New York Berry News

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What's Inside

The berry season is in full swing, just like the weather, which has done a complete 360° from an extended period of unseasonably hot and dry weather to the current rainy and unseasonably cool period. Hopefully the weather will moderate just in time for your strawberry harvest.

This month's article is jam-packed with the latest information on berry important topics. Hope you find something useful to your operation on every page. As with every business, we must keep track of our customer base. To help make our book keeping in this department a little easier, we would ask you to make note of make the following request:

UPCOMING MEETINGS

August 11-14, 2005. *Northeast Organic Farming Association 31st Annual Summer Conference.* Hampshire College, Amherst, Mass. (978) 355-2853, nofa@nofamass.org, www.nofamass.org..

August 17-19, 2005. *NASGA's 8th Annual Summer Tour, "Farming on the Urban Fringe"* in Fishkill, New York. See article below for more details.

October 14-15, 2005. *Passive Solar Greenhouse Workshop*. 1522 Lefever Lane, Spring Grove, Pennsylvania. **Contact:** Steve and Carol Moore (717) 225-2489.

October 14-15, 2005. *Highbush Blueberry Council (USHBC) Fall Meeting*, Amway Grand Plaza Hotel, 187 Monroe NW, Grand Rapids, Michigan. . **Contact**: 616-885-2000

December 6-8, 2005. *Great Lakes Fruit, Vegetable, and Farm Market EXPO*. DeVos Place Convention Center, Grand Rapids, Mich. www.glexpo.com.

December 1-7, 2005. *International Society for Horticultural Science 9th International Rubus and Ribes Symposium*, Pulcon, Chile. **For more information contact**: Pilar Banados, Facultad de Agronomia Ingenieria Forestal, Universidad Catolica de Chile, Casilla 306-22, Santiago, CHILE; fax: 56-2-55334130, E-mail: pbanados@puc.cl or online: http://www.faif.puc.cl/rubus-ribeschile.html

January 4–6, 2006. *North American Berry Conference*; Being held in conjunction with the *Southeast Regional Fruit and Vegetable Conference* at the Savannah International Trade and Convention Center, Savannah, GA, Hotel to be Determined. For more information contact Georgene Thompson, 717-243-1349 or georgenethompson@comcast.net or visit http://www.nasga.org.

February 1-3, 2006. *Mid-Atlantic Fruit and Vegetable Convention*. Hershey Lodge and Convention Center, Hershey, PA. For more information contact the Pennsylvania Vegetable Growers Association at pvga@pvga.org or visit http://www.pvga.org/.

BERRY IMPORTANT DATES!

Cathy Heidenreich, Department of Plant Pathology, Cornell University, NYSAES

Here is a checklist to help remind you of seasonal chores for the month of June. For a full description of mid to late-season small fruit insect pests and their control, see the article that follows by Greg English-Loeb. For more information on the other small fruit production topics on this month's checklist, see the 2005 Pest Management Guidelines for Small Fruit and past issues of the NYBN.

Strawberries:

Disease management-through harvest
- Gray Mold
- Anthracnose

Disease management-post renovation
- Powdery mildew
- Leaf blight, leaf spot, leaf scorch

Insect management
- Tarnished Plant Bug
- Sap Beetle

Brambles: Summer-bearing

Fertilizer
- Split application #2

Disease management
- Powdery Mildew
- Gray Mold

Insect management
- Raspberry Fruitworm
- Raspberry Sawfly
- Tarnished Plant Bug
- Japanese Beetle
- Sap Beetle
- Potato Leaf Hopper

Brambles: Fall-bearing

Weed management

Fertilizer
- Split application #2

Disease management
- Raspberry Leaf Spot
- Powdery Mildew

Insect management
- Japanese Beetle
- Potato Leaf Hopper

Blueberries

Fertilizer
- Split application #2

Disease management
- Anthracnose

Insect management
- Fruitworms-Cranberry and Cherry
- Leaf Rollers
- Plum Curculio
- Blueberry Tip Borer
- Blueberry Maggot
- Japanese beetles
- Blueberry Stem Borer

Currants and gooseberries

Weed management

Fertilizer
- Application #2

Disease management
- White Pine Blister Rust
- Leaf spot/Anthracnose

Insect management
- Currant Aphid
- Imported Currant Worm
- Currant Borer
- Currant Stem-girdler
- Gooseberry Fruitworm

SURVEY OF NEW YORK FARMERS TO BEGIN SOON

As a primary source of information, the June Agricultural Survey is one of the largest and most important conducted by the U.S. Department of Agriculture's National Agricultural Statistics Service (NASS). Farmers will be contacted during early June to take part in this nationwide survey of American agriculture. The resulting information will be used to make reliable State, regional, and national estimates of crop acreage, grain stocks, and livestock inventories. The New York Agricultural Statistical Service in Albany is handling the New York portion of the survey.

This survey is particularly vital. It will provide the first clear indications of the potential production of major crops for 2005. Producers themselves rely on the data to reach valid production, marketing, and investment decisions. Congresspersons and regulators use the information to produce better regulations and farm programs. Industry analysts, extension agents, farm organizations, and agricultural lenders need the information for a variety of reasons.

It is therefore important for farmers to participate in the survey to ensure that local agriculture is accurately portrayed. Most producers selected for interviews will soon be notified by mail.

"We safeguard the confidentiality of all survey responses," Steve Ropel, State Statistician, said. "Data about individual operations are used only in conjunction with information from other producers."

All agricultural statistics published by NASS are available at *www.usda.gov/nass/.* For more information, call 800-821-1276.

IT'S TIME TO REGISTER FOR THE NASGA 2005 SUMMER TOUR

"Farming on the Urban Fringe"
Wednesday, August 17 to Friday, August 19

An Exceptional Opportunity to Learn about Agriculture

Our tour group will be joined by one of the most well-known and well-respected "voices" for agriculture in New York's Hudson Valley. Dave Tetor is active in numerous farm organizations and is a supporter of farm life through his many public, political, and personal involvements. He was one of the leaders who propelled a comprehensive report titled "At a Crossroads: Agricultural Economic Development in the Hudson Valley." He is also a congenial and well-loved TV personality who will bring the local color to life for our NASGA travelers.

When it comes to registering for NASGA's 2005 Summer Tour in the lower Hudson area of New York there are two dates to keep in mind:

- The deadline for getting a room at our special rate of $125 per night is **Wednesday, July 20.**
- Because of our contract with the bus company, the optional side trip to New York City must be confirmed with a full bus by **Friday, July 29.**

We're letting you know early, because if you want to be part of the fellowship and learning that takes part during this annual event it would be best if you register now. A last minute registration may mean disappointment for you and for everyone else.

Right now one bus has been reserved for the main two-day tour. Registrations for a second bus will be accepted on a first come, first served basis with priority for NASGA members and those signing up for both days of the two-day tour. A second bus will only be added if interest merits it. By sending in your registration right away, you won't find yourself on the waiting list, which means you will be able confirm your travel plans right away.

The tour schedule is included in the attached brochure and is on the NASGA website:
http://www.nasga.org/meetings/2005/summerTour/brochure.htm.

Take these three steps today:

- Print the registration form and send it to NASGA. Make it easy on yourself and NASGA pay by credit card and fax your completed form to 1-814-355-2452.
- Make your hotel reservations. Call the Courtyard Fishkill by Marriott (1-800-320-5741) and be sure to mention NASGA to obtain our special group rate.
- Make your travel plans and get ready to enjoy another NASGA adventure.
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BERRIES ARE A HOT COMMODITY

The Economic Research Service's "Fruit and Tree Nuts Outlook" (FTS315) dated March 31, 2005 reports strong demand for berry crops in 2003 and 2004 has boosted the value of most berry crops with overall growth from $449 million (1980) to $1.5 billion (2000) and $2.2 billion (2004). The report notes that while berry crops account for only a small share of fruit and tree nut production, their value makes up 15% of total receipts. The strawberry crop is the highest valued berry crop, accounting for about two thirds of all berry revenues since the eighties. Blueberries accounted for 13% of the value of the total berry crop in 2004 and the value of cultivated blueberries between 2003-04 increased 25.07 percent (Table 11).

