Horticultural News

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Horticultural News

Editors: Winfred P. Cowgill, Jr. & Wesley R. Autio

The New Jersey State Horticultural Society was organized on August 17, 1875 at Geological Hall, Rutgers College, New Brunswick, NJ. It remains the oldest Horticultural organization in New Jersey.

Horticultural News began as the *The New Jersey State Horticultural Society News*, in October of 1920. The Society began "collecting paid membership in order to obtain funds to promote new features of the society and extend the usefulness of the society. The Horticultural Society News was started to be the official society publication." Published M. A. Blake, Professor at Rutgers College was the first president and chair of the publication committee.

Editors served as follows:

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Win Cowgill	1981 - 1988
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June 2010: *Horticultural News* has moved to an online web-based format. The New Jersey State Horticultural Society has partnered with the University of Massachusetts *Fruit Notes*, Dr. Wesley Autio, Editor. Cowgill and Autio will be the new editors of *Horticultural News* and *Fruit Notes*.

Horticultural News is distributed to growers, extension personnel and researchers and libraries across North America. Horticultural News focuses primarily on tree-fruit culture, but addresses small-fruit cultural issues as well. Most reports are from current research at Rutgers University, University of Massachusetts, and other universities.

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Cover: Early summer at UMass Cold Spring Orchard Research & Education Center. Photo credit: Zachary Autio.

Use of Biological Controls and Sterilants as Alternatives to Streptomycin Against Fire Blight Blossom Infections in Apples

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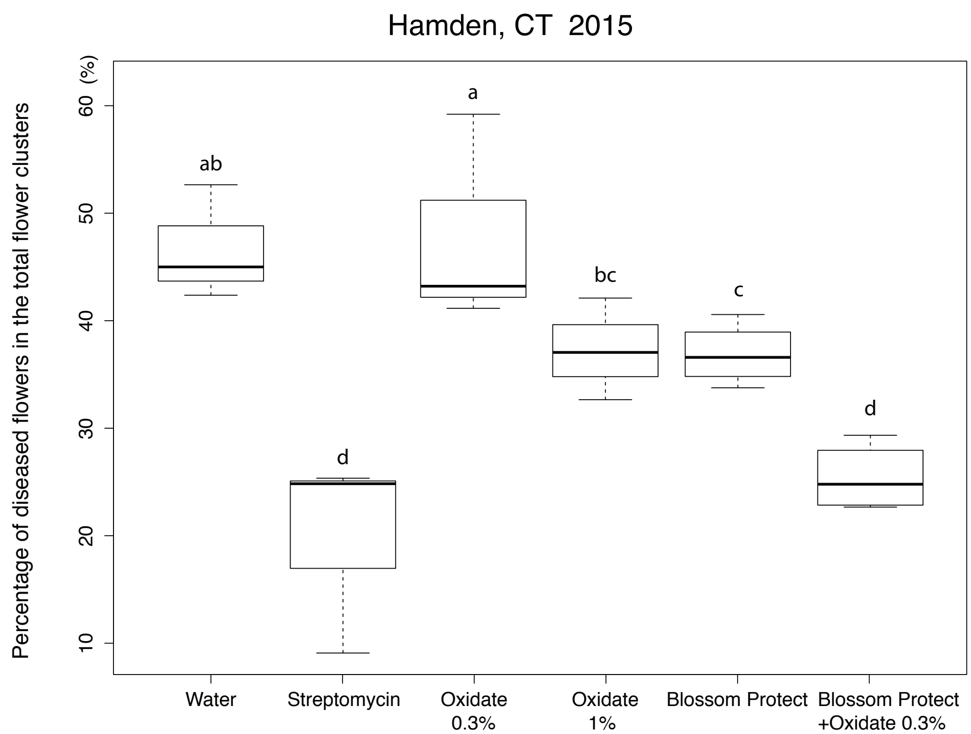
Fire blight, caused by the bacterial pathogen *Erwinia amylovora*, is a devastating disease of apples and pears. Application of the antibiotic streptomycin at bloom used to be the "silver bullet" for controlling fire blight. However, the intensive, long-term use of streptomycin not only leads to the evolution of streptomycin resistance in the pathogen population, but also raises concerns about its potential impact on the environment and human health. In 2014, the National Organic Standards Board (NOSB) terminated the use of streptomycin in organic fruit production in the U.S., making identification of effective, non-antibiotic control alternatives an urgent need for organic growers. At the same time, to reduce the reliance on streptomycin, effective alternatives need to be found for conventional growers as well.

Non-antibiotic control materials for fire blight generally fall into two categories: biological controls and non-antibiotic bactericides. Biological controls are non-pathogenic microorganisms that antagonistically inhibit pathogen growth, either by competing with the pathogenic bacteria for space and nutrients, or by producing antimicrobial compounds, or in some cases by stimulating apple tissue to be more resistant to infection. Examples of products based on microbes include *Pantoea agglomerans* (Bloomtime Biological), *Aureobasidium pullulans* (Blossom Protect) and *Bacillus amyloliquefaciens* (Double Nickel). Non-antibiotic bactericides are generally chemical toxins that kill bacteria, such as hydrogen peroxide + peroxyacetic acid (Oxidate) and copper octanoate (Cueva).

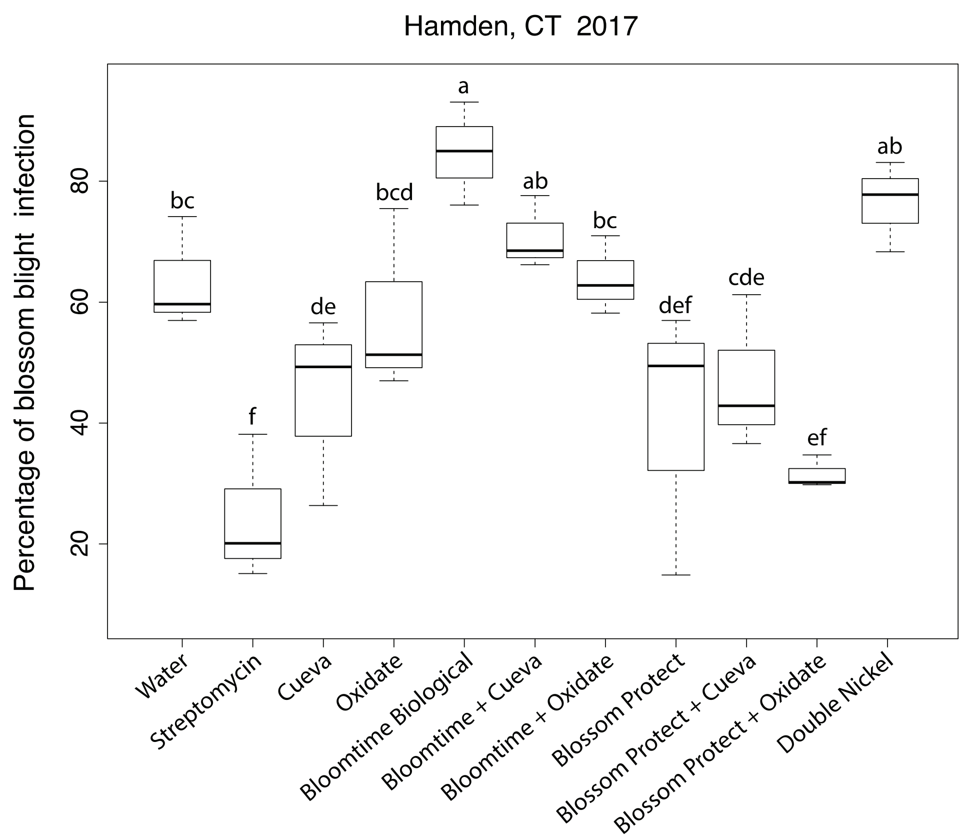
Although the use of biological controls and other non-antibiotic bactericides has been explored in fire blight management, efficacy is inconsistent and is largely affected by the climate and growing conditions of specific regions. The goal of this research is to evaluate the efficacy of non-antibiotic materials in controlling fire blight in the New England region by performing field trials at two locations (CT and MA) for multiple seasons (2015, 2017 and 2018).

Experiments

Apple trees were spray-inoculated with lab cultured *E. amylovora* cells at the concentration of 5×10^6 CFU/ml at 100% bloom. Each infected tree was treated with a biological control, or a non-antibiotic bactericide, or both. At least three trees were tested in each treatment, and trees receiving different treatments were organized in random blocks for statistical analysis. Biological control products were applied twice at 40% bloom, and again at 70% bloom. Non-antibiotic bactericides were applied two hours after *E. amylovora* inoculation unless otherwise specified. When a biological control was used in combination with a non-antibiotic bactericide, the biological control was applied first, at 40% and 70% bloom, followed by a one-time application of non-antibiotic bactericide two hours after pathogen inoculation. All pathogen inoculation and material applications were performed using a Solo motorized backpack sprayer (CT) or a hand-pumped Solo backpack sprayer (MA) to fully cover the flowers until drip. The blossom blight control efficacy was evaluated approximately two to three weeks after inoculation by calculating the percentage of infected flower clusters of the total flower clusters. The control efficacy of non-antibiotic materials was compared with water (negative control) and streptomycin (positive control) treatments.



Hamden, CT 2015
Percentage of diseased flowers in the total flower clusters
(%)
10
20
30
40
50
60
ab
d
a
bc
c
d
Water
Streptomycin
Oxidate 0.3%
Oxidate 1%
Blossom Protect
Blossom Protect +Oxidate 0.3%



Hamden, CT 2017
Percentage of blossom blight infection
20
40
60
80
bc
f
de
bcd
a
ab
bc
def
cde
ef
ab
Water
Streptomycin
Cueva
Oxidate
Bloomtime Biological
Bloomtime + Cueva
Bloomtime + Oxidate
Blossom Protect
Blossom Protect + Cueva
Blossom Protect + Oxidate
Double Nickel

2015

The field trial in 2015 was performed on 35-year-old 'Golden Smoothie' apple trees at the Lockwood Farm of the Connecticut Agricultural Experiment Station, Hamden, CT. We tested one biological control, Blossom Protect (Westbridge Inc), and one non-antibiotic bactericide Oxidate 2.0 (Biosafe Inc). Biological control alone, non-antibiotic bactericide alone and combined application of biological control and non-antibiotic bactericide were included in this year's testing. The Cougarblight disease risk level was "Extreme high" and "High" during the infection period.

Forty six percent of flower clusters from trees treated with water developed blossom blight symptoms. Effective control was achieved when trees were treated with antibiotic streptomycin; only 20% of flowers showed blossom blight symptoms. Among the non-antibiotic treatments, the best control was achieved when Blossom Protect was used in combination with 0.3% Oxidate 2.0., with 25% of flower clusters infected. When applied alone, Blossom Protect can still provide some level of control (37% of infection), although the efficacy is significantly lower than when used in combination with Oxidate 2.0. No significant reduction in blossom blight infection was observed when Oxidate 2.0 was used by itself (either at 0.3% or at 1%) compared to the water treatment.

