%), reported using drip/trickle irrigation. In addition, 59% reported using non-mobile overhead irrigation systems, and 28% reported using traveling overhead systems. Sixty-seven

percent of respondents reported using multiple irrigation approaches, while 33% reported using a single irrigation approach.

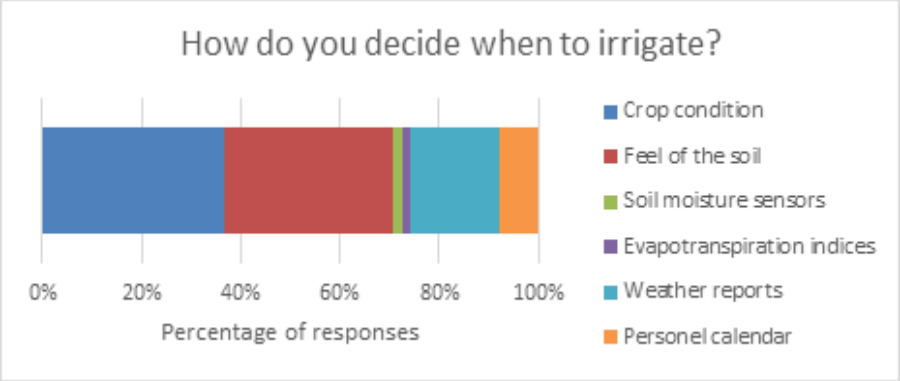


Figure 2: Cues to irrigate reported by survey respondents (n=93). Respondents were allowed to report more than one cue.

When asked how they decided when to irrigate, the majority of farmers reported that they used crop condition (89%) and/or the feel of the soil (83%) as their cue to irrigate. Forty-four percent of respondents reported using weather reports, likely related to precipitation forecasts and/or use of overhead irrigation as a method for protecting early season crops (i.e. strawberries) from frost (see figure 2). Most respondents (93%) reported that they did not measure the quantity of water used for irrigation in 2017.

Wash water: Eighty percent of respondents reported that they used water to wash or cool produce in 2017, and 51% reported doing so in winter months (December – March). The majority of respondents drew vegetable wash water from deep wells (59% of respondents), municipal sources (35%), shallow wells (8%) and springs (8%). There was no dominant method used for washing produce, with closely comparable numbers of respondents reporting use of single dunk tanks (19%), double dunk tanks (17%), triple dunk tanks (18%), barrel washers (14%), hydro coolers (13%) and overhead spray systems (20%) (see figure 3). No respondents reported measuring the amount of water used in washing or cooling in 2017.

