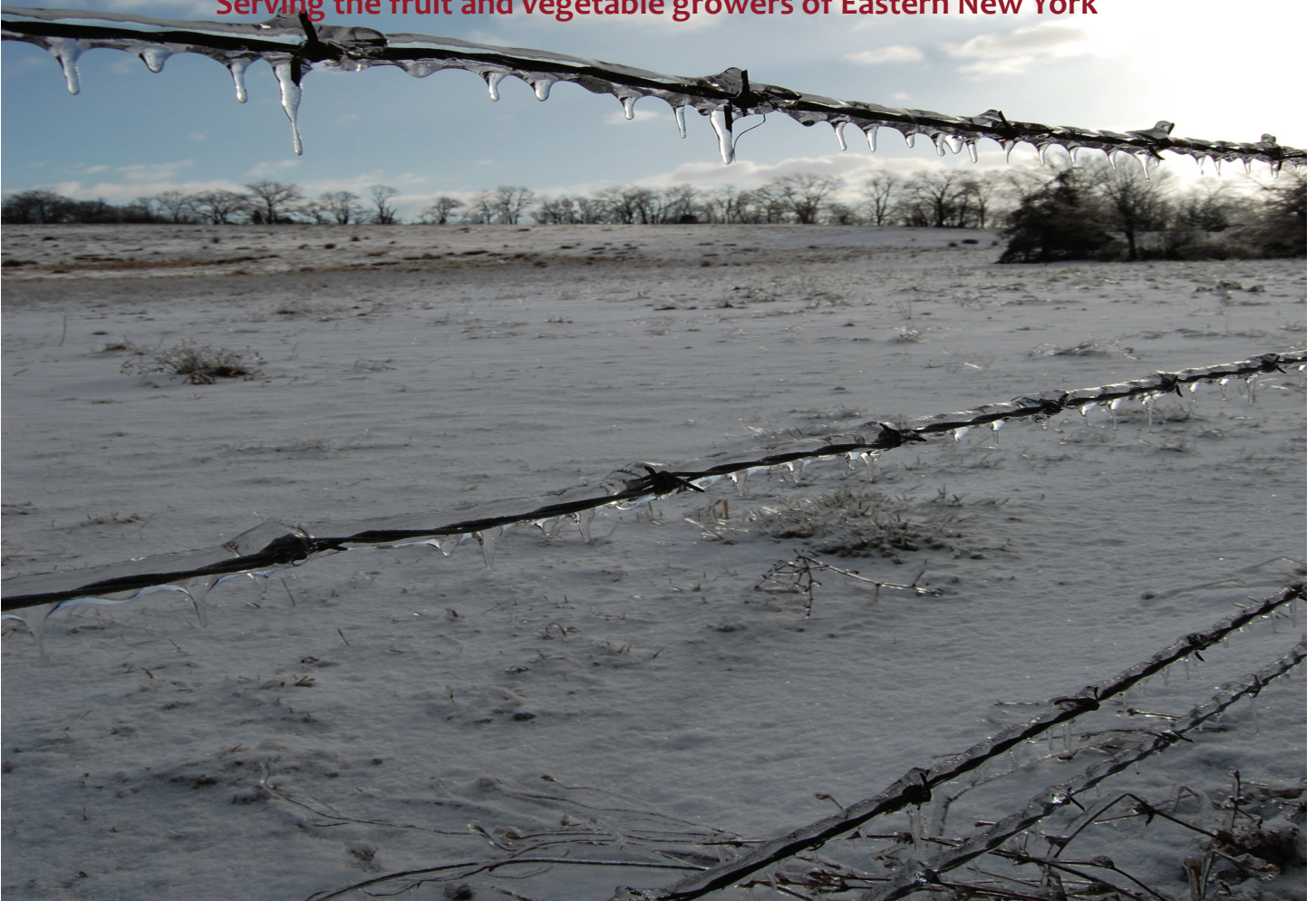


# The Produce Pages

Serving the fruit and vegetable growers of Eastern New York



## Vegetable & Fruit Grades and Wholesale Packing Conventions

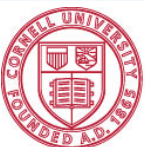
January 2016

BY ERIK SCHELLENBERG

Whether you are trying to open up your first wholesale account, expand your wholesale business, or get a better quality control system in place for your existing wholesale business, grading and packaging of the final product are the key attributes that should be on your mind. Regional food buying programs are helping to increase the amount of wholesale institutional buying in the Hudson Valley area, and producers need to be ready to meet the specific needs of large wholesale buyers.

Wholesale buyers have many different options to choose from for their supply, and they may

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Cornell University  
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# The Produce Pages

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*Serving the Educational and Research Needs of the Commercial Small Fruit, Vegetable and Tree Fruit Industries in Albany, Clinton, Columbia, Dutchess, Essex, Fulton, Greene, Montgomery, Orange, Putnam, Rensselaer, Saratoga, Schoharie, Schenectady, Ulster, Warren and Washington Counties*





mechanical or other means. Unless otherwise specified, the minimum size shall be one inch in diameter.

Most buyers will also specify the color and a (usually) larger bulb size. For example, the NYS Department of Corrections requires onions of at least 3" in diameter to fit their processing equipment. Onions are generally sold in plastic netted bags of a specified weight – 3, 5, 10, and 20 lbs are common sizes.

## Apples

The grades for apples are rather more complex. There are essentially four grades: US Extra Fancy, US Fancy, US No. 1, and US Utility.

Extra Fancy consists of consists of apples of one variety (except when more than one variety is printed on the container) which are mature but not overripe, clean, fairly well formed, free from decay, internal browning, internal breakdown, soft scald, scab, freezing injury, visible water core, and broken skins. The apples are also free from injury caused by bruises, brown surface discoloration, smooth net-like russetting, sunburn or sprayburn, limb rubs, hail, drought spots, scars, disease, insects, or other means. The apples are free from damage caused by bitter pit or Jonathan spot and by smooth solid, slightly rough or rough russetting, or stem or calyx cracks, as well as damage by invisible water core after January 31st of the year following the year of production except for the Fuji variety of apples. Invisible water core shall not be scored against the Fuji variety of apples under any circumstances.

