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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:

MA Blake	1920 - 1947
Norman F Childers	1948 - 1980
Win Cowgill	1981 - 1988
Emily Brown Rosen	1988 - 1990
Linda Butenis Vorsa	1991 - 1995
Jerry Frecon	1995 - 2010

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: Two-year-old Gibson Golden Delicious trees on M.9 NAKBT337 at Rutgers Snyder Farm. Photo credit Win Cowgill.

Evaluation of Diluted Grape Juice as an Inexpensive Attractant for the Invasive Fruit Pest, Spotted Wing Drosophila

Jaime C. Piñero and Nicole Foley
Stockbridge School of Agriculture, University of Massachusetts

The Spotted Wing Drosophila (SWD), *Drosophila suzukii*, is a fruit fly native to southeast Asia and invasive to the United States and Europe. The fly's preference for ripening fruits and the female's ability to pierce soft-skinned fruits during egg-laying make SWD a pest of great economic significance. SWD is primarily a pest of berry crops, including brambles (e.g., blackberries and raspberries), strawberries, blueberries, and currants. Soft-skinned grapes and tree fruits (e.g., cherries, peaches, nectarines, plums, and Asian pears) are also hosts for SWD.

Current pest management practices for SWD require frequent insecticide applications, which come at a high environmental and economic cost. In order to effectively time these sprays to mitigate damage, growers need to monitor SWD populations. Commercial food-based lures are available for monitoring purposes. However, those lures are based on fermentation materials and consequently they also attract a comparatively high number of other fly species that belong to the same family (Drosophilidae) as SWD, as well as other non-target insects. Captures of unwanted insects hinders trap performance and increases sorting time.

Here, we present results of laboratory and field studies conducted during the summer of 2018, which aimed at assessing the relative attractiveness of grape juice to male and female SWD. The main goal of this research is to provide fruit growers with inexpensive options for monitoring SWD populations. A secondary objective was to determine whether grape juice attracts fewer non-target insects compared to the commercial SWD Scentry® lure.

Materials & Methods

Experiment 1: Evaluation of various types of fruit juices in cages. The relative attractiveness of 5 types of fruit juices to laboratory-reared male and female SWD was evaluated from 29 May to 8 June 2018, in the tree fruit entomology / IPM laboratory at UMass Amherst campus. We used 60 cm^3 screen cages for the experiments. Four equidistant hanging wires (15 cm in length) were positioned at the roof of the cage to hang small plastic tubes containing either, fruit juices or water. For each experiment, 200 microliters of each fruit juice were pipetted onto clear 1.5 ml centrifuge tubes. Water was used as control. Prior to treatment application, the lids of the tubes were removed, a 3 cm wire was wrapped around their neck, and a thin coating of Tangletrap insect coating was applied to the outer surface of the tubes to capture alighting flies. Because only four treatments could be evaluated simultaneously inside a cage, then we conducted 3 separate bioassays. Under this approach, each bioassay evaluated 3 fruit juices (selected at random) and a water control.

For each observation day, 10 males and 10 females (2-3 days old) were released (at 8:00 am) inside each cage. Observations were initiated immediately after introducing the treatments. One person quantified the number of males and females that landed on the sticky tubes every 5 minutes for 1 hour, then again at 2 hours and again at 4 hours. Results show the number of males and females that responded over the entire 4-hour period. During the observations, cages were rotated 90° every 5 min for the first hour. With this ap-

proach, we were able to minimize the tendency of flies to accumulate on the cage wall receiving highest light intensity, which could have biased females in favor of alighting on the nearest dish. Five replicates were completed for each bioassay.

Experiment 2: Comparison of various concentrations of grape juice in cages. From 12 June to 26 June 2018 we evaluated grape, one of the best performing juices, either, undiluted or at 75% (= 3 parts of juice and one part of water) and 50% concentrations, against a water control. While cherry and pomegranate performed well in experiment 1, they were excluded from additional testing due to their higher price and reduced availability. Observations were as described in the first experiment. Tests were replicated 5 times.

Trap used to capture male and female SWD. Trap consists of a plastic 1-liter container (3.5 cm of radius and 15 cm in height) with 12 lateral holes (3/16" in diameter) that allow relatively small insects to get inside the trap.

Experiment 3: Comparison of various concentrations of grape juice in the field. This study was conducted from 12 July to 8 August 2018 at the University of Massachusetts Cold Spring Orchard (CSO) in Belchertown, MA. The goal of this experiment was to quantify the response of wild male and female SWD to the 3 concentrations of grape juice that were evaluated in cages (Experiment 1). Four low density polyethylene traps (1 liter in capacity) (see picture) were deployed in each of four cherry trees. Each trap received 200 ml of a particular juice concentration or 200 ml of water as a control. Each cherry tree served as a replicate. To minimize fermentation effects, all traps were serviced, washed, and re-baited twice a week (on Mondays and Thursdays). Insects captured were transported to the laboratory in labeled zip-lock bags for identification.

Experiment 4. Comparison of additional dilutions of grape juice in the field. This study, conducted at the UMass CSO, compared the attractiveness of 50% and 25% (prepared by mixing 1 part of juice in 3 parts of water) concentrations of grape juice against water control. Trap deployment and inspection frequency was done as in Experiment 3. Tests were replicated 4 times.

Experiment 5. Field performance of diluted grape juice when compared to a commercial lure. This study was conducted from 7 to 24 August 2018 in one section of a vineyard (table grapes) at Clarkdale Fruit Farms in Deerfield, MA. Three treatments were compared: (1) grape juice alone, (2) grape juice in combination with two synthetic plant volatiles dispensed

from centrifuge tubes, and (3) commercial SWD Scentry® lure (purchased from Great Lakes IPM). Two separate experiments were conducted. The first experiment compared grape juice at 50% concentration, whereas the second experiment involved grape juice at 25% concentration.

Four sets of 3 traps (one per treatment) were deployment along the lower horizontal wire of the trellis. Each set was considered a replicate. The distance among traps was 3 meters, and the distance among sets was 6 meters. To minimize fermentation effects, all traps were serviced twice a week (on Tuesdays and Fridays). Fruit juices were replaced at each service session. The SWD Scentry® lures were not replaced.

Results

Results from the first laboratory experiment using cages indicated that the most attractive juices to male and female SWD were grape, tart cherry, and pomegranate. Red tart cherry and blueberry were the least attractive juices (Figure 1A-C).

Results from the second experiment revealed that the response of male and females to undiluted grape juice did not differ significantly from the response shown to grape juice at 75% and 50% concentrations (Figure 2). All grape juice

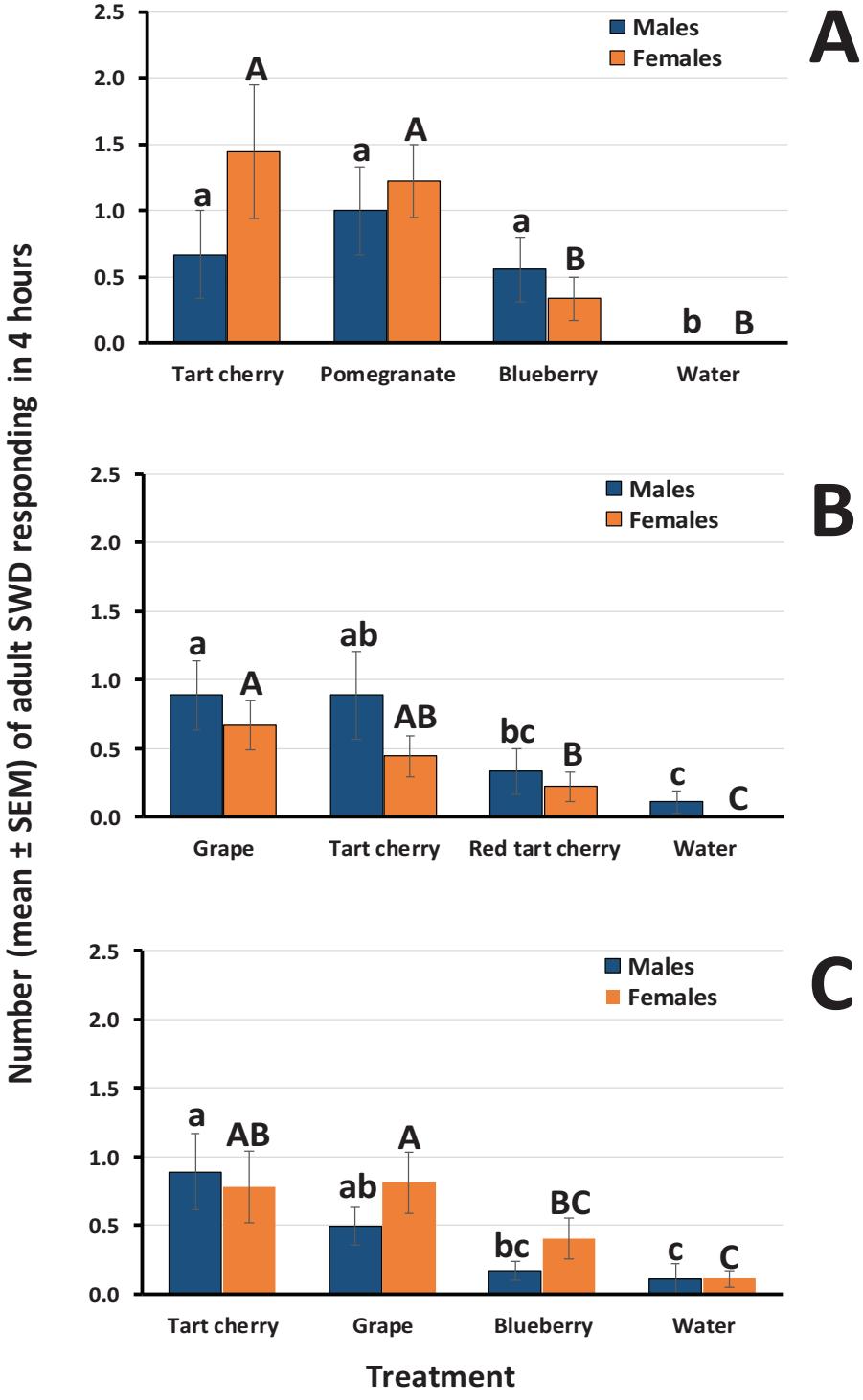


Figure 1. Response of laboratory-reared male and female SWD to fruit juices in cages. Three sub-experiments (denoted by letters A-C) were conducted separately. For each comparison, means superscribed by the same letter (lowercase= treatment comparison among males; uppercase= treatment comparison among females) are not significantly different at odds of 19:1.

