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Berry News

ENYCH Program Educators:

Fruit

Laura McDermott
Cell: 518-791-5038
Email: lgm4@cornell.edu

Berries

James O'Connell
Phone: 845-691-7117
Email: jmo98@cornell.edu

Berries & Grapes

Michael Fargione
Phone: 845-691-7117
Email: mjf22@cornell.edu

Tree Fruit

Kevin Iungerman
Phone: 518-885-8995
Email: kai3@cornell.edu

Tree Fruit & Grapes

Vegetables

Chuck Bornt
Cell: 518-859-6213
Email: cdb13@cornell.edu

Amy Ivy
Phone: 518-561-7450
Email: adi2@cornell.edu

Teresa Rusinek
Phone: 845-340-3990 x315
Email: tr28@cornell.edu

Crystal Stewart
Cell: 518-775-0018
Email: cls263@cornell.edu

Maire Ullrich
Phone: 845-344-1234
Email: mru2@cornell.edu

Layout:

Carrie-Anne Doyle

Content Editor:

Laura McDermott

Regional Updates:

North Country—Clinton, Essex, northern Warren and Washington counties

Berry phenology: Brambles: no leaf emergence as of yet. Blueberries: Some bud swell in warm locations. Strawberries: keep checking for growth from crown, straw mulch may need to be removed.

Current growing degree days 1/1/13 to 04/23/13	Base 45°F	Base 50°F
South Hero, VT	25.7	7.6
Burlington, VT	39.8	14.3
Shoreham, VT	38.7	12.7

Pest focus—scale, early season canker preventative sprays, early season weed sprays still possible—keep eye on grass growth—Poast can be sprayed when grasses are 6" tall.

Capital District—Albany, Fulton, Montgomery, Rensselaer, Saratoga, Schenectady, Schoharie, southern Warren and Washington counties

Brambles: beginning bud break. Blueberries; moving to bud swell. Strawberries: leaf growth at crown, most mulch has been removed.

Current growing degree days 1/1/13 to 04/23/13	Base 45°F	Base 50°F
Granville	45.0	14.0
North Easton	67.6	24.4
Clifton Park	42.3	13.2
Guilderland	52.5	17.0

Pest focus—scale, early season canker preventative sprays, early season weed sprays still possible in very cold locations. Spray Poast when grasses are no more than 6" tall.

Mid-Hudson Valley—Columbia, Dutchess, Greene, Orange, Sullivan and Ulster counties

Brambles: budbreak to leaf emergence. Blueberries: bud swell moving into tight cluster in warm areas. Strawberries: well leafed out but flower trusses still tucked into crowns, although warm locations are showing early bud formation. Currants and Gooseberries: leafed out, buds showing. Minor fruits: Honeyberries in bud, Hardy Kiwi leaf buds breaking.

Current growing degree days 1/1/13 to 04/23/13	Base 45°F	Base 50°F
Highland	113.5	50.3
Marlboro	90.4	43.7
Montgomery	103.8	49.5

Pest focus—Mummyberry control in blueberries. Also botrytis blossom and twig blight. For strawberries, look under leaves on warm days—upper leaves will show small yellow spots to indicate feeding injury.



Using Sprinklers to Protect Blueberries from Spring Freezes

By Mark Longstroth, Michigan State University Extension

Many blueberry growers use sprinkler systems to protect blueberry flowers from spring freezes. Sprinklers are very effective under certain circumstances but can increase injury if used at the wrong time. Sprinklers used for irrigation do not protect below 23-24°F. If the system fails due to cold or wind the blueberries can get colder than in areas with no sprinkling. When you use sprinklers to prevent freezing injury, you are using the energy that water releases when it freezes, changing from a liquid to a solid, to keep the temperature in the ice at the freezing point 32°F. As long as you keep the ice WET, the ice temperature will stay at 32°F. If the ice dries out and water evaporates from the ice, it will chill the plant down colder than the air temperature as the ice evaporates.

Protection with sprinklers

The freeze protection from sprinkler systems is limited by the irrigation rate. Most sprinkler systems in Michigan blueberries are designed to provide from 0.10 to 0.15 inches of water per hour. This volume protects plants to about 22°F with no wind or 24° to 25° F with a light wind. More water is needed to protect at lower temperatures and higher wind speeds, see Table 2.

Most irrigation systems cannot easily be changed to deliver more water and protect to lower temperatures. Increasing the operating pressure is not advisable because you need to increase the pressure 4 times to double the output. Higher pressures can break lines and reduces the uniformity of application. Larger nozzles can be installed, but the capacity of the system, mainlines, well and pump






will limit the added volume. For example, 9/64-inch nozzles that deliver 0.12 inches water per hour require 60 gallons per minute per acre of blueberries. Switching to 5/32-inch nozzles would deliver 0.15 inches per hour but require 68 gallons per minute per acre. Irrigation systems are not designed to apply enough volume to protect from temperatures in the low 20s.

