A partnership between Cornell University and the CCE Associations in these five counties: Monroe, Niagara, Orleans, Oswego & Wayne

Fruit Notes

YOUR TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE

Cornell Cooperative Extension
Lake Ontario Fruit Program

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Summer Tour Update

Craig Kahlke

Plans are firming up for our (2 years in the making!) LOF Summer Tour in Wayne County on Thursday, August 12th. The Tour will be centered in the Marion and Williamson areas, with lunch and sponsor visits at B. Foreman Park in Pultneyville. We have 2 Farms confirmed with many topics/things to see at each farm, at multiple locations per farm.

- **Stop 1 – Registration & DEC Credit Sign in – Morgan Farms, Marion, NY (Hosted by Mark Wiltberger)**
  - 2-3 separate (drive between sites) farm stops featuring:
    - Established processing apple blocks yield history
    - Newer higher density processing blocks potential & discussion
    - Fire blight management in a difficult year
    - Declining blocks – Sudden Apple Decline/Virus Issues?
    - High-value, high density fresh blocks production
    - Fruit Farm Business Summary participation

- **Stop 2 – Hermenet Fruit Farm-Williamson, NY (Hosted by Mario Miranda-Sazo)**
  - 3-4 separate sites on the same farm (park once, walk to individual sites) featuring:

    - Fine tuning the fruit growth rate model (SCRI trial) and the use of ACC as a late thinner – both at the same site, Gala on B.9
    - ATS sprays applied at bloom, guided by the PTGM, and use of ACC as a rescue treatment on Gala/B.9
    - New plantings of NY1 and Honeycrisp on B.9
      - Discussion about tree nursery production, trellising, tree training, cv. selection, etc.
      - Use of a Huron platform and development of an auto-steering system in collaboration with Ridge Automation LLC
      - How and why Mark Hermenet transitioned from Fresh to Processing Blocks with Macoun, AceyMac, and Red Delicious on M.9 rootstocks

Note: Pre-registration will be required for lunch counts/seating, and contact tracing. Walk-ins will not be accepted. The registration link will be in the next newsletter, and future email blasts and Fruit Facts issues.

Sponsors- There is still space available to connect with over 200 potential customers! Click here: https://lof.cce.cornell.edu/sponsor_new_event.php?event_id=1548

Fire Blight in WNY in 2021 – We were hoping this was last year's problem!

Janet van Zoeren and Kerik Cox

What we've been seeing so far this season

After last year, we knew we'd be coming in to 2021 with high rates of FB inoculum, and we were ready to focus on a tight line of defense throughout bloom. However, across the region we had a cold, prolonged bloom, with surprisingly few "high risk of FB infection" incidents. About a week after bloom, still not having heard of any farms with extreme blossom blight, the weather turned hot, followed by rainstorms. Beginning in Geneva, followed by Wayne, then Orleans/Niagara counties, shoot blight began to show up with devastating intensity in the worst-hit orchards.

I would characterize the rate of incidence as: nearly every grower in the region has at least a block with some noticeable shoot blight strikes, most growers have some blocks where they have been battling it hard all year and some blocks with just the odd strike, and not-infrequently I get calls from growers who feel they have been doing everything they can to get it under control, but new strikes just keep showing up.

From my observations and conversations, I don't see a clear trend to indicate which orchards have been worst hit. In general, less mature and higher density blocks have been most devastated, but I've also seen semi-dwarf and standard trees completely covered in strikes. Unexpected blocks, such as those with a low-nutrient input program, low vigor varieties, and organic blocks have also been affected. I haven't heard of the situation being worst in cider blocks or varieties prone to rattail bloom. Many growers thought they were adequately covered with antibiotics during bloom and followed recommendations regarding copper and Apogee when they started seeing shoot blight, but continue to battle to get things under control.

So, what's going on with fire blight the past few years?

