

Cornell University Cooperative Extension

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# Tree Fruit News

Eastern NY Commercial

Horticulture Program

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3/1/2016 - 3/13/2016											
Locations	Avg Temp (F)	Max Temp (F)	Min Temp (F)	Total Rain (in)							
Chazy	30.5	67.5	0.2	0.47							
Peru	31.8	68.7	3.6	0.57							
Crown Point	32.3	71.7	4.6	0.02							
Clifton Park	38.4	79	14.9	0.33							
Hudson	41.3	81	18	0.28							
Highland HVRL	43.6	78.9	19.1	0.36							
Marlboro	42.8	78	15.1	0.3							
Riverhead	45.9	75.9	27.1	0.42							

Temperature and Rain to date for March

# NYS DEC Special Permit Training has been Approved for 2016

This is very good news for the 500+ fruit and vegetable farm employees who have been trained annually in past years. There will be significant changes made to satisfy NYS DEC concerns. Expect the training to be held in early April. Watch for details in upcoming ENYCHP E-Alerts.

Serving the educational and research needs of the commercial small fruit, vegetable and tree fruit industries in Albany, Clinton, Columbia, Dutchess, Essex, Fulton, Greene, Montgomery, Orange, Putnam, Rensselaer, Saratoga, Schoharie, Schenectady, Ulster, Warren and Washington Counties

# Spring Nitrogen Management Considerations, AnnaWallis- Cornell ENYCHP

Nutrient management is one of many orchard tasks demanding attention in the spring. Providing proper nutrition is essential as it is critical for tree health, balanced vegetative and reproductive growth, and a high quality crop. It can also impact physiological disorders such as bitter pit and breakdown in storage. Timing, rates, and fertilizer source will depend on your specific trees and site. Here are a few guidelines.

Nutrition program should be based on supply-demand relationship of each nutrient. Both deficiencies and oversupply of various nutrients can result in poor or unbalanced tree growth, fruit set, and fruit quality. Begin by assessing your orchard's nutrient status with a soil and foliar analyses.

- Leaf analysis indicates what nutrients are present in the leaf tissue, thus the nutrients that are available and successfully begin taken up the by the tree. Samples should be taken 60-70 days after bloom (mid-July to August), when shoot growth has slowed.
- Soil samples are best taken after harvest, when trees are no longer pulling nutrients from the soil to support shoot or fruit growth, but can also be taken mid-summer. Optimum nutrient levels are dependent on soil type.
- Tables of optimum leaf and soil nutrient concentrations can be found in the Cornell Tree Fruit Guidelines. A comprehensive overview of soil analysis and interpretation is available in the *NY Fruit Quarterly* Spring 2004 Issue <u>http://www.nyshs.org/pdf/fq/04spring/NYFOSpring04.pdf</u>.

Nitrogen is one of the highest nutrient demands in the spring. The supply of nitrogen comes from 3 places: 1) N reserves stored from last season, 2) N in the soil, and 3) N applied as fertilizer. Therefore, fertilizer rates should be based on soil and leaf analyses. Apply nitrogen based on foliar analysis. As a rule of thumb, increasing nitrogen application by 10% will result in approximately 1% increase in leaf nitrogen content<sup>1</sup>.

Timing is also important. Match the nitrogen application to when the trees need it most: during shoot growth. Spur development uses mostly reserve nitrogen, so N applied too early can be wasted. Likewise, nitrogen demand is lower in the latter part of the season after shoot growth slows during fruit development, and can have a negative impact on color and soluble solids. A recommended maintenance program can be found in the Cornell Tree Fruit Guidelines. Standard nitrogen recommendation is 20-40lbs ground-applied N per acre applied at tight cluster.

Application method will influence the rate of application. Using fertigation is one of the most efficient ways to deliver nutrients directly to the rootzone. Likewise, it is beneficial to apply fertilizer in rings or bands directly under trees, to the weed-free zone. Both methods will result in one-half to one-third the amount of material required for broadcasting<sup>1</sup>. Nitrogen comes in various forms. Each material requires different amounts to supply 1 lb N to your orchard. Be aware that various forms will also impact pH, which will affect the availability of nutrients to your trees. A summary of the various forms of nitrogen can be found in the table below.

