Downy Mildew Alert for Onions

*by Christy Hoepting, Cornell Vegetable Program*

Downy mildew (DM) was detected this week on July 1st in upland transplanted onions in Genesee County and in direct seeded onions in Oswego County. These detections were very early and very minor with only a few plants infected. DM infection occurs during cool temperatures (less than 72°F) and wet conditions such as we are having. Spores are produced at night and are easily blown long distances in moist air. They can germinate on onion tissue in 1.5 to 7 hours when temperatures are 50 to 54°F. High daytime temperatures (> 74°F) and short or interrupted periods of humidity at night can prevent sporulation. In 2009, DM was first detected during the first week of July and this disease went on to cause serious economic losses in onions across the state as the weather conditions continued to favor disease development and spread (Fig. 1). With forecasted rainy weather for the next few days, growers should protect all of their onions from DM with mancozeb 3 lbs (high rate). Note, that Quadris products and Actigard, which some growers may be using in transplants for protection against Purple Blotch and bacterial diseases, respectfully, also have suppressive activity against DM. Growers should also scout for DM. If DM is found, apply a Ridomil product plus mancozeb.

**EARLY DETECTION OF DM IS TRICKY**

Middle-aged leaves first turn pale, and then yellowish, elongated patches may have grayish-violet fuzzy growth on otherwise green leaf tissue (Fig. 2). Sporulation is most easily ob-

Figure 1. Downy mildew epidemic of 2009. Downy mildew of onions is like late blight of potato. 

Photo: Christy Hoepting, Cornell Vegetable Program
served when dew is present (Fig. 3). DM is expected to attack older transplanted onions before direct seeded onions. DM attacks green leaf tissue and then kills it leaving a necrotic spot at the original infection site, which is readily invaded by purple blotch and other opportunistic fungi like Alternaria and Stemphylium spp. that have black spores. If you see patches in fields with a lot of black sporulation and leaf dieback, take a closer look and see if you can find purplish-gray spores on the green leaf tissue surrounding the necrotic and blackened patches (Fig. 4).

**USING RIDOMIL TO MANAGE DOWNY MILDEW IN ONIONS**

Mancozeb should be used as a protectant against DM when weather conditions are conducive to this disease. Once DM has been detected, the recommendation is to use a Ridomil Gold product (a.i. mefanoxam) + high rate of mancozeb, as two fungicides are better than one. Ridomil Gold products can only be applied every 14 days, up to 4 applications per season, so they need to be rotated to another DM fungicide in the week between. Fungicides in Group 11 chemical class, like Quadris Top, Cabrio, Pristine and Reason tank mixed with high rate of mancozeb may be used. These materials will also help to manage Purple blotch, which will be associated with DM. The fungicide program is to prevent further spread from the infected plants to healthy ones, so that the whole field does not go down. Expect original DM hot spots to worsen, despite fungicide sprays. To assess whether DM is being contained, look for lack of new infections, and lack of spores on old lesions. Unfortunately, when conditions are favorable for DM, it can still cause a lot of damage to onions, despite the best fungicide programs. Downy mildew of onions is the equivalent of Late Blight in potatoes, it is a very aggressive defoliator. If the weather turns hot and sunny, the hot spots that we are seeing now will dry out and shut down.

**USING PRE-MIXES OF RIDOMIL GOLD FOR CONTROL OF DOWNY MILDEW IN ONION**

1) **Ridomil Gold SL** (EPA No. 100-1202) is labeled for damping off in onions as an in-furrow application. **It is not labeled for DM as a foliar application.**

2) **Ridomil Gold Bravo SC** (EPA No. 100-1221) is a liquid formulation labeled at 2.5 pts per acre for DM. This formulation contains 33.1% Bravo (3.34 lbs Bravo per gallon), which equals 1.04 pts of Bravo per 2.5 pts of product per acre. **For improved control of Botrytis leaf blight (BLB), you may want to supplement Ridomil Gold Bravo with an additional 0.5 to 2 pts of Bravo. Add the highest label rate of mancozeb for added DM protection.**

3) **Ridomil Gold MZ** (EPA No. 100-1269) is a dry formulation labeled at 2.5 lbs per acre. It contains 64% mancozeb, which is equivalent to 1.6 lbs a.i. mancozeb. **The recommended rate of mancozeb is 2.25 lbs a.i. Therefore, Ridomil Gold MZ needs to be supplemented with additional mancozeb to achieve this rate. Also, for control of BLB and PB, additional fungicides would need to be added to this tankmix.**

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**Annual Elba Muck Onion Twilight Meeting**

**Thursday, August 8, 2013**

5:30 - 8:00 pm

Starting at Mortellaro’s Red Shop on Marky’s Muck, Elba Muck land. DEC credits have been applied for.

