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Editors: Winfred P. Cowgill, Jr. & Jaime C. Piñero

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
Win Cowgill & Wes Autio	2010 - 2021
Win Cowgill & Jaime Piñero	2021-

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.

October 2021: Jaime Piñero became the editor from UMass upon the reitrement of Wes Autio. Cowgill and Piñero are 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: MAIA1 (Evercrisp)/G.41 rootstock- 2 year old trees at Brookdale Fruit Farm, taken July 28, one month after hedging at the Summer Solitice (6/21) with a Lagasse Orchard Hedger. Shoots regrowing at the hedging point can be seen. Trees are supported with the Valente Concrete Post System. Brookdale Fruit Farm and Brookdale Farm Supply are located in Hollis, New Hampshire. https://www.**brookdalefruitfarm.com/**
Photo Credit: Win Cowgill

Response of Oriental Fruit Moth to Benzaldehyde and Other Plant Volatile Compounds

Ajay P. Giri and Jaime C. Piñero
Stockbridge School of Agriculture, UMass Amherst

Tortricid moths (Order: Lepidoptera) are known for their remarkable olfactory capabilities that allow them to find their host plants. The Oriental fruit moth, *Grapholita molesta*, (OFM) is a worldwide key pest of stone and pome fruits. It produces 3-4 generations per year and has the ability to switch hosts (e.g., from peach to apple) over the growing season. Sex pheromone lures are used to monitor OFM populations. However, sex pheromone lures only attract OFM males and there is a likely chance of mated female immigrating into the orchards. Because one mated female OFM can lay up to 160 eggs over its lifespan, then a few females are enough to maintain a robust population. Therefore, luring females would be more advantageous to monitor moth activity and minimize their impact compared to pheromone-based monitoring systems that target males.

The main goal of this study was to evaluate, under field conditions, the response of OFM males and females to one aromatic compound, benzaldehyde, either alone or in combination with one commercially available 4-component lure (= Megalure 4-K®). Megalure is an attractant produced by Trécé Inc. that targets male and female codling moths. Benzaldehyde is predominantly found in plants of the genus *Prunus* (Rosaceae) some of which are primary hosts of OFM and is found in traces in the flowers of apple early in the season.

Materials and Methods

This study was conducted from 28 April to 25 July, 2022, at the UMass Cold Spring Orchard in Belchertown, MA. Seven lures (= treatments) were evaluated: (1) Benzaldehyde (= BEN) at very low dose (BEN-VL), (2) BEN at low dose (BEN-L), (3) BEN at medium dose (BEN-M), (4) Megalure alone, (5) Megalure + BEN-VL, (6) Megalure + BEN-L and (7) Megalure + BEN-M. Unbaited traps served as negative controls. All lures were placed inside orange colored delta-shaped traps (Pherocon® VI, Trécé Inc., Adair, OK, USA) containing sticky liners. The BEN lures were formulated by Trécé Inc. in a black polyvinyl chloride (PVC) proprietary matrix (Figure 1). At the orchard block, each treatment was replicated 5 times (Figure 2).

Traps were hung on the upper third of the tree canopies and were 15 meters apart. Traps were examined beginning on 5 May and every seven days thereafter until 25 July. All lures were replaced every 6 weeks and sticky liners were replaced whenever the liner became crowded with insects. We also collected data on the

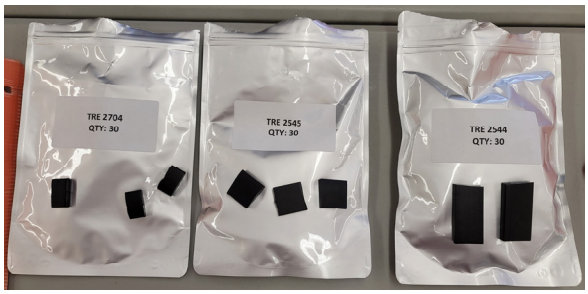

Figure 1. Experimental benzaldehyde lures formulated by Trécé, Inc., in a black polyvinyl chloride (PVC) proprietary matrix.

Figure 2. Trap deployment on the perimeter of a commercial apple orchard block. There were eight treatments replicated four times.

codling moth, but those results are not reported here.

All captured adult moths were identified according to species (i.e., CM, OFM) and examined under dissecting microscope to identify their sex.

Results

Early season captures (28 April – 8 June). OFM populations peaked during this period with 2,618 OFM (males and females) captured across all treatments. During this period, Megalure with benzaldehyde medium dose (MEG + BEN-M) and Megalure with benzaldehyde low dose (MEG + BEN-L) performed best (Figure 3). These two treatments were significantly more attractive than benzaldehyde at very low dose, which also showed to be attractive to males when compared to unbaited traps. OFM males captures in traps baited with benzaldehyde low dose (BEN-L), benzaldehyde medium dose (BEN-M), Megalure alone (MEG), and Megalure with benzaldehyde very low dose (MEG + BEN-VL) were statistically similar.

Seventy-six OFM females were captured in treatments containing Megalure, regardless of the presence or absence of benzaldehyde (Figure 3, female numbers are in red font, in parentheses). Only one female OFM was captured in traps baited with benzaldehyde alone at a low dose.

Mid-season captures (9 June – 25 July). During this period, Megalure with benzaldehyde at medium dose (MEG + BEN-M) continued to be the most attractive lure combination whereas MEG + BEN-L and MEG + BEN-VL showed an intermediate level of attractiveness (Figure 3). Benzaldehyde alone, regardless of its dose, was as attractive to OFM males as Megalure (MEG).

The number of OFM females trapped declined 19-fold during the mid-season. Only four OFM females were captured by traps containing Megalure in this period.

