New York Berry News

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What's Inside

1. Current Events
   a. Upcoming Meetings
   b. Centennial Fruit Field Days Highlights
   c. A Farewell at Arms
2. End of Season Checklist - *Cathy Heidenreich*
3. Alternaria Rot affects Both Cherries and Blueberries - *Annemiek Schilder* and *George Sundin*
4. A Picture is Worth a Thousand Words - *Cathy Heidenreich*
5. Late Leaf Rust - *Annemiek Schilder*
6. Decontaminating and Winterizing of Airblast Sprayers - *Andrew Landers*
7. Weather Reports

Wet is the word for New York and the Northeast again this summer, with record-breaking rainfalls. However, torrential rains did not dampen spirits or attendance at the Cornell Centennial Fruit Field days held at Geneva, NY on July 27 and 28. Joe Ogrodnick brings us highlights from this event. Frequent, heavy rainfalls, coupled with below average temperatures for the months of July and August have set the stage for summer diseases on a large scale. Be on the look out for the berry "bad guys" mentioned below in the "End of the Season Checklist". Annemiek Schilder and George Sundin's article on Alternaria fruit rot of cherry and blueberry details one "bad guy" to be on the lookout for during this wet weather, especially on late season blueberries. Bramble rusts are also featured in another article courtesy of Annemiek. Other bramble bad guys are caught on film (digital, that is) for your viewing pleasure- check them out at the websites featured in "A Picture is Worth a Thousand Words." Keep that sprayer warmed up and working so the "berry bad guys" don't get the jump on you- weather permitting, of course! Then give that sprayer a much-needed facial with Andrew Lander's article on sprayer decontamination and winterizing.

Upcoming Meetings

September 9, 2004. NYSAES Annual Fall Fruit Tour, Geneva, NY. For more information, contact Art Agnello at ama4@cornell.edu.

September 25-October 2, 2004: *Haygrove's North American Grower Tour of England's High Tunnels*, London, UK. For more information call 866-429-4768.

October 6-8, 2004. *Northeast Division Meeting, American Phytopathological Society*, at Pennsylvania State College, State College, PA. **Deadline** for registration is **August 31st, 2004.** Contact Wade Elmer at Wade.Elmer@po.state.ct.us or call 203-974-8503.

October 26-27, 2004. *66th Annual Meeting of the New England, New York, Canadian Fruit Pest Management Workshop*, in Burlington, VT. **Deadline** for registration is **September 14th, 2004.** Contact Lorraine Berkett at lorraine.berkett@uvm.edu or Anne Marie Resnik, aresnik@uvm.edu or 802-656-0463.

Centennial Fruit Field Days Highlights

Joe Ogrodnick, Communications Services, NYSAES Cornell University, Geneva, NY

Wet weather did not dampen the spirits of attendees of the Cornell Centennial Fruit Field Days held at the Geneva campus on July 27 and 28, 2004 at the Cornell Geneva campus Fruit and Vegetable Research Farm. Tree fruit growers had it worst on July 27 with a daylong, often driving rain and some-times ankle deep mud, as the 2004 (Centennial) edition of the Fruit Field Days and Equipment Show got underway. The Centennial designation refers to this year's celebration of Cornell's College of Agriculture and Life Sciences 100th year

Although substantial rain made conditions miserable, those who attended were very appreciative of the presentations." Dr. Terence Robinson, one of the field day organizers, stated. "Several commented that while they were wet and cold, the information they had gleaned was very useful to their fruit growing business." The positive outlook prevailed throughout a day that dampened just about everything but the obvious enthusiasm of an umbrella-wielding, boot-clad crowd as they went from location to soggy location to listen to presentations by Cornell faculty and extension field staff.

During the lunch break, interim Station Director, Dr. Bob Seem spoke to the group. "I need to say welcome to the hardy folks that braved the summer storms to visit us today, he said. "What you see today is in the tradition of the land grant universities- those universities with the mission to support agriculture. Yet in many states, this sort of tradition is but a memory of what every college of agriculture and agricultural experiment station used to do, but does no more. We here in NY are fortunate that the fruit field day still exists." Seem went on to talk about change, including the opening phase of construction of the Ag Tech Park and the impact it will have on both the Station and those it serves. "The college's motto is 'Celebrating the Past, Shaping the Present, and Inspiring the Future'. Enjoy, stay dry, and have a great time," he concluded. "

The small fruit growers attending the second day of the tour experienced much better weather and were an equally enthusiastic crowd. Topics for the small fruit program included control of white pine blister rust on currants and gooseberries, blueberry and raspberry cultivar reviews and tastings, a comparison demonstration of mechanical strawberry weeders, operation of bed making and mulch laying equipment and blueberry bird deterrent devices and products.

In all, about 300 people were in attendance over the 2-day event. Attendees were treated to more than 50 presentations on research projects dealing with crop-load management, high-density orchard systems, rootstocks, disease and insect control, fruit quality, new variety development, genetic preservation, food safety, sprayer technology, and weed control. Financial sponsors of the event included 28 fruit supply and marketing businesses whose support provided a free lunch for the attendees. Several of the sponsors exhibited their products during the lunch period and several sprayer manufacturers demonstrated their machines during field tours.

A committee of researchers and extension field staff of the Cornell Fruit Program Work Team organized this event, which is held every 4 years. The committee included Terence Robinson, Art Agnello, Courtney Weber, Andrew Landers, Alison DeMarree, Dena Fiacchino, Nancy Long, Gemma Osbourne and Mark Scott. The faculty and extension agents who shared their research projects during the field day did an excellent job of communicating to fruit growers how the research they are conducting could help improve fruit growing in NY. The Field Research Unit at Geneva also did an excellent job of preparing plots and providing logistical support to the event. (Adapted from Station News, Vol. LXXXV, No. 15, August 6-20, 2004, by C. Heidenreich)

A Farewell at Arms

It is with regret we bid farewell to New York Berry News Editor Dr. William (Bill) Turechek, who will be leaving the Tree Fruit and Berry Pathology Program at Cornell's Geneva campus in October 2004 to become strawberry pathologist for the US Department of Agriculture in Beltsville, Maryland. Bill will be replacing world-renowned strawberry pathologist Dr. J. L. Maas, editor of the *Compendium of Strawberry Diseases*, who recently retired from that position. We wish Bill all the best and expect to feature his contributions in the NYBN often in the future. Bill 's new address after 10/3/2004 will be: Dr. William Turechek, USDA-ARS, BARC Fruit Laboratory, Beltsville, MD 20705. All is not lost. Cathy Heidenreich will serve as interim editor of NYBN until a decision is made on Bill's replacement. Please send any contributions or comments to her at mcm4@cornell.edu or contact her by phone at 315-787-2367.

End of the Season Checklist

Cathy Heidenreich, Plant Pathology, Cornell University, Geneva, NY

By now your small fruit season is probably winding down. But don't let down your guard just yet. A few timely pest management decisions this fall may save you time and money in 2005. Run through our checklist to be sure you have covered all the bases before shutting down your operation for the season and taking a well-earned break...Oh by the way, don't forget to drain and/or air out those irrigation systems before winter, even if they were unused this season...

-Strawberry-

This wet weather is a great opportunity for development of foliar diseases on those new leaves. If you have a history of **leaf spot, scorch, or blight** in your planting, consider taking preventative measures. Already begun a preventative schedule? You may need to extend it through the rainy period. Nova 40W on a 14-21 day schedule is one alternative. Remember the label specifies no more than 10 oz/acre/season for this product. Nova is also labeled for **powdery mildew** control on strawberries, which we would normally be concerned about now (however, under current weather conditions it is unlikely we will see much mildew this season). For a more in depth discussion of summer management of strawberry foliar diseases, see last month's issue of the NYBN (Vol. 3, No.7). Cool, wet weather also provides very fertile ground for root rots, especially **red stele root rot**, caused by the fungus *Phytophthora fragariae*. Plantings with a prior history of root rot problems have been shown to benefit from a fall application of Ridomil Gold or Alliette. A word of caution, these products will not provide complete control for susceptible cultivars grown on wet soils. For more information, see "Pest Management Guidelines for Small Fruit, Strawberry section. Finally, wait to clean and winterize that sprayer until after you have fall herbicide applications to help suppress some of those early spring weeds. See Andrew Land'er's article on sprayer decontamination and winterizing below for sprayer cleaning and storage how-to's. And don't forget to get your straw order in- winter is just around the corner!

