

Fruit Notes

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Fruit Notes

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Cover: Dormant flower bud of Zestar! apple at UMass Cold Spring Orchard Research & Extension Center. Jon Clements photo.

The New England Apple Scab-Control Practices Survey

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Summary

- Sanitation, a nonchemical approach to disease control, is practiced by 74% of growers in northern New England, an increase of 7% over the last two years. The proportion of acres in which sanitation was 67% in 2012, an increase of 23%.
- Scab indexing, a method to predict disease and to reduce the use of fungicide, is practiced by 24% of growers, an increase of 9% over the last two years.
- In 2014, 28% of apple growers reduced fungicide use on all or part of their apple acreage by using sanitation, measuring the scab index or by growing resistant varieties.

A survey was conducted in spring 2012 and summer 2014 to learn about current apple scab management in commercial apple orchards within New England. Growers were asked nine of 11 questions using SurveyMonkey®, an online survey conducting program. Growers in Maine, New Hampshire, Massachusetts and Vermont were invited to take the survey in both 2012

and 2014. Growers in Rhode Island and Connecticut were invited to take the survey in 2012. In 2012, a total of 490 growers were invited to take the survey and 115 (23%) had responded. In 2014, 77 growers completed the survey out of an estimated total of 300 (100 in Massachusetts, 90 in Maine).

Farm Size

Farm size ranged from 1 acre to over 50 acres. The number of acres represented in the initial survey was estimated to be 3174 in 2012 and 1400 in 2014. Farms greater than 50 acres were estimated to be 100 acres in size. Most farms were less than 10 acres, accounting for over 50% of the farms in the survey (Figure 1). The relative number of midsized farms, by New England standards, or those farms that were 10 to 50 acres in size, accounted for 30%, and large farms represented the smallest sector accounting for less than 20%.

Sanitation

Growers were asked if they had used any sanitation method for scab reduction in their orchard.

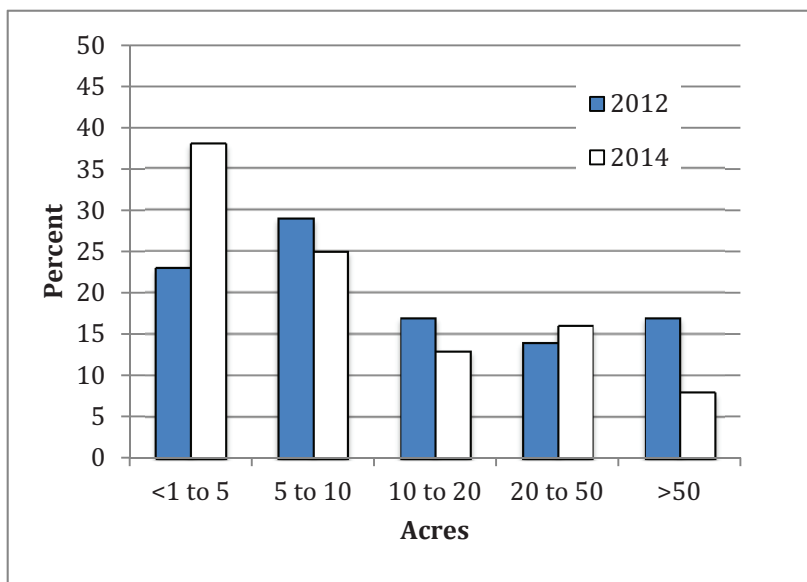


Figure 1. Survey respondent farm size, as a percentage of the total number of respondents. Number of respondents was 115 in 2012 and 77 in 2014.

The majority indicated that they had used some method of sanitation in their orchards, 67% in 2012 with an increase to 74% in 2014. The estimated proportion of acres that were given sanitation was 44% in 2012. This increased to 67% in 2014.

The most commonly used method of sanitation was flail mowing in spring or fall, with 70% mowing once during either time. The practice of applying urea to trees in fall increased from 24% in 2012 to 38% in 2014. Few growers applied urea to the ground in fall

or spring, generally less than 20%.

In 2012, 33% of the growers indicated that they did not use sanitation in their orchards. This decreased to 26% in 2014. The most common reasons for not using sanitation was the lack of a flail mower and lack of time when it needed to be performed.

Scab Indexing

The scab index or PAD, which is measured by counting the number of shoots that have scab in September or October, was not used as frequently as sanitation. In 2012, only 15% of growers surveyed indicated that they routinely do a scab index. However, this increased to 24% in 2014. Lack of time when it needed to be done and not knowing how to do an index were the most common reasons for not measuring the index.

In 2012, 4% of growers indicated that they did not do indexing because their varieties were resistant to scab and therefore, an index was not needed. This increased to 7% in 2014.

Reducing the Number of Fungicide Sprays

Most growers, 87%, plan to apply the first non-copper fungicide at either green tip or at half-inch

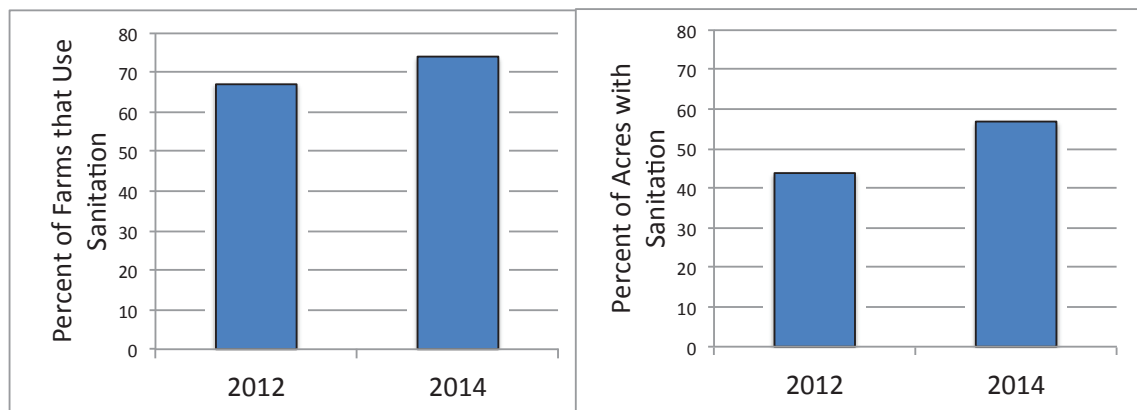


Figure 2. The percentage of farms where sanitation is used as a method for scab control and the percentage of acreage where sanitation is practiced.

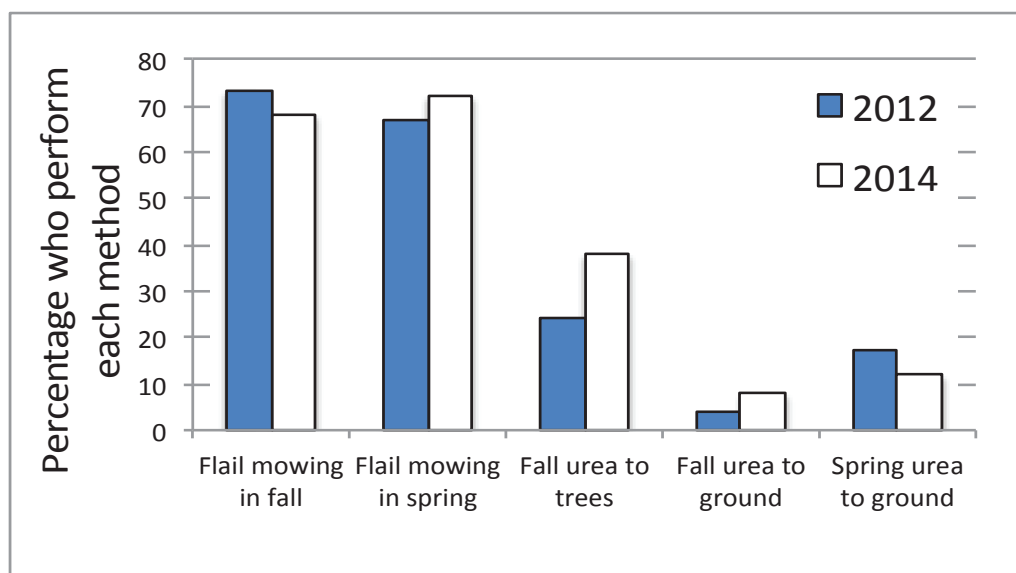


Figure 3. Scab sanitation methods used by New England apple growers. Some growers indicated more than one method being used in their orchard.

green. In 2012, 21% percent indicated that they delay the first scab fungicide to tight cluster or later. In 2014, 13% of growers indicated that they delay fungicide. However, when growers were asked how many acres were not sprayed until tight cluster or later, 28% indicated that they delayed fungicide use on 7% of the total apple acreage in 2014.

The majority of growers indicated an interest in reducing fungicide use, and close to 30% of growers already do it on all or part of their orchards. A greater number of growers would consider reducing fungicide use with greater access to disease forecast models, and additional training in methods that reduce disease.

