Cornell University Cooperative Extension

Eastern NY Commercial Horticulture Program

Vol. 1, Issue 23
September 5, 2013

Weekly Vegetable Update

ENYCH Program Educators:

Vegetables
Chuck Bornt
Cell: 518-859-6213
Email: cdb13@cornell.edu

Amy Ivy
Phone: 518-561-7450
Email: adi2@cornell.edu

Teresa Rusinek
Phone: 845-340-3990 x315
Email: tr28@cornell.edu

Crystal Stewart
Cell: 518-775-0018
Email: cls263@cornell.edu

Maire Ullrich
Phone: 845-344-1234
Email: mru2@cornell.edu

Fruit
Laura McDermott
Cell: 518-791-5038
Email: lgm4@cornell.edu
Berries

James O'Connell
Phone: 845-691-7117
Email: jmo98@cornell.edu
Berries & Grapes

Michael Fargione
Phone: 845-691-7117
Email: mjf22@cornell.edu
Tree Fruit

Kevin Iungerman
Phone: 518-885-8995
Email: kai3@cornell.edu
Tree Fruit & Grapes

Layout:
Carrie Anne Doyle

Content Editor:
Crystal Stewart

Regional Updates:

Images: CLS

A field of Gold Medal pumpkins in Schoharie County. First bins here will be shipped this week.

The Capital District is starting to pick pumpkins and winter squash harvest is well under way. Winter squash yields are solid in most areas, but pumpkin yields are off largely due to stand issues. Some growers have one early set pumpkin per plant with a large gap to the later set, which leaves them in a waiting game. Growers should keep diseases at bay down the homestretch to ensure good handle quality. Also remember that maintaining leaf cover can help reduce issues with sunscald.

Fall brassicas are coming along beautifully in most areas. Imported Cabbageworm and flea beetle pressure can still be quite high, so make sure to scout fields regularly and control these pests as necessary.

From the Hudson Valley: The intensely humid and severe lack of sunshine this week will lead to burst in disease sightings. Late Blight, if not "in-check" will absolutely destroy all but a few tomato varieties. This past week conventional growers have been surprised with the speed and ferocity with which Late Blight moved through their plantings when they were either lax in the spray timings or chemical mix. And, albeit, last week's rain was needed, we needed sunshine and dry air to follow.

Coming Events – see back page for more details

Sept 12th Twilight Meeting: Alternative weed control in plasticulture with cover crops. Migliorelli Farm, Red Hook. 1.5 DEC credits available in categories 23, 1a and 10. $15 per farm before Sept. 9th./$20 after.

October 17th Organic Cover Crop Workshop and Tour: Big Flats Research Farm. 9 am-4pm. If enough people are interested we can take a van west. Contact Crystal for details.

Winter Squash Storage Reminders

The winter squash harvest looks pretty good across the Capital District. If you are planning to store any of your squash into the winter, be especially careful that squash is mature, wound-free, and fully cured before storing. The following are reminders of best practices.

- Handle squash as gently as possible to avoid bruising or cutting the skin. Wounds will allow soft rot bacteria and other diseases to invade and reduce the storage life of your squash.
- Avoid picking up squash that is wet with dews or recent rain. This increases the risk of pressure bruise and breakdown.
- If possible cure your squash (except acorns and delicatas) to encourage cuts or bruises to heal. Place in windrows in the field (this also allows the stem ooze to dry up) if the weather is going to be warm and dry for several days then place squash in a warm, dry place (70-80°F) with good air movement. A well-ventilated greenhouse or high tunnel with fans turned on works well. Keep squash here for about 10 days. Please note—some research indicates that there is no need to cure fully mature, unwounded fruit prior to storage.
- Many growers will remove the stem especially from butternut and acorn. This practice helps reduce puncturing that can happen in the bins but squash should definitely be cured for up to a week before going into storage as this practice essentially opens a new wound on the fruit.

As night temperatures start to drop, try to avoid as much chilling injury as possible and prioritize removing squash from the field before a frost. Chilling injury occurs when squash is exposed to temperatures below 50°F in the field or in storage.

Cold damage on butternut squash opens fruit up for secondary infections and decreases storage ability.