(Find the report at: http://www.ers.usda.gov/publications/fts/mar05/FTS315.pdf)

DECREASE OF FRUIT FARMS AND ACREAGE IN NEW YORK

Final numbers from the 2002 Census show that the number of farms harvesting fruit crops in New York State decreased from 1997 to 2002, according to Steve Ropel, Director of USDA's National Agricultural Statistics Service, New York Office.

In 2002, there were 2,753 farms in New York with 99,148 acres of land in orchards, down 5 percent in the number of farms and 11 percent in acreage from 1997.

Wayne County led all New York counties in orchard acreage with 22,570. Wayne County's acreage dropped 19 percent from 1997. Chautauqua County led all New York Counties in number of fruit farms with 615. The number of fruit farms in Chautauqua County fell 11 percent during the same period.

Schuyler County had the largest increase in number of fruit farms, up from 43 in 1997 to 60 in 2002. Despite fewer farms, Chautauqua County had the largest increase in fruit acreage, increasing from 19,022 acres in 1997 to 19,670 acres in 2002.

Details on this and other Census figures can be found on-line through the New York NASS web site: www.nass.usda.gov/ny/. U.S., State, and County tables are available in PDF, Text, and CSV files. Printed copies will be available along with the CD-ROMs and a searchable database. For further information or assistance, please call the New York office at 800-821-1276 or send an e-mail to: nass-ny@nass.usda.gov.

CONVERT YOUR "G" TRACTOR TO SOLAR/ELECTRIC POWER

Vern Grubinger, University of Vermont Extension

A recent SARE farmer-grower grant resulted in step by step instructions for converting an old gasoline Allis Chalmer's "G" cultivating tractor into a smooth running, non-polluting, energy efficient, whirring and humming electric miracle worker with even more power than the original gasoline version! The author claims that the skill level required to complete this conversion is very low, and the payback in gas saved, the "coolness" factor to you customers, and time saved in tune-ups makes it completely worth it. Visit **www.flyingbeet.com/electricg**

(Reprinted from: Vermont Vegetable and Berry News - June 1, 2005)

RETAILING REQUIRES TQBM: TOTAL QUALITY BERRY MANAGEMENT

Kevin Iungerman, NE New York Area Fruit Program, Cornell Cooperative Extension, Ballston Spa, NY

We have just begun to move into berry season, with the first row-covered strawberry production coming on locally this week (week of 6/13). Despite very cold temperatures in the region on the morning of May 13 (23°F in Burnt Hills, 27°F widely0 I saw little or no cold injury in strawberries, raspberries, and blueberry plantings I have visited. Most injury was confined to tip dieback of summer red raspberries, more so with purple and black. Our recent tropical heat wave -- complete with random monsoons -- pretty much reversed our earlier heat unit deficit. As of 6/15, we are about at normal berry cropping times across the board. Because of the moisture, berries are likely to be on the larger side, and for strawberries and raspberries, may be especially prone to rapidly reach over-maturity; this will be accentuated if the heat resumes. With this in mind, I have incorporated an earlier article I prepared having to do with harvest and post harvest berry handling. The timing on this should be close to ideal.

Total Quality Berry Management (TQBM) involves aspects of proper site selection and preparation, the choice of suitable cultivars, maintaining optimum nutrition and pest management, and educating pickers regarding point of harvest criteria, especially careful handling. TQBM places emphasis upon the rapid movement of the crop from the farm to a pre-arranged market destination via a continuous maintained cold-temperature handling chain. TQBM addresses the need for storage-life plus shelf life, where 'Shelf-life' refers to the extent to which sufficient berry eating quality (i.e. marketing quality) is

maintained without cold storage. While in contrast, 'Storage-life' refers to the extent to which eating quality is maintained in berries with cold storage. The goals of TQBM are to expand berry marketing options by using rapid refrigeration to 1) extend the widow of quality fruit availability, and 2) the shipment range of this excellent eating quality fruit than was previously thought possible. TQBM changes the 1 - 2 day shelf life of picked berries @ ambient temperatures (68°F.) to a specific crop's maximum attainable post-harvest quality range. Using proper harvesting and storage techniques, it is possible to maintain quality raspberries for 7 days after harvest, strawberries for 2 weeks, and blueberries for 3 weeks.

Perhaps the three most important keys to achieving TQBM are the following:

- Appreciating the dynamics of post-harvest physiology.
- Using rapid two-stage cooling.
- Maintaining a refrigerated transport and handling chain.

First and foremost, remember that following harvest fruit remains alive! And while harvest is a radical event in a fruitlet's existence, it is not the end of the berry's life -- not yet. Life encompasses senescence and deterioration as well as growth and maturity. Respiration and transpiration are processes governing this cycle of life and post-harvest decline. Post-harvest life span is directly related to the inherent respiration rates of fruit.

Respiration rates of various fruits stored at different temperatures °F (in mg CO_2 kg^{-1} h^{-1}).

	@32	@41	@50	@59	@68
Raspberry	24	55	92	135	200
Blackberry	22	33	62	75	155
Strawberry	15	28	52	83	127
Blueberry	10	12	35	62	87

Respiration is the oxidation (O_2) of food reserves in the fruit to produce energy. A simple representation of the process would be:

$$\text{Starches / sugars} \rightarrow \overset{\downarrow O_2}{\rightarrow} \text{organic acids} \rightarrow \overset{\downarrow O_2}{\rightarrow} \text{simpler carbon compounds} \rightarrow \overset{\downarrow O_2}{\rightarrow} \text{eventually } CO_2 + H_2O + \text{heat}$$

Our second concern, transpiration, involves water loss. It is prompted by differences of water vapor concentration (i.e. which means pressure differences). Like all gasses, water vapor disperses from regions of greater concentration to regions of lesser concentration. Harvested fruits, and indeed all plants, constantly loose water to the environment. Vapor pressure decreases over a gradient between the fruit cell, the intercellular spaces surrounding those cells, to the atmosphere surrounding the fruit. This means a concentration gradient moving from about a 99% relative humidity to one of 50% to 80% depending upon the outside environment.

Putting these two forces together, unmanaged respiration and transpiration cause many undesirable outcomes:

- Sugars are oxidized and cells loose turgor pressure.
- Energy deficit and membrane disarray open fruit to pathogen invasion.
- Symptoms of deterioration and senescence as follow:
- Loss of berry crispness, texture, flavor, sweetness, and nutritive value.
- Loss of Berry weight due to shrinkage, shriveling.
- Wilting, softening, and berry rot (death).

What then must be done with harvested fruit to put the brakes on respiration and transpiration to ensure TQBM?

- Harvest in the cool of the day. Have a runner or individual pickers take filled flats to a shaded central pickup point.
- Cover flats with a moist, light-colored tarp and provide shelter from the wind in order to retain water vapor.
- Rapidly cool fruit to remove field heat. An 18° drop in fruit temperature equals a 2X - 4X drop in respiration rate.
- E.G. Raspberries held at 32°F and 90% RH, rather than 77°F and 30% RH, water loss rate will be 35 times slower.
- E.G. Strawberry shelf life, at 30°F, is 50% greater than at 40° F.

Refrigeration is an absolute to TQBM. Passive refrigeration has the advantage of being relatively inexpensive, but involves a long cool-down period, which severely compromises storage-life potential. Controlled atmosphere (CA) cold storages (which combine refrigeration, higher CO_2 levels, and reduced O_2 levels to reduce respiration rates) has a similar cool-down phase, but due to the modified gas environment, it is conducive to long-term produce storage. However, it is not rapid enough for highly respiring fruits (such as our small fruits) and is cost-prohibitive to smaller growers. A third general cooling approach is pre-Cooling which utilizes two-stage refrigeration. It has the advantage of being relatively easy to construct and adapt, and it is the least expensive approach after passive. Liquid ice, hydro cooling, or vacuum cooling as

pre-cooling methods, have differing problems of practicality for small fruit processing, higher pathogen transmittal risk, and relative expense. Rapid forced-air pre-cooling is the most practical choice for most small fruit operations. Several operating principles are involved for rapid forced-air cooling:

- Refrigerated air (35°F) is ducted so that it is pulled to and through covered vented flats. Warm air then returns to flow over the coils of cooling unit to repeat the cycle. Air leakage is controlled in the loop and the larger cooler.
- Heat is removed by convection not conduction. A monitoring unit tracks fruit flesh temperature drop and trips fans (i.e. turns them off) within 5° of 32°F. (Excess air movement causes dehydration).
- Ideal design: a separate cooling chamber sized to harvest flow. Can be adapted to a portion of a cooler.

