



The New York Berry News

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What's Inside

1. Calendar of Events
2. Current News
 - a. Guthion Changes Label
 - b. New Organic Farming Website
 - c. Fruit Chemical Use Survey
3. Fall Weed Management for Strawberries - *Courtney Weber*
4. Fall Weed Management for Brambles - *Courtney Weber*
5. Fall Weed Management for Blueberry - *Caleb Torrice*
6. Phytophthora Root Diseases of Berry Crops - *Michael Celetti*
7. Transition to Organic Highbush Blueberry Production - *Bill Sciarappa, Gary Pavlis, Nicholi Vorsa*
8. Growing Winter Raspberries in a Greenhouse - *Marvin P. Pritts*
9. Fall Bearing Red Raspberry Production in Maryland Tunnels - *Bryan Butler and David Lankford*
10. NY Weather Reports

The berry season is drawing to an end. Fall bearing raspberries and day-neutral strawberries are what remains to be harvested in what could be considered an exceptionally wet season. The updates that follow briefly discuss some the pests you should expect to encounter. A more detailed article focusing on Phytophthora root rots, a persistent threat to growers, is included as we approach the time of year where treatment is necessary in problem or potential problem plantings.

In most other small fruit plantings, growers should be preparing for their fall herbicide applications and, in this issue of the NYBN, several articles are provided that cover this topic in detail.

In addition, I have gathered articles discussing organic blueberry production and greenhouse/high tunnel production of raspberries. These represent marketing options small fruit growers have to, perhaps, increase profits. These are not options that are easily implemented in a single season, but represent a change or an addition to your current practices.

Calendar of Upcoming Events:

November 12-13, 2003: *National Blueberry Conference and Exposition*, Grand Rapids, MI. Please direct questions to MBG Marketing at 269-434-6791 or visit expo@blueberries.com for more information.

December 16-18, 2003: *New England Vegetable and Berry Conference*, Holiday Inn, Manchester, New Hampshire. Joint meeting with the New England Fruit Growers. For information please call 603-625-1000 or visit <http://www.nevbc.org/>.

November 8-11, 2003: *Southeast Strawberry Expo*, Sheraton Imperial Hotel, Research Triangle Park, NC. For more information contact the North Carolina Strawberry Association at 919-542-3687 or visit <http://www.ncstrawberry.com>.

January 21-23, 2004: *Ohio Fruit and Vegetable Conference*, Toledo SeaGate Convention Center and Radisson Hotel in Toledo, Ohio. Please visit <http://www.ohiofruit.org/> for more information.

February 9-12, 2004: *NY State Berry Growers Association Annual Meeting*, Riverside Convention Center in Rochester, N.Y. First combined show of the New York State Vegetable Growers Association (NYSVGA), the New York Horticultural Society (NYHS), the New York State Berry Growers Association and the Empire State Potato Growers. For information, contact Jeff or Lindy Kubecka at 315-687-5734.

February 23-25, 2004: *North American Strawberry Growers Association Annual Meeting*, Hilton Westshore, Tampa Bay, FL. For more information Contact Patricia E. Heuser at 814-238-3364. Email: info@nasga.org.

— Raspberry —

All bearing raspberries are winding down. The wet weather we've been experiencing all season long has spurred quite a bit of gray mold activity. Switch, Elevate and Rovral are labeled on raspberry and can be used to reduce spread of the disease on fruit. Late leaf rust continues to be a problem on some varieties. Nova 40W is the most effective fungicide labeled against rust. Applications at this time of year target the second spore stage, i.e., secondary spread from initial infections originating from within yours or neighboring plantings. Thus, mid-September applications should be limited to periods when conditions favor disease development *only* in plantings where the disease is present.

You may also be noticing raspberry leaf spot on both your summer bearing and fall bearing raspberries. This disease can cause extensive defoliation in severe cases. Nova 40W is labeled for raspberry leaf spot as well and can be applied to fall bearing raspberries at the same time you would apply it for control of late leaf rust (if necessary).

This is also the time of year when you should begin to prune out spent floricanes and diseased primocanes / floricanes; I have already seen quite a bit of spur blight this year. Diseased canes should be pruned out and burned or destroyed. If prunings are left near a planting they can re-infect the planting again next season.

Tarnished plant bug continues to represent a threat on fall bearing raspberries, as are cane borer and picnic beetles. Also keep an eye out for symptoms of feeding by potato leafhopper. The greenish adult hoppers inject toxins into leaves as they feed, sometimes causing leaves to curl and to reduce shoot growth. The adult raspberry crown borer makes its appearance in late July and August. 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 may help reduce crown borer populations. Note that no insecticides are currently registered in New York for control of crown borer. In late August or early September keep an eye out for injury on canes originating from egg laying activity of tree crickets. The female inserts eggs in canes, leaving long rows of punctures that can weaken the cane.

— Strawberry —

Unless you are growing day-neutral strawberries, you should be keeping an eye on your foliage. This is normally the time of year when you would notice infections from leaf blight, leaf spot, and leaf scorch, particularly in older plantings. You may also be noticing powdery mildew and angular leaf spot, although they don't seem to be as prevalent this year as they were last year. As the autumn rains approach, keep an eye on these diseases, as they can move thorough a planting fairly quickly if conditions turn wet. Nova 40W is labeled for control of leaf blight, leaf spot and powdery mildew on strawberry. An application may be necessary if conditions favor their development.

In fields where red stele is a problem, it is getting close to the time where Ridomil Gold or Aliette should be applied. In this month's edition of the NYBN, Mike Celetti of the University of Guelph will discuss managing *Phytophthora* diseases in berries.

For those growers with day-neutral strawberries, they should be concerned about tarnished plant bug, sap beetle, and picnic beetles. Day-neutrals should be fruiting up until the first frost.

— Blueberry —

Blueberry plants infected with blueberry stunt will be showing symptoms about now. This is an important disease of blueberry in the Northeast, particularly in New Jersey. However, I have yet to run into a confirmed case of the disease in NY. The disease is caused by a phytoplasma (similar to a virus) and is vectored only by the blueberry sharp-nosed leafhopper, *Scaphytopius magdalenis*. Agdia Inc. offers a diagnostic test for this disease, although it is nearly \$300/ sample because of the complexity of the procedure. If you suspect other problems, such as blueberry mosaic virus, blueberry scorch virus (no confirmed cases in NY), blueberry shock virus, or blueberry shoestring virus, this is a good time of year to test for these (the price is more reasonable for these tests). Apparently, this is not the time of year to test for tomato ringspot virus. Please visit <http://www.nysaes.cornell.edu/pp/extension/tfabp/extpres.shtml> or review NYBN Vol 1, No. 5 for pictures and more information.

Lastly, we should be thinking about reapplying for a section 18 for Indar and/or Topsin-M for 2004. Part of the application process requires documentation that the products were used or, if they were not used, an explanation of why they were not other than that products were perceived as ineffective. New York growers who used any of these products should contact Bill Turechek directly (wwt3@cornell.edu or 315-787-2474) or via their local CCE representative (be sure to tell them to contact me) to report their usage and their desire to resubmit an application for 2004.