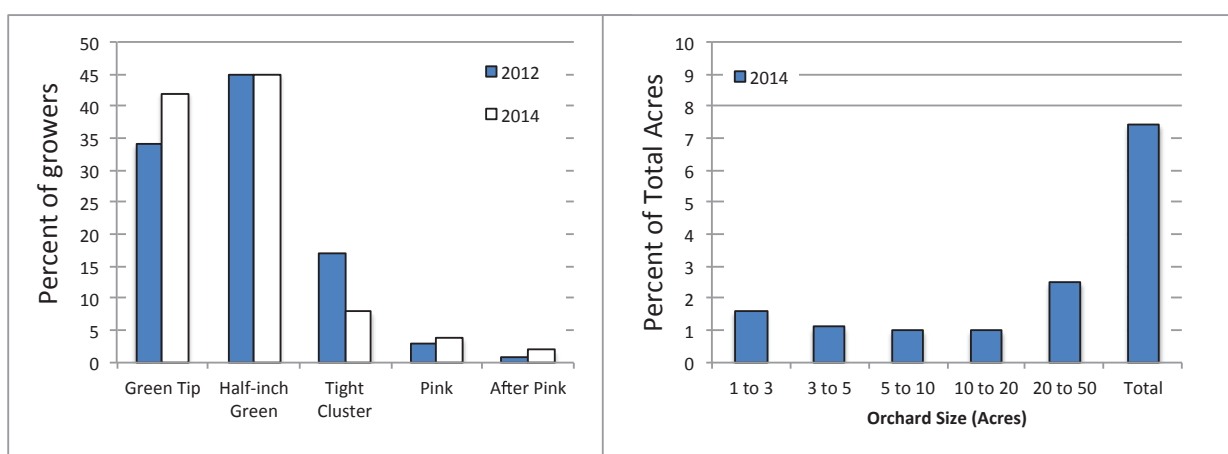


Figure 4. Bloom stage when the first non-copper fungicide is applied in apple orchards and percentage of apple acres that are not sprayed until tight cluster or later.

Survey Questions

1. Please, indicate the number of acres of managed apple orchards in your operation.

Answer Options	Response Count		Response Percent		Estimated Acres	
	2012	2014	2012	2014	2012	2014
1 to 5	27	29	25	38	81	73
5 to 10	33	19	29	25	248	142
10 to 20	19	11	17	14	285	165
20 to 50	16	12	14	15	560	420
>50	20	6	17	8	2000	600
Total	115	77			3174	1400
Skipped question	0	0				

2. Have you used scab sanitation methods in your orchard?

Answer Options	Response Count		Response Percent	
	2012	2014	2012	2014
No	38	20	33	26
Yes, (in all orchards*)	77	41	67	53
Yes, in some orchards*	--	16	--	21
Answered question	115	77		
Skipped question	0	0		

*not asked in 2012

3. If you have NOT used scab sanitation, please indicate why (select all that apply):

Answer Options	Response Percent	
	2012	2014
I do not know how to use scab sanitation.	16	26
I do not think sanitation makes a difference in the amount of scab in my orchard.	16	26
Scab sanitation requires extra time when I have none to spare.	43	37
I want to winterize my sprayers and not use them in the fall when there is risk of freezing.	22	11
Apple leaves do not fall early enough in the autumn to allow for ground application of urea before the ground is covered by snow.	30	16
I do not have a flail mower.	54	58
There is not enough time between removing winter prunings and bud break to do spring sanitation treatments.	45	21
I cannot run a flail mower before budbreak because soil is too wet for tractor traffic or because the flail will do too much damage to grass sod.	30	16
Answered question	37	19
Skipped question	1	1

4. Which of the following might help you consider using orchard sanitation? Please, select all that apply.

Answer Options	Response Percent	
	2012	2014
A better understanding of the benefits of orchard sanitation and how it works.	47	58
Demonstrations of sanitation in orchards managed by growers and/or at the University research farm.	43	41
I am not interested in using scab sanitation.	23	35
Answered question	30	17
Skipped question	8	3

5. Approximately how many acres were given scab sanitation treatment(s) in recent years?

Answer Options	Response Count		Response Percent		Estimated Acres	
	2012	2014	2012	2014	2012	2014
<1 acre	3	4	4	7	2	2
1 to <3 acres	11	11	15	19	24	22
3 to <5 acres	12	11	16	19	48	44
5 to <10 acres	19	13	26	23	142	98
10 to <20 acres	12	8	16	14	180	120
20 to <50 acres	7	6	10	11	245	210
>50 acres	10	4	14	7	750	300
Total	74	57			1389	796
Skipped question	41	0				

6. Which of the following sanitation methods are done in your orchard? Select all that apply.

Answer Options	Response Count		Response Percent	
	2012	2014	2012	2014
Flail mowing in fall.	51	34	73	68
Flail mowing in spring.	47	36	67	72
Urea applied to trees in fall.	17	19	24	38
Urea applied to the ground in fall.	3	4	4	8
Urea applied to the ground in spring.	12	6	17	12
Answered question	70	52		
Skipped question	45	25		

7. Please, indicate which of the following describes the use of fall scab indexing (PAD assessment) in your orchard (select all that apply):

Answer Options	Response Count		Response Percent	
	2012	2014	2012	2014
I do not know how to do a fall scab index.	38	24	36	35
I grow varieties with good resistance to scab and therefore do not need it.	4	5	4	7
I am not confident that my scab index would be accurate.	20	9	19	13
I have no time in September to do a scab index.	39	16	37	24
I will not use a delayed first spray strategy the next spring, so there is no gain from doing it.	25	20	24	29
I normally do a scab index in all or part of my orchard.	16	16	15	24
Answered question	105	68		
Skipped question	10	9		

8. Which of the following describes your reasons for doing a scab index (select all that apply):

Answer Options	Response Count		Response Percent	
	2012	2014	2012	2014
To determine if I can save time and money by delaying the first scab fungicide next spring.	10	12	11	19
If the scab level is high, I want to figure out why, do sanitation measures, and give priority to that block for scab control next spring.	21	13	22	21
It is worth it to have a measure of the scab level in the orchard, whether or not I am going to delay the first scab fungicide next spring.	21	14	22	22
I do not perform a scab index in my orchards.	64	40	68	64
Answered question	94	62		
Skipped question	21	15		

9. When do you normally plan to make your first fungicide application, excluding copper, in blocks that had good scab control last year?

Answer Options	Response Count		Response Percent	
	2012	2014	2012	2014
Green Tip	36	29	34	42
Half-inch Green	47	31	45	45
Tight Cluster	13	2	12	3
Pink	3	3	3	4
After pink	1	1	1	2
Timing is based on the risk of scab in each orchard, but is regularly delayed to tight cluster or after in at least one orchard.	5	3	5	4
Answered question	105	69		
Skipped question	10	8		

10. Approximately how many acres were not treated sprayed with fungicide until tight cluster or later in 2014?*

Answer Options	Response Count	Response Percent	Estimated Acres
None	50	72	0
1 to <3 acres	11	16	22
3 to <5 acres	4	6	16
5 to <10 acres	2	3	15
10 to <20 acres	1	1.5	15
20 to <50 acres	1	1.5	35
Total	69		103
Skipped question	8		

*Question not included in 2012 survey

11. Which of the following might help you consider delaying the first scab fungicide spray in low scab risk orchards (select all that apply).

Answer Options	Response Count		Response Percent	
	2012	2014	2012	2014
Training in scab sanitation and in doing a fall scab index.	36	23	37	36
Demonstration of delayed first spray in grower orchards.	39	21	40	33
Demonstration of delayed first spray in a university research orchard.	30	16	31	25
Access to disease model forecasts for timing and relative severity of primary scab infection periods.	47	30	48	47
I am not interested in delaying the first scab spray.	25	14	26	22
Answered question	98	64		
Skipped question	17	13		



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Apple “Mini” Precision Thinning Demonstrations in 2015 at UMass Cold Spring Orchard

Jon Clements

University of Massachusetts

In 2015, two “mini-precision thinning” demonstrations were done at the UMass Cold Spring Orchard in Belchertown, MA: one in Honeycrisp (Figure 1), the other in DS-41 cv. (Pazazz®), both on B.9 rootstock.. For each variety, five representative trees were selected and five spurs were tagged (Figure 2) on each of the trees during bloom. Thus, a total of 25 flowering spurs were chosen in each variety (across five trees) for subsequent measurements of fruitlet growth for Predicting Fruit set as outlined here: <http://apples.msu.edu/uploads/files/PredictingFruitset1-21-14.pdf>.

Note that while the procedure described calls for selecting 15 flowering spurs per tree (75 total) for subsequent measurement, this demonstration used only five spurs per tree (for a total of 25, hence “mini”) as an attempt to reduce the amount of time measuring fruitlets without sacrificing (too much) accuracy of fruit set prediction. (Another variation from the Predicting Fruit set protocol was the fact individual fruitlets were not numbered, there relative position was used for subsequent measurement. Somewhat dubious, but works if care is taken to make sure the same fruit is measured and documented correctly for growth rate.)

Chemical fruit thinning sprays were applied to both varieties in two

applications at an app. 3X dilute TRV concentration when fruitlet size ranged from 5 to 10 mm (Figure 3):



Figure 1. Tenth-leaf Honeycrisp/B.9 trees at post-petal fall on May 24, 2015 used for Predicting Fruit set demonstration at UMass Cold Spring Orchard.



Figure 2. DS-41 fruiting spur tagged for subsequent measurement on May 25, 2015.

1. May 24: Carbaryl 4L(Drexel) @ 1 quart per acre plus Fruitone-L (AmVac) @ 4 ounces per acre
2. May 25: Maxcel (Valent Biosciences) @ 1.5 quart per acre

Note that this was an aggressive chemical thinning application (in retrospect, way too aggressive). In addition, the carbohydrate balance during the time of thinner application was significantly negative (Figure 4).