TQBM requires both rapid pre-cooling and high relative humidity (RH). Theoretically, if the cold storage could be at 100% RH, so long as there is a vapor pressure differential between the warmer fruit and the cold air of the storage, fruit would continue to rapidly loose moisture until temperatures were equated. Cool-down in a passive system is too slow. Even if fruit and cooler have similar relative humidities, the differences of temperatures represent very different drying powers, for vapor pressure deficit. (VD)

Location and Temperature °F	Humidity Relative % Fru, Air	Pressure (mm Hg) Vapor Fru, Air	Deficit
Fruit, Air @ 37	100, 90	5.69, 5.12	.57
Fruit, Air @ 32	100, 90	4.58, 4.12	.46

(See example →) (Note: Storage RH & VD never = 0)

(Information from USDA Agricultural Handbook 68, p 20.)

- Recommended storage regimens:

Raspberries and Strawberries at 32°F and 90-95% RH. Blueberries at 32°F and 85% RH

Rapid pre-cooling puts the brakes on pathogens too. *Rhizopus* rot is unable to grow below 40°F, and *Botrytis spread* to healthy fruit is arrested at 32°F. In general, Rapid cooling to 32°F complements fungicide control to counter the incidence of various food spoilage fungi, including: *Cladosporium, Penicillium, Mucor, Aureobasidium, Alternaria, Epicoccum, Didymella Species.*

TQBM also requires that you maintain the 'Cool Quality Chain'. Consider this: farmgate to consumer fruit loss, due to deterioration and rot, is estimated at about 40%, and it is largely due to poor handling. Some 14% of the loss occurs in the chain from farmer to wholesaler, 6% from wholesaler to retailer, and 22% from the retailer to the consumer. (Gives new meaning to loss leaders in the produce section.) In the cool quality handling chain, there are plenty of opportunities or places for things to go wrong. You need to focus on your percentage piece of the problem and you need to educate your customer on his, so that together you may enhance everyone's profit and satisfaction.

TQBM seeks to avoid the losses associated with handling and transport breaks in the cool quality chain. This can be achieved by observing the following:

- After pre-cooling, cover berry containers with rubber-banded cellophane (reduces water loss, excludes contaminates, and aids overall appearance).
- Cover flats with plastic before removal from cold storage. Maintain covers over cellophaned fruit through each phase of refrigerated movement.
- When placed in ambient air, allow berries to warm above the dew point before removing the outer plastic. (Deters sweating or condensation on either berries or cello. Reduces pathogen development risk and appearance problems.)
- Pre-cool fruit first, and move by refrigerated transport. (Refrigerated trucks are incapable of removing field heat.)
- Avoid non-refrigerated breaks in cool fruit movement.
- Properly position flats on pallets in truck. Do not overload the vehicle, as free air movement is critical. Air should flow from the front elevated cooling unit, to the rear of the truck, to be deflected down and under flats.
- Avoid flat contact with the truck body (this can raise flat temperatures as much as 20°F).
- Use trucks with good air suspension. Avoid stacking over wheels. Make sure to stabilize the load

(Reprinted from**: Northeast Fruitlet, Vol. 9, No. 5, June 2005)**

ATHROPOD PEST MANAGEMENT UPDATE

Greg English-Loeb, Department of Entomology, NYSAES Cornell University, Geneva, NY

We are getting to or moving beyond the early season pests (reviewed in the May edition of New York Berry News) into summer time pests. It has been a dry spring and recently quite warm. Generally, these conditions favor insect problems over diseases. Here at the experiment station in Geneva, our strawberry varieties are pretty much done flowering and we observed (ate) our first ripe Earliglow berries on about June 6.

Blueberries

Cranberry Fruitworm and **Cherry Fruitworm** are the main blueberry arthropod pests in the spring and early summer. These moths overwinter as fully-grown larvae. They pupate in the spring and begin flying in late May and early June (around the time of flowering). Egg laying begins at around petal fall with eggs being placed at the base of newly set fruit. We are probably getting past the optimum time to treat for these pests (petal fall and 10 days later). For sites with moderate pressure, a single insecticide (Confirm or Guthion), timed at 5 days post petal fall, can be effective. Other pests to keep an eye out for at this time are **plum curculio** (notice crescent-shaped scar created from egg-laying on young fruit), **leafrollers** (larvae make shelters by silking together terminal leaves), and **blueberry tip borer** (larvae bore into stem causing shoot tips to die back). There are several summer arthropod pests of blueberries to be on the lookout for as the season progresses. **Blueberry maggot** is probably the most important one, although it has not been as serious a problem in New York as other blueberry producing areas such as New Jersey. The blueberry maggot overwinters in the ground as a pupa (the immature stage before becoming an adult fly). Emergence begins around mid-June and continues through much of the summer. Even though the blueberry maggot only has 1 generation per season, adults appear over an extended period (emergence is not very synchronized). Indeed, under some environmental conditions, pupae can stay in the soil for 2 or even 3 years before emergence. After emergence, adult females need to feed for 7 to 10 days before they start laying eggs. Eggs are inserted under the skin of ripening berries. Eggs hatch in a few days and the larvae feed and develop for around 20 days before dropping to the ground to pupate. During the early part of larval development, there are no obvious external symptoms on the blueberry that it is infested. Later the berry may become soft and appear to ripen early. An important part of controlling blueberry maggot is learning when emergence begins. Yellow sticky cards, baited with a food source for the adult flies (protein hydrolysate and ammonium acetate) can be used to detect the first flies of the season. These traps are commercially available. Place traps along the edge of the planting or in woods near wild blueberries to better estimate when activity begins. For problem fields, regular applications of pesticides, beginning after activity is detected and continuing until harvest, is necessary to adequately protect fruit. Adult **Japanese beetles** can also present problems for blueberry growers during the summer, although this is less true for U-pick operations. The adults emerge at the end of June and into July and feed both on blueberry foliage and to some extent on fruit. The damage appears as skeletonized leaves or surface scarring of the fruit. During harvest beetles can also be dislodged from the plant and contaminate the packed berries. Several insecticides are available that provide moderate to good control of Japanese beetles. Note, though, that beetles are very mobile and will fly into fields from long distances.

Raspberries

We covered most of the relevant arthropod pests of raspberries in the last edition of the electronic newsletter. **Tarnished plant bug (TPB)** and **cane borers** continue to be a threat into the summer; tarnished plant bug nymphs and adults feed on developing fruit and cane borer larvae feed inside canes. TPB overwinters as an adult. In the early spring, these overwintered adults feed and produce offspring on early flowering weed species and move into strawberries. This year's spring generation of nymphs are just becoming adults now and present a threat to both later fruiting varieties of strawberries and summer raspberries among many other crop plants. Given the warm and dry weather it may turn out to be a serious plant bug year so do some scouting. The threshold of TPB in raspberries has not been well worked out, but consider some sort of control if greater than 20 to 30% of flowering clusters have adult or immature TPB. **Potato leafhoppers** (both adults and immatures) are also showing up in New York farms. This species overwinters as adults in the southeastern USA and then migrates north in spring and early summer (it does not overwinter. They feed on a lot of different crops including many small fruits like strawberries, raspberries, and grapes. They use their soda-straw like mouthparts to pierce the water conducting vessels of the plant (xylem) and such out water and nutrients. If this were all they did, it probably would not cause much problem. But they also inject saliva into the plant and for some species, this causes a strong reaction in the plant. Typical symptoms include yellowing of leaf margins and distorted and possibly stunted leaves. Different plant species respond differently and some are very sensitive while others are not. Raspberries, grapes, and strawberries are sensitive. The adult potato leafhopper is iridescent green and wedge-shaped while the nymph is usually green and moves sideways in a unique manner when disturbed. If injury to foliage is moderate to severe, control may be necessary. Sevin [carbaryl] and Malathion 57 EC are labeled for potato leafhopper on raspberries but note there is a 7 days to harvest restriction for Sevin but only a 1 day restriction for Malathion. I should also mention **two-spotted spider mite (TSSM)** as a potential pest. These tiny spider-like arthropods can become very numerous on foliage, causing white stippling on leaves. They seem to be most problematic in dry sites and/or in mild growing areas such as the Hudson Valley and Long Island. As of a few years ago there is now a miticide registered in New York for control of TSSM