*Mark your calendars!*
Tunnels Perpetuate Tobacco Mosaic Virus (TMV)

J. Reid, CVP: There have been several cases of virus infected plants in greenhouses and high tunnels over the past week from across the state. Tobacco Mosaic Virus (TMV) appears to be the pathogen in these cases, although there are many strains, as well as many other viruses that affect tomatoes. Infected plants develop stunted and distorted leaves, with abnormal flowers and fruit (Fig. 1). Flowers will often drop with TMV infection. The severity of loss depends on the number of plants infected as well as the age of the plant at infection. It isn’t uncommon to find an occasional symptomatic plant in a tunnel or greenhouse, but recent cases approach 75% loss. Why is this becoming so severe? The high tunnel production system may be in part to blame.

TMV is a highly stable virus that can survive without a living host in debris and soil for months. Thus sanitation (cleaning and disinfection) is one of the primary management steps. Greenhouses with floors and hard washable surfaces stand a better chance at achieving complete sanitation between crops than tunnels. As tunnels are soil based systems infections can carry over from one year to the next, despite our best efforts at sanitation.

In CVP research tomatoes have been documented as the most profitable tunnel crop. Farmers confirm this finding by growing tomatoes for several years in a row in the same structure. However, rotation to non-host crops is a key management step for TMV. All high performing commercial growers practice rotation of field tomatoes. It is much less common in tunnels where there is a heightened ‘return-on-investment’ focus.

Insects can spread viruses, and are the primary vectors in cases of Cucumber Mosaic Virus (CMV), however TMV is spread manually. Tunnel tomatoes are a very ‘hands-on’ crop as many growers have come to appreciate the benefits of greenhouse methods of pruning to improve yields. As TMV is spread me-

In summary, the soil-based system, regular pruning and lack of rotation in tunnels makes them hotspots for TMV; more so than hydroponic greenhouses or traditional field production. Unfortunately, a virus infected plant is generally untreatable. So what can we do to prevent TMV in tunnels?

- **Clean seed.** TMV can be seed borne. Buy from reputable seed sources and consider treatment.
- **Clean hands.** The use of gloves, regular hand washing and disinfection will reduce the spread. This also applies to any pruning tools used. There are now commercial pruning tools with reservoirs to disinfect blades.
- **Remove suspect plants immediately.** Severe cases in 2013 may have developed from minor infections in 2012.
- **No smoking around tomato plants.** Require all smokers to practice additional hand sanitation before handling plants.
- **Practice sanitation to the full extent possible in tunnels.** This would include the removal of as much crop debris as possible, disinfection of stakes and the structure.
- **Resistant varieties.** Check with your seed company for their list.
- **Rotation.** This may be the hardest one for tunnel growers, as most vegetables are reported as hosts.

Finally, we note there has been a historical interest in the use of milk to reduce the transmission of TMV. Several reputable sources document significant reduction in the transmission of TMV when hands are dipped in milk, others suggest the treatment of foliage or plant beds with milk. Although milk is not likely more effective than other disinfectants, it is an over-the-counter, non-toxic method that workers can adopt easily.
Cercospora Leaf Spot Disease of Beets, Swiss Chard and Spinach

*J. Kikkert, CVP:* If you’ve grown beets and Swiss chard before, you are probably familiar with Cercospora leaf spot (CLS) caused by the fungus *Cercospora beticola*. The pathogen can also infect spinach. This disease has already been found in a field of processing beets this year. Periods of leaf wetness will increase the presence of this disease. To improve your cultural management practices read below to review the source and spread of this disease. Those who chose to use fungicides should be scouting and acting on the threshold of one lesion per leaf. Furthermore, resistance of *C. beticola* to strobilurin fungicides has been documented. Tips on managing fungicide resistance are also provided below.

**What Does it Look Like?**
At first, the leaf spots are small brown flecks with reddish-purple borders. As the spots enlarge, they become ashen-gray in the center. In beets, the border of the lesions remains a distinct dark brown to purple. However, in Swiss chard, the borders may not be distinct. As the lesions mature, the centers become gray and brittle and fall out giving a shot-hole appearance. When the disease is severe, the foliage is killed. Injury from post-emergence herbicides can be confused with CLS. Note that herbicide injury will not spread, whereas CLS may continue to spread to new foliage. A less common leaf disease of beets called Phoma appears as lesions of various sizes with a concentric ring pattern called Phoma. Photos: Julie Kikkert, Cornell Vegetable Program

**Cultural Practices**
- Plant high quality seed free of *C. beticola*
- Three-year or longer rotation to non-hosts
- Deeply bury crop residue soon after harvest
- Avoid overhead irrigation
- Control weed hosts
- Decrease planting densities to encourage air movement in the canopy