Image: http://plant-disease.ippc.orst.edu

- Be sure not to pile squash too high in the bins especially if they will be stacked on top of one another. Pressure bruise is another way to decrease squash quality and storage potential.
- After curing, move squash or pumpkins to a dry, well-ventilated storage area. Store squash at 55-60°F with a relative humidity of 50-70%. If humidity levels are lower than that, moisture is removed from the fruit resulting in "pithiness" or shriveling. Humidity higher than that results in conditions that favor decay organisms. *–CLS and CDB with information from Ruth Hazzard, U. Mass*

Look for Black Rot During Harvest

Black Rot can infect all of the vine crops, but tends to be most destructive on butternut and other "buckskin" type squash. What makes this disease interesting is that it has two stages that we talk about. The first stage infects the cucurbit foliage and is referred to as Gummy Stem Blight, *Didymella bryoniae*. It looks like many other diseases and environmental stresses, so can be easily overlooked. The other stage is known as Black Rot (*Phoma cucurbitacearum*) and is the one that is easily recognizable as the "rust" we see on butternut. You can find it in the field at harvest or fruit can appear clean, but when put into storage can develop symptoms. On pumpkins it will appear as a sunken area that bleaches in color and turns black.

Once black rot gets to this stage, it is impossible to control. Control needs to start back when purchasing seed and selecting which fields to plant your cucurbits crops in. The disease is both soil and seed borne so a minimum 2 year rotation out of cucurbit crops is recommended and purchasing only high quality seed will help. Additionally, reducing the amount of feeding injury (both foliar and on the fruit) by insects such as cucumber beetles, aphids and squash bugs and controlling other diseases such as Powdery Mildew will help the plant be less susceptible to Gummy stem blight/Black rot infection. I have learned that fungicides applied when the plants begins to set fruit can also reduce disease infection. Even though we do not recommend the strobilurin fungicides (Quadris, Pristine etc.) for Powdery mildew control anymore, they are still effective in controlling Gummy stem blight and Black rot but as stated previously, need to be applied starting when the fruit begin to develop. For most growers cultural controls can keep this disease in check.

As mentioned in the storage article, it is vitally important to handle the fruit as carefully as possible. Part of this handling process should involve separating fruit that has

continued on page 3

Look for Black Rot During Harvest, continued from p. 2

black rot symptoms from fruit that does not and storing them separately to reduce spread. Any kind of wound, especially where stems puncture fruit when harvesting, is a perfect site for infection to get started. This goes for winter squash, pumpkins, gourds etc. Any kind of rough handling opens the fruit for not only black rot, but other diseases such as bacterial soft rots etc. This also includes when moving bins from the field to storage—the more the fruit is jostled in the bins, the more bruising can happen and the more black rot infection can occur, especially if you have rough farm roads!

-CDB and CLS

Sweet Corn Trap Catches

Location	ECB-E	ECB-Z	Corn Earworm	Fall Armyworm	W. Bean Cutworm
C. Washington	0	4	0	0	0
C. Fulton	0	0	0	0	0
N. Columbia	1	2	0	2	0
Saratoga	0	1	0	0	0
Orange Co.	0	0	0	0	0

Identifying Potato Tuber Diseases

By S. Scheufele, UMass Extension Vegetable Program.
From UMASS Vegetable Notes, 8/29/13

Potato harvests are well underway on many MA farms and tubers are making their way to fresh markets or storage facilities. There are many diseases that affect potato tubers so as you begin to sort through your potato harvest take a moment to check for disease symptoms. Proper identification will help you decide which tubers will store well or should be sold as tablestock, and will give you a better idea of which soil-borne diseases are present in your fields and improve future rotations.

Common Scab. *Image: RW Samson*

Common Scab (*Streptomyces* spp.) produces tan to dark brown, circular or irregular lesions which are rough in texture. Scab may be superficial (russet scab), slightly raised (erumpent scab), or sunken (pitted scab). The type of lesion is dependent on potato cultivar, tuber maturity at infection, organic matter content of soil, strain of the pathogen, and the environment. Scab infections can reduce marketability of potato crop but will not spread in storage.

