Veg Edge
Your Trusted Source for Research-Based Knowledge

Cornell University
Cooperative Extension
Regional Vegetable Programs

April 2012 Volume 8, Issue 4

NYS Fresh Market Vegetable Production Stays Steady; Processing Vegetables Decline in 2011

Stephen Reiners, Cornell

2011 was a year of extremes in New York, with a wet spring followed by a very hot and dry early summer. Catastrophic flooding rains in late summer in eastern NY ruined crops and severely damaged many farms. Planted acres for fresh market vegetables were down slightly, to about 85,000 or a decline of about 4%. The value declined about 10% as the weather decreased average yields. Cabbage was once again the most valuable vegetable crop in New York with a value of $87 million. For fresh market crops, sweet corn continues to be grown on the most acres at 23,300.

Table 1. Value and planted acreage of New York fresh market vegetables, 2009-2011. (NYS Ag Statistics)

	2011		2010		2009	
CROP	VALUE (Million $)	PLANTED ACRES	VALUE (Million $)	PLANTED ACRES	VALUE (Million $)	PLANTED ACRES
Cabbage	86.6	10,900	74.5	10,600	55.8	9,600
Potatoes	61.6	16,500	69.1	16,200	61.9	17,100
Sweet Corn	53.6	23,300	71.1	23,500	58.3	23,100
Squash	42.8	4,900	36.8	4,700	23.0	4,700
Tomatoes	36.6	3,000	28.5	2,900	32.7	2,700
Onions	33.1	8,100	54.2	10,700	67.6	10,600
Snap Beans	31.0	5,600	39.2	6,900	23.6	7,100
Pumpkins	23.6	6,800	35.1	7,100	21.8	6,600
Cucumbers	18.6	3,000	18.5	3,000	16.0	3,400
Cauliflower	2.4	480	3.4	490	2.4	430
Peppers, Bell	*	*	9.9	1,200	12.3	1,100
Eggplant	*	*	4.0	400	6.0	450
Endive/Escarole	*	*	2.0	300	4.2	300
Spinach	*	*	1.0	350	0.9	340
TOTALS[1]	389.9	82,580	447.3	88,340	386.5	87,520
TOTALS[2]	405.9	84,715				

* Unavailable due to budget constraints
[1] Totals without Peppers, Eggplant, Endive/Escarole, Spinach
[2] Totals with estimates for Peppers, Eggplant, Endive/Escarole, Spinach, additional 2,135 acres and $16 million

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

CCE and its employees assume no liability for the effectiveness or results of any chemicals for pesticide usage. No endorsement of products or companies is made or implied. **READ THE LABEL BEFORE APPLYING ANY PESTICIDE.**

Veg Edge is a shared publication of two Cornell Cooperative Extension teams, the **Cornell Vegetable Program**, serving 12 counties in Western & Central NY, and the **Capital District Vegetable & Small Fruit Program**, serving 11 counties in the Capital Region of NY

Continued from cover

Average yields for vegetables declined significantly for most vegetables, with the exception of cabbage and tomatoes (Table 2). Yields of pumpkins showed the biggest decline, as many fields in eastern NY were lost in floods. As often happens when yields decline, average prices increased, but not enough to make up for the decline in yields.

On the processing side (Table 3), planted acres and value declined significantly, by 33,000 acres and $20 million, respectively. Unfortunately, we can only get individual statistics for processing snap beans. There were declines in acres of peas and sweet corn as Allens, Inc., one of two processors in New York (the other being Seneca Foods), reduced their contracted acres. Allens, Inc. have now sold their New York plants to a Canadian Processing company, Bonduelle North America. Acres should stay about the same in 2012 but will hopefully increase in the future.

In addition to the crops listed above, there are another dozen "minor crops" grown in NY for which no statistics are kept. These include carrots (both fresh market and processing), lettuce, melons, radishes, broccoli, asparagus, Chinese cabbage, garlic, and herbs. These crops would likely add another 6,000 acres and $30 million to the industry totals. ■

Table 2. Average yield and marketing year average price for fresh market vegetables, 2009-2011. (NYS Ag Statistics)

	Avg. Yield (cwt/Acre)				Avg. Price ($/cwt)			
CROP	2009	2010	2011	% Change (10-11)	2009	2010	2011	% Change (10-11)
Cabbage	380	430	440	2.3	18.3	21.2	20.0	-5.7
Potatoes*	300	320	250	-21.9	12.5	13.5	15.2	12.6
Sweet Corn	100	120	95	-20.8	27.1	26.0	28.8	10.8
Squash	120	195	190	-2.6	42.6	41.0	51.3	25.1
Tomatoes	140	140	160	14.3	93.5	72.7	84.8	16.6
Onions	415	325	305	-6.2	13.2	19.7	20.8	5.6
Snap Beans	40	70	61	-12.9	88	83.6	96.1	15.0
Pumpkins	125	215	110	-48.8	29	24.0	34.1	42.1
Cucumbers	120	170	160	-5.9	41.8	38.8	40.0	3.1
Cauliflower	130	145	115	-20.7	45.5	51.0	49.0	-3.9
Peppers	250	175	na	-	49.3	51.3	na	-
Eggplant	280	250	na	-	52.7	43.3	na	-
Endive/Escarole	240	110	na	-	60.5	62.0	na	-
Spinach	70	75	na	-	46.3	42.3	na	-

* Although some potatoes are grown for chipping/processing, in NY they count as fresh market

Table 3. Value and acreage of New York processed vegetables, 2009-2011. (NYS Ag Statistics)

	2011		2010		2009	
CROP	VALUE (Million $)	PLANTED ACRES	VALUE (Million $)	PLANTED ACRES	VALUE (Million $)	PLANTED ACRES
Snap Beans	15.2	15,100	21.6	25,600	14.8	20,000
Peas, Corn, Beets, Kraut	na	na	na	na	na	na
TOTAL, Processing	**27.0**	**25,200**	**47.6**	**58,600**	**47.6**	**51,500**
TOTAL, Dry beans	**7.9**	**12,000**	**7.8**	**15,000**	**6.6**	**16,000**
TOTAL, Fresh[1]	**405.9**	**84,715**	**447.3**	**88,340**	**386.5**	**87,520**
TOTAL, All	**440.8**	**121,915**	**502.7**	**161,940**	**440.7**	**155,020**

na - Not published to avoid disclosure of individual operations

[1] With estimates for Peppers, Eggplant, Endive/Escarole, Spinach

2012 Expo Proceedings Now Online

Steve Reiners, Cornell

The complete 2012 Expo Proceedings, including summaries for all Expo sessions, is now online. Please go to: http://www.hort.cornell.edu/expo where you can find both the 2011 and 2012 Proceedings. The Proceedings will soon be linked to the NYS Vegetable Growers website as well, on the drop down menu under Expo at: https://nysvga.org/ ■

Insect Diagnostic Lab & Website

The Insect Diagnostic Lab at Cornell is a very useful resource. The warm weather may bring out a lot of insects early this year. Would you like to know more about an insect, or how to deal with an insect problem in or around the home, yard or garden. Would you like to see photos and descriptions of common insect pests? If so, the Insect Diagnostic Lab and website, a program of Cornell Cooperative Extension in the Department of Entomology, can help. More information about this service, including a collection of factsheets covering commonly encountered outdoor and indoor insects, can be found at http://entomology.cornell.edu/IDL For a $25 fee, an insect or related arthropod can be shipped to us, or a detailed photo can be emailed, for expert determination. ■

Cornell Vegetable Program Seeks New Staff Members

Julie Kikkert, CCE Cornell Vegetable Program

To expand its capacity to serve the commercial vegetable industry within its 12 partner counties in Central and Western, NY, the Cornell Vegetable Program will be hiring two new staff members. Please share this announcement with anyone who may be qualified and interested in the positions described below. A selection committee will screen the applicants and conduct interviews. Presentations by the candidates for the Extension Associate position will be open to the larger vegetable community and will be advertised in advance. If you would like to be on the selection committee, or for more information, please contact Julie Kikkert at jrk2@cornell.edu.