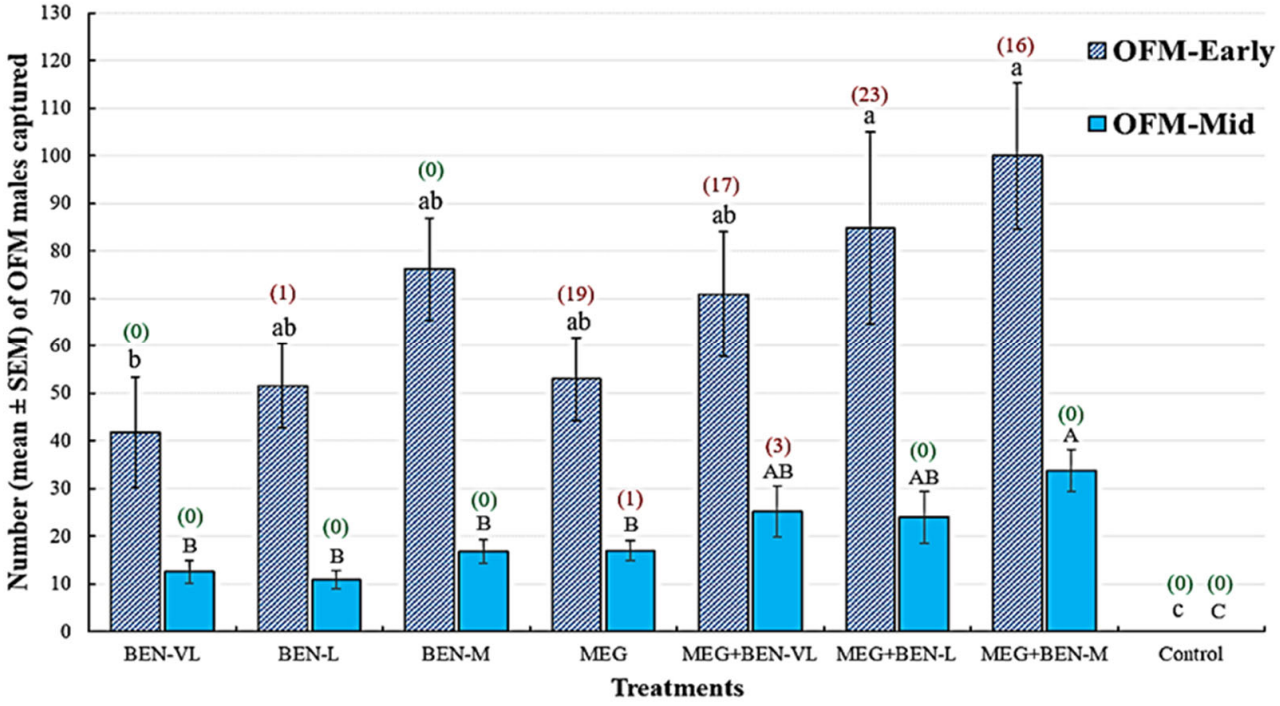

Figure 3. Captures (mean ± SEM) of male OFM in delta traps according to treatment early in the season (dotted blue texture) and in the mid-season (solid blue bar) in 2022. The numbers above the bars inside parentheses denote total number of female moths captured. Bars superscribed with the same letter do not differ significantly among treatments at odds 19:1

Conclusion

Our findings show that benzaldehyde alone is a strong male attractant for OFM and that the addition of benzaldehyde to Megalure increases OFM male captures in traps. These findings indicate that additional research needs to be conducted with benzaldehyde to develop new or improve exiting monitoring and control systems for OFM and potentially other tortricid moths.

Acknowledgements

We thank Shawn McIntire and the orchard crew for providing help with orchard management. Thanks to Brent Short (Trécé Inc., Adair, OK) for providing the lures and trapping materials, and to Heriberto Godoy-Hernandez, Prabina Regmi, and Mateo Rull-Garza for assistance.

Ajay Giri is a graduate student at the UMass Stockbridge School of Agriculture.

Paul Émile Yelle (1953-2022)

Our Friend Paul Emile passed August 29, 2022

Paul was a friend and colleague from Quebec, Canada. His career was spent working with tree fruit growers in Quebec. Paul worked for provincial ministry of agriculture as the fruit pathologist. Many of us knew him from our association and tours with the International Fruit Tree Association. In addition, Jon Clements reminded me he was well remembered as a regular attendee at the Vermont IPM meeting many of us participate in. Tim Petch, apple grower in Quebec, indicated that "Paul did a lot for his fellow fruit growers in Quebec and loved every minute of his job!" He reminisced "Paul loved all corners of fruit production, especially the orchard tours and meetings where he could rub shoulders with all, just like his dad, Bob Petch did."
https://serrefinnegan.com/en/impression-des-deces/?decesid=36293

NC-140 Fuji and Honeycrisp Apple Rootstock Trials in New Jersey: 2021 Growing Season

Megan Muehlbauer[1], Rebecca Magron[1], Win Cowgill[2]
[1]*New Jersey Agricultural Experiment Station, Rutgers University*
[2]*Professor Emeritus, Rutgers University, Win Enterprises International, LLC.*

Over the past 8 years, the New Jersey Horticulture Society has consistently supported both the NC140 2014 Honeycrisp and 2014 Fuji rootstock trials in New Jersey with their NJ Horticulture Society Grant Fund. These trials are part of the larger NC-140 Regional Rootstock Project which is also partially funded through the US Hatch Act in partnership with the USDA, NIFA and Agricultural Experiment Stations.

Our NC140 project seeks to make the best rootstocks available to fruit growers! Our project focuses on selecting and testing rootstocks that enhance the vigor, yield, disease and insect resistance of widely grown apple (and other tree fruit) cultivars. New Jersey has been part of NC-140 since 1988. Trials are established at multiple locations throughout the North America to observe and record the performance of commercially significant cultivars with different promising new rootstocks.

Overview of the Rootstock Trials

The New Jersey NC140 apple rootstock trials have been established at the Rutgers Snyder Research and Extension Farm in Pittstown, NJ since 1990. This includes both the 2014 Honeycrisp and 2014 Fuji rootstock trials. The Honeycrisp apple trial was established at a spacing of 4' x 12' (907 trees per acre), and the Fuji trial is at a slightly wider spacing 5' x 13' (672 trees/acre). The trees have been managed in accordance with the commercial standards as written in the 2021/2022 New Jersey Tree Fruit Production Guide.

The Honeycrisp planting has 14 rootstocks (B.10, G.11, G.202, G.214, G.30, G.41, G.935, G.969, M.26 EMLA, M.9 NAKBT337, V.1, V.5, V.6, V.7).

The Fuji planting includes only 11 rootstocks (G.11, G.202, G.214, G.30, G.935, M.9 NAKBT337, M.26 EMLA, V.1, V.5, V.6, V.7).

Data are collected from each of the plantings at harvest. Data collected from the Honeycrisp trial included total yield per tree, total number of fruits per tree, number of suckers per tree (not reported) and circumference. Data collected from the Fuji trial included total yield per tree, total number of fruits per tree, number of suckers per tree (not reported), circumference, tree height (not reported) and tree width (at widest part) (not reported).

At the Annual NC-140 Technical Committee Meeting in 2021, it was decided that an adequate amount of data has been obtained from the Fuji trial. Thus, 2021 was the last season of data collection for this trial.

2021 NJ Growing Season

The 2021 growing season was profitable for the tree fruit industry in part due to optimal weather conditions. Temperatures held steady in the early growing season, with no major damaging freeze events during bloom (Figure 1). This resulted in excellent cropping. Fortunately, temperatures were optimal, and rain was limited in the spring, thus there were ample opportunities for spring fruit thinning (Figure 1).

There was steady rain throughout the growing season culminating in a major rain event at the beginning of the fall (Figure 1). This resulted in very large fruit size. Ap-

