

Using low tunnels in high tunnels to grow winter greens helps against the cold but can

trap humidity. Learn 3 tips to prevent disease.

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Our Upcoming Events section now includes topic icons. Scan through the event list for topics that are of interest to you.

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Learn 4 steps growers can take to reduce the risk of getting the Potato Tuber

Necrotic Ringspot Disease.

PAGE 6



How does physical and chemical activity in the soil work together with soil microbial activity

to make plant nutrients available for organic growers.

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## Three Tips to Prevent Disease in High Tunnel Winter Greens

by Judson Reid, Cornell Vegetable Program

Great news! NYS is now the national leader in winter farmers markets, with high tunnel production of winter greens driving this growth. Storage vegetables such as potatoes, onions and carrots are essential in winter retail sales, however greens such as spinach, komatsuna and arugula draw customers as a vibrant, fresh product in the lineup. These greens, when grown in unheated or minimally-heated greenhouses (high tunnels), have outstanding flavor and shelf-life, unless plant disease becomes established in the structure.

How do we maintain yields and quality? With preventative management. But, the system itself makes this challenging. Growing winter greens in high tunnels is really about growing in low tunnels. Cornell Vegetable Program research has re-



Healthy tunnel lettuce. Photo: Judson Reid, Cornell Vegetable Program

peatedly shown that a high tunnel itself is not effective at protecting crops from very low temperatures. The addition of low tunnels (hoops with row cover), traps enough heat in the soil and canopy to allow the production of greens in all climates of New York all year long.



VegEdge newsletter is exclusively for enrollees in the Cornell Vegetable Program, a Cornell Cooperative Extension regional agriculture team, serving 11 counties in Western New York.

The newsletter is a service to our enrollees and is intended for educational purposes, strengthening the relationship between our enrollees, the Cornell Vegetable Program team, and Cornell University.

We're interested in your comments. Contact us at: Cornell Vegetable Program 480 North Main Street Canandaigua, NY 14224

Email: cce-cvp@cornell.edu
Web address: cvp.cce.cornell.edu

#### Editor

Carol MacNeil

#### **Contributing Writers**

Robert Hadad Christy Hoepting Julie Kikkert Carol MacNeil Judson Reid

### Publishing Specialist/Distribution/Sponsors

Angela Parr

VegEdge is published 25 times per year, parallel to the production schedule of Western New York growers. Enrollees in the Cornell Vegetable Program receive a complimentary electronic subscription to the newsletter. Print copies are available for an additional fee. You must be enrolled in the Cornell Vegetable Program to subscribe to the newsletter. For information enrolling in our program, visit about cvp.cce.cornell.edu. Cornell Cooperative Extension staff, Cornell faculty, and other states' Extension personnel may request to receive a complimentary electronic subscription to VegEdge by emailing Angela Parr at aep63@cornell.edu. Total readership varies but averages 750 readers.

Information provided is general and educational in nature. Employees and staff of the Cornell Vegetable Program, Cornell Cooperative Extension, and Cornell University do not endorse or recommend any specific product or service.

This publication contains pesticide recommendations. Changes in pesticide regulations occur constantly and human errors are possible. Some materials may no longer be available and some uses may no longer be legal. All pesticides distributed, sold or applied in NYS must be registered with the NYS Department of Environmental Conservation (DEC). Questions concerning the legality and/or registration status for pesticide usage in NYS should be directed to the appropriate Cornell Cooperative Extension (CCE) specialist or your regional DEC office.

CCE and its employees assume no liability for the effectiveness or results of any chemicals for pesticide usage. No endorsement of products or companies is made or implied.

READ THE LABEL BEFORE APPLYING ANY PESTICIDE.

Help us serve you better by telling us what you think. Email us at cce-cvp@cornell.edu or write to us at Cornell Vegetable Program, 480 North Main Street, Canandaigua, NY 14424.