The other grades of course allow for some of these post-harvest disorders to be present, but it is clear that achieving the US Extra Fancy grade is a matter of considerable difficulty and requires a thorough knowledge of handling and packaging to attain.

Boxes of apples generally are packed to weigh approximately 40 pounds, and with a specific count in a bushel box. The larger the count, the smaller the size of each apple. Each layer of apples is separated by a cardboard or

change suppliers because of issues with packing without even telling you what you did wrong, so it's important to know how to pack your produce correctly. The USDA's agricultural marketing service (AMS) sets the standards for produce grades, which essentially create a common language for buyers and sellers of produce. When a wholesale buyer requires produce of a certain grade, the seller must use the services of a certified auditor to have the produce officially graded. Hiring an inspector to grade a load of produce is generally done when the quality has been brought into question by the buyer or seller. Some growers choose to have their lots inspected routinely so as to avoid any potential questioning of quality from buyers. Likewise, some buyers will routinely grade the loads they buy as a means to reduce their liability. For example, onion packing operations normally have inspections done on loads brought in from foreign countries. They re-pack the 50 lb. bags of onions into smaller bags for regional retail and need to be assured of the grade of the product.

It is important to know that grades and buyer requirements are not always the same thing. For example, a buyer may not require that produce be inspected by a grader, but it usually still must conform to the normal grade guidelines. U.S. No. 1 onions are as follows, according to the AMS:

U.S. No. 1 consists of onions of similar varietal characteristics which are mature, fairly firm; free from soft rot of wet breakdown, sprouts, bottlenecks, scallions, and cull material. The onions shall also be free from damage caused by seedstems, sunscald, sunburn, roots, moisture, freezing, mold or other disease, insects,

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plastic divider to prevent bruising and ensure ease of counting. The cardboard bushel box and the dividers are never reused due to food safety risks.

## Lettuce

The AMS differentiates between field grown and greenhouse grown leaf lettuce, standard head lettuce, and romaine. Salad mixes are dealt with under the umbrella “fresh cut produce”. Field grown leaf lettuce and standard head lettuce have US Fancy, US No. 1, and US No. 2, greenhouse grown leaf lettuce has US Fancy and US No. 1, and romaine lettuce has only US No. 1. The top grades specify that the produce be of a similar variety, fresh, green, and firm. They must be free from decay, russet spotting, and doubles. They must also be free from injury by physical factors such as freezing, tip burn, or discoloration. Cut greens are generally packed in ½ bushel box or crates, weighing 8-10 lb. Leaf lettuce is generally packed in 1 1/9 bushel boxes, 12-24 per container weighing a total of 20-25 lb.

## Potatoes

US No. 1 potatoes consist of potatoes of similar varietal characteristics, except when designated as a mixed or specialty pack. They must be firm, fairly clean, and fairly well shaped. They must be free from freezing, blackheart, late blight, southern bacterial wilt, ring rot, soft rot, wet breakdown, or damage by any other cause. They must be not less than 1 7/8 inches in diameter, unless otherwise specified in connection with the grade.

Potatoes are generally sold in 50lb bags that are able to breathe.

Whether or not you decide to have your produce graded, you should be aware of the conventions normally used for the product you are selling and do your best to conform to them because they are the standards that buyers have come to expect. Even when buyers don't explicitly require them, you may be losing business by not meeting the grades without knowing it. For a full list of all grades, searchable by commodity, please visit <http://www.ams.usda.gov/grades-standards/vegetables>

## Cabbage Whitefly:

### a “newish” pest comes to town

**TERESA RUSINEK**

As I began to examine the kale leaf a cloud, reminiscent of snow, formed around me. Having never observed whitefly as a pest of field-grown vegetables I was puzzled and alarmed to find such a high population in a brassica crop otherwise growing beautifully on a brisk October day. Under magnification it was clearly not sweetpotato or greenhouse whitefly, two familiar greenhouse pests. This was cabbage whitefly, new to the Hudson Valley. Highly attracted to brassica crops and in particular the “super food” kale that farmers seem to be growing more of each year. If you grow brassica crops, keep an eye out for this pest and control it well before you get to the ‘blizzard’ stage!

Originally from Europe, the cabbage or brassica whitefly (*Aleyrodes proletella*) is making its way around the world where it is now reported in Russia, Taiwan, Australia, Brazil and Africa. It established itself in eastern United States in 1993, then moved west where it was detected in California in 2001 and more recently in Oregon in 2014. There has been one reported occurrence that I am aware of in eastern New York, on Long Island in an Organic cabbage field. This was a few years back and apparently the grower has not had a problem since. In other areas of the world it is reported as a significant pest.