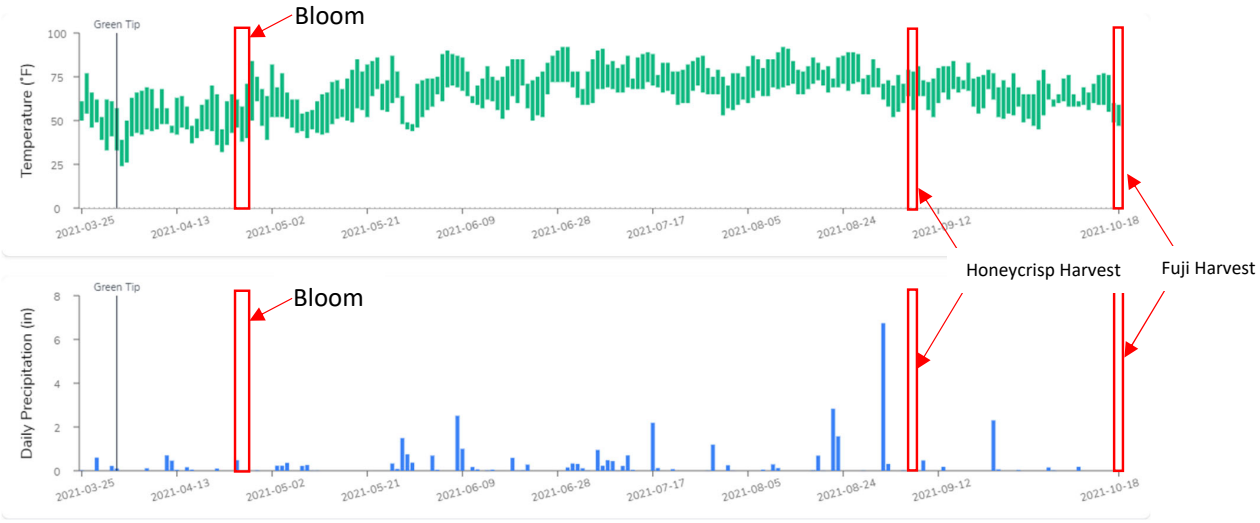

Figure 1. Daily temperature and precipitation totals (in) throughout the 2021 growing season at the Rutgers Snyder Research and Extension Farm, Pittstown, NJ.

ple harvest was a little early at first but slowed down to normal by mid-September. Apples were able to hang on the trees beyond normal picking days to improve fruit color that was poor due to warm temperatures.

Table 1: Average yield and vigor data collected in 2021 from the 2014 NC-140 Honeycrisp Rootstock T Rutgers University Snyder Research and Extension Farm Pittstown, NJ.

Rootstock	Average TCSA (in^2)	Average Yield (lb)	Average Individual Fruit Weight (oz)	Average Yield Efficiency (lb/in^2)
G.969	5.27 CDE	13.2 B	8	2.5
V.1	6.82 EF	19.8 AB	8	2.9
V.6	7.75 F	24.2 AB	7.6	3.1
G.935	4.50 BCD	19.8 AB	8.8	4.4
V.5	6.36 EF	39.6 AB	7.2	6.2
V.7	6.82 EF	46.2 AB	8.8	6.8
G.214	3.72 ABC	28.6 AB	9.2	7.7
B.10	3.72 ABC	35.2 AB	8	9.5
M.9T337	3.57 ABC	35.2 AB	8.8	9.9
G.41	3.88 ABC	37.4 AB	9.6	9.7
G.30	5.58 DE	61.6 A	9.2	11
G.202	2.79 AB	33 AB	8.4	11.8
M.26EMLA	4.34 BCD	57.2 AB	10.8	13.1
G.11	2.79 A	37.4 AB	7.2	13.4

Means separated within columns by Tukey's HSD (P=0.05).

Results

Honeycrisp. The rootstock V.6 resulted in the largest Trunk Cross Sectional Area (TCSA) for Honeycrisp (7.75 in^2) (Table 1). *TCA is the best measure of tree size for research purposes*. However, it was not significantly larger than the other Vineland Series rootstocks included in the study V.1 (6.82 in^2), V.5 (6.36 in^2), and V.7 (6.82 cm^2) (Table 1). The smallest TCSA G.11 (2.79 in^2) was not significantly smaller than a number of rootstocks including G.202 (2.79 in^2) , G.41 (3.88 in^2), M.9T337 (3.57 in^2), B.10 (3.72 in^2), and G.214 (3.72 in^2) (Table 1). Average yields were fairly consistent across all rootstocks, G.30 (61.6 lb) was statistically the largest and G.969 (13.2 lb) was the smallest (Table 1). All other rootstocks were not statistically different from the highest or lowest yielding rootstocks (Table 1).

Individual average fruit weight nor yield efficiencies were statistically different across the rootstocks (Table 1). Average fruit weight ranged from 7.2 to 10.8 oz (Table 1). Average yield efficiency ranged from 2.5 lb/in^2 to 13.4 lb/in^2 (Table 1).

Fuji. The smallest TCSA in the Fuji trial was G.202 (4.81 in^2), however it was not statistically smaller than G.11 (5.89 in^2), G.214 (5.58 in^2), G.30 (7.75 in^2), G.935 (5.58 in^2), M.26 (7.75 in^2), M.9T337 (6.36 in^2) or V.1 (7.91 in^2) (Table 2). The three largest TCSAs were rootstocks V.5 (9.3 in^2), V.6 (9.46 in^2), V.7 (9.15 in^2) and none were statistically different (Table 2).

The average yields, individual fruit weights and yield efficiencies were all statistically similar across rootstocks. Average yields ranged from 101.2 lb to 147.4 lb per tree (Table 2). Average individual fruit weight ranged from 5.95 oz to 7.28 oz (Table 2). Average yield efficiencies ranged from 12.3 lb/in^2 to 21.66 lb/in^2 (Table 2).

Comparison of Honeycrisp and Fuji. The Fuji trees surpassed the Honeycrisp

Table 2: Yield and vigor data collected in 2021 from the 2014 NC-140 Fuji Rootstock Trial at Rutgers University Snyder Research and Extension Farm Pittstown, NJ.

Rootstock	Average TCSA (in^2)	Average Yield (lb)	Average Individual Fruit Weight (oz)	Average Yield Efficiency lb/in^2
V.5	9.3 BC	114.4	6.67	12.3
V.1	7.91 ABC	101.2	6.72	12.79
V.7	9.15 BC	123.2	7.28	13.46
M.26EMLA	7.75 ABC	114.4	8.96	14.76
V.6	9.46 C	147.4	6.37	15.58
G.30	7.75 ABC	123.2	6.14	15.9
G.214	5.58 A	107.8	5.95	19.32
G.935	5.58 A	112.2	5.71	20.11
G.202	4.81 A	101.2 A	6.71	21.04
M.9T337	6.36 ABC	136.4	6.70	21.45
G.11	5.89 A	127.6	6.98	21.66

Means separated within columns by Tukey's HSD (P=0.05).

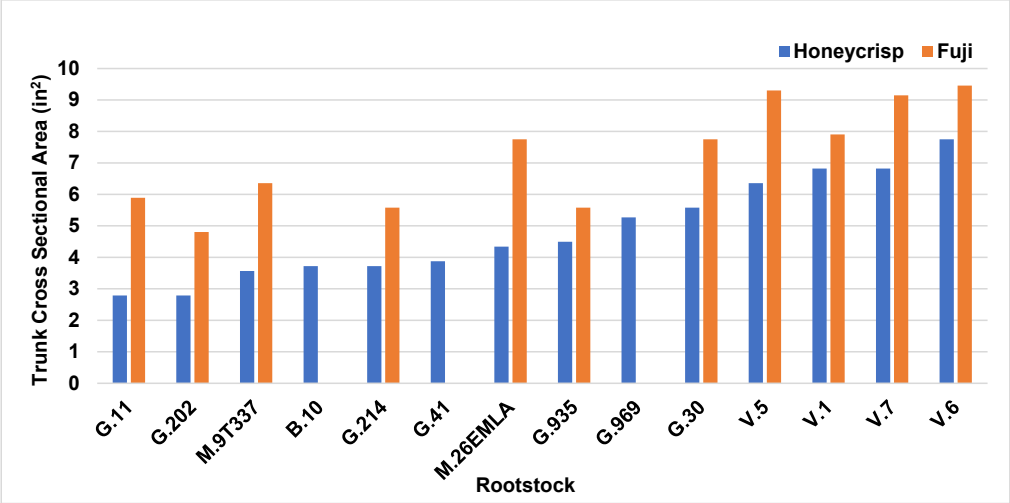

Figure 2. Average Trunk Cross Sectional Area in 2021 for the Honeycrisp and Fuji 2014 NC-140 Apple Rootstock Trials at the Rutgers Snyder Research and Extension Farm, Pittstown, NJ.