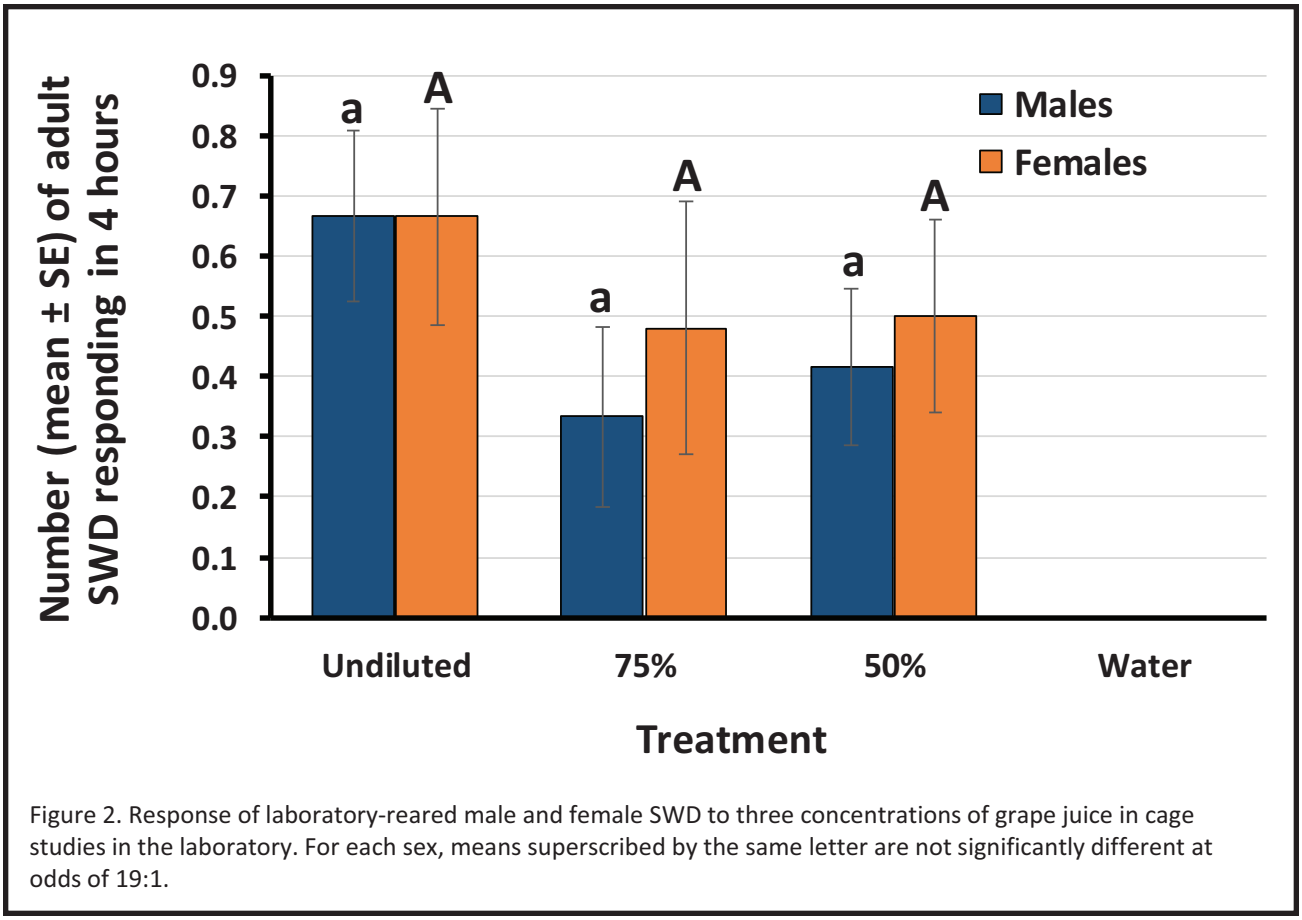


Figure 2. Response of laboratory-reared male and female SWD to three concentrations of grape juice in cage studies in the laboratory. For each sex, means superscribed by the same letter are not significantly different at odds of 19:1.

treatments were very attractive to male and female SWD when compared to the water control.

The third experiment evaluated the field response of male and female SWD to the same treatments (using traps) that were evaluated in the laboratory (Experiment 2). Over a 3-week period, traps captured 115 males and 109 females, indicating comparatively low SWD populations. Figure 3A shows that the level of response of male and female SWD to undiluted and diluted (75% and 50% concentrations) grape juice was similar, confirming the results from the second experiment. No differences in the number of non-targets (fruit flies belonging to the same family as SWD) were noted across treatments (Figure 3B).

In the fourth experiment, traps captured 372 males and 665 females in an 9-day period, indicating comparatively high SWD populations. Results show that wild male and female SWD responded in a similar manner to grape juice at 25% (= 1 part of juice in 3 parts of water) and 50% concentrations (Figure 4A). A similar pattern of response was noted for captures of other species belonging to the same fly family (Drosophilidae) (Figure 4B).

In the fifth and final experiment, 465 males and 1,010 females were captured by traps over a 17-day period, indicating comparatively high SWD populations. Results from this study revealed that when grape juice was evaluated at 50% concentration, diluted grape juice attracted 2.3 and 2.6 times more males and females, respectively, than the commercial SWD Scentry® lure (Figure 5A). The addition of plant volatiles to 50% grape juice reduced trap captures when compared to 50% grape juice alone. When grape juice was further diluted to a 25% concentration, its performance was even better than when evaluated at the 50% concentration. As shown in figure 5A, traps baited with the 25% concentration of grape juice alone captured 2.8 and 3.8 times more male and female SWD, on average, than traps baited with the SWD Scentry® lure. For the 25% concentration, the additional of plant volatiles did not increase of decrease the response of male and female SWD, relative to grape juice alone. Remarkably, diluted

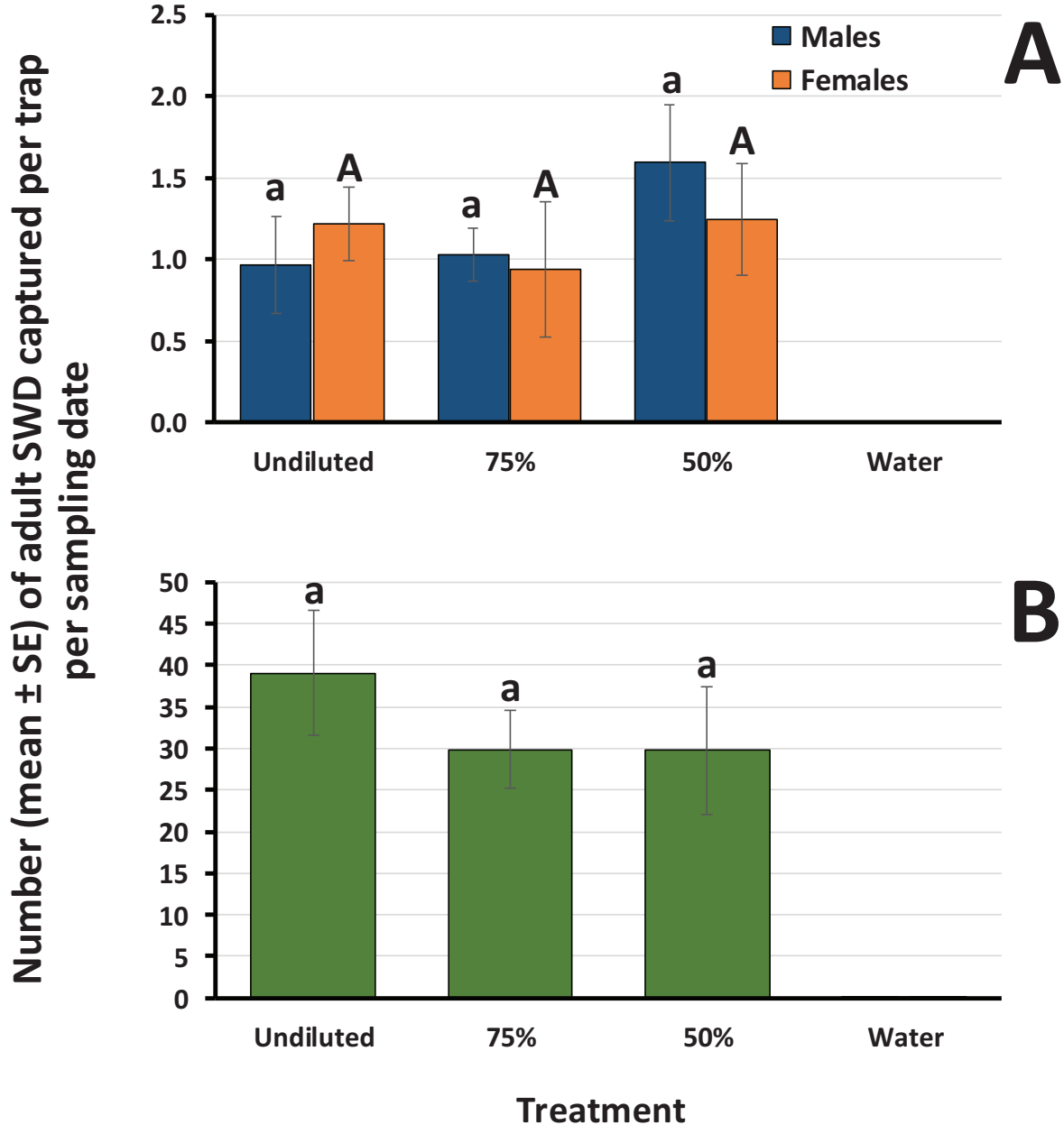


Figure 3. Response of (A) wild male and female SWD and (B) non-targets (other Drosophilidae) to three concentrations of grape juice evaluated using traps deployed on cherry trees at Cold Spring Orchard. For each sex, means superscribed by the same letter are not significantly different at odds of 19:1.

grape juice attracted significantly fewer (about three times less) non-targets than the Scentry® lure. The Scentry® lure is based on fermentation materials, which are known to attract a comparatively high number of other Drosophilid species (and other non-target insects). While effective at monitoring SWD populations, this lure can hinder trap performance and increase sorting time. Our findings indicate that an inexpensive and readily available material, grape juice, can increase SWD captures while decreasing captures of non-targets.

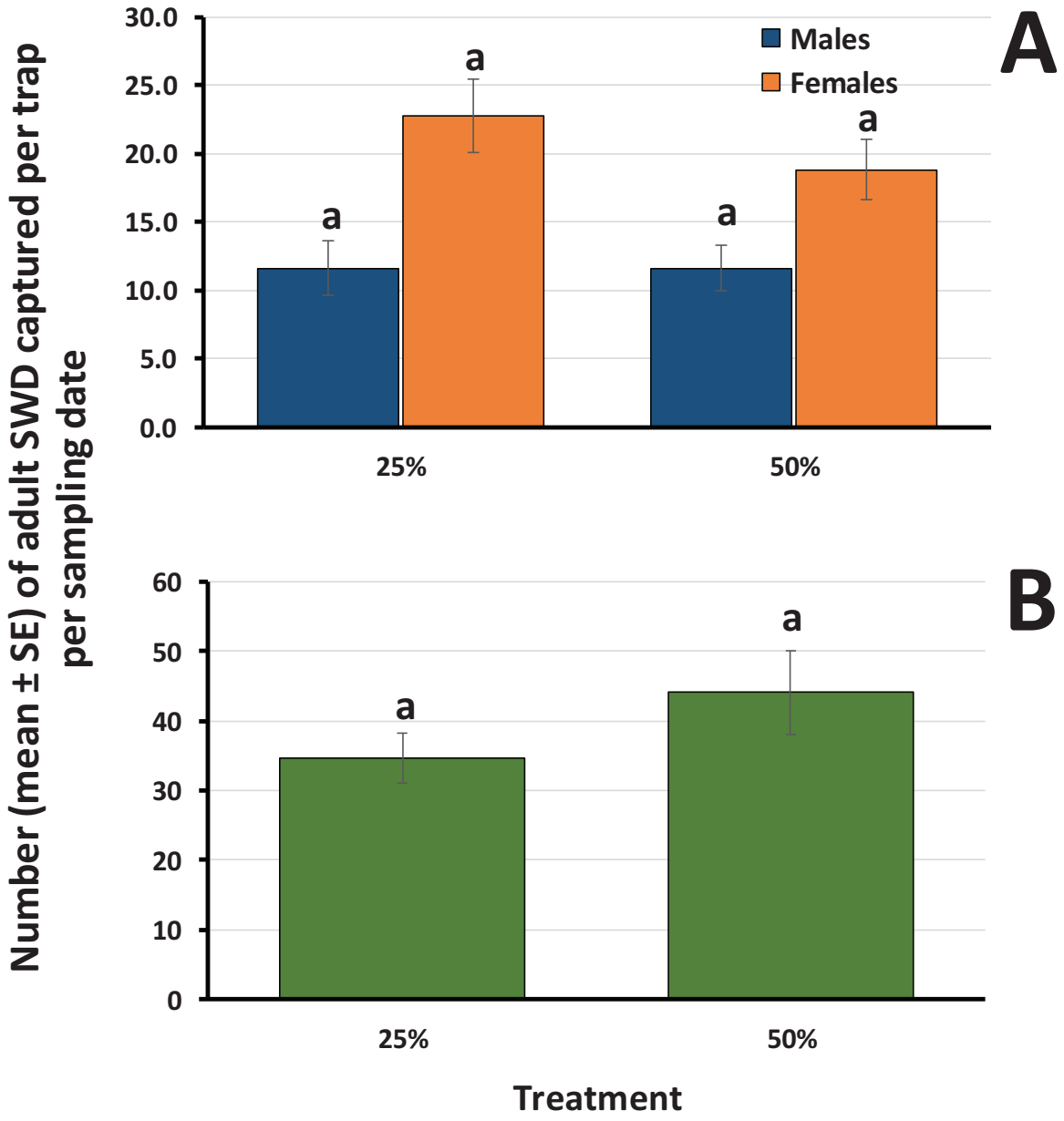


Figure 4. Response of (A) wild male and female SWD and (B) non-targets (other Drosophilidae) to grape juice at 25% (= 1 part of juice in 3 parts of water) at 50% concentrations. Materials were evaluated using traps deployed on cherry trees at Cold Spring Orchard. For each sex and for non-targets (green bars), means superscribed by the same letter are not significantly different at odds of 19:1.