Extension Associate (Vegetable Crops Specialist)
For full posting: https://hr.cornell.edu/jobs/

As part of a 6-member team, the Vegetable Crops Specialist will provide commercial growers and industry representatives with the knowledge and educational resources necessary to review production and management practices; enhancing their profitability and sustaining the growth of the vegetable industry in New York.

Required Qualifications:

- Master's Degree in Agriculture from an accredited institution with a major in Vegetable Crops, Horticulture, Plant Pathology, Entomology or closely associated fields.
- Two years of relevant work experience in Agribusiness, Crop Production, Cooperative Extension, or closely related fields.
- Experience in conducting, interpreting, evaluating and communicating the results of applied research
- Must possess or have the ability to acquire a New York State Certified Pesticide Applicators License

To apply: Send letter of application and resume to Mark Giles at mark.giles@cornell.edu. Applications will be reviewed as received, continuing until a suitable applicant is identified.

Vegetable Program Technician (full-time, year round)
Soon to be posted at https://hr.cornell.edu/jobs/

Provide technical and program support to Extension Associates in carrying out research and outreach that will ultimately enhance the profitability and sustainability of the vegetable industry served by the Cornell Vegetable Program (CVP). Participate and assist in the collection and recording of data in research plots on commercial vegetable farms in the 12-county region. Scout for insects, diseases, weeds and crop damage caused by insect pests and diseases in research plots and maintain good records. Perform basic data entry and summary. Assist with horticultural projects and educational programs for the Cornell Vegetable Program.

Requires a high school diploma plus formal training or associates degree, plus at least 6 months of relevant experience. Bachelors degree with a focus in agriculture is preferred.

To apply: Send letter of application and resume to Julie Kikkert at jrk2@cornell.edu. Applications will be reviewed as received, continuing until a suitable applicant is identified. ■

Dry Bean Research Proposals & Funding

Researchers	Title	2012-2013 Funding
Abawi, Moktan	Comparing Dry Bean Production Under Fall Prepared Zone-Till and Plow-Till (Conventional) Practices	**$2,000**
Bellinder	Evaluating Weed Management Programs in Zone-Till Dry Beans and New Herbicide Evaluations	**$3,984**
Griffiths, Halseth, Sandsted	Breeding, evaluation and development of dry bean varieties that are highly adapted to NYS growing environments and markets	**$14,609**
MacNeil, Waldron	Determining the magnitude and distribution of Western Bean Cutworm, and the Risk to Dry Beans, in the Major Production Area in New York	**$2,906**
	Cornell breeding line seed increase for 2012 grower trials	**$3,750**
	Total Funded	**$27,249**

Herbicides for Snap & Dry Bean Weed Control*

Robin Bellinder, Cornell, and Carol MacNeil, CCE Cornell Vegetable Program, revised 3/15/12

Key to Comparative Effectiveness E = Excellent G = Good F = Fair P = Poor N = None	BROADLEAF ANNUALS									GRASSES					
										ANNUAL				PERENNIAL	
	Lambsquarters	Purslane	Common Ragweed	Pigweed	Smartweed	Galinsoga	Mustard	Nightshade	Velvetleaf	Barnyardgrass	Crabgrass	Fall Panicum	Foxtail sp.	Quackgrass	Yellow Nutsedge
Pre-Plant Incorporated															
Treflan (trifluralin)	F	F	P	P	P	P	P	P	P	E	E	G	E	P	P
Prowl[9] (pendimethalin)	G	G	P	G	F	P	F	P	G	E	E	E	E	P	P
Sonalan[1,2,9] (ethalfluralin)	G	G	P	G	P	P	P	F	P	E	E	E	E	P	P
Eptam (EPTC)	F	G	P	F	P	P	P	G	P	E	E	E	E	P	F
Micro-Tech[1,2,4] (alachlor)	P	G	P	G	P	G	P	F	P	E	E	E	E	P	G
Dual Magnum[1] (s-metolachlor)	G	G	P	E	P	E	P	G[5]	P	E	E	E	E	P	E
Pre-Emergence															
Command 3ME[3,9] (clomazone)	F	F	F	P	F	F	P	P	G	G	G	G	G	P	P
Dual Magnum[1] (s-metolachlor)	F-G	G	P	E	P	E	P	G[5]	P	E	E	E	E	P	E
Permit[1,2]/Sandea[1] (halosulfuron)	E	P	E	E	G	G	G	P	G	P	P	P	P	P	F
Reflex[9] (fomesafen)	G	G	G	E	P	G-E	E	E/F[10]	P	N	N	N	N	N	F[11]
Post-Emergence															
Basagran (bentazon)	G	F	G	F	G	P	G	G[6]	G	P	P	P	P	P	P
Reflex[9] (fomesafen)	F	G	E	E	F-G	G	E	G[7]	P	P	P	P	P	P	P
Raptor (imazamox)	F	F	P	E	F	F	E	E	P	P	P	P	F	P	P
Poast (sethoxydim)	P	P	P	P	P	P	P	P	P	G	F	G	G	F	P
Assure II/Targa (quizalofop P-ethyl)	P	P	P	P	P	P	P	P	P	E	E	E	E	E	P
Select Max (clethodim)	P	P	P	P	P	P	P	P	P	E	E	E	E	G	P
Permit[1,2]/Sandea[1,3] (halosulfuron)	F	P	E	E	P	G	G	P	G	P	P	P	P	P	E
PPI, Pre- or Post-Emergence															
Pursuit[2,9] (imazethapyr)	G[8]	P	P	E	P	P	E	E	P	P	P	P	P	P	P
Outlook[1,2] (dimethenamid-p)	G	G	F	E	P	E	P	G	P	E	E	E	E	P	E

1 - Crop injury is possible on coarse soils if heavy rain occurs shortly after application and beans are emerging, especially black beans
2 - Dry beans only
3 - Snap beans only
4 - MicroTech is slightly better than Lasso EC on some annual broadleaves and grasses
5 - Eastern black nightshade only
6 - Hairy nightshade only
7 - Very small Eastern black nightshade and very small hairy nightshade only
8 - Only the pre-plant incorporated application is effective
9 - Read the label regarding crop rotational restrictions
10 - Excellent – Eastern black nightshade; Fair – hairy nightshade
11 - Fair at snap/dry bean rates

* ***For general comparison only.***

Effectiveness may vary with method of application, rate, use of an adjuvant, size of weed, soil type and weather. See the Cornell 2012 Guidelines for Vegetable Production for more details: http://nysaes.cals.cornell.edu/recommends/13frameset.html

Always read and follow label directions. ■

High Tunnel Greenhouse Cucumber Variety Trial

Judson Reid, Kathryn Klotzbach and Nelson Hoover, CCE Cornell Vegetable Program

Introduction - The unheated greenhouse, or high tunnel, offers a vertical production environment suitable for crops such as indeterminate tomatoes and cucumbers. As it is a soil based system however, and passively heated, greenhouse cucumbers must be transplanted later in the spring than tomatoes, due to their intolerance for low root zone temperatures. Cucumbers provide good returns when grown in a high tunnel, given consistent pest control and matching variety performance with market demand. A variety trial of four greenhouse cucumbers was established in a cooperating high tunnel in the spring of 2011.