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# <<< BREAKING NEWS >>>

Breaking News: On December 18, 2013 Governor Cuomo signed the Food Metrics bill into law. Although state facilities and institutions are already obliged to purchase as much New Yorkgrown food as competitively possible, there has been no tracking, reporting, or confirmation of any effort to buy locally grown foods. This new law compels procurement officials and vendors who sell food to the State to track the geographic source of food they buy and to buy more food grown on farms in New York. In other words, state agencies are being told, "You are expected to buy local; prove to us that you are."

Farmers can now use this local-food promoting law to their advantage when working with wholesalers, distributors, and other buyers who are spending state money. This bill is being applauded by many farm-supporting organizations in the State.

However, the low tunnels also trap humidity which increases the opportunity for diseases, such as Gray Mold or Downy Mildew. In our NESARE sponsored work with winter greens growers and we have noticed an increase in disease incidence in 2013. In all cases, excess relative humidity, or soil moisture, are causal factors. The low tunnels, although protecting from the cold, are worsening the situation by trapping humidity in the crop canopy.

Three important management steps can help prevent this situation:

- Remove the row covers daily if possible. Not only will this charge the soil with solar radiation (heat), but will also refresh the canopy air. Recover at sunset to trap any heat gain made during the day.
- Avoid overwatering! Growth is so slow at this low-light time of year that experienced growers report not irrigating at all during December through late January.
- Ventilate the tunnel. It is understandable to want to keep out cold air, but it is essential to have air exchange (complete replenishment of inside air with outside air). Outside air will have lower relative humidity.

The final point (ventilation) may be the most challenging due to common design features in most high tunnels. Roll-up sides at this time of year are likely inoperable as they are frozen under snow. Many high tunnels also lack gable or roof vents. If winter greens are your tunnel crop of choice consider drop-down curtains, and/or the installation of louvers in the end walls to act as gable vents. Even if the sides are never opened the exhausting of saturated greenhouse air out the louvers will improve crop health.

A fourth bonus tip: plant disease resistant varieties! When coupled with the above steps disease free greens become a profitable reality. Look for Downy Mildew and Powdery Mildew resistant varieties when choosing spinach, lettuce and brassicas.



Low tunnels with floating row cover are essential to protect the crop from cold, but they also trap relative humidity in the canopy.

Photo: Judson Reid, Cornell Vegetable Program





Winter high tunnels need ventilation as shown by the large louver in the gable end. Photo: Judson Reid, Cornell Vegetable Program



We've added topic icons to our upcoming events to make it easier for you to scan through the event list and focus on events that are of interest to you. General meetings, covering multiple topics, will not feature an icon.

We're also drawing extra attention to meetings offering DEC recertification credits. Look for the DEC logo to denote availability of DEC recertification credits.

### Farm Food Safety Training with GAPs

January 6-7, 2014 | 8:30 AM - 3:00 PM CCE Ontario County, 480 N Main St, Canandaigua 14424



Cornell National GAPs Program, Cornell Vegetable Program, Cornell Lake Ontario Fruit Team, and Cornell Cooperative Extension, along with assistance from NYS Dept. Ag & Markets, will be presenting farm food safety training/GAPs (including Harmonized GAPs) this winter. *These workshops are partially funded through a grant by the Genesee Valley Regional Marketing Authority.* 

This training is for those farmers who are being required by buyers to provide third party verification of their food safety practices and for farmers thinking about moving in this direction.

The first day of training will focus on the details of what GAPs is, how it works and what it means for your farming operation. The second day will be devoted to helping you write a food safety plan as required for audit certification. A laptop computer is required for the second day. After attending the 2-day workshop, growers are invited to a mock audit during the growing season so they know what to expect from a third party audit.

Cost: \$60. Pre-register by January 2, 2014. For more info or registering online, go to <a href="mailto:cvp.cce.cornell.edu">cvp.cce.cornell.edu</a> or contact Craig Kahlke at cik37@cornell.edu or 585-735-5448.

