

# FSMA Produce Safety Rule—Water Requirements

Insights to Get You Organized

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There has been a lot of talk about the water requirements that are part of the Food Safety Modernization Act (FSMA) Produce Safety Rule (PSR). This article will help you know what is covered by the requirements, the timing of the requirements, and some key things to help you prepare. There will be more information coming on the topic, including guidance from FDA. This article is meant to be an introduction to some of the main parts of the water requirements. Some of the key terms and phrases are marked in bold; you can expect to see these terms again so now is a good time to start getting used



Cornell University Cooperative Extension Eastern New York Commercial Horticulture continued on page 3

### The Produce Pages

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The Produce Pages is a monthly publication of the Eastern New York Commercial Horticulture Program. For more information about the program, please visit our website at http://enych.cce.cornell.edu/.

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# Enrollment Time!

You probably received electronically, and/or in paper enrollment forms for 2017.

Please note that the enrollment fee has been **decreased to \$65.** This is because enrollment will NO LONGER include a selection from the library of Guidelines.

You can still buy them separately in paper or on-line access



Please click here to enroll: <u>https://</u> enych.cce.cornell.edu/enrollment.php

Serving the Educational and Research Needs of the Commercial Small Fruit, Vegetable and Tree Fruit Industries in Albany, Clinton, Columbia, Dutchess, Essex, Fulton, Greene, Montgomery, Orange, Putnam, Rensselaer, Saratoga, Schoharie, Schenectady, Ulster, Warren and Washington Counties to them. The main points of this article are:

- Understanding when water qualifies as agricultural water
- Microbial quality requirements for agricultural water used during growing activities or during and after harvest
- Microbial Water Quality Profile: What is it, how many samples do you need to build one, and what resources are out there to help you
- Options if your agricultural water does not meet microbial water quality criteria

#### Understand When Water Qualifies as Agricultural Water

The water quality requirements in the FSMA PSR only apply to farms covered by the rule that are using water that directly contacts the edible portion of the crop during growing activities, or during and after harvest activities. The language directly from the PSR requires that "all agricultural water must be safe and of adequate sanitary quality for its intended use" (§ 112.41). Agricultural water is defined in part as "water (that is) intended to, or is likely to, contact covered produce or food contact surfaces" and covered produce is defined in part as "the harvestable or harvested part of the *crop"* (§ 112.3(*c*)). It is important to note that foodcontact surfaces are also included in this definition, so agricultural water quality requirements will have to be met when establishing cleaning and sanitation programs as well.

#### Microbial Quality Requirements For Agricultural Water Used During Growing Activities, or During and After Harvest

Different water quality criteria are established for water used during growing activities and for water used during and after harvest. Both are based on testing water for **generic** *Escherichia coli*, which is an indicator of fecal contamination. Below are the requirements. Please note, water used during growing activities can have a limited amount of *E. coli* present in the water, whereas water used during or after harvest must have no detectable generic *E.coli* present in the 100 mL water sample. The next section of this article will

outline the specifics about creating a microbial water quality profile (MWQP) and there is an additional worksheet entitled *Geometric Means, Statistical Threshold Values, and Microbial Die-Off Rates* that describes how to do the associated calculations, but for now, just review the numbers.

- The requirement for agricultural water used during growing activities is a microbial water quality profile, based on a rolling 4-year sample data set, that has a geometric mean of 126 or less CFU/100 mL generic *E. coli* and a statistical threshold value of 410 or less CFU/100 mL generic *E. coli*.
  - The requirement for agricultural water used during and after harvest is no detectable generic *E. coli* in 100 mL of water.

Please read the remainder of this article for explanations of those main points, and flexible management options included in the PSR for water that does not meet the *E. coli* based water quality requirements.

To start, it is important to talk about what is covered by the PSR. The PSR only covers microbiological hazards, so the water requirements only include microbiological testing. Controlling fecal contamination is one key to minimizing produce safety issues, and the test for generic *E. coli* indicates fecal contamination without the cost of testing for all microbial human pathogens. Again, it is important to be clear about the term agricultural water so here is the exact definition from the PSR.

"Agricultural water means water used in covered activities on covered produce where water is intended to, or is likely to, contact covered produce or food contact surfaces, including water used in growing activities (including irrigation water applied using direct water application methods, water used for preparing crop sprays, and water used for growing sprouts) and in harvesting, packing, and holding activities (including water used for washing or cooling harvested produce and water used for preventing dehydration of covered

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produce)."

Notice a couple of things in that definition.

- Agricultural water is used during covered activities on covered produce. Covered activities refer to activities that are described in the rule (e.g., growing, harvesting, packing, and holding). Covered produce has a specific definition in the PSR, generally, produce that is normally consumed raw and is a raw agricultural commodity.
- In order to be considered agricultural water, the water must be used in direct contact with the harvested portion of covered produce, or food-contact surfaces (including hands). Water used in other ways on the farm does not fall under the definition of agricultural water.

It is also important to understand when the requirements of the PSR go into effect. For many farms the answer is never. Some farms are not covered, or they qualify for exemptions or modified requirements. It is important to keep in mind that, even without a legal requirement to follow the PSR, a buyer might demand that a grower follow the provisions in the PSR. For those subject to the PSR, compliance dates for most provisions begin January 26, 2018 depending on the farm's **business size**. An extra two years is provided to come into compliance with the *E. coli*based water requirements, on top of the general compliance dates. This gives extra time for sample systems at least once a year, and to maintain their water sources and water distribution systems. These practices do not fall under the two-year extension for *E. coli*-based water requirements, so they are required at the general compliance date. It is important to remember (as mentioned above) that "all agricultural water must be safe and of adequate sanitary quality for its intended use" (§ 112.41) so you may have to pay attention to other water quality issues in addition to the presence of *E. coli* if other risks are identified.

Microbial Water Quality Profile: What is it, how many samples do you need to build one, and what resources are out there to help you

For agricultural water that is used during growing activities, a microbial water quality profile (MWQP) has to be developed. The MWOP is intended to help a grower make water management decisions using a rolling 4-year data set of results to understand water quality determined through water testing and two statistical calculations: a **geometric mean** (GM) and a statistical threshold value (STV). The MWQP is based on at least 4 samples for ground water sources of agricultural water (e.g., protected well), and at least 20 samples for surface water sources of agricultural water (e.g., pond, stream, river) tested for generic E.coli. Collection of the initial ground water sample set must be done in one year; collection of the initial surface water sample set will have to start at least two years before the water quality requirement compliance dates.

collection and analysis. See the FSMA Produce Safety Rule Compliance page for more details about compliance dates.

In addition to meeting the microbial water quality criteria, growers subject to the PSR will be required to inspect their agricultural water



As mentioned earlier, the numeric requirement for agricultural water used during growing activities is an MWQP that has a **GM of 126 or less CFU/100 mL** generic *E. coli*, and a **STV of 410 or less CFU/100 mL** generic *E. coli*.

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The terms GM and STV will be new to a lot of people. Luckily, there are tools available to help do the calculations. There is a worksheet for those who want to do the calculations by hand (mentioned above), but there is also an online calculator that can be found at the Western Center for Food Safety web site (wcfs.ucdavis.edu). Two important take away messages regarding the MWQP are:

- There are resources available to help you do the calculations and,
- The *E. coli*-based requirements do not go into effect for several years (2020 at the earliest) but the development of a surface water MWQP should start at least 2 years before the compliance date for your farm.

Please note, FDA will be publishing guidance to help you implement water testing and the creation of the MWQP. Until guidance is released, you should not invest in testing towards the development of the MWQP. If you are already doing water tests to meet buyer requirements or as part of a third party audit, then continue to do that water testing, but do not make significant changes or investments in additional water testing until FDA releases its guidance so you can be assured that the changes and investments you are making will be in compliance with the PSR.