Mishaps and Missteps - Learn from our mistakes! We seeded our first batch of cucumbers on March 16 (varieties: Celsius, Presidio, Tamazula and Trinindad). These were transplanted into the high tunnel soil on April 15 and then promptly wilted and died. We attribute this to thick skulls, cold soils, and Damping-off (caused by Pythium and Phytothphora). A new seeding took place in the greenhouse on April 26 and was transplanted into the high tunnel soil on May 13. A treatment with mefenoxam and warmer soils helped this batch survive. The grower cooperator maintained the trial for fertilization, irrigation and weed control to their (fairly high) standards. We collected data on yield and disease susceptibility. For a complete explanation of our materials and methods without mordancy visit http://cvp.cce.cornell.edu

Results - Yield as measured by pounds of fruit per plant were significantly different among the four varieties. Tamazula was the highest yielding as measured by pounds and number of fruit per plant, although in the same statistical grouping as Presidio (Table 1). Fruit weights were divided into several groupings with Celsius and Trinidad the heaviest. Trinidad was the only variety significantly susceptible to Powdery Mildew (Table 2). Trinindad also exhibited the highest susceptibility to Two Spotted Spider Mites, with significant differences detected on the final rating. (There is no significant difference between results followed by the same letter.)

High tunnel cucumber trial.
Photo: Judson Reid, CCE Cornell Vegetable Program

Table 1. Greenhouse Cucumber Yield

	Plant Yield (lbs)	Number of Fruit per Plant	Average Fruit Weight (lbs)
Celcius	21.2 b	19.8 b	1.08 a
Presidio	28.4 a	43.3 a	0.66 c
Tamazula	30.7 a	43.5 a	0.71 bc
Trinidad	20.5 b	22.4 b	0.92 ab
p-value	*0.0108*	*0.0000*	*0.0054*

Table 2. Cucumber Pests and Diseases. Powdery Mildew and Two-Spotted Spider Mites were evaluated using a 0-9 ordinal scale, with 0 representing no infection and 9 plant death.

	Powdery Mildew			Spider Mites	
	July 12	**Aug 27**	**Sept 5**	**Aug 27**	**Sept 5**
Celsius	0.14 b	0.00 b	0.50 b	3.75	3.25 ab
Presidio	0.00 b	0.00 b	0.00 b	1.75	1.50 bc
Tamazula	0.00 b	0.00 b	0.00 b	1.50	1.00 c
Trinidad	2.75 a	5.75 a	6.50 a	3.75	4.25 a
p-value	***0.0008***	***0.0003***	***0.0000***	***NS***	***0.0165***

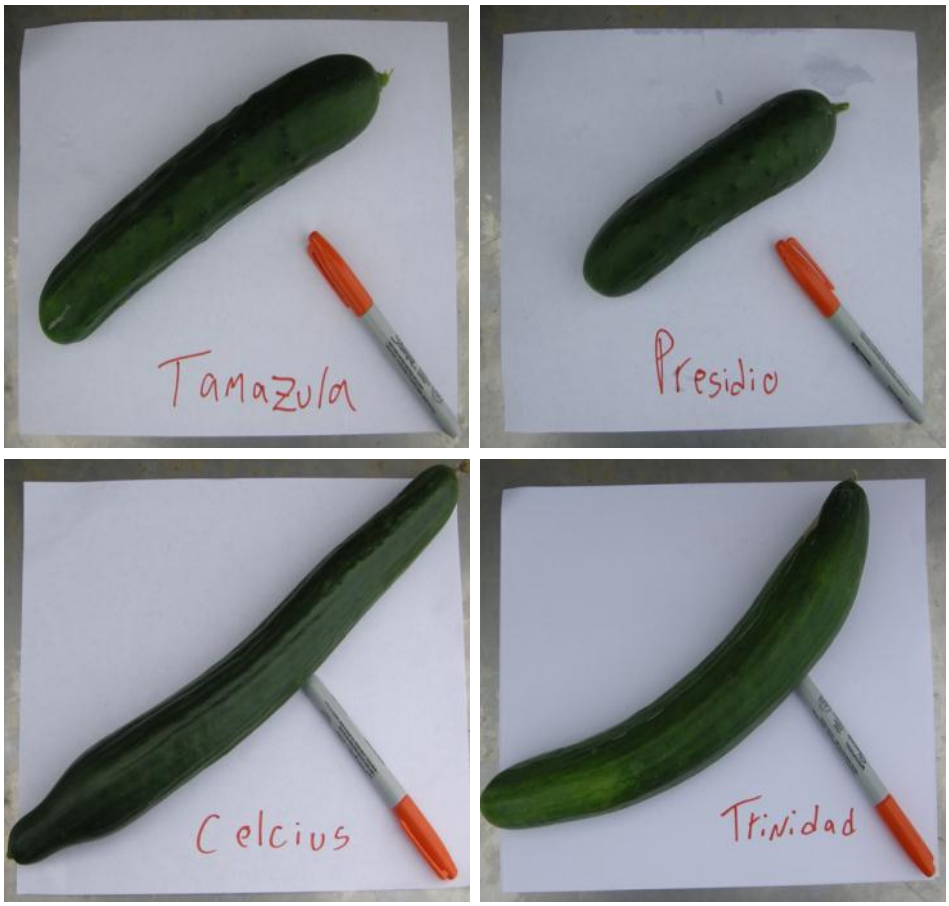
Discussion - Presidio and Tamazula fruit were shorter varieties than Celcius and Trindidad (Figures 1-4). These fruit were able to hold their shape more consistently than the longer varieties, and they yielded more fruit per plant. Celsius and Trinidad yielded heavier fruit which is consistent with their length. Considering resistance to mites and Powdery Mildew, Tamazula and Presidio are the grower preferred varieties in this trial. Presidio fruit was considered more marketable by the cooperating grower than Tamazula.

The trial experienced minor levels of Downy Mildew (*Psuedoperonospora cubensis*) in October. It should be noted that in the Northeast US this disease has become nearly unmanageable in field grown cucumbers without the application of multiple systemic fungicides in late summer and early fall. With the low moisture environment of the tunnel we were able to harvest from June until October without the use of any foliar fungicides.

As high tunnels are passively ventilated there is considerably more wind and pollinator visitation than in controlled environment greenhouses. These factors lead to misshapen fruit in greenhouse cucumbers, particularly in the longer seedless varieties. For this reason we strongly recommend shorter fruited cucumbers even for high tunnel production.

The loss of the first planting, and continued struggle with damping-off in the second planting raises concerns about the susceptibility of this crop to cold soils. Given the high yields we harvested off the second planting, growers may consider an early, less cold sensitive crop to rotate with greenhouse cucumbers. This would maximize returns and diminish soil borne disease threats. Beans or lettuce would fit well here. That said, we aren't giving up on early transplant dates. We are researching the use of grafting for cold soil resistance. Look for our latest data in the next issue of Veg Edge!

Figures 1-4. Fruit at Harvest: Tamazula, Presidio, Celcius, and Trinidad.