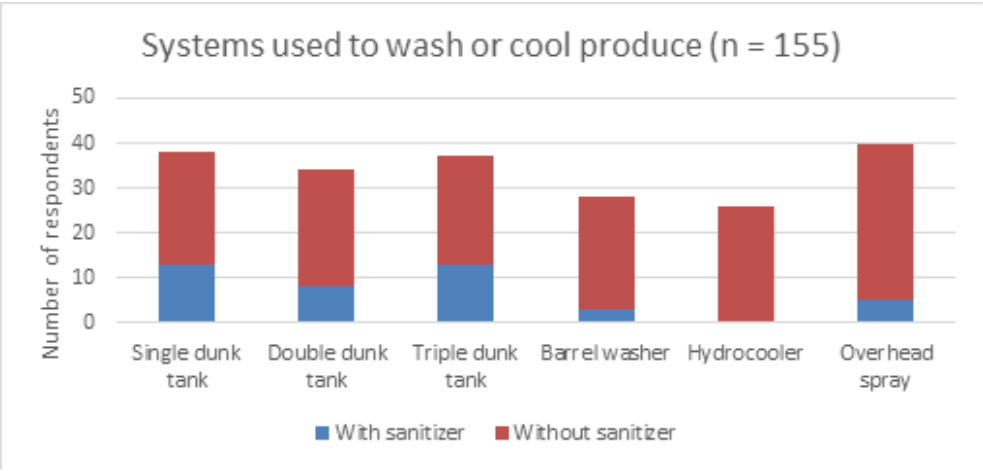


Figure 3: Washing and cooling systems reported by survey respondents

Respondents who reported adding sanitizer to their wash water used the following: 32% of respondents used peroxyacetic acid (brand names include Sanidate, Tsuamni, VigorOx) and 5% used a chlorine-based sanitizer. Sixty-five percent of respondents reported not using a sanitizer in their wash water. Those who reported using sanitizer were asked if they checked for sanitizer concentration at any time in 2017. Twenty-one percent reported that they had checked using produce-specific test strips and 4% reported checking using pH test strips, but the majority (64%) reported not checking for sanitizer concentration. Twenty-nine percent of those respondents who used sanitizers reported checking concentration levels at every wash (29%), daily (29%), weekly (14%), monthly (14%), or once a year (14%).

Reasons given for not using sanitizer are described in figure 4. The predominant reason given for not using sanitizer was *I don't think I need it* (75% of responses to this question.) Write in responses shed light on the diversity of reasons why growers may feel that they don't need to use sanitizer: one respondent reported installing a ultraviolet light system, another reported that they draw water from a municipal system, and a third reported they have not had any problems in the past. Yet another respondent cited research by the University of Vermont Extension showed that triple washing provides sufficient protection from *E. coli* contamination (Blevins and Grubinger 2015. See references below for link).

Water quality: Forty-four percent of respondents reported testing the quality of their **irrigation water**, with the majority of these testing once per year (78% of respondents). Of respondents who report testing their irrigation water, the majority (90%) report testing for *E. Coli*, 12% report testing for nitrate contamination, 12% for heavy metal contamination, and 7%

for biological or chemical agents.

Meanwhile, 49% of respondent reported testing the quality of **water used for vegetable washing or cooling purposes**. Of respondents who report testing their wash water, all reported testing for *E. Coli*, while 18% report testing for nitrate contamination, 10% for heavy metal contamination, and 7% for biological or chemical agents. Seventy-six percent reported never receiving a negative (unsatisfactory) test result from a water test. For those who have received unsatisfactory test results, 16% reported treating the water source, 3% reported ceasing use of the water source, 3% reported doing nothing, and 1 individual reported taking another sample from a different tap. The predominant method for disposing of water used for washing and/or cooling is by releasing the water onto bare ground mostly covered by vegetation (63% of respondents), or onto bare ground covered by sand, gravel, or silt (24%), or onto a non-porous surface (5%).