### **Finger Lakes Produce Auction Meeting**

January 9, 2014 | 10:00 AM - 3:00 PM Finger Lakes Produce Auction, 3691 Rt 14A, Penn Yan 14527





This winter meeting for auction growers will include discussions on weed management, invasive pests, pesticide safety, food safety, and grower/buyer panels. This event is free. 1.0 DEC credit (categories 1a, 10 and 23) and CCA credits (1.5 IPM, 1.5 CM) will be available. Contact Judson Reid at jer11@cornell.edu or 585-313-8912 for more information.

### Seneca Produce Auction Meeting

January 10, 2014 | 10:00 AM - 3:00 PM 2295 Yerkes Rd, Romulus 14541





This winter meeting for auction growers will include discussions on weed management, invasive pests, pesticide safety, food safety, and grower/buyer panels. This event is free. 1.0 DEC credit (categories 1a, 10 and 23) and CCA credits (1.5 IPM, 1.5 CM) will be available. Contact Judson Reid at jer11@cornell.edu or 585-313-8912 for more information.

### Winter Wednesday Lunch Series: Vegetable & Small Fruit Production Webinars

January 15, 2014 | Spotted Winged Drosophila and Brown Marmorated Stink Bug | 1:00 - 2:00 PM February 12, 2014 | Dealing with Late Blight | 1:00 - 2:00 PM

March 19, 2014 | Conventional and Organic Weed Control in Sweet Corn, Pumpkins, and Winter Squash | 1:00 - 2:00 PM April 2, 2014 | Fertigation: Scheduling and Water Quality Considerations | 1:00 - 2:00 PM

Penn State and Cornell University have teamed up to present a series of webinars to keep you informed about critical production issues. This series provides convenient access to timely updates in commercial vegetable and small fruit production for extension educators, producers, and industry representatives in Pennsylvania, New York, and surrounding states.

Cost: \$10/webinar. To register, go to http://extension.psu.edu/vegetable-fruit/winter-webinars or call 724-627-3745.

### Pesticide Training and Recertification - CCE Ontario County

Trainings on February 3, 10, 17, 24 | 7:00 - 9:30 PM Exam on March 3 | Exam at 6:30 - 10:00 PM CCE Ontario County, 480 N Main St, Canandaigua 14424





For anyone interested in obtaining pesticide certification who meets the DEC (Dept of Environmental Conservation) experience/education requirements OR current certified pesticide applicators seeking recertification credits. 2.5 recertification core credits for each class.

\$140 for certification includes the training manuals and all 4 classes. Does not include the \$100 exam fee. Recertification is \$75 for all 4 classes or \$20 per class. For more info or to register, contact CCE Ontario County, 585-394-3977 x427 or x436, or email <a href="mailto:nea8@cornell.edu">nea8@cornell.edu</a> or <a href="mailto:nea8@cornell.edu">nea8@cornel



### **Produce Crop Planning Meeting (Walk & Talk Discussion Group)**

February 8, 2014 | Time TBD Cuba, NY



For more info contact: Elizabeth Buck at: <a href="mailto:emb273@cornell.edu">emb273@cornell.edu</a> or Robert Hadad at: 585-739-4065. More details will be <a href="mailto:cvp.cce.cornell.edu">cvp.cce.cornell.edu</a> under Events. All Allegany/Cattaraugus vegetable growers are encouraged to attend the monthly discussion group meetings.

### Local Forum on Cover Crops & Soil Health: Harvesting the Potential

February 18, 2014 | 9:00 AM - 12:30 PM

CCE Ontario County, 480 N Main St, Canandaigua 14424





Secretary of Agriculture Tom Vilsack, Howard G. Buffett, and four Midwestern cash crop farmers will discuss by webinar the benefits of cover crops and conservation tillage to improve soil health and farm profitability. Local discussion and demos before and after the webinar. Preregister: Carol MacNeil at 585-394-3977 x406, <a href="mailto:crm6@cornell.edu">crm6@cornell.edu</a>.