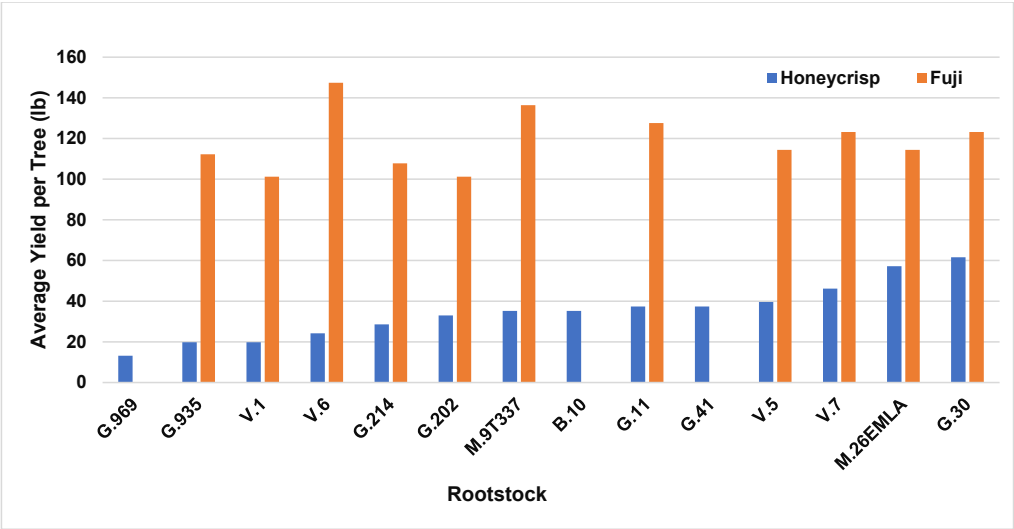

Figure 3. Average yield per tree in 2021 for Honeycrisp and Fuji 2014 NC-140 Apple Rootstock Trials at the Rutgers Snyder Research and Extension Farm, Pittstown, NJ.

trees in size for each rootstock on which they were both grafted (Figure 2). The Fuji trees also surpassed Honeycrisp in average yield per tree (Figure 3) and yield efficiency for all rootstocks onto which they were both grafted (Figure 4). The 2021 growing season was the on year for this plot of trees, Fuji is notoriously biannual.

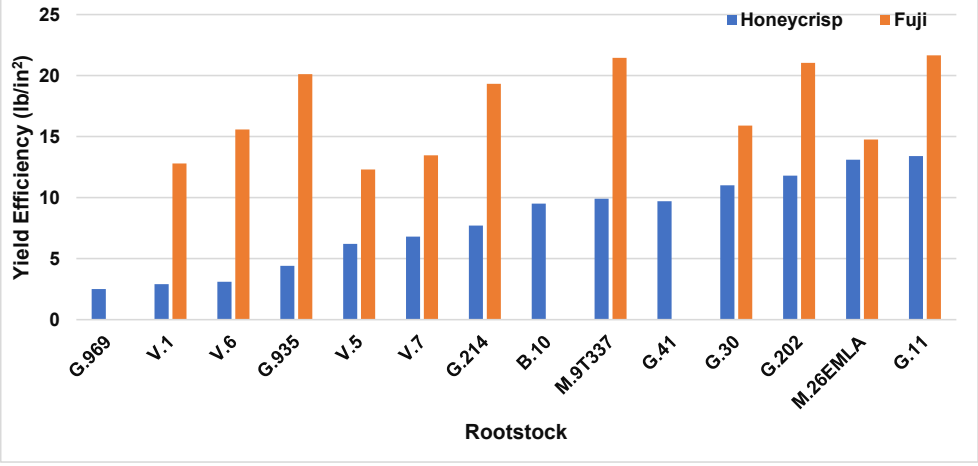

Figure 4. Average Yield Efficiency (Yield/TCSA) in 2021 for both Honeycrisp and Fuji 2014 NC-140 Apple Rootstock Trials at the Rutgers Snyder Research and Extension Farm, Pittstown, NJ.

Five year NC140 summary papers for both the 2015 Fuji and Honeycrisp rootstock trials[1] "Early Performance of 'Honeycrisp' Apple Trees on Several Size-Controlling Rootstocks in the 2014 NC-140 Rootstock Trial Early Performance of 'Honeycrisp' Apple Trees on Several Size-Controlling Rootstocks in the 2014 NC-140 Rootstock Trial, 2021

Discussion

This is the 8th and final year for the 2014 NC-140 Fuji trial. Collaborators of this trial decided to terminate it because the yields and yield efficiency have begun to level off in trials throughout the USA. This was also illustrated in our 8 years of New Jersey trial data

The 2014 Honeycrisp trial will continue for two more years as planned. The vineland series rootstocks (V.1, V.5, V.6, and V.7) have consistently had the largest TCSA and yields have been generally higher in the Geneva series rootstocks. We therefore do not recommend the Vineland stocks tested (V.1, V.5, V.6, and V.7) for tall spindle.

The 2021 NJ Honeycrisp trial tended to be the off year due to biannual bearing. G.969 s was almost blank for yield where it had been the most yield efficient with the highest yield in 2020. The best rootstock across the board in 2021 for Honeycrisp yield in was G.30. It resulted in the statistically highest yield for Honeycrisp and it was one of the most consistently high yielding rootstocks in this NJ study. This illustrates that G.30 may not display as much of a tendency toward biennial bearing as other Geneva rootstocks.

Although this was not as clearly seen in the 2021 growing season, in previous years in NJ the rootstocks, G.969 and G.935 have significantly outperformed the other stocks in yield efficiency in New Jersey and at sites throughout the United States and Canada. However, in 2021 G969 with Honeycrisp was almost blank indicating biannual bearing. G.30 was much more uniform across previous years for Honeycrisp.

Note: we cannot recommend G.935 because as it has exhibited latent virus susceptibility across the USA in commercial plantings. Therefore, only virus-free bud would can be used to propagate cultivars on G.935. ***Since there are no virus free budwood programs currently in the USA*** that check for all apple viruses, we cannot recommend G.935.

Our recommendation for Honeycrisp

G.30 is our preferred rootstock selection for NJ for Joneycrisp. While it is one of the larger trees by TCSA, we feel that when paired with Honeycrisp in a tall spindle system it will be very precocious, not prone to biannual bearing, very resistant to fireblight, tolerant to specific apple replant disease, and *Phytophthora* crown and root rot, and is not susceptible to latent viruses.