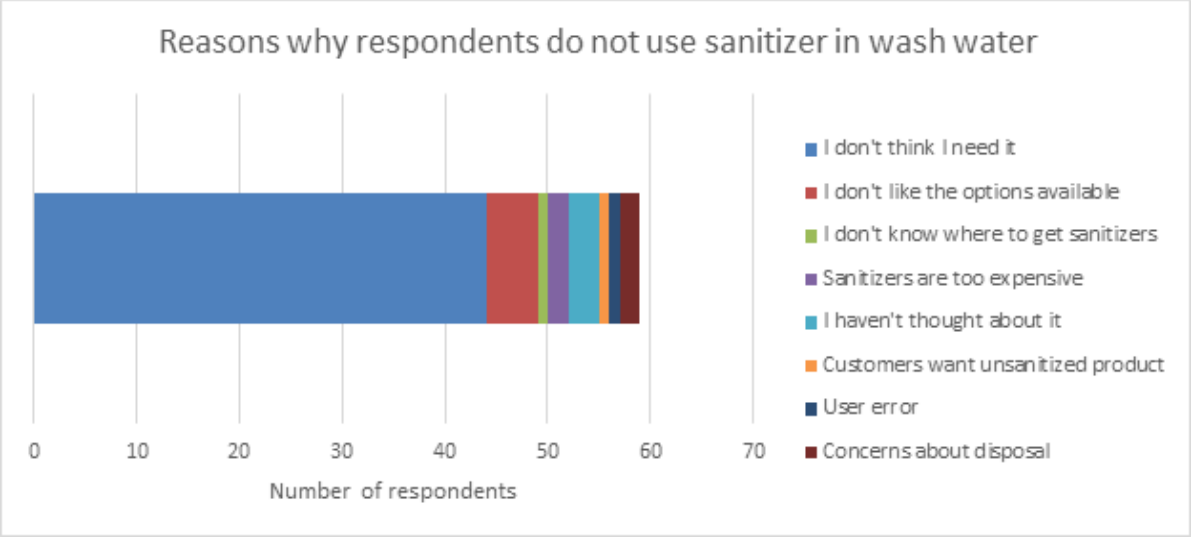


Figure 4: Respondent reported reasons for not using sanitizer in wash water (n = 155)

Water related concerns: Respondents reported concerns surrounding a variety of water-related topics. Among the topics we inquired about, producers were most concerned about irrigation-related issues, including 1. aligning irrigation quantity and timing to best meet crop needs (83% reported being very concerned or somewhat concerned about this topic), 2. water conservation in irrigation (80%), and 3. irrigation practices to protect produce safety (77%). Respondents were also concerned about wash water quality to protect produce safety (75%), and labor/time management in pre-harvest activities (77%). Topics of lowest concern among survey respondents were wash water discharge (59% of respondents reported being very concerned or concerned about this topic), and conserving water in post-harvest activities (e.g. washing or cooling produce) (67%).

Conclusions: Based on your survey responses, key areas for potential research and education appear to be:

- Irrigation timing/quantity to meet crop needs (Use of tensiometers, soil moisture sensors, environmental monitoring technologies to schedule irrigation, newer irrigation technologies to conserve water use).
- Irrigation and wash water quality and risk. Testing methods and best practices to improve and maintain water quality. (How, when, and how often to take water tests, and where to send samples.)
- Treatment options after receiving unsatisfactory water test results and monitoring irrigation distribution systems for sources of contamination.
- Wash water sanitizer use. (Selecting materials, monitoring efficacy, and understanding the value of including a sanitizer, especially in high risk crops such as leafy greens)

With only 155 respondents, these survey results may not represent the water use needs of all vegetable farms in New England, therefore, if the research priorities listed here are not what you need, or if you have others, please let us know! See contact information below.

-- by: Rachel E. Schattman (Rachel.Schattman@uvm.edu) , Northeast Climate Hub, Vern Grubinger (Vernon.Grubinger@

uvm.edu), *UVM Extension Vegetable and Berry Program, Lisa McKeag (*lmckeag@umass.edu*), and Katie Campbell Nelson (*kcampbel@umass.edu*) UMass Extension Vegetable Program*

References

Blevins, Lynn Zanardi, and Vern Grubinger. 2015. *Reducing risk and preparing for food safety regulations with improved produce washing methods for vegetable farms*. Burlington, VT: University of Vermont Extension.

Blevins, Lynn Zanardi, and Vern Grubinger. February 2014. *Effectiveness of Multiple Washings and/or Organic Sanitizer Treatment in Reducing E. coli Levels in Leafy Greens Wash Water.* Factsheet: http://www.uvm.edu/vtvegandberry/factsheets/LeafyGreensWashWater2-14.pdf Burlington, VT: University of Vermont Extension