(Savey DF). Predatory mites can also provide control of TSSM. These beneficial mites are frequently naturally present in raspberry fields, especially where few broad-spectrum insecticides are used, but can also be purchased from a supply house. For both Savey and predatory mites, it's important to start control actions early before you see lots of severe injury to foliage (bronzing). As fruit ripens, **sap beetles** can become a problem. There are several species. The most obvious one is some times called the picnic beetle. The adult is black with large white or orange spots. We have also been finding the smaller strawberry sap beetle in summer and fall bearing raspberries. The adult beetles are attracted to damaged or over ripe fruit where they feed and may spread fruit rots. Larvae can also infest the fruit but this generally happens after the fruit is over ripe and not marketable. Malathion 57 EC is labeled for sap beetle in raspberries. **Japanese beetles** can also cause injury to raspberry foliage and fruit during July and early August. August is the time that the adult **raspberry crown borer** makes its appearance. The adult is a very attractive moth that superficially resembles a yellow jacket. You may notice the adults resting on foliage during the day. It's the larvae, though, that cause the major problem. Reddish-brown eggs are placed on foliage in August and September. After hatching, the larvae find a protected place near the base of the cane to spend the winter. The next spring the larvae enter the crown and roots where they spend the next year. In the second year the larvae continue to feed until early summer, at which time they form pupae and then emerge as adults in late summer to start the cycle over again. During the growing season, look for withering, wilting, and dying canes, often with half-grown fruit. Destroying these canes (including the crown area) may help reduce crown borer populations. Guthion is currently labeled for control of crown borer on raspberries (applied to control larvae in spring) but that this registration will likely be lost next year.

Strawberries

Flowering is complete and fruit is quickly ripening. For later maturing cultivars **tarnished plant bug** (TPB) can still cause injury to fruit so keep on monitoring for nymphs. For day-neutral cultivars, TPB becomes an increasing problem for the August harvest. **Spittlebug** can still be a problem leading up to harvest. You can see the frothy spittle on leaves, stems, and flowering racemes starting about bloom and extending into harvest. They overwinter as eggs in the soil and hatch out as temperatures rise in the spring. The nymphs crawl up the plant and begin feeding on the xylem tissue (the water conducting vessels of the plant). There are not a lot of nutrients in xylem and therefore nymphs need to process a lot of sap, extracting the few nutrients out for their use and excreting the remaining water. This water is frothed into white spittle, which helps protect the nymphs from desiccation and natural enemies. Feeding by spittlebugs, if extensive, can stunt plants and reduce berry size. Perhaps more importantly, the spittle masses are a nuisance to pickers. Threshold for spittlebug masses is one mass per foot row. As fruit ripens, **strawberry sap beetles** will become more active. Recent research indicates that the adult beetles spend the winter in surrounding woods and then move into strawberry fields as fruit begins to ripen. Look for evidence of feeding damage on the underside of ripe fruit that is touching the ground (small shot holes; you usually don't see the beetle itself). Both the adult beetles and the larvae feed on ripe and overripe fruit. We still are exploring the best ways to control SSB. Two pyrethroids are labeled in New York for its control: Danitol and Brigade. Note that Brigade does not have a preharvest interval while for Danitol it is 2 days. For both materials, good coverage is likely to be important for its control. It is also worth mentioning **Root weevil** at this time. The larvae have been busy feeding on roots and crowns since last summer and are getting close to completing development and pupating to adults. If you have questions about whether you have root weevils, this is a good time to look since the larvae will be large and easy to see. Dig out the crown and roots of a couple of plants in different sections (especially look near weak-looking sections) and sift through the soil for small (eighth to quarter inch), legless, C-shaped, pale white grubs. After emerging around harvest time, the adults feed for a few days before starting to lay eggs. Chemical control (Brigade) is targeted at the adults. Look for characteristic adult feeding damage on leaves (notching from the edge) to help determine timing. Some growers have also had success controlling root weevil larvae using parasitic nematodes. These can be applied either in the spring (late April and early May) and/or in the fall. Use sufficient water to get good penetration. Rotation out of strawberries is the best remedy for root weevils.

Currants and Gooseberries

Imported Currant Worm (ICW) has completed its first generation and is getting started on the second. Larvae are greenish in color with yellowish ends, a black head region, and covered with black spots. Full-grown, they can get to be close to 3 inches long. They initially feed in colonies but as they become larger, feed singly. Malathion is labeled for use against ICW. Other currant and gooseberry pest to be on the look out for in the spring and early summer include the **currant borer** and **gooseberry fruitworm**. The currant borer, as an adult, is an attractive moth with clear wings, blue-black body with yellow markings resembling a wasp. The adult emerges in the spring, mates and begins laying brownish eggs on the bark of canes. After hatching, larvae burrow into canes and begin feeding within the pith. No insecticides are labeled for currant borer although removal of weak canes in the spring and fall will help keep populations down. The gooseberry fruitworm is also in the moth group. Larvae feed inside young fruit, sometimes weaving portions of stems together with silk. Finally, **two spotted spider mite** also feeds on currants and gooseberries and in some years, can cause considerable damage. Look on the underside of leaves for the mites and their webbing. Keep an eye out for reduced plant vigor, bronzing of foliage, and webbing on leaves and shoot tips.

(Editor's note: See NYBN Vol. 3 No. 4 for pictures of the pests described above)

THE ORGANIC WAY-ORGANIC METHODS FOR BLUEBERRY NUTRITION

Elsa Sanchez, Assistant Professor, Horticulture Systems Management, Penn State University

This article examines organic options for blueberry nutrition. Because soil pH and nutrient availability are closely linked, methods for adjusting soil pH are also included.

Before Planting

Blueberries grow optimally in soils with a pH between 4.5 and 5.0. Generally, the soil pH will need to be lowered prior to planting to meet this requirement. Some materials for lowering soil pH include sulfur, peat moss, and organic cottonseed meal. Options for sulfur include elemental sulfur and iron sulfate. Both of these products are labeled as 'restricted' according to the Organic Materials Review Institute (OMRI) that means that they are allowed in organic production but are subject to restrictions. Peat moss, which has a pH between 3.0 and 5.0, can also be used to lower the pH of the soil. It is allowable in organic crop production; however, the type used cannot contain a synthetic wetting agent. Organic cottonseed meal is a fertilizer (see table below) that also has a low pH and can be used to decrease the soil pH. It is approved for organic production as long as it is not from GMO cotton and is free from prohibited substances. Peat moss and cottonseed meal can be expensive. With all of these materials, it is best to work closely with your certifying agency before applying them to ensure organic certification is not compromised by their use.

Berry crops grow best in soils with organic matter contents between 2% and 5%. Organic matter acts as a slow release nutrient source. Methods to increase the soil organic matter content include the use of green manures, composts, and raw manures. Green manures are crops that are turned into the soil while they are young and succulent, rather than harvested, to improve the organic matter content. When planting a green manure crop before blueberries, select one that will grow well in soils with a low pH, compatible with blueberry plant requirements. Some options include: crimson clover, buckwheat, cereal rye and spring oats. All of these will grow in soils with a pH of 5.0. Finished compost typically contains 0.5 to 2.5% total nitrogen. Most of the nitrogen is in an organic or slow release form. As a general rule, about 10% of the organic nitrogen in the compost will be available to the plant per year. When using composts, it is best to apply it based on crop needs rather than on a volumetric basis for long-term soil health. When raw manures are used for blueberry production, they must be soil incorporated a minimum of 90 days before harvest. The Fact Sheet, Estimating Manure Application Rates, Penn State Publication CAT UC151, is available through cooperative Extension with detailed calculations for determining application rates for manures.

After Planting

If soil pH needs to be adjusted after planting, sulfur products used prior to planting can be used. Blueberries generally have a relatively high nitrogen requirement followed by potassium. Phosphorus is needed in lesser amounts. Compost and many 'meals' can be used to meet the nutrient requirements of blueberries. The table below contains the percent nitrogen, phosphate and potash as well as relative availability of nutrients in some of these products. Many blended fertilizers and liquid fish products are also available and allowed for organic production. Many of these products can be costly. Also, as with materials applied prior to planting, verify that the formulations you plan on using are allowable with your certifying agency to avoid compromising your organic certification.