More Notes that **G.30 rootstock** that has been evaluated in numerous NC-140 and other rootstock trials over the years. It is the right vigor for well managed

Honeycrisp Plantings especially on replant sites. G.30 fell out of favor with our US nurserymen as it is hard to propagate so there are very few stoolbeds of G.30 and therefore limited production. G.30 is available from Willamette Nurseries in Canby, Oregon. http://www.willamettenurseries.com/ and is available for propagation at Wafler Nursery in NY https://waflernursery.com. G.30 precocity and productivity are also similar to M.26. G.30 is highly resistant to fireblight and quite resistant to crown and root rots, but susceptible to woolly apple aphid. G30 was tested in the 1994 NC-140 Semi-Dwarf Apple Rootstock Trial with the cultivar Gala (and perhaps others). G.30 can be brittle at the graft union, and must be well supported as it is in a tall spindle system.

Conclusions

The Vineland (V.1, V.5, V.6, and V.7) series rootstocks we tested and M.26 EMLA, G.30 continue to show significant vigor in both the 2014 Fuji and Honeycrisp NC-140 rootstock trials. In particular, V.6 had the greatest TCA for both Fuji and Honeycrisp scions. The Vineland rootstocks tested with Fuji were too vigorous for a tall spindle system. None of the Vineland rootstocks, M.26 EMLA, or G. 30 look good in tall spindle with Fuji. Establishing this trial at 3' x 12' instead of 5' x 13' would have increased competition between trees and may have improved performance in a tall spindle system. However, at the established 5' x 13'spacing, the average fruit weight, average yield per tree, and average yield efficiency was not significantly different among rootstocks, and none were stellar performers.

For Honeycrisp G.30 is our preferred rootstock selection for NJ.

For Fuji G.11 is our preferred rootstock selection for NJ.

Future Plans

A summary final paper will be published of the 2014 Fuji trial.

2023 NC-140 Apple hard Cider Trial

The NJ site will be established in 2023 at the Rutgers Snyder Research and Extension Farm. The hard cider cultivar Porters Perfection[3] will be utilized and evaluated on the following rootstocks G.11, G.41, G.202, G.210, G.213, G.214, G.890, G.935, G.969 and B.10. Porters Perfection is an English cider apple with cream colored flesh, a dark red overcolor, and a bitter-sharp flavor for cider blending quality.

For the 2023 Hard Cider apple trial, similar horticultural data will be collected from this trial as previous NC140 trials including, yield, crop load, fruit quality, biannual bearing, etc., as affected by rootstock. This hard cider apple trial was focus as well on juice/cider quality (sugars, titratable acidity, and pH) as affected by rootstock.

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NC140 Website http://nc140.org/

NC140 Plantings Website by year http://nc140.org/plantings.html

2021 NJ NC140 State Report http://www.nc140.org:8000/2021/statereports.

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[1]Early Performance of 'Honeycrisp' Apple Trees on Several Size-Controlling Rootstocks in the 2014 NC-140 Rootstock Trial, 2021 Cline, John & Autio, Wesley & Clements, Jon & Cowgill, Winfred & Crassweller, Rob & Einhorn, Todd & Fallahi, Esmaeil & Francescatto, Poliana & Hoover, Emily & Lordan Sanahuja, Jaume & Moran, Renae & Muehlbauer, Megan & Musacchi, Stefano & Stasiak, Matt & Parra-Quezada, Rafael & Robinson, Terence & Serra, Sara & Sherif, Sherif & Wiepz, Rebecca & Zandstra, John. (2021). Early Performance of 'Honeycrisp' Apple Trees on Several Size-Controlling Rootstocks in the 2014 NC-140 Rootstock Trial. Journal- American Pomological Society. 75. 189-202

[2]Peck, Gregory & Zakalik, David & Brown, Michael. (2021). **Hard Cider Apple Cultivars for New York.** 29. 30-34.

[3]Cider Research at Cornell https://exhibits.library.cornell.edu/cider/feature/cider-research-at-cornell

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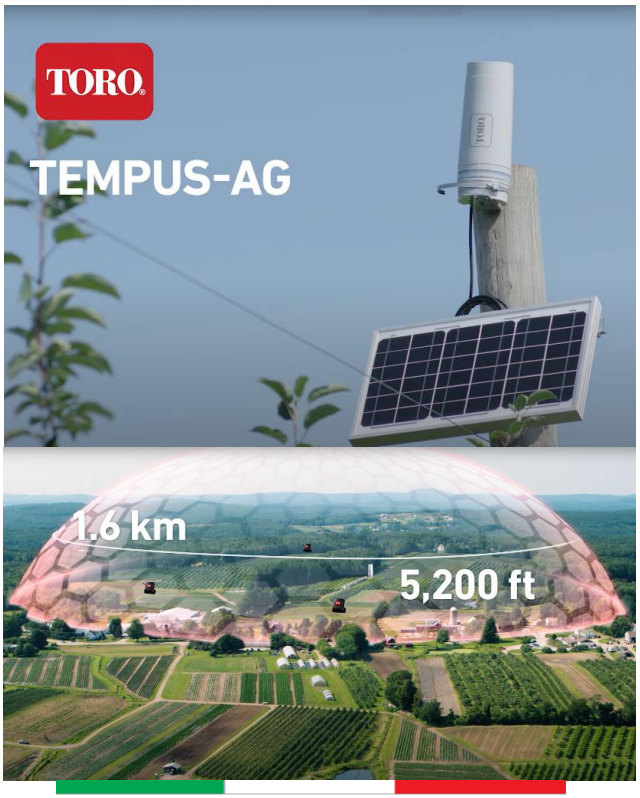