2017

In 2017, a field trial was performed on 20-year-old 'Red Delicious' apple trees at the Lockwood Farm of the Connecticut Agricultural Experiment Station, Hamden, CT. We expanded our testing to three biological controls, Blossom Protect, Bloomtime Biological (Northwest Agri Products Inc), and Double Nickel (Certis USA Inc); and two non-antibiotic bactericides Oxidate 2.0 and Cueva (Certis USA Inc). We also compared the efficacy of biological control application alone, non-antibiotic bactericide application alone, with combined applications of biological control and non-antibiotic bactericide. The Cougarblight risk level during infection period was "Extreme high" during the infection period.

Among the three biological control products tested, Blossom Protect exhibited the highest control efficacy. Forty eight percent of flowers treated with Blossom Protect was infected with fire blight, which is significantly lower than the water treated control (60%). Between the two non-antibiotic bactericides tested, Cueva (49%) performed better than Oxidate 2.0 (53%) when used alone. Notably, combined use of non-antibiotic bactericides (Cueva or Oxidate 2.0) with Blossom Protect provided better protection than when the products were used alone. The highest control efficacy was achieved when Blossom Protect was used in combination with Oxidate 2.0, which resulted in 31% of control efficacy.

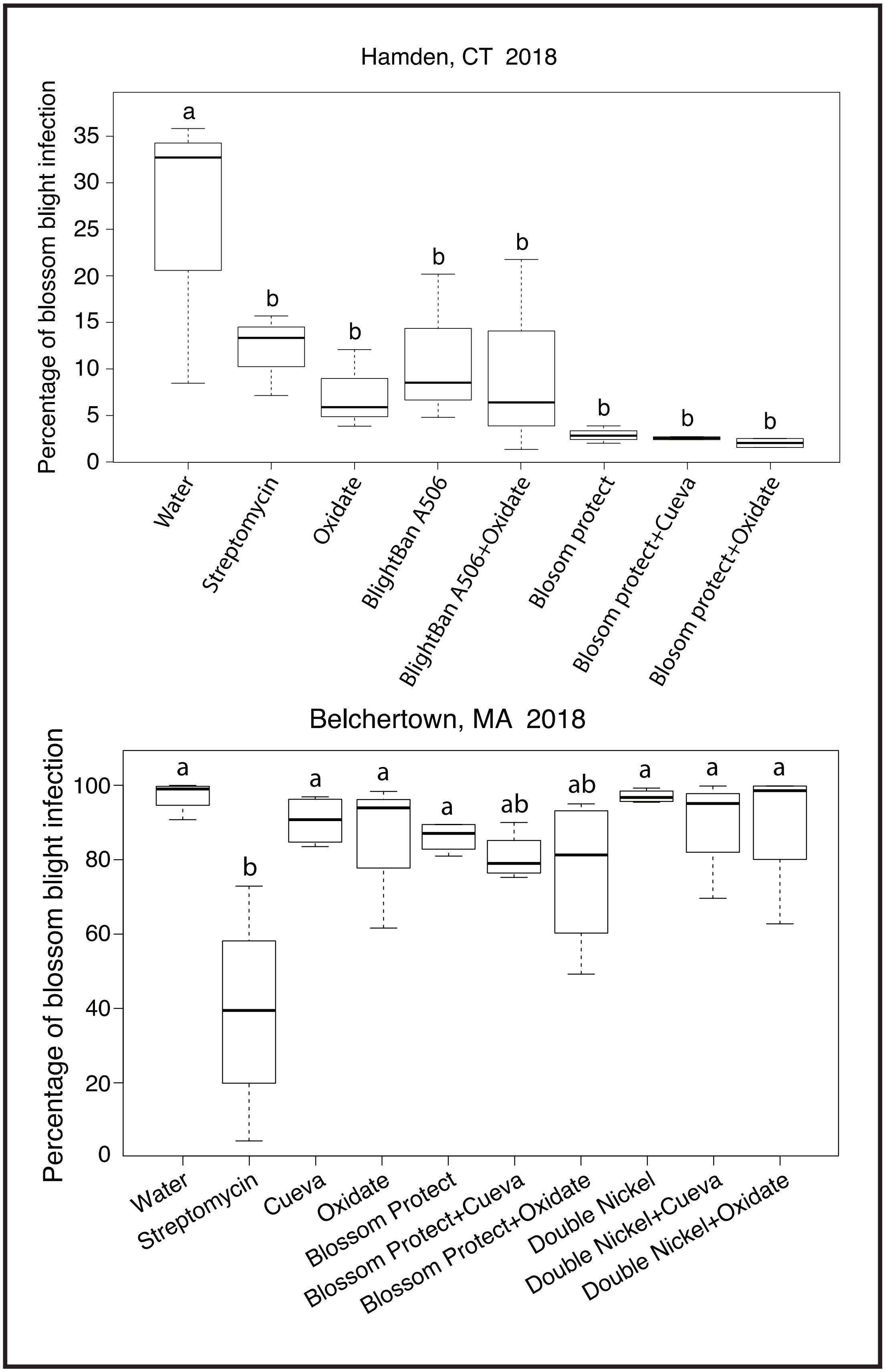
A similar test in Massachusetts was unsuccessful as cold temperatures during bloom prevented infection, even at high levels of bacterial inoculum (5 X 10^7 CFU/ml). Cougarblight risk level prior to and following inoculation was "Low".

2018

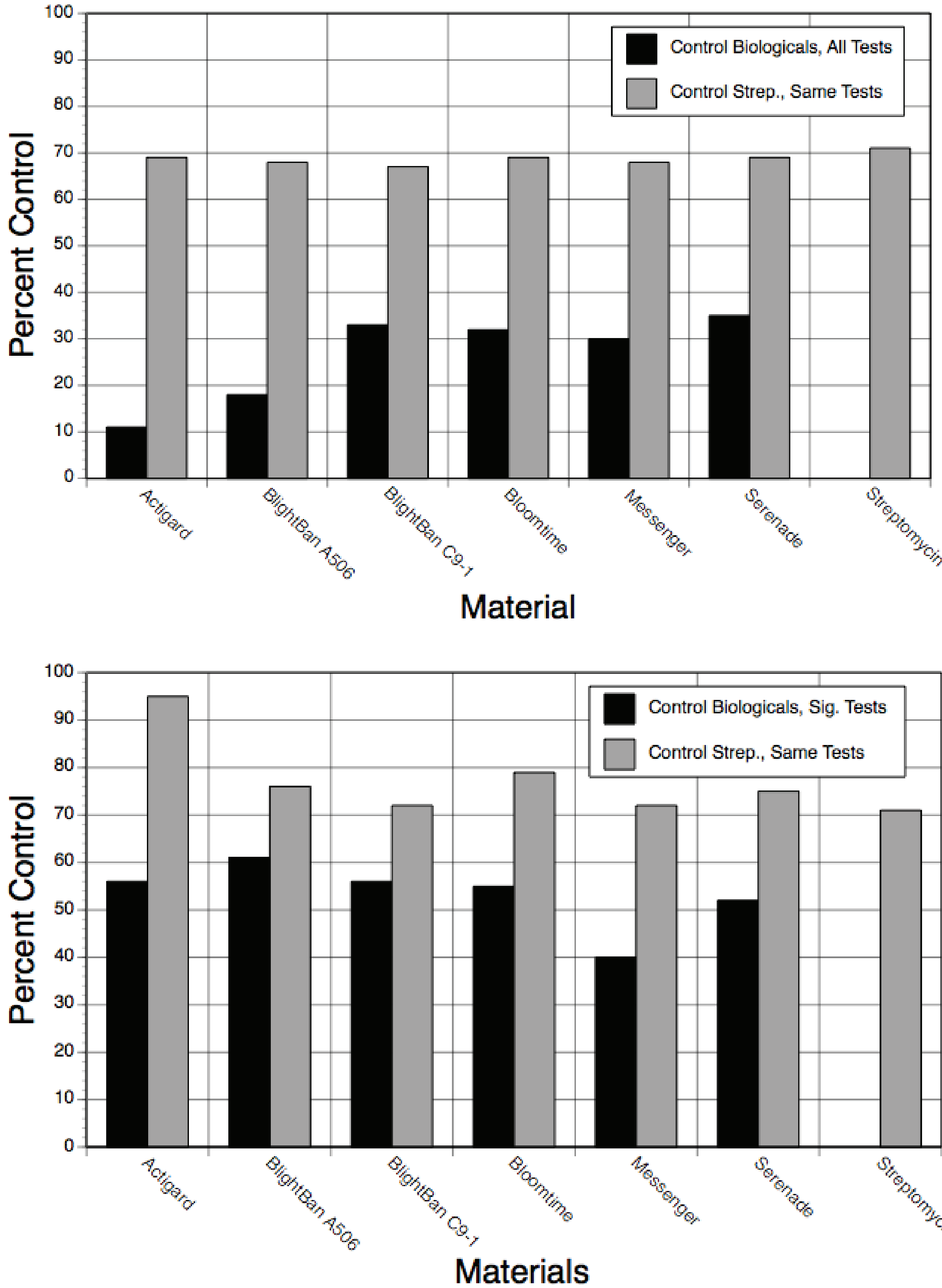
Field trial of 2018 was performed at two separate locations, one at the Lockwood Farm of the Connecticut Agricultural Experiment Station, Hamden, CT and the other one at the Cold Spring Orchard of University of Massachusetts, Belchertown, MA. Thirty-five year-old 'McIntosh' apple trees and thirty-year-old 'Jonagold' apple trees were used in CT and MA, respectively. Two non-antibiotic bactericides Oxidate 2.0 and Cueva were tested at both locations. Two biological controls, Blossom Protect, BlightBanA506 were tested at the CT location and Blossom Protect and Double Nickel were tested at the MA location. Biological controls alone, non-antibiotic bactericides alone, and combined application of biological controls and non-antibiotic bactericides were tested. The Cougarblight risk level was "Low" and "Extreme high" during the infection period at CT and MA locations respectively.

Compared to the high disease risks in previous years, low disease risk in CT in 2018 resulted in overall control success of all materials tested. This emphasizes that the biocontrol agents and non-antibiotic bactericides are particularly effective in controlling blossom blight under low disease pressure.

In contrast, the infection risk in MA was extreme, and almost all flower clusters on the water treated trees were infected. This is much higher than the average level of infection in typical inoculated experiments, where 30-60% of flower clusters are infected in water treated controls. Under this circumstance, the only treatment that caused a statistically significant difference from the water treatment was streptomycin. Despite this, we still observed a similar trend of the non-antibiotic bactericides as observed in previous years. Blossom Protect in combination with Cueva or Oxidate provided



Hamden, CT 2018
Percentage of blossom blight infection
0
5
10
15
20
25
30
35
a
b
b
b
b
b
b
b
Water
Streptomycin
Oxidate
BlightBan A506
BlightBan A506+Oxidate
Blosom protect
Blosom protect+Cueva
Blosom protect+Oxidate
Belchertown, MA 2018
Percentage of blossom blight infection
0
20
40
60
80
100
a
b
a
a
a
ab
ab
a
a
a
Water
Streptomycin
Cueva
Oxidate
Blossom Protect
Blossom Protect+Cueva
Blossom Protect+Oxidate
Double Nickel
Double Nickel+Cueva
Double Nickel+Oxidate



The top graph shows percent blossom blight control for twenty-five tests from 2000-2007. The bottom graph shows blossom blight control for just those tests in which the biological controls significantly decreased blossom blight relative to checks.

reduced blossom blight symptoms than water treated control, although the difference is not statistically difference.