Cost considerations. In terms of costs, 42 traps can be prepared with only $ 3.50, which is the cost of one bottle (1.89 liters = 64 oz.) of grape juice (assuming traps are already available). By mixing the content (1.89 liters) of the bottle of grape juice with 5.7 liters (= 192 oz.) of water to produce a 25% concentration, 7.6 liters (= 256 oz.) of diluted grape juice can be prepared. This amount of bait is enough to prepare 42 traps, each

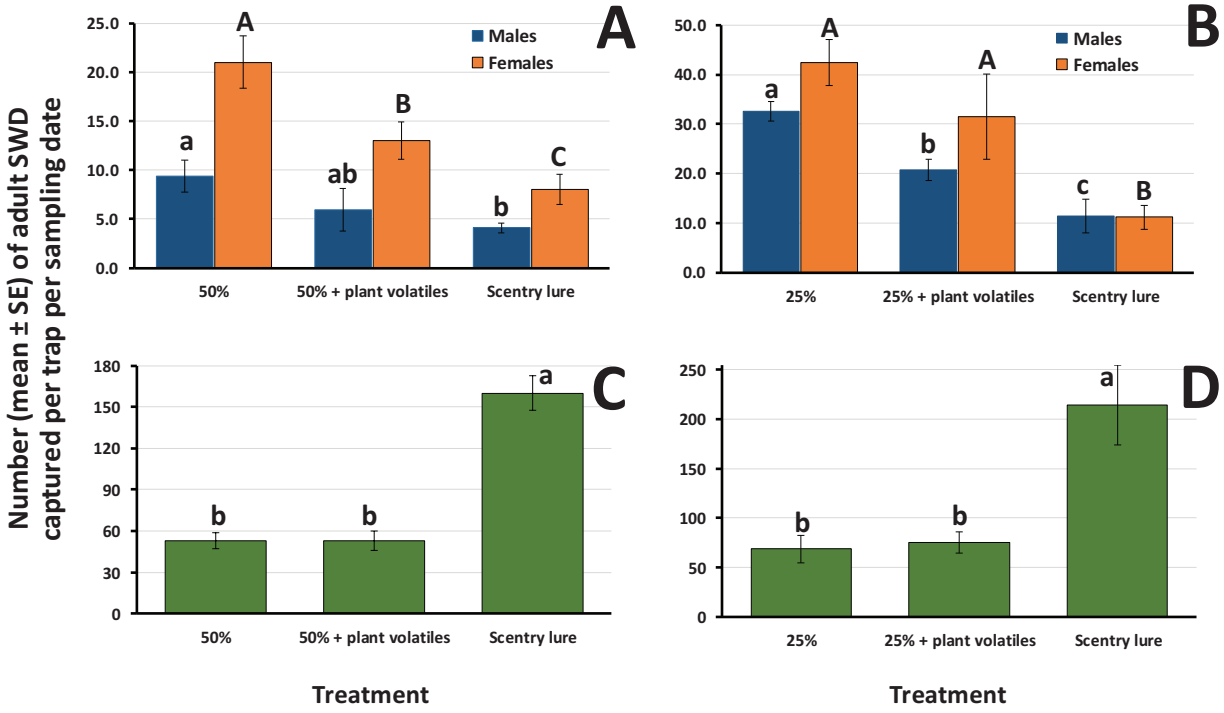


Figure 5. Response of wild male and female SWD to grape juice at (A) 50% concentration and (B) 25% concentration (= 1 part of juice in 3 parts of water), either alone or in combination with two plant volatiles, against the commercial SWD Scentry® lure. Panels C-D show corresponding mean captures of non-targets (Drosophilidae). Materials were evaluated using traps deployed in a vineyard (table grapes) at Clarkdale Fruit Farms in Deerfield, MA. For each SWD sex, and for non-targets (green bars), means superscribed by the same letter are not significantly different at odds of 19:1.

having 200 ml (6.7 oz.) of the diluted juice. The cost of bait per trap is about $0.08, whereas the cost of the SWD Scentry® lure is about $ 7 a piece.

Conclusions

Our combined findings indicate that a 25% concentration of grape juice (= 1 part of juice in 3 parts of water) is an effective and economically viable attractant for SWD. Further studies should reveal the extent to which traps baited with 25% grape juice, deployed at high densities, could reduce SWD populations, potentially making insecticide sprays against SWD more effective.

Acknowledgments

We thank Tom and Ben Clark for allowing us to work on their orchard. We also thank Natalie DiDomenico and Cam Olanyk for assistance. The UMass Center for Agriculture, Food, & the Environment (CAFE) through the 2018 Undergraduate Summer Scholars Program and the Stockbridge School of Agriculture provided funding for this research.

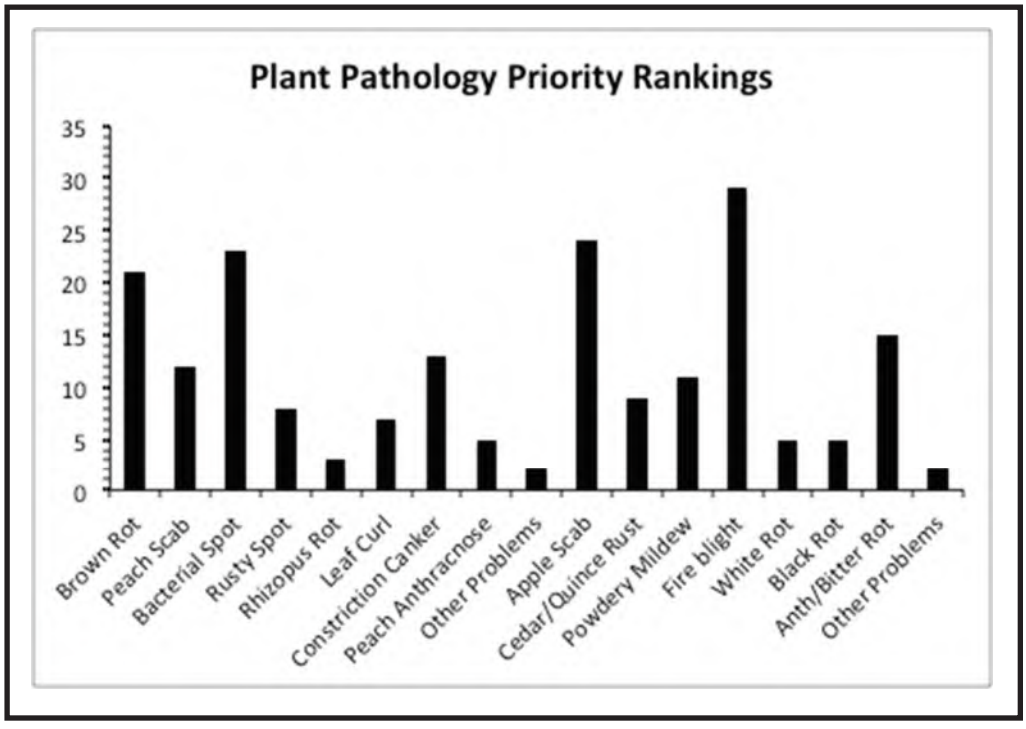
Tree-fruit Research and Extension Priority Rankings in New Jersey

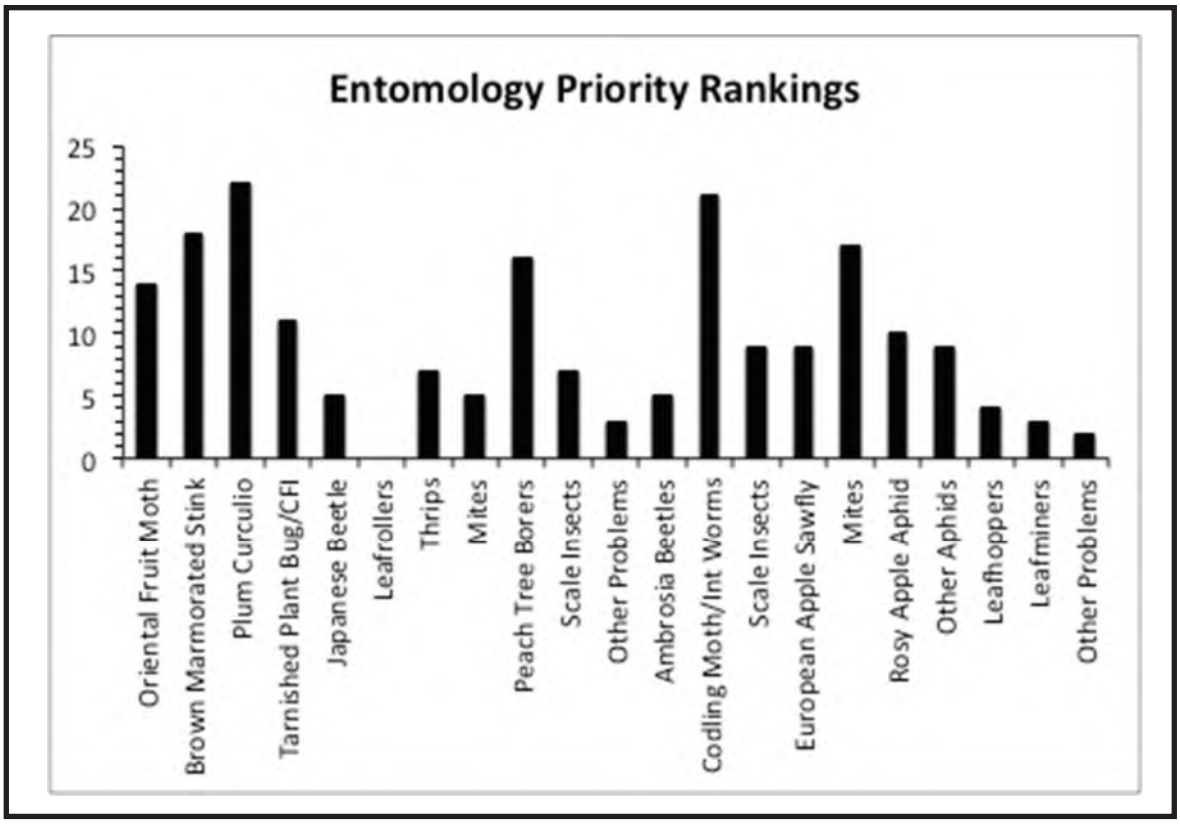
Dean Polk
Rutgers University

During the fall and winter months of 2016-17 the NJAES Tree Fruit Working Group put together a grower survey with the objective of NJ tree fruit growers ranking various tree fruit research and extension activities done by Rutgers/NJAES. The survey consisted of separate discipline or program areas with rankings for each area. A first draft survey was vetted using input from a small grower advisory group in southern counties, and again at the Hershey meetings by the NJ State Horticultural Society board of directors. Comments from the 2 advisory meetings were incorporated into the survey prior to it being given out at the South Jersey Fruit Meeting (February 16, 2017) and the North jersey Fruit Meeting (March 1, 2017). A total of 34 responses were collected, representing 12 counties, plus 1 out of state grower. NJ responses represented 2,480 acres of tree fruit production. The survey combined stone fruit and pome fruit activities under most discipline areas; so tabulated results are combined under both crop types.

Under pathology rankings, brown rot and bacterial spot research were considered the highest stone fruit priorities, and apple scab and fire blight were considered the highest pome fruit priority areas. Growers ranked plum curculio as the most serious peach insect pest needing research work and codling moth and other internal worms requiring the most attention in apples. Pesticide resistance management was ranked as the most important general pest management research area. Growers ranked obtaining labels for new herbicides and work on problem specific weeds as the two most important areas for weed science. Growers ranked work in plant growth regulators for thinning and fruit quality and variety evaluations as the two most important areas needing work in pomology. Growers' greatest needs in IPM delivery were for reducing pest management costs, while recommending best management practices for specific pests. Rankings of extension priorities showed an industry need for newsletters and "Plant and Pest Advisory" articles, on-farm consultations, and translating research results for on-farm use.