Current News & Events:

Guthion Changes Label

In the continued phase-out of Guthion (azinphos-methyl), the Environmental Protection Agency (EPA) has approved a new label for the product effective Aug. 21. The new label contains changes in crop uses as follows: Guthion is no longer available for use on alfalfa, beans, birdsfoot trefoil, broccoli, cabbage, cauliflower, celery, citrus, clover, cucumbers, eggplant, filberts, grapes, melons, onions, pecans, peppers, plums and dried prunes, quince, spinach, **strawberries** and tomatoes. Guthion remains until 2005 for **caneberries**, cotton, cranberries, nectarines, peaches, potatoes and southern pines seed orchards. Guthion remains for almonds, apples and crabapples, **blueberries**, brussels sprouts, cherries, nursery stock, parsley, pears, pistachios and walnuts.

With this action, Guthion Solupak will be the only formulation supported by Bayer CropScience. All crop uses formerly on Guthion 2L exclusively have been transferred over to the Guthion Solupak label. In addition to spray drift language changes, the newly approved label reflects previously agreed upon changes in buffer zones, use in u-pick situations, lower use rates, etc. Review the new label for specifications about particular usage patterns.

Organic Farming Website Launched

The Organic Farming Research Foundation has announced an exciting new resource on organic agriculture: OrganicAgInfo (<http://www.organicaginfo.org>). OrganicAgInfo is an on-line database of research reports, farmer-to-farmer information, outreach publications, and more. The database can be searched by keywords, region, crop or livestock type. All information on this website can be accessed free of charge. Best of all, if you have information on organic agriculture that you think would be useful to others, you can upload it to the site yourself. To add your (or your organization's) work to the web site, please click where it says "We encourage submissions to the site" on the home page. You will need to create a user name and password during your initial visit. Any information submitted on-line will be reviewed by their reviewers before being posted. This unique feature will allow the information in the database to grow through participation of the community it serves. Those using the site also can rate and comment on information already posted on the site.

OrganicAgInfo is hosted by North Carolina State University and was funded the Scientific Congress on Organic Agricultural Research (SCOAR) and the Organic Agricultural Consortium (OAC) from the Initiative for Future Agriculture and Food Systems (IFAFS) through the USDA-CSREES. (*Source: Vegetable Notes, Vol. 14, No. 13, August 14, 2003 via Berry Notes Aug. 19, 2003, Vol. 15, No. 15*)

Fruit Chemical Use Survey to be Conducted

To gather reliable, objective information about fertilizers and pesticides used on fruit crops, the USDA's National Agricultural Statistics Service (NASS) will survey fruit growers in 12 states this Fall, including New York. Information gathered from growers will be used to set state and national estimates of producers' use of fertilizers and pesticides on 24 fruit crops. Because of the unique issues and challenges facing today's fruit growers, participation in this survey is vital. Only by contacting growers directly can NASS compile and publish the most reliable statistics possible. These statistics will give growers an opportunity to tell how they use agricultural chemicals responsibly to produce a safe and abundant food supply for America and the world.

Survey results are official USDA estimates that help to clarify the facts about chemical use in agriculture. This information is used in the decision-making process for the Food Quality Protection Act (FQPA) which has an impact on pesticide registrations, re-registrations, and product alternatives. A local interviewer will contact New York fruit growers beginning in October to gather information on fruit crops such as fertilizers and pesticides used, acres treated, and rates applied. "We safeguard the confidentiality of all survey responses," said Steve Ropel, New York State Statistician. "Data

about individual operations are used only in conjunction with information from other growers. By law, we cannot disclose any data about an individual operation."

NASS will publish the resulting state and national estimates of fruit growers' use of agricultural chemicals in July 2004. The Fruit Chemical Usage report will contain information on product applied, percent of acres covered, rate per application, rate per crop year, and total amount applied for the States surveyed. All agricultural statistics published by NASS are available at www.usda.gov/nass/.

Fall Weed Management for Strawberries

Courtney Weber, Dept. of Horticultural Science, Cornell University, Geneva, NY

Weed control in strawberries continues to be one of the biggest challenges to growing strawberries in the matted row system in this region. At this time of the year, hand weeding and hoeing is needed to keep hot spots under control until late fall or winter application of herbicide and straw.

Gramoxone can be used now while weeds are actively growing with shielded sprayers for burn down of annuals between rows but will not generally control perennial weeds. Be careful with this one, as it is as toxic to people as it is to plants. Oxalis, quack grass, bindweed, pigweed, and purslane can all be a problem after renovation and can grow and produce seed well into November. Winter annuals such as chickweed and shepherds purse can also cause problems and wheat or rye seed from the straw mulch may need control.

Fall herbicide applications should wait until the strawberry plants are dormant. This generally means several hard freezes and consistently low temperatures. Herbicide options in the fall include 2,4-D, Devrinol, and Sinbar and all are applied to dormant fields. 2,4-D helps cleanup broadleaf perennials but must not be applied too early as strawberry is a broadleaf perennial and will die if this herbicide is actively taken up.

Devrinol is a good preemergent herbicide and can be applied under the straw for spring weed control. The straw protects this herbicide from being neutralized by sunlight. Sinbar is also an effective preemergent herbicide that can be applied under the straw but is not as persistent and is best applied in the spring after straw removal while plants are still dormant. It needs to be washed into the soil and off the strawberry plants and you must be aware that many strawberry varieties are sensitive to Sinbar.

Knowing your straw supplier is a good way to ensure weed seed free straw, which eliminates many weed problems. Straw mulch application serves multiple purposes including winter/cold protection, weed control, and keeping berries off the ground. Straw should be applied in very late fall to winter and often not until January. Application before full dormancy can interfere with acclimation of the plants and make them more cold susceptible. It can also decrease nutrient reserves and reduce future yields. Straw should be applied in a solid mat 3-5 inches deep using up to 3 tons or 300 bales per acre. This will provide excellent protection in for the winter and good weed control between rows in the spring. A year round program of weed control is necessary to maintain a weed free planting and ensures healthy yields. (Photographs courtesy of Dr. John Meade, Rutgers University. These can also be viewed at: www.rce.rutgers.edu/weeds/)