Trellis at Brookdale Fruit Farm, Hollis NH

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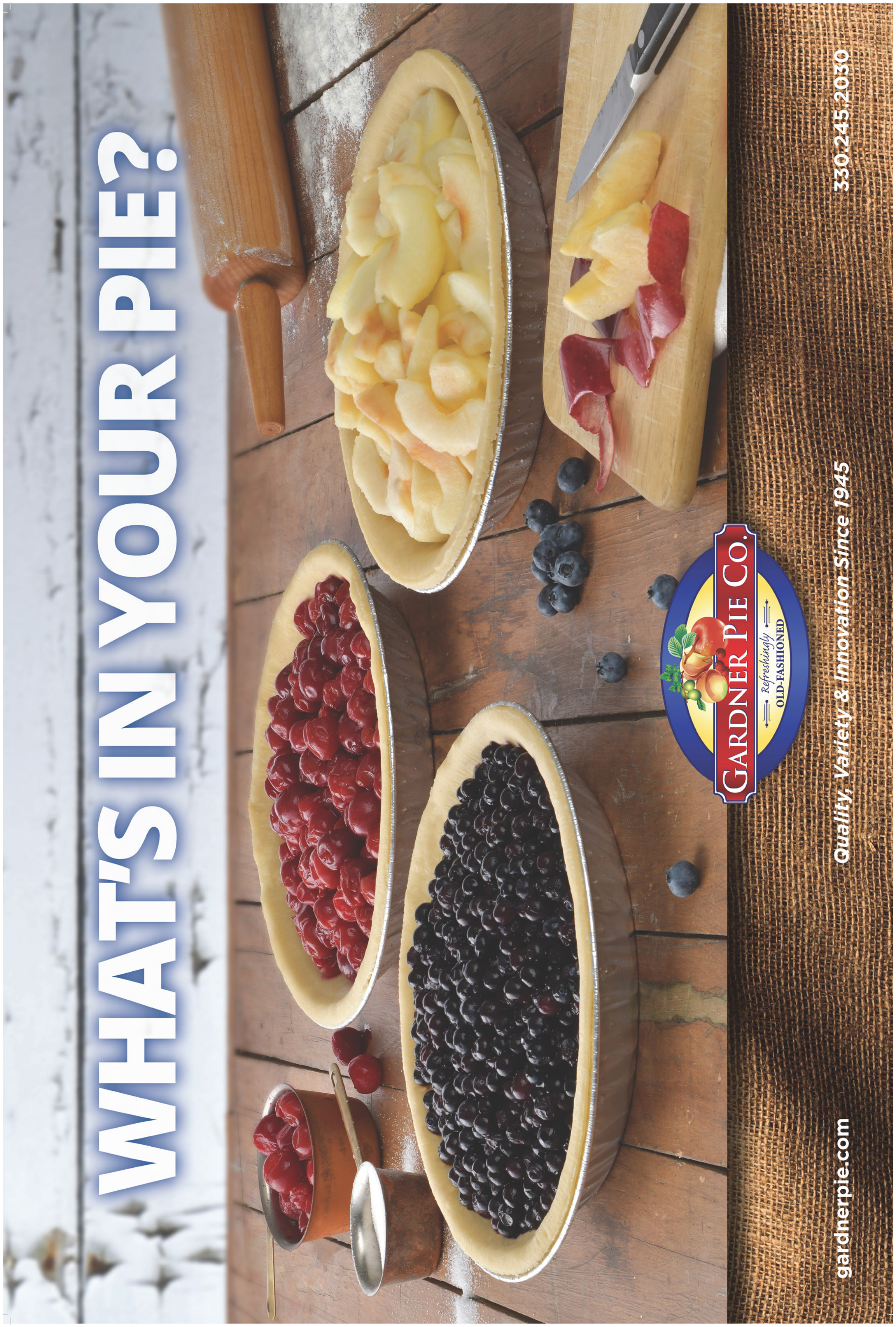
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How selective is diluted Concord grape juice laced with table salt at attracting spotted-wing drosophila?

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Fourteen years of research has accumulated since the continental U.S. invasion of spotted-wing drosophila (SWD), *Drosophila suzukii.* An important component in the effective management of SWD is to determine when adult flies become active and the presence of larvae in the fruit. Monitoring should take place from early stages of fruit development until the end of harvest. Adult SWD can be monitored using traps and a great variety of commercial lures and baits have become available for SWD monitoring. The efficacy of insect traps and lures is determined by their attractant power as well as their specificity towards the target species. Research involving the evaluation of fruit juices, in particular diluted Concord grape juice (DGJ) as SWD attractants has been conducted at UMass since 2018. The most recent research findings indicate that the level of attractiveness of fresh DGJ to male and female SWD was enhanced when DGJ was aged for one week in the presence of 2% table salt prior to field deployment in traps. By using 1-week old DGJ laced with 2% table salt captures of non-target insects were reduced drastically, increasing bait selectivity.

The above results, when combined with its low cost and accessibility make DGJ a feasible monitoring option for small-scale fruit growers. The objective of the present study was to compare and validate the performance and specificity of fermented DGJ containing 2% salt when compared to two commercial lures at six commercial fruit orchards in Massachusetts.

Materials and Methods

Three treatments were evaluated: (1) Diluted Concord grape juice (DGJ) fermented for one week in the laboratory in the presence of 2% table salt, (2) Scentry SWD lure, and (3) Trécé high selectivity 3-component lure. Traps used for the evaluations were made of 1-L clear plastic containers with 12 small holes (0.15 in in diam.) on the side to allow responding flies to enter the trap. Each trap had 7 oz of either, DGJ or unscented soapy water (as a drowning agent) in the case of the Scentry and Trécé lures. On May 2nd, 2022, one set of three traps each was deployed at each of seven Massachusetts locations: Deerfield, Belchertown, Northborough, Brookfield, Leominster, Phillipston, and Amherst. For the first two locations, traps were hung from cherry trees and then moved to grape vines after cherries were harvested. In Northborough, traps were deployed on blackberry plants. In Brookfield and Leominster, traps were deployed on raspberry plants. In Amherst, traps were positioned 2 feet above elderberry plants using steel wire. All traps were removed on August 25th, 2022. The DGJ bait was replaced weekly whereas the two commercial lures were replaced every four weeks. The results hereunder present the mean number of insects (either SWD or non-target insects) captured per trap, per month. Insect capture specificity was calculated as the number of catches of target species divided by the total number of catches.

Results

The first SWD of the 2022 growing season was one female captured on May 25th by a trap baited with DGJ with 2% salt. The total number of male and female SWD and non-target insects captured per month across all three treatments is shown in Table 1. In all, 3,934 SWD (males and females combined) and 28,337 non-target insects were captured by traps, regardless of the treatment. While captures of SWD represented roughly 12% of the total number of insects trapped, there were differ-

ences in the selectivity of the various materials that were evaluated.

Across all treatments, SWD captures increased 16-fold during the month of August when compared with July captures. In terms of treatment performance, during the months of June and July the Scentry lure attracted similar numbers of SWD males and females as the 1-week old DGJ with 2% salt (Figure 1A,B). During August, the period of highest SWD captures, the highest captures of males took place in traps baited with 1-week old DGJ with 2% salt and with Scentry lures, whereas SWD female captures were significantly greater in traps baited with 1-week old DGJ with 2% salt than in traps baited with commercial lures (Figure 1C). During July and August, the Scentry lure outperformed the Trécé lure (Figure 1B,C).

Table 1. Captures of spotted-wing drosophila males and females and non-target insects (mostly other drosophilids) across all traps according to month.

Month	Total number of SWD males	Total number of SWD females	Total number of non-target insects
May	0	1	1,980
June	10	14	5,884
July	343	431	12,986
August	1,392	1,743	7,487
TOTAL	**1,745**	**2,189**	**28,337**

Table 2. Captures of spotted-wing drosophila (males and females combined) and non-target insects (mostly other drosophilids) in traps baited with commercial lures and diluted Concord grape juice (= DGJ) laced with 2% table salt added prior to fermentation, according to month. Ratio of non-targets to SWD: the lower the value, the more selective the material given that fewer non-targets need to be counted to find SWD.

Month	Bait treatment	Mean number of SWD captured per trap	Mean number of non-targets captured per trap	Ratio of non-targets to SWD
June	1 week-old DGJ with 2% salt added	0.5	7.1	**14.2**
	Scentry	0.4	203.2	**508.0**
	Trécé	0.1	34.8	**348.0**
July	1 week-old DGJ with 2% salt added	8.2	32.7	**4.0**
	Scentry	7.4	479.8	**64.8**
	Trécé	0.5	28.5	**57.0**
August	1 week-old DGJ with 2% salt added	53.3	44.5	**0.8**
	Scentry	31.0	350.2	**11.3**
	Trécé	2.8	21.2	**7.6**

Table 2 shows the results concerning the selectivity of the DGJ and the two commercial lures. Consistently, the most selective material was 1-week old DGJ with 2% salt. In fact, the specificity of this material, which was replaced weekly, improved over time, a result that might be due to increased fermentation of the DGJ with greater ambient temperatures. For all three treatments, the ratios of non-targets to SWD improved (i.e., numbers were lower) over time. During June, the ratio of non-targets to SWD for the Scentry lure was 508, meaning that one person would need to count 508 insects for each single SWD, whereas for the Trécé lure the ratio was 348. In contrast, for the 1-week old DGJ with 2% salt treatment, only 14 non-targets were captured for each SWD. Interestingly, the much higher specificity of the 1-week old DGJ with 2% salt treatment became evident (the ratio of SWD to non-targets was nearly 1:1) when the overall number of trapped SWD and other insects increased in August.