**Time to Spray?**
Cercospora can make foliage unmarketable and may reduce crop yields. Processing table beet growers need healthy tops to help lift the roots from the ground at harvest. The disease is most damaging when it occurs early in the season or if the crop has a long time until harvest. While fungicide application to beets, chard and spinach isn’t routine for this disease, there are some important things for you to know:

*The available fungicides do not cure an established infection and must be used before the disease gets out of control.* Dr. Abawi at Cornell University recommends that when an average of one lesion per leaf is found, a fungicide treatment should be applied if the field still has a long time before harvest. Walk to 10 different spots in the field and blindly chose one leaf. Count the number of lesions per leaf and calculate the average for the 10 samples. Fungicides labeled for beets can be found in the 2013 Cornell Vegetable Guidelines. A recent addition is propiconazole labeled as PropiMax or Tilt fungicide, which has a different mode of action than the strobilurins (Quadris, Cabrio and Gem). For chard and spinach, note that copper-based fungicides may leave unattractive residues on leaves, making them unmarketable.

**Managing Fungicide Resistance**
Sugar beet growers in Michigan and Nebraska have experienced reduced control of Cercospora in recent years. Upon further investigation, strobilurin-resistant strains of the fungus were found to be widespread in the sugar beet growing counties within these states ([www.michiganbeets.com](http://www.michiganbeets.com)). Resistance was also confirmed in a processing table beet field in Western, NY in 2012. New York growers should follow good resistance management practices to minimize the chance of fungicide resistance. However, it is still possible that resistant strains could be brought in by seed or wind.

**Resistance management practices**
(from the Michigan Sugarbeet Research and Advisory Council; ed. J. Kikkert, CVP)
- Do not wait too long to begin fungicide applications
- Never spray with the same mode of action back to back
- Use strobilurin fungicides (Quadris, Gem, Cabrio) only once per season
- Tank mix strobilurins with copper
- Use the highest labeled rates of all fungicides even in tank mixtures
- Insure maximum coverage
- Use high pressure (80-90 PSI) and high gallonage (20-25 gallons of water)
How Copper Sprays Work and Avoiding Phytotoxicity

*Teresa Rusinek, ENY Commercial Horticulture Program, Weekly Vegetable Update, June 27, 2013*

Now that we’ve started seeing disease in veg crops, bacteria in particular, growers are considering copper sprays for management. Copper has been widely used in both conventional and organic production for some time. Copper was one of the first elements used as a plant fungicide (the other was Sulfur). Its discovery can be traced back to the famous origin of Bordeaux mixture, containing a mixture of copper sulfate (CuSO4) and slaked lime, and used for downy mildew control in French vineyards.

Recently, growers have asked me questions regarding the mode of action of copper and had concerns about phytotoxicity. First, let’s begin with how copper controls pathogens. Copper is usually applied in the “fixed form” which lowers its solubility in water. Fixed copper products include basic copper sulfate (e.g., Cuprofix Ultra Dispers), copper oxide (e.g., Nordox), copper hydroxide (e.g., Kocide, Champ), copper oxychloride sulfate (e.g., COCS), and copper ions linked to fatty acids or other organic molecules (e.g., TennCop, Cueva). The spray solution is actually a suspension of copper particles, and those particles persist on plant surfaces after the spray dries. Copper ions are gradually released from these copper deposits each time the plant surface becomes wet. The gradual release of copper ions from the copper deposits provides residual protection against plant pathogens. At the same time, the slow release of copper ions from these relatively insoluble copper deposits reduces risks of phytotoxicity to plant tissues. Copper ions denature proteins, thereby destroying enzymes that are critical for cell functioning. Copper can kill pathogen cells on plant surfaces, but once a pathogen enters host tissue, it will no longer be susceptible to copper treatments. Thus, copper sprays act as protectant fungicide/bactericide treatments, but lack post-infection activity.

Because different formulations have different properties when used as spray materials, growers need to learn how to read and interpret labels. The effectiveness of copper sprays is highly correlated with the amount of elemental copper that is applied. The metallic copper content varies widely by product. Potency also varies by how the product is prepared. Finely ground copper products are more active than coarsely ground ones. Professor Tom Zitter of Cornell University suggests that for vegetable crops “Begin by choosing a copper product with at least 20% or more copper as the active ingredient to insure the greatest release of copper ions”.