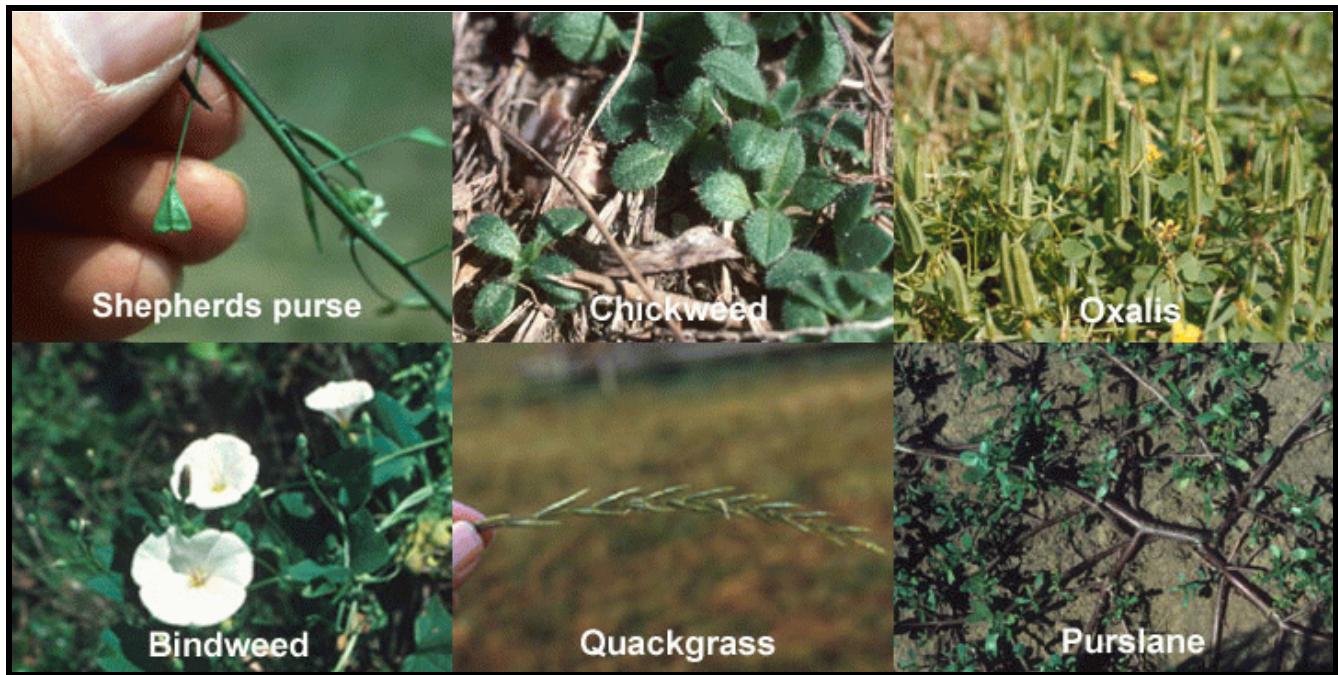
Fall Weed Management for Brambles

Courtney Weber, Dept. of Horticultural Science, Cornell University, Geneva, NY

Summer brambles are often pushed to the background during the fall as so many other crops demand attention in this busy season, but weed problems requires year round vigilance. In bramble plantings, maintaining weed free aisles through permanent sods or cover crops is the best way to reduce you weed load within the row as well. If not done already, now is the time to be planting the aisles.

For a permanent sod, a companion grass mixture is probably the best bet. A mixture of fine-leaf fescues, perennial ryegrasses, or bluegrass forms a thick sod, which holds up to traffic and needs infrequent mowing. Be sure the seed mix does not contain a broadleaf herbicide such as 2,4-D because brambles are very sensitive. Once established, be sure to prevent the grass from spreading into the row with by banding grass-selective herbicides in the spring.

For row centers maintained as bare earth, a fall cover crop can reduce weed load and add organic matter to the soil. Cover crops compete with fall germinating weed seeds and reduce erosion over the winter. They also act as mulch in the spring, which retains moisture and smothers germinating weeds. Buckwheat, oats, or rye can be fall planted and either die in the winter or can be mowed or sprayed in the spring. Deep tillage is to be avoided as raspberry roots can be



damaged and weed seeds will be uncovered. Once the aisles are taken care of, it is time to consider herbicides to control winter annuals and spring weeds.

Late fall is a good time for herbicide applications in brambles. Casoron is probably the most effective option. However, it is expensive and can be difficult to apply. It is a fine granular formulation and care needs to be taken to ensure even coverage within the row. A Casoron specific spreader or hand spreading on a wind free day is recommended. Application should not be done until daytime temperatures are below 45°F in late fall or winter. Casoron can be used in conjunction with Devrinol and Princep in late fall or spring to provide very good weed control. Devrinol can be applied in late fall or early spring and needs to be washed in within 24 hours as sunlight will break it down. It is a preemergent herbicide and works on germinating seeds. Princep is effective at a single high rate for quack grass in the fall or the application can be split between the fall and spring at a lower rate for other weeds. Princep should not be used on plantings less than 6 months old, tissue culture plants less than 1 year old, or the variety 'Royalty'. Other herbicides available for fall application are Solicam, Surflan, and Sinbar but are not commonly used due to expense and variety sensitivity.

A weed management program that anticipates problems helps to avoid emergencies during the season and ensures a long life for bramble plantings. Effective weed control in brambles is possible without undue hand weeding but requires vigilance throughout the year.

Fall Weed Management for Blueberry

Caleb Torrice, Entrepreneur. [Edited by Bill Turechek].

There are two strategies for fall weed control. They should be alternated with each other to prevent the buildup of herbicide resistance in weeds. The first strategy is a mixture of 2.5 lb/A of Princep 80WP plus either (A) 5 lb/A of Surflan, (B) 8 lb/A of Devrinol, (C) 2-4 lb/A of Kerb, or 2 lb/A Sinbar. Surflan is not recommended on high organic matter soils. Kerb is useful for quackgrass control. Solicam is labeled and could technically be a fifth option to mix with Princep, but it is expensive and injury is more likely to occur. During the planting year, wait at least until the soil is well settled around the plants before applying herbicides. Devrinol and Surflan are good safe options. Use a low rate of Princep the first year, and don't use any Sinbar.

The second strategy that should be part of your weed control rotation is 100-150 lb/A (1.5-2.25 oz/plant) of Casoron. Casoron is a granular that must be spread evenly. A hand-crank granular spreader works well. For larger acreage, perhaps the thing to do is rig up a Gandy-type box on the back of an ATV or tractor. Casoron is expensive and should be applied between October and April; March is best if the snow has melted, the soil isn't frozen and the temperature is below 40 F.

Along with the fall pre-emergent weed control program, a fall touch-up of Roundup is effective against a wide range of perennial weeds such as quackgrass, goldenrod, yellow nutsedge, field and hedge bindweed, Virginia creeper, and milkweed to name some common weeds. Blueberries are very sensitive to Roundup so spray shields should be used to reduce drift during spot treatments. Additionally, spot treatments could be made when 90% of the leaves have fallen off the blueberry plants, but before the first heavy frost, to minimize the risk of injury.

There are several formulations of Roundup so carefully read labels before application. Generally, a 2-4% solution is effective when spot treating with a backpack sprayer, or a 20-30% solution for wiper applications. The addition of ammonium sulfate (1-2 oz/gallon) or a nonionic surfactant labeled for use with herbicides may increase uptake. (Source: Blueberry Production Summary, 2003. Oswego County CCE).

Phytophthora Root Diseases of Berry Crops

Michael Celetti, Plant Pathologist, Horticultural Crops, University of Guelph, Guelph, Ontario

The wet and cool conditions experienced this spring were ideal for infection and development of the soilborne pathogens *Phytophthora* spp in berry crops. Red stele of strawberries and *Phytophthora* root rot of raspberries are two diseases that thrive in wet, cool soil.