# Potato Short Course - Disease Management, Variety Development & New Breeding Technology

February 19, 2014 | 9:30 AM - 3:30 PM

Holiday Inn, I-90, exit 37/Electronics Parkway, Liverpool



Simplot: genetic engineering for higher quality, disease resistance; Amanda Gevens, U WI: field/storage disease management; Cornell potato breeding, and licensing varieties; Using the Late Blight Decision Support System (bring a laptop; let us know if you need one). DEC pesticide credits available! Sponsored by the Empire State Potato Growers, Inc. Free! Pay for lunch off menu.

For more info, contact Don Halseth at deh3@cornell.edu or 607-255-5460.

### **Potato Grower-Processor Meeting**

February 20, 2014 | 12:30 PM - Dinner Club 57, Rt. 21, south of I-86, north of Hornell



Cornell potato updates and grower-processor discussion. Contact Bob or Gary Mahany: 585-738-7391 or 607-725-1956; or Stephanie Melenbacher: 607-664-2307. Cost: \$50 for growers and agribusiness input suppliers.

### Farm Food Safety Training with GAPs

February 27-28, 2014 | 8:30 AM - 3:00 PM Steuben County



Cornell National GAPs Program, Cornell Vegetable Program, Cornell Lake Ontario Fruit Team, and Cornell Cooperative Extension, along with assistance from NYS Dept. Ag & Markets, will be presenting farm food safety training/GAPs (including Harmonized GAPs) this winter. These workshops are partially funded through a grant by the Genesee Valley Regional Marketing Authority.

This training is for those farmers who are being required by buyers to provide third party verification of their food safety practices and for farmers thinking about moving in this direction.

The first day of training will focus on the details of what GAPs is, how it works and what it means for your farming operation. The second day will be devoted to helping you write a food safety plan as required for audit certification. A laptop computer is required for the second day. After attending the 2-day workshop, growers are invited to a mock audit during the growing season so they know what to expect from a third party audit.

Cost: \$60. Pre-register by February 24, 2014. For more info or registering online, go to <a href="mailto:cvp.cce.cornell.edu">cvp.cce.cornell.edu</a> or contact Craig Kahlke at <a href="mailto:cjk37@cornell.edu">cjk37@cornell.edu</a> or 585-735-5448.

# Farmers Market Manager Training Conference - "Navigating the Local Food Scene"

February 27 - March 1, 2014 Doubletree by Hilton, Binghamton



Go to: <a href="https://www.nyfarmersmarket.com/work-shop-programs/annual-conference-ditto-with-the-annual-conference/program.html">www.nyfarmersmarket.com/work-shop-programs/annual-conference-ditto-with-the-annual-conference/program.html</a> or contact the Farmers Market Federation of NY at: <a href="mailto:deggert@nyfarmersmarket.com">deggert@nyfarmersmarket.com</a> or 315-637-4690.

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# **Diagnosis and Management of Potato Tuber Diseases**

Carol MacNeil, CCE Cornell Vegetable Program (from N. Olsen, J. Miller and P. Nolte, Univ of Idaho, CI1131)

A seven page color fact sheet on the *Diagnosis and Management of Potato Storage Diseases* is now available online from the University of Idaho. The diseases covered are those which NYS potato growers often find themselves dealing with: pink rot, Pythium leak, late blight, Fusarium dry rot, bacterial soft rot, silver scurf, black dot, and early blight. In addition to assisting with the proper identification of the diseases, there is information on sanitation of equipment and the storage,

and recommendations on how to hold lots with some disease if you can't sell them immediately. To see the full fact sheet go to the CVP website link at <a href="http://rvpadmin.cce.cornell.edu/pdf/submission/pdf175">http://rvpadmin.cce.cornell.edu/pdf/submission/pdf175</a> pdf.pdf

The Yakima Herald Online, 12/9/13, reported an even more serious disease outbreak in the Northwest: bacterial ring rot (BRR). This feared disease has a 0% tolerance in certified seed because of its devastating effects and its ability to spread rapidly during seed cutting

and handling. BRR can remain infective for seven years on wood surfaces. Infected tubers have soft, bacterial decay in the vascular ring, which cannot be detected from the outside of the tuber. Reportedly, Washington and Idaho had thousands of unharvested acres this year due to BRR. It will take extreme vigilance and aggressive sanitation to clean this up. The Potato Commission is recommending that growers have the seed lots they've ordered tested for BRR.