Fruitlet size measurements were made beginning May 25, very shortly after the chemical thinner applica-

tions. A subsequent measurement was made on May 29. All measurements were input into the Predicting Fruit set spreadsheet (see link above). Upon the second measurement, it was immediately visually clear that many fruitlets were already not growing. In fact, after just one measurement for both Honeycrisp and DS-41, upon running the Fruit set spreadsheet calculation, that the predicted number of fruit setting was below the target number of fruit setting. For Honeycrisp the predicted number of fruit setting on May 29 was 37 per tree, while the target number was 65 (Figure 5). For DS-41, the



Figure 3. Honeycrisp fruitlets at time of chemical thinner application on May 25, 2015.

predicted number of fruit setting was 27 vs. the target number of 65 per tree (Figure 6). Clearly, no additional chemical thinning was necessary, and in fact, it's very likely the trees would be under-cropped at harvest.

This was indeed confirmed at harvest, when all the fruit was counted on each of the five trees. For Honeycrisp (Figure 7), the number of fruit on each of the five trees was: 30, 51, 28, 25, and 28 for an average of 33, which is very close to the predicted set of 37 fruit (although half the number of desired fruit per tree). For DS-41, number of fruit on each of the five trees was:

15, 25, 24, 27, and 17, an average of 22 fruit per tree, close to the predicted fruit set of 27. The number of fruit per square centimeter of trunk area was calculated for each variety: Honeycrisp, 1.8 fruit at harvest per square centimeter trunk area; DS-41, 2.2 fruit at harvest per square centimeter trunk area. Note that a target number of fruit is typically 4 to 6 fruit per square centimeter trunk area, so the crop load for both varieties was quite low. (Expect good return bloom next year!)

In conclusion, using just five spurs on five trees may be an alternative to using more spurs (up to

Apple Carbohydrate Thinning Model for Belchertown

Change green tip and/or bloom date and click "Calculate" to recalculate results.

Green tip date	Bloom date	Calculate
04/19/2015	05/11/2015	

Apple Carbohydrate Thinning Model Results

Date	Max Temp (°F)	Min Temp (°F)	Solar Rad (MJ/m2)	Tree Carbohydrate Status (g/day)				Thinning Recommendation
				Production	Demand	Balance	4-Day Ave Balance	
5/23	65	37	28.6	81.93	35.74	46.19	-11.73	Apply standard chemical thinner rate
5/24	81	45	26.4	76.96	68.27	8.69	-28.89	Decrease chemical thinner rate by 15%
5/25	82	56	13.0	39.20	83.64	-44.44	-30.37	Decrease chemical thinner rate by 15%
5/26	85	63	14.7	41.08	98.43	-57.35	-11.47	Apply standard chemical thinner rate
5/27	85	62	22.3	69.59	92.05	-22.45	9.78	Increase chemical thinner rate by 30%
5/28	82	60	22.4	80.09	77.33	2.77	12.54	Increase chemical thinner rate by 30%
5/29	83	54	24.3	95.32	64.16	31.16		
5/30	82	57	23.8	92.65	65.02	27.63		
5/31	73	48	7.2	34.94	46.33	-11.39		

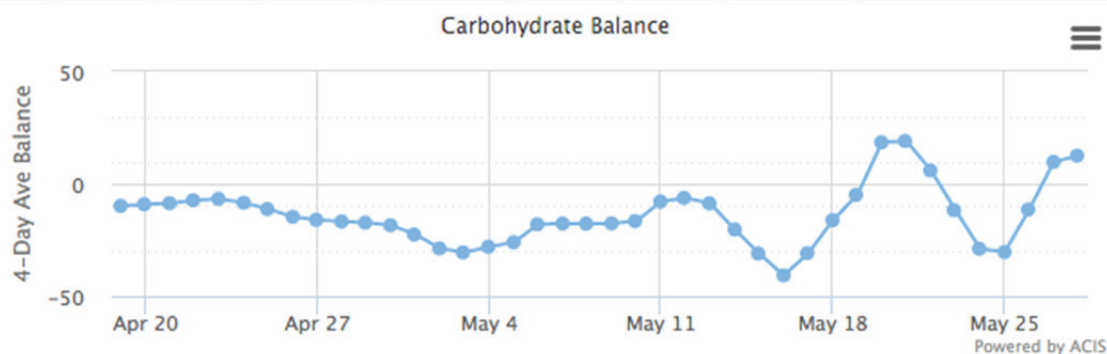


Figure 4. Apple Carbohydrate Thinning model on NEWA (newa.cornell.edu) for Belchertown, MA run on 25-May, 2015; note the call for decreased chemical thinner rate at the time chemical thinner applications were made, which was largely ignored (chemical thinner rates were actually increased, resulting in over-thinning)

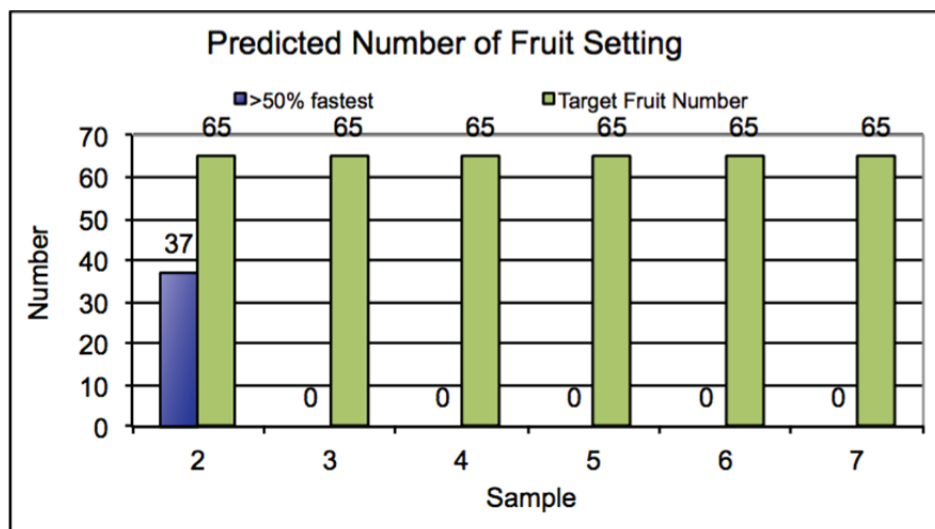


Figure 5. Honeycrisp Predicting Fruit set spreadsheet calculation. Note that 3-7 are non-measurement days, fruitlets were only measured on May 25 (not shown) and then on May 29 (2) when it was decided that no more measurements or thinning sprays would need to be made because predicted number of fruit setting (37) was already lower than the target number of fruit (65).

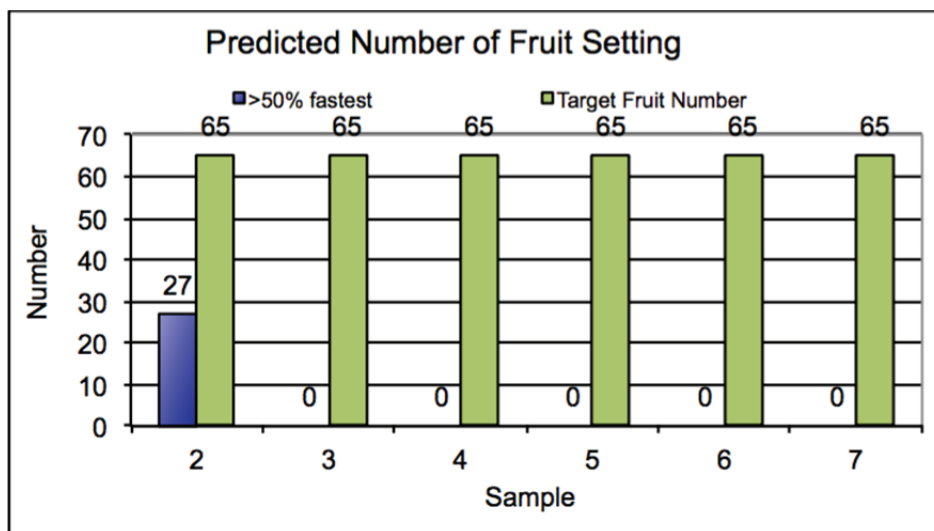


Figure 6. DS-41 Predicting Fruit set spreadsheet calculation. Note that 3-7 are non-measurement days, fruitlets were only measured on May 25 (not shown) and then on May 29 (2) when it was decided that no more measurements or thinning sprays would need to be made because predicted number of fruit setting (27) was already lower than the target number of fruit (65).



Figure 7. One of five Honeycrisp/B.9 trees on September 18, 2015 used for Predicting Fruit set at harvest. This tree had 30 fruit on it at harvest with 1.5 fruit per square centimeter trunk area. This is about half the target number of fruit; however, in retrospect, the crop load on this tree (given the size and height of the tree) maybe should only be about 45 fruit to insure return bloom the following year.

15 per the protocol) to save time in predicting fruit set because this time at least, it appears to have been accurate in predicting final fruit set. Still, using more spurs is likely to increase the accuracy of predicting fruit set. And the light fruit set could have been a result of either poor pollination or the chemical thinning treatments or a combination thereof. Here, it is likely a combination, with the chemical thinning treatment having a strong and immediate effect on fruitlet growth which was easily observed and measured. Following the Predicting Fruit set protocol, although somewhat time consuming, is highly recommended as a motivation to get out there and measure fruitlets to get a much better idea of how effective (or not) are your apple chemical thinning treatments.