Phytophthora spp. are sometimes referred to as water molds, however they are not classified in the "Mold" family. They survive as resistant oospores (persistent sexual resting spores) in soil for long periods or as mycelium (mold) in recently infected plant debris. During favorable conditions, the mycelium and oospores germinate to produce a structure called a sporangium. Under moist but not wet conditions, roots can become infected if they come in contact with the sporangium. However, when soils become saturated for a sustained period of time (30 minutes to 6 hours), sporangium produce and release many zoospores with tails that swim toward and infect the root tips of berry plants. This is why plants growing in poorly drained; heavy, wet soils are at more risk of becoming infected by *Phytophthora* spp.

Berry plants infected with *Phytophthora* frequently appear stunted during the second or third year of growth and occur in patches. They wilt very quickly under hot weather conditions. Symptoms are first noticed in low areas of a field or row where water accumulates for extended periods after irrigation or a heavy rain. Eventually the disease moves along the row from the initially infected plants.



It is relatively easy to diagnose red stele by digging up the roots of infected strawberry plants and slicing them longitudinally. The vascular tissue (sometimes called the stele) of infected roots will appear blood red surrounded by white cortex tissue hence the name "red stele". [Editors note: this symptom is usually not apparent this late in the season.] The secondary roots are often pruned significantly giving the root system a "rat tail" appearance. Healthy roots should appear white throughout were as other root diseases such as black root rot or Verticillium wilt will not reveal the blood red core.

Raspberry plants infected with *Phytophthora* root rot may be a little more difficult to diagnose. Infected plants produce few primocanes. The few floricanes and primocanes produced often appear wilted with leaves looking scorched along the margins, between veins. Eventually the leaves turn completely yellow as the disease progresses over the seasons. Scraping the

epidermis of infected raspberry roots will reveal a reddish-brown tissue with a distinct margin where it meets the healthy white tissue. This reddish-brown tissue may also extend into the crown.

[Editor's note: The management section of this article has been replaced with New York guidelines and focuses on autumn practices]

On strawberry, Ridomil Gold (mefanoxem) 4EC (1 pt/treated acre) and Aliette (fosetyl-Al) 80WDG (2.5-5 lb/A) are labeled for control. However, neither will be completely effective if susceptible varieties are grown in wet soils. The

application of both fungicides should be confined to areas of the field where disease occurs or is suspected. Ridomil Gold should be applied in September or early October after the soil begins to cool but before heavy rain fall begins. A second application can be made in Spring after the ground thaws but before bloom. Ridomil can be banded over the row and should provide the same level of protection for red stele as a broadcast application. Broadcasting, however, may provide better control of leather rot. Aliette should be applied in early fall when the weather turns cold and wet and can be applied 30 days later.

On Raspberry, Ridomil Gold 4EC (4 fl oz/1000 ft of row) and Aliette 80WDG (5 lb/A) are labeled for control. Ridomil Gold tends to be more effective than Aliette. Like strawberry, neither fungicide will be completely effective if susceptible varieties are grown in wet soils. Ridomil Gold should be applied only to portions of the planting where the disease has been diagnosed or is suspected. Ridomil Gold should be applied as a 3-foot-wide band over the affected row in early fall and again in late spring. Moreover, Ridomil Gold is also recommended as a preventative treatment for new Titan plantings except for those on the very well-drained soils. (*Source: The All Ontario Berry Grower, Volume 8, August 2002*)

Transition to Organic Highbush Blueberry Production

Bill Sciarappa, Gary Pavlis, Nicholi Vorsa, Cook Campus Center, Rutgers University, New Brunswick, NJ

[Editor's comments: This article focuses heavily on the New Jersey blueberry industry and the accomplishments of faculty located at Rutgers University and the NJ Agricultural Experiment Station, particularly those at located the Blueberry and Cranberry Research Center in Chatsworth, NJ. The intent of running this article is to simply underscore the opportunities growers may if they choose to produce organically grown blueberries.]

Four significant developments have occurred that amplify opportunity for growers to successfully grow organic highbush blueberry and to increase or transition acreage. First, there is the recent USDA national organic standardization that defines organic production practices and crop labels that creates clarity and evens competition. Second, we have the continued increase of small fruit and vegetable sales related to nutritional and human health reasons that strongly contribute in creating today's \$40,000,000 highbush blueberry market in NJ. Future agribusiness gains are promising through the "organic certification" market segment. This organic designation appeals to today's consumer as an even higher market value and creates a separate market segment above the fresh market mainstream. Third, new tools are becoming available to organic growers that reduce the risk from pest problems such as the recent organic registration of Spinosad – now known as Entrust in the organic market. Finally, the Rutgers Blueberry Research Working group has made considerable progress in refining standard IPM practices and in helping develop new tools and holistic approaches for organic production systems.

Our "Work in Progress" is establishing alternative approaches to some current agricultural practices in soil building, fertility, cultural approaches and pest management. Perhaps 2/3's of what conventional growers do horticulturally is directly applicable to organic production. Some examples include selection for resistant varieties, pruning for canopy ventilation to reduce disease incidence, adding organic amendments in building soil such as peat and humus, mulching for weed control and water conservation, raised mounds, roguing of infected plants and the use of natural plant protection products like Bt, Pyrethrum and Spinosad which are safe to natural enemies. In contrast to other fruits that have been introduced from other countries, the blueberry is one of the few native American fruits that has relatively good natural resistance to diseases and insects as well as an inherent vigor because it has been domesticated for less than 100 years.

Thus, there is this strong historic baseline for succeeding in the return to organic production although some key risk factors remain to be solved. To achieve this comprehensive vision of an integrated organic production system, specific obstacles are being addressed by a team of collaborating specialists supported by RCE administrators Dr. Nick Vorsa of the Phil Marucci Blueberry and Cranberry Research Center and Jack Rabin of the NJ Agricultural Experiment Station as follows:

Varietal Selection – Dr. Mark Ehlenfeldt comparative work for the USDA breeding program suggests using early maturing varieties to escape later season blueberry maggot attack like Weymouth, Bluetta and Earlyblue. Mark continues research with new and better varieties resistant to pathogens that are essential in initiating any organic enterprise.

Fertility – Dr. Gary Pavlis has demonstrated the importance of pH in maximizing plant health through the enhanced availability and uptake of nutrients as the ammonium nitrogen form. Gary has also demonstrated the water conservation benefits of trickle irrigation. Dr. Joe Heckman points to a listing of organic based fertilizers to include nitrogen, phosphorus and potassium sources such as rock phosphate, greensand, bone meal, fish meal, and composted manures to

restore depleted soils.

Mulching – Dr. Barbara Rogers is researching the impacts of organically approved mulches for soil benefits and weed control. Barbara's investigations with Dr. Uta Krogmann include the recycling of composted cranberry fruit and leaves, municipal leaf blends with available manures, wood chips and plastic mulch.

IPM Scouting – Our state fruit IPM specialist Dean Polk has provided timely pest population data that is GIS positioned within a blueberry field to allow spot spraying as needed based upon economic thresholds. Dean's extensive scouting program utilizes direct pest assessment, pheromone trapping systems and colored sticky boards for decision making.