Did you remember to send in your foliar nutrient analysis? If you have not done so yet, it's not too late. Refer to last month's issue of NYBN (Vol. 3, No.7) if you need further information on how to do this.

-Brambles-

Obviously **powdery mildew** is not on the short list for *Rubus* diseases this month either, but **leaf spot** and **rusts** may be key players, along with fruit rots, such as gray mold. If you have had problems with these diseases in the past, be sure to take preventative measures. Annemiek Schilder's article on bramble rusts in this issue provides a good overview of rust diseases and their control. **Phytophthora root rots** may also be a problem in bramble plantings. For cultural control methods use resistant cultivars, planted on raised beds, on well-drained sites to help reduce disease establishment. Bramble plantings with a known history of *Phytophthora* may equally benefit from a fall Ridomil or Aliette application. For a more in depth discussion of this problem on brambles see "Pest Management Guidelines for Small Fruit, Bramble section. Begin to prune out and destroy spent floricanes-especially if **cane blight, spur blight** or **anthracnose** was present earlier in the season. Fall-bearing raspberries still have their share of insect pests. Be on the look out for **tarnished plant bug, picnic beetles** and **Japanese beetles** on ripening fruit. **Potato leafhoppers** may move to fall-bearing raspberries from other crops. Watch for the characteristic yellowing and leaf curl, caused by the injection of toxins into the plant during adult feeding. Control options are outlined in "Pest Management Guidelines for Small Fruit, Bramble section.

-Blueberry-

Fruit rots may be a very real concern on late ripening varieties with all this wet weather. These may include **gray mold, anthracnose** or **Alternaria fruit rot**, which is featured this month's NYBN article by Annemiek Schilder and George Sundin. While there is no specific control program outlined for Alternaria fruit rot in New York, a regular fungicide program using a broad-spectrum material should provide some control. Prompt harvesting, rapid post-harvest cooling and minimizing fruit injury during harvest will also help to reduce fruit rots in harvested fruit. Check "Pest Management Guidelines for Small Fruit, Blueberry section", for control options for gray mold and anthracnose. If you are using mulch as part of your blueberry cultural system, remember it needs to be renewed every 2-3 years to be effective in weed suppression and moisture retention. A timely fall application of mulch also aids in suppression of **mummyberry** infections next season by burying the mummies. Renew mulch to a depth of 4 inches in a 4-ft band under plants. Remember additional nitrogen fertilizer maybe required after fresh mulch is added, usually about twice the recommended rate for a given year. How's your pH? Send in that soil sample for analysis to be sure. Obtain instructions and sample bags from your local cooperative extension office or from Cornell University, Soil Nutrient Analysis Lab (www.css.cornell.edu/soiltest/), Bradfield Hall, Ithaca, NY 14853, or call 607-255-4540 for more information. If your pH

is higher than 5.5, continue to address this problem in established plantings with split applications of prilled sulfur this fall and next spring. Apply no more than 400 LB sulfur in any one year.

-Currant and Gooseberry-

Mulch is instrumental in weed control for currants and gooseberries, as well as blueberries. Follow the instructions above for mulch renewal above. Or consider adding mulch to help with weed suppression and moisture retention. A fall fertilizer application is also in order for these crops. Otherwise, you should be good to go until winter pruning time rolls around.

Alternaria Fruit Rot Affects Both Cherries and Blueberries

Annemiek Schilder and George Sundin, Plant Pathology, Michigan State University

With a few exceptions, *Alternaria* fungi are considered opportunistic pathogens only able to grow on damaged or senescing plant tissues. This is also the case in fruit crops, where *Alternaria* occurs mostly on overripe or damaged fruit. Typically, as a fruit ripens, it loses most of its defense mechanisms and can be easily colonized by pathogens that it would otherwise be resistant to. Alternaria fruit rot can be recognized as a dark-green to black, velvety layer of fungus spores in soft or sunken areas of the fruit.

Alternaria fruit rot occurs on both sweet and tart cherries. This disease is typically a minor problem in orchards but can become important if fruit become overripe or are injured, for example by cracking. Large circular, slightly sunken lesions appear on fruit that eventually become flattened and wrinkled. These lesions become black in color because of sporulation of the fungus. Alternaria rot can also be a problem in storage again with infection initiated in injured fruit. Since this is typically a minor disease problem, there is little information on effective fungicides for control. The best way to control this disease is to avoid letting fruit become overripe on trees!

On blueberries, Alternaria fruit rot is a problem as berries ripen. The cultivar Bluecrop appears to be particularly susceptible. In the field, the rot usually occurs at the calyx end, while in storage, it also colonize the berries through the stem scar. If fruit is stored in the dark, the fungus does not produce many spores (since it needs light for that) and appears more fuzzy and grayish than on field-infected fruit. *Alternaria* is a fungus that is ubiquitous in the environment, growing and sporulating on many types of plant debris, including decaying flower parts, leaves, etc. However, spore-trapping experiments in Michigan have shown that the spores are not abundant in blueberry fields until the berries start to ripen. Attempts to infect healthy blueberries with spores have been largely unsuccessful, leading researchers to believe that some damage (e.g., chemical or physical) to berries may be needed for infection. Best ways to control the disease are timely harvesting and rapid, post-harvest cooling of fruit. Several fungicides are available with good to excellent activity against *Alternaria*, e.g., Aliette (fosetyl-Al) and Switch (fludioxonil and cyprodinil). Other products (e.g., Cabrio [STILL NOT labeled in New York] and Ziram) may also be effective. Applications are recommended beginning at the green fruit stage.
(Reprinted from: Michigan State University, Fruit Crop Advisory Team Alert, Vol. 19, No. 3, July 13, 2004)

A Picture is Worth a Thousand Words...

Cathy Heidenreich, Plant Pathology, NYSAES Cornell University, Geneva, NY

I often wish for a picture when finalizing a disease or insect diagnosis, just to reaffirm my other findings. Unfortunately, it is rare to find all pictures of any particular stage of insect or disease of interest in one place. The World Wide Web, however, is increasingly narrowing the gap and offers a wide variety of graphics featuring small fruit diseases and pests. This is the first of a series of articles spotlighting websites that provide excellent pictures of small fruit diseases, pests, and disorders. This month we are focusing on bramble web sites. A short description of each web site follows the html address. Happy viewing!

Raspberry Diagnostic Tool

(http://www.hort.cornell.edu/department/faculty/pritts/BerryDoc/Berrydoc.htm **)**

Author Marvin Pritts developed the on-line Berry Diagnostic tool for Strawberries, Raspberries and Blueberries as a companion to the NRAES Production Guides. It is to assist with the identification of diseases, insects, chemical injury and physiological disorders that affect berry crops in northeastern North America and eastern Canada. Simply click on the raspberry fruit to be re-directed to the raspberry section that holds images of various raspberry diseases, pests and disorders, organized according to symptom appearance on various plant parts.