#### Options if Your Water Does Not Meet Microbial Water Quality Criteria

Once the GM and STV values for the MWQP are calculated, they must be compared against the numeric criteria in the PSR (described in detail above). In order to be in compliance with the PSR, agricultural water used during growing activities has to meet both the GM criterion and the STV criterion. If a calculated value is above one of those criteria, the PSR includes flexibility in the form of management options called **corrective measures**. Growers have time, within the following year, to apply one or more of these corrective measures:

• Manage the water use and produce handling to include a time interval for die-off or to allow for

log reduction during other steps. These management options result in calculated reductions to the original GM and STV value. The reduction is based on expected rates of microbial die-off in the field or during storage, or log removal during processes such as commercial washing.

- Re-inspect the agricultural water system and take corrective action to address contamination sources or other issues.
- Treat the water, being sure that any antimicrobial pesticides (e.g., sanitizers, disinfectants) are used according to the label.

Corrective measures will be covered in more detail in a future article – for now, hopefully, this is enough information to get you organized and headed in the right direction.

There will be more written about water quality and water-related requirements in the PSR, and FDA is working on guidance to help guide compliance with the PSR. Contact the PSA if you have questions about what the water rules mean to you. For authoritative answers about PSR water quality requirements and regulatory compliance, you can submit questions to FDA's technical assistance network.

#### **Produce Safety Alliance Grower Training Course**

Date: Tuesday, January 31<sup>st</sup>, 2017 Time: 8:30 – 4:30 Location: Beekmantown Town Hall, 571 Spellman Rd, Beekmantown, NY

# Reminder: NYS Burning Regulations

#### MAIRE ULLRICH

DEC banned much of the outdoor burning, particularly of garbage in 2009. They created some exemptions for agriculture and this is a refresher of what changed that is still in effect.

#### 1. Do the regulations on open burning make burning household trash in burn barrels or piles illegal?

Yes. Burning trash is prohibited statewide in all cases. Our existing incinerator rule already prohibits burning household trash in wood stoves, fireplaces, and outdoor wood boilers. DEC recommends that you recycle all appropriate materials (such as newspaper, paper, glass and plastic) and compost your organic kitchen and garden waste.

### 2. What are the regulations on open burning in New York State?

All open burning is prohibited in New York with several exceptions including the following:

- Campfires less than 3 feet in height and 4 feet in length, width or diameter are allowed.
- Small cooking fires are allowed.
- Fires cannot be left unattended and must be fully extinguished.
- Only charcoal or clean, untreated or unpainted wood can be burned.
- Ceremonial or celebratory bonfires are allowed.

In towns with a total population less than 20,000, you may burn tree limbs with attached leaves. The limbs must be less than 6 inches in diameter and 8 feet in length (also referred to as brush). However, this is not allowed from March 16 through May 14 due to the increased risk of wildfires.

See Section 215.3 (link leaves DEC's website) for a full list of exceptions.

### 3. Why has DEC changed the regulations allowing open burning in New York State?

Open burning of household trash releases dangerous compounds including arsenic, carbon monoxide, benzene, styrene, formaldehyde, lead, hydrogen cyanide and dioxin, among others. Open burning is also the single greatest cause of wildfires in New York.

#### 4. Can I burn leaves if I live in a rural area?

No, burning leaves is banned in New York State. We encourage you to compost leaves.

### 5. Your rule says firewood must be untreated, some firewood is heat-treated, is that allowed?

Some firewood is heat treated (kiln dried) to control invasive insect species if it is to be transported over 50 miles. Heat treated firewood is not intended to be prohibited. However, the burning of chemically treated wood such as pressure-treated lumber and plywood is prohibited.

### 6. Are open fires allowed to control invasive plant and insect species?

Yes. Case-by-case DEC approval is not required.

#### 7. Can agricultural wastes be burned?

Yes, organic (*editors note, meaning that which contains carbon such as plant and animal matter*) agricultural wastes may be burned on-site where they are grown or generated including brush and wood produced by clearing fields and other activities. The fire must be located on contiguous agricultural land larger than 5 acres, and the materials capable of being fully burned within 24 hours.

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The burning of pesticides, plastics or other nonorganic material is prohibited.

### 8. Can I burn liquid petroleum fueled smudge pots to prevent frost damage to crops?

Yes. However, burning tires and other wastes for smudge is not allowed.

#### 9. Can prescribed burns be performed?

Yes. Prescribed burns, the burning of forest land to achieve a vegetative or wildlife management goal, can be performed but only in accordance with DEC regulations. Check with your regional DEC office.

### 10. Are fire training burning activities allowed?

Yes, with some restrictions on the use of acquired structures and in accordance with guidance from NYS Dept. of State's Office of Fire Prevention and Control. The Fire Services Bureau may be reached at 518-474-6746.

### 11. Are individual open fires to control plant and animal disease outbreaks allowed?

Yes, as approved case-by-case by DEC, upon the request by the Commissioner of Agriculture and Markets.

### 12. Can I dispose of a flag or religious item in an open fire?

Yes, in a small-sized fire if it is not otherwise prohibited by law or regulation.

### 13. Are permits for open fires still required in some parts of the state?

Yes. While a permit is not required under this regulation, the Environmental Conservation Law (ECL) still requires that a permit be obtained from the Department if you plan to burn brush under the exception and you live in a town which is totally or partially located within the boundaries of the Adirondack and Catskill Parks which is designated as a "Fire Town" under the ECL (see <a href="http://www.dec.ny.gov/chemical/58519.html">http://www.dec.ny.gov/chemical/58519.html</a> for list) In addition, any local requirements or restrictions would apply.

### 14. Can a town prohibit open burning that the state allows?

Yes, towns, villages, cities and counties can pass ordinances that are stricter than, and not inconsistent with, the open fires regulations. You should check with local authorities to find out if local law requires a permit or prohibits open fires.

### 15. Can explosives, or other dangerous contraband, be burned?

Yes, on an emergency basis by police or other public safety organizations only.

#### 16. Can brush piles be burned at transfer sites?

No, the practice of burning large piles of brush collected from local residents at town or county transfer sites is prohibited. The individual landowners in small towns may burn their brush on site as discussed under question 2 above. Downed limbs and branches generated at a transfer site are also allowed to be burned on site with the same restrictions.

### 17. Where should I call to report an illegal open fire?

Report all poachers and polluters by calling the DEC hotline at 1-844-DEC-ECOs (1-844-332-3267). The Department has received many questions regarding DEC's implementation of Part 215, regarding open fires. Call if you have further questions.

#### Source: http://www.dec.ny.gov/chemical/58519.html

#### Visit the ENYCHP Website

For online class registrations, announcements, previous issues of our newsletters, and more, visit the ENYCHP website at

http://enych.cce.cornell.edu/

Email or call any of the educators with questions or comments on the website – we want to make it work for YOU!

# Carrot Trial Results 2016

**Key conclusions:** There are significant differences in yield, quality and marketability of commercially available carrots, and a few of the higher yielding carrots also ranked high in flavor preference. Bolero is still a clear favorite.

**Introduction:** This is the second year that the Eastern NY Commercial Horticulture program has evaluated carrots for fresh market production. This year the focus was primarily on evaluating different Nantes typed carrots for flavor, total yield, and marketable yield. Some yet-unreleased varieties and some open-pollinated varieties were included in this year's study along with proven favorites.

**Background:** The carrot variety trial was planted at the Hudson Valley Farm Hub in Hurley, NY on June 9<sup>th</sup>. The trial was planted with non-pelletized seed using Jang seeder at a rate of approximately 30 seeds per foot. Thirty-foot sections of each vari-



ety were replicated three times and randomized across the planting area to account for differences in soils. The trial was grown organically, and on ridges, with optimum fertility and good weed control. Carrots were harvested on September 19<sup>th</sup>.

