New York Berry News

CORNELL UNIVERSITY

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What's Inside

Hot and dry now appears to be the order of the day. Hopefully you have your irrigation up and running to offset the lack of rainfall so far this summer. It can definitely be said 2007 has been a year for extremes so far!

Strawberries are in full swing now, with raspberries just around the corner. Looks like summer is finally here.

Lots of news and noteworthy information for you included in this issue, along with details on small fruit events added to your calendar from last month's issue, and articles of interest.

Feature articles include a report on a study of hydroponic strawberries in Hudson Valley by Steven McKay, the final article in our series on marketing, harvesting, post harvest handling and storage of small fruit by our newest NYBN author Craig Kahlke, and an article on bird management strategies for small fruit by yours truly.

CURRANT EVENTS

July 12, 2007. *Small Fruit Tour***,** Germantown, NY. Currants, Gooseberries, Brambles, Mountain Range Farm. For more information contact Steven McKay at 518-828-3346 or sam44@cornell.edu .

July 19, 2007. *NYSAES Raspberry Field Day***.** NYS Agricultural Experiment Station, Geneva, NY. Black and Red Raspberries, More information in news brief below.

July 25, 2007. *NYSAES Fruit Field Day*. NYS Agricultural Experiment Station, Geneva, NY. Cordon training of Ribes, Ribes disease control, small fruit insect research updates. For more information contact Nancy Long (315) 787 2288 or npl1@cornell.edu, or go to http://www.nysaes.cornell.edu/hort/fieldday/.

August 2, 2007. *High Tunnel Small Fruit Tour*, Ithaca, NY. Black raspberries, Blackberries, Cornell University College of Agriculture and Life Sciences. More information in news brief below. CANCELLED

August 10-12, 2007. *Northeast Organic Farming Association (NOFA) 33 Rd Annual Summer Conference.* – "A Celebration of Sustainable Living" at Hampshire College in Amherst, MA. For the full schedule of activities and further information go to www.nofamass.org, or contact Julie Rawson at (978) 355-2853 or julie@nofamass.org.

August 14-15, 2007. *NASGA Summer Tour*, Niagara Falls Canada and Niagara region of New York. For more information contact Kevin Schooley at kconsult@allstream.net or visit www.nasga.org.

September 15, 2007. *New York State Agricultural Experiment Station 125th Open House for the public*, Geneva, New York. For more information contact Gemma Osborne - gro2@cornell.edu.

October 5-6, 2007. *US Highbush Blueberry Council Fall Meeting*, Crowne Plaza Northstar Hotel, Minneapolis, Minnesota. For more information: http://www.blueberry.org/calendar.htm.

October 13-14, 2007. *Northeast Small Farm and Rural Living Expo*, Ulster County Fairgrounds. New Paltz, NY. For more information see news brief below or go to: www.smallfarmexpo.org.

NYSAES RASPBERRY FIELD DAY JULY 19th

Cornell University's New York State Agricultural Experiment Station is hosting a raspberry field day from 3 to 7 pm on Thursday, July 19, 2007. The field day will be held at the Darrow Farm at 3227 Gates Rd., which is approximately 3 miles west of the Experiment Station off County Rd. 4 (North St. in Geneva) and 1 mile south on Gates Rd.

Your host for this event will be Dr. Courtney Weber, small fruits breeder, who will be showcasing both his black and red raspberry variety trials. The black raspberry variety trial will be in full harvest with sampling of varieties. Summer red raspberry selections will also be on display. Along with the variety trials, a comprehensive program on production and pest management of bramble will be presented by Drs. Courtney Weber, Marvin Pritts, Kerik Cox and Greg Loeb.

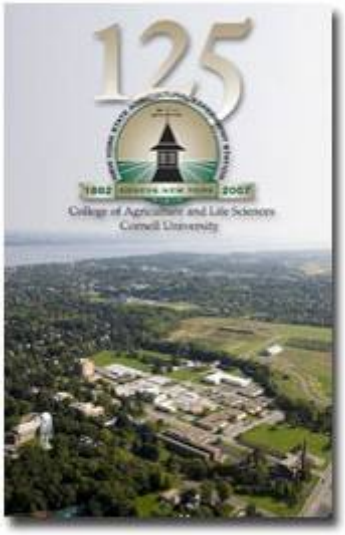
Pre-registration is strongly encouraged to ensure adequate handouts and refreshments but there is no fee. Signs will be posted on the day of the event. Registration is by email, phone, or mail to:

Lou Ann Rago,
Cornell University-NYSAES
Dept. of Horticultural Sciences
630 W. North St.
Geneva, NY 14456.
email: lar38@cornell.edu phone: (315) 787-2394.

Questions may be directed to Dr. Weber at 315-787-2395 or caw34@cornell.edu.

CORNELL TO HOST FRUIT FIELD DAY ON JULY 25th

Joe Ogrodnick, Communications Services, Cornell University's New York State Agricultural Experiment Station, Geneva, NY 14456



Geneva, NY: Cornell University will host the 2007 Fruit Field Day and Equipment Show at the New York State Agricultural Experiment Station in Geneva, NY, on Wednesday, July 25, from 8:00 a.m. to 5:00 p.m. This is one of several events that commemorate the 125th anniversary of the Experiment Station, which opened its doors on March 1, 1882.

Fruit growers, consultants, and industry personnel are invited to tour field plots and laboratories and learn about the latest research and extension efforts being carried out by researchers on the Geneva, Highland and Ithaca campuses. The focus will be on all commodities key to New York's $300 million fruit industry: apples, grapes, raspberries, strawberries, blueberries, peaches, pears, and cherries.

During lunch, equipment dealers will showcase the latest techniques to improve sprayer deposition and reducing drift. Representatives from various companies will advise growers on the latest technologies.

The event will be held on the Experiment Station's Fruit and Vegetable Research Farm South, 1097 County Road No. 4, one mile west of Pre-emption Rd. in Geneva, NY. Signs will be posted. Attendees will be able to select from tours of apples, stone fruits, small fruits, and grapes, as well as a tour of the Experiment Station's labs and greenhouses. Admission is free and lunch is provided courtesy of industry sponsors. Pre-registration is encouraged.

For sponsorship and exhibitor information, contact Debbie Breth at 585-798-4265 or dib1@cornell.edu.
More information will be posted to http://www.nysaes.cornell.edu/hort/fieldday/ in the very near future.

For additional information, contact Nancy Long at 315-787-2288 or npl1@cornell.edu Register on line at: http://www.nysaes.cornell.edu/hort/fieldday/index.html.

MEET THE NEW MEMBERS OF THE LAKE ONTARIO FRUIT TEAM (LOFT)

Greetings! My name is Craig Kahlke (pronounced cal-key), and I'm one of the newest Lake Ontario Fruit Program team members. I will be responsible for Fruit Quality Management (FQM) of pome and stone fruits, along with berry crops. Many of you may know the position by its previous title, Post Harvest. Since there are pre-harvest orchard factors affecting subsequent post-harvest fruit quality and storability, the duties of the position have changed somewhat to include investigation of these preharvest factors, along with some marketing and other issues as well. I will work out of the Niagara County CCE office in Lockport and across the LOF region. My contact information is below.

The objective of the Fruit Quality Management program is to improve the profitability and sustainability of the fruit industry though a comprehensive educational program, including applied research and demonstrations in commercial tree fruit and berry harvest/post-harvest quality to meet the various market requirements from wholesale to direct retail market.

A bit about my background- I grew up on Long Island, received my BS in Biology ('91) at SUNY Geneseo. I worked for a while in the Rochester area after that. My wife's job then brought us to Texas, in the Lower Rio Grande Valley region along the border with Mexico. I soon fell head first into the world of citrus where I was responsible for developing a certification program to produce virus-free citrus germplasm for both the commercial and homeowner industries. In the 10 years I was in TX, I also received my MS (04'-Plant & Soil Science, Texas A&M-Kingsville), built a house, and helped my saintly wife raise two children. The long-distance from family in upstate, NY, LI, and Ohio caused me to look for employment "back home"". I worked in Robin Bellinder's weed science program for commercial vegetable production from 2003-05. During the last two years, I was working on an NSF grant with alternative (non-crop) hosts of Barley yellow dwarf virus under Alison Power in Ecology and Evolutionary Biology, also at Cornell. It was also during the past year or so that I realized I really missed doing applied work, especially the extension work I did in my last years with the citrus certification program in TX. I am really excited to be working for a dynamic and progressive group of stakeholders, and I look forward to getting out and meeting all of you soon!

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Cornell University College of Agriculture and Life Sciences
Serving the Commercial Fruit Industry in Monroe, Niagara, Orleans, and Wayne Counties

Hello everyone. My name is Jason Osborne and I would like to take this opportunity to introduce myself as the newest member of the Lake Ontario Fruit Team. I will serve as the Tree Fruit and Berry Extension Educator (Cultural Practices) in Wayne, Monroe, Orleans, and Niagara counties.

I am originally from Brunswick, Maine and received my Bachelor's degree in Agriculture from the University of Maine at Orono. During my undergraduate years I worked at the Maine Soil Testing Service and summers I worked at the University of Maine Experiment Station, Highmoor Farm, as an IPM scout in apple, strawberries, and sweet corn.