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Multistate Research Project NC-140 Awarded for Improving Sustainability in Orchard Production through Changes in Rootstock Use

Multistate Research Project NC-140 has received the 2015 Excellence in Multistate Research Award from the Experiment Station Committee on Organization and Policy for “Improving Sustainability in Fruit Tree Production through Changes in Rootstock Use.” At the University of Massachusetts Amherst, Wes Autio of the Stockbridge School of Agriculture leads NC-140 orchard research trials at the UMass Cold Spring Orchard in Belchertown. At Rutgers University, Win Cowgill of the New Jersey Agricultural Experiment Station leads NC-140 orchard research trials at Rutgers Snyder Farm in Pittstown. More than 30 other US states, three Canadian provinces, and a Mexican state similarly participate in NC-140.

Tree fruit producers suffer losses, seek rootstocks for higher density orchards. In North America, fruit tree producers continue to suffer losses due to cold temperatures, diseases, poor soil conditions, and graft incompatibility. With a highly competitive international market, increased costs of production, consumer demand for high quality fruit, and strong pressure to reduce chemical use, growers are seeking economically and environmentally sustainable orchard production schemes that include improved yields and management efficiency.

Multistate research project NC-140 coordinates research on sustainable rootstocks. To address this need, Multistate Research Project NC-140 forged a viable international partnership between universities and the tree fruit community. Together, they leveraged federal and state dollars to conduct innovative research on fruit tree rootstock genetics, production, management, and economics. NC-140 has evaluated rootstocks of temperate-zone fruit trees from around the world in replicated trials, regularly measuring tree growth, root anchorage, size control, soil and climatic adaptability, and pest and disease resistance. Based on their experimental results, the group used state-of-the-art genomic tools and breeding programs to develop

improved rootstocks for temperate-zone fruit trees.

Multistate research project NC-140 provides rootstock for higher-yielding, easier to manage, more sustainable orchards. Major shifts in orchard



On behalf of the NC-140 Technical Committee, Win Cowgill and Ron Perry (Michigan State University and administrative advisor for NC-140) accept the Award for Excellence in Multistate Research at the annual meeting the Association of Public Land-grant Universities in Indianapolis, Indiana.



architecture in every U.S. state where temperate fruit trees are grown (along with Canada and Mexico) can be attributed to the collaborative efforts of NC-140 researchers, Extension educators, and industry partners. NC-140 recommendations have resulted in earlier returns, greater yields, and higher fruit quality, with a financial benefit to U.S. fruit tree producers of at least \$250,000,000. Less easily measured benefits, such as averted losses and enhanced environmental quality, likely increase the financial value of NC-140 to well beyond \$500,000,000 over the next five years. For example, adoption of NC-140 recommended dwarfing rootstocks will result in a 50% reduction in canopy volume and a concomitant 50% reduction in pesticide usage on 200,000 acres with net environmental benefits and saving of \$150,000,000 in pesticide application costs.

NC-140 rootstock trials contribute to the sus-

tainability of Northeastern tree-fruit growers. At Rutgers University, Professor Win Cowgill and Research Associate Rebecca Magron conduct extensive apple and peach rootstock research at Rutgers Snyder Farm. At the University of Massachusetts Amherst, Professors Wesley Autio and Daniel Cooley of the Stockbridge School of Agriculture, and Extension Educator Jon Clements of the Center for Agriculture, Food, and the Environment are participants in NC-140 apple and peach research conducted at the UMass Cold Spring Orchard in Belchertown. Research results from both states are disseminated through numerous talks, *Fruit Notes* (<http://umassfruitnotes.com>), *New Jersey Horticultural News* (<http://www.horticulturalnews.org/>), and many industry and scientific publications.

Throughout the Northeast, nearly all new commercial apple blocks have been planted to trees on size-controlling rootstocks. On this acreage, pruning and harvest labor has declined by 50%, fruit quality and size have increased by 20%, and profit has increased by 50%. In addition, chemical and pesticide cost and application is down by nearly 40% among apple orchards using dwarf rootstocks, and reduced tree canopy volume has led to a 70% decline in pesticide use in those orchards. Apple and peach grower Al Rose of Red Apple Farm in Phillipston, MA and President of the Massachusetts Fruit Growers' Association says "Orchardists of Massachusetts have benefited for nearly 40 years from NC-140 output. When NC-140 suggests that a rootstock performs well, we know as farmers that it will perform well." Fruit grower Ken Wightman, of Wightman Farms in Morristown, New Jersey and past president of the New Jersey State Horticultural Society, says, "I am in the process of replacing every apple tree in my orchard with dwarf trees planted in a tall spindle system based on the guidance provided by NC-140 work in New Jersey."

For more information visit the NC-140 website <http://www.nc140.org>.



Wes Autio, Ron Perry, Win Cowgill, and Jon Clements relaxing on the Putah Creek the Sunday before the 2015 NC-140 meeting in Davis, California.



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Phytelligence, A New Tree-fruit Nursery

Win Cowgill

NJ Agricultural Experiment Station

A new company, Phytelligence, has developed new technology to break the apple rootstock availability bottleneck. Many growers know the long wait necessary to get the new Geneva rootstocks. It has taken up to eight years with traditional propagation techniques to generate enough apple rootstocks to plant stool beds that grow the rootstocks for the nurseries to propagate finished trees. Dr. Amit Dhingra and his company, Phytelligence, have been able to solve this problem.

Phytelligence is a spin-off company from Washington State University (WSU), located in Pullman, Washington. WSU Research Foundation owns the inventions and is licensing the intellectual property to Phytelligence. The university will receive royalties on sales as well as maintain an ownership stake. Dhingra and his students are co-owners of Phytelligence.

The commercial fruit industry has been a strong supporter of Phytelligence. The company has raised funds from fruit growers and nurseries to get started along with strong support from commercial tree-fruit nurseries. Four major nurseries that form the North American group of the International New Varieties Network (INN) have made a significant investment in Phytelligence.

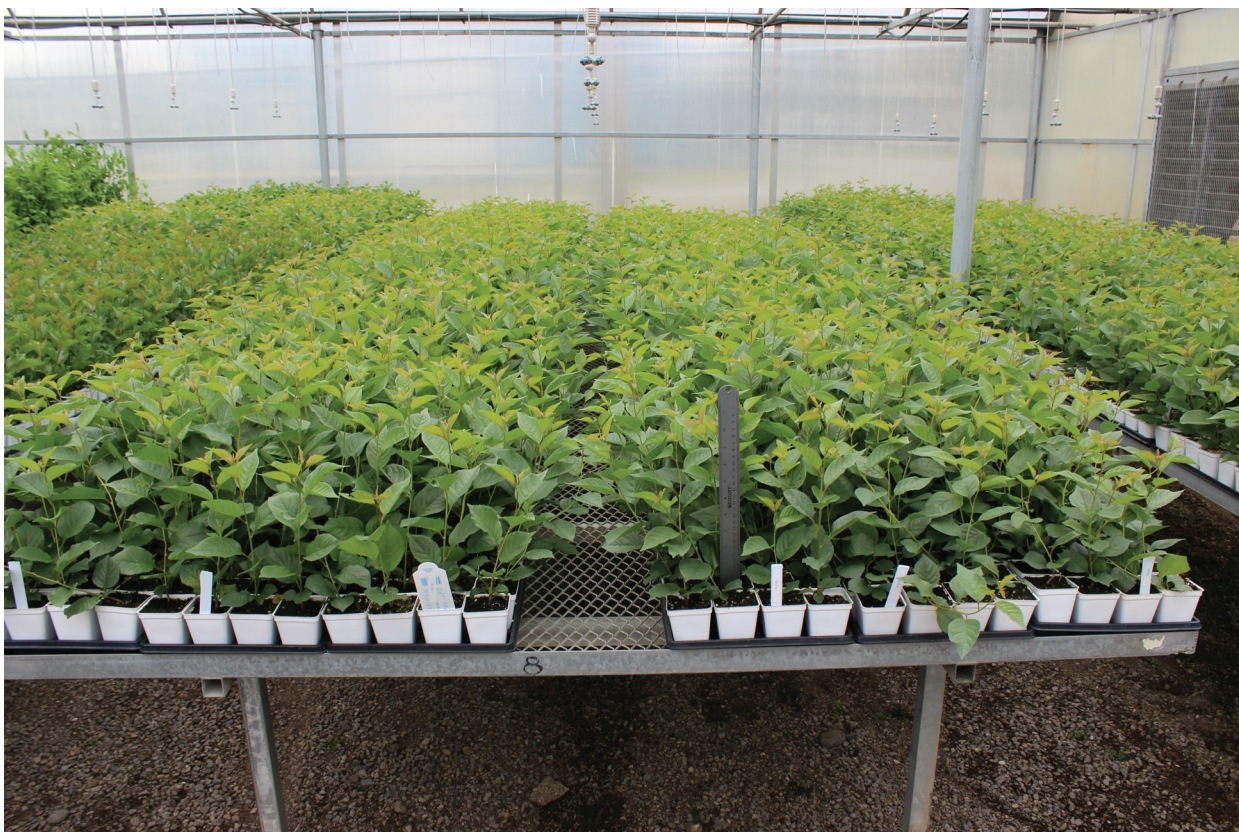
Phytelligence has focused their efforts to propagate rootstocks from tissue culture and also provide ge-



Tim Obrien, VP Marketing Phytelligence, Dr. Amit Dhingra in a collection of new pear rootstocks. Photo credit: Win Cowgill.



