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Summer Issue #2

<http://www.umass.edu/fruitadvisor/berrynotes/index.html>

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CROP CONDITIONS

Strawberries are in full-late bloom except those where rowcovers were used are being picked now. Reports continue to come in of frost/freeze damage around the state. Disease management is still important. Scouting fields for two-spotted spider mites and tarnished plant bug is an important activity now. Strawberry clipper is pretty much past except in late sites/varieties. Look for shot-holes in leaves that indicate the presence of strawberry root worm. Remember not to spray insecticides during bloom. **Highbush blueberries** are in mid-late bloom across the state. Some sites have suffered frost/freeze injury from earlier this week. Protecting against the blossom blight infections of mummyberry will be important, especially if wet weather persists. Indar® 75 WSP has received a section 18 emergency label in Massachusetts for suppressing mummyberry. More on this below. The first fertilizer applications should be put on during bloom with the second applied about 1 month later. Growers should place Cranberry Fruit Worm traps out now. Be sure to check fields regularly for aphid infestations. Aphids can vector (spread) the virus that causes Blueberry Scorch. This disease is present in Massachusetts so protection from its spread is very important. **Raspberries** are in early pre-bloom. Many sites have reported frost/freeze damage to new primocanes. This may delay fruit formation and ripening in fall bearing varieties. Growers should be prepared for Anthracnose, Spur blight, and Cane blight in summer bearers. Keep an eye out for strawberry clipper damage in expanding raspberry flower clusters and for leaf feeding by raspberry fruitworm. **Grape** are developing very slowly. Disease management is still a high priority. The coastal wine grape vineyards escaped any damage from frost/freeze events of the last week. Inland vineyards may have suffered some damage. Other grape producing regions of the northeast (Pennsylvania, New York, Ohio, Michigan) have suffered major damage to the grape crop this year. Keep an eye out for flea beetle damage to new foliage. Also, check under the bark of trunks and canes for evidence of mealy bug.

ENVIRONMENTAL DATA

This information is intended to be used as a guide for monitoring the developmental stages and planning management strategies of pests in your location. Growing degree day (GDD) and precipitation data was collected for the one-week period, May 9 through May 15, 2002. Soil temperature and phenological indicators were observed on May 15, 2002.

Region/Location	Growing Degree Days		Soil Temp (4" depth)	Accum. Precip
	1 Month Gain	Total		
Cape Cod: Barnstable	36	186	59° F	3.10"
Eastern: Hanson	31	228	54° F	5.00"
Waltham	36	320	52° F	2.51"
Central: Boylston	26	180	40° F	2.36"
Western: Amherst	27	257	47° F	3.09"
Great Barrington	25	247	56° F	2.53"

(Source: UMass Extension Landscape Message #11, May 17, 2002)

STATE WEATHER SUMMARY For the Week Ending Sunday, May 19, 2002

Prepared by AWIS, Inc. (available at <http://www.nass.usda.gov/weather/cpcurr/new-eng-crop-weather>)

STATE	AIR TEMPERATURES				PRECIPITATION	
	LO	HI	AVG	DFN	LO	HI
ME	21	75	45	-8	0.47	3.68
NH	13	79	45	-10	1.93	4.72
VT	23	78	44	-11	1.84	5.88
MA	27	81	51	-6	2.74	4.44
RI	32	77	52	-5	2.60	4.27
CT	30	82	52	-7	2.58	4.15

(Source: New England Ag. Statistics Service, Weekly Crop Weather Report, Volume 23, No. 4, May 19, 2002;)

Strawberry Update

Sonia Schloemann, UMass Extension

General: Scouting for two-spotted mite (TSSM), tarnished plant bug (TPB) are continuing. TPB nymphs may be present, so be sure to check flower clusters by shaking them over a white surface. (See last week's *Berry Notes*.)

Strawberry root worm beetles may be apparent now from visible feeding injury to the leaves. Their feeding results in a shot-hole appearance of the foliage. The beetles are quite small and hard to see on the plants. However, the feeding injury is very diagnostic since no other pest causes this type of injury. Damage to the foliage is not very important but the feeding injury that larvae do to the roots can be very significant. Check for

TSSM thrive in dry, warm weather so, mite populations have not increased dramatically,yet. As temperatures rise, continue to check for TSSM

infestations. Mite predators are an effective method for controlling TSSM in strawberries. However, if native predators are not resident in fields, TSSM can be controlled with the use of ultrafine 1% parafinic oils (e.g., Sunspray Ultrafine Oil or JMS Stylet oil). Remember, if you use one of these oil applications, DO NOT use in combination or in close proximity to the use of oil-incompatible pesticides such as **captan**; leaf damage or blossom/fruit injury will likely result.