After graduation from the University of Maine I returned to Highmoor Farm for 2 years to gain some practical farming experience. For the past 7 years, I have been employed as a Research Specialist in the Department of Horticultural Sciences at the New York State Agricultural Experiment Station where I have provided technical support to the research and extension programs of Dr. Terence Robinson and formerly in the Hudson Valley with Dr. Jim Schupp. I recently received my Master's

in Horticulture from Cornell University where I attended graduate school part time while working at the Experiment Station in Geneva.

In my role as Research Support Specialist and graduate student at Cornell University I have been responsible for coordinating and conducting experiments at the New York State Agricultural Experiment Station as well as demonstration plots on many of your farms. These included apple, peach, and cherry rootstock and training system evaluations, thinning, crop load and canopy management trials, and plant nutrition studies. I hope that my work experience, education, and my commitment to applied agricultural research and extension will prove to be valuable to the fruit industry of New York.

I anticipate making farm visits over the next couple of months and seeing many of you on your farms. I look forward to meeting as many of you as I can. I will begin my new position full time on June 11th at the IFTA Short Tour in Yakima Washington and hope to see many of you out there. Finally, I look forward to working with all of you!

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Cornell University College of Agriculture and Life Sciences
Serving the Commercial Fruit Industry in Monroe, Niagara, Orleans, and Wayne Counties

NORTHEAST SARE GROWER GRANT APPLICATIONS FOR 2008

Now is a good time to start thinking about ideas that might be suitable for the SARE Grower Grant program. Applications are not due until December 2007, but ideas take time to germinate and grow into good proposals.

To help you begin thinking about potential projects, visit the SARE Grower Grant site at http://www.uvm.edu/~nesare/FGinfo.html.

NEW RESOURCE AVAILABLE: 'MARKETING THE MARKET'

"Marketing is the whole business, taken from the customer's point of view." – Peter Drucker

The Kansas Rural Center has created a new publication with information on promoting Farmers' Markets. The straight-forward publication reviews effective marketing principles utilizing market newsletters and how to partner with the community. "Marketing the Market" (PDF / 952K) reviews effective marketing principles utilizing market newsletters and how to partner with the community. The 6-page booklet addresses topics such as salesmanship, display, and advertising. It is available online in at: http://www.kansasruralcenter.org/publications/MarketingTheMarket.pdf.

The publication focuses on many main marketing issues within a market, such as coming together, maximizing business and focusing on the market experience. Important questions are answered, such as, "What factors draw shoppers in and which can send them running?"

The authors are Jerry Jost and Mercedes Taylor-Puckett. The Kansas Rural Center publication was created with financial support from USDA's Risk Management Agency.

NAL PUBLISHES SPANISH LANGUAGE AGRICULTURAL THESAURUS AND GLOSSARY

Len Carey, ARS News Service, Information Staff, Agricultural Research Service, 5601 Sunnyside Ave., Room 1-2251, Beltsville MD 20705-5128

May 7, 2007. The USDA National Agricultural Library (NAL) has published Spanish language versions of its NAL Agricultural Thesaurus (NALT) and Glossary of Agricultural Terms. The NALT and Glossary in Spanish support increased Spanish language access to agricultural information throughout the United States and the world, accommodating the complexity of the Spanish language from a Western Hemisphere perspective.

This first Spanish language edition of the NALT comprises more than 15,700 translated concepts. Included are definitions for more than 2,400 of the concepts, in both English and Spanish, which are published in a separate interface as the Glossary of Agricultural Terms. Both publications can be downloaded and used through the NAL Services web page at http://nal.usda.gov/services/.

The NALT is used at NAL and at other organizations as a key component for organizing and describing agricultural information. Publishing a Spanish language edition of the NALT makes it a valuable bilingual reference tool which benefits both Spanish and English speakers. Organizations using the NALT terms can easily add a Spanish language capability to their agricultural information applications.

Of the estimated 480 million Spanish-speaking people in the world, about 87 percent live in the Western Hemisphere. Spanish is the second most widely spoken language in the United States, and is the most rapidly growing language used in U.S. agriculture. Future Spanish-language editions of the NALT will change in response to recommendations from the Spanish-speaking agricultural community and NAL cooperators.

Translation of the NALT into Spanish was accomplished by NAL with the American Distance Education Consortium (ADEC). ADEC (http://www.adec.edu) is a nonprofit international distance education consortium of approximately 65 state universities and land-grant colleges that promotes the creation and provision of high-quality, economical distance education programs and services to diverse audiences.

The USDA National Agricultural Library, in Beltsville, Md., is the world's foremost agricultural library and part of the Agricultural Research Service, USDA's chief scientific research agency.

(From: ARS News Service, Information Staff, Agricultural Research Service, NewsService@ars.usda.gov | www.ars.usda.gov/news. Phone (301) 504-1638 | fax (301) 504-1486

SURVEY AGAIN SHOWS STRONG CONSUMER INTEREST IN BLUEBERRIES

The "Fresh Trends 2007" report recently published by the "Packer" once again shows the growing consumer interest in blueberries. Since 1983, the "Packer" has sponsored 24 major consumer studies to track trends in the purchase and consumption of fresh produce. This past year, consumers were surveyed via an online study conducted from September 14 to 19, 2006 and completed by 1,012 households who are members of a nationwide consumer panel.

The survey continued to show that consumers in the Northeast are those most likely to purchase blueberries (56%) followed by the Midwest (43%), West (41%), and South (37%). The report notes that 43% of all consumers had purchased blueberries within the past 12 months (up from a previous 3-year average of 39%). By comparison, 69% had purchased strawberries in the past year, 26% had purchased raspberries and 18% had purchased blackberries.

Organic blueberry interest is on the rise with 16% of those who purchased blueberries in the past year noting that they had purchased organic blueberries at least some of the time. The report notes that 5% of purchasers said they bought organic blueberries exclusively, making blueberries one of the most popular organic items purchased. Shoppers in the West and Midwest were those most likely to purchase organic.

Blueberries continue to be favored by upper income households with 56% of those with an annual income of $75,000 or more likely to purchase blueberries followed by 43% of households with an annual income from $50,000 to $74,999; 38% of households with an income from $30,000 to $49,999; and 37% of those households with an annual income of less than $30,000.

(Reprinted with permission from: "The USHBC Bluespaper", May 2007.)

NORTHEAST SMALL FARM & RURAL LIVING EXPO

The Northeast Small Farm and Rural Living Expo and Trade Show is coming back to the Hudson Valley on Saturday, Oct. 13th and Sunday, Oct 14th, from 9am to 4pm. Once again the Ulster County Fairgrounds will be host to the event. The Small Farm and Rural Living Expo, which rotates between New York, Pennsylvania and New Jersey, will attract thousands of people who are interested in learning more about farming and rural living.

As in years past, this 7th annual Expo will feature demonstrations, workshops and classes on commercial horticulture, natural resources, equine/livestock farming and various topics on rural living. There will also be children's educational activities, farm animals, farm equipment, and fun activities for the entire family.

The Expo planning committee is looking for vendors to exhibit at this year's Expo. Space is available for agricultural agencies, commodity and breed associations, building and fence companies, feed and animal care companies, rural living product suppliers, small farm equipment manufacturers, and other businesses interested in reaching people interest in farming and rural living.

For more information about booth sizes and fees, please contact Joe Walsh at (845) 292-6180, jjw11@cornell.edu or Larry Hulle at (845) 344-1234, lrh6@cornell.edu . Bookmark our website for updates on the Small Farm and Rural Living Expo at www.smallfarmexpo.org. The Cornell Small Farms Program is proud to co-sponsor this year's Expo.

POSTHARVEST HANDLING AND STORAGE CONSIDERATIONS FOR SMALL FRUIT

Craig J. Kahlke, Area Extension Educator - Fruit Quality Management, Lake Ontario Fruit Program, Cornell Cooperative Extension, 4487 Lake Ave., Lockport, NY 14094

*(**Editor's note**: This is the third and final article in a series of three small fruit articles on marketing, harvesting, and postharvest handling/storage of small fruit. Many thanks to Craig Kahlke for his willingness to contribute on such short notice.)*

Introduction/Post Harvest Handling

Harvesting of strawberries has already began, with the other berry crops not far behind, so now is a good time to discuss handling of the fruit associated with postharvest activities. Berries are among the most perishable of all fruits – their small size, fragile nature, and rate of respiration all combine to make them far more perishable than other fruits. Rough handling at harvest and during any time thereafter will also increase their rate of deterioration. Thus it is critical that all personnel, from harvest activities until fruit is at its final destination for sale, be trained in the proper handling of fruit.

Direct Market Berries

The vast majority of berries produced and consumed in New York State are at local Pick Your Own (PYO) and Farmer's Markets (FM). Without the high cost of refrigeration equipment for storage potential beyond 2 days, many growers opt for this method of selling their fruit. However, there are several large wholesalers in the state that are taking advantage of large markets in big cities. Fresh consumption of berries is well over 90%. Processing acreage in New York is mainly a bi-product of unsold fruit, such as those made into jams/jellies, syrups, and fruit wines. Mechanized harvesting and sorting/processing equipment is also cost-prohibitive and virtually not done in the state. In addition, the fragile nature of berries makes mechanized equipment another step that can encourage bruising and decay.

