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## Berry News

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### Berry "To Do" List:

#### All crops

- WATER NOW
- Plan for frost protection at the end of the week (Friday looks the most likely for northern areas).
- Weed management will help control voles – so keep after that.

#### Blueberries

- Blueberries throughout eastern NY at bloom. It seems spotty in some areas – fair amount of tip burn and winter injury. Light bloom in some areas likely winter related.
- Botrytis blossom and twig blight can be controlled at pink. Many of the same fungicides labelled for mummy berry will control botrytis. Anthracnose fruit rot is best controlled by a fungicide application right at bloom.
- **Just think : Fruit Rots = Bloom Sprays!**
- 1<sup>st</sup> application of fertilizer should have been made in early May. Second application should be 6 weeks later.
- Plants need 1-2" of water each week to encourage shoot elongation at this time.

#### Raspberries/Blackberries

- Slightly above average amount of dieback on summer fruiting canes.
- Bloom on High Tunnel raspberries
- Gear up for disease sprays at early bloom (5-10%) Powdery Mildew and Gray Mold are controlled then with fungicide sprays – there are many options, check your Guidelines. Remember that on blackberries if you are using sulfur you need to begin BEFORE blossoms open.

#### Strawberries

- Full bloom for early varieties with mid-season berries showing at least 50% bloom. Buds in crown for all but the latest varieties in northern areas.
- Read Gray Mold article
- A small amount of bud weevil activity was seen this week. Look for punctured blossoms along the edge of the field that are girdled and hang from the petiole. 1 cut bud per linear foot of row is threshold. Lorsban, Brigade, Danitol or Molt-X are recommended.



Strawberry clipper damage. Photo courtesy of OMAFRA

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Berry "To Do" List, continued from previous page

- Spray for leaf diseases if they have been perennial problem. Copper hydroxide is available for organic growers, and conventional growers could also use copper or Topsin-M, but keep in mind that leaf Spot has many more options for control than do the other leaf disease pathogens – except that Topsin-M is NOT labelled for leaf spot – just leaf blight and leaf scorch.
- If you grow sweet corn or if you are near lots of forage corn, be on the lookout for corn earworm larvae feeding in the berries a bit later on. Midwest growers are reporting this as a problem, although I haven't seen it yet.

## Spray Guidelines to Manage Fungicide Resistance

Written by Dr. Cassandra Swett, Grape and Small Fruit Pathologist, University of Maryland

Source: Penn State Extension, Small Fruit Blog <http://extension.psu.edu/plants/tree-fruit/news/2015/time-for-strawberry-fruit-rot-protection>.

Here's a strawberry spray guide that manages fungicide resistance, when your main objective is gray mold (Botrytis) protection:

### Pre-bloom (crown rot protection)

**Spray:** Every 7-10 days

**Rotating:** Captan 50 WG or 80 WDG (group M)

**With:** Rovral 50 WG (Group 2) -- this compound can only be applied once, and only pre-bloom

### Early Bloom (10%) to fruit set

**Spray:** Every 7-10 days

**Rotating:** Elevate 50 WDG (group 17), CaptEstate (group M + 17), Switch 62.5 WG (group 9 + 12), Fontelis\* (group 7), Scala (group 12) and Pristine WG (group 7 + 11)

**With:** Captan or Thiram Granuflo+ (both group M)

An example: Captan+Fontelis\*, then Switch, then Captan, then Pristine, then Thiram+, then Elevate, then Captan

### After fruit set:

**Spray:** Every 7-10 days

**Rotating:** Captan and Thiram+ (both group M)

**With:** CaptEstate (group M + 17), Elevate (group 17), or Fontelis\* (group 7) -each applied only once during this interval.

### Rates

For every compound, there is a range in the rate you can apply. For fungicides at risk of resistance (Switch, Pristine, Rovral, Scala), the lower rate is always recommended. For fungicides that are not at a high chance of resistance (Elevate, Fontelis\*, Captan, Thiram+), the amount you apply should be adjusted, in part, based on how high disease pressure is. If it rained at least once since your last spray, and temperatures are between 65 and 75° F, you will want to use the higher concentration. If, in

contrast, it's been cooler than 65, warmer than 75 and / or dry, use the lower rate.