News

We're Hiring! Seeking Weed IPM Technician

UMass is seeking an individual to assist with Weed IPM activities for fruit and vegetable crops in western, central and eastern MA. This is a seasonal full-time position. Undergraduate experience in Plant Science or related discipline is required. Individuals with a B.S. or M.S. degree in Plant Science or related discipline with weed science work experience are preferred. The Weed IPM Technician will interview growers to assess weed management needs and conduct in-field surveys to determine frequency and intensity of problematic weeds. The Technician will construct IPM plans with farmers and establish field trials on farms or at one of the UMass research farms. The Technician will also perform outreach by conducting occasional workshops, field walks or twilight meetings to promote IPM for weed management, responding to grower inquiries, and contributing to newsletters and providing web site updates. Weekly or biweekly scouting of identified farms is expected. The Technician will work closely with the UMass Fruit and Vegetable Teams. Funds are available to support up to 37.5 hr/week; anticipated seasonal range is May-September with extensions possible. It is anticipated that the position will operate from Amherst, MA. Review of applications will start February 15 and continue until a suitable candidate is hired. Interested candidates should send a c.v. and a short letter of interest to:

Hilary Sandler, Project Leader, UMass Cranberry Station, PO Box 569, East Wareham, MA 02538. 508.295.2212 x21. hsandler@umass.edu

A link to the position description can also be found on the UMass Stockbridge School job site: https://stockbridge.cns.umass.edu/career-opportunity/umass-extension-weed-ipm-technician

Survey: Diseases of Winter Greens

Foliar diseases observed recently in winter greens are of special concern. They include downy mildews (spinach, brassicas and lettuce) and powdery mildews (brassicas and lettuce). All are capable of rendering a crop unmarketable. Plants are susceptible at all stages, including cotyledon stage. Their occurrence in field-grown plants in late fall and in winter tunnels is perplexing because most have not been observed recently in these crops grown during traditional production periods, with the exception of brassica downy mildew. Conditions during production of winter greens evidently are very favorable for these pathogens that tolerate cool temperatures. Prolonged periods of leaf wetness or high humidity likely is a factor. Low light levels and short days mean these pathogens have long periods to produce spores. Plastic covering high tunnels protects the pathogens from exposure to damaging UV radiation.

Occurrence of these foliar diseases appears to be sporadic, reflecting where the pathogen is present and conditions are favorable. This perception is based on reports received so far from growers. Knowledge about disease occurrence is important for developing appropriate, effective management programs. This information is needed to help determine initial sources of inoculum and potential for pathogen survival between crops and spread. If you grow winter greens, **regardless of whether or not you have seen any of these diseases, please help by clicking here to complete the survey**.

For more on management of diseases of winter greens, see the article here: http://vegetablemdonline.ppath.cornell.

edu/NewsArticles/winter-greens.html

APPLICATION PERIOD OPEN FOR MDAR ENERGY, ENVIRONMENTAL AND FOOD SAFETY GRANT PROGRAMS

MDAR announced last week that application periods are open for several grant programs available to farmers, in addition to the programs made available last month. **The application deadline for all three of these programs is Wednesday, April 25, 2018. All projects must be completed by June 30, 2019.**

Ag-Energy Grant (Ag-Energy) Programs

The purpose of the MDAR's Ag-Energy Grant Programs is to assist agricultural operations in an effort to improve energy efficiency and to facilitate adoption of alternative clean energy technologies in order that they can become more sustainable and the Commonwealth can maximize the environmental and economic benefits from these technologies.

This year's AgEnergy Grant Request for Responses (RFR) contains applications for two separate energy programs. Our Ag-Energy Traditional Grant, now in its 11th year, encompasses a wide variety of energy efficiency and renewable energy projects. Our Ag-Energy Special Projects, now in its 3rd year, has six specific project categories for agricultural energy projects that would typically require higher capital cost but potentially yield greater savings and/or positive agricultural impacts.

Reimbursement grants of up to $30,000 will be awarded on a competitive basis for the Ag-Energy Traditional Grant Program, while reimbursement grants up to varying amounts by category will be awarded on a competitive basis for the six specific categories under Ag-Energy Special Projects. Ag-Energy Grant applications are now available at www.mass.gov/service-details/agricultural-energy-grant-program-ener. The contact is Gerry Palano, 617-626-1706 or Gerald.Palano@state.ma.us.