Insects, Diseases and Disorders on Raspberry in Ontario

(http://www.gov.on.ca/OMAFRA/english/crops/facts/rasppest/rasppest.htm - part1)

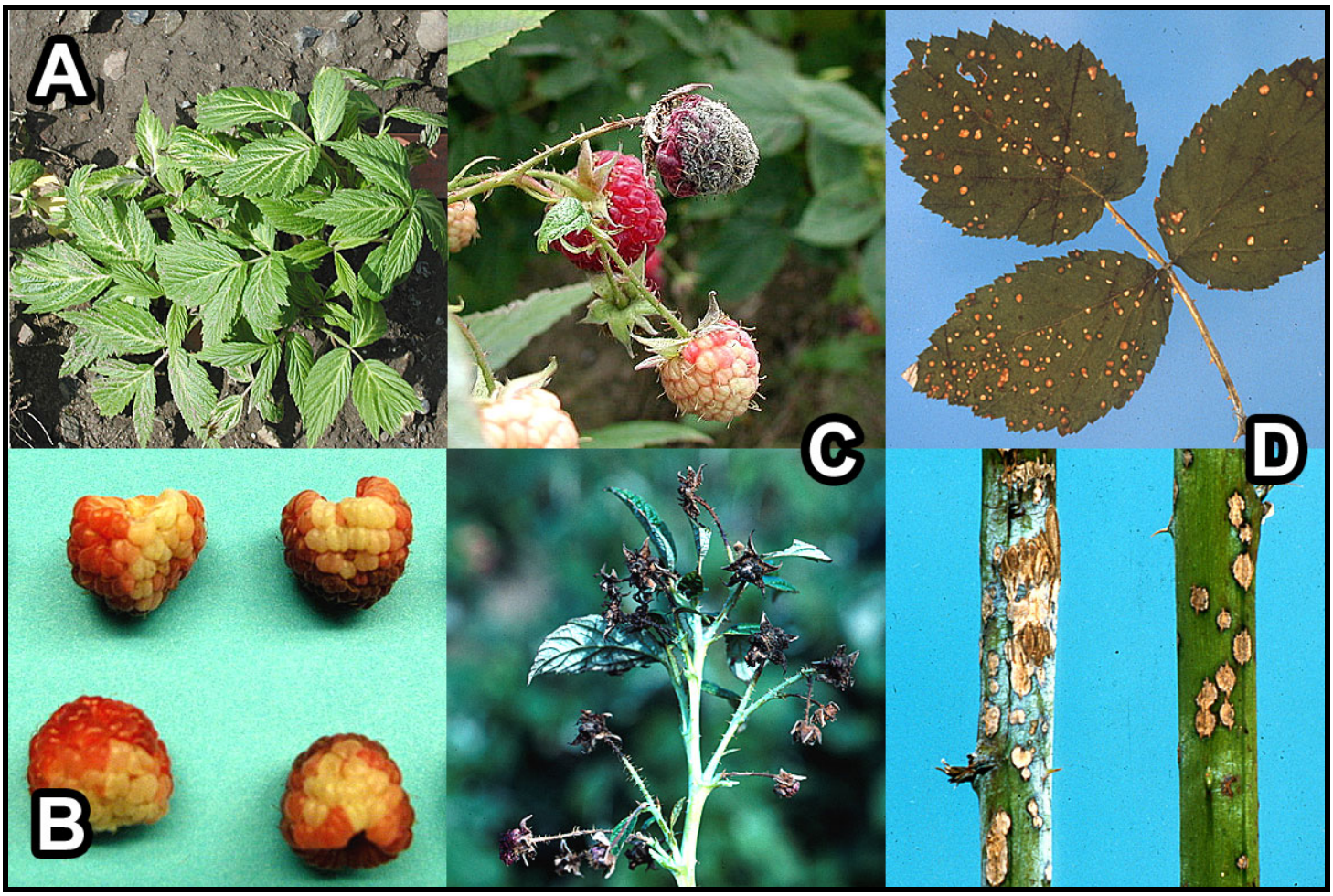
This website offering, authored by Pam Fisher - Berry Crops Specialist/OMAF - provides images of raspberry diseases, pests and disorders. It is arranged in three sections: “Diseases on canes and leaves”, “Insect and disease damage on cane and fruit”, and “What causes dead or dying canes”.

Plant Disease Diagnostics, University of Minnesota, Yard and Garden Clinic

(http://www.extension.umn.edu/projects/yardandgarden/diagnostics/raspberry.html)

While the target audience for this web site appears to be the home gardener, the authors, Floyd, Behrendt and Beckerman have assembled an interesting and informative gallery of disease images, organized according to the affected plant part. Clicking on the images brings up more information on each disease.

And just for fun, some pictures from our Tree Fruit and Berry Pathology digital image collection: Do you recognize these raspberry diseases and/or disorders? (Answers found on page 10)



Bramble Rusts

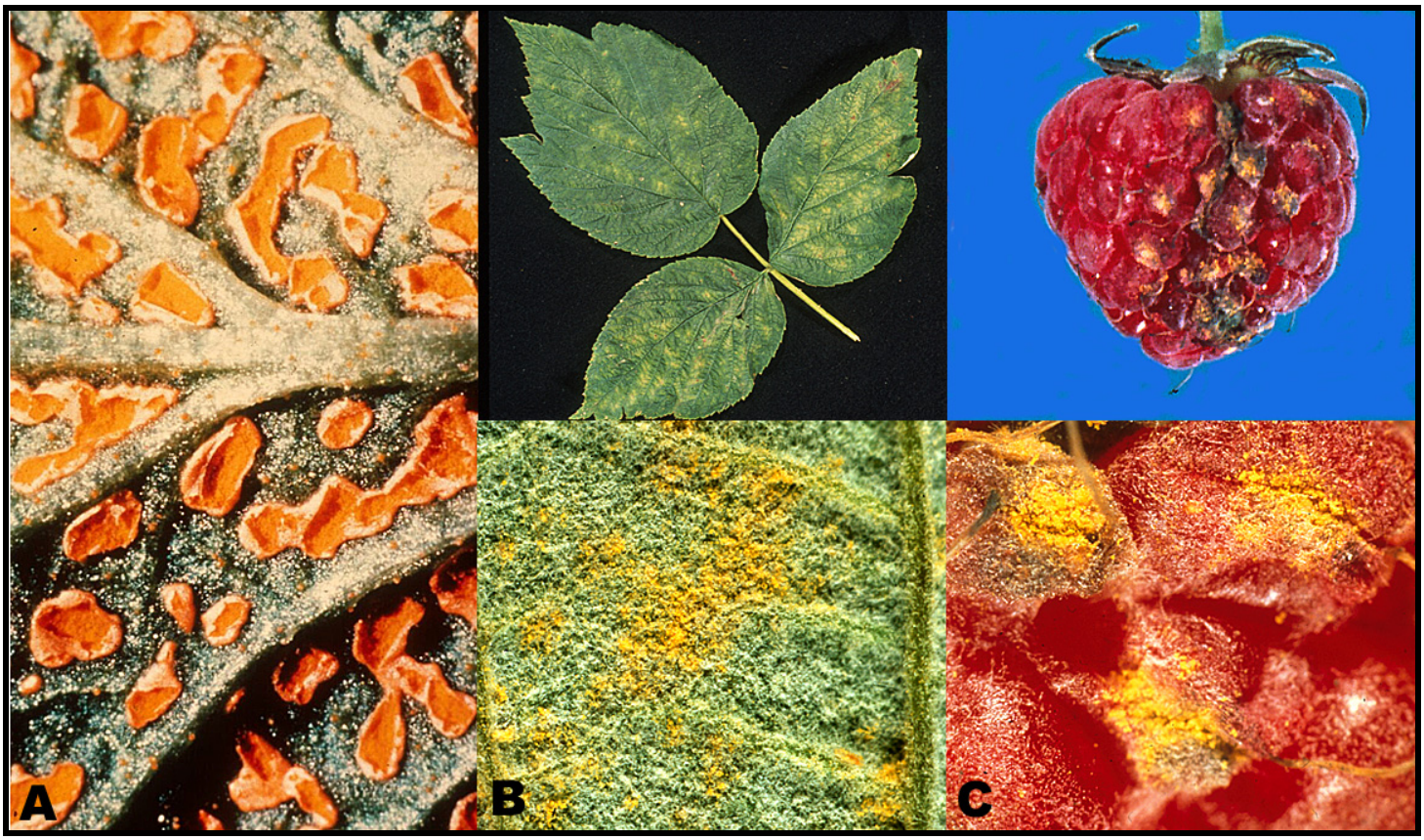
Annemiek Schilder, Plant Pathology, Michigan State University

Editor’s Note: We offer this article spotlighting both bramble rusts as it provides useful information for distinguishing between the 2 rusts. As discussed in the article, orange rust is more prevalent early season, while late leaf rust would more likely be present this time of year. This is a 2 part article reprinted from: Michigan State University, Fruit Crop Advisory Team Alert, Vol. 15, No. 8 and 9, May 30 and June 6, 2000.