Rooting in agar at Phytelligence.



Giesla 12 six months after micro propagation in soilless media.



Finished dormant G6 rootstock in Phytelligence Seattle Greenhouse.

netic analysis to growers and nurseries. Bringing these rootstocks to market is just ramping up, with 350,000 apple, cherry, and pear rootstocks spoken for in 2016 and the ability to produce up to three million rootstocks in 2017.

Utilizing the technology developed by Dr. Amit Dhingra in micropropagation techniques, apple and other tree-fruit rootstocks can be propagated rapidly and true to type. This is a big step forward in the rootstock business.

Over the past two months, I have gotten to know Dr. Amit Dingra. He is full of energy and has a passion for his work, helping growers solve problems. In visiting Amit's lab in December, nine enthusiastic graduate students showed us their work. Projects ranging from pear rootstock breeding, fruit ripening compounds, tissue culture enhancements, and advances in genomic testing were all displayed. As Amit and I communicated, we realized we know many of the same horticulturists all over the US. It is a small world in pomology.

A unique quality of Amit is his passion for working directly with farmers. He has the true heart of an Extension worker. He began his work at WSU by visiting with farmers to identify their needs. His goal was to help solve their problems. He said

“working with the farmers to learn about their problems has been the best part of my job!” As he began to solve issues with fruit production, Amit indicated he was well supported by industry, not only farmers but packing houses and nurseries. As Phytelligence was started, individual investors have played a big role in getting the company off the ground. Amit has a strong passion for research and I could see his strong commitment to his students. He indicated to me “I am here to serve”.

Amit began his University career at Rutgers University as a post doc at the Waksman Institute. He then spent 2 years at the University of Florida as a postdoc and then moved on to WSU as a faculty member in horticultural genomics and biotechnology. Besides micropropagation of tree-fruit rootstocks and genetic analysis, Phytelligence is working on many other projects including wine grapes, raspberry, blueberry, and hops propagation, all through micropropagation.

Phytelligence has a great future as they ramp up their production of apple, cherry, peach, and pear rootstocks that are true to name and add their portfolio of services for growers and nurseries to their offerings. For more information on Phytelligence see: <http://www.phytelligence.com>.



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Mid-Atlantic Fruit and Vegetable Convention

2016 Educational Program

Updated as of 12/1/15

* indicates topic expected to qualify for a category pesticide update training credit

** indicates topic expected to qualify for a core pesticide update training credit

*** indicates topic expected to qualify for a fumigation update training credit

Monday, February 1, 2016 Pre-Convention Workshops

Unless otherwise noted, workshops will be conducted at the Hershey Lodge and Convention Center in Hershey.

Farm Transition

\$40.00 fee (includes lunch) - 9:00 a.m. to 4:00 p.m.

This one day session is designed to provide farm families with critical resources to navigate through transitioning the farm from one generation to the next. You will interact with both nationally recognized experts and farm families who are currently working through the transitioning process.

- 9:00 **What You Need to Know When Transitioning the Farm From One Generation to the Next** - Louis Shuntich, Advanced Consulting Group with Nationwide Ins.
- 1:00 **Farm Family Communications - Dynamics and Challenges and Family Meeting Guidelines** - Darlene Livingston, PA Farm Link
- 2:45 **Families in the Arena** - Lenny Burger Jr. & Lenny Burger III Burgers Farm; Lewis & Robin Peregrim, Miller's Orchard Farm Market

Pesticide Applicators License Training

\$60 fee (includes lunch) - 9:00 a.m. to 4:00 p.m.

If you intend to purchase and/or apply restricted use pesticides for the purpose of producing an agricultural commodity on land which is owned or rented by you in Pennsylvania, then you need a Pennsylvania Department of Agriculture (PDA) Pesticide License. To become a certified private applicator, testing is required. This full day session on February 1 will cover the basics and prepare you for the pesticide applicator's exam (which will take place morning of February 2 from 8:30 a.m. – 11:30 a.m.). Fee includes the Private Applicator Packet (course and study material).

Tools for Farm Food Safety Planning, GAP Audits, and FSMA Compliance

\$50 fee (includes lunch) - 9:00 a.m. to 3:30 p.m.

This workshop will assist growers who are writing a USDA Harmonized GAP food safety plan and who are preparing for a GAP audit. In addition, we will provide updates on the Produce Safety Rule of the Food Safety Modernization Act (FSMA), including scope, coverage, exemptions and timelines for compliance. Limited to 50 participants. Speakers will include Dr. Luke LaBorde, Penn State Univ.; Judy Martin, Penna. Dept. of Agriculture; Lee Stivers, Penn State Ext.; and Thomas Ford, Penn State Ext.

Hops Production 101

\$90.00 fee (includes lunch) - 9:00 a.m. to 3:30 p.m.

This one day session on hops production is designed to educate hops growers and prospective hops growers on site selection, nutrient management, pest management, harvesting and processing of hops, and how to work with local brewers to market hops

- 9:00 **Site Selection and Pre-Plant Considerations for Eastern Growers** - Steve Miller, Cornell Coop Ext
- 9:45 **Nutrient Management in Commercial Hops Plantings** - Thomas Ford, Penn State Ext.
- 10:30 **Growers Perspective on Training and Planting Hops** - Noah Petronic, Keystone Hops
- 11:00 **Weed Management in Hops Production Systems** - Timothy Weigle, Cornell Univ
- 11:30 **How Brewers Use Hops, What Varieties and Why** - John Trogner, Troegs Brewery
- 1:00 **Insect and Disease Management in Commercial Hops Production Systems** - Timothy Weigle, Cornell Univ
- 1:45 **Harvesting and Processing of Hops for Eastern Growers** - Steven Miller, Cornell Coop Ext
- 2:15 **Economic Considerations for Commercial Hops Production** - Kevin Martin, Penn State Ext.
- 3:00 **Experiences With Using Local Hops and Local Growers** - John Trogner, Troegs Brewery

Hard Cider from Seed to Sip – Business and Production Workshop

\$120 fee - 1:00 p.m. to 5:00 p.m.

This workshop will be conducted at The Vineyard and Brewery at Hershey, 598 Schoolhouse Road, Middletown, PA 17057, <http://vineyardathershey.com/the-brewery/>

(fee includes networking from 5:00 to 6:00 p.m. with tapas by Sophia's at Walden and an opportunity to try Hershey Brewery Ciders)

- 1:00 **Welcome**
- 1:05 **Hard Cider Market Trends** - Carla Snyder, Penn State Extension, Marketing & Ag Entrepreneurship
U.S. hard cider market trends with a focus on Mid-Atlantic market sales, consumer outlook and competition.
- 1:30 **Developing the Modern American Hard Cider Orchard** - Eric Shatt, Cornell University, Horticulture & Redbyrd Cider
Challenges of growing cider apples, choosing your varietal blend, orchard design and much more.
- 2:30 **Benchmark Tasting of Fruit Ciders**
Tasting to focus on select fruit ciders to evaluate style relative to fruit ciders from a commercial or craft perspective. Data (i.e., residual sugar, alcohol, tannin) presented on each hard cider along with sensory descriptors and production techniques. Led by Denise Gardner.
- 3:30 **Content Marketing** - Mary Bigham, Town & Dish Works LLC
Customized, professional content marketing to increase sales, customer engagement and brand awareness for your cidery!
- 4:00 **Hard Cider Production: A Closer Look at Fermentation** - Denise Gardner, Penn State Extension, Enology
Dive into the world of primary fermentation from yeast selection to stylistic options available for hard cider producers.

Pruning by the Numbers – Simplified Rules for Pruning and Training Tall Spindle Systems

\$15 fee – 1:30 p.m. to 3:30 p.m.

This workshop will be conducted at the Penn State Fruit Research & Extension Center 290 University Drive, Biglerville, PA 17307 <http://agsci.psu.edu/frec>.

Topics to discussed and demonstrated:

- **Pruning Tall Spindle Trees at Various Tree Spacings**
- **Simplified Pruning and Training Strategies**
- **Economic Impacts based on Yield and Fruit Size**

Farm Market Bus Tour

\$60 fee (includes lunch) – Time to be announced..

This all-day bus tour will leave and return to the Hershey Lodge and Convention Center. Stops include Kauffman's Fruit Farm and Market (including their own cider pressing and canning operations) in Bird-in-Hand; Cherry Hill Orchards Outlet in Lancaster, Country Barn Farm Market in Lancaster and Kegel's Produce in Lancaster,

Tuesday Morning, February 2, 2016

Wildlife Management

- 9:00 **History and Status of Fencing for Wildlife Management** - Frank Otto, Summit Ag Systems
- 9:45 **Managing Deer Damage in Your Enterprise** - Jonathan Kays, Univ. of Maryland Ext.

Cover Crops

- 9:00 **Beneficial Cover Crop Mixes for Vegetable Rotations** - Kaitlin Dye, Cover Crop Solutions LLC
- 9:45 **Nutrient Recovery In Cover Crops** – Steven Groff, Cedar Meadow Farms

Herbs

- 9:00 **Getting Started with Growing Culinary Herbs** – Dr. Elsa Sanchez, Penn State Univ
- 9:45 ***Basel Downy Mildew: Management and Progress in Research** – Dr. Andrew Wyenandt, Rutgers Coop. Ext.