Conclusions - If considering growing cukes in a tunnel our recommendations are:

- Choose a shorter fruited variety
- Avoid planting into soils colder than 60°F
- Develop a management plan for Spider Mites
- Powdery Mildew resistance is essential

Greenhouse cucumbers are a remarkable crop for high tunnel production, given their quick maturity and heavy yields. However, cucumbers in our experience are more likely to suffer from pests such as mites and thrips, which increases input costs for control measures. Labor on cucumbers is also higher than that of tomatoes. Given a receptive market however, the higher yielding varieties in this trial would provide solid returns. High tunnels should also be considered as an alternative management approach for Downy Mildew.

The Cornell Vegetable Program and cooperating grower express gratitude to MGS Horticultural Inc. and Syngenta Seed (Rogers) for their collaboration in this project. ■

Powdery Mildew Resistant Melon Varieties Provide Good Suppression

Margaret McGrath, Cornell University, LIHREC, and Sandra Menasha, CCE - Suffolk County

Varieties with resistance are a valuable tool for managing powdery mildew in melons. Powdery mildew is the most important disease affecting cucurbit crops, occurring every year. Successful control of powdery mildew in melon is critical to ensure leaves remain healthy until fruit mature and obtain high sugar content, which results in good flavor. Resistant melon varieties can provide a very good level of control of powdery mildew; however, there is concern that evolution in the pathogen will result in appearance of another new race. Providing growers with information about the performance of resistant varieties, in terms of disease suppression as well as yield and fruit quality, has been a goal of variety evaluations conducted at the Long Island Horticultural Research and Extension Center (LIHREC).

Resistance in melons is race-specific. Genes have been identified and bred into commercial varieties that confer resistance to Race 1 and Race 2 of the pathogen. Race 1 has been the dominant race occurring recently, based on the fact that powdery mildew has been effectively suppressed by a variety with resistance to just Race 1 in previous melon variety evaluations. Varieties with resistance to both races have provided better control some years indicating that Race 2 has also been present. Most powdery mildew resistant varieties currently marketed have resistance to both races. Varieties with resistance to both races do not always exhibit similar suppression because the sources of genetic resistance, in particular regarding presence of modifier genes, differ among these resistant varieties.

A new race of the powdery mildew pathogen has appeared in the southeastern US. In spring 2007 there were reports from GA of poor control of powdery mildew in Athena, a variety grown widely that has resistance to both Races 1 and 2 of the pathogen, which suggested a new race was present. In 2008 a new race (designated 'S') was confirmed in GA. Performance of resistant varieties in GA has been poor since. As the pathogen is thought to move northwardly during the growing season, there is concern that the new race could be dispersed and become established in NY.

Powdery mildew was more severe on resistant cantaloupe varieties in the 2010 evaluation at LIHREC than in previous evaluations, suggesting Race S was present. The main goal of research conducted in 2011 at LIHREC was to determine if resistant cantaloupe varieties would again provide less suppression than before 2010. Many melon varieties have been commercialized with resistance to Races 1 and 2. Growers need to know the level of suppression provided by resistant varieties to effectively manage powdery mildew with an integrated program.

Methods: An experiment was conducted in 2011 with four varieties that have been used in previous experiments to enable comparison across years. Seedlings were transplanted into beds covered by black plastic mulch with drip irrigation on 10 June. There were 2 plants of a susceptible summer squash variety between each plot in each row to separate plots and provide a source of inoculum. No fungicides were applied with activity for powdery mildew. Fungicides were applied preventively for downy mildew and Phytophthora blight. Leaves were assessed weekly on both surfaces for powdery mildew.

Results and Discussion: All resistant varieties were much less severely affected by powdery mildew than the susceptible variety; therefore resistance was effective. Thus evidence was not obtained in 2011 for a new race being present on LI affecting control achieved with resistant varieties. Resistant varieties were much more severely affected in 2010 compared to previous years when the same varieties were evaluated. However, the susceptible variety was also much more severely affected by powdery mildew in 2010 than in previous years. Severity in 2011 was similar to severity in years before 2010. Therefore it appears possible the apparent change in performance of resistant varieties in 2010 at least partly reflected highly favorable conditions for powdery mildew. However, evidence from another trial indicates that a new race may also be present.

Recommendations for 2011 are to use an integrated program, consisting of fungicides applied to varieties with resistance to pathogen races 1 and 2, to ensure powdery mildew is effectively managed as well as to manage against further selection of new pathogen strains adapted to resistant varieties as well as fungicides. Fungicide applications should start before or at the first sign of powdery mildew. Examine both surfaces of at least 50 old leaves each week, beginning when fruit start to enlarge. The action threshold is 1 infected leaf out of the 50 examined. It is especially important to turn leaves over and examine the lower (under) side where powdery mildew develops best. Apply mobile (systemic/translaminar) fungicides that have selective activity for powdery mildew, tank-mixed with a contact, protectant fungicide (e.g. chlorothalonil, copper, oil). Make additional applications on a 7- to 14-day interval based on when additional symptoms develop. Quintec is currently the best choice based on results from recent fungicide evaluations and pathogen sensitivity tests. Quintec needs to be applied in alternation with other mobile fungicides to manage development of resistance to this fungicide, and to be in compliance with the label, which states limits of 2 consecutive applications before rotating and 4 applications to a crop. Procure (or another FRAC Code 3 fungicide) is the best choice for a rotational product; this chemistry used alone is not as effective as Quintec. Pristine may provide some suppression depending on the frequency of resistant strains. Therefore it is recommended used on a limited basis (1-2

applications). Other labeled chemistry (FRAC Code 1 and 11 fungicides) is not recommended due to resistant strains being very common at the start of powdery mildew development in recent years.

For organic production there are several oils, sulfur and other OMRI-listed products demonstrated to be effective protectant fungicides for controlling powdery mildew on upper leaf surfaces in experiments conducted at LIHREC. For more organic powdery mildew management suggestions go to: http://web.pppmb.cals.cornell.edu/resourceguide/cmp/cucurbit.php#d7

The specific directions on fungicide labels must be followed -- they supersede these recommendations, if there is a conflict. Any reference to commercial products, trade or brand names is for information only; no endorsement is intended.

This project was supported by: the Friends of Long Island Horticulture, Harris Moran Seed Co, Siegers Seed Co, and Seedway. ■

Crucifer Downy Mildew Samples

Holly Lange, Cornell - Geneva

Chris Smart's plant pathology lab is studying downy mildew of crucifers to improve management of the fungal disease. We are interested in samples from around the state. Downy mildew can infect crucifer transplants as well as older plants. It causes small, yellow leaf spots which eventually turn brown. Black lace-like markings and vascular discoloration are typical. In wet weather a fine, white mold may be seen on leaf undersides.