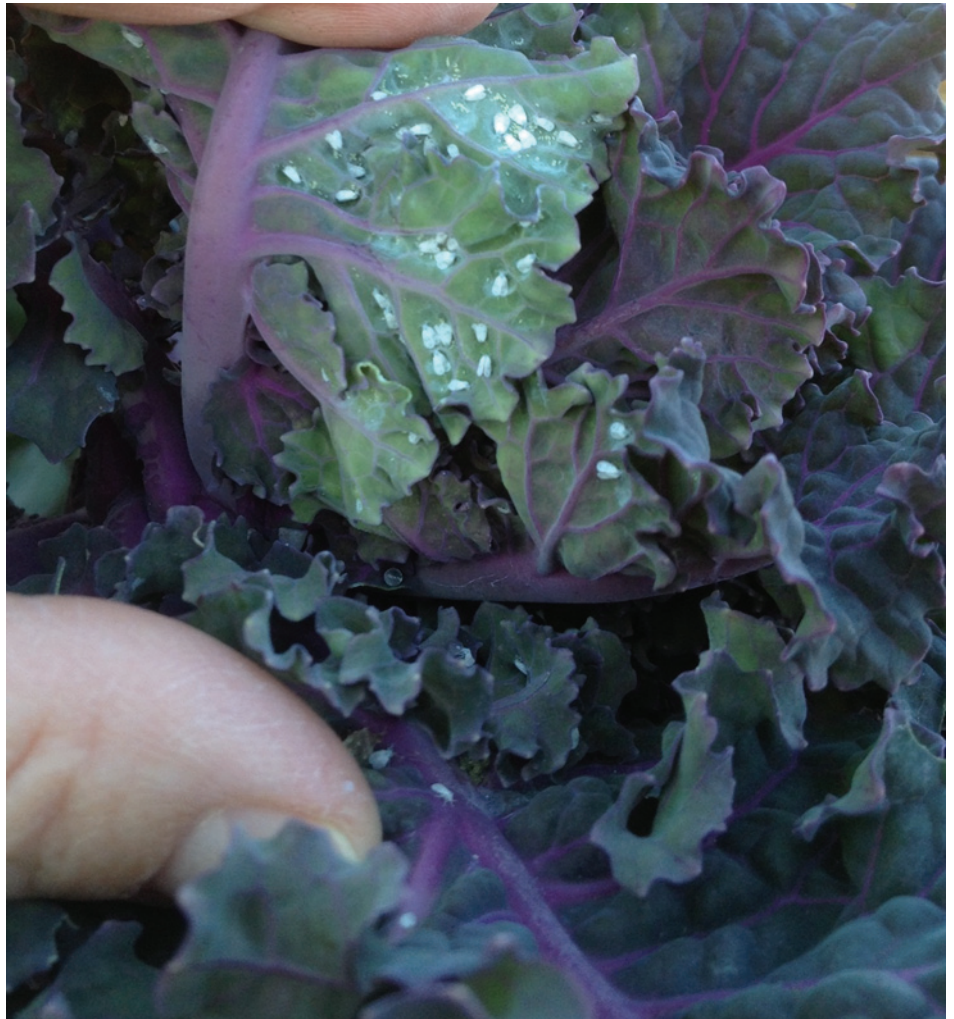
The adult stage is a small 1.5 mm white-winged insect that rests on the undersides of brassica leaves and flies about when a leaf is disturbed. The adults lay tiny white eggs in a half-moon or circular pattern on the undersides of the leaves. The immature stages are flat, scale-like, and feed on plant sap as do adults. Cabbage whitefly adults are distinguished from greenhouse and sweetpotato whiteflies by two gray blotches on each forewing.

When populations get high, plant vigor and quality are reduced by the mass presence of eggs, nymphs and adults. Furthermore, the adults and nymphs deposit honeydew on foliage, much like

*continued on next page*

aphids, on which sooty mold grows, spoiling the appearance and marketability. In our climate expect several generations per season and under the right conditions, a significant population can establish itself in a short time. It is also likely to successfully overwinter on host plant debris in the environment.

As the name implies cabbage whitefly feeds and reproduces on plants in the brassica family (including some wild relatives like pepperweed), however, it is also known to feed on other crops and weeds like alfalfa, fava bean, sowthistle, and dandelion. It was a serious pest on pansy in one Long Island greenhouse. We don't yet know the extent to which this complicates control, but the broad range of hosts suggests it will be difficult to control culturally through rotations or plowing under crop debris. Keeping field edges clear may help populations from building up and moving into the field. Some biological controls might be introduced though we don't yet know how they will perform in the field. In one study looking at two commercially available whitefly biocontrols, *Encarsia formosa* readily parasitized cabbage whitefly but *Eretmocerus eremicus* did not. Insecticides organic growers can use include M-Pede Insecticidal Soap, azadirachtin (Aza-Direct, AzaGuard, Azatrol, Azatin O, Molt-X, Neemix, etc.) or a horticultural oil (SuffOil-X, Sunspray Ultra-Fine). These are strictly contact materials, so coverage on the underside of leaves needs to be thorough and several applications may be required. Conventional growers also can use Admire Pro (foliar or soil), Leverage, Brigadier, some pyrethroids (e.g. Warrior II, Mustang Max, Baythroid XL), Verimark (soil), Durivo (soil), Fulfill, Movento, Endigo ZC, Voliam flexi, Exirel, Courier, or Vetica.



**Whitefly adults and nymphs on brassica leaf.**

*Photo by Teresa Rusinek*

#### Sources:

North American Plant Protection Organization Phytosanitary Alert System. NPAG Data: *Aleyrodes proletella* Brassica Whitefly. Draft September 24, 2001. Accessed 12/17/2015 at <http://www.pestalert.org/storage/AproletellaNAPPO.pdf>

Oregon Pest Alert: Cabbage White Fly. Oregon Dept. of Agriculture, May 19 2015. <http://www.oregon.gov/ODA/shared/Documents/Publications/IPPM/CabbageWhiteflyAlert.pdf>

Linden A. van der & M. van der Staaij. 2001. Banker plants facilitate biological control of whiteflies in cucumber. Proc. Netherlands Ent. Soc. 12: 75-79. Accessed 12/17/15 at <http://www.nev.nl/pages/publicaties/proceedings/nummers/12/75-79.pdf>

Daniel Gilrein, Extension Entomologist, Cornell Cooperative Extension of Suffolk County, LI Horticultural Research and Education Center, Riverhead



# A Brief Review of Viruses in Apples

DAN DONAHUE

## What is a Latent Virus?

An apple virus will be considered “latent” if it is present, but does not commonly express symptoms in commercially cultivated varieties. Factors that can influence the expression of symptoms include the scion variety, the specific rootstock, as well as specific combinations of scion and rootstock. Depending on the specific virus and cultivar/rootstock, symptoms can include: Stunting of leaves & general growth; Chlorotic leaf spots/rings/lines; Inner bark necrosis (measles); Stem grooving & pitting as well as union necrosis.

## What are the Latent Viruses that Commonly Infect Apples?

**Apple Stem Grooving Virus (ASGV):** Has been called “apple brownline disease”. Can cause graft union necrosis in susceptible rootstocks/cultivars, as well as premature leaf drop, abnormal leaf coloration, distortion of scion trunk and rootstock tissue. Spread through vegetative propagation, there are no known insect or nematode vectors. No commercial control measures available, bud wood can be successfully heat treated (36°C for 30 days) to remove the virus from plant material used for propagation.