Organic Vegetable Production

- 9:00 **Minimum Tillage and Cover Cropping for Managing Weeds in Organic Vegetables** – Dr. Cerruti Hooks, Univ. of Maryland
- 9:45 **Low Soil Inorganic N is Not so Yield Limiting in Established Organic Systems** – Dr. Alison Grantham, Blue Apron

Food Banking

- 9:00 **Overview of Food Banking** - Sheila Christopher, Hunger Free Pennsylvania
- 9:45 **Tax Policy for Food Donations** - Carrie Calvert, Feeding America

Introduction to Hops

- 9:00 **Site Selections and Pre-Plant Considerations & Basic Management for Eastern Growers** - Steve Miller, Cornell Coop Ext
- 9:45 **Pest Management in Hops Production Systems** - Timothy Weigle, Cornell Univ
- 10:10 **Economic Considerations of Commercial Hops Production** - Kevin Martin, Penn State Ext.

GMO's

- 9:00 **GMO Basics, The Science of it and Crafting Marketing Messages** - William Hlubik, Rutgers Coop. Ext & Heather Mikulas, Penn State Univ.
- 9:45 **Consumer Perceptions of GMO's and Mandatory Labeling** – Dr. William Hallman, Rutgers Univ.

Tree Fruit

- 9:00 **Invocation** – Ed Weaver, Weavers Orchard
- 9:05 **President's Address** – Timothy Weiser, State Horticultural Association of Pennsylvania
- 9:15 ***Managing Nematodes in Tree Fruit Orchards** – Dr. Kari Peter, Penn State Univ.
- 9:45 **George Goodling Lecture - How We Will Survive the FSMA and the Next Challenge, Whatever It Is** - John Rice, Rice Fruit Company

Keynote

- 10:45 **Mid-Atlantic Legislative Affairs Update**
- 11:00 **Keynote Presentation** – Discuss the Undiscussabull – Tools for Talking about the Tough Issues in Farm Transfer - Elaine Froese, Family Farm Coach

Tuesday Afternoon, February 2, 2016

Sweet Corn

- 1:00 ****Storage and Spills** – Dr. Timothy Elkner, Penn State Ext.
- 1:30 ***Fall Armyworm Migration - Implications for the Mid Atlantic** - Robert Meagher Jr, USDA, ARS
- 2:00 **No-Till Planter Set-Ups - Do's and Don't's** - Thomas Strzelecki, Covered Wagon Produce
- 2:30 ***Cover Crops for Weed Management and N-Supply** - Steven Mirsky, USDA, ARS
- 3:15 **Early Season Production** – Ronald & William Beinlich, Triple B Farms; Brenton Barnhart, Country Creek Produce; Mark & Andrew Duda, Duda's Farm; Harold Weaver, Meadowgate Vista Farm

Food Safety Crisis Management

- 1:30 **Impact of FSMA on Mid Atlantic Growers** – Dr. Wesley Kline, Rutgers Coop. Ext.
- 2:00 **Can Cow Manure Be Used Safely as Fertilizer for Vegetables?** – Dr. Jeffrey LeJeune, Ohio State Univ.
- 3:15 **Are You Ready for a Recall** - Amy Philpott, Watson Green LLC

Root Crops

- 1:30 ***Gain the Upper Hand in Weed Control by Understanding the Enemy** - Darcy Telenko, Cornell Coop Ext.
- 2:00 **Growing and Marketing Root Crops at Everblossom Farm** - Elaine Lemmon, Everblossom Farm
- 2:30 **Variety Selection for Flavor, Nutrition and Marketing** - Jan Van Der Heide, Bejo Seeds
- 3:15 ***Insect Pests of Root Crops** – Dr. Shelby Fleischer, Penn State Univ
- 4:00 ****Overlooked Steps to Getting the Correct Rate of Pesticides** - Lee Stivers, Penn State Ext.

Organic Vegetable Production

- 1:30 ***Weed Management in Organic Onions** - Bryan Brown, Univ. of Maine
- 2:00 ***Scouting Insects in High Tunnels** - Kathleen Ayers, Penn State Univ
- 2:30 ***Using Biocontrols for Insect Pests in High Tunnels** – Dr. Margaret Skinner, Univ. of Vermont
- 3:15 ***Identifying Common Natural Enemies in High Tunnels** – Dr. Margaret Skinner, Univ. of Vermont
- 4:00 **Planning Diversified Crops for Winter Income** - Elaine Lemmon, Everblossom Farm

Hydroponics

- 1:30 **Tomatoes Varieties for Hydroponics in the Mid-Atlantic** - Natalie Bumgarner, Univ. of Tennessee
- 2:00 ***Keeping Hydroponic Systems Clean Using Peroxides** - Vijay Kumar Choppakatta, BioSafe Systems
- 2:30 ***Utilizing Microbial Probiotics in Hydroponic Lettuce Production** - Natalie Bumgarner, Univ. of Tennessee
- 3:15 **Chasing Nutrient Solutions Targets** - Thomas Childs, Twin Springs Fruit Farm
- 4:00 ***Downy Mildew in Hydroponic Basil** - Thomas Ford, Penn State Ext.

Labor/Farm Management

To be announced

Wholesale Marketing

- 1:30 **Food Hubs - Enhance Your Understanding of This Newer Method to Get Farm Fresh Food to Consumers** - Ann Karlan, Fair Food
- 2:15 **Farm To School - Recent Successes and Future Opportunities to Connect Local Produce with School Food Programs** - Vonda Cooke, Child Nutrition Program
- 3:15 **Direct Store Deliveries - Meeting Criteria, Building Relationships and What We Do to Exceed Expectations** - James Weaver, Meadow View Farm
- 4:00 **Produce Auctions - Trends in This Industry and What is On the Horizon** - Bennie C. Yoder, Countryside Produce Auction

Tree Fruit - Honeycrisp Symposium

- 1:30 **Fruit Packer Observations on Honeycrisp Post-Harvest Disorders** - Benjamin Rice, Rice Fruit Company
- 2:00 **Three Years of Storage Research on Pennsylvania Honeycrisp—Implications for Growers and Packers** - Christopher Watkins, Cornell Univ.
- 3:00 **Growing Tips for Honeycrisp - Grower Panel**
Dr. Tara Baugher, Penn State Ext. (moderator); Bennett Saunders, Saunders Brothers Orchard; Nathan Milburn, Milburn Orchards; Joseph Lerew, Lerew Orchards
- 3:45 **Rootstocks and Site Preparation for Honeycrisp** - Rob Crassweller, Penn State Univ.

Wednesday Morning, February 3, 2016

Tomatoes

- 9:00 **Penn State Variety Update** – Dr. Majid Foolad, Penn State Univ.
- 9:30 ***Looking at Nanomaterials for Bacterial Spot Control** – to be announced
- 10:15 ***Tomato Disease Update - Planning for 2016** – Dr. Beth Gugino, Penn State Univ.
- 11:00 ***Detection of Canker and Salmonella in Irrigation Water** - Nitika Khatri, Ohio State Univ.
- 11:30 **PVGA Annual Meeting** – Crystal Room

General Vegetables/IPM

- 9:00 **Update on Biodegradable Mulch** – Dr. Michael Orzolek, Penn State Univ Emeritus
- 9:30 ****Air Blast Sprayer Calibration** - Eric Oesterling,
- 10:15 **All Season Field Production of Lettuce** – Arthur King, Harvest Valley Farms
- 11:00 **Celery Production** – Dr. Michael Orzolek, Penn State Univ Emeritus
- 11:30 **PVGA Annual Meeting** – Crystal Room

Greenhouse Skills

- 9:00 **Potting Media Management** – Dr. Youbin Zheng, Univ. of Guelph
- 9:30 ****Water Quality - Impact on Pesticide Efficacy and Plant Production** - Thomas Ford, Penn State Ext.
- 10:15 **Deconstructing Fertilizer Formulas** – Dr. Cari Peters, J R Peters Inc
- 11:00 ***Managing Western Flower Thrips Using Biocontrols** - Scott Creary
- 11:30 **PVGA Annual Meeting** – Crystal Room

Peppers and Eggplant

- 9:00 **Pepper Variety Trials** – Sheldon Sutton, Rupp Seeds
- 9:30 **Broad Mites in Peppers** – Steven Bogash, Penn State Ext.
- 10:15 **Diseases of Peppers** – Dr. Andrew Wyenandt, Rutgers Univ.
- 11:00 **Peppers and Eggplant for Ethnic Markets** – Thomas Strzelecki, Covered Wagon Produce
- 11:30 **PVGA Annual Meeting** – Crystal Room

Small Fruit

- 9:00 ***Spotted Wing Drosophila - When Do I Really Need to Start Spraying?** – Dr. Gregory Loeb, Cornell Univ.
- 9:30 **Closing the Loop in Recycling Ag Plastics - It Can Be Done!** - Ron Davis, Davis Enterprises Inc
- 10:15 ***Thrips Galore, and We Don't Want More!** – Dr. Margaret Skinner, Univ. of Vermont & Kathleen Demchak, Penn State Univ.
- 11:00 **Performance of New Strawberry Varieties in Plasticulture and Matted-Row Field Trials** – Dr. Timothy Elkner, Penn State Ext. & Kathleen Demchak, Penn State Univ.