Role of blossom blight or lack thereof and the potential for shoot blight epidemics in hot wet weather

The last two years have been characterized by low fire blight risk weather at bloom and devastating shoot blight epidemics following hot weather from early petal through shoot elongation. With low potential for blossom blight, where does the shoot blight come from? Over the entirety of our fire blight surveying efforts (2012 to 2021), we've only received a handful of blossom blight samples, and interestingly, I've never actually seen blossom blight at a commercial farm. As you consider the present season, you might ask yourself:

1) is blossom blight contributing, and if so, in what way?
2) If I'm going to get shoot blight anyway despite low infection risk at bloom and a perfectly timed management program, should I even bother spraying for blossom blight?

I asked myself these questions when I began to evaluate the concept of just skipping antibiotic applications at bloom and starting shoot blight management with prohexadione calcium at Pink and Tight Cluster. While I've had success using only prohexadione calcium in vigorous plantings, it has not worked well in low vigor plantings or formerly organic plantings. However, it should be noted that low vigor plantings don't often have a lot of shoot blight.

The situation of no blossom blight, but intense shoot blight, is common in Michigan and I'm told, by those far more experienced with fire blight, that there may be an unnoticeable level of blossom blight that leads to the explosive shoot blight when there is hot weather at petal fall. It is important to note that even in my trials, streptomycin, kasugamycin, and aureobasidium are only 98-99% effective, meaning that out of every 100 flowers, two have blossom blight. Additional possibilities for cryptic blossom blight infections include rattail bloom or potentially

even susceptible flowers at early petal fall. It only takes a single open flower to allow the bacteria into the plant where it can exponentially multiply, develop ooze, and get blown around the orchard in windy summer storms, causing shoot blight epidemics. Given these situations, I think the best course of action would be to 'still' manage high blossom blight risk periods, but take special note of warm weather near or just after petal fall. We should: 1) concede that any block could still be affected, even if was low risk for fire blight at bloom, 2) finish the bloom/post bloom period strong, and 3) start shoot blight management programs prior to forecasted heat waves as a general precaution.

Another way infections could occur and spread during the summer, even in the absence of blossom blight, is by movement of bacterial cells through the vasculature of the tree. These cells could overwinter in unnoticeable cankers from last year's infections, and become active and multiply with warm weather and moisture, moving internally throughout the tree during the summer causing new infections at actively growing shoot tips. These could then ooze to lead to new infections throughout the planting. Interestingly, we've found fire blight bacteria in seeming healthy plant tissue and buds and should these quiescent (dormant) cells become activated, they could lead to shoot blight with no apparent external infection. While the conditions to activate these quiescent bacterial cells are unknown, it seems that heat, ample moisture, and sufficient nutrition for plant growth could mobilize cells for infection. Taken together, it seems that there are several possibilities for fire blight to devastate plantings outside the normal means of blossom blight infection, especially in hot (> 80°F), wet weather.

What's the best course of action for seasons when shoot blight suddenly emerges?

Last year several farms were devastated, including the apple germplasm repository. In 2021, it seemed that fire blight was going to emerge and devastate the repository collection again. However, the caretakers of the repository were able to keep fire blight contained despite numerous heavy rainstorms, hot weather and oozing tissue, using post bloom rates of copper and prohexadione calcium at 10-14 day intervals from petal fall through early July. Before taking action, scout for ooze. If there is NO OOZE, but ACTIVE FIRE BLIGHT, apply prohexiadione calcium at a higher rate (6-12 oz/100 gal) and allow the trees to take it up for at least a day before applying copper. One could mix the two materials, but the uptake of prohexiadione calcium could be reduced if the molecules of copper are blocking the plants surface area. However, it could be ok to cover the prohexiadione calcium residues with a later copper application. If there's no ooze, apply prohexiadione calcium first. When there is ooze, it would be important to apply a copper product first to protect the rest of the planting from infection on windy or rainy days. The rubbing of young shoots on each other or guide wires is enough to cause a shoot blight infection. Always select a copper product with post-bloom rates that have worked well in your operation in terms of phytotoxicity and use adequate or slightly larger water volumes to further reduce the chance of phytotoxicity. I've had good experience in avoiding phytotoxicity on developing 'Gala' and 'NY1' fruit using CS2005, the Badge Products, MasterCop, and Cueva. Implementing this program on 10-14 days intervals over a month, while avoiding wet application days, should slow the spread of shoot blight until terminal bud set. If fire blight continues to devastate unchecked, then it is likely that the conditions for disease development are overwhelming to the ability of these products to work. In this case, you will just need to keep cutting strikes out and hope for the best, knowing that you did everything you could. There are all sorts of permutations of timing and rates that could work for managing late season fire blight, but this is a program with which we've had success.