Brambles suffer from several rust diseases, which are caused by rust fungi. It is important to tell them apart, because management recommendations differ. The main rust disease that affects blackberries, dewberries, and black raspberries is orange rust. Red raspberries are immune to the disease. Characteristic symptoms are the bright orange, powdery blisters on the undersides of leaves. Before the blisters burst open, they look waxy or shiny, as if covered with lacquer. Young shoots are often spindly and clustered, new leaves are misshapen and pale green to yellowish. On black raspberries, the rusted leaves start to wither and drop in late spring to early summer. New leaves produced towards the tips of canes may appear normal, giving the impression that the plant has "grown out" of the disease. However, such

canes will remain infected the following spring, producing a mass of spindly shoots with no blossoms. The plant becomes systemically infected and remains so for the rest of its life.

Orange rust is not known to kill plants, but it can significantly reduce vegetative growth and yield. The disease is caused by two closely related fungi: *Arthuriomyces peckianus* and *Gymnoconia nitens*. The rust-colored spores are spread by wind currents and can infect leaves of healthy plants under the right environmental conditions. The fungus overwinters in the belowground portions of infected plants. Unfortunately control options for this disease are limited and focus mainly on cultural practices. It is important to establish new plantings from disease-free nursery stock. Any plants that show signs of the disease during the spring in which they were set out were already infected at the time of planting. Upon inspection of plants each spring, any infected plants, which are economically worthless, should be dug up and destroyed promptly before rust pustules mature and spores are liberated. The location of those plants should be clearly marked, and any new suckers arising from root pieces left in the ground should be removed and sprayed with an improved systemic herbicide. It is also prudent to remove infected wild brambles in nearby wooded areas and fencerows. Management practices that improve air circulation, such as thinning out canes within the row, pruning out floricanes immediately after harvest, and effective weed control, aid in disease control by reducing leaf wetness duration. Blackberry cultivars Eldorado, Raven, and Ebony King are reported to show resistance to orange rust, but no black raspberry cultivars are known to be resistant. There are no effective fungicide programs for control of orange rust.



A. Orange rust on leaf lower surface; B. Late leaf rust on upper and lower leaf surfaces; C. Late leaf rust on fruit. (Pictures courtesy of Wayne Wilcox)

Late leaf rust is usually considered a minor disease, but occasionally can cause serious damage to susceptible red and purple raspberry cultivars. It is caused by the fungus *Pucciniastrum americanum* and usually appears late in the season. Losses are primarily due to fruit infection and premature defoliation. In contrast to orange rust, this fungus does **not** infect black raspberries and blackberries. The symptoms of late leaf rust are often rather inconspicuous. On the upper leaf surface, small chlorotic or yellow spots appear, which eventually turn brown. On the undersides of infected leaves, small light-yellow pustules appear with powdery spores. Spore masses may also occur on leaf petioles, canes, calyces, and even on fruit. Infected fruit are not marketable. If the infection is severe, the canes may be defoliated prematurely, which can reduce plant vigor and increase susceptibility to winter injury. The fungus produces urediniospores, which are capable or causing new infections throughout the growing season. The spores are wind-disseminated and may also be spread mechanically from infected to healthy fruit during harvest. The alternative host for this disease is white spruce (*Picea canadensis*). However, it appears that spruce are not absolutely necessary for the rust to survive on raspberries, because the disease has been found in raspberries year after year in areas remote from any spruce trees.
Middle-aged leaves on actively growing plants are most susceptible to infection, while the fruit is susceptible during all stages of development. Raspberry cultivars known to be susceptible are Comet, Heritage, and Festival. In Canada, the

summer-bearing cultivar Nova was highly resistant to late leaf rust. Unlike the orange rust fungus, the late leaf rust fungus is **not** systemic. Disease incidence can be reduced by any management practice that increases airflow and reduce leaf wetness duration within the canopy. Removal of old floricanes and infected primocanes during the winter should reduce the amount of overwintering inoculum. In areas with white spruce, removal of leaves and other debris from infected raspberry plantings should help break the disease cycle by reducing white spruce infection in the spring. Avoid establishing new raspberry plantings near white spruce stands. No fungicides are currently labeled for control of late leaf rust.

Major Differences between Orange and Late Leaf Rusts

	Orange rust	Late leaf rust
Host	*Black raspberries, blackberries*	*Red and purple raspberries*
Alternate host	*None*	*White spruce*
Timing of symptoms	*Early in season*	*Late in season*
Infection	*Systemic*	*Not systemic*
Symptoms	*Spindly growth, blisters on leaves*	*Rust pustules on leaves, canes, fruit*
Spores	*Bright orange, waxy at first*	*Light yellow*

Decontaminating and Winterizing Airblast Sprayers

Andrew Landers, Pesticide Application Technology Specialist, Department of Entomology, NYSAES Cornell University, Geneva, NY

Sprayers must be thoroughly cleaned inside and out after use. Ideally, a sprayer should be cleaned at the end of each day and especially before switching to a different pesticide. Pesticide residues left on the outside of the sprayer can cause operator contamination. Residues on the inside of the tank or left over pesticides trapped inside the sprayer plumbing system can contaminate the operator and possibly lead to crop damage. Growers should be concerned about this, especially if they are using one sprayer to apply different chemicals to different crops. In some cases, only a small amount of a pesticide remaining in the sprayer can cause significant crop damage or lead to unacceptable residues on a crop. Crop contamination can even occur several months after a sprayer has not been properly cleaned. Where an airblast sprayer is used to spray different fruit crops, residue left in the tank can cross contaminate another fruit crop resulting in rejection by the processor.

Sprayers can also retain tremendous amounts of pesticide solution. Depending on the size and design of the sprayer, there can be nearly 6 gallons of solution left in an airblast sprayer's plumbing. As illustrated in the following table, research conducted on boom sprayers has shown that, depending on the spray tank size, the total chemical solution retained in the sprayer ranged from just under 3 gallons to over 12 gallons. The parts that retained the most chemical solution are the chemical induction bowl, the booms, the tank and the pump and its related piping.

Quantity and Location of Chemical Remnants in Crop Sprayers (*in gallons*)

	Sprayer Size		
Location	159 Gallons- 39 foot boom	212 Gallons – 39 foot boom	396 Gallons – 59 foot boom
Tank	0.50	1.32	4.57
Pump and associated piping	0.40	0.85	2.22
Pressure agitation	0.02	0.16	0.27
Manifold	0.04	0.16	0.27
Filter relief valve	NA	0.15	0.23
Chemical induction bowl	1.16	1.69	NA
Total without boom	**2.12**	**4.33**	**7.56**
Booms	0.50	2.32	4.76
Total with booms	**2.62**	**6.65**	**12.32**

Tests have shown that triple rinsing the spray tank is better than using just one single rinse. For example, using 100 gallons of clean water in one single rinse to clean a 100-gallon sprayer tank reduced the concentration of the original spray solution from 100% to 5% both in the tank and at the nozzle. If triple rinsing was performed using 33 gallons of clean water per rinse, a concentration of 0.2% to 0.5% was gained. The aim is for maximum dilution with minimal use of water. The following table illustrates how triple rinsing reduces the pesticide concentration at the nozzle and the tank drain.