			Acidity or Basicity (lb CaCO <sub>j</sub> /lb of N)		
12 - 100 M M	Percent	Pounds per			
Source	nitrogen	I Ib N	Acidity	Basicity	
Ammonia, anhydrous	82	1.22	1.8	-	
Ammonia, aqua	20	5.00	1.8	-	
Ammonium nitrate	33.5	2.98	1.8	-	
Ammonium					
polyphosphate	12	8.33	4.1		
Ammonium sulfate	20.5	4.88	5.4	1	
Calcium nitrate	15.5	6.45	-	1.3	
Diammonium phosphate	16-18	5.56	4.1	_	
Monoammonium					
phosphate	11	9.09	5.3	-	
Nitrate of soda-potash	15.5	6.45	-	1.3	
Potassium nitrate	13	7.69		2.0	
Sodium nitrate	16	6.25	-	1.8	
Urea	45	2.22	1.6	H 1	
Nitrogen solutions	variable <sup>1</sup>	-		-	

#### Characteristics of commonly available sources of nitrogen<sup>1</sup>

Nitrogen solutions may consist of mixtures of urea plus ammonium nitrate, aqua ammonia, or anhydrous ammonia plus urea or ammonium nitrate or both of these materials. Consult supplier for analysis.

<sup>1</sup>Stiles, W. and W. Shaw Reid. Orchard Nutrition Management Information Bulletin #219. <u>http://documents.crinet.com/AqSource-Cooperative-Services/Aqronomy-&</u> <u>-Feed/OrchardNutrtnMqmt.pdf</u><sup>2</sup>Cornell Tree Fruit Guidelines

# **Diagnosing Cold Damage in Fruit Trees**, Anna Wallis– Cornell ENYCHP

It isn't news that this has been an extremely mild winter. However, low temperatures in February were still low enough to cause concern about cold damage. Extreme cold can inflict damage to sensitive tissues, affecting crop load and tree health in the following season.

Assessing damage now can help when making pruning decisions and crop load adjustments later in the season. Here's how to look for damage. Look for damage to the buds and cambium of young limbs, which are more sensitive to cold. The cambium and the phloem are the vascular tissue just under the woody bark tissue. They are re-



sponsible for transporting carbohydrates and nutrients between the leaves, roots, and fruits of the plant. Take a cutting of a small branch or twig and peel off the thin layer of bark. Look at the tissue underneath. Healthy tissue will be bright green while damaged tissue will be brown

and dry. Cutting completely through the twig will reveal a cross section. The outer layers (cambium) are living, tissues and will be green and actively growing. The center of the twig or branch is called the pith, which primarily acts as a storage tissue. The pith may be pale yellow to white,

Cross-section of a small Honeycrisp branch (lbelow) and healthy green cambium tissue (above). Both indicate healthy, undamaged tissue. Photos: A. Wallis



and becomes brown as the woody stem becomes more mature.

Bud damage is easily assessed by cutting buds in half vertically (longitudinally). Again, look for brown tissue, indicating dead cells. The damage will be in the very center of the bud, where you may be able to identify some flower parts.

# Low Temperatures for February 14-15<sup>th</sup>, 2016 in Eastern NY

Location	Feb 14-15 <sup>th</sup> Low Temperature (F)
Chazy	-18.7
Peru	-18.8
Clifton Park	-16.9
Highland	-10.6



Photo of a healthy Honeycrisp floral bud. center, near the 'lateral flower' and 'king flower' labeled. Photo P. Francescatto.

### Tree, Post & Trellis Wire Exchange

Orchard planting will soon be underway, followed closely by trellis installation. If you find yourself with trees, posts, and wire left over, or if you are just a little short to finish the block, The TPTW Exchange is here to help. Email Dan Donahue (did13@cornell.edu) with the particulars:

-Trees: Variety, Strain, Rootstock, Caliper, Structure (feathered or whip), quantity

- -Posts & Tree Supports: Material (type of wood, conduit, bamboo), diameter, length, quantity
- -Wire: Material, Gauge, Length.

Include your farm name, at minimum a township & county, contact phone number & email.

Pricing information is not required. Any transactions between growers are the responsibility of those growers, Cornell Extension is only providing a forum to get buyers together with suppliers.