### Timing

The same goes for how often you spray. We get a lot of rain this time of year, and every time it rains the fungus has a chance to infect plants. So long as it's raining about every week, plan to spray every 7-10 days.

### Tips

- Control is improved when you rotate between Fontelis\* and Switch and when you tank mix Fontelis with Captan.
- One of the compounds in Pristine is the same FRAC group as Fontelis\*, so don't use these sequentially. Switch and Pristine are both highly effective, but are at high risk of resistance if they are used too often. Because of this, it is recommended that they are only used ONCE each year.

### What about non-synthetic chemicals?

There is some interest in using non-synthetic chemicals for fruit rot

control, as a rotation with synthetic chemicals, especially in post bloom control, and for organic management. One such compound is Regalia, a plant extract labeled for use on gray mold and anthracnose fruit rot in strawberry. Trials are lacking for strawberries, but in grape Regalia can be as effective as Pristine against *Colletotrichum*, and is moderately effective against *Botrytis*. In trials in California, disease control with Regalia is best when rotated with conventional compounds. We will be doing work on strawberry starting this year to evaluate Regalia and other bio-pesticides / biologicals, so we should have more information on this in future years.

\*Fontelis is not labelled in NYS.

+Thiram Granuflo is labelled but is NOT listed in the 2015 Cornell Pest Management Guidelines for Berry Crops.



*Botrytis cinerea*, the causal agent of gray mold on strawberry, on infected fruit. Note dusty covering of gray spores on infected fruit. Courtesy of APS image database: IW000098

## Tips for Hiring Youth in Agriculture

Editors' note: this is the second in a 3-part series written by Maire Ullrich re: hiring youth. Please read it closely and if you have any questions, give Maire a call or refer to the labor websites included in the article.

### Part 2: Hazardous Occupations and Youth

Some farm jobs are clearly not something for someone under 16 to tackle but there are tasks on this list one may not immediately thought of as dangerous such as handling fresh cows & calves. Be sure to note where exemptions may exist by the notes at the bottom.

Eleven hazardous farm jobs, as determined by the Secretary of Labor, are prohibited for young workers below the age of 16. Generally, youth may not work at jobs that involve:

1. Operating a tractor of over 20 Power Take Off (PTO) horsepower, or connecting or disconnecting an implement or any of its parts to or from such a tractor; \*+
2. Operating or working with a corn picker, cotton picker, grain combine, hay mower, forage harvester, hay baler, potato digger, mobile pea viner, feed grinder, crop dryer, forage blower, auger conveyor, unloading mechanism of a nongravity-type self-unloading wagon or trailer, power post-hole digger, power post driver, or nonwalking-type rotary tiller; \*+
3. Operating or working with a trencher or earthmoving equipment; fork lift; potato combine; or power-driven circular, band or chain saw;
4. Working in a yard, pen, or stall occupied by a bull, boar, or stud horse maintained for breeding purposes; a

sow with suckling pigs; or a cow with a newborn calf (with umbilical cord present); \*

5. Felling, bucking, skidding, loading, or unloading timber with a butt diameter of more than 6 inches; \*
6. Working from a ladder or scaffold at a height of over 20 feet; \*
7. Driving a bus, truck, or automobile to transport passengers, or riding on a tractor as a passenger or helper;
8. Working inside a fruit, forage, or grain storage designed to retain an oxygen-deficient or toxic atmosphere; an upright silo within 2 weeks after silage has been added or when a top unloading device is in operating position; a manure pit; or a horizontal silo while operating a tractor for packing purposes;
9. Handling or applying toxic agricultural chemicals identified by the word "poison" or "warning," or identified by a "skull or crossbones" on the label;
10. Handling or using explosives;
11. Transporting, transferring, or applying anhydrous ammonia.

\* Limited exemptions are provided for Student-Learners under specified standards

+ Limited exemptions are provided for 14- and 15-year-old minors holding certificates of training under a 4-H Vocational Agriculture Training Program or U. S. Office of Education Vocational Agriculture Training Program.