Concentration of Pesticide in Rinse Water

Rinse Number	Sample Location	Percent Concentration
1	Nozzle	5.5
	Tank Drain	4.8
2	Nozzle	1.0
	Tank Drain	1.0
3	Nozzle	0.2
	Tank Drain	0.2

Source: Nilsson, E., Hagenwall H. and og Jorgensen L.

Before rinsing a sprayer, read the sprayer manufacturer's instructions for specific guidance on the best methods for cleaning your equipment. Also consult the pesticide label for any special cleaning instructions. When cleaning spray equipment, you should use the protective clothing listed on the pesticide label. Sprayer cleaning should be done so that rinse water ***does not*** enter any waterway, field drainage system, or well. Ideally, sprayer rinsate should be applied to a labeled crop rather than dumped at the cleaning location. If rinsing needs to be done at the mixing/loading site, it must be done on an impervious surface. All contaminated rinse water must be trapped and either used to mix another load of the same pesticide at the label recommended rates or disposed of at an approved pesticide waste handling facility.

Reducing Cleaning Problems

The need for cleaning can be reduced by good planning and equipment maintenance. The following are suggestions to help reduce cleaning needs:

- Carefully plan how much pesticide to mix so that all mixed pesticides are used up when you are finished with the field.
- Be sure that the sprayer is clean before you use it.
- Make sure all parts of the sprayer are in good condition. Corroded, cavitated or pitted surfaces are prime areas for pesticide residue to hide. Replace any worn parts.
- Mix the chemicals in the correct order. Some chemicals, when mixed in the wrong order, can actually become more difficult to remove from the equipment. Consult the pesticide label for the proper mixing order.
- Follow any label instructions for cleaning spray equipment.
- Be sure that cleaning solutions contact ALL equipment surfaces.
- Remove and clean filters, strainers and nozzle screens separately from the rest of the sprayer.

Sprayer Cleansers

Several sprayer cleansers are commercially available. These cleansers should be selected based on the pesticide formulation used. Specific recommendations can be found on the pesticide label, by contacting the pesticide manufacturer or through the label or manufacturer of the cleaning agent you wish to use. Some available cleansers are listed in the table below. Household detergents, such as laundry soaps and household ammonia, can also be used, but they may not adequately deactivate and solubalize the pesticides for effective cleaning. Chlorine bleach solutions should not be used. Cleaning agents can be used to wash both the inside and outside of the sprayer. When using commercial cleansers, follow the product's instructions for the best results.

Commercially Available Sprayer Cleansers

Product	Supplier	Product	Supplier
Protank Cleaner	*Agriliance* *P.O. Box 64089* *St. Paul, MN 55164-0089* *Phone: (651) 451-5151* www.agriliance.com	**Wipe-Out**	*Helena Chemical Company* *225 Schilling Blvd.* *Collierville, TN 38017* http://www.helenachemical.com/

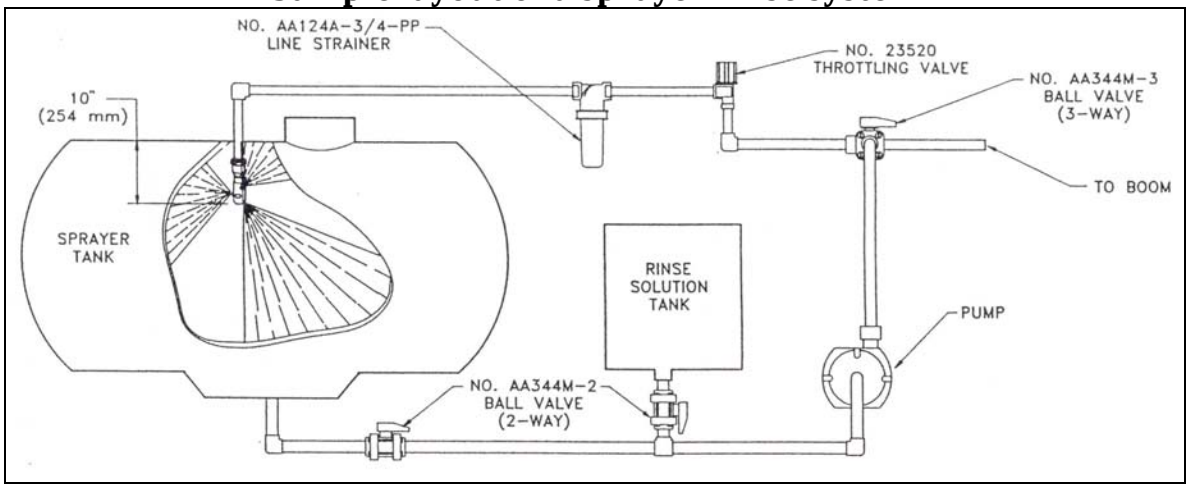
All Clear Tank Decontaminator	*UAP* *Loveland Industries, Inc.* *PO Box 1289* *Greeley, CO 80632* *Phone: 970-356-8920* http://www.uap.com/	**Ag Chem Tank Cleaner**	*Ag Chem Equipment Co.* *Ag-Chem Division* *202 Industrial Park* *Jackson, MN 56143* *Phone: 800-760-8800* http://www.sprayparts.com/

Tank Rinse Systems (Low-Volume Tank Rinsing)

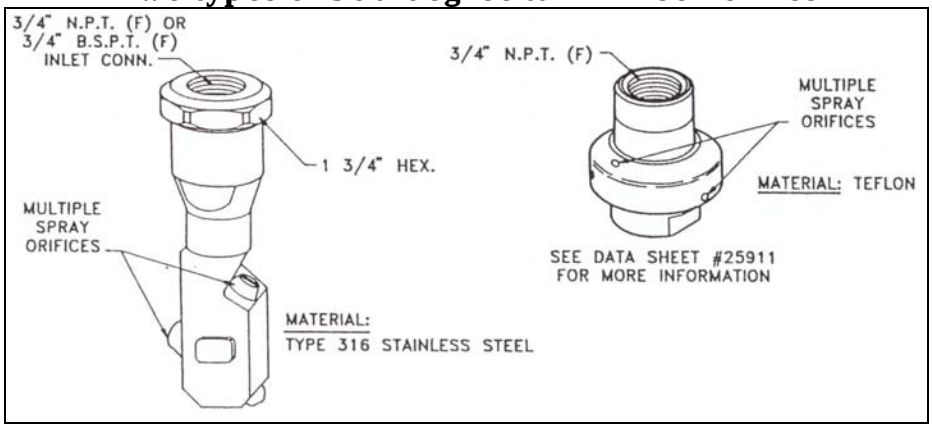
Tank rinse systems consist of a clean water supply tank mounted to the sprayer and one or more rotating discs or nozzles mounted inside the main sprayer tank. Water is pumped from the clean water tank to the rinse nozzles where the water is sprayed around the inside of the spray tank. These systems are designed for in-field rinsing of the sprayer so that the tank washings can be applied to the field and reduce the amount of time spent traveling to and from the farmyard.

A tank rinse system can be purchased as an option on some sprayers or as an add-on kit. Rinse systems can also be made from readily available parts and installed on the sprayer. A sample rinse system layout is shown below. A typical rinse system uses 360-degree tank wash nozzles mounted in the top of the tank. These nozzles are available in flow rates of 10 gallons of water per minute at 20 psi up to 20 GPM at 50 psi. If a spray tank has baffles, at least one rinse nozzle per compartment should be provided. In any case, a sufficient number of rinse nozzles should be installed to provide enough rinse water to contact the entire tank interior.