Fertilizer Source	% Nitrogen	% Phosphate	% Potash	Relative Availability of Nutrients
Alfalfa Meal	3.0	1.0	2.0	Medium-Slow
Blood Meal	10.0-14.0	1.0-1.5	0.6-0.8	Medium-Fast
Cottonseed Meal	7.0	2.5	1.5	Slow-Medium
Feather Meal	11.0-15.0	0	0	Slow
Fish Meal	10.0	4.0	0	Slow
Soybean Meal	7.0	1.6	2.3	Slow
Compost	Variable*	Variable	Variable	About 10% of nitrogen per year.

* Nutrient levels in compost vary depending on source materials and composting protocols used; therefore, it is recommended that compost be tested to determine the amount of nutrients it contains (kits are available through local county Extension offices).

Table adapted from *Blueberries: Organic Production* (G.L. Keeper, S. Diver, K. Adam, M. Guerin and P. Sullivan, ATTRA, www.attra.ncat.org), *How to Convert an Inorganic Fertilizer Recommendation to an Organic One* (W. McGauran and W. Reeves, University of Georgia Cooperative extension, http://pubs.caes.uga.edu/caespubs/pubcd/C853.htm) and *Organic Soil Amendments and Fertilizers* (D.E. Chaney, L.E Drink water and G.S. Petty grove, UC Sustainable Agriculture Research and Education Program, University of California, Division of Agriculture and Natural Resources, Publication 21505).

(Reprinted from: Vegetable and Small Fruit Gazette, Vol. 8 No. 4, April 2005.)

RASPBERRY FRUIT ROT AND CANE BOTRYTIS

Sonia Schloemann, University of Massachusetts Extension, Amherst

Botrytis fruit infections in raspberry. Illustration from Oregon State University Extension Fact Sheet 947.

Causal Agent: The fungus *Botrytis cinerea*, causes blossom blight, preharvest rot, postharvest rot, and cane infections in raspberries. It overwinters on canes, in dead leaves and as mummified fruit. Spores are produced in spring and begin a new infection cycle. A moist, humid environment is ideal for spore production and spread. All flower parts except sepals are very susceptible to infection by spores that land on flowers although these infections are latent; or dormant, until fruit ripens. In other words, no symptoms are visible at first. Because of this, growers must be aware of when their fields are in a susceptible growth stage and take measures to protect them from infection during that time. Other plant parts, as mentioned above, are also susceptible to infection and can cause cane leaf blights. Wet weather or a lot of overhead irrigation is also necessary for high levels of infection to occur. Therefore, air circulation within the canopy, especially in the fruit zone, is very important. This is accomplished through good pruning practices in the dormant season. If significant wetting periods occur during bloom, the likelihood of infection by Botrytis is very high, and control measures may be needed.

Symptoms: Rotted fruit, usually with tufts of gray fungus growing on surface. Pale brown lesions may appear on primocane leaves in mid- to late summer. Cane infections appear as tan to brown lesions often encompassing more than one node. These lesions can girdle the cane causing eventual cane collapse. Cane lesions exhibit typical concentric "watermark" patterns from fall through late winter.

Cultural control

1. Create an open plant canopy to promote optimal air circulation and drying conditions by using good pruning practices.
2. Avoid excessive nitrogen fertilization that may promote excessive vegetative growth, and control weeds. These practices also improve air circulation, increase light penetration, and speed drying of plant surfaces after irrigation and rain.
3. Pick fruit in the coolest part of the day. Keep harvested fruit in shade while in the field then move to cold storage as soon as possible.
4. Irrigate in early morning whenever possible so plants dry quickly. Switch from overhead to drip/trickle irrigation.

Botrytis cane infections in raspberry. Illustration from Oregon State University Extension Fact Sheet 947.

Chemical control Spray first at 5% bloom and then again 7 - 10 days later. More applications during the growing season aid control in wet weather. Thorough coverage and canopy penetration are essential. Fungicide options may be found in the "2005 Cornell Pest Management Guidelines for Berry Crops".

(Reprinted with some modifications by editor from UMASS Berry Notes, Vol. 17, N0. 7, June 1, 2005)

NUTRIENT ANALYSIS SAMPLING CHEAPER THAN CURE ATTEMPT LATER

Kevin Iungerman, Cornell Cooperative Extension, Ballston Spa, NY

Looking a bit ahead, mid-summer is generally a time of relative nutrient stability in fruit plants; this is the reason the time is chosen to utilize plant tissue analysis (PTA) sampling as a means of providing a snapshot (if you will) of prevailing nutrient levels. Tissue analysis is not meant to stand-alone; it represents but one leg of a three-legged stool, the other two supports being soil testing (ST), and grower attentiveness to plant growth performance. In fact, PTA is accurate only if ST discloses that soil pH is within an acceptable range for the specific fruit crop (5.5 - 7.0 for raspberries and strawberries; 4.0 - 5.0 for blueberries and cranberries; 5.5 for American grapes; 6.5 for vinifera types; [hybrids evaluated on a case-by-case basis]), and valuable if a grower is pursuing an integrated crop production practice -- one where knowledge informs action.

Plant tissue analysis (TA) is usually a better indicator of nutrient status than soil testing (ST). The soil test speaks of possibility. Tissue analysis says how things actually played out. The analysis report is kind of a signed withdrawal slip that specifies what, and to what extent, various mineral elements were taken from the soil bank and actually moved into your crop's account for use. And TA provides a more inclusive picture than ST, as it describes the status of fully 13 essential nutrients normally found in your fruit plant leaves, and then relates these findings to levels that should be expected for that time. Thus, if the assay and the tested values are different, analysis can alert the grower that specific nutrient levels are approaching deficiency, are deficient, or perhaps, if they might be in excess. Think of TA as providing an earnings report describes how your fertilization investment program is performing, and take to heart its suggestions for corrective action (recommendations) so you can maintain your quality-cropping portfolio.

The greatest economic value of TA is in its pre-emptive role: remedy can be applied before growth problems arise or before fertilizer is miss-applied. Testing cost then, is but a fraction of the expenses one could otherwise incur: expenses stemming from reduced crop quality aspects (nutrition, appearance, keeping and handling qualities; business reputation), costs arising from nutrient-stress-induced cold injury, and (or in turn) secondary pathogen and insect predation. Need-based prevention is virtually always cheaper than either a later cure or the attempt!

TA recommendations for strawberries are based on newly expanded leaves that are collected after renovation in late July or early August. For raspberries, select fully expanded primocane leaves in early August. For blueberries, select young leaves exposed to full sun in late July. Collect at least 50 leaves, remove stems, and wash leaves in distilled water. Air dry them, place in a paper bag, and send them to the lab for analysis. With grapes, submit petioles only. (Just the stem of the leaf blade; remove and discard the leaves). A sample size of 60 petioles is recommended.

Generally, any samples taken should be representative of the entire field. However, if there is a particular area that appears to be doing poorly, or there is a repetitive random pattern of individual plants with similar symptoms of malaise, these respective anomalies should be sampled separately. In the latter instance, it may also be wise to conduct a nematode analysis just beyond the affected areas, that is, on the periphery where healthy plants border the affected bushes. It is also good to sample separately areas that you are aware are fertilized differently, or which have dramatically different soil profiles, or slopes. A plant tissue analysis (leaf or petiole), including nitrogen, costs $28.

Coordinating regular assessment of soil pH and nutrient levels and plant foliar nutrients is the surest way to maintain superior crop quality and optimum acclimation and survival. Test soil pH annually, submit foliar tissue samples for analysis every other year, and carry out a complete soil test every third year. Testing results are usually returned within 2 - 3 weeks, which allows time for possible foliar sprays yet this season, or allows you to plan fertilizer orders for fall incorporation (generally the best time for nutrients other than nitrogen). Aside from testing, it is always desirable to note unusual growth patterns, leaf appearances, and unexplained reductions in yield and the environmental conditions encompassing the period of changed condition.

Foliar and petiole TA and soil test kits are available through your CCE office in your County of residence. You will soon be able to directly obtain sampling kits from Cornell's Nutrient Analysis Lab (CNAL) in Ithaca. Their website is at <http://www.css.cornell.edu/soiltest/newindex.asp>. Presently, phone, FAX, and email are your operational choices [Phone: 607-255-4540 Fax: 607-255-7656, soiltest-mailbox@cornell.edu].