Analysis and Recommendations

Over the three years, the biological control Blossom Protect in combination with Oxidate 2.0 provided the most consistent, high level of control against blossom blight. The control from the combined biological control plus non-antibiotic bactericide treatment comes in two ways. Blossom Protect, a yeast (*Aureobasidium pullulans*) competes with the pathogen for space and nutrients in apple flowers, and prevents the *Erwinia amylovora* bacteria from establishing and growing. The Oxidate 2.0 acts as a surface sterilant, destroying any *E. amylovora* that might be in flowers when it is applied.

The different modes of action of the two products makes appropriate timing of each one critical. To allow ample time for the biological control microorganisms to multiply on the apple flowers and exert their antagonistic effect, biocontrols need to be applied early in bloom, at 30-70% bloom. The surface sterilants need to be applied at a later stage of bloom, 90-100%, which will enable it to clean up any pathogen population that survived the biocontrols. Research has shown that flowers at petal fall or later are not likely to be infected by *E. amylovora*.

The New England climate imposes additional challenges to effective use of biological controls in managing fire blight. In the Pacific Northwest, average temperatures during bloom are often low, 50º to 60º F. This results in a prolonged bloom period of 10 to 14 days or more, and does not favor pathogen growth. It gives ample time to not only apply the biological controls, but also to let the biological controls multiply during flowering. In New England, mean temperatures during bloom are usually higher, as high as 70º to 80º F. At these temperatures, a flower can quickly progress from freshly open to petal fall within two to four days. This short window makes it challenging to apply biocontrol products at early bloom, and give them enough time to establish in the flower before the pathogen arrives. Higher temperatures favor *E. amylovora* growth, allowing the pathogen to compete more successfully against the biocontrol. When temperatures are high, the fireblight model Cougarblight indicates a high disease risk, biological controls' performance decreases.

A review of twenty-five efficacy tests for biological controls around the U.S. from 2000 to 2007 showed that streptomycin was consistently much more effective than biologicals for control of blossom blight in apples. In some tests, the biological controls had no effect compared to controls. However, in many tests, the biological controls did significantly reduce blossom blight. If just these tests are combined, the performance of the biologicals approaches that of streptomycin. What's the difference? Disease pressure. Weather, primarily temperature, and other factors such as the cultivar combine to generate higher or lower risk of infection. Where risk is high enough to cause some disease, but not extremely high, biologicals can significantly reduce fire blight.

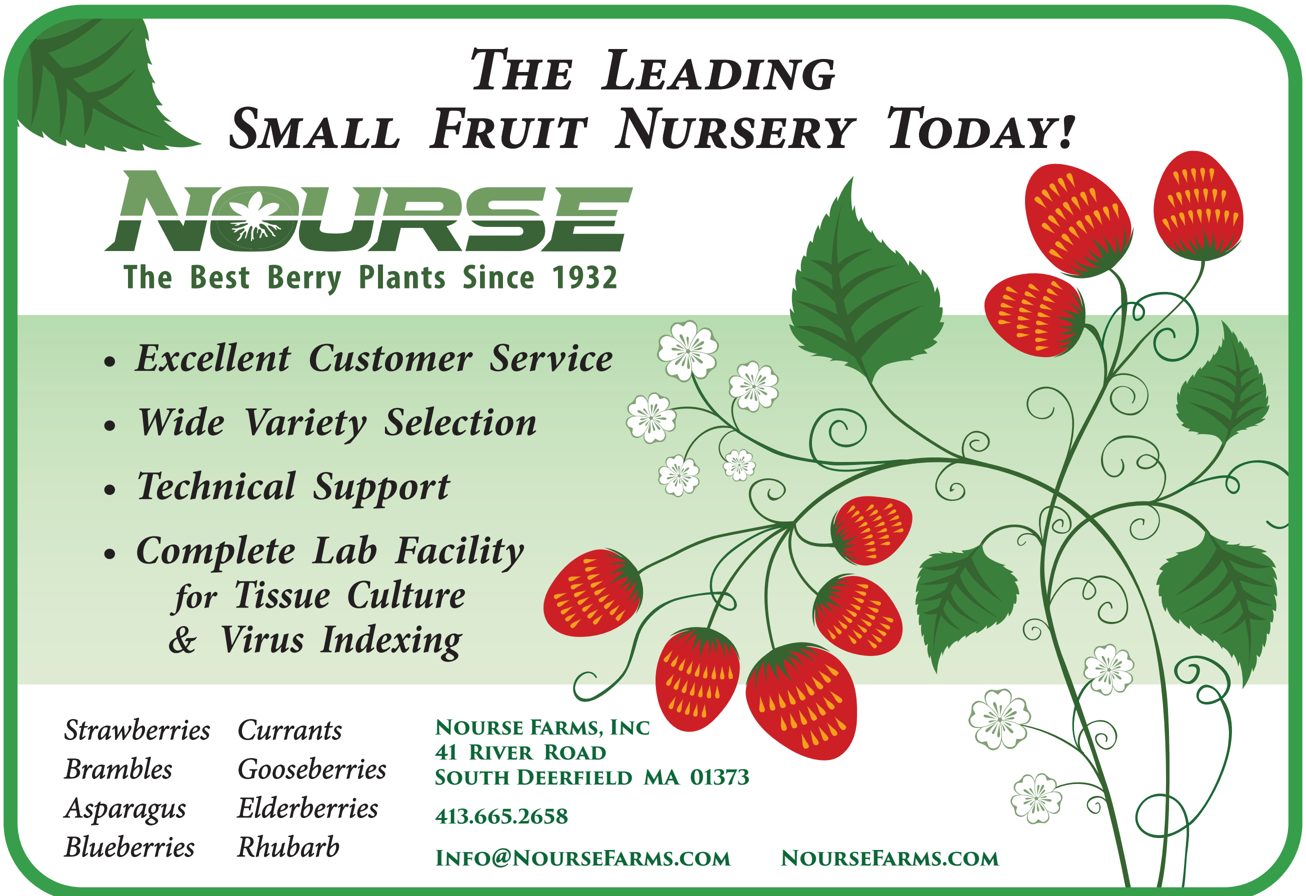
Given these facts, we recommend using streptomycin rather than biological controls or sterilants to control blossom blight when the mean temperature during bloom is above 70ºF. These temperatures typically give Cougarblight risk levels of "High" or "Extreme". Biocontrols and sterilants are more suited for controlling fire blight under moderate to low disease pressure, Cougarblight ratings of "Low" or "Caution", when temperature is below 70º F.

Since both products are allowed in organic production, the combined application of Blossom Protect plus Oxidate 2.0 may also give conventional growers an alternative to streptomycin when disease risk is relatively low. Conventional growers could use this combination, and perhaps other biological controls in applications timed around streptomycin sprays. For example, early in bloom growers might apply the biological, and if risk reaches a "High" rating in Cougarblight, apply streptomycin. Reducing streptomycin use can help growers reduce the risk of developing streptomycin resistance.

For organic growers, there really is no alternative. The Blossom Protect plus Oxidate 2.0 can be used in conjunction with other OMRI materials. It is particularly important for all growers to put on a green tip copper spray with a relatively high concentration copper. Organic growers can use, for example, Nu-Cop 50DF. In addition to the biological controls and Oxidate, growers can use low concentration copper products such as Cueva, or compounds that stimulate resistance, such as Actinovate or Regalia.

Acknowledgements

This work was funded by the Northeast IPM Center, USDA, the Connecticut Agricultural Experiment Station, and the University of Massachusetts Amherst Center for Agriculture, Food and the Environment.



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Evaluation of Metamitron as a Chemical Thinner on Apples

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Chemical thinning remains one of the most onerous tasks a fruit grower is required to do. Adjusting crop load to assure high fruit quality at harvest and allowing adequate return bloom for a crop the following year is extremely difficult since tree factors and unpredictable weather largely determine the success of a chemical thinner application. There are several thinners available that may be beneficial when used at specific times, provided that there are favorable conditions during the critical time after application.

Over 25 years ago, Ross Byers at Virginia Tech identified reduced light available to a tree during the chemical thinning period was a key component that influenced fruit abscission. This observation quickly led to a series of experiments conducted by several researchers that ultimately identified that available photosynthate at the 7 to 15 mm fruit size period determined if a fruit persisted or was signaled to abscise. Alan Lakso over a several-year period developed a computer program that was able to quantify the amount of carbohydrate available in a tree and used this as a tool to predict the ease at which a thinner could reduce crop load. Trees that were subjected to a severe carbon deficit were quite easy to thin; whereas, trees with an excess carbon balance were difficult to thin. The use of artificial shading and photosynthetic inhibitors confirmed the usefulness of the carbon-balance model. However, thinning by the use of artificial shading is not practical and available photosynthesis inhibitors could not be used because of side effects and the difficulty of getting the products registered.

Metamitron is an herbicide used to control weeds in sugar beets in Europe. It is a photosynthetic inhibitor that blocks photosystem II, thus reducing the ability of susceptible plants to produce carbohydrates. Sugar beets are immune to the effects of metamitron since they can quickly metabolize the molecule to a nontoxic breakdown product. Apple can metabolize metamitron as well, but it takes several days. The lag time until apple metabolizes metamitron is sufficiently long to create a carbon deficit in the trees that result in some of the fruit abscising. The most effective time of application of metamitron should be when fruit size is 10-15 mm, when apples are prone to a carbon deficit. During this period of time, there is intense competition between developing fruit and bourse shoot growth for the carbohydrates that are being produced at this time primarily by the spur leaves. The carbon-balance model is most useful in that it indicates an appropriate time of application and aids is selecting the dose of Metamitron to use given the prevailing weather conditions.

Metamitron is used and sold as chemical thinner (Brevis) in some European countries. It has been evaluated in this country for several years now. It is on track to be registered in the United States in as short a time as 3 years. In addition to ongoing research to support the registration of the product here, the focus of research now is to identify the concentration of the product to be used in the East and Midwest and to establish the most appropriate fruit size range to target application. Since metamitron is a photosynthetic inhibitor, the carbon balance model is used and followed closely in all research plots in order to identify environmental conditions and carbon balance that lead to consistent and predictable thinning.

The research conducted in 2018 was intended to evaluate the current formulation of metamitron (ADA 45701), the amount to apply, and the time of application (fruit size) on the thinning effectiveness of metamitron.