There are several suggestions for avoiding phytotoxicity (or plant injury) with copper sprays. Limit the copper ion concentration on plant surfaces by using copper products that are relatively insoluble in water, i.e. fixed copper. Copper can accumulate to high levels on plant tissue when sprayed repeatedly to cover new growth and there is no rain. In this situation, after a rain event, a large amount of copper ions may be released leading to phytotoxicity. Solubility of fixed cuprous increases under acidic conditions. Copper sprays will become more phytotoxic if they are applied in an acidic solution. Most copper products are formulated to be almost insoluble in water at pH 7.0. As the pH of water decreases the solubility of the copper fungicides increases and more copper ions are released. If the water used is too acidic (below pH 6.0-7.0 — depending on the copper formulation) excessive amounts of copper ions could be produced which may cause damage to fruit and foliage. Formulations vary in solubility — hydroxides are more soluble than oxychlorides which are more soluble than tribasic copper sulphates and cuprous. Less soluble formulations are usually more persistent. Check the pH of your water source. Copper sprays generally cause more phytotoxicity when applied under slow drying conditions, such as when it’s wet and cool. Always read the label instructions follow the Copper and tank mix partner labels.

For a comprehensive list of Copper Products Used for Vegetable Disease Control see: [http://vegetablemdonline.ppath.cornell.edu/NewsArticles/CopperFungicides2012.pdf](http://vegetablemdonline.ppath.cornell.edu/NewsArticles/CopperFungicides2012.pdf)

Sources: T. A. Zitter, Cornell University Department of Plant Pathology & Plant -Microbiology and David A. Rosenberger, Professor of Plant Pathology, Cornell University’s Hudson Valley Lab.

Comments Requested on Upcoming Farm Irrigation Survey

Comments are open until July 26 in regards to The Farm and Ranch Irrigation Survey (FRIS), a follow-on survey and in integral part of the 2012 Census of Agriculture which is conducted every five years under the authority of the Census of Agriculture Act of 1997. The 2013 FRIS will be obtaining data describing the irrigation activities of U.S. farm operations. Some of these activities are of national concern, such as the use of chemigation, fertigation and water-conserving practices of irrigators.

The 2013 FRIS will also include horticultural operations in a combined questionnaire that will be directed at horticultural producers. Since this survey was originally designed for field crops and pasture, it may be difficult to apply to the particulars of how irrigation is used in Eastern horticulture. This is a good opportunity to comment so that it ends up providing useful information with minimum burden on the farmer.

*continued on page 6*
The Farm and Ranch Irrigation Survey, part of the Census of Agriculture collects information on:
- acres irrigated by land use category,
- acres and yields of irrigated and non-irrigated crops,
- quantity of water applied and method of application to selected crops,
- acres irrigated and quantity of water used by source,
- acres irrigated by type of water distribution systems, and
- number of irrigation wells and pumps.

The primary purpose of FRIS is to provide detailed data on water management practices and water uses in American agriculture, and to on-farm irrigation activities for use in preparing a wide variety of water-related local programs, economic models, legislative initiatives, market analyses, and feasibility studies.

Growers may comment on:
- What are the practical uses of this information?
- Is the agency’s estimate of how long it takes to respond accurate?
- Could the quality, utility and clarity of the information to be collected be improved?
- Are there ways to minimize the burden of the collection of information?

Comments regarding this information collection received by July 26, 2013 will be considered. Written comments should be addressed to: Desk Officer for Agriculture, Office of Information and Regulatory Affairs, Office of Management and Budget (OMB), New Executive Office Building, 725—17th Street NW, Washington, DC, 20503. Commenters are encouraged to submit their comments to OMB via email: OIRA Submission@omb.eop.gov or fax (202) 395—5806 Reference OMB Control Number: 0535—0234.


Food Safety Update

R. Hadad, CVP: On June 25 & 26, the Center for Produce Safety held their annual conference at the Wegman’s Complex in Rochester. The conference brings together food safety researchers, Extension educators, produce industry officials, and produce grower groups. The focus was directed on the latest research results dealing with food borne illness spread and detection, methods of managing potential contamination in the field and packing house, Listeria problems, water quality for irrigation and produce washing and compost/manure handling.

The most sobering discussion occurred right at the beginning of the conference. The opening session was a one-man show from the biggest and most successful lawyer from Seattle who makes his living representing people who have gotten sick or lost family to food borne illnesses. William Marler of Marler Clark Attorneys at Law started his career 20 years previous by suing Jack in the Box restaurants for sickening 400 people that resulted in the deaths of several children who ate E. coli 0157H7 contaminated hamburgers. Ever since, this law firm has specialized in food borne illness cases across the country.

Due to the publicity of food safety concerns, the FDA proposed national regulations, the food industry’s push for audits and certification, and the number of food inspection schemes, insurance companies have started to either raise rates on farms who grow produce or meat or have dropped insurance policies all together for farms while litigation for plaintiffs in food safety cases have increased. The tide of concern for increased safety has turned from an industry drive to a massive fear of lawsuit. It seems that the industry and farms who want to do the right thing and be ahead of the curve on safety are being bowled over by larger, more emotional, and definitely more costly forces.