If you're unsure of the diagnosis of downy mildew consult your local vegetable extension specialist or consultant. Fresh leaves (not wet/ damp) can be mailed in a zip lock bag inside a padded envelope or box. Transplant leaves are small so send 10-20. Include the crop name, all fungicides/insecticides applied to the foliage or planting mix, your name, address, and phone/email. Samples can be sent to:

Holly Lange
210 Barton Hall
NYS Agricultural Experiment Station
630 W. North St
Geneva, NY 14456
315-787-2420, hlw7@cornell.edu ■

Pesticide Trainings & Recertification Classes

DEC Special Permit Training Class for Non-Certified Applicators and Handlers of Federally Restricted-Use Pesticides

Wayne County
Tuesday, April 10, 2012
English Session: 9:00 am - 12:00 pm
Spanish Session: 1:00 pm - 4:30 pm
Registration: 8:30 am (English) and at 12:30 pm (Spanish)
CCE Wayne County
1581 Rt. 88N, Newark

Orleans County
Wednesday, April 11, 2012
English & Spanish sessions
9:00 am - 12:30 pm
Registration: 8:30 am
Orleans County Cooperative Extension
Fairgrounds Trolley Bldg.
Rte. 31, Knowlesville
(between Albion and Medina)

Certified Supervisors are required to attend the first 30 minutes of training!
Note: In Wayne County, supervisors who attend the first 30 minutes of training in the English session do not need to repeat the training in the Spanish session

$20 per DEC Special Permit

DEC Special Permit allows non-certified workers to apply and handle federally restricted use pesticides: The Special Permit does not relieve the responsibility of the certified applicator who supervises these employees, but it does relieve the requirement of "on-site, within voice contact" supervision while these pesticides are being applied.

What are federally restricted-use pesticides?
There are several reasons why pesticides may be federally restricted including avian, fish or aquatic toxicity, acute human oral/inhalation/dermal toxicity (poison), ground and surface water concerns, reproductive effects or tumor causing. Several of the **pyrethroid, organophosphorous and carbamate insecticides** such as Warrior, Capture, Diazinon, Lorsban and Lannate, and a few herbicides such as Gramoxone and Atrazine, are federally restricted-use materials..

DEC Special Permit training
At Special Permit trainings, we review with non-certified applicators Worker Protection Standard (WPS) handler training and for each federally restricted-use pesticide the potential hazards to non-target species and the environment, and how to prevent the risk of exposure. Trainees also receive a packet with summaries of this information. **A DEC Special Permit is valid for one year and needs to be renewed every year unless the pesticide applicator becomes certified.**

To register contact Kim Hazel: 585-798-4265 x26 or krh5@cornell.edu

Fungicide Resistance Found in Phytophthora Blight Isolates from WNY

Amara Dunn and Chris Smart, Cornell

Phytophthora blight on peppers, tomatoes, eggplants, cucurbits, and beans is caused by the water mold *Phytophthora capsici*, resulting in fruit rot, wilting, and plant death. Mefenoxam (the active ingredient in Ridomil and other similar fungicides) is widely used to control Phytophthora blight, but resistance has been previously identified in the Capital District and on Long Island. In an outbreak that occurred in a pepper field in Western New York last summer, mefenoxam resistant isolates were identified. While this is the only occurrence of resistance that has been identified in Western New York so far, and involved only a single field, the pathogen that causes Phytophthora blight can be moved between fields in water, with culled fruit, and in soil (including soil stuck to farm machinery). Once the pathogen is in a field, it is essentially impossible to get rid of, because it produces thick-walled overwintering spores.

Although these resistant isolates all came from pepper, we have no reason to believe that mefenoxam resistance is specific to pepper, and resistant isolates could attack any host, including cucurbits, peppers, tomatoes, eggplants, and snap beans. If you plan to use mefenoxam to control Phytophthora blight this year, be sure to rotate it with different chemistries. ■

Start2farm.gov: A New Online Resource for Beginning Farmers

Agriculture Secretary Tom Vilsack and USDA's National Agricultural Library, in partnership with the American Farm Bureau Federation, announced Start2farm.gov, a new online portal that helps provide assistance for beginning farmers and ranchers. The portal includes links to training, financing, technical assistance and other support services specifically for beginning farmers and ranchers as well as successful case studies about new and beginning farmers and ranchers.

Start2Farm.gov was funded via the Beginning Farmer and Rancher Development Program (BFRDP). The Program was authorized in the 2008 Farm Bill with $75 million through FY12. In the first year of the Beginning Farmer and Rancher Development Program, three-year grants supported training for 5,000 beginning farmers and ranchers.

Beginning farmers, by USDA definition, are those individuals with 10 years or less experience operating farms. About 20% of the 2.1 million U.S. farms are classified as beginning farms. Most beginning farmers are not young (that is, under 35 years old), do not have a college education, nor have access to farmland through their relatives. The two most common and important challenges faced by beginning farmers are (1) having the market opportunity to buy or rent suitable land and (2) having capital to acquire land of a large enough scale to be profitable.

USDA is an equal opportunity provider and employer. ■

NYS Agricultural Research Funding Sources: Private (2007-2012)

Private Sector	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	Annual Avg.
Apple R&D	$150,122	$165,488	$203,300	$215,306	$208,784	$215,205	***$193,034***
Proc. Veg.	$129,005	$138,428	$111,314	$181,280	$158,443	$158,942	***$146,235***
Onion Ind. Council	$120,000	$136,044	$152,600	$45,000	$35,000	$35,000	***$87,274***
Lake Erie Grape	$89,000	$135,676	$83,000	$78,300	$76,000	$78,000	***$89,996***
Dry Beans	$32,482	$30,596	$32,447	$25,600	$31,000	$31,000	***$30,521***
Cabbage R&D	$21,280	$23,150	$35,900	$36,440	$31,100	$28,870	***$29,457***
TOTAL	**$541,889**	**$629,382**	**$618,561**	**$581,926**	**$540,327**	**$547,017**	***$576,517***

Online Tutorial on Installing Mid-Sized Tunnels

Matt Kleinhenz, Ohio State University

There is a new publication on mid-sized tunnels that may be of interest. The tutorial file, available at: http://hcs.osu.edu/vpslab/sites/drupal-hcs-vpslab.web/files/mid-tunnel-prep-install-tutorial-final.pdf describes one way to prepare and install gothic-framed "mid-sized" tunnels measuring 4 ft. wide and 45 inches at peak height. We have found these mid-size tunnels to be useful, including as a complement to regular low and high tunnels and in over-wintering low-statured crops. ■

Tailgate Farmers Markets

New York State Thruway Authority

The New York State Thruway Authority is seeking farmers and growers to participate in "Tailgate Farmers Markets" at travel plazas along the Thruway system. The markets operate from mid-May through Nov. 1, depending on the availability of product. Participation is limited to New York State farmers/growers of locally grown fresh fruits, vegetables, edible herbs, cider and horticultural products. Only produce grown or produced in New York State may be sold at the farmers markets.

For more information, call the Thruway Authority at (518) 436-2831. For a list of the 27 travel plazas, see the weblink: http://www.thruway.ny.gov/travelplazas/index.html ■

Upcoming Meetings

Farm Market Regulations: What Every Vendor Should Know

Wednesday, April 11

3:00 pm - 6:00 pm

Steuben County Civil Defense Training Center
7220 State Route 54, Bath

This workshop will provide updates for farmers and farmer market managers about regulations and food safety guidelines for farmer vendors. Staff from the NYS Dept of Agriculture and Markets will review the licenses and regulations associated with direct marketing farm products. Diane Eggert, NYS Farmers Market Federation, will address issues on food safety, and making the most of the modern farm market setting.

Workshop fee: $15 per person or family
Pre-REGISTER contact Cornell Cooperative Extension - Steuben Co, 607-664-2300, sms64@cornell.edu or ksb29@cornell.edu. *Supported by the Genesee Valley Regional Market Authority.*

Food Entrepreneur Workshop: Recipe to Market

Friday, May 18

9:30 am - 3:30 pm

Village of Salem Proudfit Hall
181 Main St/Rt 22, Salem, NY 12865

Food business basics, and critical issues before launching a food business. Olga Padilla-Zakour, NYS Food Venture Center, Cornell – Geneva, will lead the workshops.