Berries Destined for Local Retail Markets

Since most berry markets in the Northeast are consumed very close to the farms on which they are produced, many growers lack, and may not need the cold storage facilities used by long-distance shippers such as those employed by the larger berry production areas in other states. Direct market channels are ideal for growers in the Northeast, as fruit loss is further accentuated from shipping from the farm to wholesalers, and from the wholesalers to retail markets. By bypassing wholesale shipping, fruit loss due to bruising and fungal decay can be reduced by 20%.

Most direct market berries are shipped out to markets on refrigerated trucks the same morning, reach the retail shelves by afternoon, and are bought and consumed within a day or two. Consequently, refrigeration and packing requirements are not a major consideration for growers in these markets.

Small Fruit Destined for Wholesale (Long-Distance) Markets

The extremely perishable nature of berries reduces their potential for distribution to wholesale markets. The perishability of berries starts with their respiration, the process by which food reserves are converted to energy. In fruit, carbohydrates and oxygen produce carbon dioxide, heat, and water. This natural process results in shrinkage, reduced sugars, and decay. Respiration rates in berries are many times higher than larger fruit, such as apples and oranges. Temperature plays a huge role in reducing respiration rates. In berries, for every 10 F increase in temperature above 32F, there is approximately a 50% increase in respiration rate.

Temperature is the single most important factor affecting berry storage. Thus a lack of field heat removal via simple refrigeration at bare minimum, or via forced air cooling (preferable) will severely reduce a berry's shelf life. In fact, it is estimated that every hour delay in cooling berries at harvest reduced shelf life by one day.

For small fruit that are being transported beyond local markets, cooling is critical to reach maximum shelf life potential. As mentioned in the previous issue of New York Berry News, berries will have a longer storage/shelf life if they are harvested a day or two before full ripeness. An early morning harvest followed by cooling to remove field heat (preferably within an hour of harvest) is critical to extending shelf life. Ideally, 30-35 F forced air cold storage with high humidity (85-95% RH) is recommended. Refrigeration without forced air may also be used however storage and shelf-life will be shortened.

Proper forced air cooling removes field heat from berries in around 90 minutes, while simple refrigeration without forced air can take about 9 hours. Proper ventilation around, below, and above the fruit is essential for removing field heat quickly. Covering containers with plastic prior to cooling, and not removing plastic until berries are at room temperature for several hours after reaching market shelves will cause condensation buildup on the *outside* of the bag and delay fungal growth. It is estimated that an hour delay in cooling the fruit results in reducing shelf life of fruit by one day. Following field heat removal, shipping on refrigerated trucks to market destinations is essential. If cold storage will be limited at market destination, research shows 50F storage at high humidity will benefit storage life greatly as compared to room temperature storage. In addition, strawberries at 50F tend to retain their color and glossy appearance better than berries stored at 32F. Shelf life from harvest to market and on the consumer's table is about 14 days maximum for strawberries and blueberries, and 10 days with ideal storage for the most perishable brambles- raspberries and blackberries.

Market Trends

Strawberries

Strawberry production/consumption over recent years has remained relatively steady or stagnant. This is a bit surprising, as strawberries contain more vitamin C by weight than oranges. Perhaps local consumption has increased do to the popularity of PYOs. Very little wholesaling is done statewide, but the potential is there. Growers who already utilize cold storage for commodities such as apples can easily modify a portion of a refrigerated room to make a forced air cooler.

Blueberries

Of all the berry crops, blueberries have seen the most increase in production in the state in recent years. The fact that it has become well known that they have one of the highest antioxidant levels of any fresh fruit or vegetable is at least partly responsible for this. Antioxidants fight free radicals in our blood vessels. Free radicals oxidize and attach themselves to vessel walls, making them less pliable and prone to blockage. Thus, antioxidants help reduce the chances of stroke and heart attack. In addition blueberries are available at many PYOs.

Raspberries

There has also been at least a moderate increase in raspberry production across the state in recent years, with more expansion on-going. There are several reasons for this. Greenhouse raspberry production is on the rise, as there are several varieties that do well in the greenhouse environment with a minimum of pest problems. Greenhouse raspberry growers producing fruit in the winter can also take advantage of a market window in which there is no competing domestic field production. High tunnels are also being used in field-grown raspberries to extend the season.

Gooseberries & Currants

Gooseberries and currants and their crosses are in the plant family (genus) known as Ribes. Several PYOs across the state have small plantings of Ribes alongside larger berry plantings. Gooseberries are divided into fresh or desert cultivars, that are generally consumed raw or on top of chilled deserts; and cookers, which are very tart and cooked for processing in deserts and sauces. Currants are divided into two groups as well, the red, pink, and white grouping, and the black category. The red, pink, and white colored berries generally are sweet enough to be eaten fresh, but are also processed. Black currants are very tart, and only suitable for use in processing. Black currants are processed in many ways, including into juice and juice concentrates, jams, jellies, flavoring for yogurt/ice cream, and in candies and pie fillings.

As acreage is very limited in New York, one could surmise that there is no real market potential. However, there are those that feel Ribes would be ideal for a small, specialty crop. The shelf-life of Ribes is longer than of any other berry. With immediate field heat removal and cold storage at about 33F, currants and gooseberries can last 2-4 weeks. In addition, another advantage is that they can be picked prior to full ripeness, and will ripen fully whether kept in cold storage or room temperature. Packaging is similar to other berries. They can also be quick frozen for processing. Mechanical harvesters/sorters are often used in production areas in which the majority of acreage is for processing.

Acknowledgments – I wish to thank Jim Coulter, Cathy Heidenreich, Mark Nicholson, Marvin Pritts, Mark Russell, Jack Torrice, and Chris Watkins for their help in providing information for this article.

Resources

1. Strawberry Production Guide for the Northeast, Midwest, and Eastern /Canada, NRAES-88.
2. Highbush Blueberry Production Guide, NRAES-55
3. Bramble Production Guide, NRAES-35
4. 2007 Pest Management Guidelines for Berry Crops, Cornell University, Cooperative Extension.
5. USDA, ARS Agriculture Handbook Number 66. The Commercial Storage of Fruits, Vegetables, and Florist and Nursery Stocks.
6. Postharvest Cooling and Handling of Blueberries, North Caroline State University Bulletin AG-413-7.
7. McKay, Steven A. 2006. Developing Gooseberries for Commercial Specialty Markets, New York Fruit Quarterly, Vol.14, No. 3. p. 17-19.

HUDSON VALLEY HYDROPONIC STRAWBERRY TRIAL

Steven A. McKay, Extension Educator, Columbia County Cooperative Extension, Hudson, NY.

Growing strawberries in the Northeast can be a challenge, especially if the summer is humid or wet. Hydroponics may provide one solution that allows us to grow quality berries, free of water damage, and fungus diseases. Hydroponics is not new as a production technique, but the devices and materials we use to grow hydroponically have been improved over the years making the practice more economically feasible.

The basic system involves growing plants in a soil-free medium and supplying the plants with water containing the nutrients necessary for optimal growth. This avoids exposure to soil-borne pests. Climate, as well as above-ground pests can be controlled if the system is placed in a greenhouse.

The system being tried this summer uses a set of five Styrofoam planters stacked vertically. They are filled with a vermiculite/perlite mixture. The planters have holes punched in them so that when the nutrient medium is introduced from the top to a diffuser, it can drain through the system of planters watering all the plants. A timer turns on a pump three times a day to water the plants using nutrient solution pumped from a reservoir tank.

The stacks of 5 planters cost about $100 each, and it takes about five hours for one person to set up a system of ten stacks. It is projected that about 120 pounds of strawberries could be produced per stack per year if grown outside. Strawberries at two dollars per pound, would give a gross income of about $160 per year per stack. These simple economics make the project look feasible, so I feel that it is worth it to try the system in our area under our conditions. We are keeping records of time and material investments to do the study. A report will be issued this winter.

Other crops are also possible in the hydroponic stacks. Alpine (small flavorful) strawberries could be grown, as well as possibly lingonberries. New pots have been designed for blueberries, and they will be another item interesting to try. Blueberries normally take 10 years to come into full production, and It seems that hydroponics could shave off a few years.

Advantages of hydroponics:

* Greater control of the root zone of plants: control air, water, diseases and nutrients.
* Prevent over and under watering.
* Eliminate weeds
* Space savings
* Cleaner product
* Less pesticide use
* Labor and equipment savings

BYE BYE BIRDIE – BIRD MANAGEMENT STRATEGIES FOR SMALL FRUIT

Cathy Heidenreich, Small Fruit Extension Support Specialist,Department of Horticulture, Cornell University's College of Agriculture and Life Sciences, Ithaca, NY

To paraphrase an old but reliable resource on life, there is a time and a place for everything, including birds. But even to an ardent birdwatcher like me its obvious that the commercial small fruit planting at or near harvest is neither the time, nor the place. What to do to minimize damage caused by our colorful neighbors? An integrated approach to bird management is often the most successful.