It was announced that the lawsuit against the cantaloupe farm involved in the listeria outbreak two seasons ago will be expanded to include the 26 retailer food chains that sold the processed melons. The suits include the farm at the heart of the issue, Jensen Farms, the company that was contracted to do the third party food safety inspection, the company that was subcontracted who provided the inspectors, the company that built the potato scrubbing machinery that Jensen Farms used to clean the melons, the distributors, and now the retailers. The farm and another group have already filed bankruptcy.

The main tool for the arguments in the litigation revolves around what is known today about food safety. With the internet and media technology, the lawyer argues that there is no reason why farmers, distributors, processors, and retailers are not aware of food safety practices, protocols, and procedures. Not knowing proves negligence and apparently juries are buying this argument. Marler claims there is no legal basis for due diligence. If you know there is science out there concerning food safety and you are not on the cutting edge implementing these practices for your business, then you are negligent. The industry now finds itself swept up the net of being aggressive in food borne disease prevention.

Regardless of the FDA federal regulations that loom on the horizon. Despite the promise of exemptions for very small farms, and graduated implementation for the rest of the produce farms over a number of years, it appears that the lawyers are now in charge of the food production practices in this country. The court of public opinion is being used by lawyers and insurance companies to dictate the practices of growing food and seemingly are removing it from the hands of the experts.

This session did cast a dark cloud over the conference. There many insightful research results presented by university and industry specialist using sound scientific means to find answers to many of the problems poised in keeping food safe. One project focused on the persistence of E. coli in a field of leafy greens and how long it took to degrade in the environment. A study looked at how easily pathogens can be transferred from smooth container surfaces, such as harvest bins to fruit. Another study investigated if and how E. coli can be blown from livestock operations across distances to fields of greens being grown. Several studies looked at sanitation of water, listeria in irrigation water, and methods of reducing pathogen transfer in wash water.

These promising results conducted by researchers across the country offered real hope on using sound science to answer the tough questions. Logic over emotional hysteria maybe can turn the tide of the advancing strength of the litigators. It will be a truly bad day when it is a court of lawyers that decide the fate of the food system instead of the hard working farmers who grow the food for all of these generations.
Late Blight Risk

C. MacNeil, CVP: Weather has been very favorable for late blight (LB) once again this week. Scout your fields frequently and carefully! Check culr piles to be sure no sprouts are emerging. 

Predicted Blight units (BU) for the past six days are listed in the chart. Predicted BUs for the next 3 days, based on the National Weather Service (NWS) forecast, are also listed. Warning! Forecast BUs can change day by day, just like the weather! Generally, a 5 day spray interval is needed. For a susceptible variety the threshold is 60 BUs after spraying the high rate of chlorothalonil. The interval can be stretched, even with a susceptible variety, if a more effective LB fungicide is used such as Ranman + protectant, Revus Top, Previcur Flex + protectant, or Gavel (all minimum 7 day intervals). 41 BUs triggers spraying after the use of the first three fungicides, while 34 BUs triggers a spray after using Gavel.

If you think you might have LB contact Carol MacNeil at 585-313-8796, John Gibbons at 585-394-3777 x405, or other CVP staff so we can confirm whether it’s LB and get a sample to Bill Fry to determine the LB strain. Mefenoxam fungicides (Ridomil, etc.) are extremely effective against LB strain US 23, which NY had last year, but is totally ineffective against some other strains.

From Meg McGrath, Cornell, and the USABlight website at http://www.usablight.org: 

FL - 1/3 - 6/14: 22 reports, some samples submitted - most US-23, dominant in 2012. Two potato samples were US-7.


LA - Late May: 3 separate occurrences; tomatoes and 2 gardens.

TN - 6/7: Garden tomato, US-23.

MD - 6/14: Tomato, commercial field.

KY - 6/18: Tomato, commercial field.

VA - 6/20: Tomato, commercial field.


DE - 7/1: Potato.

From Amanda Gevens, U-WI, Madison: LB has just been confirmed in Adams and Juneau counties, WI, on potato. Adams Co. is confirmed as US-23.

For photos of LB on potato or tomato, or for LB imitators, go to Cornell plant pathologist Meg McGrath’s photo index at: http://www.longislandhort.cornell.edu/vegpath/photos/index.htm and click on Tomato or Potato, then Late Blight. On the tomato or potato LB pages, at the top right, click on Late Blight brochures for gardeners – For the rest of New York to print a leaflet with color photos and recommendations to give to your neighbors or customers.