Entomological Research – Dr. Sridhar Polavarapu has emphasized pruning of old cane to reduce scale infestation, clean cultivation to suppress cranberry weevil and plum curculio and using OMRI approved insecticides as *Bacillus thuringiensis* (Bt), azadirachtin (neem plant extract), rotenone, pyrethrum and spinosad. Spinosad should handle the difficult to control caterpillar complex and other economically important insect pests. Sridhar's research on baited toxicant sphere attractant traps for blueberry maggot and pheromone trapping approaches for oriental beetle are quite promising for commercialization.

Phytopathology Research – Dr. Peter Oudemans has stressed the importance of sanitation in the field to minimize pathogen entry and spread, use of certified free nursery stock, roguing of virus-infected diseased plants, pruning of bacterial or fungal infected stems and the promotion of rapid drying of leaf and fruit surfaces. OMRI certified fungicides as oxidate are part of his efficacy evaluation program as have been the natural minerals sulfur, lime and copper and Bordeaux mixture, kaolin clay and urea. Mechanical cultivation and new biological controls appear promising for mummyberry suppression in the soil.

Weed Control – Dr. Brad Majek provides weed species identification and essential information as to the life cycle of these annual, biennial or perennial grass and broadleaf weeds. Brad's advice helps plan for a weed control program, which includes trying various mulching practices and treatments.

Commercial Organic Grower – John Marchese, Emery's Berry Farm. John's progressive approaches to planting, weed control and fertility from an organic underpinning have been extremely helpful in establishing commercial utility. His comparative use of the Weed Badger rotary hoe, flaming, cover cropping, mulching and alleyway establishment and other methods are pointing out some ways for economically solving problems specific to large-scale organic production.

Commercial Conventional Grower – Bobby Galletta, Atlantic Blueberry. Bobby and his family continue to share their legendary experiences and extensive knowledge in blueberry production in efforts to expand the industry and maintain profitability.

Certification & OMRI Information – Karen Anderson - Erich Bremer – NOFA-NJ. The Northeast Organic Farming Association of NJ has been actively involved in certifying acreage for organic production and in explaining to growers the approved practices and materials that are essential to maintaining compliance. Through NOFA, growers can connect with other growers as to successful farming practices and can gather current information on plant protection materials and fertilizers through OMRI: Organic Materials Resource Inventory. Call 609-737-6848.

Final Comments – Currently, about 7,500 acres of blueberries are grown in New Jersey with less than 2% (approximately 110 acres) produced organically. Considerable undeveloped potential exists in Pennsylvania as well. The author believes that the agribusiness situation is that of an advanced market ahead of agricultural research; demand ahead of supply. The price of a flat of organic blueberries has ranged from \$18 to \$28 over the last three years while conventional production prices have generally ranged between \$8 to \$14 per flat. Any northeastern growers interested in transitioning to organic blueberries may feel free to contact the author for advice and connection to the team of leading experts referred to in this article. 732-431-7260 or e-mail sciarappa@aesop.rutgers.edu. (Source: Vegetable & Small Fruit Gazette, Vol. 7, No. 5 via Berry Notes Aug. 26, 2003, Vol. 15, No. 16)

[Editor's comments: In a similar vein to the article above, the following two articles represent opportunities for raspberry growers. The first article is an excerpt from a detailed series of articles on greenhouse raspberry production that can be accessed by visiting the website: <http://www.hort.cornell.edu/departments/faculty/pritts/greenhouse/Frontpage.htm>. The second article focuses on high-tunnel production in Maryland. Several small fruit workers visited the High Tunnel Research and Education facility at the Horticultural Farm in Rock Springs, PA last July to view first hand some of the impressive growth that can be achieved in these tunnels.]

Growing Winter Raspberries in a Greenhouse

Marvin P. Pritts, Department of Horticulture, Cornell University, Ithaca, NY

Navigating snowy, ice-covered roads on the way to market is among the challenges facing a new type of raspberry grower. A few innovative producers are harvesting up to 60 flats (720 half-pints) of fresh raspberries from a 24 X 30 ft. house between February and May, and selling them for \$2,000. Greenhouses have been used for many years to produce tomatoes and cucumbers during winter, but these vegetables require relatively warm temperatures and high levels of light, making their production expensive. Raspberries, however, are uniquely suited for greenhouse production during the off-season. They grow best at a relatively cool temperature (20C, 70F) and do not require supplemental light to produce a crop, especially if production is targeted for May and June. In northern states, many greenhouses are empty during the winter months, but these could be used to grow raspberries with only moderate inputs, providing greenhouse owners with an opportunity to produce an extremely high value crop during a time of the year when they are realizing no return on their capital investment and when no domestic raspberries are available.

The vast majority of winter raspberries currently on the market are flown in from the Southern Hemisphere. Quality is generally poor because raspberries have an extremely short post-harvest life and bruise easily during shipping. As a result, consumers are willing to pay between \$3.00 and \$6.00 per half-pint for fresh fruit of superior quality, and restaurant chefs seem willing to pay even more.

Local raspberry production is now possible because of two accomplishments in the area of entomology. First, bumble bees have now been domesticated and are available in small hives for pollinating greenhouse crops. Bumble bees perform better than honey bees in greenhouses, especially under the cooler temperatures used for growing raspberries. Second, predatory mites are now available that feed on phytophagous mites, and these can keep populations of damaging mites at low levels.

Compared to field production, greenhouse-produced berries are larger, firmer and much less prone to fruit rot. Fruit tends to be slightly less sweet and more acid in the greenhouse, but well within the limits of acceptability. Varieties differ in performance and flavor; varieties that do well in the field will not necessarily perform well in the greenhouse.

Several approaches can be taken to extend the raspberry season from the normal June- September season:

- 1) Grow primocane-fruiting raspberries under high tunnels to extend the fruiting season late into the fall (see article below);*
- 2) Grow primocane-fruiting raspberries in a greenhouse to produce a supply of fruit over a long period of time on the same plant; and*
- 3) Use florican-fruiting raspberries to produce a large volume of fruit during a short period of time. Production periods can be staggered to create a long extended season.*

Summary: It is now possible to produce raspberries close to market during most months of the year. Raspberries are the most perishable of all fruits, so even though they can now be grown close to market, they must still be handled with the utmost of care. Raspberries must be cooled quickly after harvest, and delivered to the customer as soon as possible. Most markets for winter raspberries are small, so a producer will need to line up and supply a larger number of smaller markets. Despite these challenges, the opportunities for producers are great. At this point, there exist only a few winter raspberry producers, so the market is wide open. Furthermore, the quality that can be produced is very high. Consumers and restaurant chefs are willing to pay very high prices for high quality berries in winter. Several growers are already producing winter raspberries in northern states.

Fall Bearing Red Raspberry Production in Maryland Tunnels

Bryan Butler and David Lankford, University of Maryland, Cooperative Extension, Central Maryland Research and Education Center, Ellicott City, Maryland

Along with Kathy Demchak at Penn State, we have been attempting to adapt primocane, fall bearing red raspberry culture to tunnel culture in the Mid-Atlantic States. We have, until recently, been focusing on stretching the season into November and December. Our experience has been that in Carroll County (North Central MD), unheated houses have protected the fruit until mid-November twice and into mid December once. We have used the MD/VA/NJ/WI cooperative breeding program super sized, late fall, selection: ND-f1 (avg. 6 gm) to extend the season. We are now experimenting with raspberry potting systems to increase the opportunity to use the tunnels for other crops

in the summer, for example day neutral strawberries.