**Results:** The carrots varied dramatically in their yield. This information is shown graphically below, with the orange line representing the total average yield per 30 feet, and the blue line representing how much of that yield was considered marketable in a fresh market setting. We graded out carrots with cracks longer than one inch, forked carrots, and carrots shorter than four inch-



#### DECEMBER 2016

Complete information about all varieties is listed below. Please note, the weights are totals harvested, whereas the graph on the previous page is based on averages from the 3 plots. This table also includes observational information about Alternaria infection rates at harvest, and notes from the seed companies. Note: These carrots were never sprayed to control Alternaria, and the site is conducive.

Varieties	Total # Marketa- ble Roots in 90'	Marketable Weight in	Total# Culls in	Total Weight of	Total yield	Average % marketable roots by lb
NT 1	5(0	90' (lbs)	90'	Root Culls	57.05	0.00/
Naval	560	50.45	142	1.5	57.95	88%
Field Notes:	30-40% Alternaria	infection. Sho	ort tops			
Catalog notes ops smooth 8 Naval's tops	Catalog notes (Bejo): Superior storage Nantes. Rivals Nelson for taste and Bolero for long term storage. Naval devel- ops smooth 8-9" long blunt ended carrots with exceptional smoothness, sweetness, flavour, and deep orange colour. Naval's tops are healthy and strong 14" long and tolerant to leaf diseases					
Napoli	384	44.05	130	10.7	54.75	79%
•	Field Notes: 40% Alternaria infection.					
Catalog note	es (bejo): Very early	full-sized Na roots; 10-1	antes, with 2 inch tops	strong, dark a. Available a	green tops. S as organic se	Slightly tapered, cylindrical, 7-8 inch ed.
Mokum	251	21.05	82	6.55	27.6	76%
	Fiel	ld notes: 70%	Alternaria	infection. V	ery short, br	ittle tops
	Catalog notes (be	ejo): Very hig	sh-colored;	almost core	less. Sweet, o	early bunching carrot.
Cupar	368	35.15	356	11.05	46.2	76%
	Field N	otes: 40% Alt	ernaria inf	ection. Vigo	rous tops, str	ong petioles.
Catalog not tive, uniform	Catalog notes (Bejo): Tapered deep orange roots with broad shoulders and very little greening. Maintains its attrac- tive, uniform appearance and sweet flavor improves in storage; ideal for CSA growers looking for a reliable and long- storing carrot for bunching or season extension. Storage : 8" Chantenay-type					
Bastia	643	56.95	715	19.2	76.15	74%
Catalog notes (Bejo): Jumbo processing carrot for dicing, sticks, or cellos. Smooth 9 inch x 2 inch slightly tapered roots with excellent internal color. Strong tops. Stores well. Bastia is a multi-use carrot: harvest early for cello, and late for jumbos. Stores well						
Negovia	496	39.35	487	16	55.35	71%
		Fi	eld notes:	Alternaria 50	)-60%	
Catalog notes (Bejo): Smooth, cylindrical roots with great flavor and stronger tops than Yaya, plus great storage qualities! Excellent uniformity makes this a great variety for bunching and mechanical harvest; compares well to Bo- lero with similar sweetness and great crunch. Bunching or storage · 7-8" Nantes-type						
Yaya	174	15.85	48	3.3	19.15	81%
	Field notes: Alternaria infection 60%. Short tops					
Catalog notes (Bejo): Uniform root. The 5 <sup>1</sup> / <sub>2</sub> -6 <sup>1</sup> / <sub>2</sub> " roots have good flavor, but not as dependably sweet as Nelson. Medium-short tops. Early Nantes type.						
Bolero	236	27.7	115	5.75	33.45	83%
	Field notes: Alternaria Infection: 10%. Vigorous, tall tops.					
Catalog notes (Stokes): Use as an early, long Nantes like Nanco, Presto or Napoli for fresh market and storage, or ful- ly mature as an Oranza/PY60 type for slicing and dicing. Smooth bright orange, 7-8 in/17-20 cm blunt tip roots hold longer. Tops 15 in/38 cm. Tolerant to PM and Alternaria Leaf Spot.						
Magnum	142	14.15	38	3.9	18.05	80%
	Fie	eld notes: Alte	ernaria infe	ection: 30%.	Medium heig	ght tops
Catalog notes (Stokes): Excellent tasting medium orange roots are cylindrical, averaging 8.5 in/21 cm in length, with blunt tips at full maturity. Very strong tops, stores well, good tolerance to breakage, some tolerance to Alternaria Leaf Spot.						

Varieties	Total # Marketable Roots in 90'	Marketable Weight in 90' (lbs)	Total# Culls in 90'	Total Weight of Root Culls	Total yield	Average % marketable roots by lb
Envy	357	33.95	265	18.85	52.8	63%
	Field notes: Alternaria lesions: 50%, medium to short tops					
Multipurpose F1 hybrid. Use as an early Jumbo or leave it to mature as an extra large slicer. 12 in/30 cm long with 1.5- 1.75/3.8-4.5 cm diameter which may vary depending on spacing. Smooth bright orange roots with blunt tips. Tolerant to Alternaria.						
Romance	269	25.85	104	5.7	31.55	82%
	I	Field notes: A	lternaria le	sions: 60%, r	nedium to sh	ort tops
Catalog notes (Stokes): F1 hybrid. Uniform, smooth, cylindrical, medium orange roots average 8 in/20 cm, excellent taste. Outstanding orange interiors. Medium tops have good attachment, suitable for mechanical harvesting.						
Early Milan (OP)	387	24.1	564	12.25	36.35	65%
	Field notes: 60% Alternaria lesions.					
An early, uniform, blunt-ended carrot that can be forced under row cover for spring bunching carrots, or plant it later for a great storage carrot. This wonderful dual purpose variety is selected for its distinct, rich, flowery carrot flavor.						
Coral (OP)	49	3.4	65	1.8	5.2	64%
Field notes: 20% alternaria lesions. Very vigorous tops. Incredibly poor stand. Low germination?						
SCR 8457	173	103.05	102	16.8	119.85	69%
Field notes: 30-40% Alternaria lesions. Medium tops.						
SCR 8431	80	11.65	42	7.1	18.75	63%
Field notes: Alternaria lesions: 30-40%. Sparse, wispy tops.						
FCR 14411	237	65.55	157	19.5	85.05	78%
	Field notes: Alternaria lesions: 50-60%. Strong, vigorous tops.					

Images of the top three yielding carrots from this year's trial are found below. To see images of all varieties, visit our website: enychp.cce.cornell.edu (Images courtesy of Hudson Valley Farm Hub)



**Taste-testing the varieties:** During our September twilight meeting, growers sampled the different varieties of carrots and provided feedback on their flavor. The following directions were given, along with a feedback form:

Please rank each of the varieties that you taste based on your eating preference. Consider flavor, texture, color, etc. One is great, 3 is average, and 5 is very bad. There can be more than one of each ranking number. Only rank varieties you taste, please.

Based on the feeback of growers at this meeting, Yaya ranked the highest in flavor preference, followed by Bolero, Naval, Napoli, and Cupar. Growers could not see variety names during tasting, and were therefore not influenced by this information.

Notably, many varieties had both very low and very high rankings, showing either the variability in people's preferences or a certain lack of direction following. Regardless of the reason, the distribution of flavor data suggests that growers may want to select a few varieties to trial on their own for comparison to favorites. This conclusion is also supported by the variability of carrot flavor in different soils and environmental conditions.

**Conclusions:** This trial helped us understand the performance of primarily Nantes typed carrots in low-moisture conditions. It also helped us effectively evaluate Alter-



naria susceptibility. This data, compared to last year's data, show us that different environmental conditions lead to vastly different performance of the varieties. Last year's more optimal rainfall and heavier soils were conducive to higher overall yields, with some varieties that were average this year rising to the top. With moisture stress and high Alternaria pressure, a different set of varieties were favored. Choosing varieties suited to each farm's unique environment, and trialing a handful will allow each grower to make the best decision. To choose varieties for your farm, examine both years' data at our website, talk to your seed companies, and feel free to contact me if you have any additional questions.