Bejo Seeds Open House and Demonstration Trials 2013

Noelle Allen, Bejo Seeds

Come join us August 27-28 to view a wide variety of quality vegetable crops at Bejo’s Research & Demonstration Farm at 4188 Pre Emption Road, Geneva, NY 14456! Open from 10:00 am - 6:00 pm, visitors can expect to see the following:

- Home & Market Garden Exhibit
- Commercial Strip Trials
- Food Concept Sampling
- Organic Variety Exhibit
- Seed Dealer Displays
- Product & Equipment Demonstrations
- Produce Market Displays

Refreshments plus a light lunch will be served on Tuesday, August 27. To RSVP, please call 315-789-4155.
CABBAGE & OTHER COLE CROPS
Wet conditions continue to delay new plantings. Cool and wet weather in combination with insecticide sprays have knocked back worm and flea beetle activity from last week. Alternaria leaf spot occurring on lower frame leaves (Fig. 1) may spread to broccoli or cabbage heads (Fig. 2) and it would be prudent to protect these crops as they near harvest. In recent Cornell studies, Helene Dillard found that different strains of ALS respond differently to different fungicides with no all strains being susceptible to all fungicides. Therefore, for best control, when disease pressure is threatening head quality, a tank mix of Quadris/Quadris Top + Bravo should be used, perhaps alternated with Switch or Inspire Super. Note that there are restrictions on the number of consecutive applications and rotation partners that can be used with Quadris/Quadris Top and Inspire Super for resistance management. For example, Inspire Super, Quadris and Cabrio cannot be used as rotation partners with Quadris Top. Bravo, Quadris and Cabrio will also provide some protection against downy mildew, which can also cause problems to broccoli heads in wet and cool weather. The pre-harvest interval for Bravo, Inspire Super and Switch is 7 days and 1 day for Quadris Top. Read labels carefully!

DRIEBEANS
Dry bean planting is finishing up between rains. Many growers are finished planting. Some acreage will not be planted. The largest beans have fully expanded trifoliates and post-emergence herbicides are going on. A strange leafspot was observed on early planted dry beans on at least one farm. Bacterial and fungal diseases have been ruled out, as have common viruses, and pesticide applications or common carryover herbicide residues. So far only the cotyledons have been affected and the trifoliate leaves are growing normally. See the article on post-emergence herbicide applications on page 9.

GREENS
Lettuce rots is a big worry. Treatment on younger plantings critical to prevent issues that could occur in several weeks. Tarnish plant bug and aster leaf hoppers along with slugs would be key pests to be on top of. Aphids too. Flea beetles have kicked up in some spots (maybe due to the cooler weather). Saw some moderate damage to brassica plantings over the past 4 days where there wasn’t any before.

ONIONS
New rainfall events have left onion fields wet once again with significant crop losses due to water damage inevitable across the region. The big news of the week is that downy mildew was detected in onions and that all onions should be protected from this disease at this time – see cover article. Fungicide programs including Bravo, Scala and iprodione (Rovral) have been keeping Botrytis leaf blight in check. Purple Blotch (PB) and other opportunistic fungi that attack necrotic tissue such as Alternaria spp. and Stempthylium spp. can more readily be found in big transplants that have started bulbing. Fungicides for protection against Purple Blotch should be applied to onions with 8 leaves or more. Fungicides with good activity against PB include Quadris Top, Scala and Rovral. Also found in transplants this week were a few plants with bacterial disease. Onion thrips pressure is increasing at a very slow rate and most direct seeded fields do not need to be sprayed. Timely first applications of Movento (when thrips were 0.5 to 0.7 OT per leaf) to transplanted onions continue to crush the onion thrips populations for a second consecutive week and these onions do not need to be sprayed with an insecticide again this week. Due to the systemic nature of Movento, timely applications early in the season can sometimes provide control for 2-3 weeks, and it is recommended to start the insecticide spray program with Movento – see “Momentum of Movento” in June 19th issue of VEW.

POTATOES
Field work has been difficult once again this past week due to the rains. A few more potatoes got planted, more potatoes got hilled. The higher, better areas have good looking potatoes and the lower areas have stunted or drowned out potatoes. Areas that had flooded before are once again flooded. Nothing’s had a real chance to dry out for weeks. All stages of Colorado potato beetle (CPB) are present. If you’re having trouble controlling them contact Carol MacNeil at cm6@cornell.edu or 585-313-8796. From the 2013 Cornell Vegetable Guidelines Potato section: Enhance the color of red skinned varieties with 2,4-D – If you’re growing smooth skinned red potatoes and need brighter red color for your markets you can apply low rates of specific formulations of 2,4-D around the time potatoes are 7-10 inches tall and again in 10-14 days. Do not mix with pesticides or adjuvants; do not apply to stressed potatoes or when temperatures are 85+ degrees. Potatoes may show very significant hormone herbicide symptoms but will grow out of it. Pre-harvest interval is 45 days. The following materials are labeled for this use in NYS. NOTE! Rates vary between these materials so read the label carefully for this specific use on potatoes! Materials listed: Riverdale 2,4-D L.V. 4 Ester; Riverdale 2,4-D L.V. 6 Ester; Alligare 2,4-D LV6; Nufarm Weedone LV4 EC.
Control Bean Weed Escapes with Post-emergence Herbicides &/or Cultivation