Botrytis gray mold control is primarily accomplished during bloom. Elevate®, Topsin-M® and Switch® are effective materials for controlling the Botrytis fungus. Be sure to rotate these materials and tank mix with a broad spectrum material like Captan or Thiram® in order to avoid the development of resistance.

Slugs in Strawberries - Scout Now

Bob Tritten, Michigan State Univ.

In my visits to strawberry farms over the last week, I have noted very high populations of slugs feeding on grasses and other plants in surrounding or bordering fields. This is an indication that the population levels may be high enough to cause problems as berries begin to ripen. I encourage strawberry growers to scout their fields and surrounding areas this week; and to place slug traps as well.

Slugs are dark gray, black, yellow or brown wormlike mollusks. They may be covered with spots and range in size from three-fourths to one and a half inches long. Slugs have become a common pest of strawberries, vegetable, field crops, and ornamentals throughout the US and Canada. Large numbers of slugs can be found in a wet year when the preceding winter was mild, especially in heavily mulched fields.

A slug is often described as a snail without a shell. The head of the slug has two sets of tentacles. The eyes are on the tips of the upper tentacles. The lower tentacles, which are shorter, are used for tasting and smelling. The mouth is located between and below the lower tentacles and is equipped with a radula, a tooth-covered rasp that the slug uses to grate plant tissue. The slug glides along a path of mucus that is secreted by the pedal gland located just below the mouth.

Newly hatched slugs resemble the adults but are much smaller. The average life span of the slug is from nine to thirteen months, and an adult can lay from 300 to 500 eggs during its lifetime. Because the eggs are very resistant to cold and drying, they are often the only life stage to overwinter. The adults can survive mild winters and winters where they are well sheltered in the ground.

Slugs injure plants by chewing holes of various sizes in the fruit. Because slugs often feed at night, the only evidence of

their presence may be glistening patches or streaks of dried slime seen on the plants and the ground nearby.

One way to sample slug populations in strawberries is to dig holes four inches in diameter and six inches deep and cover them with asphalt shingles wrapped in aluminum foil. The reflective surface keeps the hole dark, cold and moist – and ideal hiding place for slugs. The hole also can contain a shallow dish containing beer as an attractant. Slugs exhibit homing behavior and a tendency to aggregate. They will return to a secure hiding place night after night and will also seek out other slugs.

In some years, slug damage can be high even when large numbers of slugs are trapped. Treating fields with poisonous slug baits in the fall and again in early spring provides some control. Unfortunately, the straw mulch, which provides many benefits in terms of disease and weed suppression, encourages high slug populations. Slug populations are often highest in fields that were in sod the previous year. – This article was adapted from *Strawberry Production Guide For the Northeast, Midwest and Eastern Canada*, produced by the Northeast Regional Agricultural Engineering Service, Cooperative Extension. (**Source:** *Fruit Crop Advisory Team Alert, Vol. 16, 8, May 29, 2001*)

Brambles

Raspberry Fruitworm

Sonia Schloemann, UMass Extension

Infestations of raspberry fruitworm, *Byturus unicolor*, are evident during the prebloom period from the leaf feeding done by the adult form (small brown beetles) of this insect. Larvae (worms) that are later found inside the fruit can cause significant yield losses if they are not controlled.

Field Symptoms - The first indication of raspberry fruitworm is often be the presence of small yellowish-white worms mixed in with harvested fruit. Earlier detection is possible if you know what to look for. The first indications is the tell-tale leaf tattering or elliptical holes in the leaves that results from the feeding by adults on unfolding leaves. The next indication is injury to the unopened blossom buds also done by the adult beetle. Finally, adult feeding injury can also be found on open blossom petals and fruit receptacles. When this feeding is severe, entire fruit clusters can fall off the plants.

Life Cycle - Adult beetles emerge from the soil during late April and early May, about the time the first leaves of raspberries are beginning to unfold. They begin to feed along the midrib of partially folded leaves. Beetles later seek protection between the blossom buds where

they attack the soft tissues of the supporting pedicles. As buds begin to separate, the insects attack the blossom buds, making large entrance holes to feed on floral parts.