Recently, Harry Jan Swartz gave us a new early fall selection to try, QEG-f1 (see it on www.fiveacesbreeding.com). He said he thought it was early, it was. On the middle eastern shore, in unheated tunnel, potted plants were producing fruit in late May — on primocanes. In Carroll County, the "fall crop started in early July. Fruit has been coming off at 1/2 to 3/4 ton/acre rates since at both locations (the plantings are small so this is a gross extrapolation). Fruit size outdoors at The Berry Farm in Matawan NJ, where production started the week of the 20th of July, has averaged 3.4 grams/fruit (its probably higher in the tunnels). Now, consider that temperatures have been very hot, in the 90's most days in July at all locations. Fruit quality at indoor and out has been excellent, especially flavor in the tunnels. QEG-f1 flavor has been the best of all selections tried, including Anne. Anne and Caroline are a 2-3 weeks later than QEG-f1 and Anne has good to excellent flavor and size as does its more productive seedling, OAY-f1 (both golden raspberries).

Other selections are not as promising, but we are just now trying Caroline and Josephine, two other cultivars from the program. Although new fruiting canes are being produced by QEG-f1 to extend the fall crop season, we are trying pruning to extend the production of individual canes once they have stopped. Yes, Tiny Tim, we'll have raspberries for Christmas, and "fall bearers" for the 4th of July!

The Basic High Tunnel. A high tunnel is a simple inexpensive structure similar to a greenhouse that provides a great deal of season extension versatility. High tunnels offer the opportunity for the grower to get a crop in early in the season, to stay in production later in the season, and, possibly to produce a crop such as greens through the winter. High tunnels also provide protection from rain and hail and can reduce disease and pest pressure. In Maryland, the seasonal weather patterns vary greatly from one year to the next and even with these unheated tunnels it is difficult to confirm exactly the best timing and choice of crops. However, with good planning, variety selection, and close management, this low cost system can add another dimension to a vegetable or small fruit operation. In a high tunnel system, the tunnel is large enough for the grower to plant, monitor and harvest the crop from inside the structure. The standard tunnel is 14 feet wide, 96 feet long, and 7 feet 6 inches tall at the center. Tunnels should be no wider than 30 feet, for good cross ventilation and reduction of snow accumulation on the roof in the winter.

The Quonset frame consists of metal bows made by bending steel pipe or tubing and potential stresses caused by the weight of snow or heavy wind must be considered. Metal pipes are driven into the ground approximately 2 feet deep and set every 4 feet of the high tunnel length, providing support for the Quonset frame. The bows fit into the ground pipes and are attached by bolts. The ends of the structure can be plastic or wood on a wood stud frame, but should be removable to allow access for tillage equipment and to increase ventilation in the summer. The structure is typically covered with a single layer of 6-mil polyethylene with provisions for rolling up the sidewalls. The poly is secured onto a batten board on each side of the high tunnel about 3.5 feet above the soil line. A vertical sidewall helps to keep rain out of the tunnel and when rolled up, provides ventilation. A pipe is then attached to the loose bottom end of the plastic along the length of the structure. A "T" handle on the end of the pipe is used to roll the plastic onto the pipe to open the sides. Cross ventilation is assisted by wind and has proven to be very efficient.

The key to successful use of the high tunnel is to spend the time laying out and preparing the site for construction. The better the tunnel is constructed, the easier the roll-up sides will work and the easier it will be to ventilate. During periods of cold weather the sides are lowered in the afternoon to hold heat and then raised in the morning to vent before temperatures inside get too high. The floor of the structure is covered with a layer of 6-mil black plastic. This helps to raise the temperature inside the house, control weeds, and prevent evaporation of soil moisture. Excess moisture will raise humidity in the tunnel and may lead to disease problems. Humidity of the air will increase at night as the air cools down. Venting in the morning will allow drying of any condensed water.

High tunnels can actually reduce the incidence of some diseases, particularly if trickle-irrigation tubing is used underneath the black plastic mulch. No water (rain or irrigation) gets onto the foliage to transport spores or otherwise encourage disease development.

Benefits for Production. The use of high tunnels for crop production creates a microclimate that provides the opportunity to increase quality. Since the plants are grown in a structure covered with one layer of plastic, the foliage, flowers, and fruit do not get wet. This can reduce the incidence of many diseases. The soil does not become excessively wet since the only water supply to the plants in the tunnel is trickle irrigation. Proper water management will also help to reduce the incidence of certain root rotting diseases. The single layer of plastic only reduces light levels about 10% as compared to growing outside. Therefore photosynthesis is not reduced except in shaded parts of the plant canopy. Temperatures inside the tunnel are usually warmer than outside temperatures, providing the environment for season extension. The floor in the house will not freeze during most winters. This allows work to be done with soil amendment incorporation or the growing of a cover crop during the coldest part of the winter. Since the floor receives no rainfall, if

irrigation is done carefully the area between the beds becomes too dry for weeds to germinate. The roll up sides that truly make the structure a high tunnel provide passive ventilation to cool the structure and to dry the foliage, again helping to reduce disease incidence. These sides can be lowered in the evening to hold in heat and can protect cut tender plants from blustery conditions. The structure will also provide a foundation for the use of plastic netting for support, shade cloth, and row covers for increased plant protection on cold nights.

Potential Problems. The use of high tunnels does require an increase in both the level and the amount of management required to grow the crop. The sides must be raised and lowered to regulate temperature and humidity. Plants must be irrigated regularly and fertigated as needed. Plants can be grown on raised beds covered with plastic or landscape fabric with the rows in between bare dirt, or the entire floor can be covered with landscape fabric. Unless supplemental heat is provided the tunnel may not be able to provide adequate protection to the plants after the November/ December time frame depending on the year.

Disease problems may occur in the protected environment; management of the environment is critical. Ventilation to avoid high temperatures or high humidity is very important. Maryland's unpredictable weather in spring and fall will make management intensive. Powdery mildew is one disease that may be favored by the high tunnel climate and should be monitored for closely.

Insects will find the microclimate created for the plants to be favorable to their growth also. Without a doubt, integrated pest management (IPM) scouting must begin when the plants are set out. The use of beneficials may be the most practical way to deal with some insect and mite problems. However, season extenders can actually be used as physical barriers to keep insects off the plants. For example, screening the sides to exclude insects, and the use of floating row covers that have the edges secured will prevent many insects from reaching the crop.