### For Your Information:

- You might be interested in this booklet put together by Liette Lambert and her colleagues in Quebec, Canada. It is meant to be printed and then cut into small parts for easy carrying in the field. It is available for downloading at [http://www.lutteintegree.com/IMG/pdf/swd\\_booklet\\_quebec\\_2014.pdf](http://www.lutteintegree.com/IMG/pdf/swd_booklet_quebec_2014.pdf).
- **Newly updated** 2015 Spotted Wing Drosophila Pesticide Management tables are available at: <http://www.fruit.cornell.edu/spottedwing/pdfs/swd-insecticides-berries-ny.pdf>.
- **Top seal packaging** - Last year, CFP Flexible Packaging Films introduced new packaging, called top seal. The bottom is the same as a traditional clam shell, but the top is a sealed film instead of plastic. It is resealable and available in 18 oz. and 2 lb. packs. CFP also introduced the top seal for its pint packs. The new top reduces the need for plastic by 30 percent. Source: [www.freshplaza.com](http://www.freshplaza.com)



Photo credit: hofeldplastics.com



## Water Requirements and Water Stress in Strawberry

*Editors note: This article has been edited from a fact sheet written by A.H. El-Farhan and Marvin Pritts, Cornell University. You can read the full article by going to: <http://www.fruit.cornell.edu/berry/production/pdfs/strwaterreqstress.pdf>*

Water is a relatively inexpensive input in fruit production, especially in the Northeast where ample water is usually available. Only 5 days after a soaking rain, it is possible that strawberries will require irrigation. Strawberry yields with supplemental irrigation are often 40 to 60% greater than when no additional irrigation is provided.

### How much water does a strawberry plant need?

- Transplant establishment is critical. For about two weeks, newly set transplants are susceptible to even mild water stress. This vulnerability is mainly because plants have not developed a good fibrous root system with fine root hairs for water absorption.
- In the fruiting year, yield reductions of 33% and size reductions of 17% have been documented under only moderately dry conditions without irrigation.
- Strawberries grown on plastic beds in warm climates require about 18 in. of water over a 200 day growing season - after they have become established. This is the equivalent of about 22 gal per plant per season.
- Matted row growers apply 1 inch of water per week as irrigation or rainfall during the growing season, mainly to replace soil moisture lost to evapotranspiration. This is only a "ballpark" figure and requirements can be greater under extended warm, dry conditions.



### How do water deficits affect growth?

Photosynthetic rates of drought stressed strawberry plants can be less than half the rate of non-stresses, well watered plants. Root systems of strawberry are affected by water shortages, with the root/shoot ratio increasing in response to water stress. Reductions in the number of leaves, runners, and crowns also have been observed when long and frequent droughts are experienced.

The rate of leaf expansion is greatest during a 5 hour period beginning one hour before sunset. Water stressed plants have a reduced rate of leaf expansion during this period, and these differences can accumulate over the season until well-watered plants have twice the leaf area as non-irrigated plants. With only moderate water stress (75% of required water), leaf area can be less than half that of the well-watered plants after a four month period. A portion of the difference in leaf area can be attributed to leaf death under droughty conditions, especially of older leaves. The older the leaf, the more prone it is to senescence should stress conditions occur. Furthermore, under moderate water stress, younger leaves are able to maintain a higher relative water content than older leaves.

### How do water deficits affect fruiting?

Water deficit has been shown to cause fruit yield reduction by decreasing flower numbers, fruit set, numbers

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*Water Requirements and Water Stress in Strawberry, continued from previous page*

of fruit per plant and fruit size. Differences in yield and fruit quality between well watered and stressed plants have been demonstrated by many studies on various cultivars and in various production systems. Numbers of fruit per plant can be decreased by more than 30%, and total fruit production can decline by about 80% when plants are severely stressed from the beginning of the growing season. Accelerated ripening and smaller fruit size occur in water-stressed strawberries.

### **How to determine if irrigation is required?**

Maximum yield response is achieved when soil moisture is kept above 65% of field capacity in the top 60 cm of the soil. Tensiometers or EC meters can be used, but an easy trick is to look for leaf guttation. Set a bucket over a strawberry plant in the evening and examine the plant the next morning for beads of water forming on the edges of younger leaves during the night. "Guttation" is a phenomenon by which xylem sap is exuded through the pores in the leaves as the result of root pressure. Guttation usually takes place at night when transpiration is low, and humidity and soil moisture are high. Research suggests that guttation only occurs in the younger leaves of well-watered plants.