Every effort has been made to provide correct, complete and up-to-date pesticide recommendations. Nevertheless, changes in pesticide regulations occur constantly, and human errors are possible. These recommendations are not a substitute for pesticide labelling. Please read the label before applying any pesticide. This material is based upon work supported by Smith Lever funds from the Cooperative State Research, Education, and Extension. Diversity and Inclusion are a part of Cornell University's heritage. We are a recognized employer and educator valuing AA/EEO, Protected Veterans, and Individuals with Disabilities.

### 2016 Fungicide Update for NY *Kerik Cox* , Cornell University, Plant Pathology and Plant-Microbe Biology Section

Fungicide selection for apple scab management is still a complicated matter for apple producers. The issues of fungicide selection are complicated by fungicide resistance, pre-mix products of multiple fungicides, an abundance of new chemistries in one fungicide group, potentially injurious tank mix combinations, and the need to manage diseases other than apple scab. In recent years, the issues of fungicide resistance in *Venturia inaequalis* (the apple scab pathogen) appear of have subsided since the advent of newly released succinate dehydrogenase inhibitor (SDHI) fungicides. However without careful use and fungicide group rotation, it will only be a matter of time before the new SHDI fungicides are overcome. While the paradigm of marketing pre-mix fungicides may fall out of favor in the coming years, the complexity of tank mixes at petal fall and incompatibilities between new and existing fungicide products will continue to present new issues. Below I present an update on new fungicide products and perspectives on the use of existing products.

#### Overwintering inoculum

If there was a high level of apple scab in the fall, inoculum reduction should be practiced this spring. If inoculum reduction was practiced in the fall, it is necessary to repeat inoculum reduction measures in the spring. Now that the snow may be gone for the season, it is important to implement inoculum reduction as soon as tractors can enter the orchard. The two best options for inoculum reduction are to shred leaves with a fail mower or treat the leaf litter with an application of urea. In the case of flail mowing, the leaves need to be swept or raked from underneath the canopy into row middles. Subsequently, the row middles should be mowed with the fail mower set to scalp the sod. If applications of Urea used, applications should be made 40 lbs. of feed grade urea per acre in 100 gallons of water. Dolomitic lime can be used instead, but it should be applied at rate of 2.5 tons per acre. Of the two options, applying urea is the typically the simplest approach, but take care to rinse sprayer with water afterwards since the urea is caustic and can wear out a sprayer pump over time. Indeed, the farm managers in Geneva have reported wearing out pumps in a single season when adequate rinsing was not practiced.

#### Available fungicides

#### Dodine (syllit)

Syllit (dodine) should be applied in the early season given that applications aren't allowed in apples after pink according to the label. However, applications after bloom are still allowed on pears. Although, it's been several years since we've detected dodine resistance in commercial plantings, we have found a few *V. inaequalis* isolates from research orchards that seem to be capable of growing in the presence of dodine in culture. However, the orchard populations from which these isolates were collected were fairly sensitive to Syllit, which still provided excellent control during the season of collection. In this regard, Syllit should be still applied in combination with mancozeb and applied no more than twice. If there are heavy rains prior to pink, Syllit may be a good choice as it has some post-infection utility even in blocks that have been shifted towards resistance. Since copper is often applied at sliver/green tip to suppress fire blight inoculum, Syllit plus mancozeb could be applied from late green tip to tight cluster. If powdery mildew is a concern, Syllit may not be a good choice at tight cluster as it has no activity against mildew. Although the key application timings for powdery mildew in NY usually occur from bloom to 1<sup>st</sup> cover, reduced efficacy of the demethylation inhibitors (DMIs) & quinone outside inhibitors (Qols) due to resistance may necessitate applications for powdery mildew earlier at tight cluster. Aside from mildew, Syllit has no activity on rust diseases, but in most cases these rust disease could be managed by the mancozeb recommended as a tank-mix partner for Syllit.