C. MacNeil, CVP: Post-emergence herbicide applications are most effective against weeds less than 1” tall. Beans should just have their first trifoliate leaves fully expanded. If beans are much larger than this they shade the soil and small weeds below the plants and weed control will not be good there. With post-emergence herbicide applications temperatures of 85+ degrees F, or the use of crop oil (vs. non-ionic surfactant), increase the risk of bean injury. A few days of cloudy weather also makes bean foliage more susceptible to injury from herbicides.

If you use pre-plant incorporated herbicides for bean weed control you will likely have a problem with ragweed and mustard, and may have a problem with lambsquarters, and will need to apply a post-emergence herbicide &/or have an aggressive cultivation program. Basagran or Reflex will control the first two weeds once they’ve emerged, while Basagran is needed for the lambsquarters. If you’re zone-tilling and rely on a pre-emergence herbicide program (Dual Magnum plus Permit/Sandea, or Dual Magnum plus Reflex), and your farm has a history of hairy nightshade, you will likely need to apply Basagran (with Raptor on snap beans to avoid a delay in maturity). If you didn’t do an early cultivation a later cultivation could pick up other weed escapes.

If you have other problem weeds see the chart on herbicide effectiveness against specific weeds in the April Veg Edge or on the CVP website at: http://cvp.cce.cornell.edu
Dates...visit our website for a complete list of upcoming events

JULY 11 - SOIL HEALTH FIELD DAY
9:30 am - 2:00 pm, Roger and Scott Arliss’ Pit Farms, 895 Lockpit Rd, Clyde 14433. Soil health is never more important, nor more obvious, than in a very wet year. At this field day, learn about options for improving crop and soil performance through rainfall extremes. Observe the dramatically different effect of simulated rainfall on a soil with good health vs one that’s been overworked. See soil layers, compaction and crop root growth in a soil pit. On-farm trial results with a wide range of grass, legume and crucifer cover crops will be presented, including information on winter triticale and winter malting barley. Reduced tillage equipment, including planters, will be demonstrated. There will time for you to discuss your experiences with other growers, as well as to ask questions of Roger and Scott Arliss, and the speakers. Registration is at 9:30 am at the field and costs $5. A picnic lunch is included. For more information, contact Ron Thorn at 315-946-9912 or rdtswc@rochester.rr.com. Additional information can also be found on our website, http://cvp.cce.cornell.edu/event.php?id=99. Sponsored by Wayne County Farm Bureau, USDA NRCS, Wayne County SWCD, and Cornell Cooperative Extension.

JULY 15 - SELLING YOUR FARM PRODUCTS TO LOCAL BUSINESSES AND INSTITUTIONS
9:00 am - 12:00 noon, Foodlink Distribution Center, 1999 Mt Read Blvd, Rochester 14615. One important way to boost your farm revenue and improve cash flow for your farm is larger-scale direct marketing to nearby food hubs, restaurants, institutions, auctions, and other bulk buyers. Cornell Cooperative Extension and Foodlink are hosting this new workshop and tour to give you the practical facts about how to plan for marketing relationships with businesses and institutions, maintain the supply contacts, and other important factors, like risk and profitability. Tour Foodlink’s new food hub distribution center and learn their role as a potential marketing partner and hear from an institutional purchaser looking to local farms as a source of food. Cost: $10.00 per person includes lunch. REGISTER or MORE INFORMATION: Nancy Anderson at CCE Ontario County at 585-394-3977 x427 or nea8@cornell.edu. Supported by Farm-to-Institution New York State (FINYS).

JULY 16 - MECHANICAL WEED MANAGEMENT - ROLLING HILLS DISCUSSION GROUP
4:00 - 7:00 pm, Clearview Farm, 243 Faas Rd, Palmyra 14522. Kurt Forman of Clearview Farm and the Cornell Vegetable Program staff will show and explain a cultivation timing demonstration for weed management. Dr. Chuck Mohler will return for this follow up to last fall’s Cultivation Equipment workshop to discuss the results of the demonstration and answer weed management questions. This event is free. The Rolling Hills Discussion Group is for new and beginning farmers in the Upper Finger Lakes and is free to join. Contact Elizabeth Buck at 607-425-3494 or Robert Hadad at 585-739-4065 for more details.