$50 fee; Pre-register by May 11th. Details and registration form at: http://bit.ly/Recipe2market2012Brochure. Contact Steve Hadcock at 518-380-1497, or Trish Kozal at 518-854-3032 with questions. *Sponsored by the CCE Capital Area Ag & Horticultural Program, and the Battenkill Kitchen, Inc.*

Food Entrepreneur Workshop: Acidified (Pickled) Foods

Saturday, May 19

8:30 am - 4:00 pm

Battenkill Kitchen, Inc.
Historic Salem Courthouse
58 E. Broadway, Salem, NY 12865

Hands-on training to provide small processors with the basic processing steps.

Olga Padilla-Zakour, NYS Food Venture Center, Cornell – Geneva, will lead the workshops.

$50 fee; Pre-register by May 11th. Details and registration form at: http://bit.ly/Recipe2market2012Brochure. Contact Steve Hadcock at 518-380-1497, or Trish Kozal at 518-854-3032 with questions. *Sponsored by the CCE Capital Area Ag & Horticultural Program, and the Battenkill Kitchen, Inc.*

Forecasting Late Blight on Your Potatoes or Tomatoes

W. Fry, L. Joseph, I. Small, S. McKay, G. Danies, Cornell (from the Expo Potato Session Summary, 1/24/12); edited by C. MacNeil, CVP)

***(Sixteen growers, consultants and agribusiness reps recently attended online workshops** on using the new, updated Late Blight (LB) Decision Support System developed by Bill Fry, Cornell, to improve late blight management on their farms. If you are interested in learning how to use this system contact Carol MacNeil at 585-394-3977 x406 or crm6@cornell.edu C. MacNeil, CVP)*

During the past several years, we have been developing and evaluating a Decision Support System (DSS) to aid late blight management. It is highly personalized because the data are specific to a given farm. The outputs of the system are meant to assist growers/ consultants in decision-making in protecting their crop from late blight. The system is not intended to replace grower decisions. The components of the DSS incorporated into the forecast include:

- observed (recent) weather from a station on-farm or nearby (Fig. 1)
- very local forecast weather from the National Weather Service on a ~2.5 mile grid (Fig. 1)
- late blight disease forecast based on observed (recent) weather and forecast weather (Fig. 2)
- late blight development in moderately resistant and susceptible potato and tomato varieties (Fig. 2)
- prediction of the effect of weather on fungicides previously applied
- email alerts (Fig. 3), or briefer text alerts, on disease development and fungicide residues on your farm
- predictions (using a simulation) of future late blight development and fungicide coverage
- choice of fungicides for the farm input record *(soon)*
- predictions of risk concerning local reports of late blight *(not yet operational)*

Figure 1. Observed (recent) weather and forecast weather. Recent weather is in green (left), and forecast weather is in red (right).

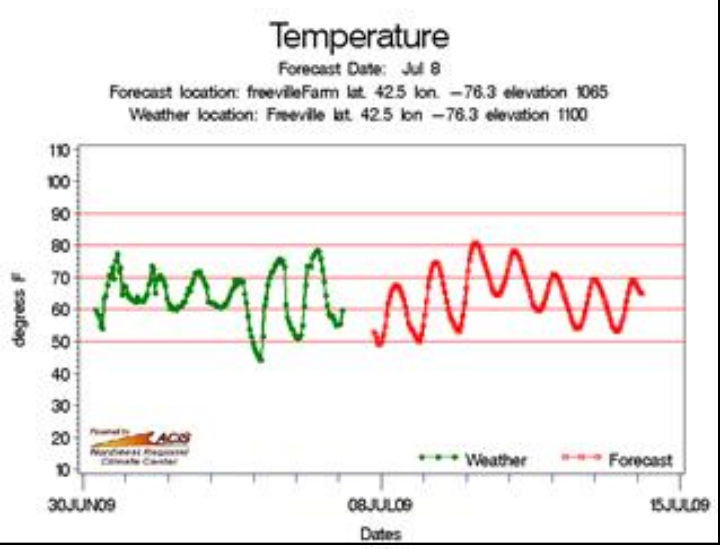
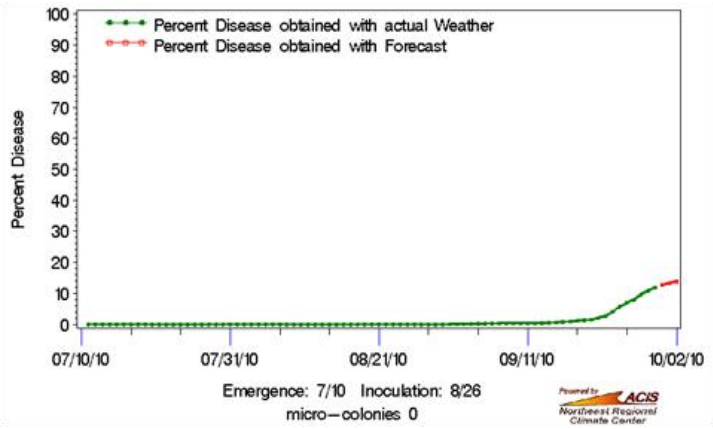
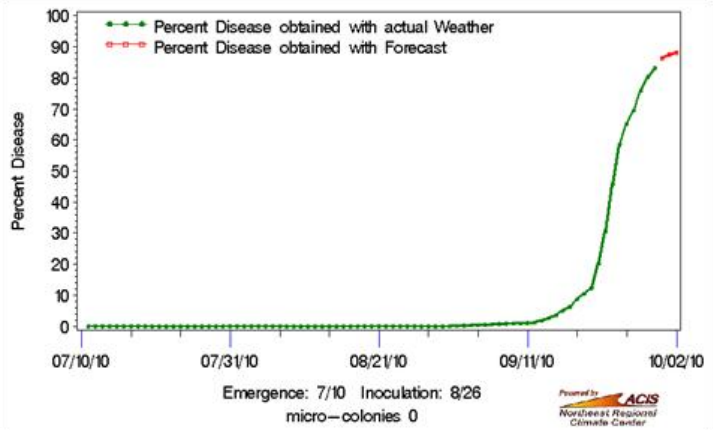


Figure 2. The effect of host resistance on late blight development. Late blight develops more slowly on moderately resistant varieties than on susceptible varieties.



Moderately Resistant Variety



Susceptible Variety

Evaluation of the DSS. We used Simcast to guide fungicide applications in research plots. This experiment involved Katahdin as the susceptible variety and Kennebec as the moderately resistant variety. LB was known to be present about 0.5 miles away. Chlorothalonil was the fungicide. Treatments consisted of i) weekly applications, ii) applications according to the DSS, or iii) no fungicide. At the end of the season there was no late blight in any plot receiving fungicide, but different treatments had received different amounts of fungicide. Plots sprayed weekly had received 8 applications. Katahdin plots sprayed according to the DSS had received 6 applications, and Kennebec plots sprayed according to the DSS had received 5 applications. Late blight was a threat because by the end of the season the untreated Kathahdin plots were severely affected by late blight (60% defoliated), and the untreated Kennebec plots were about 10% defoliated.

Future Directions. There are several improvements planned for the next version of the DSS. These include: i) incorporating the effects of diverse fungicides of diverse modes of action and diverse effectiveness ii) providing more types of alerts via email/text messages (the alerts include recommendations from a disease forecast and information about LB detections in your region); iii) modifying disease forecasts to include the diverse effects of diverse pathogen genotypes.