**Apple Stem Pitting Virus (ASPV):** Does not commonly express visible symptoms unless grafted on a sensitive rootstock such as European crab or Virginia crab. Symptoms can include general tree decline, leaf epinasty, and inner bark necrosis. Mild and severe strains have been identified. Spread is through vegetative propagation, there are no known insect or nematode vectors. No commercial control measures are available.

## Apple chlorotic leaf spot virus (ACLSV):

Symptoms in *Malus spp.* can include chlorotic leaf spots/rings/lines as well as stunting. The virus can reduce tree growth and productivity, as well as contribute to tree decline. Virus

spread is through vegetative propagation, there are no known insect or nematode vectors. No commercial control measures are available.

## Serious Apple Viruses that are not considered to be “Latent”

**Apple Mosaic Virus (AMV):** Symptoms will be visible (expressed) if the virus is present. The expression is known to vary by variety, with Golden Delicious considered to be highly susceptible, and McIntosh significantly less so. Visible symptoms include pale to bright chlorotic (yellow) spots on unfolding (new) leaves. The reduction of fruit yield of infected trees ranges from 0 to 50%. Transmission is through budding or grafting, there are no known insect or nematode vectors. No commercial controls are available.

**Tomato Ringspot Virus (TmRSV):** Infected trees may express a condition termed Apple Union Necrotic Decline (AUND), a thin, brown, line of necrotic tissue at the graft union. The union of an infected tree is severely weakened, and subject to breakage. TRV is vectored by a nematodes *Xiphinema americanum* and *Xiphinema riversi*. The commonly planted semi-dwarfing rootstock MM-106 is particularly susceptible to TmRSV. No commercial controls are available.

## Disease caused by a Phytoplasma (not a virus)

**Apple Rubbery Wood (RW):** Originally thought to be caused by a virus, later determined to be a “phytoplasma”. Phytoplasma are very small bacteria which lack cell walls, and survive as parasites in plants. Infected apples exhibit an unusual degree of limb flexibility, along with shortened internodes. Tree vigor and yield may be reduced. Transmission is through budding or grafting, there are no known insect or nematode vectors. No commercial controls are available.

## How are Latent Viruses Spread?

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## YIELD REDUCTION IN APPLE PRODUCTION DUE TO VIRAL DISEASES.

Apple Cultivars	Virus Strain	Yield Reduction (%)	References
Golden Delicious	Apple Mosaic Virus (AMV)	46	Baumann and Bonn, 1988
Golden Delicious	AMV, Rubbery Wood Disease (RW)	21-67	Baumann and Bonn, 1988
Golden Delicious	RW	46	Wood, 1978
Golden Delicious	Apple Stem Grooving Virus (ASGV), Apple Stem Pitting Virus (ASPV), Apple Chlorotic Leaf Spot Virus (ACLSV)	12	Meijnske et al., 1975
Golden Delicious	ASGV, ASPV, ACLSV	30	van Oosten et al., 1982
McIntosh	AMV	9	Zawadzka, 1983
McIntosh	RW	8	Zawadzka, 1983
Red Delicious	AMV	42	Zawadzka, 1983
Red Delicious	RW	20	Zawadzka, 1983

The short answer is human beings. Grafting infected (“dirty”) Budwood onto “clean” virus-free rootstock is the most likely way for viruses to be introduced into a commercial orchard. It is tempting for a commercial apple producer to supply the bud wood from that stellar orchard for a custom batch of trees from his/her nursery. However, if that bud wood is infected, and subsequently not tested or treated to eliminate the virus(es), the newly grafted trees are at risk. The original orchard may appear to be fine, no obvious symptoms, but the new trees could prove to be a scion variety/rootstock combination that is more sensitive to those latent viruses, with the result being economic loss.

A second possibility is poor quality control in the nursery, leading to the introduction of virus-

contaminated scion or rootstock. The recent interest in heirloom and European hard cider varieties, and the scramble to harvest bud wood and produce much-needed trees, could lead to the introduction of latent viruses into newly planted cider orchards. It is generally accepted that the bud wood currently available for heirloom and European hard cider varieties are virus infected, and have not been processed in a “virus-free certification” facility. Heat treatment of plant tissue for 30 days at 36°C is a common method used to “clean up” virus infected stock for use in propagation. Root grafting has been shown to occur between adjacent apple trees, and successful virus transmission has been documented. Unfortunately, root grafting in both orchard and forest systems has not been extensively researched. It would be reasonable to hypothesize that the extremely close proximity of individual trees in modern high density planting systems (3-5') could present many opportunities for root grafts to develop. In this scenario, a small population of infected trees scattered

throughout the orchard could significantly impact the productivity of the entire orchard, over time.

### What is the Virus Status of Currently Popular Dwarfing Rootstocks?

Malling 9 (M-9) and Malling 26 (M-26) were developed over a century ago, and are known to harbor latent viruses. The EMLA versions (EMLA-9 and EMLA-26) were developed from virus-free stock, and are now sold alongside the “dirty” originals. Why are the originals still available? The EMLA versions resulted in trees that grew 10 – 20% larger than the originals, a testament to the stunting capability of the latent viruses. Growers with a lot of experience growing M-9 could

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choose to grow vigorous scion varieties on the original M-9 as a way to further manage vigor, while propagating weak scion varieties on the EMLA version in order to facilitate growth.

### **Recent Rootstock Selections that show Virus Susceptibility**

- G16: Very susceptible to latent virus in the scion. Scion wood must be virus free. Tree death in year one following grafting is even possible.
- G65: Susceptible to Apple Stem Grooving (ASGV) and Tomato Ringspot Viruses (TmRSV).
- G814: Susceptible to latent viruses.
- Poland 2 (P2): Red Delicious is susceptible to Apple Union Necrosis (AUND) when propagated on P2.
- Ottawa 3 (O.3): Very susceptible to Apple Mosaic Virus (AMV), only known virus-free scion wood should be used.
- Budagovsky 9 (Bud9): Susceptible to Tomato Ringspot Virus (TmRSV), status of susceptibility to latent viruses is unclear.