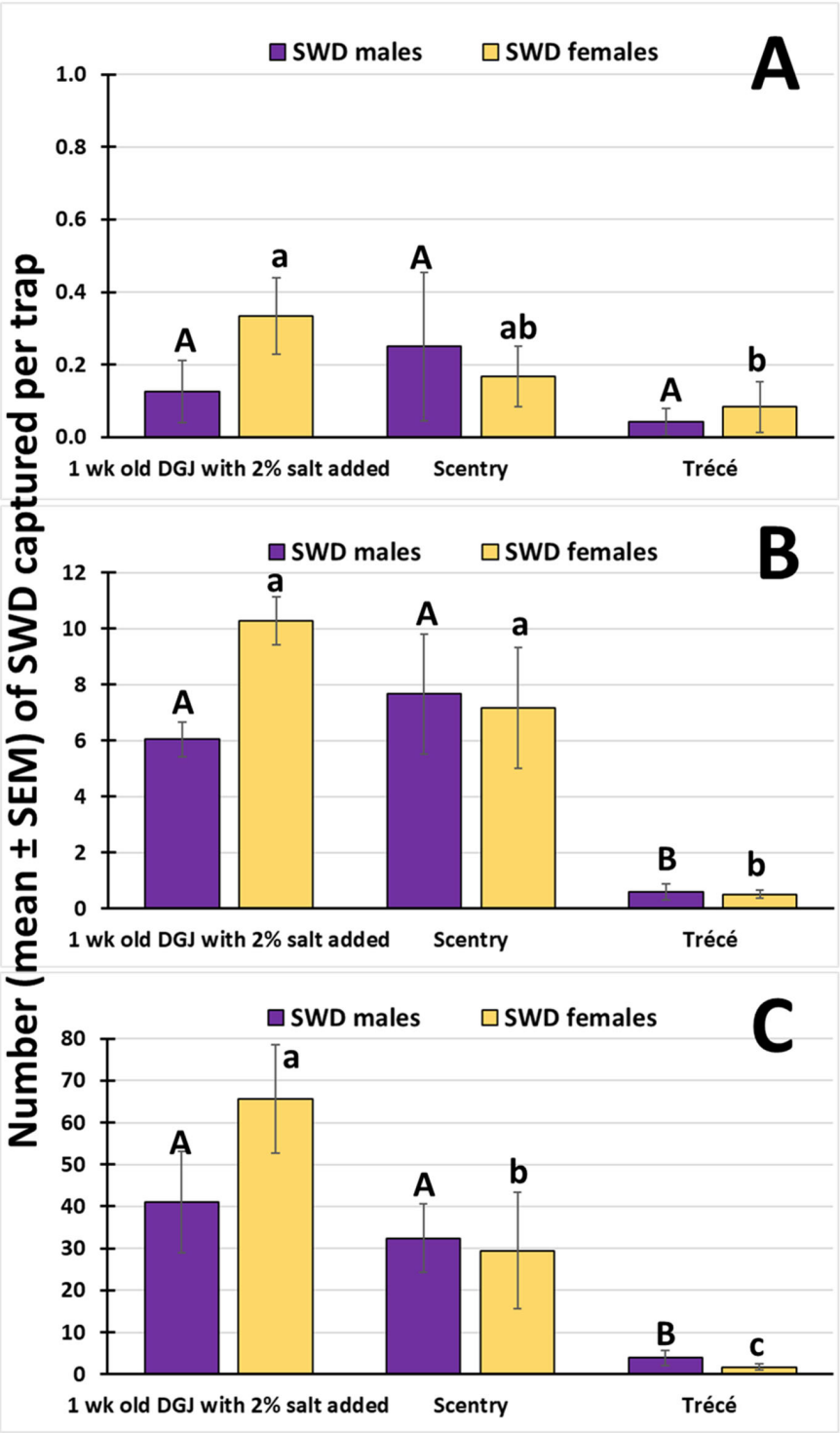

Figure 1. Captures of male and female SWD in traps baited with either, fermented diluted Concord grape juice (DGJ), Scentry SWD lure, or Trécé high selectivity SWD lure during (A) June, (B) July, and (C) August, 2022. For each sex of SWD, bars superscribed by the same letter are not significantly different at odds of 19:1.

Conclusion

Our combined findings validated the notion that 1-week old DGJ with 2% table salt is an effective and inexpensive bait that in terms of female SWD captures outcompetes the performance of commercial lures and greatly reduces captures of non-target insects, thereby increasing bait selectivity.

Acknowledgments

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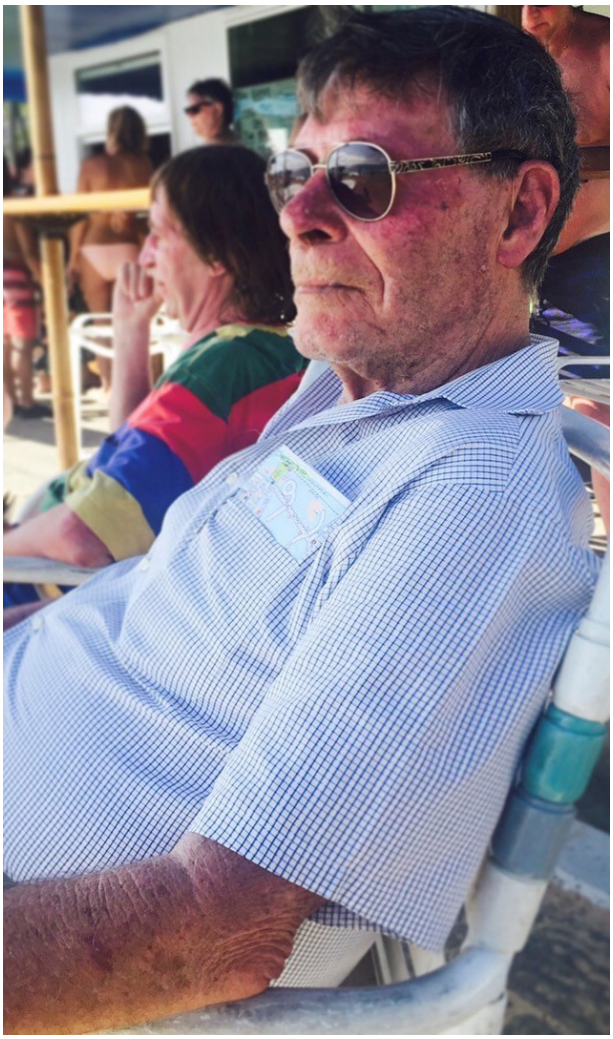
Ajay Giri and Heriberto Godoy-Hernandez are graduate students and Mateo Rull-Garza is a research associate at the UMass Stockbridge School of Agriculture.