Materials & Methods

A block of mature Summerland McIntosh/M.9 was selected for this trial. Sixty uniform trees were selected at the pink stage of flower development. Three limbs per tree were selected, tagged, and the circumference of each was measured at the base. The number of flowering spurs was counted and recorded, and the bloom density was then calculated for each tree. Trees were separated into six groups (replications) of 10 trees each based upon blossom cluster density. Within each replication, trees were randomly assigned to one of ten

Table 1. Influence of metamitron on fruit set of Summerland McIntosh when applied 0n 24 May or 30 May		
Metamitron (lb/acre)	Fruit Set	
	Fruit/cm LCSA	Fruit/100 blossom clusters
	7.5 mm fruit size- applied 24 May	
ADA 46701 0	9.7 a	105 a
ADA 46701 1	8.6 abc	82 bc
ADA 46701 1.5	6.3 de	70 cd
ADA 46701 2.0	5.9 de	44 e
ADA 46701 2.5	7.5 bcd	74 bcd
MaxCel + carbaryl 64 oz 1 qt	9.2 ab	94 ab
Significance	l***q**	l***q**
	13.2 mm fruit size- applied 30 May	
ADA 46701 0	9.7 a	105 a
ADA 46701 1	6.4 bc	55 bc
ADA 46701 1.5	5.2 d	38 c
ADA 46701 2.0	3.9 d	19 d
ADA 46701 2.5	3.6 d	21 d
Significance	l***q*	l***q**

treatments which are shown in Table 1. Briefly, one tree in each group received ADA 46701 at 1, 1.5, 2, or 2.5 pounds per acre applied when fruit size averaged either 7.5 or 13.2 mm in diameter. One tree in each group was sprayed with 64 oz of MaxCel plus 1 quart of carbaryl at the 7.5 mm timing and one tree was not sprayed and served as the untreated control. Final fruit set was taken at the end of June drop in early July. Two weeks after application, all trees were rated for phytotoxicity symptoms on a scale of 1 no phytotoxicity to 9 extensive leaf injury and necrosis. At the normal commercial time of ripening during the third week in September, a 25-apple sample was harvested randomly from each tree. Fruit were taken to the laboratory where they were weighted, red color was estimated to the nearest 10%, and then flesh firmness, soluble solids and residual starch were rated using the Cornell generic starch chart on 10 representative apples.

Results & Discussion

Final fruit set data shows that metamitron thinned effectively in 2018, although there were differences in severity of thinning which can be attributed to fruit size at the time of application (Table 1). There was primarily

Table 2. Calculated carbon balance in McIntosh trees on the day of and the 5 days following metamitron application.		
Days after application	Date applied	
	May 24[1,2]	May 30
0	-22.5	- 5.2
1	-21.0	8.5
2	-21.4	4.2
3	- 7.0	22.2
4	11.0	35.1
5	- 3.0	23.3

[1]Suggestion on NEWA was to reduce thinning spray by 15% on 24 May and to apply the standard thinning rate on May 30.
[2]Averge fruit size was 7.5 mm on May 24 and 13.2 mm on May 30.

a linear reduction in crop load as the rate of metamitron increased that was recorded for both times of application. However, application when fruit size averaged 13.2 mm resulted in a greater thinning response. The use of higher rates at this fruit size resulted in over thinning. In general, a final set of 6 fruit per cm limb cross-section area is considered an appropriate final fruit set. When application was made at 7.5 mm the highest rates were required to achieve adequate thinning. The carbon balance in trees at the time of application differed (Table 2). The carbon balance in trees sprayed on May 24 was generally negative and the suggestion on the NEWA site was to reduce thinning severity sprays by 15%. The carbon balance in trees sprayed on May 30 when fruit size averaged 13.2 mm was neutral to slightly positive and the suggestion on the NEWA site was to apply the chemical thinners at the standard thinning rate. Fruit size at the time of metamitron application appears to be as important as the rate that is used. (In the 2019 thinning trial, metamitron application was made when fruit sized averaged 14 mm using a wide range of metamitron rates.)

Fruit quality parameters were evaluated on all fruit harvested in this trial. In general, metamitron had no direct effect on fruit red color, flesh firmness, or time of ripening as assessed by fruit starch rating, regardless of time of application (data not shown). Metamitron treatments increased fruit size and increased fruit soluble solids. We consider these responses to be secondary effects since metamitron reduced crop load which resulted in larger fruit sizes. Trees with a reduced crop load usually have higher sugar content due to a more favorable leaf-to-fruit ratio.

Under some circumstances metamitron can cause some leaf damage. This damage generally appears as a slight chlorosis or yellowing of the leaves. In this investigation, phytotoxicity was rated very low even at the highest rates used (data not shown). One had to look very hard to even detect it. We do not think orchardists will consider phytotoxicity to be a problem. In the past, when phytotoxicity was a concern, it was attributed to problems with previous product formulations and the use of surfactants in the spray. The formulations have been adjusted and improved, and surfactants are not recommended to be used in the East.

Conclusions

Metamitron is a chemical thinner that is registered and used in several countries in Europe. It is on track to receive regulatory approval in the United States within 3 years. The availability of metamitron will provide a unique tool for orchardists to thin apples. Its ability to inhibit photosynthesis will give orchards the ability to regulate the carbon balance in a tree, thus having more control over the thinning process. Once available, metamitron can be used alone or in conjunction with other chemical thinners thus providing orchardists more options and better control of the thinning process.


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Using Diluted Grape Juice for Early-season Monitoring and Its Potential for Attract-and-kill of Spotted Wing Drosophila, *Drosophila suzukii*

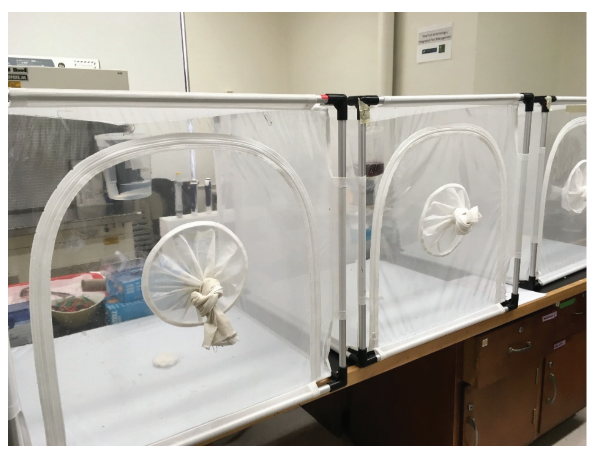
Jaime C. Piñero[1], Xiaojian Wen[1,2], and Emily Begonis[1]
[1]***Stockbridge School of Agriculture, University of Massachusetts***
[2]***Beijing Forestry University, Beijing, China***

Spotted Wing Drosophila (SWD), *Drosophila suzukii,* is primarily a pest of berry crops (brambles, blueberries, elderberries, and grapes) and some stone fruits (cherry, nectarine, and peach). While most commonly encountered fruit (or vinegar) flies typically infest over-ripe or damaged fruit, SWD is different in that it attacks healthy ripening fruit. The female flies possess a serrated ovipositor that can cut into sound fruit to insert their eggs. Current management options for SWD rely heavily on insecticide applications. While monitoring tools are critical to implementation of pest control tactics against SWD, effective monitoring represents a challenge for pest managers largely due to a lack of species-specific attractants. Commercial food-based SWD lures are available to monitor SWD populations. However, lures are based on fermentation materials and they attract a comparatively high number of other Drosophilid species (and other non-target insects), hindering trap performance and increasing sorting time.

In the fall 2018 issue of *Fruit Notes*, we reported on the high attractiveness of Concord grape juice, a low-cost and readily available material, to male and female SWD. When diluted at a ratio of one part grape juice to three parts water, diluted grape juice was three times more attractive to male and female SWD than one commercial lure under field conditions. Grape juice diluted at the 1:3 ratio also attracted significantly fewer (about three times less) non-targets than the commercial lure, highlighting the greater selectivity of grape juice. Here, we assessed the efficacy of traps baited with diluted grape juice at monitoring SWD early in the season, compared to two commercial lures. A secondary objective was the quantification of the relative trapping power of traps baited with either, diluted grape juice and three commercial lures using large cages in the laboratory.

Materials & Methods

SWD monitoring. On April 30, 2019, three sets of traps were deployed at five Massachusetts locations: Deerfield (two locations), Belchertown (UMass Cold Spring Orchard), Whately, and Amherst (UMass campus). For the first three locations, traps were hung from cherry trees. In Whately, traps were deployed in a non-host area located next to commercial raspberries. In Amherst, traps were positioned 50 cm above elderberry plants using steel wire. Three olfactory treatments were evaluated at each location: (1) grape juice diluted at the



Experiment layout for the comparison of the attractiveness of diluted grape juice against that of commercial lures to male and female Spotted Wing Drosophila in the laboratory. Cage dimensions: 55 cm^3.

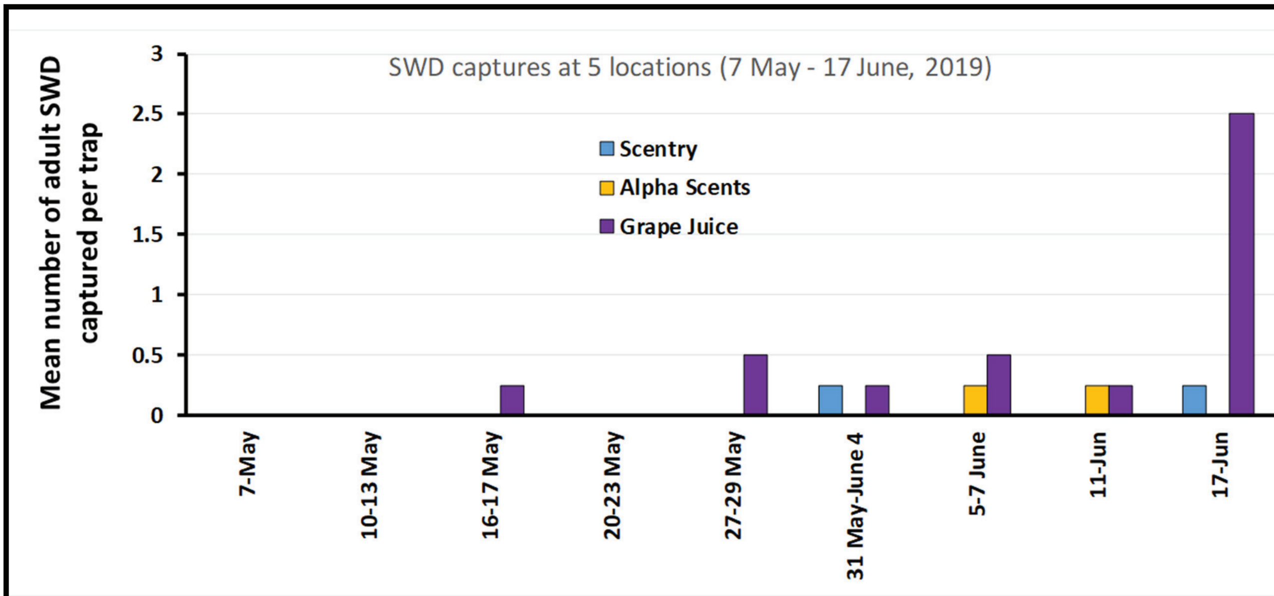


Figure 1. Captures (average number of insects per trap) of adult SWD (male and female data combined) by traps baited with either, grape juice diluted at a 1:3 ratio, Scentry® SWD lure and Alpha Scents® SWD lure. Each set of three traps was deployed at five Massachusetts locations. Traps were baited with commercial lures on 30 April 2019, and lures were replaced on 27-29 May 2019. Diluted grape juice was replaced at each inspection date.