Critical temperatures

Growers should only use sprinklers to protect blueberry from freezing, around bloom time. The temperature range for sprinkler protection is relatively narrow from 24-32° F. This temperature range is also the range that damages open blueberry flowers. When blueberries begin to grow in the spring the buds can handle very cold temperatures. Swollen buds can easily tolerate temperatures down to 20° F. At bud burst or tight cluster temperatures in the 20° to 23° F range can cause damage. The lower end of the range is temperature at which almost all the flowers are killed and the upper end is where damage begins to occur. At "early pink bud" (individual flowers are visible in bud), injury occurs between 23° and 25° F. These temperatures are still colder than you can protect with an irrigation system. In "late pink bud", when the flowers have separated in the cluster but the flower petals are still closed, the range is 24-27° F. This is in the range where we can protect. But if there is wind or the temperature gets a colder than predicted we could cause more damage than if we had not turned on the system. Once we turn on the system we need to keep it on until the temperatures are above freezing or you will cause a lot of damage as the

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Table 1. Blueberry Critical Temperatures

Bud Stage	Tight Cluster	Early Pink Bud	Late Pink bud - Pre-Bloom	Bloom	Green
Damage					
Slight	23° F	25° F	28° F	29° F	31° F
Severe	20° F	23° F	24° F	27° F	28° F

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temperature of the ice goes down colder than outside the irrigated area. Because of this narrow margin of error, I recommend that growers only try to protect at bloom when the temperature range that causes damage is well inside the range of protection with an irrigation system.

Fully open flowers are killed between 27° and 28° F. Right after bloom when the petals fall, fruit is the most sensitive, 31° F will damage green fruit. If the temperature gets colder or if it is windy, we have a safety margin and our system can still protect the blueberries. When we operate the system at the edge of its effectiveness it is more likely to fail. Dr. Mike Mainland of North Carolina State says that he would not turn on his frost protect system in blueberries unless there were open flowers in the field.

When to turn on the System

Once you have looked at the field and see open flowers and checked the weather and see that the temperature is supposed to get down to 26° F, you need to decide if you are going to turn on the system that night. I would not turn on the system if the temperature were forecast to fall below 24° F. If windy conditions (more than 10 MPH) were forecast, I would not turn on the system at all. When you turn the system on and start to irrigate the air temperature will fall in the field. This is because the water is evaporating and cooling the air. The dryer the air, the greater the temperature falls. How dry the air is will dictate when you turn the system on. This can be calculated from the dew point, which is measured with a wet bulb thermometer or a sling psychrometer.

Once you start the system it is necessary to keep it running until the ice starts to melt on its own. If your system fails, as the ice dries and begins to evaporate it changes from a blueberry heating system to an effective refrigeration system that can significantly reduce your crop. As long as water drips from the ice the system is working. If the ice is clear, and the water is freezing uniformly and the system is working properly.

Fertilizing Berry Crops

The beginning of May is the trigger date for fertilization and given our cool temperatures, I wouldn't put material down any earlier as plants are not actively growing yet and won't be able to grab that nitrogen. Table 1, on the following page, is the chart right out of the Cornell Guidelines.

When can I stop irrigating?

Stop irrigating when the ice is melting and temperature is rising. Ice breaking free from branches indicates water is forming under the ice and it is likely safe to quit. Normally this is when temperatures are above freezing and rising. Beware of sudden dips in the temperature soon after sunrise.

Table 2. Irrigation rate (inches/hour) needed to protect fruit buds under different wind and temperature conditions. *U of Florida Ext. Circ. 287*

Temp (°F)	Wind speed (mph)			
	0-1	2-4	5-8	10-12
27	.10	.10	.10	0.1
26	.10	.10	.14	0.2
24	.10	.16	.30	0.4
22	.12	.24	.50	0.6
20	.16	.30	.60	0.8
18	.20	.40	.70	1.0
15	.26	.50	.90	

Table 3. Starting temperature for overhead sprinkler freeze protection based on the dew point of the air.

Dew point	Start irrigation at
26° F	34° F
25 to 24	35° F
23 to 22	36° F
21 to 20	37° F
19 to 17	38° F
16 to 15	39° F

Remember to measure your plantings if you haven't already done so. Some excellent growers that I know have been under the impression that they were farming just under 7 acres of mixed vegetables for the past decade, but they took the time to carefully measure each of their

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individual fields. The actual production acreage was just over 5.5 acres. They were measuring chemicals and fertilizer for almost 1.5 acres more than they needed. For large growers, that difference surely doesn't seem like much, but if your margin of error is the same for large acreage? We could be talking decent money.