Business Planning for Direct Marketers

- 9:00 **Yes, You Really Do Need a Business Plan** - Keith Dickinson, Farm Credit East
10:00 **You Think you're Being Smart, but...** - Ed Weaver, Weavers' Orchard, David Fleming Jr., Shady Brook Farm & Caleb Torrice, Tabora Farm
11:30 **Family Dynamics - I Can't Fire My Sister!** - Elaine Froese, Family Farm Coach

Wine Grapes

- 9:00 **What People Should Know Before Establishing Their Vineyard** – Dr. Joseph Fiola, Univ. of Maryland:
9:45 **Identifying and Managing Weed Problems That Escape Conventional Practices** - Andy Senesac, Cornell Coop. Ext.
10:15 **Ecological Considerations for Winegrape Growers** - Alice Wise, Cornell Coop. Ext.
11:00 **Evaluation of Winegrape Cultivars for Cool Climate Regions** - Michela Centinari, Penn State Univ.:
11:30 **The Essentials of Grape Nutrient Management** – Dr. Gary Pavlis, Rutgers Coop. Ext.

Tree Fruit

- 9:00 **Performance of European Pears** – Dr. James Schupp, Penn State Univ.
9:30 **The Continuing Quest for Optimal Harvest Management & Storage of Apples** - Christopher Watkins, Cornell Univ.
10:15 **Rootstock Scion Combination Observations** - Bryan Butler, Univ. of Maryland
10:45 ****The Worker Protection Standard is Here** - James Harvey, Penn State Univ.
11:15 **The Young Grower Alliance & Precision Management Innovations** - Russell Homberg, Ben Lerew, Mark Boyer

Spanish

- 9:00 **Practica sobre Identificación de Malezas (Hands-On Weed Identification)** - Dwight Lingenfelter & Lee Stivers, Penn State Ext.; Beth Sastre, VCE-Loudon Ext. Office
10:00 ***Técnicas de MIP para Producción en Macrotúnel (IPM Techniques for High Tunnel Production)** - Maria Gorgo (NRCS), Noel Soto (NRCS), Cathy Thomas (PDA)
10:45 ****Protegernos y Nuestras Familias de la Exposición a Pesticidas (Protecting Yourself and Your Family from Pesticide Exposure)** - Hector Nunez-Contreras, Penn State Ext.

Wednesday Afternoon, February 3, 2016

Tomatoes

- 1:30 ***Bio Pesticides - Where Is the Future** - Timothy Johnson, Marrone Bio Innovations
2:00 ****Storage and Spills** – Dr. Timothy Elkner, Penn State Ext.
2:30 ***Fruit Rots and Timing of the Last Fungicide Application – What's the Best Approach?** - Cheryl Trueman, Univ. of Guelph
3:15 **Top Tomato Production** - Steven Bogash, Penn State Ext.
4:00 ***What We Have Learned about Managing Stink Bugs in Tomatoes** – Dr. Thomas Kuhar, Virginia Tech

General Vegetables

- 1:30 **Succession Planting** – Dr. William Lamont, Jr., Penn State Univ
2:00 **Asparagus Production** – Dr. Thomas Orton, Rutgers Co-op Ext.
2:30 ***Evaluating Select Management Strategies for Bacterial Diseases of Onion** - Jennie Mazzone, Penn State Univ
3:15 **How Plant Growth Promoters Size Grain and Fill Fruits** – Dr. Richard Woodward, Stoller USA
4:00 ***New Vegetable Herbicides** – Dr. Mark Van Gessel, Univ. of Delaware

Greenhouse Ornamentals

- 1:30 ***Diagnosing Disease Problems in the Greenhouse** - Virginia Brubaker, GGS-Pro
2:00 ***Diagnosing Insect Problems in the Greenhouse** - Virginia Brubaker, GGS-Pro
2:30 **Succulents - All the Juicy Details** - John Friel, Emerald Coast Growers
3:15 **Best Plants From the 2015 Penn State Flower Trials** - Sinclair Adam, Penn State Ext.
4:00 **LED's in Greenhouse Production** – Dr. Youbin Zheng, Univ. of Guelph

Specialty Crops

- 1:30 **Outstanding New PawPaws** - Carl Cantaluppi, North Carolina Ext.
2:00 **You Can Grow Ginger** - Leah Tewksbury, Tewksbury Grace Farms
2:30 **Chick Peas Have Potential** - John Esslinger, Penn State Ext. & Joseph Yodock
3:15 **Growing Okra on Plastic** – Dr. William Lamont, Jr., Penn State Univ

4:00 ****Get My Drift?** - John Esslinger, Penn State Ext.

Agritourism

- 1:30 **How to Handle Large Crowds at Your AT Events** - Timothy VonThun, VonThun Family Farm
2:00 **Practical Advice for Managing Liability on Agritourism Farms** - Brian Schilling, Rutgers Coop. Ext.
2:30 **Tips for Hiring and Managing Employees for Agritourism** - Gillian Armstrong, Rutgers Univ. & William Hlubik, Rutgers Coop. Ext.
3:15 **Agritourism Need Not to be a Risky Business** - Patricia Hastings, Rutgers Coop Ext.
4:00 **Consumers Want to Know Their Farmer, But Do Farmers Know Their Customers** - Richard VanVranken, Rutgers Univ.

Peaches

- 1:30 ***Contribution of Mid-Season Cover Sprays to Management of Peach Brown Rot at Harvest** - Norm Lalancette, Rutgers Univ.
2:15 ***The Use ProGibb and ReTain to Reduce Peach Flower Bud Density & Enhance Fruit Firmness** - Win Cowgill, Rutgers Univ.
3:00 **Peaches: Trends and Opportunities** - Eric Gaarde, Gaarde FoodSource
3:45 ***Bacterial Spot Management in Stone Fruit** - Sarah Bardsley Capasso, Penn State Univ.

Wine Grapes

- 1:30 **Clean Plant Material - An Effective Strategy for Disease Prevention in the Vineyard** - Hemant Gohil, Rutgers Coop. Ext.
2:00 **Early Season Disease Control for Mid-Atlantic Wine Grape Production** - Bryan Hed, Penn State Univ.:
2:45 **Diagnosis and Integrated Management of Late Season Fruit Rots in Wine Grapes** – Dr. Cassandra Swett, Univ. of Maryland
3:30 **Update on Spotted Lanternfly Research in Grapes** – Dr. Michael Saunders, Penn State Univ.

Tree Fruit

- 1:30 ****Top Ten Tips for Pesticide Applicators** – Dr. Kerry Richards, Penn State Univ.
2:00 ***Attract and Kill for BMSB** - Chris Bergh, Virginia Tech
2:45 **US Apple Association & PA Apple Marketing Board Updates**
3:30 ***Solid Set Systems as a Novel Method of Delivering Chemical Inputs in Apple** - Dr. Larry Gut, Michigan State Univ.

Spanish

- 1:15 **Visita al Mercado de Productores de la Villa Masónica** – *This session will be held at Masonic Village, 310 Eden View Road, Elizabethtown.*
1:20 **Poda Básica y Principios de Manejo de Carga del Cultivo de Arboles de Manzana (Basic Pruning/ Crop Load Management Principles for Apple Trees)** - Mario Miranda Sazo, Cornell Coop. Ext.
2:00 **Equipo de Crecimiento de Frutales – Comunicación en Áreas de Trabajo (The Fruit Growing Team – Workplace Communication)** - Miguel Saviroff, Penn State Ext.
2:30 **Pasos para Podar Arboles de Manzana en un Sistema de Eje Alto (Steps for Pruning Apple Trees to the Tall Spindle System)** - Mario Miranda Sazo, Cornell Coop. Ext.

Thursday Morning, February 4, 2016

Vine Crops

- 9:00 ***New Options for Cucumber Beetle Management** – Dr. Shelby Fleischer, Penn State Univ
9:30 **Growing Seedless Watermelons** – Dr. Gordon Johnson, Univ. of Delaware
10:15 ***Weed Control in Vine Crops - Making the Most With What We Have Available** – Dr. Mark Van Gessel, Univ. of Delaware
11:00 **Seedless Watermelon Varieties - Results of the SE PA Trial** - Tanner Delvalle, Penn State Ext.
11:30 **Biological Strip-Till for Vine Crops** – Dr. Gordon Johnson, Univ. of Delaware

Bio Controls in High Tunnels

- 9:00 ***Managing Key Pests of Tomatoes with Biocontrols** - Scott Creary
9:30 **TerraGrow and TerraClean 5.0 in High Tunnel Systems** - Vijay Kumar Choppakatla, BioSafe Systems
10:15 ***Pathways to Biological Control - Case Studies from the 2015 Growing Season** - Nicolas Ellis, Norden Agricultural LLC
11:00 ***Managing Leaf Mold in High Tunnel Tomatoes** - Steve Bogash, Penn State Ext.
11:30 **Root Zone Temperature Management** - Natalie Bumgarner, Univ. of Tennessee

Potatoes

- 9:00 **Update from the United States Potato Board** - Nolan Masser, Red Hill Farms Inc and David Fraser, United States Potato Board
- 9:30 **Review of the 2015 Potato Season** - Robert Leiby, PA Coop Potato Growers
- 10:15 **Fertility Management for Potatoes** – Dr. Steven Johnson, Univ. of Maine Coop. Ext.
- 11:00 ***General Disease Update** – Dr. Beth Gugino, Penn State Univ.
- 11:30 ***Insect Control Measures** – Dr. Thomas Kuhar, Virginia Tech