### **Recent Rootstock Selections Not Considered to be Virus Susceptible**

- G11: Not susceptible to latent viruses
- G41: Not susceptible to latent viruses
- G210: Not susceptible to latent viruses

### **Recent Rootstock Selections Which are Virus-Free, but Susceptibility is Unclear**

- NIC-RN-29 (NIC29): Free of latent viruses, susceptibility undetermined
- M9-NAKB-337 (M9-337): Free of latent viruses, susceptibility undetermined
- G935: Free of latent viruses, susceptibility undetermined

### **How to keep your orchards free from virus infection?**

- Only purchase trees where both the rootstock and scion variety are certified to be virus free.
- Do not supply bud wood to a commercial nursery from your own (or someone else's) orchard unless it has been tested and certified to be virus free.

- Remember, viruses will transfer successfully in both directions across the graft union.
- Monitor your orchards for tree decline and chlorosis, noting any virus symptoms in the leaves, on the trunk, and the graft union. Contact your CCE Regional Specialist for further assistance.

*The article below was written in 2006 and albeit not all of the statements are true for 2015, these are some increasing truths among them. Please see the last section on fungicides. When this was first out growers expressed some displeasure that I may be suggesting that no fungicides should be used. That certainly is not true, I just wanted to help folks see that fungicide applications may be part of the reason we see more bacterial infections in modern times. Not that we would forgo fungicides but use them with the foreknowledge of what they might open the door to.*

## **Thoughts on Onions**

**MAIRE ULLRICH**

Below are some anecdotal conclusions I have drawn from discussions with growers and crop success and failure I have witnessed over the years. All of these "opinions" and ideas are subject to your disagreement and I welcome any communications that will further my education. So, if you agree, and especially if you disagree with what I write here, please call me.

### **This Year's Weather**

There is no doubt that the weather this summer has left us with some "issues" in a few fields. One small area that offered spotty hail re-

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sulted in high decay rates when subsequent weather was not helpful in their healing. Even where hail was not noted, the hard and heavy rains resulted in tissue damage and spots with significant decay. I think the damaging rains that fell after bulbing was initiated (and any warm weather following that) were the most damaging to the crop. One recommendation I have is that all fields should be sampled (30-40 total onions at least collected from a few different areas in the field) and examined/cut to determine rate and type of decay. I think there might be a few surprise fields out there and you don't want that surprise in storage. This will give you the opportunity to manage your marketing more effectively. Try not to sample the onions more than a week before you plan to harvest.

### Varietal Differences

There were significant differences in how onions fared this year based on variety. The past couple of dry years (what onion growers would usually prefer since you would rather have a slightly smaller crop providing it is of exceptionally good quality) have left growers selecting the onions they outperform on size in a dry year. Those tend to be varieties with Spanish influence. I think that those varieties are more susceptible to bacterial issues in years such as we have had this year. This is just another reason to have "different baskets" for "eggs".

### Rolling Recommendation

I think, for the most part, any onion with any bulb size on it should be rolled if they are

hailed on after the longest day. I know this sounds severe but I think most of you would rather harvest a small-ish crop than one with bacterial infections.

### Fertilizers and Herbicides



I know I have speculated, and so have growers, about certain herbicides and the foliar damage they leave on onions. I am not willing to point at any herbicide or combination but I am tending to think that any damage that occurs to a plant larger than 5/6 leaves and/or after bulbing is initiated may increase incidence of bacterial disease. It is a similar case with fertiliz-

ers. I am inclined to believe that fertilizers applied to correct deficiencies, lead to higher decay rates. I think both potential irritants have more to do with timing (earlier is less risky than later) and less with exact quantity or formulation.

### Fungicide Applications

Now here is where I really go out on a limb ....I actually believe that the use of fungicides is increasing the crops susceptibility to bacterial diseases. In years past,

Before fungicides, the incidence of bacterial diseases was few. However, the crop would be "blighted-out" and virtually lost in cool wet Botrytis-prevalent years. Clearly, I am not advocating eliminating fungicides. I just think that the great green lush tops that come to your waist when walking the field may be a bacterial playground waiting to happen. I think that Botrytis infections,

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<http://enych.cce.cornell.edu/>

with their ability to somewhat dry tissue didn't allow for the crop to be as juicy as it is on fungicides, especially in the wetter years. To continue with crazy thoughts, maybe it will be an advantage to decrease fungicide use after wet, hot and humid cycles that favor bacterial infections? The use of copper compounds may still be warranted and they too provide low levels of fungicidal activity. But, to allow Botrytis to naturally decrease the moisture content of the plant, making the environment less preferable to bacteria may be something that could "help" in the situation. This would only be a viable practice well after bulbing has been initiated so as to secure that Botrytis would not ravage the crops productive capabilities.

## Matted-Row Strawberry Variety Trial Results

**KATHY DEMCHAK, SMALL FRUIT  
EXTENSION SPECIALIST, PENN STATE**

It's the time of year when many growers are figuring out what varieties to include in their strawberry orders. For an impartial view of the performance of some of the newer cultivars, here are the first harvest year results from a matted-row trial at the Penn State Horticulture Research Farm at Rock Springs.

The experiment was established in 2014 and included 9 cultivars, including 'Earliglow' and 'Jewel' as standards for comparison, 4 advanced selections from the breeding program at Cornell and 3 advanced selections from the breeding program at Rutgers. Some of the varieties/selections were bred for plasticulture, but given the way they produced runners on plastic, we decided to try them out in matted row production also. Rows were on 4' centers, and plants were originally planted 2' apart.

The harvest season was fairly wet, and it seemed like the foliage almost never completely dried out. This was especially problematic with a couple of the very vigorous cultivars, and is reflected in the high percentage of fruit loss to gray mold

that they had. We also had a hot spell in the middle of June, which likely spurred on some fruit anthracnose development, which was problematic for other cultivars. I guess the good part in all of this was that it turned out to be a good year for testing disease susceptibilities. No fungicides or insecticides were sprayed during harvest, and only one insecticide application was made during the summer primarily for Japanese beetle foliar feeding.