Agricultural Environmental Enhancement Program (AEEP)

The purpose of AEEP is to support agricultural operations that are looking to install conservation practices that prevent direct impacts on water quality, ensure efficient use of water, as well as address impacts on air quality. By providing reimbursement directly to agricultural operations that implement eligible projects that prevent, reduce or eliminate environmental impacts, the program achieves its purpose and goals of minimizing environmental impacts from these operations for the benefit of the Commonwealth.

AEEP is a competitive, re-imbursement grant program that funds materials and labor up to $25,000 or 85% of project costs. AEEP grant applications are available at www.mass.gov/service-details/agricultural-environmental-enhancement-program-aeep. The contact is Laura Maul, 617-626-1739 or Laura.Maul@state.ma.us.

Agricultural Food Safety Improvement Program (AFSIP)

The purpose of AFSIP is to support produce operations that are looking to upgrade food safety practices within their operation. By enhancing food safety measures these operations are able to maintain or increase their market access while working towards minimizing the risk of microbial contamination and food-borne illnesses. This re-imbursement grant program is currently only open to produce operations.

AFSIP is a competitive, re-imbursement grant program that funds projects up to $25,000 or 75% of total project costs. AFSIP grant applications are available at www.mass.gov/service-details/agricultural-food-safety-improvement-program-afsip. The contact is Laura Maul, 617-626-1739 or Laura.Maul@state.ma.us.

The other MDAR grant programs with open application periods are listed below. The due date for these applications is April 10, 2018.:

- **Farm Viability Enhancement Program (FVEP)**. Contact Craig Richov at 617-626-1725 or Craig.Richov@state.ma.us.
- **APR Improvement Program (AIP)**. Contact Melissa Adams at 413-548-1904 or Melissa.L.Adams@state.ma.us.
- **Matching Enterprise Grants for Agriculture (MEGA)**. Contact Melissa Adams at 413-548-1904 or Melissa.L.Adams@state.ma.us.
- **Stewardship Assistance and Restoration on APRs Program (SARA)**. Contact Melissa Adams at 413-548-1904,

Melissa.L.Adams@state.ma.us.

WOULD YOU LIKE TO GROW GOLDENBERRIES THIS SUMMER?

You are cordially invited to participate in a USDA sponsored SARE (Sustainable Agriculture Research and Education) Project NE-SARE Project LNE18-362 'Goldenberries (*Physalis peruviana*): A New Fruit for CSA Farms and Farmers Markets'.

Goldenberries are related to tomatillos and are similar to ground cherries. They grow to 5 feet and produce many cherry-size golden fruit with a tropical flavor combination of pineapple, strawberry and cherry. They need a long growing season to mature, so they are planted at the same time as tomatoes or peppers and benefit from mulched, raised beds. They can be trellised much like tomatoes, but it is not required. While ground cherries fall from the plant when ripe, making them difficult to harvest, goldenberries do not.

As a participant you will receive:

25 seeds each of two superior goldenberry selections for evaluation as a new annual fruit crop and detailed instructions on germination, transplanting and field care.

Access to a MOOC (Massive Open Online Course) course (beginning December 2018) which includes unlimited e-mail support for production related questions.

An electronic copy of 'The Sustainable Goldenberry Production Guide' (available 2019).

Participation in this project is free and will contribute to our knowledge about this unique new fruit. All we ask is that you provide feedback regarding your experience with this new fruit.

If you wish to participate, please email Edward Durner at durner@sebs.rutgers.edu with: Contact Name, Farm, Mailing address, City, State, Zip, Phone #, and e-mail:

DEVELOPMENT OF PRODUCE SAFETY RESOURCES – FARMER FEEDBACK NEEDED

The New England Produce Safety Coalition (NEPSC) is seeking small and medium-scale produce growers to participate in an interview about the impact of new produce safety regulations, including the cost of implementing best practices. Feedback from growers will help shape future produce safety informational materials to help with adaptation.

If you are willing to participate in a 45-minute interview (phone or in-person), please contact research assistant Alisha Utter (University of Vermont) at autter@uvm.edu.