Pollination for many crops such as raspberries, strawberries and tomatoes is provided to a large extent by the large amount of air movement from side to side. However, bumble bees or honeybees may be required to maximize production in the early and late part of the season when the sides are rolled up less often. Maryland researchers are currently examining the use of a honeybee hive placed at the end of a tunnel with the opposite end open during the day. The bees flying in and out will stop off on the various flowers on their way in and out each day, which should provide adequate pollination. Further research regarding the use of bees is being planned. (*Source: The Bramble, Vol. 18, Issue 2, Summer 2002 via Berry Notes, Aug. 19, 2003, Vol. 15, No. 15*)

Check out the NYSAES Tree Fruit and Berry Pathology web site at:

www.nysaes.cornell.edu/pp/extension/tfabp

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WEATHER REPORTS OF TEMPERATURES AND PRECIPITATION THROUGHOUT
NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am, AUGUST 17th, 2003

	Temperature				Growing Degree			Precipitation (Inches)				
	High	Low	Avg	DFN ¹	Days (Base 50)		DFN	Week	DFN	Season	DFN	
					Week	Season ²						
Hudson Valley												
Albany	87	62	76	7	184	1986	167	0.23	-0.57	17.18	2.08	
Glens Falls	88	58	74	7	171	1678	84	1.11	0.27	17.94	3.25	
Poughkeepsie	87	63	76	5	182	1796	-104	2.34	1.52	24.45	6.86	
Mohawk Valley												
Utica	83	58	73	5	163	1704	52	0.32	-0.52	20.73	3.6	
Champlain Valley												
Plattsburg	89	58	75	8	174	1696	74	0.47	-0.5	13.83	-0.2	
St. Lawrence Valley												
Canton	85	56	73	8	165	1658	210	0.46	-0.49	17.23	2.53	
Massena	85	60	73	7	165	1624	92	0.21	-0.63	15.45	1.97	
Great Lakes												
Buffalo	86	62	74	6	173	1721	-14	1.16	0.19	14.28	-0.58	
Colden	85	62	72	7	159	1475	65	0.98	0.07	21.19	3.99	
Niagara Falls	86	62	74	5	167	1684	-60	0.28	-0.61	13.8	-0.58	
Rochester	87	64	74	7	172	1792	111	0.87	0.1	13.8	0.94	
Watertown	84	55	73	7	166	1625	164	0.42	-0.32	13.24	1.76	
Central Lakes												
Dansville	85	62	73	5	161	1508	-181	1.04	0.34	23	8.76	
Geneva	85	62	74	6	168	1703	29	0.61	-0.09	18.36	4.18	
Honeoye	86	61	73	4	164	1649	-92	0.82	0.1	19.93	5.94	
Ithaca	85	61	73	6	163	1594	77	1.21	0.44	20.44	5.13	
Penn Yan	85	62	75	7	175	1787	113	1.13	0.43	16.27	2.09	
Syracuse	87	60	75	7	176	1865	160	0.12	-0.65	16.96	0.87	
Warsaw	84	58	71	7	152	1343	31	1.32	0.46	20.91	4.32	
Western Plateau												
Alfred	86	56	71	6	151	1429	42	1.71	1.01	23.42	7.02	
Elmira	87	60	74	6	170	1664	57	0.17	-0.48	16.97	2.3	
Franklinville	85	59	71	8	149	1290	107	0.53	-0.38	22.96	6.16	
Sinclairville	84	62	72	7	156	1385	57	0.87	-0.12	21.69	3.01	
Eastern Plateau												
Binghamton	83	61	72	5	155	1576	15	0.32	-0.43	18.49	3.08	
Cobleskill	84	60	73	7	162	1580	130	1.27	0.5	18.72	2.21	
Morrisville	85	58	71	5	148	1389	6	1	0.23	24.88	8.58	
Norwich	87	59	73	7	164	1549	97	0.38	-0.39	18.31	1.93	
Oneonta	88	62	75	11	176	1688	346	0.23	-0.61	21.11	3.17	
Coastal												
Bridgehampton	88	55	77	6	190	1811	80	0.58	-0.19	27.44	11.3	
New York	91	70	81	5	216	2351	0	0	-0.84	26.41	9.09	

1. Departure From Normal
2. 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. Their cooperation is greatly appreciated.

**WEATHER REPORTS OF TEMPERATURES AND PRECIPITATION THROUGHOUT
NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am, AUGUST 24th, 2003**

	Temperature				Growing Degree			Precipitation (Inches)				
	High	Low	Avg	DFN ¹	Days (Base 50)		DFN	Week	DFN	Season	DFN	
					Week	Season ²						
Hudson Valley												
Albany	88	49	72	4	157	2143	192	0.25	-0.55	17.43	1.53	
Glens Falls	87	43	69	3	131	1809	99	0	-0.84	17.94	2.41	
Poughkeepsie	89	51	71	2	149	1944	-96	0.05	-0.72	24.5	6.14	
Mohawk Valley												
Utica	86	46	69	2	133	1837	63	0.01	-0.86	20.74	2.74	
Champlain Valley												
Plattsburg	87	52	70	5	146	1842	105	0.01	-0.97	13.84	-1.17	
St. Lawrence Valley												
Canton	85	40	69	4	131	1789	233	0.02	-0.96	17.25	1.57	
Massena	85	43	68	3	130	1754	113	0.01	-0.83	15.46	1.14	
Great Lakes												
Buffalo	84	48	69	2	137	1858	-5	0.08	-0.9	14.36	-1.48	
Colden	85	46	67	2	122	1597	80	0.11	-0.86	21.3	3.13	
Niagara Falls	86	50	70	2	139	1823	-49	0.21	-0.7	14.01	-1.28	
Rochester	88	48	70	3	140	1932	130	0.01	-0.8	13.81	0.14	
Watertown	85	39	68	3	129	1754	180	0.13	-0.66	13.37	1.1	
Central Lakes												
Dansville	86	45	67	-1	120	1628	-185	0.07	-0.7	23.07	8.06	
Geneva	87	53	70	3	139	1842	44	0.04	-0.68	18.4	3.5	
Honeoye	87	45	68	-2	124	1773	-99	0.13	-0.64	20.06	5.3	
Ithaca	86	45	67	1	121	1715	84	0	-0.77	20.44	4.36	
Penn Yan	86	49	70	3	142	1929	131	0.04	-0.68	16.31	1.41	
Syracuse	88	48	71	4	146	2011	183	0	-0.79	16.96	0.08	
Warsaw	82	49	66	3	114	1457	47	0.03	-0.88	20.94	3.44	
Western Plateau												
Alfred	86	40	66	2	110	1538	49	0	-0.7	23.42	6.32	
Elmira	87	47	68	2	131	1795	70	0.07	-0.63	17.04	1.67	
Franklinville	83	40	64	2	99	1389	116	0	-0.91	22.96	5.25	
Sinclairville	85	46	67	3	121	1506	77	0.15	-0.9	21.84	2.11	
Eastern Plateau												
Binghamton	83	50	68	3	130	1706	30	0.01	-0.76	18.5	2.32	
Cobleskill	85	50	70	5	138	1718	159	0.15	-0.64	18.87	1.57	
Morrisville	82	46	66	2	115	1504	18	0.06	-0.78	24.94	7.8	
Norwich	87	43	68	3	127	1674	113	0.01	-0.76	18.32	1.17	
Oneonta	88	48	70	6	138	1826	384	0	-0.84	21.11	2.33	
Coastal												
Bridgehampton	87	57	73	3	161	1972	97	0.77	-0.03	28.21	11.2	
New York	93	64	79	5	205	2556	32	0.24	-0.6	26.65	8.49	