Sample layout of a sprayer rinse system



Two types of 360-degree tank rinse nozzles



A 50 to 100 gallon tank is plumbed into the sprayer plumbing system to provide the clean water. This tank should be permanently marked "Clean Water Only" so that only clean water is placed in the tank, reducing the chance for contamination of the rinse system. The tank should be mounted above the pump in order to aid in priming the pump. Ideally, the tank should be mounted on the sprayer.

When using tank rinse systems, you may want to check the pesticide label or with the chemical manufacturer to be sure that low-volume rinsing is suitable for the products you're using. Also, during the rinse process, be sure to open and close

the pressure valve and other control valves on the sprayer to ensure that any chemical that may be trapped in the valve is rinsed out, further reducing the chance for contamination of future pesticide mixes. To obtain the best results, practice using the rinse system by placing spray marker dye or food coloring in the spray tank. Using the rinse system, run three rinse cycles, making sure the water discharged from the nozzles is completely clear by the end of the third rinse.

Cleaning the Sprayer

The pesticide applicator should try to keep the volume of tank wash water produced to a minimum. Ideally a tank rinse system should be used. There are two levels of sprayer cleaning: 1) Where the same or similar products are to be used on consecutive occasions or 2) Where the type of product is changed for another or at the end of the season.

Cleaning Where Similar Products are to be Used

Reminder: Before cleaning application equipment, remember to wear the protective clothing listed on the pesticide label.

- Be sure that all mixed pesticides have been used up from the sprayer or removed and disposed of properly.
- Flush sprayer with clean water, making sure to wash all inside surfaces of the tank, including the underside of the lid. Use of a tank rinse system is preferred so that rinsing can be done in the field where the rinse water can be applied to the crop. If a tank rinse system is not available, fill the spray tank about half full with clean water and flush the system for at least 5 minutes using both agitation and spraying. Be sure to open and close any control valves during the rinse process. The rinsate should be applied to the crop at labeled rates. Repeat this procedure two more times.
- Hose down the outside of the sprayer making sure to reach all parts, scrubbing if necessary.
- Remove suction, main and in-line filter elements and wash them thoroughly in clean water using a soft bristle brush. Put the filters back on the sprayer when clean.
- Remove the nozzles, nozzle screens and nozzle bar end caps (if used) and wash them thoroughly in clean water with the appropriate cleanser and rinse. Remember to use a soft bristle brush, such as an old toothbrush, when cleaning nozzle parts.
- Partly fill the sprayer with clean water and run the sprayer to flush out all parts.
- Reinstall nozzles and nozzle screens.
- Hose down the outside of the sprayer once again.

Cleaning Where Product Type is Changed

This procedure should also be followed at the end of a season or before sprayer maintenance.

Reminder: Remember to wear the protective clothing listed on the pesticide label.

- Be sure that all mixed pesticides have been used up from the sprayer or removed and disposed of properly.
- Flush sprayer with clean water, making sure to wash all inside surfaces of the tank, including the underside of the lid. Use of a tank rinse system is preferred so that rinsing can be done in the field where the rinse water can be applied to the crop. If a tank rinse system is not available, fill the spray tank about half full with clean water and flush the system for at least 5 minutes using both agitation and spraying. Be sure to open and close any control valves during the rinse process. The rinsate should be applied to the crop at labeled rates. Repeat this procedure two more times.
- Hose down the outside of the sprayer making sure to reach all parts, scrubbing if necessary.
- Remove suction, main and in-line filter elements and wash them thoroughly in clean water using a soft bristle brush. Put the filters back on the sprayer when clean.
- Remove the nozzles, nozzle screens and nozzle bar end caps (if used) and wash them thoroughly in clean water with the appropriate cleanser and rinse. Remember to use a soft bristle brush, such as an old toothbrush, when cleaning nozzle parts.
- Partly fill the sprayer with clean water and run the sprayer to flush out all parts.
- Refill the tank with clean water, adding any detergent recommended by the pesticide manufacturer. Remember; use commercial cleansers according to their directions. Agitate the solution and pump it through the sprayer plumbing system.
- Discharge the cleaning solution from the sprayer through the plumbing system, making sure to drain the system as thoroughly as possible.
- Rinse the sprayer and flush the plumbing system with clean water.
- Inspect the sprayer for deposits that may remain in the tank or plumbing system. If any remain, use some of the cleaning solution and scrub the problem spots. Rinse the sprayer out completely.
- Repeat steps 7 to 9.

- Hose down the outside of the tractor and sprayer, scrubbing if necessary.
- If changing from one type of pesticide to another, refit nozzles, filters and other parts that may have been removed in the cleaning process.
- When cleaning and preparing the sprayer at the end of the season, safely store nozzles and filters to keep them clean and damage-free. Leave valves open and the tank lid loosely closed.

Tank Rinse Nozzle Suppliers

Spraying Systems (TeeJet)
Delavan

References

1. Cornell Cooperative Extension. (2002.) Pest Management Guidelines for Commercial Tree Fruit Production.
2. DuPont Agricultural Products. (1995.) A Guide to Application Equipment Cleanout for DuPont Sulfonylurea Herbicides. DuPont Agricultural Products.
3. Hardi International web site: www.hardi-international.com
4. Harrison, Scott and Hock, Winand. (N.D.) Agrochemical Fact Sheet #9 - Options for In-field Pesticide Sprayer Rinsing and Clean Water Utilization. Penn State Cooperative Extension.
5. Johnson, Bill, et al. (1997.) Cleaning Field Sprayers to Avoid Crop Injury, Fact Sheet G 4852. MU Extension, University of Missouri - Columbia.
6. Peterson, Dallas E., Kuhlman, Dennis K., and Devlin, Daniel L. (1998) Cleaning Field Sprayers. Kansas State University Department of Agronomy.

Please note: *Where trade names appear, no discrimination is intended and no endorsement by the author or Cornell University is implied.*

Answers to the Raspberry Disease Quiz, Page 5

A. Herbicide Damage on young red raspberry canes (Solicam)

B. White Drupelet Disorder (High temperature and UV radiation) on ' Heritage' red raspberry

C. Gray Mold Blossom Blight (courtesy of Dr. Wayne F. Wilcox) and Fruit Rot

D. Raspberry Anthracnose on leaves and canes (courtesy of Dr. Wayne F. Wilcox)

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

Questions or Comments about the New York Berry News?

Send inquiries to:
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WEATHER REPORTS OF TEMPERATURES AND PRECIPITATION THROUGHOUT NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am, JULY 18th, 2004