Rankings are summarized in the following charts:




Entomology Priority Rankings
25
20
15
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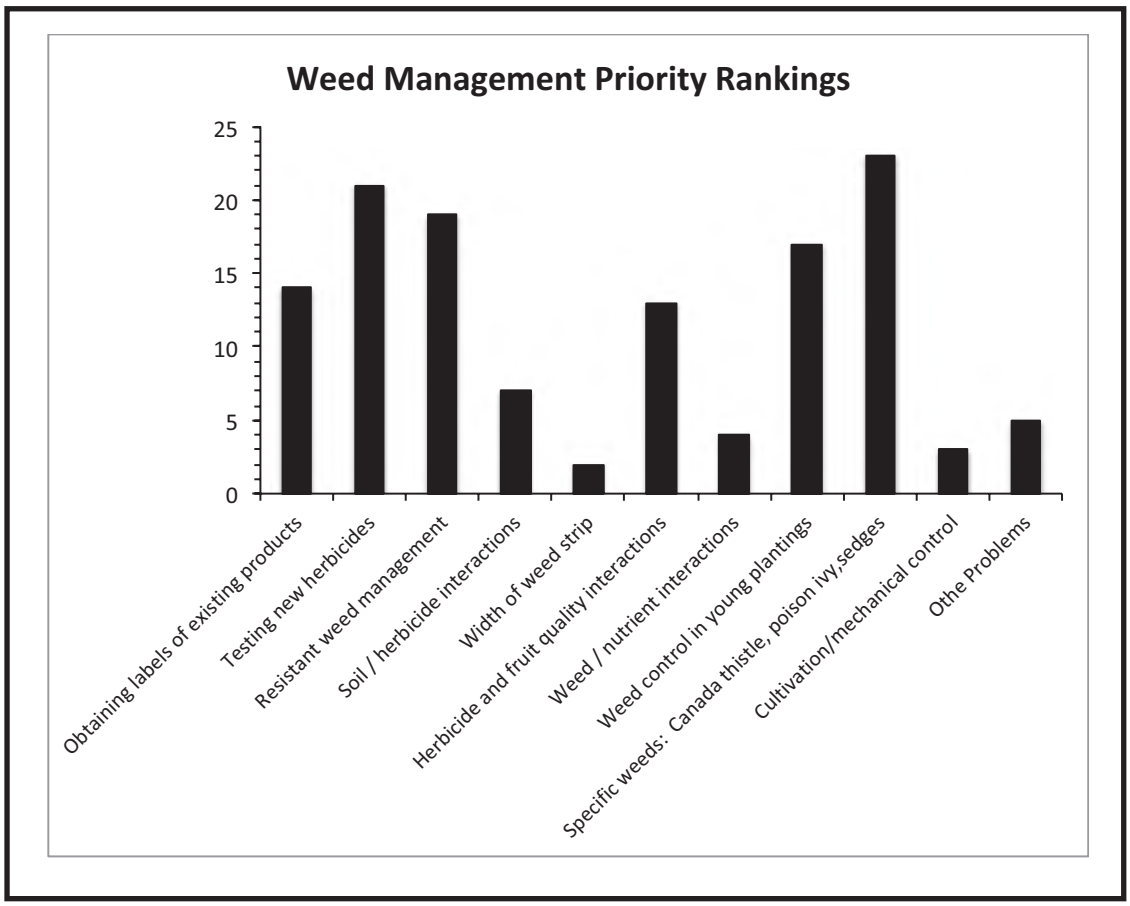
0
Oriental Fruit Moth
Brown Marmorated Stink
Plum Curculio
Tarnished Plant Bug/CFI
Japanese Beetle
Leafrollers
Thrips
Mites
Peach Tree Borers
Scale Insects
Other Problems
Ambrosia Beetles
Codling Moth/Int Worms
Scale Insects
European Apple Sawfly
Mites
Rosy Apple Aphid
Other Aphids
Leafhoppers
Leafminers
Other Problems


Weed Management Priority Rankings
25
20
15
10
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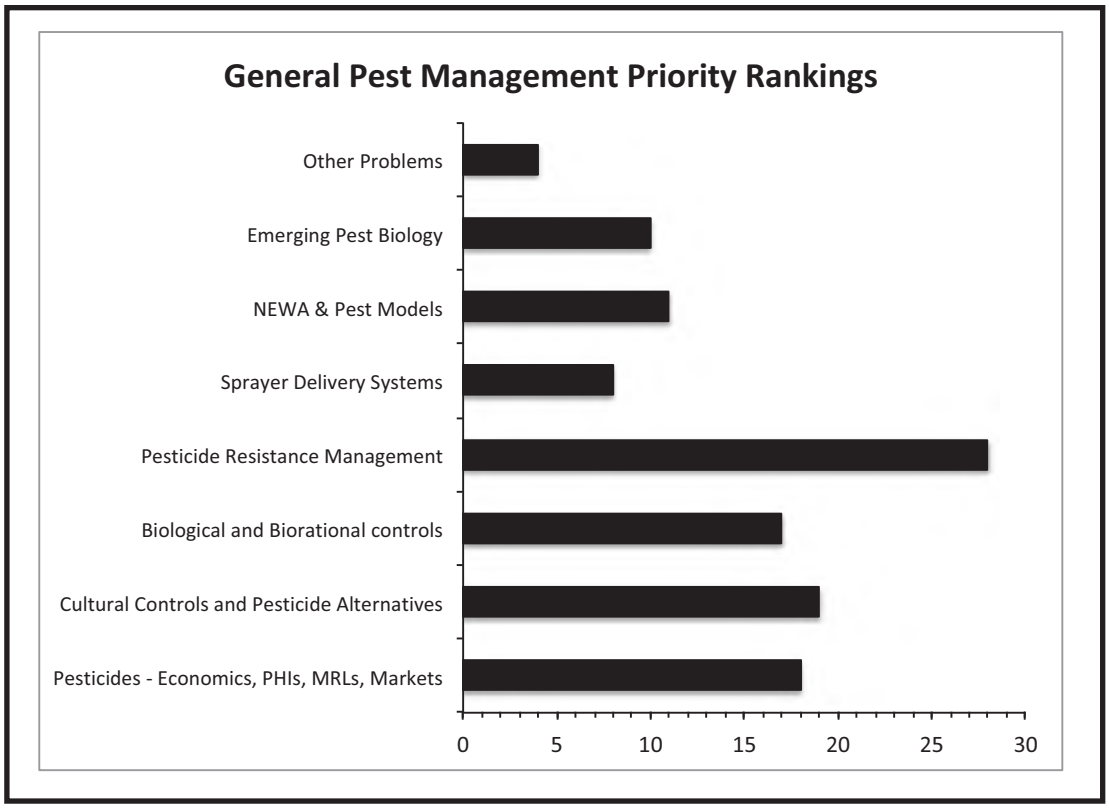
0
Obtaining labels of existing products
Testing new herbicides
Resistant weed management
Soil / herbicide interactions
Width of weed strip
Herbicide and fruit quality interactions
Weed / nutrient interactions
Weed control in young plantings
Specific weeds: Canada thistle, poison ivy,sedges
Cultivation/mechanical control
Othe Problems


General Pest Management Priority Rankings
Other Problems
Emerging Pest Biology
NEWA & Pest Models
Sprayer Delivery Systems
Pesticide Resistance Management
Biological and Biorational controls
Cultural Controls and Pesticide Alternatives
Pesticides - Economics, PHIs, MRLs, Markets
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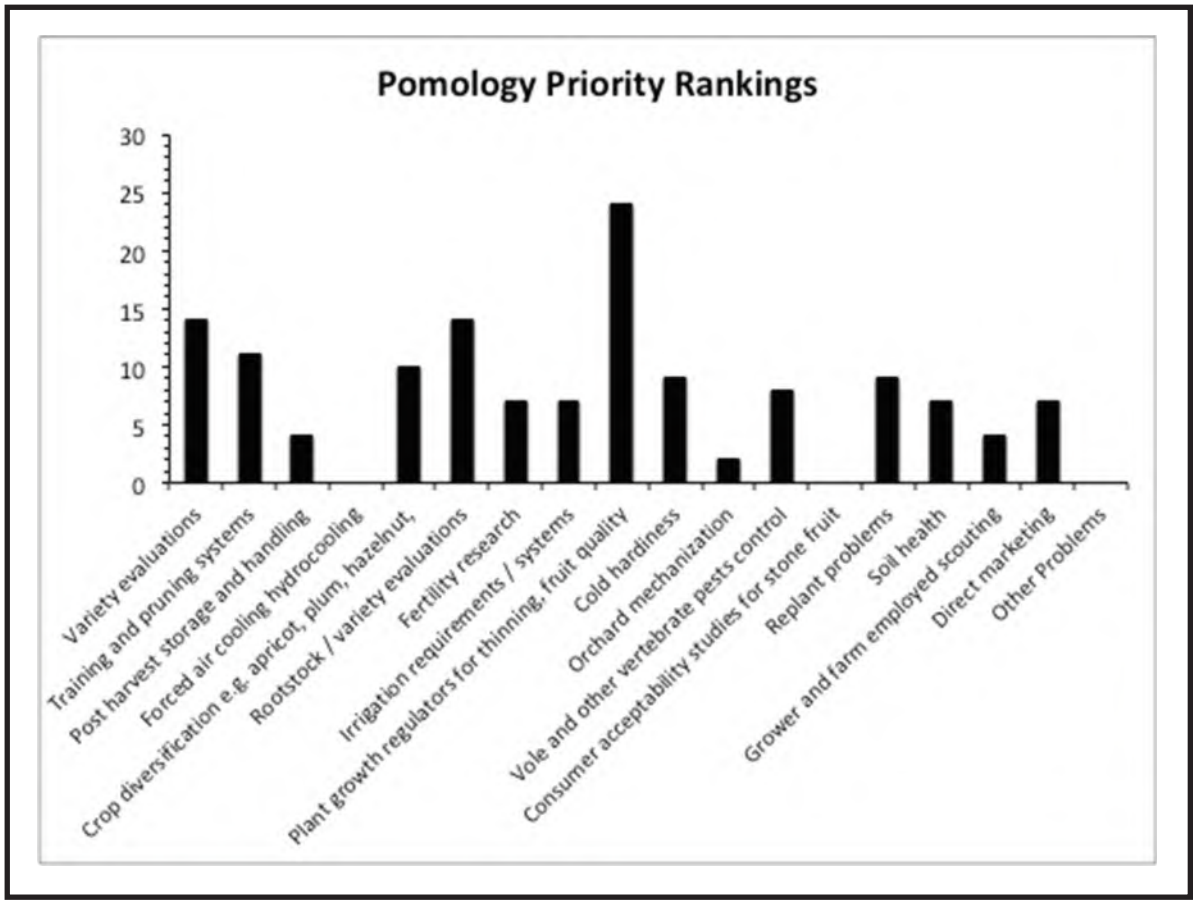
Pomology Priority Rankings
30
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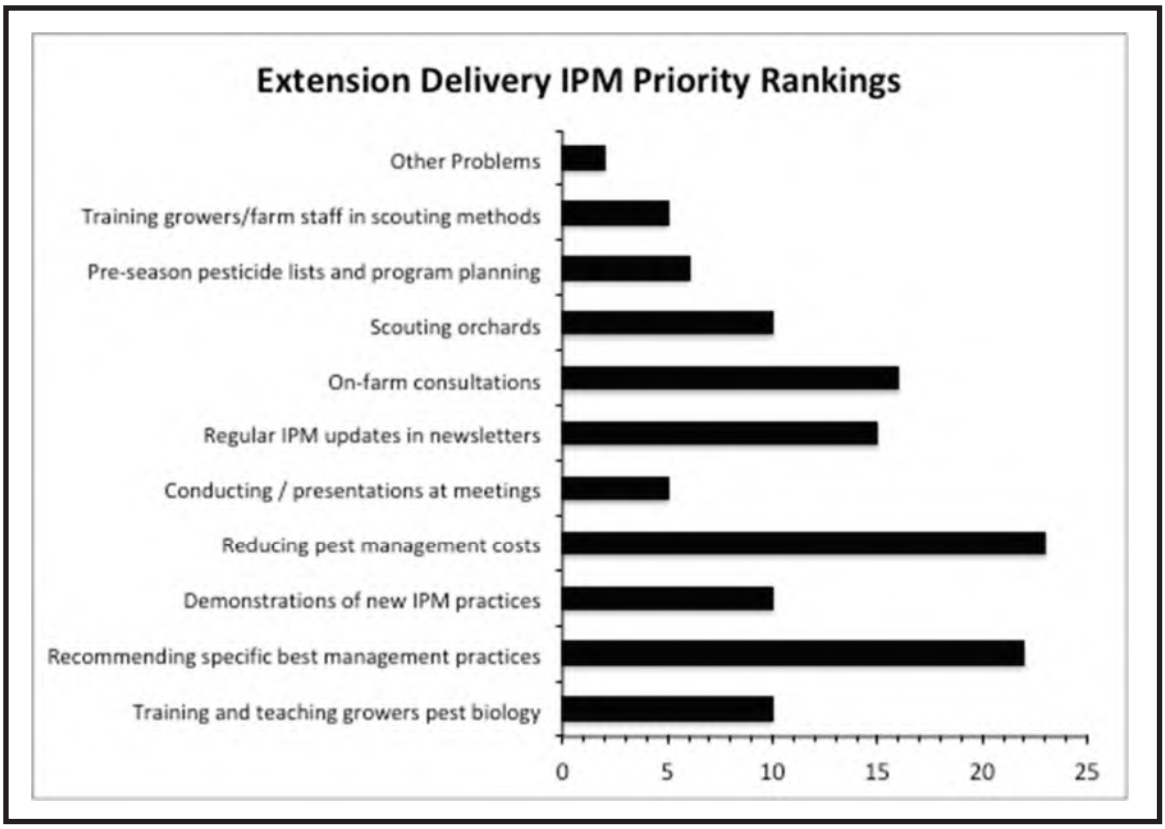
0
Variety evaluations
Training and pruning systems
Post harvest storage and handling
Forced air cooling hydrocooling
Crop diversification e.g. apricot, plum, hazelnut,
Rootstock / variety evaluations
Fertility research
Irrigation requirements / systems
Plant growth regulators for thinning, fruit quality
Cold hardiness
Orchard mechanization
Vole and other vertebrate pests control
Consumer acceptability studies for stone fruit
Replant problems
Soil health
Grower and farm employed scouting
Direct marketing
Other Problems