Interviewees will receive a $25 gas card as a "thank you" for participating.

EVENTS

Produce Safety Alliance Grower Training Series

Wondering where to begin with food safety? Start here! The PSA Grower Training is currently the only FDA-recognized produce safety training to help growers implement Good Agricultural Practices (GAPs) and understand their responsibilities under new Federal regulations. Whether you have a farm that is fully covered by the law or a small, exempt farm and you're just looking for information, this training is for you.

The PSA Grower Training Course satisfies the FSMA Produce Safety Rule requirement outlined in § 112.22(c) that requires 'At least one supervisor or responsible party for your farm must have successfully completed food safety training at least equivalent to that received under standardized curriculum recognized as adequate by the Food and Drug Administration.' The training is also required for participation in Massachusetts' Commonwealth Quality Program.

Cost is $40 for each program and includes the required PSA Grower Manual ($50 value), a Certificate of Course attendance from AFDO ($35 value), and lunch and refreshments

There are 2 locations remaining in this series:

When: Tuesday, March 20, 2018 - 9:00am to 5:00pm

Where: UMass Cranberry Station Library, 1 State Bog Road, (For GPS, enter: Intersection of Spectacle Pond Road and Glen Charlie Road), Wareham, MA 02538

REGISTER HERE: https://www.regonline.com/builder/site/?eventid=2148029. *There is currently a waitlist for this program. Please call Lisa McKeag at 413-577-3976 if you are interested in attending.*

When: Tuesday, March 27, 2018 - 9:00am to 5:00pm. *Rescheduled from March 13 due to weather.*

Where: Lenox Town Hall auditorium, 6 Walker Street, Lenox, MA 01240

REGISTER HERE: https://www.regonline.com/builder/site/?eventid=2152815. *There are still a few spots left for this program!*

Respirator Train-the-Trainer Course for Farmers, Beekeepers, and other employees who need to use respirators

UMass Extension is offering a series of Respirator Train-the-Trainer workshops in 2018. Farmers, beekeepers and other who need to wear respirators, required by pesticide labels, can benefit from the workshop. Participants will learn how the fit test a respirator and select, use, clean, maintain and replace respirators. All handlers must be trained under the EPA Worker Protection Standard (WPS) Respirator Requirement if they apply any pesticide that requires a respirator. Several organic approved (OMRI) pesticides and some miticides used by beekeepers require respirators.

The respirator train-the-trainer workshops are 2 hours long and will be held in Marlboro, Taunton, Hadley, and Marlborough. The registration fee is $30.00 per person. Participants will received a Certificate of Attendance, a check list for respirator training, and a fit test protocol. This is an hands on workshop. Bring your respirator or use one of ours.

To register for these workshop via the mail please click here for the registration form. To register online with a credit card (extra $5.00/person) see below.

When: Wednesday, April 4, 2018 from 1:15 PM to 3:45 PM

Where: Best Western Royal Plaza Hotel, 181 Boston Post Road West, Marlborough, MA 01752

REGISTER HERE: https://www.regonline.com/registration/Checkin.aspx?EventID=2267189

When: Friday, April 6, 2018 from 1:15 PM to 3:45 PM

Where: Holiday Inn Taunton-Foxboro Area, 700 Myles Standish Boulevard, Taunton, MA 02780

REGISTER HERE: https://www.regonline.com/registration/Checkin.aspx?EventID=2267203

When: Monday, April 9, 2018 from 1:15 PM to 3:45 PM

Where: Hadley Farms Meeting House, 41 Russell Street, Hampton Village Barn Shops on Route 9, Hadley, MA 01035

REGISTER HERE: https://www.regonline.com/registration/Checkin.aspx?EventID=2267207

When: Tuesday, June 19, 2018 from 1:15 PM to 3:45 PM

Where: Best Western Royal Plaza Hotel, 181 Boston Post Road West, Marlborough, MA 01752

REGISTER HERE: https://www.regonline.com/registration/Checkin.aspx?EventID=2267202

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