	Temperature				Growing Degree Days (*Base 50*)			Precipitation (*inches*)			
	High	***Low***	***Avg***	***DFN*[1]**	***Week***	***YTD*[2]**	***DFN***	***Week***	***DFN***	***YTD***	***DFN***
Hudson Valley											
Albany	82	63	71	-2	150	1375	178	2.33	1.63	12.98	1.09
Glens Falls	81	58	69	-2	135	1113	78	1.88	1.24	12.79	1.39
Poughkeepsie	88	56	70	-3	140	1449	197	1.26	0.35	12.24	-1.74
Mohawk Valley											
Utica	83	61	69	-2	135	1126	57	1.51	0.67	18.62	5.02
Champlain Valley											
Plattsburgh	81	58	68	-3	129	1049	-10	1.39	0.73	12.76	2.32
St. Lawrence Valley											
Canton	82	58	70	2	138	1002	76	2.54	1.78	13.59	2.55
Massena	83	58	70	1	142	1040	51	2.83	2.13	13.42	3.27
Great Lakes											
Buffalo	82	60	70	-2	142	1179	47	1.01	0.36	15.14	3.84
Colden	82	57	68	0	127	1035	131	2.26	1.49	17.64	4.02
Niagara Falls	83	59	70	-2	143	1140	-5	2.1	1.48	12.83	1.71
Rochester	81	59	70	-2	139	1146	35	2.03	1.47	14.37	4.51
Watertown	81	59	69	1	137	969	44	0.91	0.51	10.84	1.88
Central Lakes											
Dansville	82	57	68	-3	127	1071	-35	2.29	1.62	17.46	6.06
Geneva	82	58	69	-3	133	1151	65	3.1	2.47	15.41	4.04
Honeoye	84	56	68	-4	130	1120	-8	1.58	0.97	16.12	4.95
Ithaca	82	58	68	-1	126	1129	147	1.84	1.07	16.62	4.58
Penn Yan	83	61	69	-2	136	1228	142	0.36	-0.27	12	0.63
Syracuse	84	62	70	-2	141	1252	130	1.8	0.96	17.31	4.63
Warsaw	80	57	67	0	121	962	123	2.23	1.47	18.7	5.5
Western Plateau											
Alfred	83	54	68	1	127	1068	167	2.5	1.67	18.19	4.88
Elmira	83	56	68	-3	129	1166	120	2.85	2.08	16.56	4.83
Franklinville	84	53	68	3	128	945	200	2.57	1.78	17.99	4.75
Sinclairville	82	56	68	2	126	1067	218	2.63	1.73	18.54	3.84
Eastern Plateau											
Binghamton	81	58	67	-4	117	1137	126	1.94	1.17	13.06	0.89
Cobleskill	82	57	68	-1	127	1092	155	1.42	0.65	13.95	0.72
Morrisville	79	58	67	-1	120	946	60	1.85	1.07	16.2	3.18
Norwich	84	56	67	-2	121	1080	145	1.75	0.98	15.64	2.36
Oneonta	83	59	68	2	129	1200	336	2.03	1.12	16.38	2.02
Coastal											
Bridgehampton	82	60	69	-4	133	1129	36	3.37	2.73	16.56	3.46
New York	86	64	74	-3	171	1752	173	2.57	1.62	15.12	1.55

1. *D*eparture *F*rom *N*ormal
2. *Y*ear *T*o *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, July 25th, 2004

	Temperature				Growing Degree Days (*Base 50*)			Precipitation (*inches*)			
	High	***Low***	***Avg***	***DFN[1]***	***Week***	***YTD[2]***	***DFN***	***Week***	***DFN***	***YTD***	***DFN***
Hudson Valley											
Albany	88	56	73	1	159	1534	182	0.75	0.05	13.73	1.14
Glens Falls	87	48	70	-1	145	1258	83	1.78	1.08	14.57	2.47
Poughkeepsie	88	60	73	1	163	1612	199	1.64	0.76	13.88	-0.98
Mohawk Valley											
Utica	86	52	70	-2	141	1267	51	1.04	0.20	19.66	5.22
Champlain Valley											
Plattsburgh	89	51	71	1	147	1196	-8	0.83	0.11	13.59	2.43
St. Lawrence Valley											
Canton	86	47	70	2	143	1145	86	0.37	-0.40	13.96	2.15
Massena	87	51	70	2	144	1184	55	0.26	-0.45	13.68	2.82
Great Lakes											
Buffalo	84	55	69	-3	139	1318	32	0.30	-0.40	15.44	3.44
Colden	84	51	67	-2	122	1157	127	0.82	0.05	18.46	4.07
Niagara Falls	85	56	70	-2	141	1281	-16	0.26	-0.37	13.09	1.34
Rochester	85	52	69	-3	132	1278	20	0.48	-0.15	14.85	4.36
Watertown	86	43	69	0	135	1104	46	0.41	-0.02	11.25	1.86
Central Lakes											
Dansville	84	50	67	-4	124	1195	-58	1.01	0.38	18.47	6.44
Geneva	86	53	69	-2	138	1289	56	0.06	-0.57	15.47	3.47
Honeoye	85	47	68	-5	127	1247	-35	0.40	-0.19	16.52	4.76
Ithaca	85	49	69	-1	131	1260	145	1.71	0.94	18.45	5.64
Penn Yan	86	51	69	-3	138	1366	133	0.35	-0.28	12.35	0.35
Syracuse	89	54	71	0	151	1403	134	0.46	-0.38	17.77	4.25
Warsaw	81	48	65	-3	107	1069	111	1.22	0.50	19.92	6.00
Western Plateau											
Alfred	84	49	67	0	122	1190	167	1.11	0.34	19.30	5.22
Elmira	86	48	69	-2	132	1298	112	0.29	-0.42	16.85	4.41
Franklinville	83	44	64	-2	102	1045	188	0.84	0.07	18.83	4.82
Sinclairville	83	51	67	-1	120	1187	219	0.94	0.07	19.48	3.91
Eastern Plateau											
Binghamton	82	51	68	-3	125	1262	111	1.43	0.66	14.49	1.55
Cobleskill	85	48	69	0	131	1223	159	0.93	0.16	14.88	0.88
Morrisville	85	51	68	-1	124	1070	58	0.76	-0.01	16.96	3.17
Norwich	85	52	69	-1	130	1210	143	0.85	0.12	16.49	2.48
Oneonta	88	58	70	3	141	1341	358	1.92	1.08	18.30	3.10
Coastal											
Bridgehampton	83	57	71	-2	151	1280	33	0.51	-0.14	17.07	3.32
New York	88	67	77	-1	187	1939	171	3.73	2.82	18.85	4.37

1. *D*eparture *F*rom *N*ormal
2. *Y*ear *T*o *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, August 1st, 2004

	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	58	71	-1	151	1685	179	2.47	1.73	16.20	2.87
Glens Falls	83	57	70	-1	139	1397	82	1.28	0.54	15.85	3.01
Poughkeepsie	85	59	72	-2	154	1766	192	1.90	1.06	15.78	0.08
Mohawk Valley											
Utica	84	57	69	-2	137	1404	43	3.47	2.65	23.13	7.87
Champlain Valley											
	83	54	69	-2	134	1330	-14	0.48	-0.32	14.07	2.11
St. Lawrence Valley											
Canton	85	47	68	0	130	1275	86	2.81	1.98	16.77	4.13
Massena	87	48	69	-1	132	1316	53	1.89	1.12	15.57	3.94
Great Lakes											
Buffalo	81	61	70	-2	141	1459	26	2.29	1.50	17.73	4.94
Colden	79	54	67	-1	121	1278	122	2.65	1.84	21.11	5.91
Niagara Falls	80	61	69	-3	136	1417	-27	3.55	2.84	16.64	4.18
Rochester	81	59	69	-2	133	1411	13	2.67	2.00	17.52	6.36
Watertown	82	52	69	0	135	1239	48	1.46	0.94	12.71	2.8
Central Lakes											
Dansville	80	54	67	-4	122	1317	-79	2.80	2.17	21.27	8.61
Geneva	81	57	68	-3	130	1419	39	2.73	2.10	18.20	5.57
Honeoye	82	56	69	-4	132	1379	-54	2.00	1.37	18.52	6.13
Ithaca	81	53	69	-1	130	1390	142	2.25	1.49	20.70	7.13
Penn Yan	80	61	69	-2	136	1502	122	2.49	1.86	14.84	2.21
Syracuse	84	60	71	1	150	1553	139	3.25	2.44	21.02	6.69
Warsaw	78	53	66	-2	113	1182	105	1.88	1.11	21.80	7.11
Western Plateau		au									
Alfred	79	50	66	-2	113	1303	161	2.54	1.82	21.84	7.04
Elmira	81	59	69	-2	137	1435	109	3.23	2.53	20.08	6.94
Franklinville	77	53	66	1	113	1158	194	1.43	0.61	20.26	5.43
Sinclairville	78	54	67	0	120	1307	220	2.76	1.85	22.24	5.76
Eastern Plateau											
Binghamton	78	58	68	-3	124	1386	100	3.37	2.60	17.86	4.15
Cobleskill	83	52	68	-1	125	1348	158	3.14	2.38	18.02	3.26
Morrisville	82	54	67	-1	122	1192	56	3.64	2.87	20.60	6.04
Norwich	84	55	69	2	133	1343	150	3.16	2.46	19.65	4.94
Oneonta	86	55	70	4	139	1480	378	3.96	3.12	22.26	6.22
Coastal											
Bridgehampton	84	56	70	-3	142	1422	18	0.55	-0.15	17.62	3.17
New York	87	66	76	-2	185	2124	167	1.48	0.57	20.33	4.94