(**Reprinted from**: Northeast Fruitlet, Vol. 9, No. 5, June 2005)

A KEY TO SUCCESSFUL MARKETING STRATEGIES – AND WE ALL HAVE IT!

Judith A. Barry, Extension Associate, Department of Applied Economics and Management, Cornell University

Here is a riddle. Within it contains one of the secrets to successful marketing strategies. When you are born, you have lots of it. As you get older, it seems that you use it at a more rapid rate. Some people are good at keeping it; others are definitely not. Whether you are a good marketer or a bad marketer, you are likely to claim you never have enough of it.

What is it that I am talking about? The answer of course is ***time***. Successful marketing strategies require wise use of time.

Every commercial farmer is both a producer and marketer. Whether you are selling your vegetables at a farmers' market or your milk to a dairy cooperative, your product must be marketed off the farm. How important it is to have detailed-planned marketing strategies will vary from farm to farm, but as every farmer knows, to produce and successfully market a product requires smart use of time. Here are some points to help you question your use of time and assess whether you are getting as much as you can out of your marketing strategy:

- **Time costs money**. As one of the most costly inputs into any business, the value of time is often underestimated and incorrectly predicted in a business plan. Whether the owner is paying him/herself or an employee, the business should be delivering adequate returns on time invested. If it is not, is the use of time being distributed in the correct areas of your business?

- **Assess your skills**. Successful marketers do not have more time than unsuccessful marketers, but the use of their time may be managed in a more effective and efficient way. Every person on this earth has his or her unique set of skills and personalities. Some extrovert personalities are great at facing people all day long and actually feel that by doing so, it charges their batteries. Introvert personalities, in contrast, are sapped of energy when they are with people all day but are energized when they are working on more solitary jobs. We all have skills and different personalities. Identifying those skills and the skills of others in the business can utilize people more efficiently and help give the highest return on time investment. Brainstorming and sharing ideas with family and co-workers will probably confirm what is already known, but may also help to recognize how the skill sets within the business can be better applied to operations.

- **Come in the middleman**! Recognizing the use of external people and their individual skills in your business may save money and time in the long run. Delegating tasks and concentrating on areas of competency may achieve a higher return on business time invested.

- **"Time costs money, but my time is free".** Families in farm businesses frequently misconstrue this concept as it shies away from the real costs of doing business. It becomes a problem when the person with the "free" time is incapable of working (illness, injury) causing costs to be incurred to pay someone else to do the job and bringing in some very real costs to the bottom line. People's time is the essence of successful marketing and should not be undervalued when calculating profitability. It is important to remember, of course, some return on time invested might not have a $ value. Lifestyle factors do not have a price tag but can certainly provide a positive return on time invested.

- **Where can I get more time?** It is probably safe to say that everyone needs more time. Food and product quality is increasingly in demand. However, quality production typically commands more time and energy. Many producers find that after producing the finest quality, they have insufficient time to actually get the product from farm to the consumer. Successfully marketing a quality product to the consumer is, no doubt, an extremely time consuming task. Strategic planning is a useful tool that can help allocate time and people to implement a marketing plan. Doing this establishes the feasibility of the marketing task with the skills and resources available. Producing and marketing a product to meet the demands of the consumer need to go hand in hand, but if there is not the time or resources to achieve both, the strategy may not be profitable.

All of this said, we all have 24 hours in a day. Some sleep less, some eat for less, but to be a producer, ***AND*** a marketer it is necessary to make "Smart" use of your time to succeed in managing your smart marketing strategies.

(Reprinted from: Smart Marketing, April 2005. **"Smart Marketing**" is a monthly marketing newsletter for extension publication in local newsletters and for placement in local media. It reviews the elements critical to successful marketing in the food and agricultural industry. Articles are written by faculty members in the Department of Applied Economics and Management at Cornell University.)

STRAWBERRY DISEASE FAST FACTS

Cathy Heidenreich, Department of Plant Pathology, NYSAES Cornell University, Geneva

Most growers are aware of potential disease problems in their fruit plantings, based on prior disease history and current/projected weather conditions. However, a brief review is always beneficial. Links are provided if you want more details.

FOLIAR DISEASES: Powdery Mildew

What: fungal disease caused by *Sphaerotheca macularis*.

When: Powdery mildew occurs sporadically during the growing season, when disease conditions are favorable for infection.

Where: Leaf distortion and discoloration are usually the first signs of powdery mildew infection. Powdery patches of white mycelium develop primarily on lower leaf surfaces. Patches may enlarge and coalesce to cover the entire lower leaf surface. Leaf edges often roll upwards, giving a clear view of the powdery white fungal growth below. Purple to reddish blotches may also appear on lower leaf surfaces. Infected flowers are covered with white powdery mycelium, and may be distorted or killed, depending on infection severity. Fruit set may be reduced as infections cause reduced pollen production and/or low pollen retention. If green fruit are infected, they remain hard and fail to ripen. Fruit may also develop purple blotches similar to those on leaves. Infected areas of ripe fruit are often described as "seedy" in appearance as the smaller seeds in infected areas appear raised from the fruit surface. Infected ripe fruit are soft and pulpy, and may become covered with profuse white mycelia.

How: *S. macularis* overwinters on living, infected leaves. When conditions are favorable, the fungus resumes production of chains of dry, hyaline spores. Conidia are wind disseminated to newly emerging flowers and foliage. Cleistothecia are produced under conditions of cool temperature, short day length, and high humidity. Ascospores are produced by cleistothecia; however, these spores do not appear to play a major role in disease intensification or initiation.

Unlike other fungal pathogens, disease development is inhibited by wet, rainy conditions. Infection and spread of *S. macularis* is favored by moderate to high relative humidities and temperatures between 60 and 80 ^{o}F (15-27 ^{o}C).

What to do:

- Good cultural practices may help to lessen the chance of establishment and spread of powdery mildew.
- Select planting sites with care, avoiding areas with poor air drainage.
- Good nutrition is key; avoid excess nitrogen application.
- Planting of less susceptible varieties is also suggested. Strawberry cultivars show a wide variety of resistance to powdery mildew, with many commercial cultivars being highly resistant to infection **(See Appendix of Strawberry Disease Resistance)**.
- It is believed that contaminated transplants are often the primary means of disease initiation in a growing area. Purchase only certified plants from a reputable nursery. Standard nursery practice is to remove leaves from transplants during harvest and packing; this practice lessens the chance of disease introduction, however, inoculum may still be present in crowns.
- Scouting is essential to good powdery mildew control; fungicide applications should begin at the first sign of disease.
- Applications of systemic and protectant fungicides during the growing season will protect fruit and flowers, as well as reduce overwintering inoculum. In areas with a history of the disease, fall control of powdery mildew can greatly reduce both repeat leaf infections and possible flower and fruit infections the following spring.
- Thoroughly cover all above ground plant parts with spray, especially undersides of leaves.

Fore more information: 2005 Pest Management Guidelines for Berry Crops

Powdery mildew on leaf tips	conidia chains	cleistothecia on the lower leaf surface
		

Check out the NYSAES Tree Fruit and Berry Pathology web site at:
www.nysaes.cornell.edu/pp/extension/tfabp

Questions or Comments about the New York Berry News?