# Reducing Risk from PVY Necrotic Ringspot Disease

Carol MacNeil, CCE Cornell Vegetable Program

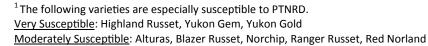
At the December 4<sup>th</sup> Upstate New York Potato Advisory Committee Meeting in Canandaigua Cornell plant pathologist Keith Perry described the steps growers can take to reduce the risk of getting the Potato Tuber Necrotic Ringspot Disease (PTNRD) on susceptible varieties they're growing. PTNRD is caused by the necrotic tuber strain of Potato Virus Y (PVYntn). This problem has been increasing throughout NYS and the US in recent years. Some lots of Yukon Gold have been severely affected. Symptoms often don't show up until after a period of storage. They can extend into the tuber.

The PVY virus, which is susceptible to mutation and hybridization of strains, unfortunately has been shifting rather quickly towards strains like PVYntn with the potential to cause PTNRD. Potato varieties have a range of susceptibility/ tolerance/resistance to infection by PVY. (Solanaceous crops like tomato, eggplant, etc., and weeds like nightshade can also be infected.) In addition, potato varieties show varying degrees of PVY foliar symptoms, not necessarily related to their susceptibility. Many potato varieties show no foliar symptoms of PVY infection at all with the newer strains. Winter lab tests on seed lots are needed to determine incidence of PVY. Potato growers should be sure they see the results of PVY winter tests for each seed lot they've ordered. Unfortunately current standard tests can't

distinguish between PVY strains. Viral incidence on a certified seed lot must be less than 5% but aphid and mechanical transmission can spread the virus across the farm during the season. Foundation seed is allowed less than 0.5% viral infection.

<u>If you grow Yukon Gold</u>, or another of the varieties susceptible to PTNRD<sup>1</sup>, Keith Perry recommends that you:

- Plant only certified seed with a low % PVY from the winter test
- 2. Do not grow PVY-symptomless varieties<sup>2</sup> on the farm
- 3. Eliminate all volunteers and culls
- 4. Talk to your seed grower. Does he have PVY on his farm? What were the results of the winter tests for PVY on the seed lots you've ordered?



<sup>2</sup> The following varieties show few - no symptoms of PVY, even when infected. They can carry the virus, however, and serve as reservoirs for aphid transmission to susceptible varieties.

**Banana** Innovator Blazer Russet **Keystone Russet** CalWhite LaRatte Chipeta Mesa Russet Purple Peruvian Crestone Russet Dakota Diamond Rose Finn Apple French Fingerling Russet Norkotah Gem Russet Shepody **GemStar Russet** Silverton Russet Green Mountain Winema

Varietal susceptibility from "Managing Potato Virus Y in Seed Potato Production," at: <a href="http://www.potatovirus.com/index.cfm/page/index.htm">http://www.potatovirus.com/index.cfm/page/index.htm</a> (funded by USDA NIFA Specialty Crop Research Initiative (SCRI) with assistance from the Idaho Potato Commission and seed certification agencies in WI, MT, ID, MN, ME, NY, CO, and OR)



Potato Tuber Necrotic Ringspot Disease, caused by PVYntn, on Yukon Gold. Photo: Carol MacNeil, Cornell Vegetable

# **Interested in Organic Certification?**

NOFA-NY E-News Digest, December 2013



Application info, with the requirements for certification, the records that need to be kept, and the inspections that need to be done, are at: <a href="http://www.nofany.org/">http://www.nofany.org/</a> organic-certification/certification-forms. Or contact the

certification office at 607-724-9851 or certifiedorganic@nofany.org Paper application packets can be purchased for \$50 plus tax through the certification office. Postmark or email the completed application for crops by March 15 for new applicants. For more go to: http:// www.nofany.org/organic-certification •