Early Blight (*Alternaria solani*) usually affects potato foliage but tuber infections can also occur. Tuber lesions are dark, sunken, and circular often bordered by purple to gray raised tissue. The underlying flesh is dry, leathery, and brown. Lesions can increase in size during storage and tubers become shriveled.

Early Blight. *Image: S. Jensen*

Fusarium Dry Rot (*Fusarium* spp.) causes internal light to dark brown or black dry rot of the potato tuber. The rot may develop at an injury site such as a bruise or cut. The pathogen penetrates the tuber, often rotting out the center. Extensive rotting causes the tissue to shrink and collapse, usually leaving a dark sunken area on the outside of the tuber and internal cavities. Disinfect containers before storing and keep temperatures below 50°F.

Fusarium. *Image: C. Averre*

Black Dot (*Colletotrichum coccodes*) On potato foliage symptoms are nearly indistinguishable from early blight and on tubers it produces tiny black sclerotia (fungus resting structures). Symptoms on tubers can be easily mistaken for silver scurf.

Silver Scurf (*Helminthosporium solani*) affects only tuber periderm. Lesions are initiated at the stolon end as small pale brown spots which may be difficult to detect at harvest but will continue to develop in storage. In storage, lesions may darken and the skin may slough off and many small circular lesions may coalesce to form large affected areas. Tubers may also become dried out and wrinkled due to excessive moisture loss in storage. Avoid late harvest, prevent condensation and maintain high relative humidity and low temperature during storage.

Black Scurf. *Image: MSU*

Black Scurf and **Rhizoctonia Canker** (*Rhizoctonia solani*) Black scurf is purely cosmetic and does not reduce yield or spread in storage. Irregular, black, hard masses on the tuber surface are sclerotia of the fungus. Presence of these sclerotia may be minimized by harvesting tubers soon after vine-kill and skin set. However, *R. solani* can also attack underground

continued on page 4

Identifying Potato Tuber Diseases, continued from p. 3

sprouts and stolons, reducing tuber production and yield and deforming tubers. The fungus causes cankers on tubers which can be small and superficial but may be large, sunken and necrotic. These diseases are most common in cool, moist soils.

Canker from *rhizoctonia.*

Pink Rot (*Phytophthora erythroseptica*) and **Pythium Leak** (*Pythium* spp.) Pink rot infections start at the stolon end and result in rotten and discolored periderm with a clear delineation between healthy and diseased tissue. When exposed to air, tuber flesh turns pink and then brown-black. *Pythium* spp. that cause leak infections invade tubers through harvest wounds and continue to develop in transit and storage. Infections result in internal watery, gray or brown rot with well-defined red-brown lines delineating healthy and diseased tissue. Avoid harvesting during warm, wet weather, cure for proper wound healing and keep temperature low to reduce disease spread in storage.

Late Blight (*Phytophthora infestans*) affects potato foliage and tubers. Early foliar symptoms are brown to black, water soaked lesions on leaves and stems which produce visible white sporulation at the lesion margins under humid conditions. Whole plants and fields may collapse rapidly. Tuber infection is initiated by sporangia from foliage being washed down into the soil and usually begins in wounds, eyes, or lenticels. Lesions are copper brown, red or purplish and white sporulation may occur on tuber surfaces in storage or cull piles. Infected tubers are susceptible to infection by soft rot bacteria which can turn entire bins of potatoes in storage into a smelly, rotten mass.

Black Heart is physiological disorder caused by lack of oxygen during storage which causes the tissue to die from the inside out and turn black. The condition is not reversible but if you notice it quickly and correct your storage conditions you can prevent the whole crop from being affected.

Germination and Establishment Considerations for Spinach and Leafy Greens

By Jan VanDerHeide, Bejo Seeds.
From the 2012 EXPO Compendium.

Several growers, from different parts of the Northeast, have reported problems with germination of spinach in high tunnels. The reports of problems with spinach germination come mostly from crops that are established in the fall for overwintering in high tunnels.