A Bird's Eye View of Bird Biology

Berries are a good food source for birds, especially in dry years when other food sources may be in short supply (Could one of those years be 2007?). Damage to commercial berry crops by birds during these years may be a serious problem. Some studies estimate up to 30% of blueberry crops may be lost under such conditions. Three types of bird damage may occur in small fruit plantings – whole berry removal, fruit knocked off bushes by foraging birds, or punctures/pecking damage. Whole berries may be stripped from bushes or canes or holes pecked in attached fruit in the case of brambles and blueberries. Strawberries are most often slashed or partially consumed. Some birds, such as jays, robins, and woodpeckers can easily peck out larger berries. However, most birds prefer a berry size of 1/2-inch or less in diameter so that they can swallow the berry whole. Smaller birds may puncture fruit, leaving them open to infection by fruit rots. Punctured fruit are difficult to detect during harvest and sorting. Berries developing post-harvest fruit rots jeopardize pack quality. *(Blueberry damage photos courtesy of T. Peerbolt, Peerbolt Crop Management, Inc.)*

De-Bird or Not to De- Bird, That is the Question?!

On many farms bird damage is minimal. Growers may choose to ignore the problem or consider small losses incurred as part of the costs of small fruit production. Other growers may experience substantial losses with large portions of the crop being consumed or damaged. If you have experienced serious bird damage in the past, there is definitely cause for continued concern. If bird damage in your plantings has been minimal, you may only need to adress bird management in years when damage is likely to increase significantly.

How to decide if bird management is warranted? A study done in New Zealand (Spurr and Coleman, 2005) suggests a simple pretreatment cost-benefit analysis of the bird control technique(s) under consideration should be used to make bird management decisions. In this instance, the bird control technique under review was repellents. Cost effectiveness was calculated based on the cost and effectiveness of each repellent, the value of the crop, and the loss to birds if the crop was not protected (Table 1). Total cost was cauculated based on cost of raw materials + labor to make an application *x* the number of applications needed.

Table 1. Maximum total cost per acre allowable for a bird repellent treatment to be cost-effective on a berry crop yielding $10,000/acre[1]. *(Source: Spurr and Coleman, 2005 with some revision by the author)*

	Effectiveness of treatment (i.e. reduction in loss to birds)			
Loss to Birds	25%	50%	75%	100%
5%	<$125	<250	<$375	<$500
10%	<$250	<$500	<$750	<$1,000
20%	<$500	<$1,000	<$1,500	<$2,000
30%	<$750	<$1,500	<$2,250	<$3,000

[1]*For berry crops of differing values, simply multiply the values in the table by the value of the berry crop divided by $10,000 i.e. for berry crops valuing $25,000/acre, multiply the corresponding table value by 2.5. For a berry crop valuing $5,000/acre multiply the correspondingvalue by 0.5.*

So, for example, if your berry crop is worth $10,000/acre, the expected loss to birds without treatment is 20%, and the bird repellent under consideration is 50% effective, then the repellent should cost less than $1,000/acre to be cost effective. The same sort of simple cost benefit analysis would also be applicable to other bird management techniques. In

the case of netting or other durable equipment suh as distress callers or canons, however, the duration of the technique (i.e. life of the netting) would need to be factored in as well.

A Bird in the Hand is Worth Two in the Bush

In the event a bird problem develops, how to determine who is the culprit? Which of our feathered “friends” are just flying by and which are the ones to keep an eye out for in your small fruit plantings? Fire up those binoculars and do a little investigative birding. Early morning and evenings before dusk are times when birds are most active. Take that lawn chair and cup of coffee to the field and be prepared to be “vewry, verwy quiet!” Refer to Table 2 for information on the most probable miscreants and their ID. While these may be the most frequent/numerous visitors to your berry plantings, other birds may visit as well (Table 3).

Table 2. Common berry-feeding birds and their identification.

European Starling *(Sturnus vulgaris)*	Starlings have shiny black plumage spangled with white. They walk rather than hop. Starlings are noisy birds uttering a wide variety of mechanical-sounding and melodic sounds, including a distinctive "wolf whistle." These birds will eat almost anything, including farmland invertebrates, berries, and garbage. They may descend on plantings in large flocks. Smaller fruits like blueberries are consumed whole; larger fruits such as strawberries may be slashed.	
Red-Winged Blackbird *(Agelaius phoeniceus)*	The common name for this species is taken from the mainly black adult male's distinctive red shoulder patches, or "epaulets", which are visible when the bird is flying or displaying. At rest, the male also shows a pale yellow wing bar. The female is blackish-brown and paler below. The female is considerably smaller than the male, at 7 inches verses his 9.5 inches. The Red-winged Blackbird feeds primarily on plant seeds, including weeds and waste grain. In season, it eats blueberries, blackberries, and other fruit.	 
House Finch (*Carpodacus mexicanus*)	Adults have a long brown tail and are a brown or dull-brown color across the back with some shading into deep grey on the wing feathers. Breast and belly feathers may be streaked. In most cases, adult males have a reddish color to their heads, necks and shoulders. Adult females have brown upperparts and streaked under parts. House Finches forage on the ground or in vegetation. They primarily eat grains, seeds and berries. In blueberries, they start at the top of the bush and peck berries in rapid succession, leaving many berries damaged.	

Cedar Waxwing (*Bombycilla cedrorum*)	The Cedar Waxwing has smooth, silky plumage and a "bandit mask" It is between the size of a sparrow and a robin. Waxwings eat berries and sugary fruit year-round. When the end of a twig holds a supply of berries that only one bird at a time can reach, members of a flock may line up along the twig and pass berries beak to beak down the line so that each bird gets a chance to eat. Cedar Waxwings often feed in large flocks numbering hundreds of birds. They will move in huge numbers if berry supplies are low.	
American Robin (*Turdus migratorius*)	The American Robin is 10–11 in long. It has gray upperparts and head, and orange under parts, usually brighter in the male. It has a small yellow beak and distinctive crescents around the eyes. Food consists mainly of insects and earthworms. Robins are also fond of some berries; they will fly in especially to feed on them during periods when they ripen. Robins may feed in large flocks from roosting sites. They, along with starlings, are probably the birds most frequent reported as causing small fruit bird problems.	
Common Grackle (*Quiscalus quiscula)*	The 11-13" adults have a long dark bill, a pale yellowish eye and a long tail; their plumage is an iridescent black. Adult females are slightly smaller and less glossy. Grackles forage on the ground, in shallow water or in shrubs; they will steal food from other birds. They are omnivorous, eating insects, minnows, frogs, eggs, berries, seeds and grain, even other smaller birds.	
Sea Gulls (*Larus spp.*)	Gulls are typically medium to large birds, usually grey or white, often with black markings on the head or wings. They have stout, longish bills, and webbed feet They are omnivorous; their diet may include insects, fish, grain, berries, eggs, earthworms and rodents.	

(Sources for descriptions and images: Wikipedia: http://en.wikipedia.org/wiki/English.)

Table 3: Feeding Preferences of Common Northeastern Species of Birds

Most of diet is fruits and berries			
Catbird, Gray	**Waxwing, Cedar**		

Some of diet is fruits and berries			
Bluebird, Eastern	**Grackle, Common**	**Robin, American**	Towhee, Eastern
Blackbird, Red-winged	Grosbeak, Rose-breasted	Siskin, Pine	Vireo, Red-eyed
Bluebird, Eastern	**Gulls**	Sapsucker, Yellow-bellied	Vireo, White-eyed
Bobwhite, Northern	Jay, Blue	Sparrow, Song	Vireo, Yellow-throated
Bunting, Indigo	Kingbird, Eastern	Sparrow, White-throated	Warbler, Palm
Cardinal, Northern	Kingbird, Gray	**Starling, European**	Warbler, Yellow-rumped
Crow, American	Kinglet, Ruby-crowned	Swallow, Tree	Woodpecker, Downy
Dove, Mourning	Meadowlark, Eastern	Tanager, Summer	Woodpecker, Hairy
Finch, House	Mockingbird, Northern	Thrasher, Brown	Woodpecker, Pileated
Finch, Purple	Oriole, Baltimore	Thrush, Hermit	Woodpecker, Red-bellied
Flicker, Northern	Oriole, Orchard	Thrush, Wood	
Flycatcher, Great Crested	Phoebe, Eastern	Titmouse, Tufted	

*(Source: **NSiS: Florida's Fruit- and Berry-Eating Birds**. Names in bold indicate the most common species found in small fruit plantings.)*

Your Bird Management Arsenal- Everything But the Kitchen Sink?!
Whatever the tactics employed, decisions on bird management need to be pro-active. Discouraging bird feeding becomes difficult, if not impossible, once a feeding pattern has been established and birds recognize your planting as a food source.

Is a somewhat peaceful co-existence possible? Yes, if you take a long-term approach to bird management and have your annual tactics in place and employed well before fruit begins to ripen. Use several tactics simultaneously, and vary the types and locations of tactics frequently for best results.

Remember to keep good records from year to year on amounts of bird damage occurring, control tactics used, and their success (or lack thereof) , along with environmental conditions of years when bird damage increased. Be vigilant in observation and scouting, and always begin tactics before fruit begin to ripen and feeding habits become established.

What bird management tactics should you include in your arsenal? Everything but the kitchen sink! Seriously, birds, like other animals, become accustomed to various scare tactics over time. Those distress call tapes that worked so well the first week may not be as successful by weeks 2 and 3. Unfortunately, no one single tactic is effective as a stand alone method of bird control, with the exception of bird netting.

Tactics to consider include the following: cultural practices, exclusion, sensory deterrents, scare devices, and protection/development of predator habitat. Each tactic is discussed below. See Resource lisrt at the end of the artcile for sources (not an exhaustive list, by any means...)