1. Departure From Normal
2. Season accumulations are for April 1st to date

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**WEATHER REPORTS OF TEMPERATURES AND PRECIPITATION THROUGHOUT
NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am, AUGUST 31st, 2003**

	Temperature				Growing Degree			Precipitation (Inches)				
	High	Low	Avg	DFN ¹	Days (Base 50)		DFN	Week	DFN	Season	DFN	
					Week	Season ²						
Hudson Valley												
Albany	85	48	68	2	129	2272	202	1.23	0.46	18.66	1.99	
Glens Falls	84	41	64	-2	98	1907	94	0.36	-0.48	18.3	1.93	
Poughkeepsie	84	50	67	-2	124	2068	-99	0.32	-0.49	24.82	5.65	
Mohawk Valley												
Utica	85	42	65	-1	108	1945	62	0.08	-0.86	20.82	1.88	
Champlain Valley												
Plattsburg	79	42	63	-2	93	1935	96	0.48	-0.43	14.32	-1.6	
St. Lawrence Valley												
Canton	79	42	62	-3	83	1872	221	1.11	0.13	18.36	1.7	
Massena	78	44	62	-3	84	1838	101	1.1	0.19	16.56	1.33	
Great Lakes												
Buffalo	82	49	68	2	129	1987	7	0.05	-0.92	14.41	-2.4	
Colden	83	47	66	2	111	1708	94	0.91	-0.13	22.21	3	
Niagara Falls	84	48	68	2	130	1953	-35	0.34	-0.6	14.35	-1.88	
Rochester	87	49	68	3	130	2062	148	0.74	-0.03	14.55	0.11	
Watertown	84	41	64	-1	101	1855	180	0.05	-0.79	13.42	0.31	
Central Lakes												
Dansville	84	46	66	-2	110	1738	-190	0.73	-0.04	23.8	8.02	
Geneva	85	47	67	1	121	1963	51	0.29	-0.48	18.69	3.02	
Honeoye	83	46	66	-2	115	1888	-106	0.53	-0.24	20.59	5.06	
Ithaca	85	41	65	1	107	1822	88	0.07	-0.73	20.51	3.63	
Penn Yan	85	47	67	1	120	2049	137	0.35	-0.42	16.66	0.99	
Syracuse	88	47	68	2	128	2139	197	0.07	-0.77	17.03	-0.69	
Warsaw	83	47	65	3	107	1564	67	0.56	-0.37	21.5	3.07	
Western Plateau												
Alfred	85	43	65	2	105	1643	62	1.34	0.6	24.76	6.92	
Elmira	89	45	68	3	126	1921	88	0.54	-0.16	17.58	1.51	
Franklinville	81	43	63	2	91	1480	126	1.67	0.73	24.63	5.98	
Sinclairville	83	48	66	3	113	1619	99	1.32	0.24	23.16	2.35	
Eastern Plateau												
Binghamton	83	45	66	2	117	1823	43	0.26	-0.51	18.76	1.81	
Cobleskill	83	43	64	-1	98	1816	160	0.58	-0.26	19.45	1.31	
Morrisville	80	43	62	-2	87	1591	13	0.21	-0.66	25.15	7.14	
Norwich	86	42	64	-1	98	1772	114	1.23	0.4	19.55	1.57	
Oneonta	84	49	66	4	116	1942	412	3.13	2.29	24.24	4.62	
Coastal												
Bridgehampton	87	53	71	3	150	2122	113	0.31	-0.53	28.52	10.7	
New York	89	61	78	5	194	2750	62	0.07	-0.77	26.72	7.72	

1. Departure From Normal
2. Season accumulations are for April 1st to date

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**WEATHER REPORTS OF TEMPERATURES AND PRECIPITATION THROUGHOUT
NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am, SEPTEMBER 7th, 2003**

	Temperature				Growing Degree			Precipitation (Inches)				
	High	Low	Avg	DFN ¹	Days (Base 50)		DFN	Week	DFN	Season	DFN	
					Week	Season ²						
Hudson Valley												
Albany	76	50	63	-3	93	2365	191	1.78	1.03	20.44	3.02	
Glens Falls	74	43	61	-3	77	1984	83	1.77	1	20.07	2.93	
Poughkeepsie	75	49	62	-6	84	2152	-128	2.79	1.95	27.61	7.6	
Mohawk Valley												
Utica	74	46	61	-4	79	2024	46	1.07	0.05	21.89	1.93	
Champlain Valley												
Plattsburg	78	44	63	1	94	2029	102	0.01	-0.82	14.33	-2.42	
St. Lawrence Valley												
Canton	75	46	63	2	91	1963	232	0	-0.98	18.36	0.72	
Massena	76	44	62	0	86	1924	106	0.2	-0.67	16.76	0.66	
Great Lakes												
Buffalo	75	52	64	-2	101	2088	2	0.34	-0.57	14.75	-2.97	
Colden	75	48	61	-2	82	1790	91	1.7	0.59	23.91	3.59	
Niagara Falls	76	47	65	-1	106	2059	-33	0.26	-0.65	14.61	-2.53	
Rochester	76	49	64	-1	101	2163	147	0.34	-0.43	14.89	-0.32	
Watertown	77	52	64	2	98	1953	191	0	-0.84	13.42	-0.53	
Central Lakes												
Dansville	74	47	61	-4	79	1817	-213	2.02	1.21	25.82	9.23	
Geneva	74	48	62	-4	84	2047	33	1.48	0.71	20.17	3.73	
Honeoye	78	49	62	-4	88	1976	-127	1.06	0.29	21.65	5.35	
Ithaca	73	44	60	-4	69	1891	67	2.55	1.71	23.06	5.34	
Penn Yan	74	49	63	-3	92	2141	127	2.16	1.39	18.82	2.38	
Syracuse	75	50	64	-2	96	2235	191	0.91	0.02	17.94	-0.67	
Warsaw	73	49	60	-1	75	1639	68	1.53	0.55	23.03	3.62	
Western Plateau												
Alfred	76	38	59	-4	65	1706	45	2.09	1.29	26.85	8.21	
Elmira	78	48	62	-2	89	2010	82	2.36	1.66	19.94	3.17	
Franklinville	75	45	59	-1	68	1548	126	2.3	1.33	26.93	7.31	
Sinclairville	75	48	61	-1	81	1700	100	1.94	0.82	25.1	3.17	
Eastern Plateau												
Binghamton	72	44	59	-5	68	1891	21	3.75	2.97	22.51	4.78	
Cobleskille	75	45	60	-3	75	1891	150	2.82	1.94	22.27	3.25	
Morrisville	73	46	59	-4	62	1653	-5	2.53	1.62	27.68	8.76	
Norwich	75	46	60	-3	72	1844	101	2.69	1.82	22.24	3.39	
Oneonta	74	48	61	0	79	2021	416	3.05	2.21	27.29	6.83	
Coastal												
Bridgehampton	78	51	65	-3	105	2227	96	1.39	0.55	29.91	11.2	
New York	79	62	69	-4	131	2881	42	1.68	0.84	28.4	8.56	

1. Departure From Normal
2. 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. Their cooperation is greatly appreciated.