When measuring plantings, consider that for fertilizer, we measure just the planted row acreage. Measure the width and length of the rows to determine actual acreage.

Also, remember that Table 1 is recommending **actual N** – not pounds of total fertilizer material. To determine the

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Table 1 – Nitrogen Guidelines for Berry Crops. *Source: 2013 Cornell Pest Management Guidelines for Berry Crops*

Crop	Age of planting	Amount/timings (actual N)	N source	Comments
Strawberries				
	0	30 lb/A, <i>early June</i> 30 lb/A, <i>early September</i>	calcium nitrate ammonium nitrate or calcium nitrate	Be sure plants are growing well prior to application.
	1+	70 lb/A, <i>at renovation</i> 30 lb/A, <i>early September</i>	ammonium nitrate, urea, calcium nitrate	Adjust fall amount based on leaf analysis.
Raspberries and Blackberries (summer-bearing)				
	0	25-35 lb/A, <i>4 weeks after planting</i>	calcium nitrate	Avoid touching plants with fertilizers after planting.
	1	35-55 lb/A, <i>in May or split between May and June</i>	urea or ammonium nitrate	Use higher amount on sandier soils or if irrigation is used.
	2+	40-80 lb/A, <i>in May or split between May and June</i>	urea or ammonium nitrate	Use higher amount on sandier soils or if irrigation is used.
Raspberries (fall-bearing)				
	0	25 lb/A, <i>4 weeks after planting</i>	calcium nitrate	Avoid touching plants with fertilizers after planting.
	1	50-80 lb/A, <i>split between May and June</i>	urea or ammonium nitrate	Use higher amount on sandier soils or if irrigation is used.
	2+	70-100 lb/A, <i>split between May and June</i>	urea or ammonium nitrate	Use higher amount on sandier soils or if irrigation is used. Adjust with leaf analysis.
Blueberries				
	0	Do not fertilize newly planted blueberries		Soil should be adjusted to pH 4.5 prior to planting.
	1	15 lb/A, <i>split between May and June</i>	ammonium sulfate or urea	Use ammonium sulfate where soil pH is >5.0.
	2	20 lb/A, <i>split between May and June</i>		
	3	25 lb/A, <i>split between May and June</i>		
	4	35 lb/A, <i>split between May and June</i>		
	5	45 lb/A <i>split between May and June</i>		
	6	55 lb/A <i>split between May and June</i>		
	7+	65 lb/A <i>split between May and June</i>		

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actual N in your fertilizer source, look at Table 2 and Table 3. Table 3 lists organic sources – remember that there could certainly be variation in your compost so getting it tested is recommended.

To calculate the amount of fertilizer to apply, divide the desired amount of actual N by the percent N in the fertilizer and then multiply the result by 100. Apply the

total amount of fertilizer in a 3-foot band in the row (1 foot band over the row for strawberries).

Example: Calcium nitrate, actual N recommended is 30lbs/A on strawberries. Calcium nitrate is 15% N.

Calculation:

$$\frac{30 \text{ lbs/A actual N}}{15\% \text{ N in Ca nitrate}} \times 100 = 200 \text{ lbs/A calcium nitrate} \\ \text{-LGM}$$

Fertilizer	% actual N in fertilizer
Ammonium nitrate	34.0
Ammonium sulfate	20.5
Calcium nitrate	15.0
Diammonium phosphate	17.0
Potassium nitrate	13.0
Urea	46.0

Organic Source	% N	C/N ratio	Lb N/ton	Example FOB cost/ton	\$/lb N	Release Rate
Finished field compost	1.2	17	24	\$25	\$1.04	slow
alfalfa meal	2,7	15	54	\$348	\$6.44	medium
poultry manure compost	4	15	80	\$251	\$3.13	slow
soybean meal	6	7	120	\$314	\$2.62	medium
feather meal	10	4	200	\$968	\$4.48	Very slow
‘Pro-Gro’ 5-3-4 5	5	3	100	\$340	\$3.40	medium
‘Pro-Booster’ 10-0-0	10	2	200	\$375	\$1.87	medium

How do I manage Spotted Wing Drosophila (SWD) on my farm?

Ripening and ripe fruit are susceptible to SWD attack, but they appear to be only mildly attracted to unripe fruit. **If adult SWD are present on your farm, manage them aggressively.**

Aggressive management entails:

- 1. Excellent sanitation:** Fruit should be harvested frequently and completely. Unmarketable fruit should be removed from the field and either frozen, “baked” in clear plastic bags placed in the sun, or disposed of off-site. This will either kill larvae or remove them from your farm.
- 2. Canopy and water management:** Prune to maintain an open canopy. This may make plantings less attractive to SWD and will facilitate pesticide applications. Leaking drip lines should be repaired, and overhead irrigation should be minimized.
- 3. Insecticide treatments:** Insecticide treatments should begin when scouting reports in the region alert growers to the first fly finding. Treatments should be applied at least every seven days and repeated in the event of rain. Choose the most effective insecticides with pre harvest intervals that work for your picking schedule. Rotate insecticides

according to their modes of action. Check the 2013 Cornell Guidelines <http://ipmguidelines.org/BerryCrops/> for the list of approved pesticides. Growers should be careful to avoid exceeding maximum applications per season which may be difficult for organic growers. We will have updated tables of pesticides printed in the May Berry newsletters, and also available at the May Sprayer workshops.