Cultural Management Practices
One of the bird management tactics to consider begins before planting! Cultural management begins with site selection. The site where your planting is located may be a critical factor in bird problems later so choose wisely.

While all small fruit plantings are susceptible to damage, those located closer to urban environments where robins and starlings are more abundant may have greater damage. Isolated plantings may receive more damage. Smaller plantings tend to exhibit more damage than larger plantings. So much fruit is available in larger plantings that damage on any one site is generally low.

Locate new plantings away from convenient cover or perch sites such as woods, hedgerows, power lines, and brushy fields. Control grass and weeds in and around plantings to limit numbers of seed-eating birds.

Bird damage to small fruit is often greatest on early ripening varieties, as they mature when other fruits may not be available. Netting on these varieties may be cost effective.

Exclusion
Various methods of exclusion may be used, including row covers, netting, and other types of physical barriers. These barriers simply prevent birds from reaching fruit.

Netting continues to be the most complete and effective way to reduce bird damage in small fruit plantings. That said, it is relatively expensive compared to other methods and probably the most labor intensive. However, it is also the most durable. Netting materials, with proper care, may last 3 to 10 years.

In some cases, netting is placed directly over plants or bushes. In other instances, a framework is constructed over the planting and netting is suspended on the frame.

Several commercial small fruit growers in the northeast use netting on frames, supported by wire. The netting support structure is 6 to 10 feet above the ground and allows for routine agricultural activities to be carried on under the netting, such as spraying, mowing, and fruit harvest. Netting is removed and stored each season to prolong netting life.

Nylon, polyethylene, cotton, plastic-coated wire and other netting materials are available. Select netting with a ¾" mesh to exclude small birds. Support posts that are pounded rather than augured give stronger support. Augered posts should be set in concrete for additional stability. Tops of poles are generally covered with some type of smooth covering (rubber inner tubes, plastic bottles etc.) to protect netting as it is applied and removed, and as it moves in the wind. Pounded anchor posts need to be set outside netted areas to serve as additional support for outside posts.

Bird netting cost varies considerably with type, manufacturer, and quality (available from many sources, see list at end of article). The intial installation costs may be quite high but costs may be pro-rated over the 3 to 10 year life of the material. One estimate indicates material and labor to erect a 1 acre bird netting system 7-8 ft in height is approximately $2,280 (Dellamano, 2006). Additional annual costs involved application, removal and winter storage of netting; these costs were estimated to be approx. $619/acre for the same system.

Sensory deterrents

Sensory deterrents are those which assault the senses. They may be olifactory (smelly!), gustatory (taste bad!), auditory (the Noise, oh the Noise, Noise, NOISE, **NOISE**!), or visual (*SCAR-R-R-R-EY!*). Sensory deterrents may target a single sense, such as a repellent applied to fruit to discourage feeding or more than one sense such as motion acitvated lights/sprinklers, or owl models which emit predator calls followed by bird distress calls.

Chemical Repellents

Bird repellents are often portrayed as an effective, "clean, green" method of bird management (Spurr and Coleman, 2005). There are currently 2 bird repellents labeled for use in NY State. They are the methyl anthranilate-based products Bird Shield and Rejex-It Crop Guardian. Research here and in other states (Michigan, Oregon, Washington, Florida) indicates these products have both positive and negative aspects.

The active ingredient methyl anthranilate is similar to the chemical responsible for the major flavor component of Concord grapes. It is manufactured in large quantities by food processors and is considered safe for human consumption by the FDA. However, it is a volatile compound and has a short residual on exposed fruit giving good repellency for approx. 3 days, then gradually loosing effectiveness. In addition, a large amount of product needs to be consumed in one bite in order for it to be most effective. Application technologies for small fruit such as air blast sprayers are designed to apply small amounts of product uniformly over larger areas, thus reducing product efficacy.

Applications of sucrose syrups have been demonstrated to repel birds from blueberry plantings. The exact method of repellency is not well documented, but it is thought birds such as European Starlings and American Robins are unable to digest the disaccharides in sugar. Most birds are able to digest simple monosaccharide sugars found in fruits (Brugger *et. al.*, 1993).

Sugar solutions in New York were applied to blueberry plantings when fruit began to turn blue. In this trial 230 lbs of sugar was dissolved in 21 gallons of hot water, for a total of 40 gallons of sugar solution. Olympic Spreader Sticker was also added at 310 PPM. The treatment cost $40-$50/acre and was applied 4 times during the season for a total control cost of $160. Bird damage was reduced 50% where sugar solution was applied verses untreated adjacent plots. The toal expense was far less than losses to birds experienced in the non-treated plot. An increase in Japanese beetles and yellow jackets was observed, however, in year 2 in treated plots.

Auditory Scare Devices

Sound may be used as bird repellent, causing fear, pain, disorientation, communication jamming, audiogenic seisures or internal thermal effects. The sounds most frequently used fall into 2 categories: distress calls, and noise makers (pyrotechnics).

(Netting and distress caller photo courtesy of T. Peerbolt, Peerbolt Crop Management, Inc.)

Distress call repellers have been used successfully to drive birds from fields or roosts.

However, these calls are species specific, so a grower must be able to identify the bird causing damage for them to be successful. Units are also available that incorporate predator calls as well as distress calls. Most units are programmable as to time between calls, species of bird, randomized calls, etc. Units are battery, solar, or electrically powered. Smaller units cover 1-3 acres; larger units may cover up to 8 acres.

Units range in price from $250 to $3,500 depending on the size of the area to be protected, power supply, cables, and additional speakers needed (available from many sources, see list at end of article).

Some auitory units come packaged in the form of visual deterrents. One unit available is in called the “Screech Owl” (Birdbusters), and pivots on a bearing with the wind, providing both auditory and visual deterrent in one unit. Four predator/scare sounds are programmed in the unit: birds in distress, predator attack cries and wing beats from birds taking flight. The rotating base mounts easily to any flat surface and spins in the wind. A photo cell activates the sounds during daylight hours only ($95).

A similar unit, sold as the “Eagle” (Spec Trellising) also provides both auitory and visual deterrents. This bird-scare device (a large black bird shaped kite with a 5' 6" wingspan and 3' 4"in height) is launched into flight by the wind. The Eagle flaps its wings as it darts around the sky, adding both movement and a "swooshing" noise to scare away hungry birds. As the wind eases off, a counterweight retracts the line back into the pole, leaving the Eagle perched atop it’s pole. The 45 degree angled PVC top section encloses a 11'6" line which launches the birdscarer into the wind. The kite, when not in motion, sits upon a 20' steel pole scaring birds by it’s very presence, shape and color. One Eagle is recommended per 2.5 acres.

New York studies have shown distress call devices to be effective for 7-10 days in plantings with high bird pressure. Use of predator models in conjunction with distress call units gave further reduction in feeding. Best results were obtained when units were moved regularly and used in conjunction with visual scare devices. Distress calls have a tendency to have more long-term effects than noise makers, which rely on fear or avoidance of perceived danger.

Pyrotechnics, or noise makers, such as bangers, poppers, sirens, and so on provide short term control of birds. They may include Bird Bombs, Bird Whistlers, and Shell Crackers (Sutton Ag). However, these products are often as annoying to neighbors and customers as they are to the birds! *(Bird Canon photo courtesy of T. Peerbolt, Peerbolt Crop Management, Inc.)*

In fact, a group of concerned (annoyed) citizens in British Columbia has even developed a web site called, appropriately, Ban the Canon, located at: http://bancannons.tripod.com/devices.html. This web site provides information on all sorts of bird control alternatives to pyrotechnics in an effort to reduce noise pollution caused by propane canons and the like in their province!

The “Zon Gun” (Birdbusters, Sutton Ag) pictured left is a lightweight portable propane-fired cannon emits automatic thunderclaps that deter pest birds and other nuisance wildlife. The intervals between detonations can be adjusted from 2-30 minutes. The Zon Gun operates on LP gas and uses a 'piezo' lighter for ignition, that is good for 100,000 sparks. Eack 10kg bottle of propane produces 12-15,000 detonations. The standard model is fully automatic, ground mounted, simple, practical, effective and rotates a full 360 degrees for wide coverage. Cost for this unit, plus timer and tripod is $650.

Visual Deterrents

Many types of visuals scare devices are available from simple holographic tapes to large predator kites. Terror eyes are an inflatable visual scare device that confuses birds with lifelike reflective predator eyes and markings. They come in 3 colors (black, orange and yellow) and cost approximately $5 - $45 each (available from many sources, see list at end of article).

Another visual scare device is flash tape, or holographic ribbon. These come in various length rolls, materials and colors and repell birds by producing an optical, audible discomfort zone. Made from holographic Mylar foil, holographic ribbons provide spot control for nuisance birds by producing an optical, audible and physical discomfort zone. The light reflected from its holographic surface is menacing to most pest birds. A light breeze provides movement and a metallic rattle which encourages birds to keep their distance.

Application is easy; with scissors, cut several pieces of ribbon 2 to 3 foot long. Position the length of ribbon where nuisance birds will see and hear it. Fasten them at one end to the desired locations using Velcro, string, twine, staples, etc. Make sure the length of ribbon can move freely with the wind. Approximate cost of this type of material ranges from $4-$88 a roll depending on roll length and material (available from many sources, see list at end of article).