We're still monitoring for strep resistance in NY.

Although our NYFVI grant will begin this fall, we're already getting started with surveying for

strep resistance in 2021. We want to get as much data for NY growers as we can. If you are seeing fire blight and want it tested, check out the link here on our blog (https://blogs.cornell.edu/coxlab/disease-sample-submission-forms/). It will tell you how and where to submit samples. There's a simple submission form to fill out on Google forms; just put in as much information as you can. The information helps us understand where and how streptomycin resistance in developing in NY.

What is Your Revenue Potential for that Block of Apples? Price-Yield Tables for Process and Fresh Apple Orchards

Mark Wiltberger

Price-yield tables are commonly used in agriculture because, unlike other commercial enterprises, revenue and profit for a farm depend on both price *and* yield. In this article, I show two price-yield grids, one for typical prices and yields for process apples, and one for fresh apples.

A price-yield table is a quick and easy way to visualize the relationship between price and yield and the effect on revenue. You can play "what-if" scenarios just by following along a row or a column. "What if I get this price per pound for this variety?" "What if my yield ends up being this much?"

The tables are generated very simply. They are based on the equation:

Revenue per Acre = Price x Yield

In essence, it is a multiplication table, but with useful values and units for apple production.

Let's take a look first at the "Price Yield Grid – Returns per pound – Process apples" table, below.

Price-Yield Grid - Returns per Pound - Process Apples

Revenue at various prices and yields typical for process apples

return per bin ($)	price per pound (cents)	Yield (bu/acre) 700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800
92	11	3234	3696	4158	4620	5082	5544	6006	6468	6930	7392	7854	8316
97	11.5	3381	3864	4347	4830	5313	5796	6279	6762	7245	7728	8211	8694
101	12	3528	4032	4536	5040	5544	6048	6552	7056	7560	8064	8568	9072
105	12.5	3675	4200	4725	5250	5775	6300	6825	7350	7875	8400	8925	9450
109	13	3822	4368	4914	5460	6006	6552	7098	7644	8190	8736	9282	9828
113	13.5	3969	4536	5103	5670	6237	6804	7371	7938	8505	9072	9639	10206
118	14	4116	4704	5292	5880	6468	7056	7644	8232	8820	9408	9996	10584
122	14.5	4263	4872	5481	6090	6699	7308	7917	8526	9135	9744	10353	10962
126	15	4410	5040	5670	6300	6930	7560	8190	8820	9450	10080	10710	11340
130	15.5	4557	5208	5859	6510	7161	7812	8463	9114	9765	10416	11067	11718
134	16	4704	5376	6048	6720	7392	8064	8736	9408	10080	10752	11424	12096
139	16.5	4851	5544	6237	6930	7623	8316	9009	9702	10395	11088	11781	12474
143	17	4998	5712	6426	7140	7854	8568	9282	9996	10710	11424	12138	12852

42 pounds per bushel
20 bushels per bin
840 pounds per bin

Color breaks are a
$4,000
$5,000
$6,000
$7,000
$8,000
$9,000

Let's say there is an older process block that typically produces 900 bushels per acre, and it has in recent years returned 13 cents per pound. Following down the column, revenue is calculated at $4914 per acre. If it fetches a higher price this year, say 14.5 cents per pound, revenue goes up to $5481 per acre. You can easily see the limits of increases in revenue if you only change price.

Another example: a newer process block planted at a higher density that yields 1100 bushels per acre (1136 bushels per acre was the yield for process apples in the 2019 Fruit Farm Business Summary). Given the same price of 13 cents per pound, follow along the row to find $6006 per acre revenue generated.

A further example: a very productive process variety that tends to generate higher yields, such as Rome, planted at a high density. Let's say it produces 1400 bushels per acre. Continue to follow along the row, and at 13 cents per pound, revenue generated is $7644 per acre.