#### Dear Betty with Betty Van Pacht

#### Agriculture Business and Relationship Advice

#### Dear Betty,

I have a commercial orchard that my father started about 30 years ago. I am just taking over the business and, unfortunately, am doing it at the same time that several of the property owners around us have sold parcels off for subdivisions around my farm. Some of our new neighbors are friendly, but I am also getting a lot of calls and complaints about normal farming practices. My dad tells me to just ignore the calls – that we are in an ag district, we aren't doing anything wrong – in his opinion, the new neighbors can "go jump in a lake". I know he is right, but it is really stressful. My kids have to ride the same bus as a lot of these families and I see my neighbors at the school and around town. What should I do?

#### Dear Stressed,

Although your dad is right

that your practices are legal, protected, and necessary for your business, there may be better strategies for managing the long term relationship with your neighbors than telling them to go jump in a lake or ignoring them when they call with concerns. It is increasingly recognized in the business research literature that having a reputation for trustworthiness is one of the key factors in a business's success. Your new neighbor's concerns are an opportunity for you to build your personal reputation for trustworthiness. Numerous experiments and studies have found that how a business handles problems and complaints can either lead to increased trust and lovalty - building a stronger business relationship - or decreased trust and conflict.

As a strategy, I recommend reaching out to your neighbors before doing something that would reasonably be annoying, or of concern to people unfamiliar with farming practices (spraying your orchard at night, for example), explaining to them why you will be doing it, letting them know how long you expect the inconvenience to them to last, apologizing for the inconvenience and thanking them for their patience. Apologizing, in this case, is not admitting fault on your part, but is demonstrating empathy for the other person's situation. In a recent article in the Journal of Social Psychological and Personality Science, "I'm Sorry \_\_Stressed About the Rain! Superfluous **Apologies Demonstrate Empathic** Concern and Increase Trust", researchers from the Harvard Busi-

ness School and Wharton School of business found that superfluous apologies (apologies issued by a person who is not admitting fault to a situation. but is acknowledging empathy for the recipients suffering) represented a powerful and easy-to-use tool for social influence. Another strategy you can use to increase trust and empathy is to invite your surrounding neighbors to an "open house" on your farm where you show them your business and invite them to ask questions. Many people do not have a good understanding of how a commercial farm operates and would be interested in learning more. By bringing them onto your farm vou are also helping them to empathize with you and the challenges you face as a local farm business.

Should you encounter a neighbor who, despite your best efforts, continues to complain about how you farm, you can always fall back on your rights, but you will also have the confidence of having developed other supporters in the community. Good luck!

### Do you have an ag business relationship problem?

Write to Betty Van Pacht (also known as Elizabeth Higgins).

Contact "Dear Betty" at emh56@cornell.edu or c/o ENYCH Team, P.O. Box 727, Highland, NY 12528. Confidentiality respected.

### Which Plates?

#### MAIRE ULLRICH

The difference between Agriculture and Farm Plates is a common question that crosses my desk. Here's a quick cart and additional information in what you need to register vehicles for farm use.

	Agriculture	Farm
Registration & Where I can drive	<ul> <li>You can register your vehicle or trailer as an <i>Agricultural vehicle of trailer</i> if you are engaged in any of these activities</li> <li>planting, cultivating and harvesting vegeta- ble and food products, including horticultural specialties such as nursery stock, ornamental shrubs, ornamental trees and flowers</li> <li>raising, feeding and caring for livestock, bees and poultry dairy farming</li> </ul>	Farm vehicles can only be operated on public highways for the purpose of trav- eling by the most direct route, but not more than 25 miles one way, for going between portions of the owners farm operated as a single farm enter- prise from the owners farm to a municipal sanitary land fill from the owners farm to a licensed mo- tor vehicle repair shop
	<ul> <li>You can only use your Agricultural vehicle or trailer on public highways</li> <li>to transport your own agricultural or dairy commodities or supplies</li> <li>for personal use</li> <li>in conjunction with lumbering activities connected with but only incidental to the oper- ation of a farm</li> </ul>	from the point of sale to the owners farm The owner of the vehicle must submit a <u>Certification of Farm Vehicle</u> <u>Routes</u> (MV-260F), with the original reg- istration application and at renewal if the route has changed.
Vehicle	the agricultural class is restricted to Truck Trailer - except for a coach, house trailer or semitrailer	A farm vehicle can be a motor vehicle (except vehicles that transport passenger for hire), motorcycle, trailer, or semi- trailer.
Fees	There is an annual fee of two dollars fifty cents (\$2.50) for each 500 pounds maximum gross weight, or fraction thereof. If you register your vehicle or trailer for less than a year you can pay a proportional amount of fee (on monthly computation basis). County fees, in addition, may apply.	None listed. No response when called.
Insurance	Agricultural class vehicles and trailers are subject to the same as other vehicles and trailers registered in New York State. See Below.	Yes. See Below
Inspection	Agricultural class vehicles and trailers are subject to the same as other vehicles and trailers registered in New York State.	An inspection is not required for farm registration, but the Vehicle & Traffic Law requires that tires on farm vehicles must meet the same standards as other vehicles, and farm vehicles must be equipped with signaling devices, reflec- tors and lamps that are in good working condition.

#### If I use a passenger vehicle for business, must I register it as a commercial vehicle? If I do not use my truck for business, can I register it as a passenger vehicle?

The answer to both questions is no. Under the law in New York State, vehicles are normally registered according to how they are made, not according to how they are used.

It is normally correct to register a car as a passenger vehicle, even when it is used for business. A passenger car used to give rides for hire must be registered as a taxi or livery.

It is normally correct to register a truck as a commercial vehicle, even when it is not used for business. For example, many pick-up trucks that are never used for business are registered as commercial vehicles.

There is an exception for some pick-up trucks. The DMV can issue passenger plates for a pick-up truck that is never used for business and weighs 6,000 or as a 'passenger' class vehicle at the DMV website. If you make special changes to a passenger car, you can register the car as a commercial vehicle. If you make special changes to a commercial vehicle, you can register it as a passenger vehicle. See the topic Modifications for Class Change at the DMV web site.

#### **Insurance Requirements in New York Do I need insurance?**

Yes. To register a vehicle in New York State you must have New York State issued automobile liabil- • ity insurance coverage. If you do not maintain the coverage, the DMV can suspend your vehicle registration and your driver license.

#### What kind of insurance do I need?

New York law requires that you have auto liability

insurance coverage. The minimum amount of liability coverage is

- \$10,000 for property damage for a single accident
- \$25,000 for bodily injury • and \$50,000 for death for



a person involved in an accident

- \$50,000 for bodily injury and \$100,000 for death for two or more people in an accident Your liability insurance coverage must
- remain in effect while the registration is valid, even if you don't use the vehicle (there are exceptions for motorcycles)
- be New York State insurance coverage, issued • by a company licensed by the NYS Department of Financial Services and certified by NYS DMV out-of-state insurance is **never** acceptable
- be issued in the name of the vehicle registrant, and remain in the name of the registrant at all times

The New York State Department of Financial Services website has more information about liability insurance and insurance companies licensed in New York: http://www.dfs.ny.gov.

#### Can there be more than 2 names on a vehicle registration?

No. There can only be 1 or 2 names on a registrafewer pounds. See the topic register a pick-up truck tion (registrants). Both the primary registrant (first name listed on the registration) and the coregistrant must sign the Vehicle Registration / Title Application (MV-82) and provide their proofs of identity and date of birth. Both names must appear on the Insurance ID Card.

#### Do I need insurance to register my vehicle?

Yes. The DMV requires auto liability insurance to register a vehicle in New York. When you get insurance, your insurance company will issue proof of insurance in two ways. It will

- give you two original NYS Insurance ID Cards or provide you with access to your digital electronic NYS Insurance ID Card.
- send an electronic notice of insurance coverage • to the DMV (your insurance agent or broker cannot file this notice)

Your NYS Insurance Identification Cards and the electronic notice of insurance together verify your insurance coverage. We need both.