# Availability of Nutrients from Organic-**Approved Sources**

Carol MacNeil, CCE Cornell Vegetable Program

While most conventional fertilizers are available to plants quickly, organic-approved fertilizers vary in how quickly their plant nutrients become available. In some cases these plant nutrients become available through natural physical and chemical activity in the soil. This is largely true for lime and other mineral products. On the other hand, soil microbial activity is required to mineralize the nutrients from plant and animal materials for them to become available to crops. The activity of soil microorganisms is dependent on adequate but not excess moisture, adequate oxygen, and warm temperatures. As soils warm in the spring microbial activity speeds up. If you're planting a very early crop in cold soils the only plant nutrients available will be those present before the soil microbes get to work. Once the soil warms the plant and animal materials will provide a steady source of nutrients over a long period of time. One advantage with plant and animal sources of nutrients is that the activity of soil microorganisms mirrors the growth of plants. The conditions that promote the growth of the microorganisms generally promote the growth of the crop.

A resource which organic growers and those who advise them should find very useful is Using Organic Nutrient Sources, Elsa Sanchez, Penn State University, at: <a href="http://pubs.cas.psu.edu/freepubs/pdfs/uj256.pdf">http://pubs.cas.psu.edu/freepubs/pdfs/uj256.pdf</a> This publication is a complete guide for using soil tests, choosing organic nutrient sources for the crop and time of year, and determining what amounts of organic nutrient sources are needed. There are tables which list dozens of organic nutrient sources, the percentage of the major plant nutrients they contain (nitrogen, phosphate and potash), and how quickly the nutrients become available. Rapid to medium rapid availability would be desired for a very early crop planted in cool soils. The approximate amount of nitrogen available from a range of legumes is also listed. (Not all legumes listed do well in Upstate NY. ed. CRM, CVP) The actual amount of nitrogen will depend on the legume stand, the amount of growth at the time of incorporation, and when the incorporation occurred. Legumes plowed down in the fall will lose some nitrogen before spring planting. Some mineralization will occur during warm spells over winter, and snowmelt and spring rains will leach it away.

Always check with your organic certifier before using a product to be sure it is allowed. Not all OMRI-approved products are allowed by all certifiers. 0

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VegEdge is the award-winning newsletter produced by the Cornell Vegetable Program in Western New York. It provides readers with information on upcoming meetings, pesticide updates, pest management strategies, cultural practices, marketing ideas and research results from Cornell and Cornell Cooperative Extension. VegEdge is produced every few weeks, with frequency increasing leading up to and during the growing season.

### **VEGETABLE SPECIALISTS**

**Robert Hadad** | 585-739-4065 cell | 716-433-8839 x228 office | rgh26@cornell.edu food safety & quality, organic, business & marketing, and fresh market vegetables

Christy Hoepting | 585-721-6953 cell | 585-798-4265 x38 office | cah59@cornell.edu onions, cabbage and pesticide management

Julie Kikkert | 585-313-8160 cell | 585-394-3977 x404 office | jrk2@cornell.edu processing crops (sweet corn, snap beans, lima beans, peas, beets, and carrots)

 $\textbf{Carol MacNeil} ~\mid~ 585\text{-}313\text{-}8796 \text{ cell} ~\mid~ 585\text{-}394\text{-}3977 \text{ x406 office} ~\mid~ \text{crm6@cornell.edu potatoes, dry beans, and soil health}$ 

**Judson Reid** | 585-313-8912 cell | 315-536-5123 office | jer11@cornell.edu greenhouse production, small farming operations, and fresh market vegetables

### PROGRAM ASSISTANTS

Elizabeth Buck | 607-425-3494 cell | emb273@cornell.edu

John Gibbons | 716-474-5238 cell | jpg10@cornell.edu

Courtney Hill | 585-813-5136 cell | ch733@cornell.edu

Nelson Hoover

#### **ADMINISTRATION**

Angela Parr | 585-394-3977 x426 office | aep63@cornell.edu

Steve Reiners | sr43@cornell.edu

Mark Giles | fmg4@cornell.edu

For more information about our program, email cce-cvp@cornell.edu or visit us at CVP.CCE.CORNELL.EDU