Extension Delivery IPM Priority Rankings
Other Problems
Training growers/farm staff in scouting methods
Pre-season pesticide lists and program planning
Scouting orchards
On-farm consultations
Regular IPM updates in newsletters
Conducting / presentations at meetings
Reducing pest management costs
Demonstrations of new IPM practices
Recommending specific best management practices
Training and teaching growers pest biology
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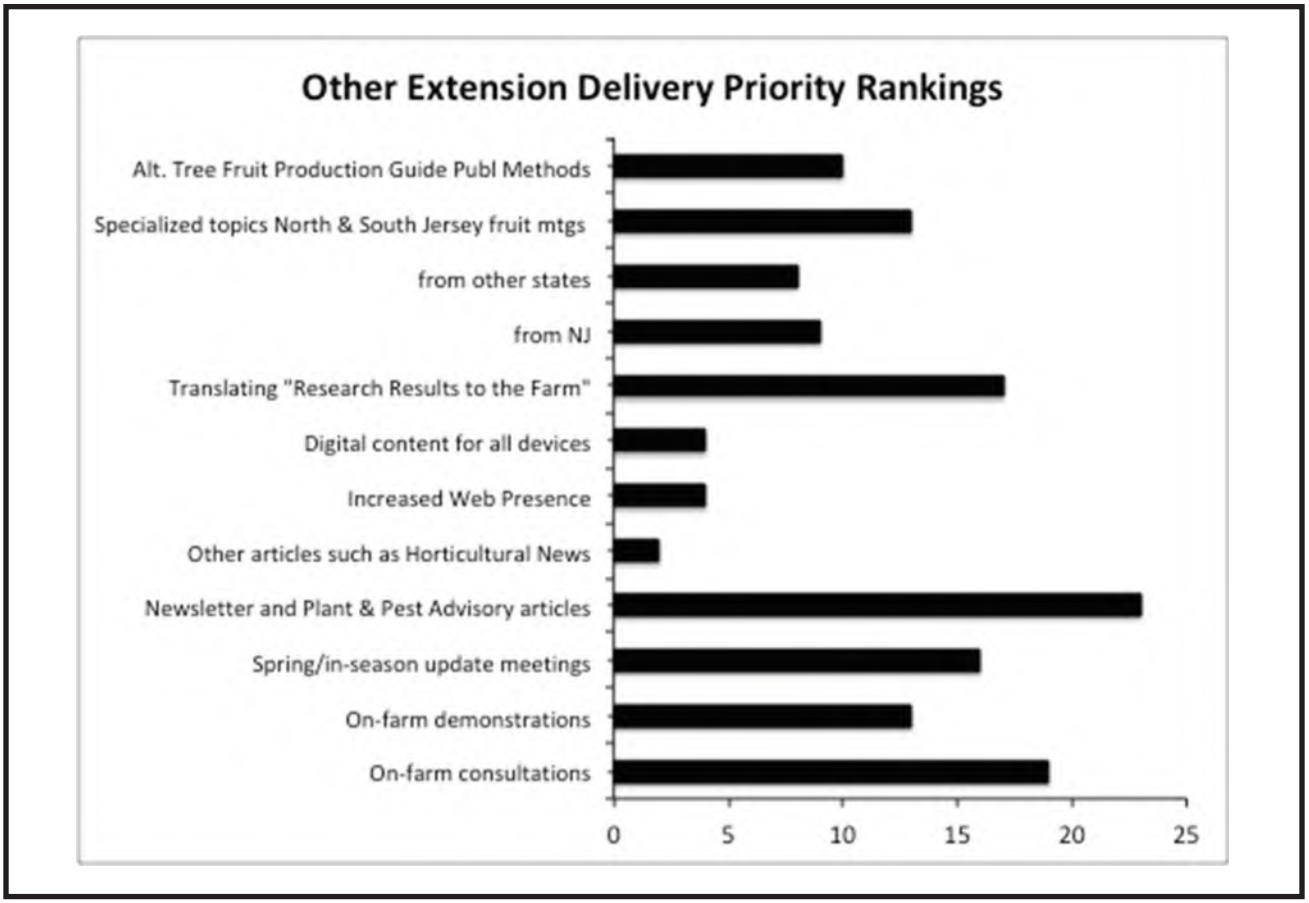
Other Extension Delivery Priority Rankings
Alt. Tree Fruit Production Guide Publ Methods
Specialized topics North & South Jersey fruit mtgs
from other states
from NJ
Translating "Research Results to the Farm"
Digital content for all devices
Increased Web Presence
Other articles such as Horticultural News
Newsletter and Plant & Pest Advisory articles
Spring/in-season update meetings
On-farm demonstrations
On-farm consultations
0
5
10
15
20
25

Promising New Jersey Hard Cider Apple Trial Updates

Megan Muehilbauer
Rutgers Cooperative Extension/NJAES

The 2018 apple growing season is in full swing and the hard cider variety demonstration plot at the Snyder Research and Extension Farm has been established. The majority of the grafts that successfully healed showed significant 1st year growth. A complete report of the trial will be published in the Winter 2018 Issue of *Horticulture News* and *Fruit Notes*. Overall grafting success in the trial was a bit lower than expected where the cleft grafting resulted in 82% success. Despite this, the failed grafts will be replaced next year in an attempt to develop the complete planned block of hard cider apples.

Preliminary data illustrates the varieties Stoke Red and Red Astrachan resulted in the most apical growth and largest trunk cross sectional area of

Newly grafted 'Ellis Bitter' scion in the hard cider apple topworking trial at the Rutgers Snyder Research and Extension Farm, Pittstown, New Jersey.

Six months of growth on 'Ellis Bitter' scion in the hard cider apple topworking trial at the Rutgers Snyder Research and Extension Farm, Pittstown, New Jersey.

the 31 cultivars respectively. As noted in the Summer 2018 Issue of *Horticulture News/Fruit Notes*, this variety demonstration trial holds a number of hard cider, heirloom, and dual purpose varieties, however both Stoke Red and Red Astrachan were notable in that both are particularly well suited as hard cider varieties. Stoke Red is described as having a bittersharp flavor with yellow skin and red flesh, while Red Astrachan is considered an astringent variety with dark red scarlet skin. Future work in this trial will involve assessing the varieties for disease resistance, yield, vigor and flavor profiles.

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Selected White Heirloom Grape Varieties for the Northeast

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

This article outlines white heirloom grape varieties that I have grown on my farm and evaluated for the past fifteen years. My farm, Cedar Cliff, is located in Athens, NY, which is on the west bank of the Mid-Hudson River Valley. These quality heirloom varieties were bred in New England and in the Hudson Valley between 1820 and 1890. Here we detail some of those varieties that are suitable for cultivation in most of New England and the Middle Atlantic States except for its coldest regions. Many of these varieties are dual-purpose grapes that can be used to produce wine or sold as table grapes.

The reader will find that all of these varieties are productive, winter hardy, fungus disease, and drought resistant, and tolerate wide swings in temperature. Hence, they need fewer cost inputs than most commercial varieties that are grown today; consequently, they can be profitably grown on most vineyard sites in the Northeast. Further, since they are locally developed heirloom grape varieties, they should command heightened interest and demand in the market place as either wine or table grapes.

Croton *(vinifera, labrusca, bourquiniana)* is a hybrid bred by Dr. Richard T. Underhill (1802-1871) and possibly his nephew Stephen W. Underhill (1837-1925) of Croton Point, New York around 1863. It comes from a seed of Delaware pollinated by Chasselas de Fontainbleau. This is a high quality white grape that makes quality wines. Like Riesling, it is moderately susceptible to winter injury and has suitable fungus disease resistance. It is moderately vigorous in heavy soils, and seems to grow optimally in well drained rich, silty soils. The vine blooms late, is self-fertile, and ripens by mid-season. Its clusters are very pretty, with a prominent shoulder, very long, slender, cylindrical, and moderately compact. The berries are medium sized and translucent yellowish-green. The skin is thin, but tough. The taste in the fruit and wine is delicate that has a superior *vinifera*/Delaware flavor. It is refreshingly spritely with high sugars.

Diamond *(labrusca, vinifera)* was bred by Jacob Moore of Brighton, NY (1835-1908) around 1870. It is a Concord seed fertilized by Iona pollen that was introduced as Moore's Diamond around 1885. Its progeny includes: Cayuga White, Horizon, and Melody. Diamond is an early mid-season ripening variety that ripens about one week before Concord. It is very winter hardy, productive, and a vigorous grower. The plant resembles its seed parent Concord, but it is not as vigorous. However, it grows as well in the same soils as Concord, hence it has a wide range of habitat. It buds out by mid-season, with disease resistance as good as Concord, but it is more susceptible to black rot. The pale green compact clusters can be somewhat variable in size – medium to short, rather broad, somewhat blunt, and cylindrical.

The wine is clean, balanced, spicy, and rich, but mild and slightly perfumey. It can be an assertive white wine with flinty overtones and some spice with fewer of the astringent Native-American *labrusca* flavors. It is floral with clean notes of guavas, honey/mead, banana, some pineapples, and melons.

Empire State *(riparia, labrusca, vinifera?)* is a James H. Ricketts (1818-1915) hybrid that first fruited in 1879 and was introduced in 1884. Ricketts of Newburgh, NY maintained that Empire State came from a seed of Hartford pollinated by Clinton, however others believe that it is a hybrid of Clinton with a white European grape. Empire State is comparable to Niagara and Diamond in its vigorous growth habit, fungus disease resistance, and productivity. However, it is slightly less winter hardy and does not have as attractive a cluster for the table market. The fruit quality is very good, much better than Niagara and nearly as good as Diamond. Its flavor profile is more of *riparia* and Muscats, rather than the foxiness of a Native-American *labrusca.* It is a vigorous to very vigorous vine, healthy, and winter hardy. The grape ripens late mid-season to late, a few days earlier than Niagara. The clusters are medium-large, long, and rather slender and cylindrical, with a pretty pale yellowish-green to light green color.

Empire State *(riparia, labrusca, vinifera?)* is a James H. Ricketts (1818-1915) hybrid that first fruited in 1879 and was introduced in 1884. Photo credit: Linda Pierro, Flintmine Press.

The grapes ripen to 18˚ - 20˚ Brix and it is very suitable for wine production. The wines are clean, acids are well balanced, and it is floral in nose and taste. The wines are a pale light green to yellow; soft, not foxy, with fruit of pink grapefruit, slight appealing petroleum, pears, bananas, soft melons; bright, full, and flinty, with a long clean finish.

Golden Drop *(labrusca, vinifera, bourguiniana)* is a late-early season ripening white grape of superior quality. Cyrus G. Pringle (1838-1911) of East Charlotte, VT bred this grape (Adirondac x Delaware) and planted its seed in 1869. The vine is of medium vigor to moderately vigorous and very winter hardy, but not so productive since its cluster and berry size are below average. The cluster is cylindrical, moderately loose, and of moderate length. Golden Drop is somewhat resistant to fungus diseases. The berry is medium to medium-small and becomes a deep golden color when ripe. Golden Drop is a superior wine grape. It has a soft, delicate, and clean Native-American *labrusca* flavor profile like its pollen parent Delaware without its Muscat flavors. It is a clean tasting fruit that achieves a Brix of 17˚ to 18˚. The flowers are sterile or nearly so, open by mid-season, with upright stamens. My experience is that while the flowers are said to be self-sterile, it will easily pollinate with other mid-season pollinators and in mixed variety vineyards. Golden Drop, due to its winter hardiness, quality of juice, and early ripening time, should be considered for our shorter season growing areas.