You must register your vehicle at the DMV within 180

#### DECEMBER 2016

days of the effective date on your insurance ID card. Bring one copy or form of your Insurance Identification Cards with you. The DMV office will keep the paper card. Keep the other paper card with the vehicle as your proof of insurance. Anyone operating your vehicle must be able to provide proof of insurance while they are operating the vehicle.

#### Does the name on my vehicle registration application and Insurance Identification Card need to be the same?

Yes. Your insurance cards must have the same name as the name on your vehicle registration application.

#### Will the DMV accept copies or faxes of my Insurance Identification Card?

Yes. However, the DMV will not accept a card if the DMV barcode reader cannot read (scan) the barcode.

#### Does the DMV accept any out-of-state insurance documents?

No. We will **never** accept out-of-state vehicle insurance coverage of any type. If your vehicle is registered in New York, it must have New York State auto liability insurance coverage.

#### Source:

<u>https://dmv.ny.gov/registration/about-agricultural</u> <u>-and-farm-vehicles</u> <u>https://dmv.ny.gov/insurance/insurance-</u> <u>requirements</u>

#### **Don't Forget About** Beginning Farmer Webinars

**Even if you're not...share with those who** are.

Many production and business management topic covered. January starts a Tree Fruit Session!

http://www.nebeginningfarmers.org/onlinecourses/

#### Business Management Book Review

#### Drive: The Surprising Truth About What Motivates Us by Daniel H. Pink (2009) ELIZABETH HIGGINS

One of the advantages of having a job where I spend a lot of time driving around is I get a chance to catch up on my reading, via audiobooks. I just finished *Drive: The Surprising Truth About What Motivates Us* by Daniel Pink. Although almost 10 years old, *Drive* is a useful and accessible overview of the history of and major thinkers in the areas of behavioral economics and social psychology. Pink also discusses how their ideas are being applied, or could be better applied, in the business world to engage and motivate employees and improve labor productivity.

A main focus of the book is intrinsic vs extrinsic rewards and motivation techniques. Extrinsic rewards are rewards that come from outside a person, they are endowed by others. Money, recognition, fame are examples of extrinsic rewards. Intrinsic rewards come from inside a person – a feeling of accomplishment or pride in an achievement are intrinsic rewards. Research in psychology on extrinsic vs intrinsic motivation has led to three conclusions. First, human beings are naturally intrinsically motivated – as a species we are cu-

rious, have an innate desire to learn and increasing mastery of a task makes us feel good. Second. extrinsic rewards for an activity can reduce the intrinsic satisfaction that a person receives from doing that activity and can lower the amount of time and effort that they put into mastery of the



activity. Finally, people who place more value on extrinsic rewards tend to be less happy and healthy than people who are more intrinsically motivated.

In the business world, extrinsic motivation techniques "carrot and stick" have traditionally been how employees are managed. However, research in behavioral economics, based on social psychology, is finding that these tools are not optimal for employee satisfaction and productivity and, if poorly executed, can have unintended negative consequences. For example, studies have found that offering high financial bonuses in advance of a task that requires a specific outcome or a creative outcome can result in a worse result than not offering the bonus at all as employees become focused on the money and fear of loss of the money rather than the task. Ironically, the highest payments tended to result in the worst outcomes.

According to Pink, three conditions in the workplace are necessary for optimizing employee satisfaction and productivity: autonomy, mastery and purpose. Autonomy in the workplace is the ability to have control over how work is done or what work is done. Mastery in the workplace is the ability for employees to gain skills through opportunities for learning and growth. Purpose is the desire for the work to have meaning and be important. The presence of these three conditions at work tends to strengthen and reinforce employees intrinsic reward systems related to their job.

One limitation to this book, and to much of the business literature in the area of social psychology as applied to the workplace, is: if autonomy, mastery and purpose are universal human needs, how can they be met in low-wage, low skill work environments where the jobs are routine? Unfortunately, most of the examples of how to meet these human needs in the work environment are for the creative class and knowledge workers. Few recommendations are given that are applicable to farm labor, manufacturing and other low wage, low skill positions. Still, for agricultural employers, finding a way to meet these needs may help to address labor shortages, turnover and performance.

### Upcoming Workshops on Berry Growing

As dramatic weather events increase, pest pressure intensifies, and local markets vitalize, berry growers are looking for ways to protect their crop and lengthen their season. Growers and educators are trialling techniques for growing berries under cover. Berry farmers can attend one of three regional workshops offered by the New York State Berry Growers Association (NYSBGA) this winter to learn more about these innovations in berry growing. These day-long workshop will feature multiple short presentations, interactive activities, and words from growers discussing the newest research in tunnels and exclusion netting.

Workshop registration is \$25 per person for NYSBGA Members, and \$50 per person for Non-Members. Participants can save on workshop registration by joining the NYS Berry Growers Association; 2017 Membership is \$125 and applies to two individuals per farm. Associate Membership is \$75 for non-profit agricultural professionals. Business members can join for \$250 and receive two advertisements in our newsletter which reaches berry growers throughout the state.

#### Regional dates and locations:

- January 17, 2017: Oncenter Convention Center Syracuse, NY at the Empire State Producers EXPO to attend this workshop, register at <u>https://</u> nysvga.org/expo/information/
- **February 28, 2017:** CLEREL (Cornell Lake Erie Research and Extension Lab) 6592 West Main Road Portland, NY, 14769. Lunch included.
- March 7, 2016: Cornell Cooperative Extension Suffolk County Extension Education Center 423 Griffing Avenue, Suite 100 Riverhead, New York 11901-3071. Lunch included.

The workshops are sponsored by the NYS Berry Growers Association, Cornell Cooperative Extension, Cornell University College of Agriculture and Life Sciences, with funding support from the NYS Legislature

For workshop details and agendas visit: <u>www.hort.cornell.edu/grower/nybga/</u> or contact: Cara Fraver, NYS Berry Growers Association, (646) 284-7762, <u>nysbga@gmail.com</u>



Bean Insects, Epilachna varivestia and Heliothis zed, M. A. Latheef, R. D. Irwin, Volume 9, Issue 2, April 1980, Entomological Society of America, Dept. of Agriculture, Virginia State Univ., Petersburg, VA 23803.)

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#### Companion Planting Myths and Realities

In the '70s I really wanted to believe in companion planting as represented by Rodale Press and others. And I did. Until I looked for the science to back up what turned out to often be anecdotal information. Luckily there's been some important research since then.

There are many definitions for companion planting. The one I like is: a specific type of polyculture when two plants are grown together because they are thought to have a beneficial, synergistic improvement on the growth of each other. This not to be confused with intercropping, which is the good use of space by planting vegetables close together or in close sequence to each other. Another definition comes from Companion Planting and Insect Pest Control (by Joyce E. Parker, William E. Snyder, George C. Hamilton and Cesar Rodriguez-Saona, © 2013; licensee InTech) "...we define companion plants as inter-plantings of one crop (the companion) within another (the protection target), where the companion directly benefits the target through a specific known (or suspected) mechanism."

To this day my favorite example of the complexity of companion plants is a study (published in 1980!) of intercropping bush beans with marigolds—one of the most common "guidelines" of companion-planting books. It was the idea that French marigolds (*Tagetes patula*) and African marigolds (*T. erecta*) help keep Mexican bean beetles (*Epilachna varivestis*) away from green beans. The control plot had more damage than the beans with marigold rows, *but* the control plot produced *more* beans. It is thought that this is due to the exudates marigolds produce (thiopene and alphaterthienyl) to stunt the growth of plants nearby: a form of evolutionary competitiveness of marigolds over other plants.