Resources Regarding Late Blight.

- **LB DSS forecasting website:** http://blight.eas.cornell.edu/blight/
- **For a sign-in name, password:** Laura Joseph, lje5@cornell.edu or Ian Small, ims56@cornell.edu
- **Cornell Vegetable Program** *Veg Edge* monthly & *weekly* mail or email
- **USAblight website:** http://usablight.org/
- **NYS IPM Program NEWA website:** http://newa.cornell.edu/
- **Abby Seaman's, NYS IPM, LB website:** blogs.cornell.edu/lateblight/ ■

Figure 3. Alert Email, 7/22: Reba (susceptible); fungicide applied 7/19

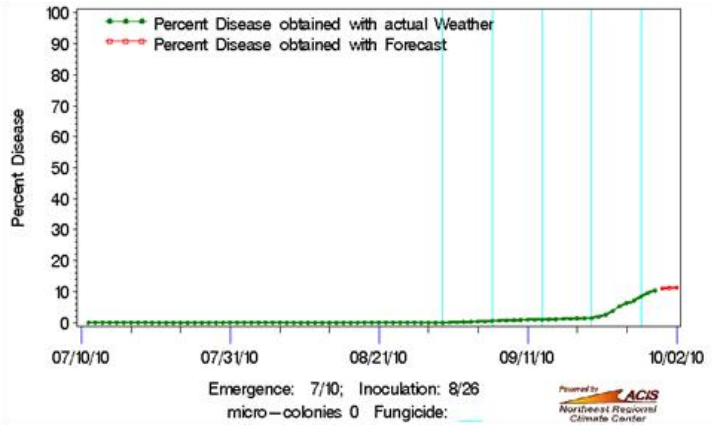
Blight Units and Fungicide Units

Date	7/21	7/22	7/23	7/24	7/25	7/26	7/27
Blight Units	12	18	22	22	27	27	32
Fungicide Units	-7	-12	-17	-21	-22	-23	-24

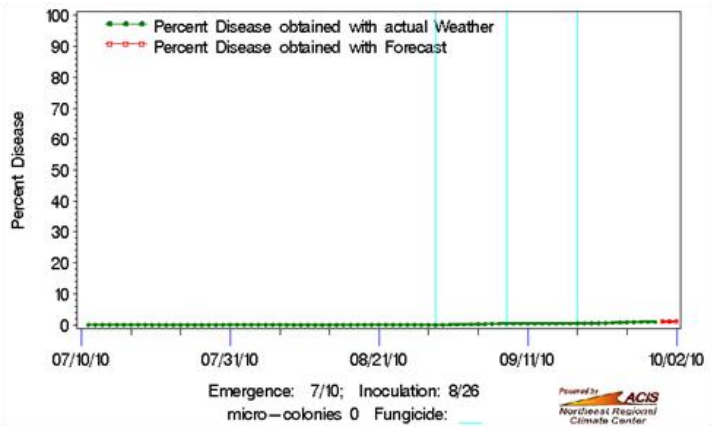
Key

	Below threshold.
>=30	Blight unit threshold exceeded.
<=-15	Fungicide unit threshold exceeded.
	Both blight and fungicide unit thresholds exceeded.

Figure 4. The need for fungicide in disease favorable weather forecast by the DSS for a susceptible and for a moderately resistant variety.



Susceptible Variety



Moderately Resistant Variety

Reducing Problems in Warming Potato & Seed Storage

Carol MacNeil, CCE Cornell Vegetable Program; (info from A.J. Bussan, U. Wisconsin, Veg Crop Update, 3/23/12)

The unusually warm weather of the past few weeks has warmed all but refrigerated potato storages. Fortunately temperatures dipped to normal the last week in March and the National Weather Service 14 day forecast predicts that they'll stay normal through the first week of April (see the NWS Climate Prediction web page at: http://www.nws.noaa.gov/climate/climate_prediction.php?wfo=buf).

Warming temperatures can cause sprouting as well as development of any diseases which are present. Warming also increases potato respiration which accentuates warming. The increased respiration rate can result in high levels of carbon dioxide (CO_2) levels in the storage, which can increase further the activity of some bacterial diseases. It's important to ventilate to bring in fresh air at least 30 – 60 min. per day even if the outside night air temperature is warmer than desired.

Large and rapid fluctuations in seed temperature can have negative effects on the development of the seed after it is planted. It's thought that the large, rapid changes in seed temperatures after planting last spring may have caused secondary dormancy and led to the large delays in emergence and uneven emergence seen in some fields in WI in 2011. To avoid this in 2012 do not rapidly cool down seed that has warmed up. Don't cool it down more than 5 degrees F, or cool it below 42 degrees. A potato pulp thermometer (one with a pointed stem) is useful for checking the internal temperature of the tubers. ■

Reduce Potato Stand Problems

Carol MacNeil, CCE Cornell Vegetable Program

Last spring many growers had fields with uneven emergence or thin stands. The cold weather right after planting was likely to blame. Potato seed does best in warm, moist soil because these conditions are best for healing cut surfaces and for sprout development. If cut seed doesn't promptly heal/cure then microbial infection and seedpiece decay is more likely.

The varieties which are slow to heal cut surfaces, have long tuber dormancy, or have thin skin are most likely to suffer if temperatures are either hot or cold, or if soils are either dry or wet. Pre-cutting and holding these varieties gives them time to heal/cure and good stands are more assured. Some of the varieties which have benefited from pre-cutting are: Allegany, Atlantic, Eva, Genesee, Kennebec, Redsen and Yukon Gold.

Tubers should be warmed up to 50° to 60°F before being handled and cut. Pre-cutting and curing cut seed is best accomplished by placing seed in half-full pallet boxes or spread out in piles only a few feet deep with adequate air circulation, temperature between 55° and 60° F, and about 90% relative humidity. After cut seed has been held at optimal curing conditions for one week, the storage temperature should be lowered to 45°F to maintain vigor and avoid excessive sprout growth.

(Info from Don Halseth, Cornell, and the 2012 Cornell Vegetable Guidelines at http://www.nysaes.cornell.edu/recommends/) ■

Reduce the Risk of Pink Rot this Season

Carol MacNeil, CCE Cornell Vegetable Program

Many growers had problems with pink rot in their later potatoes last year, which means that there's a lot of inoculum for infection this year. While this year's weather will have the most influence on infection and severity of pink rot there are steps growers can take to reduce the risk. First, if pink rot was a problem in a field, rotate it out of potatoes if possible. If that's not possible, plant a more resistant variety there that can be harvested relatively early, before colder and possibly wetter weather sets in.

Pink Rot Susceptibility of Potato Varieties, Tom Zitter, Cornell, 12/11

- Very susceptible (Red LaSoda)
- Susceptible (Lehigh, Monona, Norland, Yukon Gold)
- Susceptible/moderately susceptible (Allegany, NY 118, Red Maria/NY 129)
- Moderately susceptible (Chieftain, Eva, Reba, Nordonna)
- Moderately resistant (Atlantic, Snowden)
- Resistant/moderately resistant (Andover, Keuka Gold, Marcy, Norwis, Pike, Superior)
- Resistant (Yukon Gem)

In addition, some in-furrow, at-hilling and/or foliar fungicides can be helpful in reducing pink rot. If a field is at high risk plan on applying recommended fungicide(s) more than once. In-furrow materials include: Ridomil Gold or OLF* (if pink rot resistance is not present); Phostrol, Prophyt or OLF; and Ranman. Foliar materials include: Ridomil Gold Bravo; or, Phostrol or OLF. Ranman can be applied as a side-dress at hilling or as a foliar application. Combinations of materials may provide additional control.