Cut Flowers

- 9:00 ***Biologically Based Approaches to Disease Management in Specialty Cut Flowers** - Thomas Ford, Penn State Ext.
- 9:30 **High Tunnels as Overwintering Structures for Perennials and Semi-Hardy Annual Cut Flowers: A Sharing of Experiences** – Dr. Chris Wien, Cornell Univ.
- 10:15 **Hybrid Lilliums & Other Bulb Crops for Summer Production** - Ko Klaver, Botanical Trading Co
- 11:00 **Utilizing Topping Pinching Techniques to Increase Floral Stem Yield in Cut Flowers** – Dr. Chris Wien, Cornell Univ.
- 11:30 **Grower's Perspective on the Cut Flower Industry** - Michelle Elston, Roots Cut Flower Farm LLC

Small Fruit

- 9:00 *****What's New in Biofumigants for Strawberry Production** – Dr. Charles Johnson, Virginia Tech
- 9:30 **Pruning Brambles - Increase Harvest Efficiency and Winter Hardiness While Improving SWD Management** - Nathan Nourse, Nourse Farms
- 10:15 ***A National Research Effort to Manage Spotted Wing Drosophila and Recent Advances in Biology and Management** – Dr. Hannah Burrack, North Carolina State Univ. & others to be announced
- 11:00 ***Strawberry Diseases and Early Season Stunting** – Dr. Charles Johnson, Virginia Tech
- 11:30 ***Strawberry Crown Rots - How to Tell Them Apart and Differences in Control** – Dr. Cassandra Swett, Univ. of MD

Marketing 101

- 9:00 **Capturing Your Virtual Customer** - Rebecca Frimmer, Kitchen Table Consultants
- 10:15 **Are Your Products Paying the Rent?** - Josh Smith, Frecon Farms
- 11:15 **Business Collaborations to Expand Your Market - The Partnership of a Hard Cidery and Diversified Farm Market** - Reed Soergel, Soergel Orchards

Stone Fruit

- 9:00 ***Ernie Christ Lecture - Getting Back into an IPM Program in Peaches & Nectarines** – Dean Polk, Rutgers Univ.
- 10:00 **Cherry Rootstock Update** – Dr. Rob Crassweller, Penn State Univ.
- 10:30 **Nectarine Varieties – 50 Years of Experiences in the East** - Jerry Frecon, Adams County Nursery
- 11:15 **Peach Genetics and Breeding for the Future** Ralph Scorza, USDA, Kearneysville

Tree Fruit

- 9:00 ***Fungal Leaf Pathogens of Apple** - Keith Yoder, Virginia Tech.
- 9:30 ***Mating Disruption Then, Now and the Future** – Dr. Larry Gut, Michigan State Univ.
- 10:30 **Getting to the Root of the Tree** - Emily Lavelly, Penn State Univ.
- 11:00 **What Affects the Tree's Photosynthesis Factory** – Dr. Richard Marini, Penn State Univ.
- 11:30 **Flower Power: Apple Pollen Tube Growth and its Management** - Thomas Kon, Penn State Univ.

Thursday Afternoon, February 4, 2016

Pumpkins

- 1:30 ***Update on Insect Pest Management Research in Pumpkins** – Dr. Thomas Kuhar, Virginia Tech
- 2:00 **Tale Of A Thousand Pumpkins - Creating Magic at the Arboretum at Penn State's Pumpkin Festival** - Shari Edelson, Penn State Univ
- 2:30 ***Soil Borne Cucurbit Disease Management and a Foliar Disease Update** – Dr. Beth Gugino, Penn State Univ.
- 3:15 ***Palmer Amaranth and Waterhemp Anxieties - Management and Legal Implications?** - Dwight Lingenfelter, Penn State Univ.

High Tunnels

- 1:30 **Supplemental Heating for High Tunnels** - David King, Harvest Valley Farms

- 2:00 **Plastic Films for High Tunnels** – Dr. Michael Orzolek, Penn State Univ Emeritus
- 2:30 **Managing Key Pests of Peppers and Cucumbers with Biocontrols** - Scott Creary
- 3:15 *****Pesticide Sprayers for High Tunnels** - Thomas Ford, Penn State Ext.
- 3:45 **Growing Cucumbers in High Tunnels** - Steven Bogash, Penn State Ext.

Potatoes

- 1:30 **Developing Infrastructure in MSU Potato Breeding Program to Facilitate Bringing New Specialty to Small Growers** – Dr. David Douches, Michigan State Univ.
- 2:00 ***Dickeya, an Emerging Pathogen on Potatoes** – Dr. Steven Johnson, Univ. of Maine Coop. Ext.
- 2:30 **New Varieties for Pennsylvania Potato Growers** - Michael Peck, Penn State Univ.
- 3:15 **New Opportunities in Disease Resistant Breeding in Potatoes** – Dr. David Douches, Michigan State Univ.
- 3:45 **Blue and White Potato Chips** – Dr. William Lamont Jr., Penn State Univ

Innovations Equipment & Infrastructure

- 1:30 To be announced
- 2:00 **Future of Drones in Ag** – Paul Caskey, SkyPhilly
- 2:30 **Irrigation Optimization** – to be announced
- 3:15 **Is There a Future in Interseeding Cover Crops?** - Corey Dillon, Penn State Univ
- 3:45 To be announced

Small Fruit

- 1:30 **Crop Production Methods in Beach Plum and Aronia** - Jenny Carleo, Rutgers Coop. Ext.
- 2:00 ***Demystifying Blueberry Declines in the Mid-Atlantic** – Dr. Cassandra Swett, Univ. of MD
- 2:30 **Understanding Winter Hardiness and Injury in Blueberries** – Dr. Mark Ehlenfeldt, USDA - ARS
- 3:00 ***Recent Developments in Blueberry Pest Control Options** – David Trinka, MGB Marketing
- 3:30 ***Practical Monitoring and Management of Spotted Wing Drosophila in Highbush Blueberries** – Dean Polk, Rutgers Univ.

Social Media and Technology

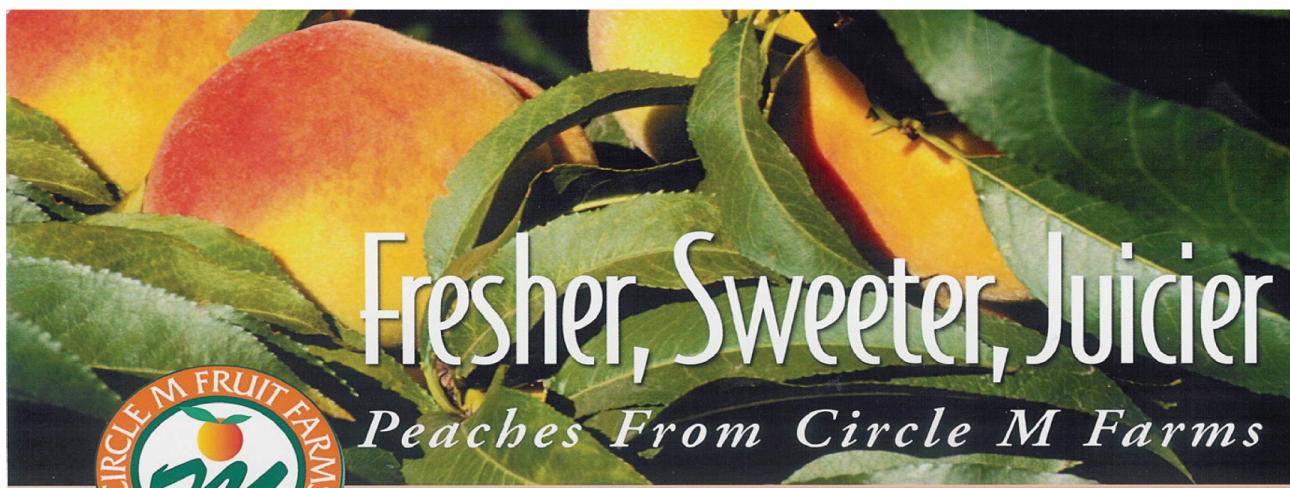
- 1:30 **Apps, Sensors and Technology for Crop Results** - Ben Butler, Butlers Orchard
- 2:00 **Using Videos to Share Your Story** - Sarah Cornelisse, Penn State Univ.
- 2:30 **Social Media Realities** - Shannon Dill, Univ. of Maryland Ext.
- 3:15 **Tricks of the Trade** - Shannon Dill, Univ. of Maryland Ext.

Peaches

- 1:30 **Ripening in Peach & Nectarine & Internal Breakdown** – Dr. Christopher Walsh Univ. of Maryland
- 2:00 **National Peach Council Industry Update** - Kay Rentzel, National Peach Council
- 2:30 **Microbiology of an Orchard Soil** - David Eissenstat, Penn State Univ.
- 3:00 **Managing Nematodes in Tree Fruit Orchards** – Dr. Kari Peter, Penn State Univ.
- 3:30 ****Sprayer Deposition** – Dr. Kerry Richards, Penn State Univ.

Tree Fruit

- 1:30 ****Effect of Water Quality on Pesticides** - Dr. Kerry Richards, Penn State Univ.
- 2:00 ***How to Use Harvista Technology** - Dr. Nancy Brill, AgroFresh
- 2:45 ***Managing BMSB as Part of the Total Insect Pest Management System** - Dr. Greg Krawczyk, Penn State Univ.



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