1:3 ratio (1 part of grape juice and 3 parts of water), (2) SWD Scentry® lure (purchased from Great Lakes IPM), and (3) Alpha Scents® SWD lure (purchased from Alpha Scents, Inc.). Except for a few dates, all traps were serviced twice a week (on Tuesdays and Fridays) to minimize the effects of grape juice fermentation.

Trapping efficiency. Two experiments were conducted using screened cages (55 cm^3) in the laboratory (Amherst). The first experiment compared the attractiveness of diluted grape juice (200 ml) against that of the Scentry® SWD lure, and the Alpha Scents® SWD lure. Traps with commercial lures had 200 ml of unscented soapy water as drowning solution. The second experiment compared the attractiveness of diluted grape juice (200 ml) against that of Suzukii Trap® (200 ml). All attractants were evaluated using 1 L low-density containers with 12 openings in the sides to allow adult SWD to get inside (Figure 1).

For each observation day, 15 males and 15 females (4-6 days old) were released inside each cage between 8:45 and 9:00 am. Observations were initiated immediately after introducing the traps with the treatments. One person quantified the number of males and females that were captured by traps at 4, 8, and 24 hours after starting the experiment. Results show the percentages of males and females that were captured by traps over a 24-hour period.

Results

SWD monitoring. Monitoring traps were inspected 6-10 times from 7 May to 17 June 2019. Diluted grape juice was the only bait that detected SWD in the 16-17 May (1 female) and 27-29 May (1 female) sampling dates. Subsequent SWD captures took place on 27-29 May (2 females), 31 May – 4 June (1 male, 1 female), 5-7 June (1 male, 2 females), 11 June (2 females), and 17 June (11 females) (Figure 1).

Across all trapping dates, two males (one in a trap baited with the Scentry® SWD lure and one in a trap baited with the Alpha Scents® SWD lure) and 18 females were captured by traps. Traps baited with diluted grape juice captured 88.8% of all females; whereas, each of the two commercial lures captured 5.6% of the females (Figure 2).

In terms of non-targets, 21,119 insects belonging to the family Drosophilidae were captured by traps across all locations, bait treatments, and sampling dates.

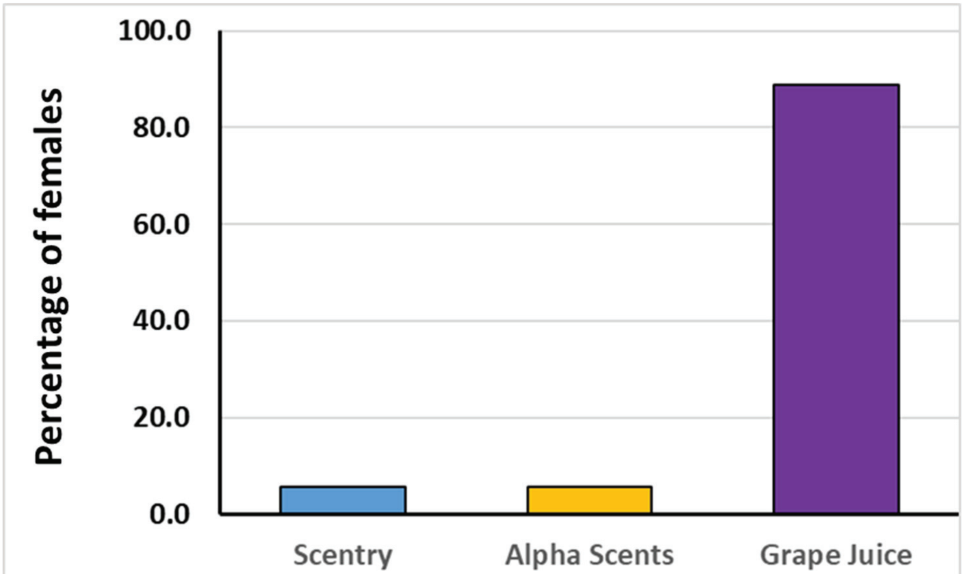


Figure 2. Distribution (expressed as percentages) of captures of female SWD according to olfactory treatment (n= 18 females).

Traps baited with the Scentry® and Alpha Scents® lures captured the most non-targets (6,766 and 11,325 specimens, respectively) whereas traps baited with diluted grape juice captured 3,048 non-targets. Efforts were made to minimize the effects of juice fermentation by checking traps twice a week. However, for some weeks, traps were inspected only once; therefore, captures of non-targets in traps baited with diluted grape juice may have been influenced by fermentation of this material.

Trapping efficiency. In the first experiment, traps baited with diluted grape juice captured 58% of the males and 87% of the females that were released inside cages, in a 24-hour period (Figure 3A). Traps baited with the Scentry® and Alpha Scents® lures captured significantly fewer males (29.7 and 36.7%, respectively) and females (23 and 35%, respectively) than traps baited with diluted grape juice, in a 24-hour period. Our results also revealed that twice as many females responded to grape juice than did males, suggesting that grape juice is female-biased. In the second experiment, traps baited with diluted grape juice captured twice as many females than the Suzukii Trap (average of 65.6 and 32.2%, respectively); whereas, male captures over a 24-hour period were similar between the two olfactory treatments (Figure 3B).

Conclusions

Our results indicate that diluted grape juice was effective at attracting the first SWD of the season at each of the five locations. In addition, traps baited with diluted grape juice captured most (89%) of the females that were trapped over a 6-week period, highlighting the effectiveness of this inexpensive material for SWD monitoring. The cage studies revealed that a statistically greater percentage of both males and females (first experiment), respectively, were killed by traps baited with diluted grape juice within a 24-hour period, when compared to three commercial lures. Diluted grape juice shows promise for monitoring and potentially for attract-and-kill of SWD.

Acknowledgments

We thank Tom and Ben Clark (Clarkdale Orchards), and Tim Nourse (Nourse Farms) for allowing us to work on their farms. We also thank Victoria Salemme for assistance. The Massachusetts Department of Agricultural Resources funded a large portion of this work using Specialty Crops Block Grant funds provided by the United States Department of Agriculture (USDA), Agricultural Marketing Service through agreement number AM180100XXXXG025. The views or findings presented here are the Grantee's and do not necessarily represent those of the Massachusetts Department of Agricultural Resources. The Short-term International Student Program provided research support for Ms. Wen for Postgraduates of Forestry First-Class Discipline (2019XKJS0501), Beijing Forestry University.

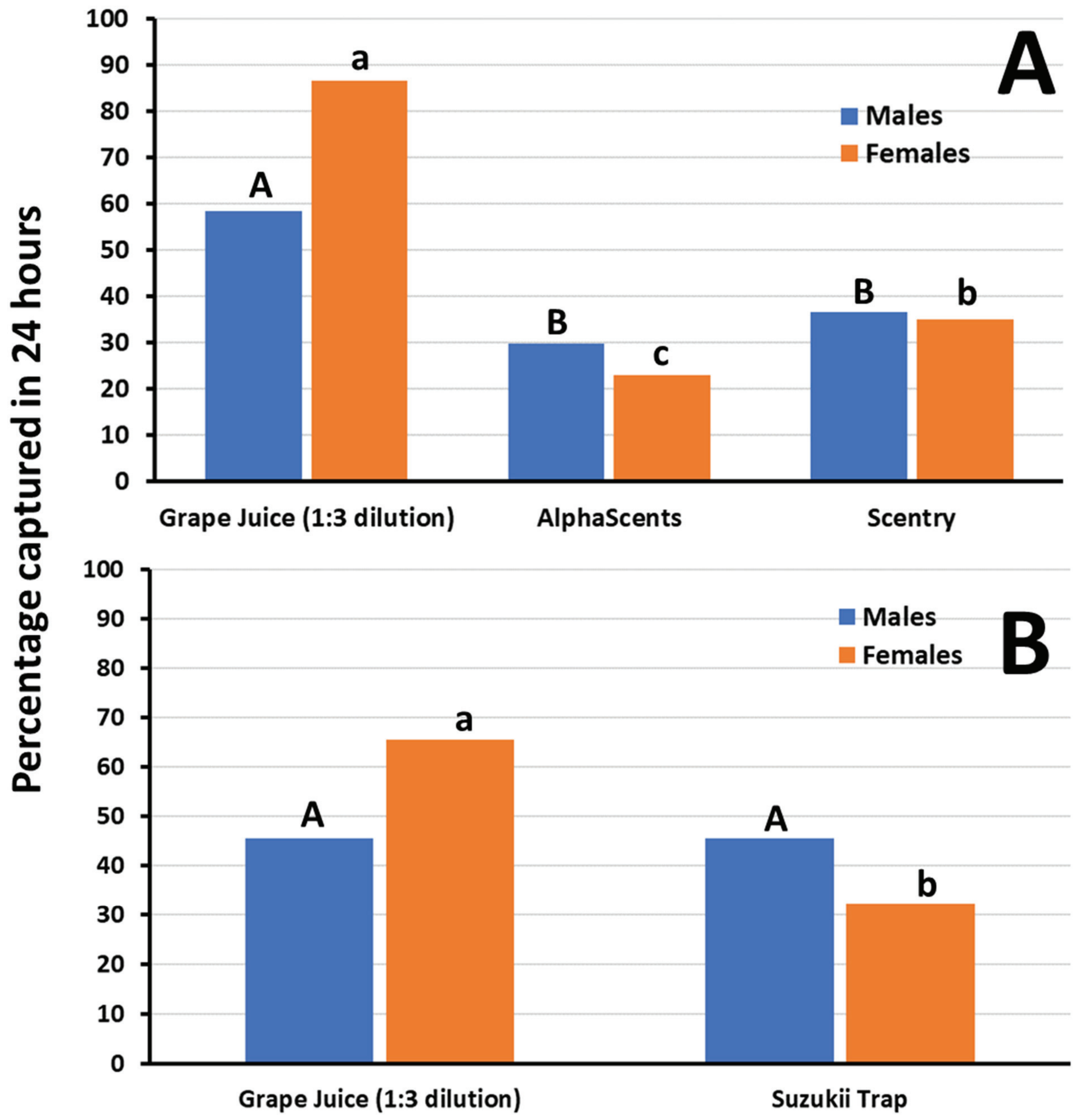


Figure 3. Captures of male and female SWD in traps baited with (A) diluted grape juice, Scentry® SWD lure, and Alpha Scents® SWD lure, and (B) diluted grape juice and Suzukii Trap®, in 55 cm^3 cages. Results are for combined captures across a 24-hour period. For each sex, means superscribed by the same letter (uppercase= treatment comparison among males; lowercase= treatment comparison among females) are not significantly different at odds of 19:1.