#### Captan and Mancozeb

Combinations of mancozeb and captan applied on a 5-7 day schedule have been popular for the last few years. However, these two fungicides are contact fungicides and must be applied before rains. Moreover, they have little to no effect powdery mildew and may be weak against rust in high-inoculum situations. As the season progresses to bloom and the tanks mixes become complicated by the fact that growers need to manage insects, diseases, and thin apples, captan should be used with caution because it is phytotoxic if absorbed into plant cells. Adjuvants, oils, and other tank mix partners that cause excessive wetting or enhance uptake will increase chances that captan will get through the cuticular layer of leaves and fruit. This is especially the case when there are slow drying conditions in the early morning, in the late evening, or during a light rain. Although, there haven't been as many reports of captan related injury in recent years, I suggest that grower still curtail applications of captan at petal fall and first cover when the cuticles of apples leaves and fruit are not fully developed. New fungicides in formulated in organic carriers are being released faster than can be evaluated by extension scientists in context of low volume applications (<50 gal/A) that are common in modern high-density apple plantings. If mancozeb is to be selected over captan at this timing, it will be important to also avoid any prebloom applications of mancozeb or polyram that exceed 3lbs/A to remain in compliance with labeling restrictions. If rates of mancozeb higher than 3lbs/A are used at any time during the early season, the label will not allow post-bloom applications of mancozeb. TREE FRUIT NEVVSLETTER

#### 2016 Fungicide Update for NY Continued....

#### SDH1 fungicides

There are several SDHI fungicide chemistries registered for apples and several more are forthcoming (table 1). The SDHI fungicides are either marketed alone or pre-mixed with another fungicide chemistry such as a QoI or AP (anilinopyrimidine) fungicide. The SDHI fungicides in general have a high level of activity against apple scab and a low to moderate level of activity against apple rust diseases and powdery mildew. The AP fungicides are typically more effective in colder weather but have no activity against powdery mildew and apple rust. Hence, it would be best to apply products with AP fungicides prior to bloom. The SDHI fungicide products with QoI mix partners provide a little better control of powdery mildew and apple rust diseases. Hence, these premix products could be applied from the bloom to first cover. Since the SDHI plus QoI premix products also work well for summer disease, the making applications at first cover and at the final pre-harvest covers would be advisable. While there are concerns about QoI fungicide resistance in NY and New England, the performance of the SDHI plus QoI premix products

Fungicide	Class	Efficacy	Registration Status	Use on Long Island
Pristine	SDHI +	High: apple scab, Moderately High:		_
(BASF)	Qol	Rust and Mildew	Not-restricted	Yes
Luna Tranquli- ty (Bayer)		High: apple scab, Moderate: Mildew,	SLN	No
		Low. Rust	OLIN	INC
Sensa- tion (Bayer)	SDHI + Qol	High: apple scab, Moderately High: Rust and Mildew	Outside NY	No
Aprovia (Syngent a)	SDHI	High*: apple scab, Low to moderate: Rust and Mildew	Outside NY	No
Isofetam-				
id		High*: apple scab, Low to moderate:		
(ISK)	SDHI	Rust and Mildew	Not registered	No

\* In high disease pressure years, I have observed an exceptionally high level of apple scab efficacy.

#### Ool or strobilurin fungicides

The Qol or strobilurin fungicides provide a high level of activity against apple scab, apple rust diseases, and powdery mildew. Unfortunately, resistance to Qol fungicides in apple scab is widespread in Michigan, and has been documented in orchards in NY and many New England states. The development of resistance may appear gradual at first, but can quickly progress to a near complete loss of effectiveness similar to that experienced for the benzimidazole fungicides. Given the risk and uncertainties with the level of Qol resistance present in orchards in the region, it may be best to avoid using the stand-alone Qol fungicide products from pink to 1<sup>st</sup> cover. Instead consider using a SDHI plus Qol fungicide premix product such as Merivon or Pristine. It would provide the same activity as Flint or Sovran, but with less risk of resistance development.

#### DMI fungicides

Resistance to the DMI fungicides (Rally, Indar, Topguard, Inspire Super) in apple scab is fairly widespread, and we believe that DMI resistance in apple powdery mildew may also be fairly widespread. Since it is impossible to grow apple powdery mildew in culture, we cannot test the fungus for DMI resistance, and can only make inferences from grower frustrations with using the products and the need for higher rates in research trials. Indeed, resistance to this group of fungicides is rate dependent and gradual, meaning that resistance may be overcome by higher product rates and the use of DMI chemistries with higher intrinsic activity, especially in orchards with only low to moderate disease pressure and/or on cultivars that are less susceptible to apple scab (i.e., more resistant than McIntosh). In the case of difenoconazole, one of the two fungicides in Inspire Super, it appears that the apple scab pathogen has hit a metabolic ceiling for resistance.