(From: Effects of Companionate Planting on Snap

(However, marigolds are a proven control of nematodes. Some of the cultivars that work the best for controlling nematodes are 'Nemagold', 'Petite Blanc', 'Queen Sophia', 'Tangerine', 'Golden Guardian', 'Single Gold', and 'Nema Gone'. These are best planted as a green manure one or more seasons before planting the crop. Intercropping has little effect. Once the soil is planted to a crop the nematodes begin to reappear.)

#### Attracting Beneficial Insects

There a number of very different ways in which a companion plant might work:

- as a trap crop
- to repel the pest
- mask the target plant
- camouflage the crop
- by physically blocking the pest
- to harbor beneficial insects

Many people think of companion plants as those that repel pests when planted next to each other. The recommendations are not always accurate. Sometimes it doesn't work:

- 1. When three companion plants, rue (Ruta graveolens), zonal geranium (Pelargonium hortorum), and garlic chives (Allium scheonparum) were interplanted with roses the roses were not protected from the Japanese beetle, Popillia japoni*ca*. In fact, the geraniums increased the number of beetles. The same study surrounded roses with sachets of fennel seeds, cedar shavings, crushed red pepper, or osage orange fruits significantly *increased* the number of beetles than the control plants. (Evaluating Companion Planting and Non-host Masking Odors for Protecting Roses from the Japanese Beetle (Coleoptera: Scarabaeidae) D. W. Held, 1 P. Gonsiska, and D. A. Potter, J. Econ. Entomol. 96(1): 81-87, 2003)
- 2. Several putative companion plants were studied in their ability to deter Japanese beetles

(*Popillia japonica*) from damaging roses and concluded that companion plants were unlikely to help. (Held D W, Gonsiska P and Potter D A. *Evaluating companion planting and non-host masking odors for protecting roses from the Japanese Beetle (Coleoptera: Scarabaeidae)*. Journal of Economic Entomology 2003; 96: 81-87.

- 3. ...found no significant differences in the number of eggs, larvae, pupae, or damage by cabbage pests between companion plants; French marigold (Tagetes patula L.), garden nasturtium pennyroyal (Mentha pulegium L.), peppermint (Mentha piperita L.), garden sage, thyme and control treatments. (Latheef M A and Irwin R D. The effect of companionate planting on lepidopteron pests of cabbage. The Canadian Entomologist 1979; #111: 863-864.
- 4. French marigolds (*Tagetes patula*) intercropped in carrots did not repel the carrot fly (*Psila rosae*). (Uvah III and Coaker T H. *Effect of mixed cropping on some insect pests of carrots and onions*. Entomologia Experimentalist et Applicata 1984; #36: 159-167.)
- Even though sage and thyme represent two common companion plants noted for their pungent odors, there were no differences in diamond back moth oviposition between Brussels sprouts (*B. oleracea*) intercropped with sage (*S. of<sup>G</sup>icinalis*) and thyme (*T. vulgaris*). (Dover J W. The effects of labiate herbs and white clover on Plutella xylostella oviposition. Entomologia Experimentalis Applicata 1986;42: 243-247.)

Sometimes it does:

1. With the tests of Brassica crops the companion plants that helped included sage (*Salvia of*<sup>6</sup>*icinalis*), rosemary (*Rosemarinus officinalis*), hyssop (*Hyssop of*<sup>6</sup>*icinalis*), thyme (*Thymus vulgaris*), dill (*Anethum graveolens*), southernwood (*Artemisia abrotanum*), mint (*Menta spp.*), tansy (*Tanacetum vulgare*), chamomile (several genera), and orange nasturtium (*Tropaeolum majus*). (Isman B., *Botanical insecticides, deterrents, and repellents in modern agriculture and increasingly regulated world*. Annual Review of Entomology 2006; #51: 45-66.)

**3.** Basil (*Ocimum basilicum*) planted with tomatoes have been recorded to repel thrips and tomato hornworms. (Anon. Organic vegetable IPM guide. 2004.)

Note: The source of the above information is from: Companion Planting and Insect Control, Joyce E. Parker, William E. Snyder, George C. Hamilton, and Cesar Rodriguez-Saona. 2013. InTech. As this review states: "As a result, a repellent plant that can be effective for one pest might not provide effective control for another. Finally, many experiments to determine plant's repellent capabilities were carried out in laboratory settings and do not necessarily represent field conditions."

#### Hedges and Flower Borders for Companion Pest Control

One of the most important crossovers from agricultural research to the home garden is how to enhance the habitat for beneficial insects. This has a lot to do with what can truly be scaled down from an agricultural setting to the backyard. Or, front yard.

There has been a lot of research at the California of Davis in a suburban setting of near-by Village Home's backyards about using borders (hedgerows) to farm fields as shelters for beneficial insects to help control pests in the field. The most work was done by Robert Bugg (true name, must be destiny!) and Miguel Altieri. Altieri found that many of the beneficial insects could migrate from the hedgerow 25 meters (82 feet) into the neighboring field of corn. (personal communication 10-29-10) Obviously 82 feet covers most gardens if not landscapes. So a hedgerow has plenty of habitat for beneficial insects to pursue pests throughout the garden.

1. In the fields bordered with *Phacelia tanacetifolia* (Lacy Phacelia), significantly more hover fly eggs were found in fields surrounded with *P. tanacetifolia* than in control <sup>P</sup>ields. (Hover<sup>P</sup>ies are syrphid flies that look a lot like bees but can, unlike bees, hover—thus the name. They belong to the insect Family *Syrphidae*.) Thus biological control of aphids by syrphid larvae can reduce the use of insecticides. *Use of Phacelia tanacetifolia Strips To Enhance Biological Control of Aphids by Hoverfly Larvae in Cereal Fields*, by Janice M Hickman, Stephen D Wratten.

- 2. When predators of Colorado potato beetle (Leptinotarsa decemlineata) in eggplant <sup>P</sup>ields were studied it was found that dill (Anethum graveolens) and coriander (Coria drum sativa) had flowers that were complementary to Colorado potato beetle predators. The number of predators was significantly higher in the fields inter-planted with dill and coriander (ed. - not each dill or coriander adjacent to each eggplant, but strips of the herbs with rows of continuous eggplant between) than in the control field without flowers. *Impact of strip-insectary* intercropping with flowers on conservation biological control of the Colorado potato beetle. By Joseph M. Patt, George C. Hamilton, James H. Lashomb.
- 3. When the effects of the flowers of sweet alyssum, *Lobularia maritima* were studied with the suppression of aphids in California lettuce fields, the presence of alyssum resulted in more hoverfly larvae and fewer aphids (*Hemiptera: Aphididae*). The results of this study showed that increasing flowers can enhance aphid suppression and crop quality due to the elevated levels of natural enemies. *Increasing Syrphid Fly Diversity and Density in Sown Flower Strips within Simple vs. Complex Landscapes.* Journal of Applied Ecology. Sebastian Haenke, Barbara Scheid, Matthias Schaefer, Teja Tscharntke and Carsten Thies.
- 4. In another study of hoverflies (*Diptera: Syrphidae*), plantings in broad and narrow sown <sup>h</sup>lower strips, grassy strips and in wheat fields (as a control) were studied. The landscape complexity was studied within a .5-4.0 km radius around the strips. Syrphid density was higher in narrow and broad sown flower strips compared to grassy strips and wheat. Within the flower strips (at a radius of .5-1.0 km) the syrphid flies were the most concentrated. Making local flower strips is more effective in simple while in complex landscapes, keeping the overall diversity is important. *The syrphid visitors to certain flowers*. By E. & H. Drabble. New

*Phytologist*. Vol. XVI, Nos. 9 &  $^{0}$ . May & June, <u>1917</u>!

5. Holland, J.M., Thomas, S.R. & Courts, S. found that the plant attracting most species of syrphid flies was *Rubus* spp. The number of Syrphids visiting *Convolvulus arvensis* was unexpected, as it does not strike it to be a beneficial attractant. They also recommended *Phacelia tanacetifolia* strips as a part of an integrated farm.