Female fruitworm beetles deposit their eggs on unopened blossom buds. Sometimes eggs may be laid inside buds or on developing fruit. The grayish-white eggs hatch after a few days, and the larvae commonly bore through the bud and enter the receptacle where they begin to tunnel. As the larvae increase in size, the tunnels are made larger, ultimately becoming grooves in the receptacle adjacent to the berry. When infested fruit is picked, some larvae remain attached to the interior of the fruit and end up in the harvesting basket. Those that remain on the receptacle soon drop to the ground where they pupate and remain over winter.

Control – There is some evidence suggesting that this insect is more of a problem in weedy planting. If early damage is noted (leaf tattering), cover sprays should be applied prior to bloom. Adults (beetles) tend to be most active and noticeable on plants in the early evening hours. Sevin (carbaryl), malathion, and Pyrethrin are among the insecticides labeled for this insect.

Blueberries

Insect Update

Dr. Sridhar Polavarapu, Mr. Dean Polk, Rutgers University

Leafrollers and Other Worms: Activity has decreased, with larvae found in roughly a third of our sampling. An additional 8% of samples showed some gypsy moth activity. Overall levels are low, and well below treatment levels.

Aphids: Aphid populations have increased for a second week, with activity in just over 50% of samples (more than double from the previous week). Populations were found above 10% of terminals infested in about 30% of samples. These higher levels of aphid populations will

further increase the probability of spread of blueberry scorch virus, if scorch infested bushes are still in the field. Therefore, rouging out blueberry scorch infested bushes is a high priority. If aphids are the main pest target, you should consider using a broad-spectrum insecticide such as Lannate which will also control thrips, leafrollers, and cranberry fruitworm in addition to aphids.

Cranberry Fruitworm (CBFW): Trap captures indicate that we are a few days from peak flight. The recent cold spell has negatively affected the pheromone trap captures. Trap

captures will further increase in the next 4-5 days once temperatures rebound to 70 F and above. The timing for the cranberry fruitworm insecticide application is 4-7 days after the peak flight. This usually falls around June 1 to June 5.

Thrips: Sampling showed activity in about 77% of samples. Only 8% of samples were at or above 25/100 fruit clusters. While this is below 1 thrips per cluster, beating trays will tell only part of the story. There are more thrips than what fall out in a beating tray sample, but the numbers do tell us that activity in and around the fruit clusters has decreased since last week. During the past few days thrips were also found on new tender leaves in about 20 to 30% of our samples. These are the same leaves where aphids are found. It may be possible that there is thrips movement from flower and fruit clusters to tender growing shoots.

Plum Curculio (PC): Injury was found in about 14% of our sampling, with a high of 1.3% of clusters showing egg laying scars. Adults are being found in about 3% of sampling. We are also seeing increased activity in some peach orchards, with egg laying prolonged over more time than is usual. Post-pollination insecticide applications with Guthion will further suppress adult activity. Grubs that are already in the berries will not be affected by insecticide applications.

Monitoring blueberry maggot: Adult blueberry maggot flies are expected to emerge in the first week of June. If you are planning on using baited yellow sticky traps (Pherocon AM traps manufactured by Trécé Inc.) for monitoring blueberry maggot fly, you should be ready to place the traps in the following 5-7 days. Please make sure that you have asked for “baited” Pherocon AM traps from your supplier. Baited Pherocon AM traps can be purchased from the following suppliers:

Gemplers
 100 Countryside Drive
 P. O. Box 270
 Belleville, WI 53508
 Tel: 1-800-382-8473
 Fax: 1-800-551-1128

Great Lakes IPM
 10220 Church Road NE
 Vestaburg, MI 48891
 Tel: 517-268-5693
 Fax: 517-268-5311
 (Source: *The Blueberry Bulletin*, Vol. 18, no. 6, May 23, 2002)

Blueberry Disease and Culture Update

Dr. Gary C. Pavlis, Rutgers University

Iron Chlorosis: When the symptoms of iron chlorosis occur, the blueberry plants are sending the grower a message. Yes, the plants are deficient in iron due to an elevated pH. However, iron is just the first deficiency that shows up. When the pH is high, the blueberry plant has a harder time taking up all nutrients and water. So iron chlorosis is an early warning sign which can be fixed by a couple of foliar sprays of iron chelate and lowering the pH with sulfur. Please remember that if you have iron chlorosis, the plant growth is being stunted and this will reduce yield the following year. Powdered sulfur is the fastest acting, about 1-2 months to bring the pH all the way down to the 4.5 - 4.8 range. Pelleted sulfur is much slower, sometimes 6 months. This form is easier to apply however too slow if the plants are deficient. This is a good formulation for a late fall

application when a new planting is going in the next spring. Lastly, never use aluminum sulfate. Blueberries don't like aluminum. So, if you see new leaves with green veins and the rest is yellow, get a pH test of your soil. Here is a quick chart to determine the amount of sulfur to use to lower the pH.