Continued on Page 6...

### 2016 Fungicide Update for NY Continued....

A metabolic ceiling would be the point at which the level of resistance provided the metabolic machinery of *V* inaequalis cannot exceed the amount/potency of the fungicide applied at the upper end of the label rates. Simply put, if Inspire Super is applied at the highest labeled rate, the effective dose of difenoconazole s greater than *V* inaequalis can tolerate even in populations with a high level of DMI resistance. Regardless of this phenomenon, DMI fungicides should still be used with extreme caution, and should not be relied on for post-infection activity.

One of the more noticeable effects of DMI resistance is the failure of DMI fungicides to provide acceptable control of powdery mildew at rates that were historically effective. This is most commonly observed with the DMI fungicides difenoconazole (Inspire Super) and fenbuconazole (Indar 2f). By comparison the DMI fungicides myclobutanil (Rally) and flutriafol (Topguard) are more effective against powdery mildew. If DMIs are used for powdery mildew control, it may be worthwhile to include a low rate of sulfur to compensate to for the presence of DMI resistance. If summer temperatures exceed 85°F, applications of sulfur may be injurious to the crop

### Weather Station Maintenance– Get Ready for the Growing Season Juliet Caroll - Fruit IPM Coordinator and Leader of NEWA, NYS IPM Program

To keep your NEWA-connected weather station running in top shape this season, consult the <u>Maintenance Guidelines</u> and the <u>Troubleshooting Guide</u> we put together for Rainwise weather stations in NEWA. Developed with input from Rainwise Technical Support personnel and incorporating questions and **answers from our workshops**, "*Improving the Reliability of your Weather Station*" the Guide provides a comprehensive overview and detailed steps for fixing problems that arise with your weather station. Simple fixes, such as turning the station off and then on to reset it, are on the main web page.



Common maintenance issues like the need for a new battery, if not taken care of can lead to anomalies in data or data not being reported. You can download the <u>Maintenance and Troubleshooting Guide</u> and keep it on hand for reference. The troubleshooting guide is organized by the types of problems you might encounter with your weather data. These include:

This time of year is an excellent time to maintain your weather station. Take a look at the station, make sure the rain gauge bucket is clean, and check all the connections.

Rainfall Data Not Collected – <u>Rainfall Missing</u> Excess Rainfall Data Collected – <u>Excess Rainfall</u> Station is Not Transmitting – <u>Data Transmission</u> The Receiving Base is Not Uploading Data to RainwiseNet – <u>Data Upload Failur</u>e

When weather stations are 3 to 5 years old, they may begin to show need for repair – new sensors (temperature/relative humidity, leaf wetness, etc.), or new battery. Keep an eye on your weather data to make sure it is within normal parameters. Scan <u>Hourly Data</u>, (under Weather Data on the blue main menu on NEWA) or check your data feed on Rain-

wiseNet. We've upgraded the <u>NEWA Hourly Data page</u> to include a State selection box. Select your state and then either select a station, month, and year using the drop down boxes and hit "Get report" or click on a month provided in the table (blue links; purple links are previously viewed). Once you make the selection, the page of results will display in an "Hourly Data Summary" for that month. If NEWA isn't getting your weather data the Hourly Data page will show patched gaps as brown italicized font—indicating missing or extrapolated data that could indicate a weather station problem. Hourly Data variables can show you daily weather patterns, extremes in temperature and rainfall that are beneficial to maintaining your crops, but also maintaining your weather station. Only functioning weather stations are included in the drop down lists. If you can't find the station you are looking for, chances are it is currently inactive. Any weather stations inactive for more than a month are taken out of NEWA until they are back up. A list of inactive weather stations is provided in the "Select station" drop down box. This time of year is an excellent time to maintain your weather station. Take a look at the station, make sure the rain gauge bucket is clean, and check all the connections.

We'd like to acknowledge the New York State Apple Research and Development Program for funding OUr workshops and making it possible to create the Troubleshooting Guide and web pages that are now available to everyone connected to NEWA across the Eastern US.