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WEATHER REPORTS OF TEMPERATURES AND PRECIPITATION THROUGHOUT NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am, May 15th, 2005

	Temperature				Growing Degree Days (*Base 50*)			Precipitation (*inches*)			
	High	*Low*	*Avg*	*DFN*[1]	*Week*	*YTD*[2]	*DFN*	*Week*	*DFN*	*YTD*	*DFN*
Hudson Valley											
Albany	83	30	59	3	68	179	60	0.33	-0.44	2.78	-1.80
Glens Falls	84	24	56	2	52	102	14	0.21	-0.61	5.03	0.35
Poughkeepsie	84	35	59	2	65	166	19	0.09	-0.89	4.12	-1.46
Mohawk Valley											
Utica	83	28	58	4	68	139	31	0.16	-0.64	5.55	0.27
Champlain Valley											
Plattsburgh	80	30	52	-3	28	78	-11	0.40	-0.23	5.39	1.24
St. Lawrence Valley											
Canton	84	25	52	-2	32	65	-10	0.58	-0.05	3.77	-0.49
Massena	85	26	53	-2	35	77	-9	0.42	-0.14	5.11	1.26
Great Lakes											
Buffalo	81	36	58	3	64	145	35	0.37	-0.33	4.86	0.52
Colden	82	32	56	4	48	90	14	0.60	-0.17	5.01	-0.46
Niagara Falls	83	36	58	3	66	137	16	0.26	-0.37	4.48	-0.08
Rochester	84	31	57	2	61	126	-1	0.69	0.11	4.85	0.97
Watertown	84	22	54	2	44	82	4	0.74	0.15	6.04	2.28
Central Lakes											
Dansville	88	28	56	2	53	111	-3	0.30	-0.33	3.88	-0.28
Geneva	84	28	55	1	52	116	11	0.39	-0.24	5.84	1.55
Honeoye	88	26	56	2	59	112	4	0.75	0.14	5.38	1.10
Ithaca	82	27	55	2	51	100	11	0.26	-0.45	5.09	0.67
Penn Yan	85	27	57	3	67	146	41	0.11	-0.52	5.21	0.92
Syracuse	85	30	59	4	73	169	44	0.18	-0.52	5.99	1.10
Warsaw	81	30	54	3	44	80	15	0.45	-0.32	5.76	0.74
Western Plateau											
Alfred	83	29	56	3	51	92	15	0.42	-0.30	4.66	0.04
Elmira	83	25	57	3	61	130	32	0.14	-0.56	4.16	0.00
Franklinville	83	26	53	4	38	58	9	0.35	-0.42	5.10	0.17
Sinclairville	82	34	56	5	50	93	26	0.70	-0.14	4.93	-0.71
Eastern Plateau											
Binghamton	81	29	58	4	66	140	47	0.30	-0.47	4.72	-0.01
Cobleskill	82	29	54	1	46	86	5	0.13	-0.66	4.03	-0.93
Morrisville	77	30	55	2	48	89	14	0.30	-0.53	5.47	0.67
Norwich	85	27	55	2	49	87	2	0.16	-0.68	4.66	-0.48
Oneonta	87	32	57	6	54	107	35	0.30	-0.68	5.33	-0.20
Coastal											
Bridgehampton	67	38	54	-2	27	82	-7	0.00	-0.85	6.02	0.16
New York	70	46	59	-3	62	254	30	0.00	-0.86	4.91	-0.78

1. *D*eparture *F*rom *N*ormal
2. *Y*ear *T*o *D*ate: Season accumulations are for April 1st to date

The information contained in these weekly releases are obtained from the New York Agricultural Statistics Service (http://www.nass.usda.gov/ny/), who in turn obtains information from reports from Cornell Cooperative Extension agents, USDA Farm Service Agency, Agricultural Weather Information Service Inc., the National Weather Service and other knowledgeable persons associated with New York agriculture.

WEATHER REPORTS OF TEMPERATURES AND PRECIPITATION THROUGHOUT NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am, May 22nd, 2005

	Temperature				Growing Degree Days (*Base 50*)			Precipitation (*inches*)			
	High	***Low***	***Avg***	***DFN*[1]**	***Week***	***YTD*[2]**	***DFN***	***Week***	***DFN***	***YTD***	***DFN***
Hudson Valley											
Albany	73	38	55	-4	39	218	37	0.30	-0.47	3.08	-2.27
Glens Falls	69	32	52	-6	20	122	-1	0.27	-0.57	5.30	-0.22
Poughkeepsie	73	39	57	-4	50	216	1	0.31	-0.67	4.43	-2.13
Mohawk Valley											
Utica	69	34	52	-6	21	160	-1	0.34	-0.50	5.89	-0.23
Champlain Valley											
Plattsburgh	68	33	52	-6	17	95	-44	0.49	-0.14	5.88	1.10
St. Lawrence Valley											
Canton	69	32	51	-5	12	77	-41	0.00	-0.67	3.77	-1.16
Massena	69	31	51	-6	16	93	-41	0.00	-0.56	5.11	0.70
Great Lakes											
Buffalo	69	36	52	-7	25	170	3	0.00	-0.70	4.86	-0.18
Colden	68	33	51	-5	17	107	-13	0.05	-0.75	5.06	-1.21
Niagara Falls	73	36	53	-6	30	167	-14	0.01	-0.63	4.49	-0.71
Rochester	67	35	51	-8	18	144	-43	0.09	-0.54	4.94	0.43
Watertown	71	35	51	-5	16	98	-24	0.00	-0.63	6.04	1.65
Central Lakes											
Dansville	75	33	52	-6	27	138	-33	0.12	-0.51	4.00	-0.79
Geneva	69	37	53	-5	27	143	-17	0.05	-0.62	5.89	0.93
Honeoye	71	33	51	-7	21	133	-31	0.00	-0.63	5.38	0.47
Ithaca	70	31	50	-7	20	120	-17	0.04	-0.73	5.13	-0.06
Penn Yan	69	36	52	-5	27	173	13	0.08	-0.59	5.29	0.33
Syracuse	71	38	53	-6	28	197	10	0.04	-0.69	6.03	0.41
Warsaw	65	33	49	-6	11	91	-13	0.05	-0.72	5.81	0.02
Western Plateau											
Alfred	68	32	50	-6	16	108	-14	0.16	-0.61	4.82	-0.57
Elmira	72	28	51	-7	23	153	2	0.04	0.68	4.20	-0.68
Franklinville	69	29	48	-6	7	65	-16	0.03	-0.75	5.13	-0.58
Sinclairville	69	32	50	-5	17	110	4	0.05	-0.85	4.98	-1.56
Eastern Plateau											
Binghamton	69	38	52	-6	22	162	18	0.04	-0.73	4.76	-0.74
Cobleskill	69	36	52	-6	17	103	-24	0.39	-0.45	4.42	-1.38
Morrisville	69	32	51	-5	14	102	-17	0.16	-0.68	5.63	-0.01
Norwich	75	33	51	-6	19	106	-25	0.07	-0.77	4.73	-1.25
Oneonta	74	32	54	-2	31	138	2	0.08	-0.90	5.41	-1.10
Coastal											
Bridgehampton	72	44	56	-3	41	123	-18	0.08	-0.76	6.10	-0.60
New York	78	49	61	-3	77	331	16	0.22	-0.62	5.13	-1.40

1. *D*eparture *F*rom *N*ormal
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WEATHER REPORTS OF TEMPERATURES AND PRECIPITATION THROUGHOUT NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am, May 29th, 2005

	Temperature				Growing Degree Days (*Base 50*)			Precipitation (*inches*)			
	High	***Low***	***Avg***	***DFN*[1]**	***Week***	***YTD*[2]**	***DFN***	***Week***	***DFN***	***YTD***	***DFN***
Hudson Valley											
Albany	76	47	56	-6	41	259	1	0.79	-0.02	3.87	-2.29
Glens Falls	76	40	54	-5	33	155	-47	0.72	-0.12	6.02	-0.34
Poughkeepsie	76	46	56	-7	41	257	-40	1.16	0.18	5.59	-1.95
Mohawk Valley											
Utica	72	44	54	-6	34	194	-34	0.41	-0.44	6.30	-0.67
Champlain Valley											
Plattsburgh	69	46	54	-6	30	125	-79	0.79	0.10	6.67	1.20
St. Lawrence Valley											
Canton	73	38	54	-5	31	108	-65	0.11	-0.59	3.88	-1.75
Massena	74	38	53	-6	26	119	-75	0.35	-0.24	5.46	0.46
Great Lakes											
Buffalo	75	44	56	-4	45	215	-23	0.15	-0.60	5.01	-0.78
Colden	73	42	54	-4	31	138	-37	0.49	-0.36	5.55	-1.57
Niagara Falls	77	45	57	-4	53	220	-34	0.30	-0.40	4.79	-1.11
Rochester	72	45	54	-7	31	175	-84	0.39	-0.24	5.33	0.19
Watertown	71	43	55	-3	39	137	-40	0.08	-0.55	6.12	1.10
Central Lakes											
Dansville	75	41	53	-7	28	166	-75	0.38	-0.33	4.38	-1.12
Geneva	71	44	55	-5	37	180	-48	0.53	-0.20	6.42	0.73
Honeoye	73	40	54	-7	30	163	-71	0.29	-0.39	5.67	0.08
Ithaca	70	41	53	-6	24	143	-55	0.82	0.03	5.95	-0.03
Penn Yan	72	43	54	-6	33	206	-22	0.20	-0.53	5.49	-0.20
Syracuse	73	47	57	-4	52	249	-12	0.33	-0.44	6.36	-0.03
Warsaw	69	37	51	-6	26	117	-39	0.54	-0.31	6.35	-0.29
Western Plateau											
Alfred	73	42	53	-5	26	134	-45	0.57	-0.29	5.39	-0.86
Elmira	75	41	54	-6	32	185	-32	0.64	-0.13	4.84	-0.81
Franklinville	73	37	52	-4	19	84	-40	0.32	-0.53	5.45	-1.11
Sinclairville	73	42	54	-3	33	143	-13	0.58	-0.36	5.56	-1.92
Eastern Plateau											
Binghamton	71	43	53	-7	28	190	-18	0.33	-0.44	5.09	-1.18
Cobleskill	73	43	52	-7	25	128	-57	1.65	0.77	6.07	-0.61
Morrisville	70	43	53	-6	26	128	-46	0.59	-0.31	6.22	-0.32
Norwich	76	43	55	-4	37	143	-47	0.48	-0.40	5.21	-1.65
Oneonta	73	36	53	-5	28	166	0	0.90	-0.08	6.31	-1.18
Coastal											
Bridgehampton	76	42	54	-6	34	157	-49	1.86	1.02	7.96	0.42
New York	79	48	59	-7	66	397	-23	0.43	-0.41	5.56	-1.81