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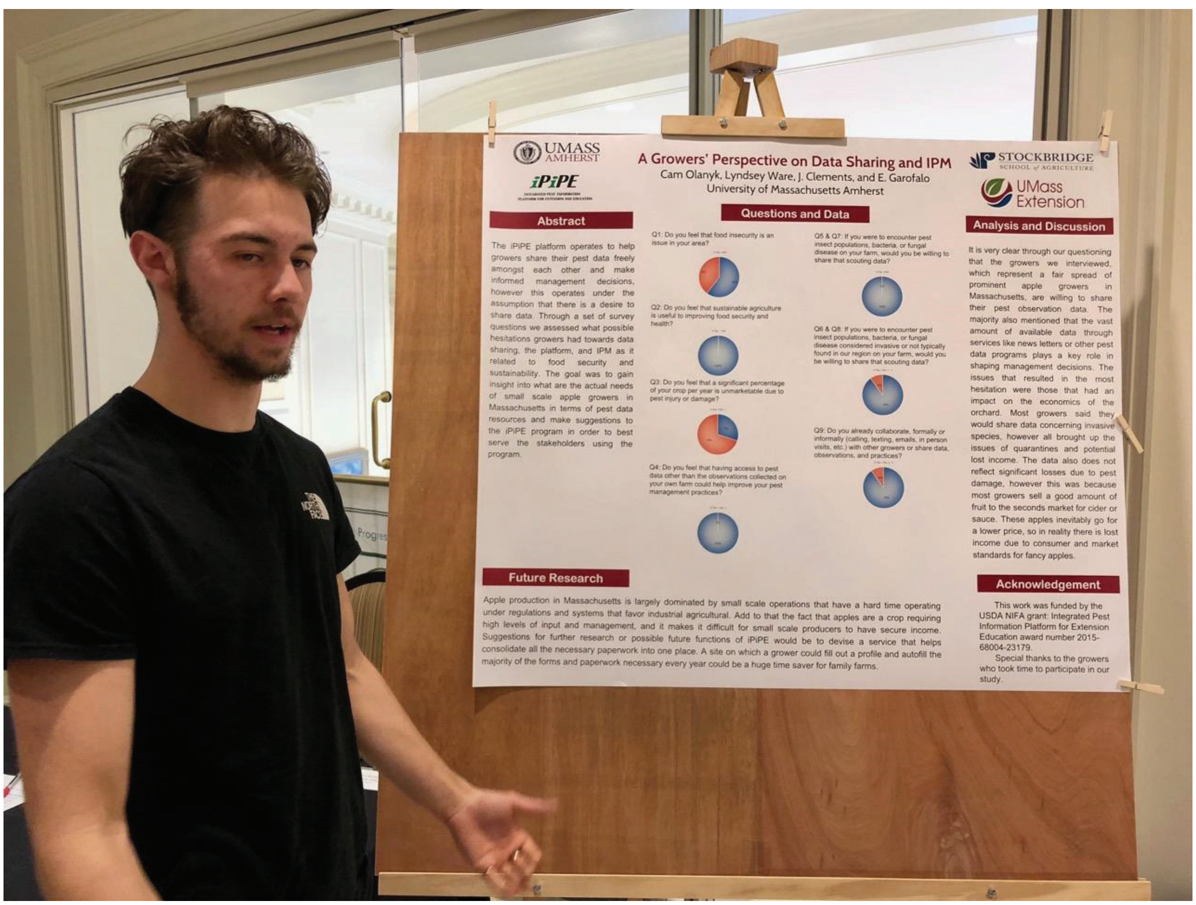
Growers’ Perspectives on Data Sharing and IPM

Camron Olanyk, Lyndsey Ware, Elizabeth Garofalo, and Jon Clements
Stockbridge School of Agriculture, University of Massachusetts

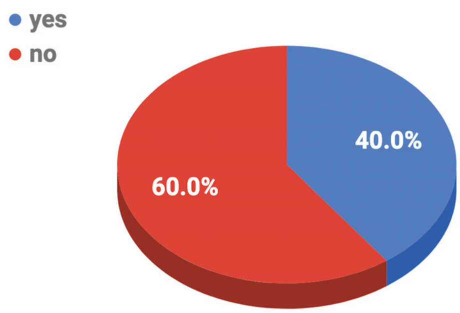
iPiPE is an online portal (ipipe.org) designed to help agricultural professionals, including growers, share pest observation data freely amongst each other to make better, informed management decisions. iPiPE therefore assumes there is a willingness and desire to share data. Through a set of survey questions, we assessed growers’ perceptions towards data sharing, the iPiPE platform, and IPM as it relates to food security and sustainability. Our goal was to gain insight into the needs and perceptions of apple growers in Massachusetts in terms of pest data resources to make suggestions and improve iPiPE so it can better meet its objective of “developing a national infrastructure of professionals who routinely monitor crop health and pest incidence then share this knowledge enabling dissemination of mitigation measures to limit food security impairment.”

During the 2018 growing season, we worked with Jon Clements and Elizabeth Garofalo as student interns on the iPiPE Northeast Apple Crop Pest Program (CPP). As already mentioned, iPiPE allows growers and other ag professionals to input and observe their own pest data, as well as see the pest data from other growers

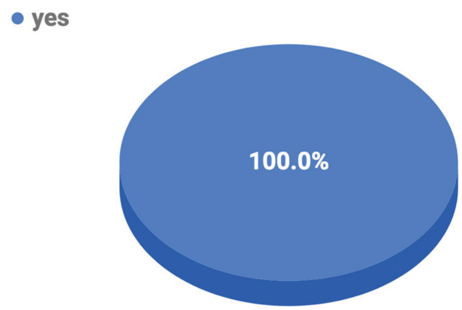


Cam Olanyk presents poster at iPiPE Mixer, North Carolina State University, 5-February, 2019

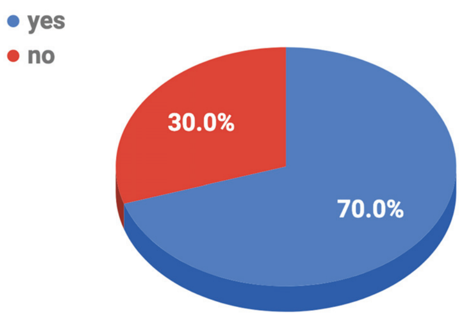
Question 1. Do you feel that food insecurity is an issue in your area?



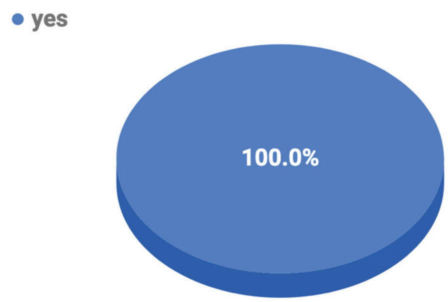
Question 2. Do you feel that sustainable agriculture is useful to improving food security and health?



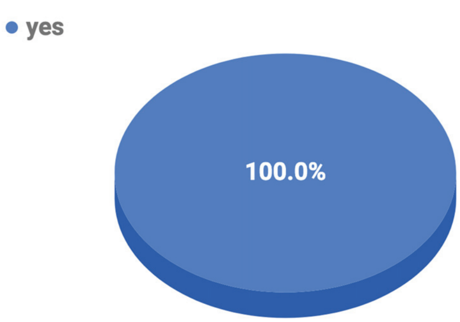
Question 3. Do you feel that a significant percentage of your crop per year is unmarketable due to pest injury or damage?



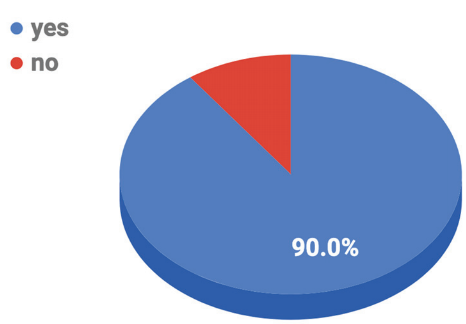
Question 4. Do you feel that having access to pest data other than the observations collected on your own farm could help improve your pest management practices?



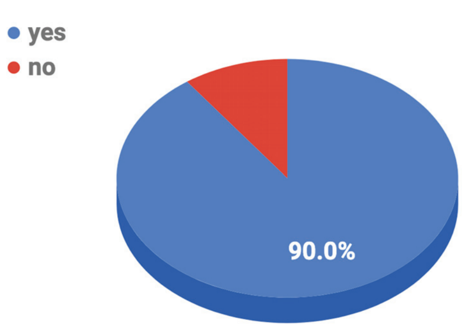
Question 5. If you were to encounter pest insect populations, bacteria, or fungal disease on your farm, would you be willing to share that scouting data?



Question 6. If you were to encounter pest insect populations, bacteria, or fungal disease considered *invasive or not typically found* in our region on your farm, would you be willing to share that scouting data?



Question 7. Do you already collaborate, formally or informally (calling, texting, emails, in person visits, etc.) with other growers or share data, observations, and practices?



to help better inform them of pest trends in their area. Part of our role was to scout and check traps in Massachusetts apple orchards and enter and record these pest observations into iPiPE. In addition, we were expected to create a research poster -- to be formally presented at the iPiPE 'Mixer' in February, 2019 at North Carolina State University -- based on something we had learned during our summer scouting and interaction with growers. It was our observation that most growers -- those being fruit growers in Massachusetts and the greater New England region -- seemed generally open to collaboration and sharing of information. To validate this assumption, we conducted an in-person survey in late August 2018 of ten apple growers who we had visited regularly though the growing season to get a more objective indication of their willingness to share pest data in certain situations.

After conducting interviews and compiling the data -- see pie charts -- it was overwhelmingly obvious that growers are more than willing to share information amongst one another and that in the majority of cases they already do just that. All of our growers said they are willing to share insect, bacterial, and fungal pest data, and 90% said they already actively share that information via email, phone calls, or other direct communication with growers in their area. The only time in which there was any hesitation to share data was in the case of invasive pests, and this brought up an interesting concern shared by many growers. How can small growers and family farmers compete against the industrial agriculture system if they have to quarantine their orchard or remove an entire productive block in response to an outbreak of some invasive pest? This may be a minor hurdle for larger scale operation, however, for a small grower this could spell disaster.

The Northeast is arguably the best place in the country for small, local agriculture. There is a long history of support from the community for growers as well as a culture of collaboration and comradery. This seems to be the key to continued success for small growers, that is openly sharing data and information to ensure the success of every farm. And we thank very much the growers who allowed us to survey them and openly answered our somewhat tough questions.

Cam Olanyk and Lyndsey Ware are undergraduate students in the Stockbridge School of Agriculture at UMass Amherst. Elizabeth Garofalo and Jon Clements are Extension Educators in the Center for Agriculture, Food, and the Environment at UMass Amherst. This work was partially funded by USDA/NIFA iPiPE 2015-68004-23179 and Extension Implementation Program 2-14-700006-22579.

Selected Red French-American Grape Varieties for the Northeast

J. Stephen Casscles, Esq.
Cedar Cliff Farm, Athens, NY

Baco Noir

This article covers recommended red grapes that I grow in the Mid-Hudson Valley at my farm Cedar Cliff, in Athens, New York. It outlines the viticultural aspects of these grapes and the wines they produce. Winemaking capability is an important consideration as growers need to grow varieties that are not only consistently productive, and economically & ecologically sound to grow; but which produce high quality wine. In the Northeast, many growers also own a winery. A grower should be interested in growing grapes in a profitable manner, but which can be used to produce quality wine. These varieties can produce more than one style of wine; this versatility in the cellar is an added bonus for the wine producer.