### **How to apply water?**

Drip irrigation is much more efficient (requiring about 50% less water) than overhead for meeting the water requirements of the strawberry.

To summarize:

- Ensure that the irrigation system is up and running at planting, since young plants are most susceptible to drought stress.
- Develop a method of assessing plant water needs, whether it be using tensiometers, looking for guttation, or using electrical conductivity meters.
- Determine if your irrigation system is applying water uniformly. If not, make necessary adjustments. Drip irrigation systems tend to be more uniform and efficient than overhead systems.

*Resource: El-Farhan, A.H. and M.P. Pritts. 1997. Water requirements and water stress in strawberry. Adv. in Strawberry Research 16:5-12.*

## **SAVE the DATE!!**

July 14<sup>th</sup> – High Tunnel Raspberry Field Day, Geneva, NY. More details to follow

July 21<sup>st</sup> – Blueberry Variety Review Field Day, Winney's Farm, Schuylerville, NY.  
More details to follow.

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.

**2015 Weather Table**—The weather information contained in this chart is compiled using the data collected by Network for Environment and Weather Applications (NEWA) weather stations and is available for free for all to use. For more information about NEWA and a list of sites, please visit <http://newa.cornell.edu/> This site has information not only on weather, but insect and disease forecasting tools that are free to use.

<b>2015 Weekly and Seasonal Weather Information</b>						
	<b>Growing Degree Information Base 50<sup>o</sup> F</b>			<b>Rainfall Accumulations</b>		
<b>Site</b>	<b>2015 Weekly Total</b> 5/11 - 5/17	<b>2015 Season Total</b> 3/1 - 5/17	<b>2014 Season Total</b> 3/1 - 5/17	<b>2015 Weekly Rainfall</b> 5/11 - 5/17 (inches)	<b>2015 Season Rainfall</b> 3/1 - 5/17 (inches)	<b>2014 Total Rainfall</b> 3/1 - 5/17 (inches)
<b>Albany</b>	97.5	333.9	216.5	0.06	2.51	6.26
<b>Castleton</b>	96.0	318.1	213.9	0.08	2.43	6.46
<b>Clifton Park</b>	97.4	329.5	191.4	0.09	1.79	6.97
<b>Fishkill</b>	98.7	323.0	Na <sup>1</sup>	0.81	3.52	Na <sup>1</sup>
<b>Glens Falls</b>	84.5	243.1	226.5	0.92	2.36	9.93
<b>Griffiss</b>	73.9	218.1	178.5	1.52	6.95	12.82
<b>Guilderland</b>	92.6	291.1	193.5	0.09	2.90	Na <sup>3</sup>
<b>Highland</b>	104.2	361.0	254.2	0.57	5.17	9.67
<b>Hudson</b>	106.7	349.0	241.7	0.23	3.62	8.13
<b>Marlboro</b>	95.2	323.7	211.0	0.85	4.66	9.73
<b>Montgomery</b>	101.0	326.7	223.0	0.08	4.20	9.84
<b>Monticello</b>	74.7	224.1	135.0	Na <sup>2</sup>	Na <sup>2</sup>	5.27
<b>Peru</b>	57.5	219.5	168.3	0.77	2.75	6.80
<b>Red Hook</b>	96.7	323.8	257.5	0.20	4.73	2.08*
<b>Shoreham, VT</b>	75.0	250.0	176.6	1.52	3.85	6.25
<b>Wilsboro</b>	56.0	201.7	162.1	1.12	4.17	3.82
<b>South Hero, VT</b>	60.2	220.6	144.6	0.75	3.87	7.69
<b>N. Adams, MA</b>	78.8	206.3	167.5	0.05	3.00	7.45
<b>Danbury, CT</b>	93.1	263.7	187.0	0.92	4.57	10.87

Na<sup>1</sup>: The Fishkill site is new for 2015 so there is no historical data to report.

Na<sup>2</sup>: The Monticello station is not properly recording data at this time.

Na<sup>3</sup>: The Guilderland weather station was not properly reporting precipitation data in 2014 so no data will be shown for this site.

\*: Precipitation data for this site did not begin until May of 2014.