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WEATHER REPORTS OF TEMPERATURES AND PRECIPITATION THROUGHOUT NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am, June 6th, 2005

	Temperature				Growing Degree Days (*Base 50*)			Precipitation (*inches*)			
	High	***Low***	***Avg***	***DFN*[1]**	***Week***	***YTD*[2]**	***DFN***	***Week***	***DFN***	***YTD***	***DFN***
Hudson Valley											
Albany	86	46	66	4	116	375	26	0.00	-0.84	3.87	-3.13
Glens Falls	86	39	63	2	92	247	-33	0.18	-0.60	6.20	-0.94
Poughkeepsie	83	47	64	0	100	357	-37	0.93	-0.01	6.52	-1.96
Mohawk Valley											
Utica	83	43	64	3	100	294	-14	0.00	-0.91	6.30	-1.58
Champlain Valley											
Plattsburgh	84	47	64	3	97	222	-61	0.53	-0.17	7.20	1.03
St. Lawrence Valley											
Canton	84	45	65	6	109	217	-25	0.03	-0.70	3.91	-2.45
Massena	84	44	65	5	105	224	-43	0.00	-0.66	5.46	-0.20
Great Lakes											
Buffalo	83	48	64	3	100	315	-9	0.03	-0.79	5.04	-1.57
Colden	79	44	61	2	80	218	-24	0.27	-0.66	5.82	-2.23
Niagara Falls	81	46	64	3	101	321	-20	0.12	-0.64	4.91	-1.75
Rochester	77	44	62	1	89	264	-78	0.09	-0.60	5.42	-0.41
Watertown	80	43	61	3	81	218	-26	0.00	-0.65	6.12	0.45
Central Lakes											
Dansville	82	44	63	1	90	256	-69	0.07	-0.75	4.45	-1.87
Geneva	82	46	64	3	100	280	-30	0.18	-0.62	6.60	0.11
Honeoye	82	42	63	0	90	253	-66	0.13	-0.67	5.80	-0.59
Ithaca	80	41	62	2	86	229	-43	0.12	-0.72	6.07	-0.75
Penn Yan	82	48	64	3	101	307	-3	0.06	-0.74	5.55	-0.94
Syracuse	83	48	65	4	109	358	12	0.00	-0.81	6.36	-0.84
Warsaw	76	46	60	2	74	191	-27	0.04	-0.90	6.39	-1.19
Western Plateau											
Alfred	79	42	61	2	75	209	-39	0.37	-0.58	5.76	-1.44
Elmira	80	37	60	-2	72	257	-39	0.28	-0.56	5.12	-1.37
Franklinville	79	39	59	2	61	145	-34	0.17	-0.77	5.62	-1.88
Sinclairville	78	43	60	2	76	219	-1	0.34	-0.67	5.90	-2.59
Eastern Plateau											
Binghamton	76	45	62	2	85	275	-9	0.19	-0.63	5.28	-1.81
Cobleskill	83	43	63	3	90	218	-38	0.13	-0.83	6.20	-1.44
Morrisville	79	43	62	3	85	213	-27	0.00	-0.91	6.22	-1.23
Norwich	84	40	62	3	86	229	-31	0.11	-0.81	5.32	-2.46
Oneonta	84	41	63	5	91	257	27	0.34	-0.66	6.65	-1.84
Coastal											
Bridgehampton	78	48	62	0	83	240	-48	0.29	-0.58	8.25	-0.16
New York	84	53	67	-1	120	517	-24	0.29	-0.55	5.85	-2.36

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WEATHER REPORTS OF TEMPERATURES AND PRECIPITATION THROUGHOUT NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am, June 13th, 2005

	Temperature				Growing Degree Days (*Base 50*)			Precipitation (*inches*)			
	High	***Low***	***Avg***	***DFN*[1]**	***Week***	***YTD*[2]**	***DFN***	***Week***	***DFN***	***YTD***	***DFN***
Hudson Valley											
Albany	91	59	78	13	199	574	119	0.61	-0.26	4.48	-3.39
Glens Falls	89	50	74	11	168	415	43	0.41	-0.36	6.61	-1.30
Poughkeepsie	93	60	78	13	198	555	52	1.24	0.33	7.76	-1.63
Mohawk Valley											
Utica	92	57	76	13	185	479	78	0.97	0.01	7.27	-1.57
Champlain Valley											
Plattsburgh	88	51	71	8	151	373	-5	0.23	-0.49	7.43	0.54
St. Lawrence Valley											
Canton	90	54	74	13	168	385	62	0.02	-0.75	3.93	-3.20
Massena	90	53	73	12	165	389	35	0.23	-0.47	5.69	-0.67
Great Lakes											
Buffalo	90	62	77	13	188	503	79	2.28	1.44	7.32	-0.13
Colden	88	60	75	14	173	391	69	1.64	0.66	7.46	-1.57
Niagara Falls	91	63	78	15	199	520	78	0.41	-0.40	5.32	-2.15
Rochester	91	61	77	14	189	453	16	0.90	0.20	6.32	-0.21
Watertown	90	52	74	13	169	387	64	0.20	-0.50	6.32	-0.05
Central Lakes											
Dansville	93	60	76	13	186	445	22	1.03	0.12	5.48	-1.75
Geneva	96	60	78	15	194	474	69	1.11	0.24	7.71	0.35
Honeoye	92	54	75	12	179	432	14	1.49	0.62	7.29	0.03
Ithaca	91	57	76	14	182	411	51	0.86	-0.02	6.93	-0.77
Penn Yan	93	61	77	14	192	499	94	0.82	-0.05	6.37	-0.99
Syracuse	94	60	79	16	204	562	119	0.44	-0.42	6.80	-1.26
Warsaw	86	64	75	15	174	365	73	0.53	-0.47	6.92	-1.66
Western Plateau		au									
Alfred	89	58	74	13	171	380	51	1.52	0.47	7.28	-0.97
Elmira	90	53	74	12	169	426	38	2.64	1.77	7.76	0.40
Franklinville	89	53	73	14	159	304	59	2.01	1.02	7.63	-0.86
Sinclairville	87	60	74	14	172	391	96	1.46	0.40	7.36	-2.19
Eastern Plateau											
Binghamton	89	61	75	13	176	451	78	1.38	0.54	6.66	-1.27
Cobleskill	90	56	75	14	174	392	53	0.15	-0.83	6.35	-2.27
Morrisville	87	56	73	13	164	377	60	0.58	-0.40	6.80	-1.63
Norwich	92	55	74	13	171	400	59	0.55	-0.43	5.87	-2.89
Oneonta	92	60	76	16	179	436	130	0.60	-0.38	7.25	-2.22
Coastal											
Bridgehampton	90	58	71	8	146	386	2	0.00	-0.87	8.25	-1.03
New York	92	66	79	10	204	721	44	0.70	-0.11	6.55	-2.47

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