Baco Noir *(riparia, vinifera)*, is a small berried, thin-skinned black grape that is hardy to very winter hardy for most of the Northeast. It was bred in 1902 by François Baco (1865-1947) of Armagnac, France. Baco Noir is a cross of Folle Blanche, a traditional grape used to make brandy, by a mix of pollen of a *riparia* grape called Grand Glabre and V. *riparia ordinaire*.

Like many other *riparia* hybrids, the vine buds out early, so it is subject to late spring frost damage, but it produces a reduced secondary crop. Similar to other *riparias*, the vine has lush vegetative growth. Baco Noir is moderately susceptible to black rot and powdery mildew, but is resistant to downy mildew. It is susceptible to botrytis, especially if it rains during harvest, in which case the berries readily crack and botrytis sets in.

Baco Noir can be grown on moderately heavy clay soils. Since Baco is a *riparia* hybrid, it tolerates excessive soil moisture, but the ground cannot be wet or swampy for long periods of time. Baco Noir is a productive variety that ripens consistently by mid-season, around the third week of September, with sugars of between 20˚ and 23˚ Brix. While Baco Noir has some issues in the field, it is great in the cellar. It ferments easily and clears rapidly. To make quality wines, it needs to be harvested when mature to reduce its naturally high malic and tartaric acids.

Baco Noir can produce a wide range of quality wines similar to: Burgundian Pinot and Gamay Noirs; light Italian Valpolicellas, Nouveaus; and Rosés. Baco Noir has deep color, lots of berry, black cherry, and plum fruits, and relatively high-acid levels with a long clean finish. It has great aging potential and brings presence

Burdin Noir

to red wine blends, but does not dominate.

Burdin Noir (B. 6055) *(rupestris, riparia, labrusca, lincecumii, vinifera)* is a great red wine grape whose heritage is approximately one quarter *vinifera*. It is a cross of Plantet x Seinoir. It was bred by Joanny Burdin, who began breeding grapes around 1925 in the Saône-et-Loire department, Burgundy, France.

Burdin Noir is easy to grow with a vigorous, upright growth habit, with thick three to four foot canes that grow in an open canopy. It has good fungal disease resistance, even in wet years. The vine is moderately winter hardy with strong vigor and heavy yields. The medium-large sized compact clusters are cylindrical. The dark blue berries are large with thick skins. Burdin Noir likes a deep, well-drained soil, but will grow in fertile and damp, but not wet, clay soils. The grape ripens by late mid-season to late and hangs well after the grapes ripen.

Burdin Noir makes a superior wine with aging potential. The wine's color is of light beet juice. It has a pronounced berry nose and a soft, but full, tannin structure, with a long clean finish. The flavor profile is of strawberry jam, pomegranates, lots of berries, with a pleasant flint undertone.

Chambourcin (J.S. 26-205) *(berlandieri, cinerea, labrusca, lincecumii, riparia, rupestris, vinifera)*, is a versatile red wine grape that was developed by Joannes Seyve (1900-1966) in Bougé Chamalud, just south of Lyon on the Rhône. Its' parentage is uncertain, but Chancellor may be one of its parents. It can make Rhône or northern Italian-type reds or Anjou-type rosés.

Chambourcin can make big, rich reds as well as light fruity rosés. Chambourcin grown in colder or short season locations can have a thin austere quality, so the variety's northern-most range should be confined to the southern-most coast of New England.

Chambourcin buds out very late, but produces a secondary crop after a late spring frost. The vine is moderately vigorous, of standard size, and produces very large, moderately loose bunches of blue-black grapes. It is consistently productive, but needs cluster thinning. The vine is sensitive to lime soils and should not be planted in droughty places. It does well in deep, well-drained soils. It is only slightly less winter hardy than Baco Noir and about as hardy as Chelois. The grape is somewhat resistant to fungus diseases. It is resistant to botrytis and most bunch rots due to its thick skin, loose-forming clusters, and late harvest date. It is somewhat sensitive to sulfur treatments. Due to its airy canopy and loose clusters, the vine readily accepts fungus sprays and dries out quickly. The grape ripens late to very late.

Chambourcin has elements of a soft, light Rhône or Cabernet Franc. It has a soft, but firm, tannin structure, lovely flavor profile, subtle nuances, and prominent black pepper aroma. These flavors overlay nicely with the grape's basic berry front of blackberries, black cherry/raspberry, cooked mulberries, and chocolate.

Chambourcin

Chelois

The wines are aromatic and earthy with a bouquet of eucalyptus, spice, and cigar box. Chambourcins can have a muted grapey nose, unless aged for five years or more or blended with varieties such as Baco Noir, Burdin Noir, Cabernet Franc, or Chelois to soften it up.

They make lovely rosés, like an Anjou rosé which are partially made with Chambourcin. These rosés are not like sweet Pink Catawbas, but steely rosés that have presence. These high-acid raspberry-red to peach-colored wines are bright, with elements of cranberries, lemons, watermelons, and Hawaiian Punch with a slate finish.

Chelois (S. 10878) *(aestivalis, cinerea, labrusca, riparia, rupestris, vinifera)* makes an excellent *vinifera-like* red wine that is complex, approachable, with great balance and tannin structure. It is also a good performer in the field. Chelois was developed by the French physician, grape breeder and nurseryman, Dr. Albert Seibel (1844-1936) who lived in the Rhone-Alpes region of France. Chelois, a hybrid of S.5163 x S.5593, was hybridized during the first part of the twentieth century, and has the same seed parent (S. 5163) as the red Seibel hybrids Chancellor and De Chaunac. The *vinifera* heritage of Chelois constitutes about 50 percent of its genetic make-up.

Chelois is a vigorous grower that is moderately productive. Its harvest date is no earlier than late mid-season to early late season, about ten days after Baco Noir. Its bud break is late, but if injured by a late frost, it has a small secondary crop. It is winter hardy, but less so than Maréchal Foch or Baco Noir.

The vine is healthy and vigorous, with a slightly upward to lateral growth habit that is bushy. Chelois has an open canopy, which increases sunlight to the fruit and encourages the foliage and fruit to dry off quickly. The very compact cluster is medium in size and cylindrical with a medium-sized blue-black berry. It likes deep, well drained, and rocky soils, not droughty or heavy clay soils. The grape is somewhat resistant to black rot and downy mildew, but is susceptible to powdery mildew. Further, due to its very compact cluster, it can get bunch rot. Often, in the United States, Chelois vines or their cuttings seem to have a virus problem, perhaps tomato ringspot, which can lead to early vine decline.

The quality of Chelois wines is excellent. Chelois has soft mature fruit, medium-bodied tannin structure, and an approachable acid profile that ages very nicely for twenty years. Chelois is a complicated wine, that is Burgundian in character.

The wine's color is a medium scarlet red. The nose is aromatic, complex, and layered with elements of dried fruits, smoky wood, cedar box, black cherry, raspberries, and other berries, strawberry jam, and a nice spiciness reminiscent of anise and eucalyptus. Chelois has a firm, but approachable acid/tannin profile that can stand on its own or blended with other reds. What distinguishes Chelois from many other French-American hybrid wines is that it has a very complete *vinifera* nose and taste, with soft spice and black pepper.

Chelois blends well with deeply pigmented/highly acidic wines such as the Minnesota red hybrids. This is because it tones down their deep purple pigments and high acids. In addition, Chelois blends well with heavy-bodied reds such as Chambourcin, Chancellor, Cabernet Franc, or Cabernet Sauvignon; and the resultant wine remains a hefty long-lived wine that is more approachable.

Landot Noir (L. 4511) *(aestivalis, berlandieri, cinerea, labrusca, lincecumii, riparia, rupestris, vinifera)* is a hybrid of Landal Noir (L. 244) x Villard Blanc that is between forty to fifty percent *vinifera* in heritage. It was bred by Pierre Landot (1900-1942) of the Rhône-Alpes region of France. Landot Noir is the seed parent of Frontenac.

It is a vigorous vine, with a late bud break. It ripens early mid-season to mid-season. It is winter hardy with good disease resistance, especially to downy mildew. The growth habit is upright to lateral. Landot Noir is a consistent and heavy producer that is effortless to grow. The long and relatively narrow cluster is medium-large to large, consisting of medium to medium-large-sized blue berries. The wine is a fruity Beaujolais-like wine with full body and good tannin structure.

Léon Millot (Kuhlmann 194-2) *(riparia, rupestris, vinifera)*, is productive and makes an excellent hearty, sometimes opaque, red wine. Léon Millot is a cross of a seedling of Millardet et Grasset101-14 by pollen of Goldriesling. Léon Millot, along with Maréchal Foch, was developed around 1911 by Eugene Kuhlmann (1858-1932). Kuhlmann was the director of the Institut Viticole Oberlin at Colmar, Alsace. Reports of the growing habits and wine attributes of Léon Millot vary widely. This is because there are two clones of Léon Millot.

The clones are the Foster (nursery) Millot (or ***Millot Rouge***) and the Boordy (nursery) Millot (or ***Millot Noir***). The descriptors below will bear out why they are referred to this way. Both clones produce sugars of 24˚ Brix.

Millot Rouge was distributed by Foster's Nursery as Léon Millot and has the same genetic makeup as Maréchal Foch. It is similar to Foch in its growth habit and the wine that it produces. This black grape ripens very early, sometimes even before Foch, but generally no more than one week later. Its early bud break, small cluster size, tight and compact clusters, and shape are similar to Foch, but Millot Rouge is a bit more vigorous in vegetative growth. The variety is very vigorous in the field, more so than Foch, more productive, and has higher acid and sugar levels.

Léon Millot

While very winter hardy, its canes are more spindly than Foch and winter dieback can be more pronounced because of the thin canes. Millot Rouge has good disease resistance, but due to its thick canopy, it must be sprayed carefully to control fungus diseases. The wine is medium bodied and fruity, with lots of berry, blackberry, and bright prune notes in a Burgundian style. The berry notes of Millot Rouge are more herbal, woody, and complex than Foch and its color is darker.

Millot Noir was distributed by Boordy Nursery, the now sadly defunct nursery of Philip and Jocelyn Wagner of Riderwood, Maryland. It is a vigorous grower, more like Baco Noir, and more productive than Millot Rouge. It has larger clusters that ripen later than Millot Rouge.

Millot Noir, it is believed, has the same genetic makeup as Millot Rouge and Foch, and while it has some of the attributes of Millot Rouge, there are significant differences. While Millot Rouge clusters and plant look like Foch, Millot Noir is a very vigorous vine that also has more spindly, but longer growing canes. Also, it ripens by mid-season or later, a full ten days to two weeks after Foch or Millot Rouge. The clusters are much larger than Millot Rouge or Foch, but its berries are small, sometimes very small. The vine is much more productive than Millot Rouge. It has good disease resistance, but is more susceptible to botrytis than Foch. For the Northeast, Millot Noir, may be one of the few very winter hardy varieties that can consistently produce these large, dark, complex reds.