One conclusion is that, unless you can find a big increase in price, the route to break out of the revenue per acre circle is to plant new orchards with higher yields. However, that route comes with the risk and cost of investment in a new orchard, which must be considered.

Onto the "Price-Yield Grid - Returns per Bin - Fresh Apples" table, below:

Price-Yield Grid - Returns per Bin - Fresh Apples

Revenue at various prices and yields typical for fresh apples

return per bu ($)	return per bin ($)	Yield (bu/acre) 700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800
4.00	80	2800	3200	3600	4000	4400	4800	5200	5600	6000	6400	6800	7200
6.00	120	4200	4800	5400	6000	6600	7200	7800	8400	9000	9600	10200	10800
8.00	160	5600	6400	7200	8000	8800	9600	10400	11200	12000	12800	13600	14400
10.00	200	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000	17000	18000
12.00	240	8400	9600	10800	12000	13200	14400	15600	16800	18000	19200	20400	21600
14.00	280	9800	11200	12600	14000	15400	16800	18200	19600	21000	22400	23800	25200
16.00	320	11200	12800	14400	16000	17600	19200	20800	22400	24000	25600	27200	28800
18.00	360	12600	14400	16200	18000	19800	21600	23400	25200	27000	28800	30600	32400
20.00	400	14000	16000	18000	20000	22000	24000	26000	28000	30000	32000	34000	36000
22.00	440	15400	17600	19800	22000	24200	26400	28600	30800	33000	35200	37400	39600
24.00	480	16800	19200	21600	24000	26400	28800	31200	33600	36000	38400	40800	43200
26.00	520	18200	20800	23400	26000	28600	31200	33800	36400	39000	41600	44200	46800
28.00	560	19600	22400	25200	28000	30800	33600	36400	39200	42000	44800	47600	50400

42 pounds per bushel
20 bushels per bin

Color breaks are at
$3,000
$6,000
$9,000
$12,000
$15,000
$18,000

For a first example, let's take a block netting $160 return per bin ($8 per bushel), and yielding 700 bushels per acre (the average yield in the 2019 Fruit Farm Business Summary for fresh apples was 690 bushels per acre). Revenue generated is $5600 per acre.

For the next example, if we go to the "golden child" of Honeycrisp and assume a $440 bin return on 800 bushels per acre, revenue generated is $17,600 per acre.

But it is interesting to note that a more modest price return, say $200 per bin, with a higher yielding variety, say 1000 bushels per acre, would generate a return of $10,000 per acre.

The point here is that although there is always the tendency for the eye to be drawn to the price, a combination of good price and good yield can generate good results, on a per acre basis.

The other side of the equation is to know how much it costs to produce per acre. For every farm, this number is going to be different. In the 2019 Fruit Farm Business Summary, this number centered around the value of $7500 per acre. However, this number includes *all* costs, including investment in new orchards and depreciation of equipment. Farms may be much higher or lower than this value, depending on the operating expenses for their crops and the amount of new investment. In the end, you need to estimate this number for your own farm.

When you know your costs per acre for a particular block, then the price-yield table becomes a "break-even" table – your revenue per acre must equal your cost per acre to break even.

In the end a price-yield table is just a multiplication table. However, it can help you make some estimates of how much a particular variety in a particular block is making, *on a per acre basis*, and get a handle on which of your blocks are performing and which are not. It is also useful for planning future orchards and gauging their revenue potential. I encourage you to take a few of your own blocks and varieties and run them across the chart to find out how well they are performing for you.

Why Are My Trees Growing So Poorly?

Webinar- Monday, August 2nd, 3-4 PM

Mike Basedow & Janet van Zoeren

1.5 DEC Credits Available

We have been increasingly noticing tree collapse in New York orchards over the past several years. There are a number of causal factors, both biotic and abiotic, that can cause poor tree growth and death. In this webinar, Cornell and Penn State experts will provide a quick summary of some of the common agents of tree collapse typical of northeast apple orchards.