Iona *(labrusca, vinifera)* is a Dr. Charles William Grant (1810-1881) hybrid that originated on his farm on Iona Island, in Rockland County, New York on the west bank of the Hudson River between 1855 and 1860. Dr. Grant maintained that Iona originated from a seed of Diana planted in 1855. Iona was introduced in 1864. Iona tends to want a warm soil that is deep and dry, such as well drained sandy or gravelly clays. It does not do well in damp, rich black soils, or on poor sand or gravelly soils without sufficient organic matter. The vine

Iona *(labrusca, vinifera)* is a Dr. Charles William Grant (1810-1881) hybrid that originated on his farm on Iona Island, in Rockland County, New York on the west bank of the Hudson River between 1855 and 1860. Photo credit: Linda Pierro, Flintmine Press.

is winter hardy to moderately winter hardy, of average productivity and vigorousness. Iona is only somewhat resistant to most fungus diseases. Its nearly self-fertile flowers bloom by late season; hence, it is more productive when placed in a mixed variety vineyard for cross pollenization purposes. Its fruit ripens late mid-season to late, later than Concord. The berries have a unique pale to dark pink/red hue with some amethyst and watermelon shades that are not uniform. The cluster is medium-large to large, with rather loose large berries of varying size that can ripen unevenly. The cluster is double-shouldered and nearly cylindrical. Its sugars range from between 18˚to 22˚ Brix.

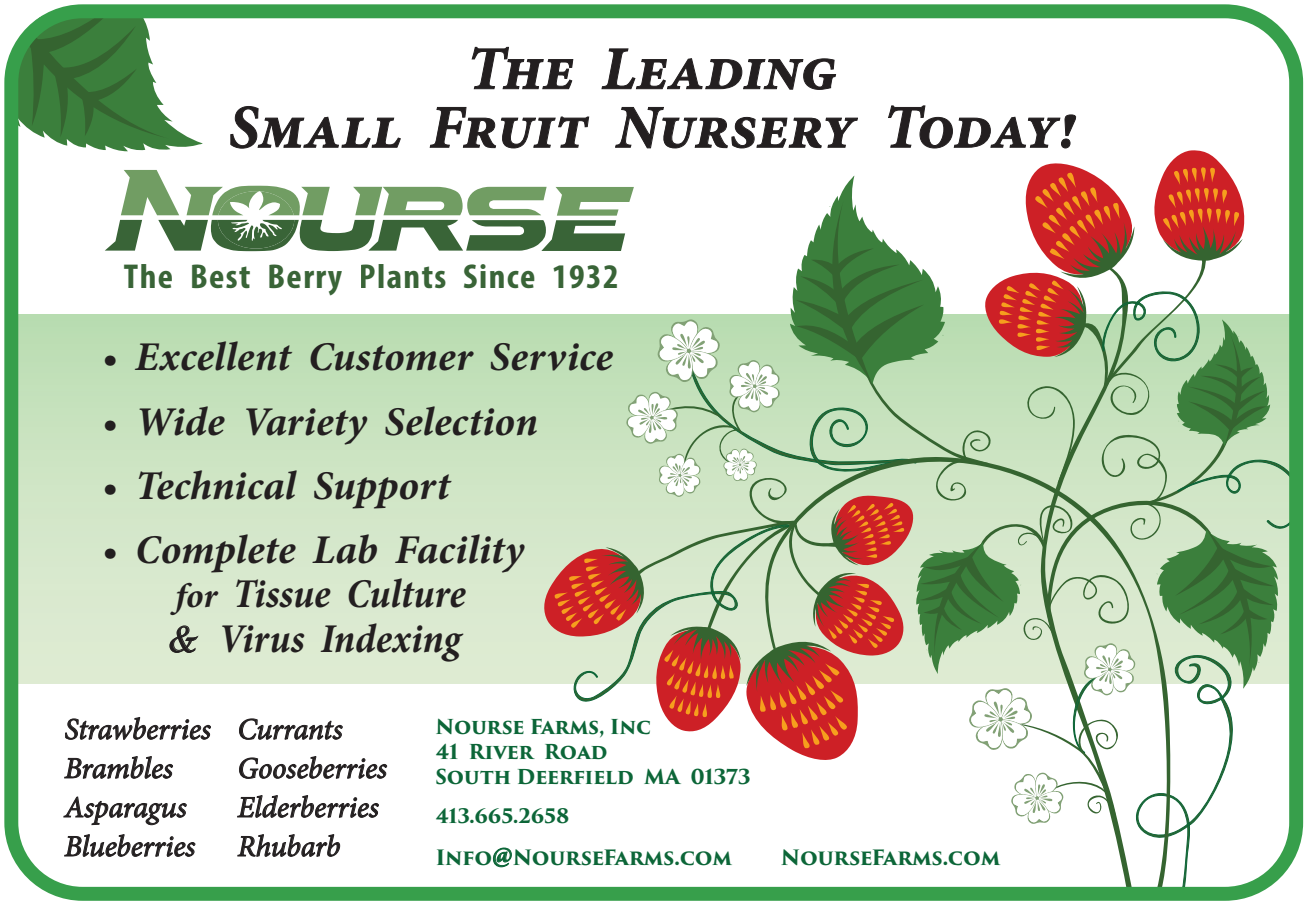
Despite its not so perfect cultivation attributes, Iona is great in the cellar. The grape has delightfully soft *labrusca* flavors that carry through into its wines. It is of similar quality to Delaware, but it is much softer, rounder, and approachable; with elements of melons, white peaches, pears, soft tropical fruits, guava and watermelon and none of the mustiness

of Delaware. It is perfumey and welcoming that makes a refreshing white wine.

Winchell *(seed of unknown purple grape)* is a superior white grape that was raised by James M. Clough (1820?-1890?) of Stamford, Vermont around 1850. Winchell is a viticulturally superior grape both in the field and in the wine cellar. While its genetic ancestry is unknown, observers maintain that while it is chiefly a *labrusca* variety, that it may have some *vinifera* and *aestivalis* in its genetic background.

Winchell is a vigorous to very vigorous growing white variety that is adapted to many different soil types and cool climates. It is very winter hardy, healthy, fungus disease resistant, and very productive. It has a very dense canopy, so it should be pruned to open its canopy to minimize fungus diseases. While Winchell is not a good table grape because it shells, it is a fine wine grape. The cluster is moderately compact, moderately large in size, slightly cylindrical that tapers, with one prominent shoulder. The medium sized berries are greenish to yellow with small brown dots. The variety ripens by late-early to early mid-season and attains sugars of between 18˚ to 19˚ Brix, but its taste is perceived to be sweeter because of the grape's low acidity. Winchell clusters hang on the vine until they ripen, but then the berries start to fall off. The variety has a soft, nuanced, and very approachable Native-American *labrusca* taste that is muted and subtle. The wines are yellow-green in color, floral, grapey, with very fine soft white *labrusca* flavors complimented by notes of honey, apricots, bananas, and pineapples, with a body and viscosity that is medium to heavy for a white wine. Winchell was used to breed the Geneva hybrids Cayuga White and Horizon.

As they say: "what is old is new again". It is my hope that growers in the Northeast who are looking for new fruits to cultivate will consider these locally developed heirloom white grape varieties. This article is based on the author's over forty years of experience growing cool climate grapes in Athens, NY and making wine from them; and *Grapes of the Hudson Valley and Other Cool Climate Regions of the United States and Canada,* by J. Stephen Casscles (Coxsackie, N.Y.: Flint Mine Press, 2015) (the book is available at www.flintminepress.com). The author's email address is cassclesjs@yahoo.com.



Blue and Black Heirloom Grape Varieties for the Northeast

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This article outlines some recommended blue and black heirloom grape varieties that I have grown and evaluated for the past fifteen years. My farm, Cedar Cliff, is located in Athens, NY, which is on the west bank of the Hudson River about fifty miles north of Newburgh, NY. These quality heirloom varieties were bred in eastern Massachusetts and in the Hudson Valley between 1840 and 1880. Here we will detail some of those varieties that are suitable for cultivation in most of New England and the Middle Atlantic States except for its coldest regions. These varieties are used primarily to produce red wines.

All of these varieties are productive, winter hardy, fungus disease and drought resistant, and tolerate wide swings in temperature. Because of their resilience in the field, they need fewer, and sometimes much fewer, inputs of costly labor, spray material, other supplies, or cultivation considerations than most commercial varieties that are currently grown today. Consequently, they can be grown profitably on most viable vineyard sites in the Northeast. They may indeed be candidates for those interested in organic grape cultivation or very low spray programs. Further, since they are locally developed heirloom grape varieties, they should command heightened interest and demand by wineries and the wine consuming public.

Bacchus *(riparia, labrusca)* was created by the noted grape hybridizer James H. Ricketts (1818-1915) of Newburgh, NY. It is a seedling of Clinton that was first exhibited in 1879. It is vigorous to very vigorous, healthy, productive, very winter hardy, and very resistant to fungus diseases and insect damage. Bacchus adapts to a wide range of soils, but does not thrive in soils that are droughty or which contain too much lime.

It is self-fertile and flowers very early to early. However, it ripens late in the season. The clusters are small to medium, below average in length, slender, often have a single shoulder, and compact. The thin-skinned berries are slightly smaller than medium size, black, and glossy in texture. Its virtues include its very high winter hardiness, freedom from fungus and insect damage, ease of propagation, high productivity, and capability to bear grafts. Its sugars at harvest are between 22˚and 25˚ Brix.

The red wines produced by Bacchus are big, dark, fruity and flinty with muted native-American *labrusca*-type flavors that can be improved with wood aging. The wines have big middle acids and tannins to provide its wines with great body and presence. The wine is not overpowering, so it can be utilized in blends.

Barry (Rogers No. 43) (*labrusca, vinifera*) was bred by Edward S. Rogers (1826-1899) of Salem, MA in 1851. It is a Carter x Black Hamburg hybrid. The color is black to dark purplish-black, glossy with a heavy blue bloom. Barry is a vigorous variety that is winter hardy in a manner similar to Delaware or Baco Noir. The variety is productive and susceptible to somewhat susceptible to fungus diseases, especially powdery mildew. Its female flower blooms by mid-season and it is sterile with reflexed stamens. Its best pollinators include other mid-season self-fertile varieties such as Concord, Cottage, Empire State, Delaware, Iona, and Winchell. Barry is harvested late mid-season to early late season, after Concord or Baco Noir.

The berry is large to very large with a thin skin that adheres to the pulp. The attractive cluster is compact, medium to large, short, very broad, slightly tapering to cylindrical, that sub-divides often with double shoulders. In sum, it grows well and has a soft and appealing Concord-like taste with little or no Muscat flavors.

Black Eagle *(labrusca, vinifera)* was hybridized by Dr. Richard T. Underhill (1802-1871) around 1862, possibly along with his nephew Stephen W. Underhill (1837-1925). It comes from a seed of Concord fertilized by Black Prince. This is a self-infertile variety, but easily pollinates in a mixed vineyard. It buds out late and its leaf pattern looks very much like *vinifera*, but its thick leathery leaves are olive colored like the *labrusca* Concord. Its female flowers open by mid-season and it ripens by mid-season like Concord. The variety is vigorous in the field on heavy loam soils, has good cold resistance, and is moderately susceptible to

fungus diseases. The clusters are large, long, tapering, and single or double shouldered, moderately compact to moderately loose. The berries are oval and black with a glossy thick bloom. The flavors are integrated and full with a combination of soft Native-American *labrusca* and some Muscat elements.

Concord *(labrusca)* is a purebred Native-American *labrusca*, the seed of a wild grape that was planted by Ephraim Bull (1805-1895) of Concord, MA in the fall of 1843. Concord was introduced to the public in 1854 and spread rapidly throughout most of America's fruit-growing regions to become the leading blue grape grown in the eastern United States as early as 1865. It continues to this day to be the most widely planted blue grape in the eastern United States and Washington State.

It is a vigorous to very vigorous variety that is very productive on many different soils and in different climates. Concord is very winter hardy and relatively resistant to fungus diseases and insect damage that ripens by mid-season to late mid-season.