# **Critical Temperatures for Frost Damage on Fruit Trees**

#### Thanks to Marion Murray, IPM Project Leader, Utah State University

The following table, developed by Washington State University, lists Fahrenheit temperatures for each stage of development at which 10% and 90% bud kill occurs after 30 minutes exposure. The percentage bud kill which causes crop reduction will vary with each crop. For example, to have a full crop of cherries requires well over 50% bud survival in most years, while apples, pears, and peaches may only need 10-15% bud survival.



	Silver Tip	Green Tip	Half-Inch Green	Tight Cluster	First Pink (Pink)	Full Pink (Open Cluster)	(King Bloom)	Full Bloom and Post-bloom
10%	15	18	23	27	28	28	28	28
90%	2	10	15	21	24	25	25	25

PEAR		a				
	Swollen Bud	Bard Barst	1			

	(Scale Separation)	(Blossom Buds Exposed)	Green Cluster (Tight Cluster)	White Bud (First White, Popcorn)	Full White	First Bloom (King Blossom)	Full Bloom	Petal Fall (Post-bloom)
10%	15	20	24	25	26	27	28	28
90%	0	6	15	19	22	23	24	24

APRICO	Se-	- Star	9	-			K
T	First Swell (Bud Swell)	Tip Separation (Swal- len Bud)	First White	First Bloom	Full Bloom	In the Shuck (Petal Fall)	Shuck Spilt (Post-bloom)
10%	15	-20	24	25	27	27	28
90%		- D.	14	19	22	24	25



PEACH	-	X		10			
Ĕ	Swollen Bud (First Swell)	Calyx Green	Quarter-Inch Green (Calyx Red)	Pink (First Pink)	First Bloom	Ful Bloom	Post-bloom
10%	18	21	23	25	26	27	28
90%	F	5	9	15	21	24	25

PLUM	Swollen Bud	Side White	Green Tip	Tight Cluster	First White	First Bloom	Full Bloom	Post-bloom
10%	14	17	20	24	26	27	28	28
90%	0	3	7	16	22	23	23	23

# Hudson Valley Research Lab Annual Membership Meeting

The Hudson Valley Research Laboratory will be hosting its Annual Membership Meeting on March 31, 2016 4:00 PM. The meeting will be hosted by the HVRL Board of Directors with membership from the regional tree fruit, small fruit, grape and vegetable growers who will or have already become members in 2016. The purpose of the meeting is to update the membership on the future direction of the lab.

We need to hear from the agricultural industry to help chart the course and direction in future research and outreach to optimize your production. We encourage you to attend this important meeting so that your voice can be heard.

We will have Dr. Srdjan Acimovic available to update us on his new appointment as plant pathologist at the HVRL. We plan to distribute annual reports on what we have done over the past 3 years, review the present membership, re-elect existing and elect new members to the Board of Directors and discuss issues of greatest importance to you, the agriculturalists of the Hudson Valley.

# New Resource Available to Growers

Brian Lehman and Kari Peter, Ph.D. from the Department of Plant Pathology and Environmental Microbiology at Penn State University Fruit Research and Extension Center have a presentation entitled "DEMYSTIFYING COPPER FOR DISEASE MANAGEMENT" that is available for download at the link below.

http://extension.psu.edu/plants/tree-fruit/presentations/2016winter-tree-fruit-meeting/demystifying-copper-for-diseasemanagement

### DEMYSTIFYING COPPER FOR DISEASE MANAGEMENT



Thursday, March 31st Navigating NEWA, Champlain Valley – Dr. Juliet Carroll Miner Institute, 1034 Miner Farm Rd, Chazy, NY \$10/person http://enych.cce.cornell.edu/event.php?id=509 Friday, April 1st Navigating NEWA, Capital Region – Dr. Juliet Carroll Saratoga County CCE Office, 50 W High St., Ballston Spa, NY \$10/person http://enych.cce.cornell.edu/event.php?id=510 Ν First Week of April (tentative) – Special Permit Training for 2016 D Stay Tuned for the Latest Status Update А Thursday, April 7th Effective Orchard Spraying, Champlain Valley - Dr. Andrew Landers Forrence Orchards, 86 River Rd, Peru, NY R \$15/person http://enych.cce.cornell.edu/event.php?id=506