Other Devices

Other bird scare devices utilize various techniques such as lights, sprinklers, and motion. “Scarecrow” is one such device which uses an infrared sensor that detects birds when they are present, and releases an immediate shot of water to startle them and keep them away. Scarecrow protects day and night for up to 6 months (or 3000+ activations) on one 9 volt battery. Scarecrow covers aproximately 1,600 sq. ft. in a single blast of water. (connection to a garden hose is required for operatio of this device. Prices for these units range from $80 to $100 for these units (available from many sources, see list at end of article).

Another device, “ScareWyndmill” uses motion to frighten birds, along with blades painted with special uv light reflecting paint. Purportedly to the birds the uniquely painted spinning blades look like the flapping of wings of a flock of birds taking off in fright. The 36" diameter blades repel birds in up to a one acre area. Approximate cost for these is $79 each)JWB Marketing. They have been found effective on small birds, and tested in blueberry plantings.

Encouraging Natural Predators

Owls and Hawks are natural predators of birds that may be a problem in small fruit plantings. One method of bird management to consider then is how best to encourage these birds to live in the vicinity of berry plantings. An easy way to encourage owls is to install nest boxes the size that owls would use. Sharp-shinned hawks surprise and capture all their prey from cover or while flying quickly through dense vegetation. They are adept at navigating dense thickets. The great majority of this hawk's prey is small birds, especially various songbirds such as sparrows, wood-warblers and American Robins. Birds caught have ranges in size from a 4.4 g-Anna's Hummingbird to a 577 g (1.2 lb)-Ruffed Grouse and any bird within this size range is potential prey. Typically, males will target smaller birds, such as sparrows, and females, will pursue larger prey, like robins and flickers. The Sharp-shinned Hawk is a regular visitor to bird feeders, where it eats birds, not seed.

There are also companies who will visit your property and bring trained hawks or falcons with them to attack your bird situation. According to their information, once a hawk starts circling a field, problem birds leave the area very quickly. Usually hawk silhouettes or heli-kytes that simulate hawks in flight are flown simultaneously, and the problem birds will stay away for a good while thinking that the silhouettes are the real thing. These companies also give recommendations for more permanent bird control solutions.

A Word About Wildlife Conservation and Protection

The following birds, for various reasons, may be permanently removed from plantings: European Starling (introduced species not protected by state or federal law), , Red-winged Blackbird (protected by State and Federal law--but a depredation order allows you to take these birds *when they are committing or about to commit damage to crops*.) and American Crow (protected by State and Federal law--but a depredation order allows you to take these birds *when they are committing or about to commit damage to crops*.)

All other species listed in Table 3 are protected by State and Federal law and would require special permits from the Federal government (US Fish and Wildlife Service) and the State (New York Department of Environmental Protection) to live trap and relocate or kill these birds to protect crops.

If You Can’t Beat ‘Em, Feed ‘Em

As a last resort, after a feeding pattern has already been established and other methods have failed, consider placing feeders filled with sunflower, millet, nectar, and peanuts away from plantings to distract birds from fruit. (Remember sharp-shinned hawks frequent feeders...) Or plant border rows with smaller berried plants outside the main planting as an alternative food source to the larger berried varieties inside the planting. Then get out that lawn chair and those binoculars again, sit back and enjoy the view!

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Photo credits: Many thanks to Tom and Anna Peerbolt of Peerbolt Crop Management Inc. (PCM), for their willingness to share some of Tom's excellent photos. Tom and Anna's on line newsletter, *Small Fruit Update*, while targeting the Northwestern part of the country, is an excellent small fruit resource located at: http://www.peerbolt.com/pcmupdate.htm.

Bird Control Resources

Bird Control Resources:

Bird-B-Gone, Inc.
Mission Viejo, CA
800-392-6915
http://www.birdbgone.com/birdnet2000.htm

Nixalite of America Inc
1025 16th Avenue
East Moline, IL. 61244, USA
888-624-1189
http://www.nixalite.com/

Bird-X Inc.
300 N. Elizabeth St.
Chicago, IL. 60607 U.S.A
800-662-5021
http://www.bird-x.com/

Fly Bye Bird Control Products
13609 NE 126th PL #150
Kirkland, WA 98034
1-800-820-1980
http://www.flybye.com/

Spec Trellising
www.spectrelising.com
info@spectrellising.com
1-800-237-4594

Birdbusters
300 Calvert Avenue
Alexandria , Virginia 22301
1-800-NO-BIRDS (662-4737)
http://www.birdbusters.com/

BirdGuard Bird Control Products
100 State Street
Erie PA 16507
1-800-455-5167
http://www.birdguard.com/

BirdShield Repellant Corporation
PO B ox 141556
Spokane, WA 99214-1556
866-272-2473
http://www.birdshield.com/

Sutton Agricultural Enterprises, Inc.
746 Vertin Ave.
Salinas, CA 93901
866 280-6229
http://www.suttonag.com/

JWB Marketing LLC
2308 Raven Trail
West Columbia, SC 29169
800 555-9634
http://www.scarewindmill.com/

WEATHER NOTES

NEW YORK CROP WEATHER SERVICE NOTES

Week ending May 20th: The week began dry and cool with a broad area of high pressure building in from southeastern Canada and the Great Lakes region. A warming trend occurred Monday into Tuesday, as the area of high pressure moved off the Mid-Atlantic Coast. A warm front on Tuesday brought scattered showers and thunderstorms, especially from the Mohawk Valley northward into northern New York. A wave of low pressure moving across northern New York and its associated cold front brought scattered showers and thunderstorms across much of New York State Tuesday night through Wednesday. Damaging winds from some of the thunderstorms were common across the lower Hudson Valley Wednesday afternoon. High pressure near the upper Mississippi River Valley brought mainly dry weather on Thursday. A coastal low brought some showers to southern New York on Friday, and a widespread soaking rainfall to eastern New York on Saturday. Precipitation for the week was above normal across northern and eastern New York, as well as Long Island. Rainfall was generally below normal over western New York, and the western Finger Lake Region. Temperatures for the week were below to slightly below normal. The warmest day of the week across central and eastern New York was Tuesday. In Onondaga County, strawberries showed some blossoms. Growers were expected to spray for disease and insects sometime this week.

Week ending May 27th: Except for some rain early Sunday, it was a dry week across the region with total rainfall amounts of a tenth of an inch or less. The exception was northeast New York where a departing system brought heavy convective rains Sunday afternoon and evening with amounts ranging from a quarter inch to two inches. The week began cool with average temperatures about 5 to 10 degrees below normal and areas of frost Monday and Tuesday mornings. By Thursday and Friday temperatures were averaging 10 to 15 degrees above normal with highs between 80 and 90. In Albany County, strawberry bloom was good with the first berries expected in early June.

Week ending June 3rd: The week began dry and seasonable then warmed to above normal by Wednesday. Temperatures reached the mid to upper 80's Wednesday through Saturday in most areas and around 90 in southern areas. Scattered thunderstorms affected the region Thursday through Saturday, with locally severe weather in the Adirondacks, Catskills, Schoharie Valley, and Mohawk Valley. Most areas received less than a tenth of an inch of rain but localized amounts over an inch occurred where scattered thunderstorms were experienced. In Onondaga County, strawberries were in full bloom and appeared to be in good conditions. In Albany County, growers so far were satisfied with the growing season. Planting went well, good blooms occurred, and growers were able to spray when needed. Growers in Dutchess County were excited that most fruit crops observed were in excellent conditions and had escaped damaging frost. One grower reported that this has been the first time in many years growers did not file notices of loss on early fruit.

Week ending June 10th: Precipitation was above normal for the week across most of the state with temperatures averaging near normal. The week started off wet with slow moving thunderstorms across southeast portions of the state on Sunday and the remnants of Tropical Storm Barry impacting much of the state Sunday into Monday. Some locations in the Catskills picked up over 5 inches of rain during these two days. On Tuesday, a strong cold front moved through the state with strong to severe thunderstorms ahead of the front producing hail in many areas along with some damaging wind gusts. This cold front also brought very cold air to the state with frost occurring on Tuesday night across parts of the Adirondacks. From Wednesday through much of Friday, dry weather occurred across the state as a large ridge of high pressure moved into the state with a significant warming trend occurring during the period. High temperatures rose from the 50's and 60's on Wednesday to the 60's and 70's on Thursday to the 80's and 90's on Friday. On Friday evening another round of strong to severe thunderstorms impacted western and central New York ahead of another cold front with many reports of wind damage and a few large hail reports. The storms weakened considerably as they moved into eastern New York. On Saturday, mainly dry and seasonable conditions occurred across the state with high temperatures in the 70's and 80's. In the Long Island fruit region strawberry harvest is underway. "Pick your own" berries will begin soon.

Week ending June 17th: Temperatures were fairly close to average, while precipitation was generally below average except for locations that received thunderstorms. The weather pattern during the early part of the week featured a persistent upper level cut off low pressure system that meandered near the New England coast, and a dominant high pressure system across the western and central Great Lakes. Moisture wrapping around the low brought periodic episodes of showers and thunderstorms to portions of east and central New York on Monday and Tuesday mainly during the afternoon and evening hours. The upper low than shifted southward towards the Mid-Atlantic region, allowing high pressure to build in across the state from Wednesday through Friday. By Saturday though, the upper low shifted back into the region which once again resulted in scattered showers and thunderstorms during the afternoon and evening hours. In Oneida County, strawberry harvest was underway. In Albany County, strawberry picking began throughout the area and the berry quality looked good. Harvest also got started in Onondaga County. Size seemed a little small.