JULY 17 - SENECA COUNTY - VEGETABLE PEST AND CULTURAL MANAGEMENT FIELD MEETING
JULY 25 - ORLEANS COUNTY - VEGETABLE PEST AND CULTURAL MANAGEMENT FIELD MEETING
AUGUST 2 - YATES COUNTY - VEGETABLE PEST AND CULTURAL MANAGEMENT FIELD MEETING
AUGUST 8 - CHAUTAUQUA COUNTY - VEGETABLE PEST AND CULTURAL MANAGEMENT FIELD MEETING
These courses will demonstrate pest management in fresh market vegetables in both field and greenhouse (high tunnel) vegetables; primarily for those growing for wholesale auction. A hands-on demonstration of weed, insect and disease identification in vegetables including management options such as inter-row cover crops, grafting and where appropriate, spray options will be used to educate growers. Judson Reid, Senior Extension Associate with the Cornell Vegetable Program will instruct participants and facilitate peer-based learning. Cooperating farms will be selected to host the meetings as the season progresses. Details on each topic will focus on field observations at these farms. Addresses to be provided soon. General agenda can be found at cvp.cce.cornell.edu. Call Jud at 585-313-8912 for more information.

AUGUST 6 - PENNSYLVANIA VEGETABLE GROWERS ASSOCIATION FIELD DAY
Penn State Southeast Agriculture Research and Extension Center (Landisville Farm). See the latest applied research and new equipment in the field. $20 per person before July 30; $30 per person after. Call 717-694-3596 or email pvga@pvga.org for more details and registration info.

AUGUST 8 - ANNUAL ELBA MUCK ONION TWILIGHT MEETING - see bottom of page 2 for details

NOVEMBER 7 - TOMATO SCHOOL
SAVE THE DATE! Jordan Hall, NYSAES, Geneva 14456. A thorough school for tomato growers of all experience levels and farm management systems, this program will begin with the basics and move through advanced topics. Speakers from across NYS and Pennsylvania will discuss pest and disease management, hot water treatment of seeds, post-harvest handling, precision nutrition management, and more. Growers will share their tips and experience in raising transplants and field production. DEC credits will be available. Pre-registration will be required as space will be limited. More information on this event will be available later this summer.

NOVEMBER 8 - SQUASH SCHOOL
SAVE THE DATE! CCE Monroe County, 249 Highland Ave, Rochester 14620. This school will cover pest, disease, and weed management, fertility management, post-harvest handling, and more. For squash growers of all sizes. Summer squash will be discussed, with a heavier focus on winter squash production. DEC credits will be available. Pre-registration will be required as space will be limited. More information on this event will be available later this summer.
Weather Charts

J. Gibbons, CVP:

Weekly Weather Summary: 6/25 - 7/01

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Accumulated Growing Degree Days (AGDD) Base 50°F: Jan. 1 — July 01, 2013

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* Airport stations
** Data from other station/airport sites is at: [http://newa.cornell.edu](http://newa.cornell.edu) Weather Data, Daily Summary and Degree Days.
Veg Edge Weekly is a seasonal weekly publication of the Cornell Vegetable Program providing information about crop development, pest activity and management, pesticide updates, local weather conditions, meetings and resources.

Veg Edge is published 28 times annually, monthly from October-May and weekly from May-September. If you have any questions about this publication, contact Julie Kikkert at 585-394-3977 x404 or irk2@cornell.edu. Visit the Cornell Vegetable Program website at http://cvp.cce.cornell.edu/ for information on our research, upcoming events and enrolling in our program.

Cornell Cooperative Extension provides equal program and employment opportunities.

Cornell Vegetable Program Extension Specialists

<table>
<thead>
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<th>Name</th>
<th>Phone Number</th>
<th>Email Address</th>
</tr>
</thead>
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<tr>
<td>Robert Hadad</td>
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<td><a href="mailto:jer11@cornell.edu">jer11@cornell.edu</a></td>
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</table>

Cornell Cooperative Extension specialists are available to answer questions about pest activity and management, pesticide updates, local weather conditions, meetings and resources.

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 New York State must be registered with the New York State Department of Environmental Conservation (DEC). Questions concerning the legality and/or registration status for pesticide usage in New York State should be directed to the appropriate Cornell Cooperative Extension specialist or your regional DEC office.

Cornell Cooperative Extension and its employees assume no liability for the effectiveness or results of any chemicals for pest control usage. No endorsement of products or companies is made or implied. READ THE LABEL BEFORE APPLYING ANY PESTICIDE.