It is in the wine that really differentiates Millot Noir from Millot Rouge. Millot Noir is a very big, aromatic, chewy, herbaceous, and earthy wine that is more reminiscent of a Rhone or a big Italian red. It's flavor profile includes cooked mulberries, chokecherries, tobacco, black olives, and licorice. It is integrated, but layered, with elements of leather, thyme, eucalyptus, and lots of earth. It has none of the soft berry flavors of Millot Rouge.

Both Millots are solid wines, with aging potential. They are also good for blending and benefit greatly from wood aging. Millot Rouge adds a nice berry nose to any blend and softens its acid profile, while Millot Noir has big tannins that can provide deep color, depth, and complexity to a blend. Leon Millot has been overlooked in the past and should be considered for future plantings in the Northeast.

Maréchal Foch (Kuhlmann 188-2) *(riparia, rupestris, vinifera)* is versatile both in the field and cellar. Like Léon Millot, it is a seedling of Mgt. 101-14 x Goldriesling that was bred in 1911 by Kuhlmann.

Maréchal Foch (Foch), is an early ripening, vigorous variety. Foch is not particular about its soil. It is relatively productive, but due to its small cluster size, has only average yields. It buds out very early to early on a vine that is smaller than average. Its compact cylindrical cluster is small to medium in size. It is very winter hardy in the Northeast and will produce a small secondary crop if hit by frost. The vine is generally resistant to fungus diseases, particularly downy mildew and botrytis, and slightly less so for black rot and powdery mildew. Further, it is somewhat sensitive to sulfur treatments.

Foch is versatile in the cellar. It makes a standard red table wine; soft and easy to drink Beaujolais-style red; rosé; and Nouveau. In addition, it blends well with other red wines to add more fruit or to soften other wines. The deep to medium-deep colored red-violet wines are light to medium in body. The wines tend to be relatively high in malic acid, and low in tannins. It has some limited ageing potential and can benefit for oak aging.

Maréchal Foch

Foch can be made into many different wine styles. Among its flavors are fresh blackberries, blueberries, cooked strawberries, bramble-berry jam, and red cherries. The wines can have a creamy fleshy feeling and a soft-acid/tannin profile, so it may need to be blended to enhance its presence. Some have a musty, herbaceous, metallic finish; however, they can be complex and perfumy with elements of chocolate, cloves, leather, black olives, burnt toast, and mocha.

The red grape varieties detailed above can prosper in some or most of the Northeast. They make high quality wines and are versatile in the cellar. Very importantly, they consistently produce bountiful crops to boost the growers' bottom-line and can be grown in an ecologically sound and sustainable manner that make a diverse set of quality wines that are unique to the Northeast.

This article is based on the author's over forty years of experience growing French-American hybrid grapes and making wine from them at the Hudson-Chatham Winery. See generally, J. Stephen Casscles, Grapes of the Hudson Valley and Other Cool Climate Regions of the United States and Canada *(Coxsackie, N.Y.: Flint Mine Press, 2015.*

Tyler David Hardy of Brookdale Fruit Farm Passes

Tyler David Hardy, 35, of Hollis, New Hampshire, passed away suddenly on Saturday, June 15, 2019. The fruit industry lost a great friend in Tyler Hardy. Loved by all it was a shock to New England growers to loose a great young grower so early. Born on March 1, 1984, he was the son of Charles and Leigh (Byers) Hardy, of Hollis, and the husband of Madison (Lowell) Hardy, also of Hollis.

In his younger years, Tyler enjoyed playing soccer, snowmobiling, golfing, spending time at the lakes and downhill skiing. He carried his passions for golfing and skiing into his later years and enjoyed both activities with family and friends.

Tyler attended Hollis/Brookline High School, graduating in 2003. He continued on to Endicott College graduating with a business and history degree in 2007.

After college, Tyler went on to work for the family business as a farm manager at Brookdale Fruit Farm, demonstrating an innate and exceptional ability as an orchardist.

He was active in the community as well as the farming industry participating in several organizations such as the New Hampshire Farm Bureau and the International Fruit Tree Association. He served as the president of the New Hampshire Fruit Growers Association and was the chairman of the New Hampshire Agricultural Advisory Board.

Out of all of his passions and activities, he always said being a husband and father was by far his greatest honor and accomplishment. In addition to his loving wife Madison, their newborn son Edwin, his parents, and his favorite furry companion Pilot, family members include his brother and sister-in-law, Trevor and Katie Hardy; his in-laws, John and Carrie Lowell; sisters-in-law and brothers-in-law, Katherine and Andrew Raucci, and Trevor and Emily Lowell; as well a large extended family and a tremendous group of friends.

Tyler was an exceptional human being: he was kind, generous and always brought humor and grace to everything he touched. There has been no other like him and he will be greatly missed. “There is a place called ‘heaven’ where the good here unfinished is completed; and where the stories unwritten, and the hopes unfulfilled, are continued. We may laugh together yet...” J.R.R. Tolkien.

In lieu of flowers, memorial donations may be made to the Tyler D. Hardy Memorial Fund through the following GoFundMe page: https://www.gofundme.com/tyler-d-hardy-memorial-fund.

New Jersey News

NEW JERSEY PEACH PROMOTION COUNCIL ELECTS THREE NEW DIRECTORS

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Glassboro, NJ (March 15, 2019)—The New Jersey Peach Promotion Council welcomes three new board members, Erica Shiles, Bonnie Lundblad and Matt Duffield.

Erica is a fourth-generation family farmer on F & R Grasso, in Sewell, purchased in 1953. The farm harvests several peach varieties throughout the season including white and yellow peaches, white and yellow donut peaches and nectarines, selling them retail at their farm markets. "Our most popular are donut peaches." Says Erica. "They are only in season for a few weeks in August, but customers rave about their delicious sweet taste and unique shape." (www.duffieldsfarm.com)

Matt Duffield is also a fourth-generation peach grower on the Duffield Family Farm, in Sewell, started by his great grandfather in the 1940's. The family harvests yellow and white peaches and nectarines throughout the season, from mid/late June through September, selling at their retail farm market (www.duffieldsfarm.com)

Erica Shiles.

Matt Duffield.

Bonnie Lundblad.

Bonnie Lundblad brings retail expertise to the Peach Promotion Council. She has a degree in advertising and communications and 20 years sales experience in the produce industry. She currently is a sales representative for Sunny Valley International, in Glassboro, a premier packer and distributor of fresh fruits and vegetables since 1986 (www.sunnyint.com)

"We are delighted to have these three young-generation members on our board," says Santo John Maccherone, chair of the Peach Council. "They bring fresh perspectives and ideas for promoting our locally grown peaches."

For further information, email the New Jersey Peach Promotion Council information office, info@jerseypeaches.com; or visit the website www.jerseypeaches.com Find jersey peaches on facebook.com/newjerseypeaches. Follow us on Twitter @NJ_Peaches.

The New Jersey Peach Promotion Council is a non-profit voluntary organization of growers, shippers, wholesalers, marketers and associated industries dedicated to maintaining a viable peach industry in the Garden State for the purpose of preserving farmers and farmland; and to providing the highest quality and best tasting fresh peaches for consumers by insuring the orderly marketing and promotion of New Jersey Peaches. New Jersey is the fourth largest peach producing state in the country, with approximately 75 orchards on 5,000 acres, producing 22,000-2,5000 tons, valued at approximately $30-million.

Twilight Meetings, Spring 2019

Dr. Megan Muehlbauer (Hunterdon County Agricultural Agent/Rutgers Cooperative Extension) hosted two twilight meetings for fruit growers, both of which were sponsored by Rutgers the State University/ New Jersey Agricultural Experiment Station.

The first meeting of the two-part series was held at Stony Hill Orchards in Chester New Jersey (http://stonyhillfarms.com), and was hosted by the Davis Family. Speakers included Dr. Clement Akotsen-Mensah a Post-doctoral Fellow in Dr. Anne Nielsens tree fruit entomology laboratory at Rutgers University. Dr. Akotsen-Mensah spoke on plum curculio management in peaches.

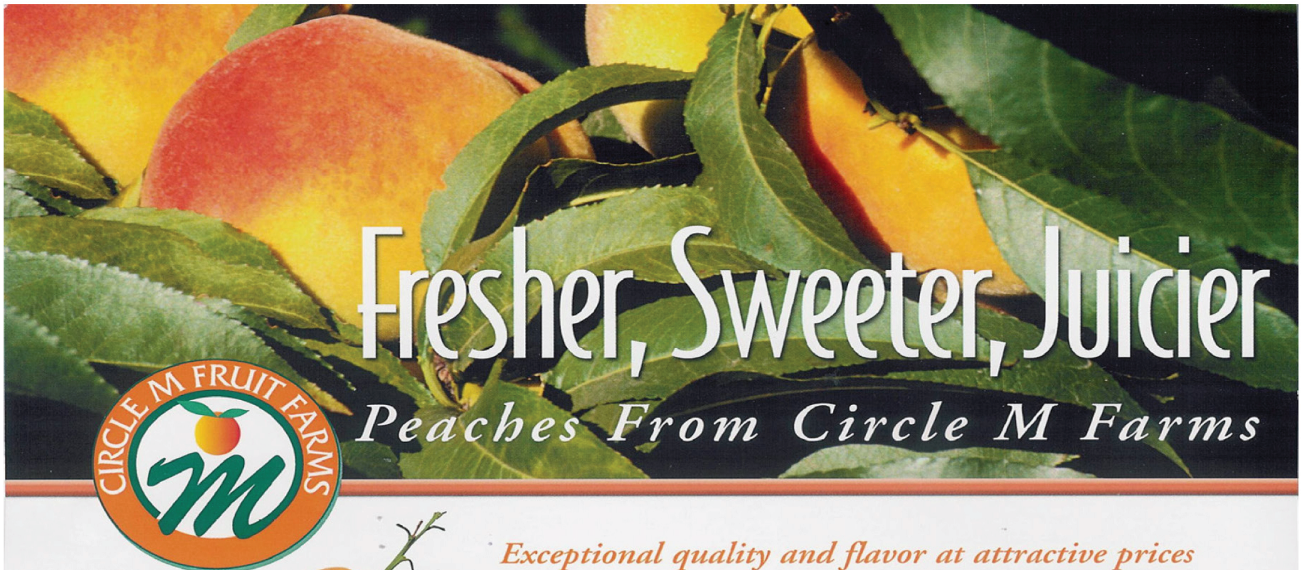
Twilight meeting II was held at the Rutgers University, Snyder Research and Extension farm in Pittstown, NJ (https://snyderfarm.rutgers.edu) and included a tour of a number of field trials including Dr. Megan Muehlbauers hard cider apple variety trial (Photo 2). Details and preliminary data on this trial can be found in the previously published horticulture News articles:

Promising New Jersey Hard Cider Apple Trial Updates

http://www.horticulturalnews.org/98-4/a3.pdf

Assessment of One Year of Growth in the New Jersey Hard Cider Variety Trial

http://www.horticulturalnews.org/99-1/a2.pdf



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