Solution to Berry Tyme Puzzle from last month's issue:

		C	O	B	B	L	E	R	S	E	I	H	T	O	O	M	S	T	I	U	R	F
J	U	I	C	E				E	L	D	E	R	B	E	R	R	Y			B		S
Y	R	R	E	B	P	S	A	R	D	E	R		S	Y	R	U	P		L			T
F	R	U	I	T	S	A	L	A	D	K					C	R	E	A	M			N
L			S	E	N	A	C	M	A	A			G	N	I	K	C	I	P		Y	I
A	S	T	R	A	U	Q				C					S	K	P	Y	D	R	G	P
E	H	A	R	V	E	S	T	A	R	T	A			A	B	R	R	E	R	O		H
R	S				M		J			R			B	E	E	R	W	E	O	W		C
E	R				A			A		O			R	S	E	B	B	S		S		T
C	A		M		E	C			M	H		R	E	B	E	E	E			G		A
S	I	T	U		R	U	E			S	Y	R	W	R	U	B	F	I	E	L	D	P
E	R	E	F		C	R	I				V	A	R	L	E					A	Y	Y
H	B	B	F		E	R	P			E	R	Y	B	R						Z	L	R
S		R	I		C	A			S	T			R	S	L	I	A	P		E	L	R
U		O	N		I	N			S			Y	B	R	A	M	B	L	E	S	E	E
B		S	S	R	E	T	I	Y	R	R	E	B	S	A	R	K	C	A	L	B	J	B

Questions or Comments about the New York Berry News?

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

WEATHER REPORTS OF TEMPERATURES AND PRECIPITATION THROUGHOUT NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am, May 20th, 2007

	Temperature				Growing Degree Days (*Base 50*)			Precipitation (*inches*)			
	High	***Low***	***Avg***	***DFN[1]***	***Week***	***YTD[2]***	***DFN***	***Week***	***DFN***	***YTD***	***DFN***
Hudson Valley											
Albany	85	36	57	-2	49	219	57	1.49	0.72	8.77	3.64
Glens Falls	81	30	53	-4	31	144	22	1.01	0.17	6.50	1.22
Poughkeepsie	88	35	60	2	72	277	83	0.94	-0.04	9.30	3.02
Mohawk Valley											
Utica	75	34	49	-5	17	87	3	1.06	0.08	6.27	-1.18
Champlain Valley											
Plattsburgh	69	35	50	-7	25	151	28	1.80	1.17	6.17	1.57
St. Lawrence Valley											
Canton	71	32	50	-5	25	135	31	1.64	0.99	5.29	0.56
Massena	71	33	51	-6	25	143	24	1.39	0.83	4.94	0.69
Great Lakes											
Buffalo	75	38	55	-3	39	173	24	0.68	-0.02	3.79	-1.05
Colden	79	32	51	-5	24	116	10	0.85	0.07	4.79	-1.24
Niagara Falls	82	35	55	-3	41	167	4	0.74	0.11	3.93	-1.08
Rochester	81	37	57	-1	56	216	47	0.17	-0.46	3.66	-0.67
Watertown	74	31	51	-4	28	127	19	1.08	0.45	3.07	-1.14
Central Lakes											
Dansville	88	31	53	-5	35	161	8	0.44	-0.19	3.40	-1.21
Geneva	81	36	54	-3	42	156	13	0.63	-0.02	4.88	0.12
Honeoye	84	30	54	-4	41	171	25	0.63	0.00	4.55	-0.18
Ithaca	85	29	52	-4	34	145	23	0.34	-0.42	4.25	-0.72
Penn Yan	86	34	56	-1	55	207	64	0.37	-0.28	4.39	-0.37
Syracuse	84	35	55	-3	48	189	21	0.31	-0.40	4.79	-0.61
Warsaw	78	32	51	-4	27	120	28	1.19	0.42	5.86	0.29
Western Plateau											
Alfred	85	27	51	-4	28	102	11	0.43	-0.21	4.02	-0.52
Elmira	88	27	54	-3	49	176	41	0.20	-0.50	2.88	-1.78
Franklinville	83	27	51	-2	30	107	36	0.39	-0.38	4.38	-1.10
Sinclairville	84	32	52	-2	30	149	55	0.53	-0.35	5.70	-0.58
Eastern Plateau											
Binghamton	85	33	55	-2	44	188	60	0.38	-0.39	3.89	-1.39
Cobleskill	80	32	52	-4	28	137	24	1.61	0.77	10.56	5.00
Morrisville	77	34	51	-5	22	113	8	0.59	-0.25	6.10	0.70
Norwich	87	29	52	-5	26	111	-6	1.28	0.44	6.93	1.19
Oneonta	86	32	55	1	36	169	69	1.40	0.42	9.57	3.37
Coastal											
Bridgehampton	68	37	55	-2	41	176	51	1.63	0.79	8.54	2.08
New York	89	50	64	2	96	404	117	0.84	0.00	13.91	7.62

1. *D*eparture *from N*ormal
2. *Y*ear *to 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 27th, 2007

	Temperature				Growing Degree Days (*Base 50*)			Precipitation (*inches*)			
	High	***Low***	***Avg***	***DFN[1]***	***Week***	***YTD[2]***	***DFN***	***Week***	***DFN***	***YTD***	***DFN***
Hudson Valley											
Albany	89	39	65	5	105	324	90	0.00	-0.79	8.77	2.85
Glens Falls	90	32	61	3	81	225	42	0.20	-0.64	6.70	0.58
Poughkeepsie	92	40	66	6	117	394	122	0.00	-0.98	9.30	2.04
Mohawk Valley											
Utica	83	36	59	4	67	153	26	0.03	-0.96	6.30	-2.14
Champlain Valley											
Plattsburgh	87	35	60	2	72	223	39	0.20	-0.47	6.37	1.10
St. Lawrence Valley											
Canton	86	34	61	4	79	214	58	0.05	-0.65	5.34	-0.09
Massena	88	33	61	3	77	220	44	0.11	-0.46	5.05	0.23
Great Lakes											
Buffalo	86	41	65	6	107	280	64	0.01	-0.72	3.80	-1.77
Colden	84	34	61	5	81	197	39	0.13	-0.71	4.92	-1.95
Niagara Falls	87	37	63	4	96	263	31	0.02	-0.67	3.95	-1.75
Rochester	91	38	65	6	109	325	88	0.00	-0.63	3.66	-1.30
Watertown	83	32	58	2	63	190	30	0.03	-0.60	3.10	-1.74
Central Lakes											
Dansville	89	35	63	5	95	254	35	0.23	-0.45	3.58	-1.71
Geneva	86	36	63	5	90	246	39	0.12	-0.59	5.00	-0.47
Honeoye	88	31	62	4	94	265	53	0.03	-0.63	4.58	-0.81
Ithaca	87	30	61	4	83	229	50	0.13	-0.64	4.28	-1.46
Penn Yan	87	38	65	7	104	311	104	0.14	-0.57	4.53	-0.94
Syracuse	89	38	63	4	95	284	45	0.08	-0.69	4.87	-1.30
Warsaw	83	35	61	6	83	203	63	0.18	-0.64	6.04	-0.35
Western Plateau											
Alfred	87	32	59	4	73	175	37	0.27	-0.47	4.29	-0.99
Elmira	89	30	63	4	85	261	64	0.00	-0.77	2.88	-2.55
Franklinville	86	33	59	6	71	178	68	0.35	-0.48	4.73	-1.58
Sinclairville	86	37	61	6	81	227	87	0.11	-0.81	5.81	-1.39
Eastern Plateau											
Binghamton	85	38	63	5	94	282	94	0.10	-0.67	3.99	-2.06
Cobleskill	87	34	61	4	82	219	52	0.09	-0.77	10.65	4.23
Morrisville	86	37	61	4	80	193	36	0.16	-0.72	6.26	-0.02
Norwich	87	32	61	4	80	191	19	0.01	-0.85	6.94	0.34
Oneonta	90	34	63	7	93	262	112	0.18	-0.80	9.75	2.54
Coastal											
Bridgehampton	88	42	64	5	96	272	86	0.01	-0.83	8.55	1.25
New York	89	55	71	7	149	553	165	0.04	-0.80	13.95	6.82

1. *D*eparture *from N*ormal
2. *Y*ear *to D*ate: 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, June 3rd, 2007