1. *D*eparture *F*rom *N*ormal
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WEATHER REPORTS OF TEMPERATURES AND PRECIPITATION THROUGHOUT NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am, August 8th, 2004

	Temperature				Growing Degree Days (*Base 50*)			Precipitation (*inches*)			
	High	***Low***	***Avg***	***DFN*[1]**	***Week***	***YTD*[2]**	***DFN***	***Week***	***DFN***	***YTD***	***DFN***
Hudson Valley											
Albany	86	49	68	-4	126	1811	155	0.32	-0.45	16.52	2.42
Glens Falls	86	46	65	-4	108	1505	56	0.19	-0.60	16.04	2.41
Poughkeepsie	90	49	71	-2	150	1916	187	1.45	0.61	17.23	0.69
Mohawk Valley											
Utica	84	47	65	-5	106	1510	9	0.20	-0.60	23.33	7.27
Champlain Valley											
Plattsburgh	86	49	65	-5	106	1436	-43	3.45	2.56	17.52	4.67
St. Lawrence Valley											
Canton	82	46	64	-4	102	1377	63	1.08	0.18	17.85	4.31
Massena	82	48	65	-4	107	1423	30	0.45	-0.36	16.02	3.58
Great Lakes											
Buffalo	84	52	66	-5	114	1573	-5	0.18	-0.70	17.91	4.24
Colden	83	48	64	-4	101	1379	101	0.28	-0.56	21.39	5.35
Niagara Falls	83	49	66	-5	114	1531	-57	0.46	-0.35	17.10	3.83
Rochester	83	51	65	-5	109	1520	-14	0.42	-0.32	17.94	6.04
Watertown	80	40	63	-7	90	1329	8	0.22	-0.43	12.9	2.37
Central Lakes											
Dansville	84	48	64	-6	101	1418	-118	0.33	-0.37	21.60	8.24
Geneva	84	51	66	-5	111	1530	10	0.03	-0.64	18.23	4.93
Honeoye	85	49	64	-7	101	1480	-100	0.60	-0.09	19.12	6.04
Ithaca	85	47	65	-4	108	1498	121	0.46	-0.31	21.16	6.82
Penn Yan	83	51	67	-4	118	1620	100	0.09	-0.58	14.93	1.63
Syracuse	86	50	67	-4	122	1675	121	0.01	-0.76	21.03	5.93
Warsaw	81	47	62	-6	83	1265	75	0.16	-0.66	21.96	6.45
Western Plateau											
Alfred	84	47	64	-3	99	1401	141	0.26	-0.44	22.10	6.60
Elmira	86	47	66	-4	113	1548	88	0.41	-0.29	20.49	6.65
Franklinville	84	42	62	-4	83	1241	172	0.43	-0.41	20.69	5.02
Sinclairville	83	47	64	-3	97	1404	201	0.29	-0.66	22.53	5.10
Eastern Plateau											
Binghamton	82	50	65	-5	104	1490	71	0.46	-0.29	18.32	3.86
Cobleskill	86	46	65	-3	109	1457	142	0.44	-0.33	18.46	2.93
Morrisville	83	47	64	-4	98	1289	34	0.04	-0.73	20.64	5.31
Norwich	87	47	65	-3	108	1451	133	0.75	0.05	20.40	4.99
Oneonta	85	50	66	0	115	1595	377	0.70	-0.14	22.96	6.08
Coastal											
Bridgehampton	83	53	70	-3	139	1561	3	0.57	-0.16	18.19	3.01
New York	88	62	75	-3	173	2297	153	0.24	-0.61	20.57	4.33

1. *D*eparture *F*rom *N*ormal
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WEATHER REPORTS OF TEMPERATURES AND PRECIPITATION THROUGHOUT NEW YORK STATE FOR WEEK ENDING SUNDAY 8:00am, August 15th, 2004

	Temperature				Growing Degree Days (*Base 50*)			Precipitation (*inches*)			
	High	*Low*	*Avg*	*DFN*[1]	*Week*	*YTD*[2]	*DFN*	*Week*	*DFN*	*YTD*	*DFN*
Hudson Valley											
Albany	84	53	71	+1	146	1957	158	0.85	0.06	17.37	2.48
Glens Falls	82	43	67	-2	123	1628	51	2.84	2.00	18.88	4.41
Poughkeepsie	83	53	71	-1	146	2062	183	3.54	2.71	20.77	3.40
Mohawk Valley											
Utica	81	54	67	-3	122	1632	-2	2.11	1.27	25.44	8.54
Champlain Valley											
Plattsburgh	83	55	67	-1	123	1559	-46	1.15	0.19	18.67	4.86
St. Lawrence Valley											
Canton	80	50	65	-3	107	1484	52	0.97	0.03	18.82	4.34
Massena	82	51	66	-3	111	1534	19	2.14	1.30	18.16	4.88
Great Lakes											
Buffalo	79	56	66	-4	116	1689	-27	0.49	-0.47	18.40	3.77
Colden	78	52	64	-4	97	1476	82	0.89	-0.02	22.28	5.33
Niagara Falls	80	53	66	-4	115	1646	-79	0.80	-0.08	17.90	3.75
Rochester	81	54	66	-3	115	1635	-28	0.28	-0.49	18.22	5.55
Watertown	80	49	66	-3	111	1440	-4	0.86	0.13	13.79	2.50
Central Lakes											
Dansville	79	51	64	-6	103	1521	-149	1.14	0.44	22.74	8.68
Geneva	80	54	67	-3	119	1649	-6	0.72	0.02	18.95	4.95
Honeoye	81	52	66	-5	115	1595	-126	1.10	0.39	20.22	6.43
Ithaca	80	51	66	-2	116	1614	114	1.56	0.79	22.72	7.61
Penn Yan	80	54	67	-3	120	1740	85	1.31	0.61	16.24	2.24
Syracuse	83	55	69	-1	133	1808	121	0.98	0.21	22.01	6.14
Warsaw	76	50	63	-3	90	1355	58	0.49	-0.36	22.45	6.09
Western Plateau											
Alfred	79	48	63	-4	92	1493	121	2.02	1.32	24.12	7.92
Elmira	81	48	66	-4	111	1659	70	0.88	0.23	21.37	6.88
Franklinville	76	46	61	-4	76	1317	148	0.45	-0.45	21.14	4.57
Sinclairville	78	51	63	-4	92	1496	183	0.77	-0.21	23.30	4.89
Eastern Plateau											
Binghamton	77	55	66	-2	117	1607	63	1.30	0.56	19.62	4.42
Cobleskill	80	54	68	+2	125	1582	148	1.82	1.05	20.28	3.98
Morrisville	79	51	65	-2	107	1396	28	1.96	1.19	22.60	6.50
Norwich	82	52	67	0	119	1569	133	1.93	1.17	22.33	6.16
Oneonta	84	53	69	+4	131	1726	399	3.10	2.26	26.06	8.34
Coastal											
Bridgehampton	80	57	71	-1	150	1711	1	2.45	1.68	20.64	4.69
New York	84	68	77	+1	189	2486	161	2.60	1.76	23.17	6.09

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

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