### Summary of the characteristics of each variety

#### Standards

'Earliglow' and 'Jewel' performed as expected – yields were good, flavor was good, and other than Jewel having more common leaf spot than most of the other plants, they had no particular disease susceptibilities. For comparison with the rest of the cultivars, total yield was 8004 lb/a for 'Earliglow', and 12,745 lb/a for 'Jewel'. With 'Earliglow', 53% of the fruit was marketable, with gray mold and some tarnished plant bug damage being the primary reasons for unmarketable fruit. For 'Jewel', 63% of the harvest was marketable, with gray mold being the primary reason for unmarketable fruit. Mean berry weight was 10.0 g/berry for 'Earliglow', and 11.3 g/berry for 'Jewel'.

#### Order of ripening

This was a little difficult to sort out this year, as almost everything started to ripen at once.



**'Malwina' strawberry plant - bred in Germany.**

*Photo: Kathleen Demchak*

*continued on next page*

'Earliglow' was the first variety to ripen, with 'Jewel' less than a week behind (!).

### 'Galletta'

'Galletta', from the breeding program at NC State, was bred for plasticulture. It began ripening right after 'Earliglow', and wasn't great for matted row - at least, not the first year. Yields were low at 4711 lb/a, but this berry had the largest size of all of the named cultivars at 13.5 g/berry. Berry size for the first 3 harvests was over 20 g/berry, and berries were nicely firm with good flavor and color. It bounced back after renovation, runnering well and filling the beds in very nicely, so we'll see if the yields come up next year.

### 'Laurel'\*

'Laurel', from AAFC-Nova Scotia, was also early. Total yield was high, at 10,379 lb/a, with 61% marketable fruit, and nice-sized berries averaging 11.0 g/berry. They were nearly twice this size for the first few harvests. The plants were very vigorous, and with our wet season, gray mold was the main reason for unmarketable fruit. Flavor was good, but not outstanding. Despite the vigor, the plants themselves were among the most disease resistant in the planting, with very little common leaf spot or leaf scorch. This is definitely one variety worth trying out.

*\*Editors' note: Please be aware that Nourse Farms has stopped carrying 'Laurel', so currently it is only available through Canadian nurseries.*

### 'Herriot'

'Herriot', from the breeding program at Cornell, apparently wasn't suited to our warmer conditions. The yield was on the low side (5767 lb/a total), and only 32% of the fruit was marketable due to a truly impressive susceptibility to fruit anthracnose. Berry size was good, however, at 12.8 g/berry. Next year we'll likely try spraying more and see what happens to anthracnose incidence.

### 'Sonata'

'Sonata' was one of the top yielders, though it definitely was more productive when we had it in plasticulture. Yields were similar to those from 'Jewel', at 12,434 lb/a, with 56% of the fruit marketable, and an average berry size of 10.5 g/berry. It had very little trouble with foliar diseases, but

because of vigorous foliage, gray mold was problematic on the fruit. Flavor was decent.

### 'Rubicon'

'Rubicon' plants were likewise extremely vigorous. Rubicon was bred from varieties that survived Jim LaMondia's and Richard Cowles' "death plots" that they used for black root rot research at the Conn. Ag. Expt. Station. Total yield was decent at 8244 lb/a, but the percentage marketable fruit was low at only 43%, primarily because the plants were so vigorous that the foliage never dried out so gray mold was problematic. The fruit also suffered a fair amount of damage from tarnished plant bugs. Berries were nice-sized (10.9 g on average), but they were light in color and on the tart side. The light color might come from one of its parents, 'Idea', which some of you may remember from a little over a decade ago.

### 'Mayflower'

'Mayflower' total yields were average at 7846 lb/a, but this cultivar had a higher percentage of marketable fruit (62%) than most. 'Mayflower' was somewhat susceptible to fruit anthracnose and tarnished plant bugs, perhaps because of its late harvest season when tarnished plant bug populations were higher, and berries were on the smaller side averaging 10.5 g/berry. 'Mayflower' was quite late, but its main characteristic of note was unusual flavor which different people described as "spicy", "floral", or "tangy" and usually "needs sugar". The berries were pretty with large caps, but the variety's susceptibility to leaf scorch often resulted in lesions on the caps.

### 'Malwina'

'Malwina', from Germany, is later than any other strawberry I've ever seen. We picked our first ripe fruit on June 22, and we stopped harvesting it on July 15 so we could renovate the plots. At that point, its fruit was just trickling in. It produced very few runners, so the beds were not very well filled in, resulting in low total yields of 4353 lb/a. Fruit size averaged 10.5 g/berry, and 62% of the fruit was marketable. Fruit losses were due primarily to fruit anthracnose and tarnished plant bug injury, again likely prevalent because of the late harvest season.

*Continued on next page*



### Cornell advanced selections

Among the 4 Cornell advanced selections, one produced extremely high yields of 14,579 lb/a with large fruit averaging 11.9 g/berry. The percentage of fruit harvested that was marketable was low, however (53%) because of significant susceptibility to fruit anthracnose, similar to the degree experienced with 'Herriot', and also gray mold. Another selection was extremely vigorous with very good yield (11,250 lb/a) but had small berries (10.1 g – similar to 'Earliglow'). Two others were lower in yields and percent marketable fruit due to gray mold susceptibility.

### Rutgers advanced selections

The 3 Rutgers advanced selections got everyone's attention for an assortment of reasons. These cultivars were developed for use in the plasticulture system with flavor being the primary breeding objective. Plants were very small when planted and had difficulty becoming established, so I'll want to see how they do in their second harvest year. All had very good flavor, except for one brief spell when flavors became a little "off".

One selection in particular was very vigor-



ous, produced decent yields despite the slow start, and after renovation was in second place for runner production of all 16 cultivars or selections. The most interesting characteristic of this selection was its very unusual long narrow shape, so it might take some creative marketing to encourage consumer acceptance, or perhaps people will just need to sample the berries. The two other selections had lower yields, but very good flavor. All 3 of these selections were included in a plasticulture variety trial at the SE Research and Extension Center. Information on that trial will be forthcoming. The disclaimer is that varieties perform differently in different locations. It's still always worth trying out at least a few plants of each variety on your own farm.

**Source:** Veg and Small Fruit Gazette, Penn State University, December 3, 2015

## Upcoming Berry Workshops

**Thursday, January 19- 21<sup>st</sup>** Empire State Producers EXPO, OnCenter, Syracuse, NY. For information or to register visit: <http://nysvga.org/expo/information/>.