Spinach planted in unheated High Tunnels will establish in late fall as long as soils are not too cold, and survive the cooler winter temperatures, to resume growth in early spring when the lengthening days warm the high tunnels for harvest in early spring. Spinach planted in heated High Tunnels can be established as long as soil temperatures are in the right range, and could produce a crop earlier in the winter. In a typical situation where problems are reported, spinach is seeded in sequential plantings, on separate beds with separate seedings about one week apart. The spinach variety and seed lot are the same, the seeding equipment is the same, etc. and yet there can be marked differences in stand establishments between the different beds. What causes this poor performance of the same seed in some beds?

The Basics

Seed germination happens when seeds imbibe with water, which starts the germination process. Several enzymes are activated to start the physiological process of cell division and elongation, the conversion of starchy reserves into water soluble sugars, protein synthesis, etc.

Temperature

The process of seed germination is temperature dependent; generally speaking, germination is quicker at higher temperatures. Different plant species have a different range of temperatures for seed germination (cool weather crops germinate at lower temperatures, and warm weather crops germinate at higher temperatures….). The trick in getting the best germination and stand establishment is finding the optimum temperature for seed germination. In any given seed lot, there will be variation in seed size, physiological age and maturity, and genetic variation – all of these are factors that contribute to variation in seedling vigor, temperature sensitivity, and speed of germination. This variation among seeds in the same lot becomes a concern as the soil temperature gets farther away from the optimum temperature (too high or too low). As the soil temperature becomes less optimal, fewer seeds will germinate and fewer seedlings will establish themselves. There is an optimum temperature range for germination, with a minimum and a maximum temperature. Germination will be good between minimum and maximum temperatures, but will become erratic beyond these limits (temperature too high or too low).

continued on page 5

Germination and Establishment-Spinach and Leafy Greens, continued from p. 4

The optimum temperature range for spinach is (50-68°F). Germination above 68°F or below 50°F will be spotty. Optimum germination temperature will be 59°F.

Seeding depth

Generally speaking, seeds should not be planted deeper than about twice their diameter. Smaller seeds should be planted shallower, larger seeds can be planted deeper. Planting too deep can prevent germination, resulting in poor stands. Problems with planting too deep are easily diagnosed: the stand will be good where the seeder was introduced into the bed, and where the seeder was pulled out of the bed (shallower seeding).

Damping off

Several soil borne fungi (*Fusarium, Pythium, Rhizoctonia*) can cause poor seedling performance, either during or shortly after germination. Often, seedlings will emerge, only to die shortly afterwards. In some cases, however, seedlings can be attacked and killed before emergence, leaving the impression that the seeds never germinated. Seed treatments with fungicides can help prevent problems with damping off, but keeping germination temperatures and soil moisture in the optimum range should be able to prevent most of these diseases.

Troubleshooting

In the case where spinach seed shows variable performance in successive plantings, environmental conditions are almost certainly at play. On the other hand, in cases where all plantings perform poorly, a simple germination test should be able to tell you if the seed itself is bad.

The temperature in high tunnels can build quickly on sunny days, and adequate ventilation is needed to prevent the soil from heating up too much. A soil temperature recorder will be helpful in tracking temperature fluctuations in the germination zone.

While dry and dormant spinach seed is quite resilient, the germinating seed is actually quite fragile. Temporary spikes in temperature can be quite damaging to the enzymes responsible for the physiological processes involved in germination, and can quickly lead to tissue damage, and even seedling death. The period where seedlings are most fragile is as they emerge from the seed, while still underground. A temporary spike in temperature can kill the seedlings at this time, but give the impression that the seed never germinated (because nothing came up…).

Crop	Optimum Temp (°F)	Range (°F)
Claytonia	Cool	
Spinach	59	50-60
Mache	59	50-60
Lettuce	68	---
Swiss Chard	86 day, 68 night	---
Cress	86 day, 68 night	---
Mizuna	---	68-86
Kale	---	68-86
Radish	68	50-77

The optimum germination temperature range for spinach is quite a bit lower than that for lettuce, Swiss chard, the various mustards or cabbages. Poor germination performance in spinach may be an indicator that the temperature spiked during a sensitive part of the germination process and affected the spinach seedlings. Other crops in the same tunnel (even other plantings of spinach in a different stage of development) may be less sensitive to high temperature damage, and may perform normally at the same time when a single planting of spinach is performing poorly.