	Temperature				Growing Degree Days (*Base 50*)			Precipitation (*inches*)			
	High	***Low***	***Avg***	***DFN[1]***	***Week***	***YTD[2]***	***DFN***	***Week***	***DFN***	***YTD***	***DFN***
Hudson Valley											
Albany	89	51	71	9	146	470	149	0.70	-0.14	9.47	2.71
Glens Falls	87	44	68	8	127	352	96	0.54	-0.26	7.24	0.32
Poughkeepsie	91	49	72	10	156	550	185	0.61	-0.35	9.91	1.69
Mohawk Valley											
Utica	84	44	65	9	108	261	81	0.27	-0.78	6.57	-2.92
Champlain Valley											
Plattsburgh	79	44	64	4	99	322	63	1.05	0.35	7.42	1.45
St. Lawrence											
Canton	83	44	65	7	106	320	99	0.35	-0.36	5.69	-0.45
Massena	81	44	65	5	105	325	80	0.92	0.28	5.97	0.51
Great Lakes											
Buffalo	88	48	70	10	144	424	126	0.01	-0.79	3.81	-2.56
Colden	84	42	65	7	111	308	86	0.00	-0.90	4.92	-2.85
Niagara Falls	87	44	69	8	134	397	82	0.01	-0.73	3.96	-2.48
Rochester	90	46	71	10	147	472	155	0.01	-0.66	3.67	-1.96
Watertown	82	39	64	6	101	291	67	0.31	-0.32	3.41	-2.06
Central Lakes											
Dansville	90	43	70	9	138	392	93	0.19	-0.60	3.77	-2.31
Geneva	88	48	69	8	132	378	93	0.10	-0.68	5.10	-1.15
Honeoye	88	43	68	7	125	390	97	0.65	-0.11	5.23	-0.92
Ithaca	87	42	67	8	120	349	99	0.39	-0.45	4.55	-2.03
Penn Yan	89	45	70	10	142	453	168	0.21	-0.57	4.74	-1.51
Syracuse	89	47	70	9	140	424	104	0.35	-0.44	5.22	-1.74
Warsaw	83	42	65	7	104	307	108	0.35	-0.56	6.39	-0.91
Western Plateau											
Alfred	87	32	59	4	73	175	37	0.27	-0.47	4.29	-0.99
Elmira	89	30	63	4	85	261	64	0.00	-0.77	2.88	-2.55
Franklinville	86	33	59	6	71	178	68	0.35	-0.48	4.73	-1.58
Sinclairville	86	37	61	6	81	227	87	0.11	-0.81	5.81	-1.39
Eastern Plateau											
Binghamton	85	47	69	9	132	414	153	1.75	0.95	5.74	-1.11
						340			0.55	12.14	478.0
Cobleskill	86	45	67	8	121		106	1.49			0
Morrisville	85	44	66	8	117	310	90	0.31	-0.60	6.57	-0.62
Norwich	89	42	67	8	119	310	72	1.03	0.12	7.97	0.46
Oneonta	88	48	68	11	130	392	182	1.91	0.91	11.66	3.45
Coastal											
Bridgehamton	81	49	68	7	126	398	135	0.54	-0.31	9.09	0.94
New York	92	62	78	11	194	747	242	0.01	-0.83	13.96	5.99

1. *D*eparture *from N*ormal
2. *Y*ear *to D*ate: 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, June 10th, 2007

	Temperature				Growing Degree Days (*Base 50*)			Precipitation (*inches*)			
	High	***Low***	***Avg***	***DFN[1]***	***Week***	***YTD[2]***	***DFN***	***Week***	***DFN***	***YTD***	***DFN***
Hudson Valley											
Albany	90	40	66	2	113	583	160	1.66	0.81	11.13	3.52
Glens Falls	88	34	63	2	95	447	103	1.86	1.09	9.10	1.41
Poughkeepsie	91	42	65	1	110	660	189	1.46	0.55	11.37	2.24
Mohawk Valley											
Utica	84	37	59	0	72	333	87	1.84	0.75	8.41	-2.17
Champlain Valley											
Plattsburgh	86	36	61	-2	83	405	55	0.84	0.14	8.26	1.59
St. Lawrence Valley											
Canton	89	40	63	3	96	416	117	1.11	0.34	6.80	-0.11
Massena	90	40	63	2	91	416	88	1.12	0.42	7.09	0.93
Great Lakes											
Buffalo	88	45	66	3	115	539	145	1.22	0.38	5.03	-2.18
Colden	87	39	60	-1	73	381	83	0.89	-0.09	5.81	-2.94
Niagara Falls	88	43	65	2	108	505	93	1.01	0.22	4.97	-2.26
Rochester	92	41	66	4	116	588	179	0.99	0.29	4.66	-1.67
Watertown	90	39	64	4	99	390	91	0.91	0.21	4.32	-1.85
Central Lakes											
Dansville	88	42	63	0	97	489	96	1.07	0.18	4.84	-2.13
Geneva	91	41	63	-1	90	468	91	1.02	0.17	6.12	-0.98
Honeoye	88	38	63	-2	90	480	92	2.79	1.94	8.02	1.02
Ithaca	89	38	62	-1	85	434	100	0.77	-0.09	5.32	-2.12
Penn Yan	90	42	65	3	108	561	184	1.12	0.27	5.86	-1.24
Syracuse	92	41	65	3	107	531	117	1.90	1.06	7.12	-0.68
Warsaw	85	37	60	0	70	377	107	1.94	0.96	8.33	0.05
Western Plateau											
Alfred	84	36	59	-2	64	345	81	1.65	0.60	6.42	-0.81
Elmira	91	38	63	0	91	484	124	1.68	0.83	5.14	-1.96
Franklinville	88	35	60	2	72	354	129	1.82	0.84	6.94	-1.26
Sinclairville	87	41	62	2	83	426	153	1.23	0.18	8.51	-0.73
Eastern Plateau											
Binghamton	88	41	63	2	94	508	161	0.81	-0.03	6.55	-1.14
Cobleskill	89	38	62	1	87	427	113	1.30	0.32	13.44	5.10
Morrisville	89	37	61	0	80	390	96	1.20	0.24	7.77	-0.38
Norwich	89	38	62	1	86	396	79	1.32	0.35	9.29	0.81
Oneonta	92	38	65	5	104	496	213	1.06	0.08	12.72	3.53
Coastal											
Bridgehampton	76	48	64	1	96	494	139	3.36	2.47	12.45	3.41
New York	85	58	71	3	147	894	257	2.86	2.04	16.82	8.03

1. *D*eparture *from N*ormal
2. *Y*ear *to D*ate: 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, June 17th, 2007

	Temperature				Growing Degree Days (*Base 50*)			Precipitation (*inches*)			
	High	***Low***	***Avg***	***DFN[1]***	***Week***	***YTD[2]***	***DFN***	***Week***	***DFN***	***YTD***	***DFN***
Hudson Valley											
Albany	85	36	57	-2	49	219	57	1.49	0.72	8.77	3.64
Glens Falls	81	30	53	-4	31	144	22	1.01	0.17	6.50	1.22
Poughkeepsie	88	35	60	2	72	277	83	0.94	-0.04	9.30	3.02
Mohawk Valley											
Utica	75	34	49	-5	17	87	3	1.06	0.08	6.27	-1.18
Champlain Valley											
Plattsburgh	69	35	50	-7	25	151	28	1.80	1.17	6.17	1.57
St. Lawrence Valley											
Canton	71	32	50	-5	25	135	31	1.64	0.99	5.29	0.56
Massena	71	33	51	-6	25	143	24	1.39	0.83	4.94	0.69
Great Lakes											
Buffalo	75	38	55	-3	39	173	24	0.68	-0.02	3.79	-1.05
Colden	79	32	51	-5	24	116	10	0.85	0.07	4.79	-1.24
Niagara Falls	82	35	55	-3	41	167	4	0.74	0.11	3.93	-1.08
Rochester	81	37	57	-1	56	216	47	0.17	-0.46	3.66	-0.67
Watertown	74	31	51	-4	28	127	19	1.08	0.45	3.07	-1.14
Central Lakes											
Dansville	88	31	53	-5	35	161	8	0.44	-0.19	3.40	-1.21
Geneva	81	36	54	-3	42	156	13	0.63	-0.02	4.88	0.12
Honeoye	84	30	54	-4	41	171	25	0.63	0.00	4.55	-0.18
Ithaca	85	29	52	-4	34	145	23	0.34	-0.42	4.25	-0.72
Penn Yan	86	34	56	-1	55	207	64	0.37	-0.28	4.39	-0.37
Syracuse	84	35	55	-3	48	189	21	0.31	-0.40	4.79	-0.61
Warsaw	78	32	51	-4	27	120	28	1.19	0.42	5.86	0.29
Western Plateau											
Alfred	85	27	51	-4	28	102	11	0.43	-0.21	4.02	-0.52
Elmira	88	27	54	-3	49	176	41	0.20	-0.50	2.88	-1.78
Franklinville	83	27	51	-2	30	107	36	0.39	-0.38	4.38	-1.10
Sinclairville	84	32	52	-2	30	149	55	0.53	-0.35	5.70	-0.58
Eastern Plateau											
Binghamton	85	33	55	-2	44	188	60	0.38	-0.39	3.89	-1.39
Cobleskill	80	32	52	-4	28	137	24	1.61	0.77	10.56	5.00
Morrisville	77	34	51	-5	22	113	8	0.59	-0.25	6.10	0.70
Norwich	87	29	52	-5	26	111	-6	1.28	0.44	6.93	1.19
Oneonta	86	32	55	1	36	169	69	1.40	0.42	9.57	3.37
Coastal											
Bridgehampton	68	37	55	-2	41	176	51	1.63	0.79	8.54	2.08
New York	89	50	64	2	96	404	117	0.84	0.00	13.91	7.62

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

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