**Thursday, February 16-18<sup>th</sup>** Hudson Valley Fruit School – Two full days of Tree Fruit information followed by a third day of Berry and Grape information PLUS NEWA (Network for Environment and Weather Applications) workshops. Visit our website for agenda information and to register: <https://enych.cce.cornell.edu/>.

**Tuesday, February 23<sup>rd</sup>** Berry Processing Workshop – CCE Columbia County and Micosta Enterprises, Hudson, NY. Keep checking our website for information to come: <https://enych.cce.cornell.edu/>

**Thursday, March 24<sup>th</sup>** Cornell Berry Production Workshop - CCE Saratoga County, 50 West High Street, Ballston Spa, NY 12020 – agenda and registration details forthcoming.

## Why is Certified Potato Seed so Important?

**MAIRE ULLRICH**

A variety of diseases, fungal, bacterial and viral (and nematodes, depending on whether you count them as diseases or insects!) can be transmitted through potato seed pieces. It is critical that certified seed be used to prevent the transmission of these pests.

It is tempting to forgo the "store-bought" seed to save money but, in my experience, the money will be worth it. Some of the worst crop losses have been from carry-over of infected seed or plant parts.

The biggest risk you face is carry-over of Late Blight (are you SURE you didn't have so much as 1 lesion in 2015?) that could then infect your

## On the Passing.....

Robin Redfern Bellinder, of Ithaca, a professor of horticulture at Cornell University for 31 years and an international expert in weed control in vegetable crops, died unexpectedly on Nov. 13, 2015. She was 70 years old.

Robin died of a pulmonary embolism after a brief hospitalization and stay in a physical rehabilitation clinic for an unrelated spinal injury.

Robin was born in Astoria, Ore., on Aug. 7, 1945, the first child of Capt. Richard "Dick" Dunning Redfern and Dorothy A. Warren. The family was on the West Coast for her father's deployment with the U.S. Coastal Artillery during World War II. They returned to Michigan after the war and settled in the northern village of Bellaire, where she and her younger brother Tod spent much of their youth. The family moved to Traverse City, Mich., and then Lansing, where she graduated from Lansing Eastern High School in 1963.

Robin took a serpentine path to her Cornell professorship. She began studying at the University of Michigan in 1963. When she expressed interest in a degree in the sciences, her advisor told her that, based on her math and science test scores, she should instead get a degree in English. She left school shortly after to explore the world, hitchhiking through much of the U.S. and Europe and ending up in Uppsala, Sweden, in 1966. She returned to her studies in 1968 but took another break in 1969 to travel for a year overland from Sweden to India, Singapore and back. She had her daughter, Jessica, in 1971, and as a single parent resumed her studies and earned a degree in English from Uppsala University in 1972. She returned to the U.S. in 1974 and, after several years working in the hospitality industry in northern Michigan, she returned to college and completed her bachelor's degree in science at Michigan State University in 1979. She went on to get her master's and, in 1984, doctoral degrees from Virginia Polytechnic Institute and State University in Blacksburg, Va. In the same year, before her graduation ceremony, she began working as an assistant professor of horticulture at Cornell.

Robin balanced her obligations as a graduate student and professor with her role as a single parent



in an era and professional arena where this was uncommon. Although money was tight when she was a student, she maintained an unwavering commitment to nurturing her daughter. During the relocation from East Lansing to Blacksburg in December 1979, she loaded a Michigan Christmas tree on top of everything in the U-Haul to make sure the family would have a real Christmas celebration when they arrived.

At Cornell, Robin's research program focused on weed management for vegetable crops. One of few

women in her field at that time, she became a national and international leader. She published research results widely in peer reviewed publications, as well as publications that advised growers about her work's practical applications. She served as president of the Northeastern Weed Science Society and, in 2005, was named the recipient of Cornell's College of Agriculture and Life Sciences award for outstanding accomplishments in applied research. She will be remembered as a weed scientist who ardently and tirelessly supported New York vegetable growers.

Robin had a deep concern for people, whether farmers in South Asia, for whom she championed the introduction of more efficient weed control practices, or hungry families in New York's southern tier. She initiated Cornell's efforts to provide fresh fruits and vegetables from the Homer C. Thompson Research Farm to the Food Bank of the Southern Tier. She realized that rather than composting the farm's edible produce, they could feed hungry area families. Since 2004, as a result of her initiative, Cornell has donated more than 1 million pounds of produce from the Thompson farm.

Robin will be remembered as an intense, thoughtful, loyal, generous, creative and loving person who tenaciously advocated for the things she believed were important. She will be greatly missed.

She is survived by her daughter, Jessica Bellinder, son-in-law, Brian Arthur, and granddaughter, Fiona Claire Bellinder, of New York; her brother, Tod Willis-Redfern, of Eaton Rapids, Mich. her half-sister, Susan Fujii, of Mountain View, Calif. and her nieces, Alexis Willis-Redfern and Keilani and Malia Fujii. She will be buried next summer at a family plot in Lakeview Cemetery in Bellaire, Mich.



tomato planning. The types infecting crops in recent years have infected both tomatoes and potatoes and planting infected tubers will give the fungus the early start it needs to

create total havoc on your farm. The time and money spent on fungicides should you contract an early infection would easily outpace the cost of purchasing certified potato seed.

Remember to check other state's directories and/or ask for inspection paperwork when buying potato seed.

A good factsheet on the matter:

<http://www.cals.uidaho.edu/edcomm/pdf/CIS/CIS0974.pdf>

NYS 2015 Certified Potato Seed Directory:

[http://rvpadmin.cce.cornell.edu/uploads/doc\\_331.pdf](http://rvpadmin.cce.cornell.edu/uploads/doc_331.pdf)

We can print you a copy if you would like paper.

### *USDA Pilot Project:*

## Unprocessed Fruits & Vegetables

As part of the 2014 Farm Bill, AMS and the Food and Nutrition Service (FNS) are conducting a pilot project in up to eight States to provide more purchasing flexibility and options for unprocessed fruits and vegetables, including minimally processed products such as sliced apples, baby carrots, and shredded lettuce. The Pilot project allows participating states to (1) use multiple suppliers and products established and qualified by the Secretary and (2) designate a geographic preference, if desired.