Sometimes it doesn't work:

1. In another study of Phacelia tanacetifolia, syrphid flies moved up to 100m into the field. With Phacelia it was found that beneficial Ichneumonid wasps were more abundant in the Phacelia strip compared to the nearby wheat crop. Aphid populations and percentage of those parasitized were unaffected by differences in the wasps' distribution. Syrphids are stimulated in the crop by the vicinity of flowering plants like buckwheat and cornflower. During summer the differences in syrphid populations were not reflected in aphid populations perhaps because of other natural enemies that are less dependent on flower resources. The impact of *Goral resources* on syrphid performance and cabbage aphid biological control. Paul C.J. van Rijn5, Jurgen Kooijman1, Felix L. Wäckers.

Here's another important study's conclusion. (It was done with a hedgerow next to a farmer's field, but applies to home gardens.) "...many (beneficial) insects moved 250 feet into adjacent field crops. Studies...showed that syrphid flies (70% of the introduced flies), parasitic wasps and lacewings fed on flowering cover crops in orchards and that some moved 6 feet high into the tree canopy and 100 feet away from the treated area (ed. where the beneficial insects where released.). The use of nectar or pollen by beneficial insects helps them survive and reproduce. Therefore, planting flowering plants and perennial grasses around (ed. my italics) farms may lead to better biological control of pests in nearby crops." This report is from: California Agriculture 96(9):67-26. DOI: 10.3733/ ca.v052n05p23. September-October 1998. So, research often shows that many beneficial insects can fly a long distance to pursue a pest. To

work, most beneficial plants DO NOT have to be changing conditions and information. planted right next to the plant you want to protect from a pesty insect. This means one concept of companion planting is often irrelevant. And much of companion "literature" is just anecdotal and usually very locally oriented, not necessarily appropriate to the whole country.

Robert Kourik is the author of 15 horticultural books, from Designing and Maintaining Your Edible Landscape - Naturally  $(5^{320})$  to Understanding Roots, discover how to make your garden flourish (6459). For more on this topic, see: Designing and Maintaining Your Edible Landscape - Naturally.



Do You Need a Formal Business Plan?

> ELIZABETH HIGGINS

I know that if you have read this far you are pretty sure that I am going to say yes. Actually, the results of research are mixed as to whether or not having a written business plan correlates to business success or failure for a new business. However, most researchers have found that successful entrepreneurs do have a plan, even if it is in their head and not written down and, more importantly, update that plan based on

Lining up actual paying customers for your product trumps having a theoretical plan. A business plan is no substitution for actual market research and legwork. If you don't know who will really buy your product, at what price, and under what conditions, a written plan isn't going to help.

What a written business plan can do is help an entrepreneur articulate his or her business objectives, document their assessment of the market and document that the business has started to put together a budget that can help them (and others) assess under what circumstances their business model can be profitable. A written plan can be useful for getting feedback from others. A business plan is almost always a necessity for getting outside funding.

Business plans should be short - a short clearly articulated plan is more likely to be read and is easier to update. Business plans should focus on the business - the product to be developed, the process to develop it, the market strategy and the qualifications and passion of the management team. Financials, while important, are usually the least accurate section of most business plans, especially for start-ups, and should not be the focus of the plan but rather should demonstrate some thinking about how different scenarios will be managed and should show that the firm has cash flow to keep the company going during the startup phase.

If you need a plan, the University of Minnesota offers Ag Plan https://agplan.umn.edu/. Ag Plan is a free, annotated program to help guide you through the steps of writing a business plan. It also allows for nice formatting, attachments, inserting tables and graphics. The final plan can be printed out or saved as pdf or word document. One very nice feature is that you can provide access to the plan for feedback. If you need to write a business plan, and would like assistance, this is the tool that I recommend using. Please feel free to contact Liz at emh56@cornell.edu if you need assistance with a business plan.

## Growing Raspberries and Strawberries in Containers

#### KATHY DEMCHAK, PENN STATE

Periodically growers have asked for information on growing strawberries and raspberries in containers. Thanks to our Specialty Crop Research Initiative (SCRI) high tunnel project, we can share some experiences on

what worked for us this past year or so. We started using a containerized system in our high tunnels because soil variability at Penn State's high tunnel research site was an issue. The high tunnels had been used to grow many different crops over the past 17 years and so over time. the nutrient levels in each tunnel became quite variable. This was a problem for our research, as we are testing different plastic coverings for the tunnels and



'Albion' strawberries and 'Polka' (left) and 'Josephine' raspberries (right) at Penn State's High Tunnel facility.

we wanted to make sure we were correctly attributing any effects to the plastics, not to differences in the soil in each tunnel.

In 2015-16, we compared 4 different media types and 2 different fertilization regimes for growing day-neutral strawberries. In this experiment, we tried the type of bag used for coir gro-slabs, these are white-on-black plastic "sleeves" that lie horizontally on the ground and, when filled with media, are only 4 to 5 inches high. The media we compared were:

- coir
- Metromix 360
- a mix that was a 2:1 ratio of peat:perlite
- a 2:1:1 mixture of peat:perlite:coir.

#### Results

We found that since the sleeves are not very deep, it helped to have a well-drained mix, because there wasn't much room for error when it came to over-watering. Top growth and root growth were best in the 2:1 peat:perlite mix, and the root growth was truly amazing

as just extracting the plants from the bags to take measurements was a challenge because they were so packed with new roots. The flip side was that bags with the 2:1 peat:perlite mix were the first to dry out, and while part of this effect was due to a lower water-holding capacity, the large root systems could have been pulling out a lot of water.

We also compared fertilizer mixed into the media to a constant feed of a complete soluble fertilizer at 100 ppm N. When we mixed the fertilizer in, we used an older recipe which wasn't the best option! Because our water is from a well and is really high in pH and bicar-

bonates, we opted for an 18-18-18 complete soluble fertilizer made for this situation (Peters® Excel pHLow<sup>™</sup>), which dropped the water pH from 7.6 to 6.6. It should be pointed out that we did not add any lime to the media because we figured we'd get plenty of that from our water. Fertilizer in the mix resulted in much more plant variability than the constant-feed treatment, and plants being watered with the soluble fertilizer grew larger regardless of the type of media used.

In 2016-17, we opted for deeper containers that would provide a wider margin for error when watering. We used 1-gallon grow-bags for strawberries, and 3-gallon grow-bags for raspberries. Results of work in Florida and Arizona showed that growing strawberries in deeper containers worked better than using more shallow ones. The only difference was a couple of inches. In 1gallon grow-bags, the media was 6 to 7 inches deep, but it was enough of a difference to make watering easier. Both the strawberries and raspberries grew extremely well overall.

In 2016-17, we also tried a different fertilizer made for water high in bicarbonates (Plant Marvel 20-7 -20), and that worked well, too. We may eventually end up acidifying our water, but for the time-being just using fertilizers made for high-bicarbonate water worked. What is important is to make sure that the fertilizer is dissolved completely, and also that a precipitate isn't forming after the fertilizer solution stands for a while. In the past, when we tried more commonly-used soluble fertilizers, precipitates were forming, as there was often a fine white powder in the bottom of the container. At the time, we had thought this was calcium phosphate, but we were also having deficiencies of iron and zinc, so possibly other complexes were also forming as well.

#### Conclusions

So, as a recap, what worked for both raspberries and strawberries was a 2:1 peat:perlite mix; with the plants receiving either of the 2 complete fertilizers (18-18-18 or 20-7-10, both made for an irrigation source that is high in bicarbonates) at 100 ppm N. Strawberries in 1gallon grow-bags, and raspberries in 3-gallon growbags worked well.

For more information on the project, and on growing

berries in protected culture, please visit the TunnelBerries web site:

http://www.tunnelberries.org/.

#### Source: Penn State Vegetable and small Fruit Gazette, November 2, 2016

Research on this project is supported by the USDA National Institute of Food and Agriculture, Section 7311 of the Food, Conservation and Energy Act of 2008 (AREERA), Specialty Crops Research Initiative under Agreement 2014-51181-22380. Thanks also to PVGA for providing funds towards the matching requirement.