- 4. Monitor success of insecticide treatments** with baited traps: Use red cups with holes no larger than 5mm in size. Bait can be apple cider vinegar or a yeast/sugar mix – whatever is easier for growers to accurately monitor. Traps should be hung in mid-canopy or on the north side of the row. Monitor these traps weekly.
- 5. Regular fruit sampling:** at least 100 fruit per block per harvest should be observed for infestation. Talk to your local CCE agent about a scouting program.
- 6. Cool berries immediately:** Chilling berries immediately after harvest to 32° -33°F will slow or stop the development of larvae and eggs in the fruit. U-Pick customers should be encouraged to follow this strategy to improve fruit quality at home. *-LGM*

I-9 Audits and Compliance

By Sandy Buxton, Capital Area Ag & Hort Program,
Cornell Cooperative Extension

One of the most common labor slip-ups with the federal Department of Labor is a required piece of paperwork for every employee – the I-9. Employers can be compelled to provide these documents with short notice for review by authorities. This form is supposed to document the eligibility of a person to work at a position. It must be completed when an employee starts work and employers must hold it for 3 years after date of hire or 1 year after the date employment ends, whichever is later.

The process of filling out an I-9 is two-fold. The employee must fill in their information (Name, address, birth date, Social Security number, date of form completion) and sign the form. If a translator/ third party participates in completing the document, the middle section must be filled out.

Finally, the employer or representative must re-verify documents presented by the employee, describe the document (number, issuer, expiration date, etc) and then sign the form. If the employee presents a document which will expire, it is the employer's

responsibility to document that a new version of the document has been presented before the expiration date. Also, a name change due to marriage or divorce must be documented and dated.

Frequently I-9 audits will turn up inconsistencies such as Column B or C documents listed in Column A's spot, signatures in the wrong place or forms not being dated. Maintaining a standard method of completing the form is one of the best procedures. Several of the attendees at a recent Labor Issues meeting discussed the best system they have found to reduce errors was to have a single person be responsible for processing all I-9 paperwork and new employee hires.

Many employers will copy employees documents for convenience sake, however this is a bad habit.

Nowhere on the I-9 does it ask you to copy the documents and hold them in the file. If your business chooses to copy the documents then it must be done consistently for ALL employees. The Department of Homeland Security will tell employers the file should contain copies but it is not stated on the I-9 that copies are required. To maintain consistent files, do not copy- just record- the documents and purge the files each year of extraneous, out dated material.

ANNOUNCEMENTS

Berry Sprayer Optimization and Calibration Workshops

Proper sprayer calibration and optimization will be a major part of an effective Spotted Wing Drosophila management program. Join us for one of these three workshops to learn more about sprayers – large and small – and how you can improve spray distribution, monitor output and improve efficacy.

Improving the efficacy, coverage and management of your pesticides will be of imperative this year. Learn how to calibrate air blast, boom and small hand-held or back-pack sprayers. We will demonstrate the utility of water sensitive paper and discuss alternate row spraying and nozzle selection. SWD management will be part of the workshop. There will be time for questions and discussion. **2 DEC Pesticide Re-certification credits available.**

Mead's Orchard, 15 Scism Rd, Tivoli, NY 12583

Wed. May 22, 2pm-4pm *Jim O'Connell 845-943-9814*

Winney's Farm, 113 Winney Rd., Schuylerville, NY 12871

Tues. May 28, 2pm-4pm *Laura McDermott 518-791-5038*

Valley View Farm, 228 Route 9N, Ticonderoga, NY 12883

Thurs. May 30, 10am-12pm *Laura McDermott 518-791-5038*

Please let us know you're coming! Call contact listed for each location; **if leaving a message include name/phone number.**

Cornell Cooperative Extension and the staff assume no liability for the effectiveness of results of any chemicals for pesticide use. No endorsement of any product is made or implied. Every effort has been made to provide correct, complete, and current pesticide recommendations. Nevertheless, changes in pesticide regulations occur constantly and human errors are still possible. These recommendations are not substitutes for pesticide labeling. Please read the label before applying any pesticide. Where trade names are used, no discrimination is intended and no endorsement is implied by Cornell Cooperative Extension.

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