Solutions

Keeping temperature and soil moisture in the proper range will help with germination of all crops, of course. Knowing what the optimum temperature range is, and measuring the soil temperature during germination will help determine if soil temperature is indeed the cause of the problem. Shading of the beds, improved ventilation, thermostatic controls on louvers, and keeping an eye on the weather, etc. will help prevent temporary overheating of the beds.

Meetings and Notices

Oct. 17, 10 am - 4 pm Organic Cover Crop Workshop and Tour

USDA-NRCS Big Flats Plant Materials Center, 3266 Route 352, Big Flats, NY 14814

This workshop will feature speakers from Cornell University presenting in depth information on cover cropping and reduced tillage for vegetable growers with an emphasis on organic systems. There will be a tour of the time of seeding cover crop demonstration with single and multiple species of cover crops, reduced tillage tools and a row crop interseeder. Lunch available for $12.00, CCA credits available

For a detailed schedule, speakers, topics and tour sites go to http://www.nofany.org/events/field-days/organic-cover-crop-workshop-and-tour or contact Paul Salon, USDA-NRCS, 607-562-8404, paul.salon@ny.usda.gov.

Register online at http://events.constantcontact.com/register/event?llr=7ex5qzeab&oeidk=a07e7j0eqy23d4363df

****

Sept. 12, 5:00-6:30 pm Grower Twilight: Alternative Weed Control in Plasticulture Vegetables with Cover Crops

Migliorelli Farm, Rockefeller Lane at Linden Avenue, Red Hook, NY - Featured Speaker: Judson Reid, Cornell Veg Program

- See one of three on-farm trials where Reid and Cornell Cooperative Extension of Ulster County are researching inter-row cover crops in plasticulture vegetables for weed management and soil conservation
- Learn about research findings, challenges, and opportunities observed to date
- Learn about important aspects to consider before establishing an inter-row cover crop
- Bring your weed management questions and observations for discussion
- 1.5 DEC credits in categories 1a, 10, & 23

Registration: $15 per farm by 9/9, $20 afterwards. Contact: Carrie Anne 845-340-3990 x311 or email cad266@cornell.edu, or mail form at http://www.cceulster.org/2013%20Migliorelli%20Twilight%20REVISED%20Reg%20Form.pdf

Weekly and Seasonal Weather Information

	Growing Degree Information Base 50^{O} F			Rainfall Accumulations		
Site	**2013 Weekly Total** 8/28—9/03	**2013 Season Total** 3/1 - 8/28	**2012 Total** 3/1—8/28	**2013 Weekly Rainfall** 8/28—9/03 (inches)	**2013 Season Rainfall** 3/1—8/28 (inches)	**2012 Total Rainfall** 3/1—8/28 (inches)
Albany	**168.4**	**2210.4**	**2521.8**	**0.73**	**21.57**	**19.09**
Castleton	**137.5**	**2119.0**	**2751.9**	**0.56**	**22.56**	**18.17**
Chazy	**142.5**	**2025.1**	**2718.7**	**0.26**	**20.71**	**14.56**
Clifton Park	**158.3**	**2206.4**	**2473.3**	**0.95**	**23.95**	**22.13**
Clintondale	**165.2**	**2476.1**	**2057.5**	**0.12**	**NA**	**NA**
Glens Falls	**157.0**	**1933.9**	**2205.0**	**0.19**	**19.24**	**14.63**
Granville	**154.0**	**NA**	**2337.5**	**0.19**	**NA**	**18.85**
Guilderland	**158.5**	**2001.3**	**2312.0**	**0.13**	**6.96**	**6.69**
Highland	**163.3**	**2473.6**	**2666.2**	**0.12**	**21.88**	**23.25**
Lake Placid	**69.9**	**1327.7**	**NA**	**NA**	**22.27**	**NA**
Montgomery	**169.8**	**2577.7**	**2405.5**	**0.11**	**23.81**	**NA**
Monticello	**139.5**	**1765.0**	**2288.5**	**0.00**	**0.28**	**1.49**