New Jersey News

Professor Chaim Frenkel Passed Away August 12th, 2022

Chaim Frenkel passed away in the arms of his loving family early in the morning of August 12th, 2022 in New Brunswick, NJ. Chaim lived a long and meaningful life and passed away at the age of 88 after a long battle with lung cancer. He is remembered by his wife of 44 years, Daphna, and his sons Jonathan, Guy, and Ariel.

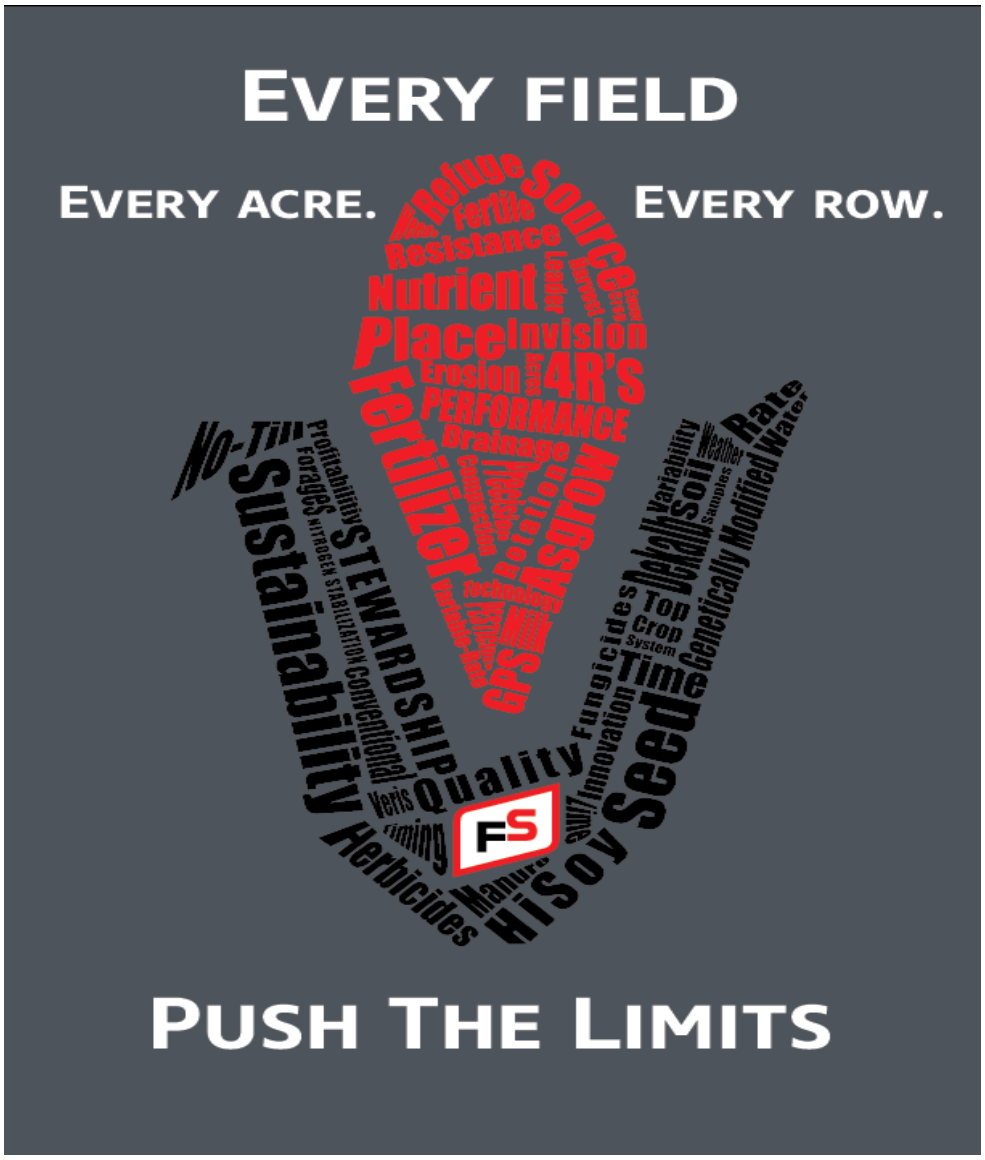


Chaim was born in Tel Aviv, Israel, grew up during a historical time and served as an officer in the IDF. He received his undergraduate degree from Hebrew University before immigrating to the United States and received his Masters from the University of Massachusetts, Amherst, his Ph.D. from Pullman in Washington State, and his postdoc at Michigan State.

His first and only academic job was at Rutgers University, where, for over 50 years, he committed his life and career to, among other things, the post-harvest physiology of fruit, the behavior of water in biological systems, and, in the last few years, concentrated on the post-harvest handling of vanilla. His contribution to vanilla research and technology was, by his own admission, his most impactful work.

Chaim will be buried in Israel in Sheikh Abreik in the Jezreel Valley among his family and heroes from Israel's history.

Dr. Frenkle was a post harvest Researcher at Cook College, Rutgers on both apple and pear crops. He often called North Jersey Growers directly to obtain fruit samples in which to conduct his work. Link to obituary if you'd like to share it: https://www.mycentraljersey.com/obituaries/asb284647



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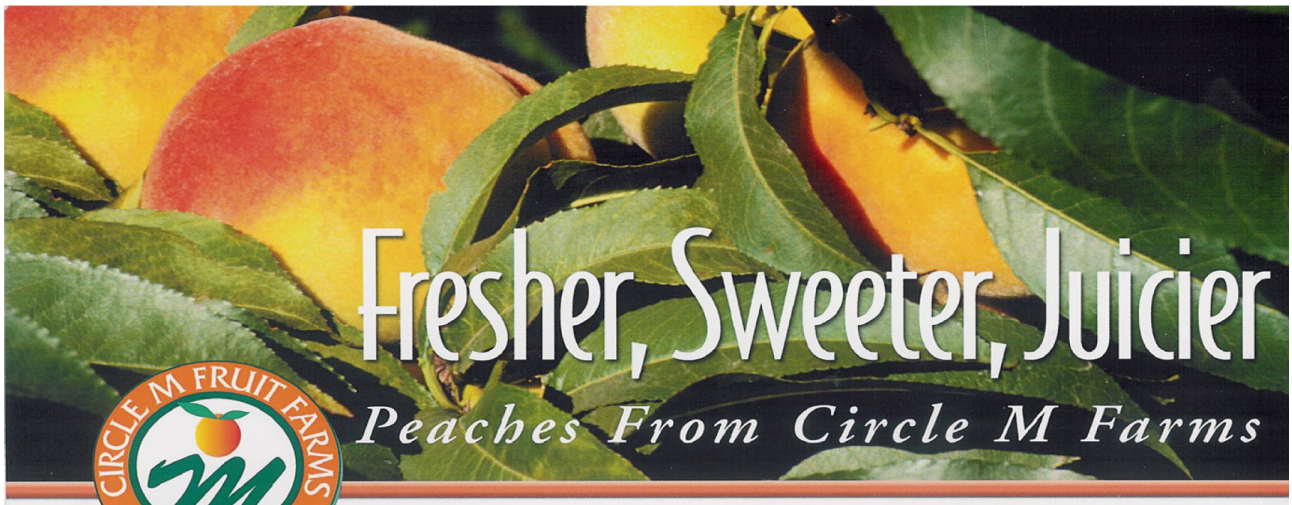

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