*(*OLF = other labeled formulations. Variety and fungicide Information above taken from two articles at Veg MD Online at: http://vegetablemdonline.ppath.cornell.edu/NewsArticles/NewsList.htm and from 2012 Cornell Vegetable Guidelines at: http://www.nysaes.cals.cornell.edu/recommends/)* ■

New York Vegetable Processing Plants Being Sold

Julie Kikkert, CCE Cornell Vegetable Program

On March 9, 2012, The Bonduelle Group formally announced its intention to acquire some vegetable processing operations in New York and one in Fairwater, Wisconsin http://Bonduelle.com/en/. The New York sites include the frozen vegetable production plants in Bergen and Oakfield, NY as well as the packaging center in Brockport, NY. In the press release, Bounduelle said that the transaction could be completed by the end of March, pending approval from the US Competition Authorities. The plants are being purchased from Allen's, Inc. and were formally owned by Birds Eye Foods, among others.

In 2011, New York growers supplied around 100,000 tons of snap beans, sweet corn, peas and carrots to the Allen's plants in Western, New York. Although 2012 will be a challenging year of transition, local growers are hopeful that the sale of the plants will provide future stability to the processing vegetable industry in New York.

The Bonduelle group, headquartered in Northern France, is a world leader in the production of prepared vegetables. It currently operates 42 production plants in Western Europe, Poland, Hungary, Russia, Canada and Brazil. Bonduelle North America (head office in Montreal) is a leader in canned and frozen vegetables in Canada under its own labels. It previously exported 30% of its production to the US, primarily as frozen product through food service outlets. With the purchase of the US plants, it will expand its production and sales capabilities. ■

Soil Type Influences Irrigation Strategy

Ron Goldy, Michigan State University Extension (from Michigan State U Extension News, 2/12)

When it comes to irrigation, many growers question how much, how long, how fast and how often they need to irrigate. The answers usually involve a combination of soil characteristics, plant growth stage and weather, however, how fast to apply water is based solely on soil type. Clay-based soils have small, flat, compact particles with large surface to volume ratios. These soils are often difficult to prepare for planting since they are slippery when wet and hard when dry, making timing for field operations critical to avoid damaging soil structure and getting proper soil tilth for planting. Sand-based soils are at the other end of the spectrum having comparatively large particles with small surface to volume ratios. They are generally easier to prepare for planting and can be worked shortly after significant rainfall.

For irrigation purposes, it is important to remember water is absorbed and moves **slowly** through clay soils, but once wet, they retain significant amounts of moisture. Water is absorbed and moves **quickly** through sandy soils, but they retain very little. This means water applied quickly to clay soil has a tendency to run off rather than move into the soil. Therefore, when irrigating clay soils, water should be applied slowly over a long period but then the site may not need irrigation for several days. Irrigation on sandy soils can be applied more quickly but for short periods, otherwise water will move beyond the root zone, becoming unavailable to the plant. For efficient water use under certain weather conditions, very sandy soils may need nearly daily irrigation for short periods. Clay soils have greater capillary (sideways and upward) movement than do sandy soils. Quick water application on sandy soils will contribute to a broader wetting area, providing more soil volume for roots to exploit.

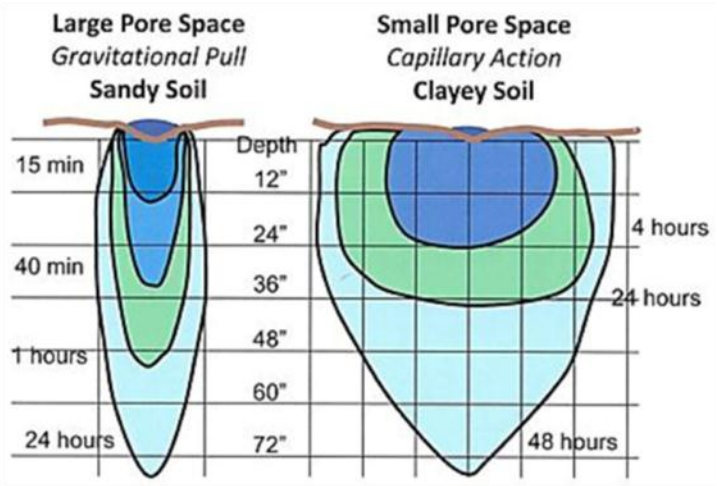


Figure 1. Water spread and penetration time and distance in sandy and clay soils. *David Whiting, 2011.*

Soils can vary considerably within the same field. Drip systems can be zoned to account for this variation and each zone irrigated according to the predominant soil type. Emitter flow rate can also be selected to accommodate different soil types; with high flow emitters used on sandy sites and low flow emitters on clay sites. Emitter spacing can also be changed with larger spacing on clay soils and shorter spacing on sandy sites. Growers using drip systems should take advantage of these options to maximize water use while minimizing environmental concern. Overhead irrigators do not have this option, so they need to be more aware of the weather and should avoid saturating the soil, especially if there is a chance of rain. Also avoid large applications of water shortly after fertilizer or pesticide applications. Paying attention to soil type and how it should be irrigated will make water applications more efficient. ■

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Chuck Bornt, Team Leader
Extension Specialist

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Advisory Members

Albany:	Tim Albright and Tim Stanton
Columbia:	John Altobelli, Bryan Samascott, Jody Bolluyt (organic)
Fulton:	Eric and Stephanie Grey
Greene:	Pete Kavakos, Jr. and Jim Story
Montgomery:	Jim Hoffman and Ken Fruehstorfer (organic)
Rensselaer:	Larry Eckhardt and David Mesick
Schenectady:	Al Lansing and Keith Buhrmaster
Saratoga:	Cyndi Pastore and Craig DeVoe
Schoharie:	Bob and Linda Cross, and Jake Hooper
Warren:	Kim Feeney
Washington:	George Armstrong and Rich Moses
Industry Representatives:	Jay Matthews and Paul Peckham

If you have questions or comments about this publication or the Capital District Program in general, please contact your county's grower advisory member or the Agricultural Program leader of your local Cornell Cooperative Extension office.

Dates to Remember...

April 10 (Wayne Co.) - DEC Special Permit Training Class for Non-Certified Applicators and Handlers of Federally Restricted-Use Pesticides, CCE Wayne County, 1581 Rt 88N, Newark, *page 9.*

April 11 (Orleans Co.) - DEC Special Permit Training Class for Non-Certified Applicators and Handlers of Federally Restricted-Use Pesticides, Orleans County Cooperative Extension Fairgrounds Trolley Bldg, Rte 31, Knowlesville, *page 9.*

April 11 - Farm Market Regulations: What Every Vendor Should Know, 3:00 pm - 6:00 pm, Steuben County Civil Defense Training Center, 7220 State Route 54, Bath, *page 11.*

May 18 - Food Entrepreneur Workshop: Recipe to Market, 9:30 am - 3:30 pm, Village of Salem Proudfit Hall, 181 Main St/ Rt 22, Salem, NY 12865, *page 11.*

May 19 - Food Entrepreneur Workshop: Acidified (Pickled) Foods, 8:30 am - 4:00 pm, Battenkill Kitchen, Inc., Historic Salem Courthouse, 58 E. Broadway, Salem, NY 12865, *page 11.*

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