The following amounts of sulfur are recommended lbs./per acre to reduce the soil pH one-half unit (ex. 5.0-4.5):

Loamy Sand	Sandy Loam	Loam	Silt Loam
196	305	435	609

(Source: *The Blueberry Bulletin*, Vol. 18, no. 6, May 23, 2002)

General

Drought Conditions in Massachusetts - a look at the groundwater

Craig Hollingsworth, UMass Extension

Are we out of the drought? With recent rainfall, stream flow in all areas is higher than normal, but drought experts caution us to look at the groundwater to make drought determinations.

The United States Geological Survey (USGS) maintains a series of observation wells throughout the country

where depth to groundwater is digitally recorded (60-minute interval), up-linked to satellite and posted on their website. In Massachusetts there are eight observation wells, and the website URL is:

http://ma.water.usgs.gov/ground_water/ground-water_data.htm

The table below is a summary of a small part of the data from the website.

It indicates that some areas have higher than normal groundwater levels (those in the 75th quartile have higher groundwater levels than in 75% of previous years),

normal levels (50th quartile), and some wells are lower than in the 75% of the previous years (25th quartile). The Q25 (25th quartile) is shown to provide an idea of what is a low level for that particular well. All sites are well above record low groundwater levels.

Depth to groundwater at USGS observation wells in Massachusetts

Well Site	Year the well was established	Historic Mean for MAY (ft)	Record low (ft)- year	Q25 (ft)	Depth of GW On May 22, 2002	Quartile
Lakeville	1964	13.6	23.7 -1966	15.1	16.5	25
Duxbury	1965	8.2	10.7 - 1965	8.5	7.4	75
Norfolk	1963	5.8	8.0 - 1997	15.1	5.9	50
Pelham	1981	13.2	No data	14.8	15.6	25
Pittsfield	1963	14.6	27.6 - 1964	15.1	14.8	25
Acton	1965	17.8	21.9 - 1966	18.5	19.7	25
Wakefield	1965	6.5	10.0 - 1965	7.0	6.0	75
Wilmington	1951	7.3	11.3 - 1957	7.8	7.2	50

It appears that some areas are out of drought conditions, while other areas still have lower groundwater levels than are normal. However this is a snap shot of the immediate conditions. Reviewing additional information over the next month will provide more confidence in the assessment.

More drought information with links to many data-rich sites can be found at the UMass Drought Information website at <http://www.umassdroughtinfo.org>

Food safety and U-Pick Operations

Craig Hollingsworth and Rita Brennan Olson, UMass Extension.

U-pick operations have their own challenges, perhaps most of them involving how to manage customers. Here’s another challenge: humans and pets can be the source of disease-causing bacteria and viruses, and can contaminate the produce they handle at your farm. Here is a last-minute checklist to help you protect your customers from themselves.

- If possible, do not allow pets in the field or orchard. If pets must accompany customers, encourage them to pick up and properly dispose of any pet waste.
- Establish guidelines for customers with children in the field and orchard. Discourage diaper changing in the field.
- Provide trashcans for any customer trash.
- Provide toilet facilities and hand washing facilities that are accessible, clean, and regularly supplied with toilet paper, paper towels, soap, water, and trash can.

- Encourage customers to wash their hands after petting animals and using toilet facilities.
- Use signs and fact sheets to promote hand washing and safe food handling.
- Clean and sanitize the pick your own containers that you provide to customers.
- Do not sell produce that has been picked by customers.

Adapted from the New England Extension Food Safety Consortium

Also, please check out the NEP website <http://www.umass.edu/umext/nutrition/foodsafety/fspartnership.html>

where you can get handwashing posters and other information.

Massachusetts Berry Notes is a publication of the University of Massachusetts Extension Fruit Program which provides research based information on integrated management of soils, crops, pests and marketing on Massachusetts Farms. No product endorsements over like products are intended or implied.