The fruit quality of Concord is not high; it lacks richness and delicacy of flavor and does not make very good wine (except for sherries and ports) when compared to other *labrusca* varieties. However, as a table grape, the cluster is of good size and attractive. This article covers Concord because while it is widely grown in the Northeast, it is seldom seriously covered in survey articles. Also, Concord is mentioned here because it is so commonly grown that it is a great reference grape to compare it to other grape varieties covered in this article, as it relates to their winter hardiness, flowering time, ripening time, disease resistance, and productivity.

Cottage *(labrusca)* is Ephraim Bull's second most successful hybrid grape variety after Concord and in some ways is its superior. Cottage is a seedling of Concord and was introduced by Bull in 1869. Cottage resembles its seedling parent Concord in many ways,

Concord *(labrusca)* is a purebred Native-American *labrusca*, the seed of a wild grape that was planted by Ephraim Bull (1805-1895) of Concord, MA in the fall of 1843. Photo credit: Linda Pierro, Flintmine Press.

but distinguishes itself in others.

Cottage is a very vigorous growing variety with thick olive-colored leathery leaves similar to Concord. The canes are thinner and more spindly than Concord and it develops a thicker canopy. Cottage is more particular to the soils in which it thrives, unlike Concord, which thrives in most soil types; hence, this characteristic can limit the productivity of Cottage when compared to Concord. Otherwise, it is a very vigorous, healthy, and winter hardy that has moderately good fungus disease resistance, but it is not as resistant to fungus diseases as Concord.

Cottage fruit is of better quality than Concord, with a less foxy native-American *labrusca* flavor. It is richer and more delicate in flavor that lends itself to the production of better quality wines. Cottage wines have a more muted foxy *labrusca* flavor profile, with tannins that are more balanced and a softer acid structure. This variety ripens at about the same time as Concord, or earlier, but tends to ripen unevenly and drops its fruit when ripe. The clusters are somewhat smaller than Concord, with similar sized berries that are a dull black color. This is not a table grape. It can make acceptable wines, especially when used as a base for ports and sherries or for semi-dry country red wines.

Eumelan *(labrusca, vinifera, aestivalis)* is a chance seedling that grew in the yard of Mr. Thorne of Fishkill Landing (Beacon), New York around 1847. The vine is vigorous, very winter hardy, and productive. Its clusters and berries are well formed and of good size. The round, medium-sized berries are a very attractive black to blue in color with a fine bloom. The cluster is loose, large, and rather long and slender, slightly tapering to cylindrical with one shoulder.

The flavor of the grape has little foxiness and is rich, sweet, and vinous, which makes a good and hearty red wine. The sugars can reach 24˚ Brix with low acid. Eumelan ripens late early to early mid-season, but since it hangs on the vine well and does not crack or shell, it can be harvested mid-season to late mid-season. Some of its disadvantages are its moderate susceptibility to fungus diseases and sterile female flowers. The flowers bloom late, but with a compatible pollinator, Eumelan does pollinate easily. Eumelan can produce relatively complex flinty red wines with good body and fruit in the nose and taste for an heirloom variety. These wines are good on their own or used in blends.

Herbert (Rogers No. 44) *(labrusca, vinifera)* is a quality Rogers black heirloom grape that can be used for wine or the table. It was used extensively by the New York State Agricultural Experiment Station grape breeding program to develop Steuben, Corot Noir, Noiret, and Geneva Red (GR-7). Like most other Rogers hybrids, it is a Carter x Black Hamburg cross. Its color is dull blue-black to black with a thick blue bloom.

Herbert is vigorous to very vigorous for a *labrusca-vinifera* hybrid and is productive that produces a quality black grape. Its growth habit is open and airy which helps to keep fungus diseases in check. The variety is winter hardy to moderately winter hardy and its fungus disease resistance is good. The bloom date is mid-season, and as with most Rogers hybrids, it has a self-sterile female flower with reflexed stamens. Its pollinators can be other mid-season self-fertile flowering varieties such as Concord, Delaware, Empire State, Iona, Winchell, or Worden, but not any of the self-infertile Rogers hybrids even if they bloom in mid-season. It pollinates well in a mixed variety vineyard to produce full clusters.

The berry is round oval, and very large to medium large, but is irregular in size. The skin adheres to the flesh of the berry somewhat. The cluster, like most first generation Rogers' hybrids, is large to medium large, broad and tapering. The cluster can be rather long, with one shoulder and moderately compact to loose. The harvest date is mid-season to a bit earlier, along the lines of Concord and earlier than Barry. Herbert is a dual-purpose grape, with an emphasis on wine with sugars at 19˚ to 21˚ Brix. Overall, its taste is of a soft Concord variety with a few Muscat flavors.

It is my hope that growers and wineries in the Northeast who are looking for "new" grape varieties to cultivate and wines to produce will consider these locally developed heirloom blue and black wine grape varieties. Further, that those interested in low or no spray programs to produce grapes organically will consider these grape varieties. This article is based on the author's over forty years of experience growing cool climate grapes in Athens and Middle Hope, NY and making wine from them; and *Grapes of the Hudson Valley and Other Cool Climate Regions of the United States and Canada,* by J. Stephen Casscles (Coxsackie, N.Y.: Flint Mine Press, 2015). This book has much more specific information on many of the grapes covered by this article. (the book is available at www.flintminepress.com). The author's email address is cassclesjs@yahoo.com.

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Pink and Light Red Heirloom Grape Varieties for the Northeast

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This article recommends pink and light red heirloom grape varieties that I have grown and evaluated for the past fifteen years. My farm, Cedar Cliff, is located in Athens, NY, which is on the west bank of the Hudson River about fifty miles north of Newburgh, NY. These quality 19th century heirloom varieties were mostly bred in eastern Massachusetts and in the Hudson Valley between 1840 and 1880. They are suitable for most of New England and the Middle Atlantic States except for its coldest regions. Many of these varieties can be used for both wine production and as table grapes. They are all productive, winter hardy, and fungus disease resistant. Because of their resilience, they need less labor, spray material, and other cultivation practices than most of today's commercial varieties. Consequently, they can be grown profitably in the Northeast. Further, since they are locally developed heirloom grape varieties, they should command heightened interest and demand from wineries and the wine consuming public.

Agawam (Rogers No. 15) *(labrusca, vinifera)*, a Carter x Black Hamburg hybrid, was bred in 1851 by Edward S. Rogers (1826-1899) of Salem, MA. Agawam is dark & dull purplish-red with a lilac bloom. Agawam is a vigorous variety that is hardy with thick canes. It is winter hardy, like Delaware; productive to very productive, but needs a careful spray program to combat fungus diseases.

Agawam prefers a somewhat heavy soil, doing better on clay than on sand or gravel. Agawam is harvested mid-season to late-mid season, soon after Concord. Of the Rogers hybrids, it is the only completely self-fertile variety, but its production is enhanced when placed in a mixed variety vineyard.

The berry is large to very large like Concord. The attractive cluster is medium-large to large and somewhat loose to moderately compact. The cluster is short, rather broad, tapering to somewhat cylindrical with one shoulder. The grape has a thick tough skin, but it is not a slip skin variety. The sugar levels are at 19˚ to 20˚ Brix, with acid levels like Concord. It is a dual-purpose grape that is good for the table and for wine production. It makes a quality white wine that is aromatic and fruity with a Muscat flavor and herbal finish, that blends well with other white wines. As a table grape, it is rich, sweet, with a soft aromatic Muscat quality.

Delaware *(aestivalis, labrusca, bourquiniana, labrusca, vinifera)* is a premium dark pink grape that was first identified in Ohio in 1849. It produces a white wine that is great either alone or in blends. It is one of my most favorite grapes for the table or the cellar.

Delaware is well balanced to make a quality dry or semi-dry white wine. The self-fertile grape can be somewhat finicky in the field, but is generally tolerant of most soils. It prefers a rich, but not too rich, loam or slightly clay loam soil. It is winter hardy. The medium-sized vine has moderate to average vigor and productivity. The one-shouldered clusters are very pretty, compact and small-medium in size. It is more resistant to fungus diseases than most French-American hybrids. Delaware ripens early mid-season to mid-season, with sugars which easily can reach 22˚to 27˚Brix. It can hang on the vine for a long time, even if attacked by *Botrytis cinerea*, to produce exceptional dessert wines.

Delaware is versatile in the cellar. It can make delicate and interesting fruity/floral dry table or sparkling wines, with multiple layers of flowery fruit and light spice that is both agreeably foxy and of Muscat. The pale green to slight yellow colored wines have flavors of white peaches, guava, honey, ripe bananas, and almonds with a musky element in both the nose and body. Semi-sweet or late harvest Delawares possess ripe guava, honey, apricots, orange rinds, ripe bananas, muscat, and almond flavors.

Diana *(labrusca, vinifera)* was planted by Diana Crehore (1795?-1870?) of Milton, MA about 1834 from open pollinated Catawba seeds. Diana did not do well in cool New England; however, it thrived in the warmer climate and soils of the Mid-Hudson River Valley. Diana has a full and pretty cluster, exotic flavors, and sugars between 19˚ and 20˚ Brix. The flavor is similar

Delaware *(aestivalis, labrusca, bourquiniana, labrusca, vinifera)* is a premium dark pink grape that was first identified in Ohio in 1849. Photo credit: Linda Pierro, Flintmine Press.

to Catawba, but with more guava flavors that are rich, spicy, and tangy.

The vine is capricious where it grows; and does best on relatively poor, dry, gravelly soil that does not have much compost or nitrogen. Diana does well in the soils that it likes, being vigorous and productive. The flowers are self-fertile and open by mid-season. The cluster is moderately compact with a delicate pale red/amber to rose color. It ripens about one week to ten days after Concord. The vine can be somewhat cold tender, is somewhat resistant to fungus diseases, with medium-sized berries. The skin adheres to the flesh. The cluster is medium large and stubby, being tapering to cylindrical.

Goethe (Rogers No. 1) *(labrusca, vinifera)* is a Rogers' hybrid of Carter x Black Hamburg. This is a high quality grape that shows more Muscat and less *labrusca* flavors that meld well together. Goethe is red-brown to pale red covered with a slight bloom. Descriptions of its vigorousness range from being a medium difficult grower to being vigorous to very vigorous. This varied description may be because Goethe is sensitive to the soils that it grows in. Goethe likes sandy and gravelly soils. In rich clay soils, it grows too much foliage to yield a quality crop.

The variety is hardy to very winter hardy. It is productive and fairly immune to fungus diseases to somewhat susceptible; but, is sensitive to powdery

mildew. It blooms mid-season and is one of the few Rogers hybrids that is partially self-fertile. Some of the more effective self- fertile varieties that can be used to pollinate it are Concord, Delaware, Diamond, Iona, and Winchell.

The berry size is above medium to very large. The skin is thin and adheres moderately to the pulp. The cluster is attractive, of medium length, but broad and tapering, with a single shoulder that is somewhat compact. Goethe is one of the best quality Rogers grapes for the table and for wine production. Its flesh is tender with a pleasant aromatic soft *labrusca* taste. For wine, it is successfully grown in the southern Brazilian State of Santa Catarina. Goethe has sugar levels at around 18˚ to 19˚ Brix, and low acids like Delaware. The harvest date for Goethe is late to very late. This is a grape that cries out to be planted in New Jersey, the warmer parts of Pennsylvania, and the lower Hudson Valley.

Jefferson *(labrusca, vinifera)* was bred by James H. Ricketts (1818-1915) of Newburgh, NY and introduced in 1880. It is a Concord x Iona hybrid and is excellent as a table grape or for wine production. Jefferson can resemble the vigor, productivity, health and disease resistance of Concord, but is not Concord's equal. In color and quality, the fruit resembles Iona, but the cluster is much prettier than Iona.

It produces fruit early-late season, approximately seven to ten days after Concord. Jefferson is not particular about its soils, but does not like lime soils. Jefferson is a high quality red/bronze grape. It is a superior table grape because of its attractive appearance, very large to large clusters, thin adhering skin, soft non-cloying taste, and ships and keeps well. The clusters are cylindrical to tapering, well formed, and well filled to compact. The berries are medium-large and uniform in color. The flavor and texture of the grape is juicy with rich vinous flavors and delicate strawberry-like aroma. The light pale golden colored wines are of excellent quality; with fruits of apricots, soft *labruscas*, honey, pears, melons, and light almonds.

Jefferson *(labrusca, vinifera)* was bred by James H. Ricketts (1818-1915) of Newburgh, NY and introduced in 1880. Photo credit: Linda Pierro, Flintmine Press.