The goal of the Pilot Project is to develop additional opportunities for schools to purchase fresh fruits and vegetables with entitlement funding, while using pre-existing commercial distribution channels and school relationships with grow-

ers, produce wholesalers, and distributors. The pilot supports the use of locally-grown foods in school meal programs using entitlement funds.

New York is a participating state. Companies/producers interested in being placed on the Pilot Project Eligible Vendor List should review the eligibility requirements before contacting AMS Commodity Procurement Staff. Please note that vendor eligibility for participation in this pilot project does not constitute approval to participate in other AMS' commodity purchase programs (AMS solicitations and contract awards).

For more information on becoming a vendor or assisting a school district in accessing the project:

<http://www.ams.usda.gov/selling-food/pilot-project>

# Permaculture

for the

## Backyard and the Small Farm

Thursday, January 14, 2016 - 10:00 AM - 3:00 PM

Cornell Cooperative Extension of Ulster  
232 Plaza Road, Kingston, NY 12401

Whether you're a DIY type who wants to be self-reliant or you're concerned about the broader impacts of humanity's unsustainable relationship with the planet (or both!), the best place to begin is the same: right out your front door. We will explore what permaculture design is and how to use it.

The first half of this workshop will be a presentation that includes design principles and concepts. During the second half, we will break into small working groups and everyone will put pencil to paper on a small design project (their own backyard). Please bring maps, pictures or other resources to help you as you design your property. The goal is for everyone to leave the workshop knowing which project is most important to do first within their own context, and with at least a



# Calendar of Events

**January 19-21, 2016. *Empire State Producers EXPO*.** Syracuse, NY.

<http://nysvga.org/expo/information/>

**February 2-4, 2016. *Mid-Atlantic Fruit and Vegetable Convention*,** Hershey, PA.

<http://www.mafvc.org/>

**February 9-11, 2016. *NJ Agricultural Convention and Trade Show*,** Atlantic City, NJ.

<http://www.njveggies.org/convention>

**February 15, 2016. *Northeast NY Tree Fruit School*.** Lake George, NY.

**February 16-17, 2016. *Hudson Valley Fruit School – Tree Fruit Sessions*.**

**February 18, 2016.**

***Hudson Valley Fruit School – Berry and Grape session*.**

**February 24, 2016. *ENYCHP Capital District Vegetable Grower's School*,** Albany, NY.

**February 25, 2016. *ENYCHP Hudson Valley Vegetable Grower's School*,** Kingston, NY.

**March 2-4, 2016. *North American Raspberry and Blackberry Conference*,** Colonial Williamsburg in Williamsburg, VA.

<http://www.raspberryblackberry.com/>

**March 8, 2016. *Onion School*,** CCE Orange County, 18 Seward Ave. Middletown, NY.



## Northeastern NY & VT Winter Grape School

Save the date for is event!

The ENYCHP and the UVM Grape Program will be offering a one day program covering the most recent information on research, horticultural practices, business, new products, and industry topics.

Speakers will include Cornell faculty, industry representatives, and other specialists.

This will also be an opportunity to earn DEC credits.

**Thursday, March 17, 2016  
Holiday Inn Lake George,  
2223 Canada St. , Lake George, NY**

More information, including program agenda and event registration, will be available on our website in the coming weeks.



**Cornell Cooperative Extension****Hudson Valley presents**

# 2016 Hudson Valley Nursery & Greenhouse Growers School

**Wednesday, January 27, 2016.****8:30 AM ~ 3:45 PM**

**Cornell Cooperative Extension Orange County**  
**18 Seward Ave., 3RD Floor**  
**Middletown, NY 10940-1919**

**NYSDEC Pesticide Recertification Credits have been applied for in the following categories: 1a, 10, 3a, 3c, 23, 24, 25.**

**Registration required and seating is limited. \$70 per person if postmarked by Jan. 20, 2016 (includes lunch), \$80 thereafter, including by phone. No refunds, substitutions are allowed.**



Cornell Cooperative Extension and the staff assume no liability for the effectiveness of results of any chemicals for pesticide use. No endorsement of any product is made or implied. Every effort has been made to provide correct, complete, and current pesticide recommendations. Nevertheless, changes in pesticide regulations occur constantly and human errors are still possible. These recommendations are not substitutes for pesticide labeling. Please read the label before applying any pesticide. Where trade names are used, no discrimination is intended and no endorsement is implied by Cornell Cooperative Extension.

*Diversity and Inclusion are a part of Cornell University's heritage. We are a recognized employer and educator valuing AA/EEO, Protected Veterans, and Individuals with Disabilities.*

**AGENDA**

8:30 AM Registration and sign in for NYS DEC credits  
 9:00 Welcome and announcements

9:15 Pollinator Issues, New Landscape Pests,  
 Q & A - What's Bugging You  
 Dan Gilrein, *Cornell Cooperative Extension Suffolk County*

10:15 Do Happy Aphids make Happy Beneficials?  
 Betsy Lamb, *Cornell University IPM Program*  
 Research on the interaction of Nitrogen level, aphid population, and biocontrol

10:45 Break

11:00 Biopesticide Efficacy Trial on Control of Cucurbit Powdery Mildew  
 Brian Eshenaur, *Cornell University IPM Program*

11:30 Selling Knowledge - Providing Pest Management Information to Your Customers  
 Betsy Lamb, *Cornell University IPM Program*

12:00 PM Lunch

1:00 Alternatives to Invasive Landscape Plants  
 Brian Eshenaur, *Cornell University IPM Program*

1:30 Proper Planting Techniques for Trees and Shrubs  
 Jim Presutti, *Hudson Valley Horticultural Services*

2:00 The Garden Professional's Wish List  
 Cheryl Alloway, *Alloway Garden Design*  
 and Russel Wiser, *Victoria's Gardens*

2:30 Worker Protection Standards and Changes  
 Maire Ullrich, *Cornell Cooperative Extension Orange County*

3:00 Evaluations and Adjourn.