Contact Information: Kathy Demchak, <u>efz@psu.edu</u>, 814-863-2303 or Matthew Cooper, msc5251@psu.edu

#### **Produce Safety Alliance Grower Training Course**

**Date:** Tuesday, January 31<sup>st</sup>, 2017 **Time:** 8:30 – 4:30

#### WHO SHOULD ATTEND

Fruit and vegetable growers and others interested in learning about produce safety, the Food Safety Modernization Act (FSMA) Produce Safety Rule, Good Agricultural Practices (GAPs), and co-management of natural resources and food safety. The PSA Grower Training Course is one way to satisfy the FSMA Produce Safety Rule requirement outlined in § 112.22 $\mbox{W}$  HAT TO EXPECT

The trainers will spend approximately seven hours of instruction time covering content contained in these seven modules:

- Introduction to Produce Safety
- Worker Health, Hygiene, and Training
- Soil Amendments
- Wildlife, Domesticated Animals, and Land Use
- Agricultural Water (Part I: Production Water; Part II: Postharvest Water)
- Postharvest Handling and Sanitation
- How to Develop a Farm Food Safety Plan

In addition to learning about produce safety best practices, key parts of the FSMA Produce Safety Rule requirements are outlined within each module. There will be time for questions and discussion, so participants should come prepared to share their experiences and produce safety questions.

#### BENEFITS OF ATTENDING

The course will provide a foundation of Good Agricultural Practices (GAPs) and co-management information, FSMA

Produce Safety Rule requirements, and details on how to develop a farm food safety plan. Individuals who participate in this course are expected to gain a basic understanding of:

- $\Rightarrow$  Microorganisms relevant to produce safety and where they may be found on the farm
- ⇒ How to identify microbial risks, practices that reduce risks, and how to begin implementing produce safety practices on the farm
- $\Rightarrow$  Parts of a farm food safety plan and how to begin writing one
- $\Rightarrow$  Requirements in the FSMA Produce Safety Rule and how to meet them.

After attending the entire course, participants will be eligible to receive a certificate from the Association of Food and Drug Officials (AFDO) that verifies they have completed the training course. To receive an AFDO certificate, a participant must be present for the entire training and submit the appropriate paperwork to their trainer at the end of the course.

#### COSTS TO ATTEND

Total costs to attend this PSA Grower Training Course is \$100. Cost includes the PSA Grower Training Manual, a Certificate of Course Attendance from AFDO, lunch, and venue expenses.

For further questions about this training, please contact: Anna Wallis

To register for this course, please visit the ENYCHP website: <u>http://</u> enych.cce.cornell.edu/

# Free Money???

Find the <u>right</u> grants, cost-share programs and low-interest loan programs for your farm business

These programs aim to help farmers learn about current grant and financial incentive programs for their farm business and how to assess whether a program is a good fit.

#### **Topics Will Include:**

 What makes a good grant project – how to assess if a grant program is a good fit for your farm business?
 Understanding common grant program terminology and requirements – knowing what will be required before you apply!

3. What programs are available now, and where do you look for programs in the future? Some of the programs to be covered include:

NYS Beginning Farmer Grant (due January
USDA Value Added Producer Grant
NYS Consolidated Funding Application
NRCS EQIP Cost Share Program
USDA REAP Energy Efficiency
NYS and USDA loans for farmworker housing
USDA SBIR

4. Where can you get help?

This program is FREE OF CHARGE Please Pre-Register Online at http://enych.cce.comell.edu/events.php or by calling Abby at 518-746-2553

Elizabeth Higgins is the Ag Business Management Extension Specialist for the Eastern NY Commercial Horticulture Program. She has over 15 years experience grant writing and project management. She has as-

### **Ulster County**

December 15 11:00am-1:00pm Cooperative Extension Building 232 Plaza Rd Kingston, NY 12401

### **Dutchess County**

December 15 6:00pm-8:00pm Cooperative Extension Building 2715 US-44, Millbrook, NY 12545

### **Clinton County**

December 16 10:00am-12:00pm Cooperative Extension Building 6064 NY-22 Plattsburgh, NY 12901

### Washington County

December 16th 4:00pm-6:00pm Cooperative Extension Building

415 Lower Main Street Hudson Falls, NY 12839

## Calendar of Events

January 10, 2017. Vegetable and Field Crops Pest Update. 2 -Credit pesticide update primarily for old-order Amish community. Open meeting. Henry Byler's Farm, 100 Grey Rd. Palatine Bridge, NY . 1:00-3:00PM No registration fee. E-mail or call Crystal at cls263@cornell or 518-570-5991 to sign up.

January 12&13, 2017. Long Island Ag Forum. http://ccesuffolk.org/events/2015/01/08/long-island -agricultural-forum

January 13&14 or February 17&18, 2017. Farm Business Succession Retreat Day 1 &2. Two days of working facilitated time for your family or business partners to build a stron business succession strategy. Jan13/14 @ CCE Vorheesville, NY & Feb 17&18 @ Highand Lab, NY. Contact Liz Higgins emh56@cornell.edu

January 17-19 2017. Empire State Producers Expo, Syracuse, NY http://nysvga.org/expolinformation/

January 17, February 28 & March 7 Growing Berries Under Cover—NYS Berry Growers Association Workshop. Berry farmers across New York can attend one of three regional workshops offered by the New York State Berry Growers Association (NYSBGA) this winter to learn more about innovations in berry growing. Various Locations. See p. 16 for specifics.

**January 24, 2017** *Nursery/Greenhouse School. Lots on fertility, pests and other greenhouse topics suitable for non-ornamental producers. DEC Credits have been applied for.* CCE Middletown. Contact Rose Baglia rsb22@cornell.edu or call 845-344-1234 for more. January 31, 2017. Produce Safety Alliance Grower Training Course. See p.66 for more. Open to Fruit and vegetable growers and others interested in learning about produce safety. Beekmantown Town Hall 571 Spellman Rd., Beekmantown, NY . 8:30AM-4:40PM. No fee. E-mail or call Anna at aew232@cornell or 518-570-5991

February 7, 2017. ENYCHP Regional Vegetable School: Hudson Valley. Best Western, Kingston.

**February 8, 2017.** *ENYCHP Regional Vegetable School: Capital Region.* Ramada Albany Plaza. 8:00AM-4:00PM

**February 13, 2017.** *ENYCHP Northern NY Tree Fruit School.*<sup>2</sup>:44AM-4:00PM Ft. William Henry Hotel & Conference Center, Lake George, NY

February 14&15, 2017. ENYCHP Hudson Valley Tree Fruit. Best Western, Kingston, NY

**February 16, 2017.** *Berry & Grape School.* Best Western, Kingston, NY

#### February 28, 2017. Orange County Onion

**School.** Updates on pest and disease management in onions, EPA Worker Protection Standard changes, GAPs and FSMA, and more. Program includes a catered lunch. Pesticide recertification credits will be available. 8:45AM-4:00PM, Middletown, NY. Enrollees: \$50 before Feb 10, \$65 after Feb 10. Non-enrollees \$80 before Feb 10, \$95 after Feb 10. Contact Ethan eg572@cornell.edu

See the Website to register for many of these programs

<u>http://enych.cce.cornell.edu/</u> <u>events.php</u>

The Label is the Law. Cornell Cooperative Extension and the staff assume no liability for the effectiveness of results of any chemicals for pesticide use. No endorsement of any product is made or implied. Every effort has been made to provide correct, complete, and current pesticide recommendations. Nevertheless, changes in pesticide regulations occur constantly and human errors are still possible. These recommendations are not substitutes for pesticide labeling. Please read the label before applying any pesticide. Where trade names are used, no discrimination is intended and no endorsement is implied by Cornell Cooperative Extension.

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