Massasoit (Rogers No. 3) *(labrusca, vinifera)* is a Rogers hybrid of Carter x Black Hamburg. The color is dark-brownish red to red with lilac bloom. Massasoit is a strong, hardy, and a vigorous to very vigorous grower that is productive. It is winter hardy, but fairly susceptible to fungus diseases. It is self-sterile that blooms mid-season to late season. It will occasionally set out very partially filled clusters of small to very small seedless grapes, referred to a Williams Seedless.

The berry is large to medium-large. Its thin skin adheres mostly to the pulp. The cluster size is medium and short, rather broad, that is cylindrical to tapering with a single shoulder. The harvest date is early for a Rogers hybrid, along with the early ripening varieties such as Delaware. The sugars of Massasoit average 19.5˚ Brix, with acids like Concord.

Salem (Rogers No. 22 and 53) *(labrusca, vinifera)* is a hybrid of Carter x Black Hamburg. The color is an attractive dark red/chestnut, with a medium blue bloom. Salem is a vigorous variety that is moderately productive that can be variable in its production. The variety can be susceptible to fungus diseases without a good spray program. On the plus side, it has an open canopy which increases air flow and sunshine to facilitate fungicide sprays. It is very winter hardy, one of Rogers most winter hardy varieties and as hardy as Delaware or more so.

Salem is not particular to the soils that it will grow in. Its self-sterile flowers bloom by mid-season. Self-fertile pollinators that bloom with it include, Catawba, Concord, Delaware, Iona, Empire State, Jefferson, Niagara, Winchell, and Worden.

Its harvest date is early for a Rogers hybrid and it ripens mid-season along with Concord or even before. The berry is large to very large. Its cluster is medium to large, compact, short and broad, tapering to cylindrical, that is shouldered. The skin of the berry is a rather thick non-slip skin which adheres to the pulp.

This is a dual-purpose grape. It is a handsome fruit of quality for the table and makes a high quality white wine for a *labrusca-type* grape. It has a soft *labrusca*/Muscat nose, with a delicately rich aromatic, sprightly, and vinous flavor. Salem is relatively low in sugar at 17˚ Brix, with low acidity like Delaware.

Vergennes (*chance seedling, labrusca*) is a red grape that was found in the garden of William E. Greene (1810-1886) of Vergennes, Vermont in 1874. Vergennes wines, both dry and semi-dry, are quality white *labrusca-type* wines that are still produced by Arbor Hill Winery in the Finger Lakes.

The vine is generally winter hardy and productive to very productive. Vergennes produces a large berried attractive bright colored red grape. The clusters are of medium size and length, broad and cylindrical to tapering, and of variable compactness, but generally are loose. Overall, the vine is healthy and somewhat resistant to fungus diseases. It is a safe and productive variety for marginal vineyard sites. Vergennes flowers by mid-season to late season, whose flowers are semi-sterile. The variety ripens late about one to two weeks after Concord.

It is my hope that growers and wineries in the Northeast who are looking for "new" grape varieties to cultivate and wines to produce will consider these locally developed heirloom pink and light red wine grape varieties. Further, that those interested in low or no spray programs to produce grapes organically will consider these grape varieties. This article is based on the author's over forty years of experience growing cool climate grapes in Athens and Middle Hope, NY and making wine from them; and *Grapes of the Hudson Valley and Other Cool Climate Regions of the United States and Canada,* by J. Stephen Casscles (Coxsackie, N.Y.: Flint Mine Press, 2015). This book has more information on many of the grapes covered by this article. (the book is available at www.flintminepress.com). The author's email address is cassclesjs@yahoo.com.

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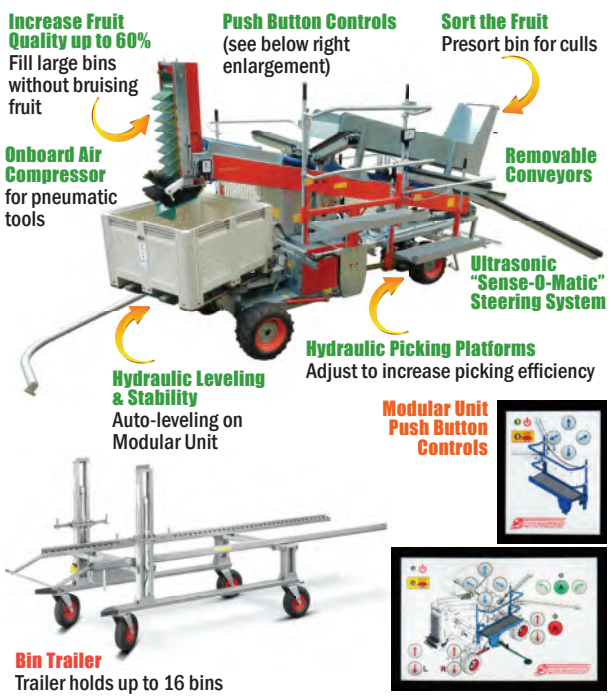

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Dr. Joshua Feldstein, Former Delaware Valley University President, Passes Away at 97

Affectionately known as Josh to all, Dr. Joshua Feldstein died June 19, 2018. Dr. Feldstein's remarkable association with Delaware Valley University lasted nearly 80 years. It included stints as a student, faculty member, department chair, associate dean, dean, president, trustee, and emeritus trustee.

"To generations of DelVal students, faculty, staff and alumni, Joshua Feldstein **was** Delaware Valley University," said current President Dr. Maria Gallo. "The entire University community is deeply saddened by his passing."

A memorial service was held on Sunday September 30, 2018 at Delaware Valley University. Attended by 250 friends, family and alumni, we got to pay our respects to Josh one last time. A short video interview with Dr. Feldstein was played that captured his essence and characterized his long well lived life. It can be viewed at: *https://www.delval.edu/offices-services/presidents-office/dr-joshua-feldstein*

When asked how he wished to be remembered, Dr. Feldstein replied, "He was never sorry for anything he did. He was only sorry for the many things he couldn't do."

As president of the university, Dr. Feldstein strengthened ties between DelVal and Bucks County. He also introduced new academic majors, including agribusiness, and built new athletic and academic facilities. These included the Student Center, James Work Memorial Stadium, the Kenneth W. and Helen H. Gemmill Center for Animal Husbandry, and the Sydney Markovitz Equine Facility. He oversaw improvements in computer facilities in the Feldman Building, the addition of laboratory and classroom space to the greenhouse complex, and renovations to the Allman Building, and helped secure the donation of the Roth Farm, which is now DelVal's Roth Center for Sustainable Agriculture.

During Dr. Feldstein's terms as interim president, DelVal built additions to the James Work Gymnasium and James Work Hall and constructed the Arthur Poley Greenhouse Complex. Dr. Feldstein was also responsible for the start of construction on the addition to the Mandell Science Building, which includes the Jefferson Center.

Known as a person who valued honesty and loyalty, and possessed of a sincere desire to help people, Dr. Feldstein made small classes and personal attention hallmarks of the DelVal educational experience. Even as an administrator, he made time to teach classes. He was a valued counselor to students and kept up with alumni long after they left campus. "Our students are our life's blood," he once said, "and our alumni are our claim to fame."

As president, Dr. Feldstein advocated for access and inclusion. He helped admit the first women to DelVal in the 1960s and increased the number of women on the faculty. "To teach is to mold minds and to influence people forever," he said. "If you don't extend an opportunity to people, or exclude them from an opportunity, they will never be able to accomplish what they could."

To thousands of DelVal Alumni, especially in Horticulture, Josh was instrumental in influencing our careers. DelVal alumni are scattered though out the USA. Josh was loved and will be missed, but we are thankful we got to know him and thankful for the opportunities Delaware Valley University provided for us because of the work and passion of Dr. Joshua Feldstein.

Southwest injury on 'Honeycrisp' left an open wound for opportunistic fungi. As a result, this tree pictured succumb to **white rot fungus** *Botryosphaeria dothidea*. Note to growers make sure to remember to spray/paint your trunks with exterior white latex paint this fall! Win Cowgill always recommended a whitewash of 60% exterior white latex paint plus 40% water, painted or sprayed on- 1- to 6-year-old peaches and apples which were most susceptible. You should paint annually with white wash or 2-3 years if you use straight latex. Paint protects form Winter Injury, rodent damage and herbicide injury.

New Jersey News

Former Middlesex County Ag. Agent, Warner H. Thurlow, Died on September 15, 2018 at 93

For 32 years, Warner served as County Agricultural Agent for Middlesex County, where he was responsible for adult education programs for County residents. He was noted especially for his work advising homeowners on landscaping and gardening problems, and worked closely with commercial nurseries, landscaping businesses, and public agencies. He also regularly hosted gardening programs on radio station WCTC, in New Brunswick, NJ.

Warner was an old-school county ag agent. He was a generalist and a servant to all. He was predeceased by his first wife, Ruth (Gruner), his second wife, Amelia (Hamilton), and his son-in-law, Timothy Meaney. He is survived by his third wife of 25 years, Jean (Walker), his daughter, Marjorie Meaney, son and daughter- in-law, Ernest and Joanne Thurlow, and several grandchildren to whom he was affectionately known as "Pop": Scott Thurlow, Breanne Meaney, Caitlin and her husband Ryan Lormel, and a great-grandson Ryan Timothy Lormel,

Born in Newark, Warner grew up in Spring Lake and graduated from Manasquan High School. After serving in the U.S. Navy during WWII, he enrolled at Rutgers University, receiving a Bachelor of Science in Agriculture and later a Master of Science Degree.

Warner served on the Board of Directors of the Middlesex County Tuberculosis & Health League, was Chief Financial Officer of the American Lung Association of Mid-Jersey, and, for more than 30 years, served on the Board of Directors of the American Lung Association of New Jersey.

He was a parishioner of Pinelands Reformed Church, Toms River, where he served as a deacon, elder, and vice president. A proud veteran, he was a member of the Tin Can Sailors, the National Association of Destroyer Veterans, and the USS O'Hare DD-DDR 889.

To his entire family, Warner "Pop" Huntington Thurlow will forever live in our memory, a stalwart figure of life, wisdom, and light, who never failed to remind us that simply gathering together to share is, in and of itself, sublime, and something always to be celebrated.

In lieu of flowers, contributions can be made to the Pinelands Reformed Church, 898 Rt 37 West, Toms River, NJ 08755 or to Grace Healthcare Services, 105 Fieldcrest Ave, Suite 402, Edison NJ 08837 (www.gracehcs.com/donation-program). For further information or to send condolences, please visit www.ryanfuneralhome.com.

Several Spotted Lantern Fly sightings have been reported in Northwestern New Jersey this growing season. Pictured here is one of our findings on the host of Spotted Lanternfly, Tree of Heaven (Ailanthus altissima), at a vineyard in Hunterdon County. Tree of Heaven serves as a trap or indicator for this pest.

E. Randall Miller, Delaware Valley College Graduate, Passed Away September 26, 2018

It is with great sadness that the family of E. Randall Miller announce his passing on September 26, 2018 at the young age of 66. Randall will forever be remembered and loved by his wife of 35 years, Debbie Magner Miller, his mother, Phyllis Miller, his daughters, Dawn Miller and Justine Sillers, her husband Matthew and their two children, Parker and Griffin and family members Tom, Lynn, Jessica, Zachary and Courtney Magner, Steve, Donna and Evan White, Sarah Baybutt and Elizabeth Miller. He was predeceased by his father Edwin G. Miller and his brother Geoffrey B. Miller.

Many of us knew E. Randal as an enthusiastic friend know for his energy, quick whit and Randallisms!

Randall was born and raised in Lancaster, PA where he was a standout athlete in baseball and football at Manheim Twp. High School. He graduated from Delaware Valley College where he further developed his passion for agriculture. E. Randal was well known for his love of the Angus Cattle industry and the many years he worked in it. We all knew Randal as the cow guy! He was also a career Horticulturist. Upon retirement, he served as a substitute teacher for Ocean Twp. Schools and was loved by all. The thing he enjoyed most in life was spending time with his family and friends, especially his grandsons. He will be remembered for his "Heidi-Ho" energetic personality and his love of roses, the JETS, and Oakland Mills Baseball Team.

Burial was held in Lancaster, PA on Sat Oct 6, 2018. In lieu of flowers, contributions in his memory may be sent to the Oakland Mills Baseball Program. 9410 Kilimanjaro Rd, Columbia, MD 21045. For more information on arrangements: https://www.meaningfulfunerals.net/.

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