Hosted jointly by CCE-ENYCHP and CCE-LOFP. There is no fee to attend, however you must register online at the following link by Friday, July 30th: **Click Here to Register**

Agenda:

2:45 – 3:05 - Credit Check in and Introduction - Mike Basedow

3:05 – 3:15 - Boring insects and tree decline- Janet van Zoeren

3:15 – 3:25 - Nematodes and their association with apple replant – Dr. Kerik Cox

3:25 – 3:35 - Could viruses be involved in poor tree growth? - Dr. Marc Fuchs

3:35 – 3:45 - Apple tree decline case studies and quality - Dan Donahue

3:45 – 3:55 - Investigating causes of apple tree decline in Pennsylvania – Dr. Kari Peter

3:55 – 4:05 - Abiotic issues, such as drought and cold damage – Dr. Terence Robinson

4:05 – 4:30 - Questions and discussion

1.5 DEC credits are available for this online meeting in categories 1a, 3a, 10, 22, and 25. In order to receive credits, you must complete the following:

- Enter your NYSDEC applicator ID number into the registration field when you register for the meeting. (Attendees from Vermont, Massachusetts, and Connecticut may also enter in their ID's to receive credits through their state reciprocity agreements.)
- Each employee seeking credit must register separately, and watch from their own device to receive credit.
- Send a photocopy of your applicator ID to Mike Basedow at **mrb254@cornell.edu** or (518) 410-6823 by noon on August 2nd.
- Log onto the meeting by 2:45 for a virtual roll call so we can ensure your screen name matches the applicator ID we have on file.
- Attend the meeting in its entirety.
- Using in-session polling, answer occasional poll questions to verify that you are actively engaged throughout the course of the session.
- Questions on this process may be directed to Mike Basedow at **mrb254@cornell.edu** or to (518) 410-6823.

Hard Cider Research & Education Needs Assessment – Last Chance to Give your Value Input - Poll closes July 19

Dear Cider Industry Member,

The New York Farm Viability Institute, New York Cider Association, and Cornell University have teamed up to conduct a research and outreach needs assessment of the New York hard cider sector and we need your input! Please take a few minutes and share your thoughts about the greatest needs in your operation and the industry overall. The general topics include fruit production, cider production, and marketing and economics. The information we collect will all be anonymous and used to inform grant funding, research projects, workshop topics, and policy agendas.

The survey is attached as a PDF, or you can access the survey at:

https://corexms6ch5fq3hh4pt3.sjc1.qualtrics.com/jfe/form/SV_0cU2eo5mbHtPalM

or:

On behalf of the New York Farm Viability Institute, New York Cider Association, and Cornell University, thank you for your time and input.

Sincerely,

Dave Grusenmeyer	Greg Peck	Scott Ramsey
NY Farm Viability Institute	Cornell University	NY Cider Association

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Contact Us

Fruit Notes

YOUR TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE

Fruit Specialists

Craig Kahlke | 585-735-5448 | cjk37@cornell.edu
Team Leader, Fruit Quality Management

Areas of Interest: Fruit Quality and factors that affect fruit quality before, during, and after storage,
Crops: Blueberries, Raspberries / Blackberries, Strawberries, Apples, Apricots, Cherries, Nectarines, Peaches, Pears, Plums

Mario Miranda Sazo | 315-719-1318 | mrm67@cornell.edu
Cultural Practices

Crops: Blueberries, Raspberries / Blackberries, Strawberries, Apples, Apricots, Asian Pears, Cherries, Currants, Gooseberries, Nectarines, Peaches, Pears, Plums

Janet van Zoeren | 585-797-8368 | jev67@cornell.edu
Integrated Pest Management (IPM)

Areas of Interest: IPM of tree fruit and berry pests, biological control, and pollinators.
Crops: Blueberries, Raspberries / Blackberries, Strawberries, Apples, Apricots, Asian Pears, Cherries, Currants, Nectarines, Peaches, Pears, Plum

Mark Wiltberger | 315-272-8530 | mw883@cornell.edu
Business Management

Crops: Apples, Cherries, Nectarines, Peaches, Pears, Plums

For more information about our program visit us at lof.cce.cornell.edu