



UMASS  
**EXTENSION**



# Vegetable Notes

For Vegetable Farmers in Massachusetts

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## CROP CONDITIONS

Heavy rains (from just over one to over four inches) drenched the state this past week. Growers are eyeing their cucurbit and pepper crops closely, knowing that the wet soils put these crops at greater risk of soil-borne diseases such as *Phytophthora capsici*. Overall crops are growing well and often ahead of schedule, though disease pressure tends to be high. Fortunately there have been no new reports of late blight in the Northeast this week, even though weather conditions have been very favorable (see table). Tomato crops have other foliar diseases including early blight, *Septoria* leaf spot, *Fulvia* leaf mold and powdery mildew (see article below). Early-planted winter squash and pumpkin are approaching maturity, and harvest of early butternut is beginning. Later-planted cucurbits are still setting fruit. Harvested fields are begging for fall cover crops to hold on to soil and nutrients and block out weeds – and moist soil conditions will get them up and growing fast. Corn earworm pressure has shot up and sweet corn needs lots of attention to keep it clean.

Downy mildew of basil has been found in both field and greenhouse crops around the state. See [www.umassvegetable.org](http://www.umassvegetable.org) homepage for alert and more details. UMass Plant Pathologist Rob Wick is studying the genetics of this pathogen and is looking for samples; contact him at 413-545-1045 or [rwick@pltpath.umass.edu](mailto:rwick@pltpath.umass.edu) to send samples for diagnosis.

## IPM UPDATES

Sap beetle invades tips of sweet corn, especially where these are exposed tips or damage from other pests. Growers find that the first indication of sap beetle activity is tiny, thin pink or white ‘worms’ (actually beetle grubs) that can hollow out individual kernels. There are several generations of sap beetle per year and they reproduce in-season on decayed or rotting fruit and vegetables. Controls should target adults. Monitor for adult sap beetles when silks begin to wilt. Inspect the silk area at the tip of 20 ears at each of five sites and determine the percent of ears infested with adults, eggs, or larvae; spray if 10% are infested with sap beetle. With corn earworm pressure so high, sprays for earworm and corn borer are likely to provide control. Once larvae are in the ears, little can be done to save the ears. Bt hybrids do not control sap beetle. Check the farm for any piles of rotting fruit or vegetables that could be harboring sap beetles.

Date	Location	Rainfall 7 days	7-day SV	SV Season total
18-Aug	Pittsfield	2.2	13	92
18-Aug	Ashfield	4.1	16	115
18-Aug	S Deerfield	3.9	14	89
18-Aug	Dracut	2.3	13	75
18-Aug	Tyngsboro	1.9	14	86
18-Aug	Bolton	2.9	14	93
18-Aug	E. Bridgewater	1.9	14	108
18-Aug	New Bedford	1.3	15	78

Weather data from NEWA, other New England locations are available

<http://newa.cornell.edu/index.php?page=degree-days>

SV= Severity Value, based on BLITECAST

SV Seasonal Total ASSUMES POTATO EMERGENCE MAY 20

(earlier emergence results in higher seasonal SV)

	Total severity values during last 7 days					
	<3	3	4	5	6	>6
Total rain/irrigation for past 10 days	Spray Interval for late blight control (in number of days)					
>1.2 inches	10-14	10	7	5	5	5

## POWDERY MILDEW ON CUCUBITS

Powdery mildew is rampant on cucurbit crops. Powdery mildew fungi attack both the top and bottom of the leaf, and this makes the disease more difficult to control with non-systemic fungicides. However, powdery mildew fungi tend to become resistant to systemic fungicides such as Topsin-M, Nova, Cabrio, Flint and Quadris. Cabrio, Flint and Quadris are strobilurins (group 11) and have the same mode of action so they should not be rotated with each other. In fact, resistance to strobilurins in New York and Mid-Atlantic states has resulted in the removal of this class of fungicides from their recommendations, with the exception of Pristine which is a combination product with boscalid. Resistance to the DMI fungicides (Rally, Procure, Group 3) is also widespread; use Rally or Procure at the high labeled rate only. Note group numbers when selecting fungicides. See Vegetables Notes July 21 and July 28 issues regarding decision making for which products to use for multiple diseases. If you are investing in fungicides for effective control of powdery mildew, avoid strobilurin products.

## INSECTS AND NON-PATHOGENIC DISORDERS OF LATE SUMMER BRASSICAS.

**Non-pathogenic disorders of broccoli: Brown bead, heat injury, and hollow stem of Broccoli.** Each of these disorders can be caused by a combination of factors – heat stress during head initiation, excessive water especially after a dry period, excessive nitrogen, rapid growth during head formation, deficiency of boron, and cultivar susceptibility. Heat injury is most often manifest as unevenness of the crown and uneven bud size on the head, as well as small head size. Brown bead appears as heads approach maturity and is usually associated with rapid growth during periods of high temperature followed by abundant rainfall. Floral buds turn tan or brown and become easily detached. These may then become infected with soft rot bacteria. Boron deficiency, which shows up as hollow stem of broccoli or cauliflower, brown discoloration of turnip or rutabaga roots, or internal discoloration of cauliflower, can be more severe if plants are water stressed or pH is greater than seven. Adequate supplies of soil organic matter, consistent and adequate water levels in the soil, and supplemental boron applied before planting if boron levels are low can all help in avoiding these problems.



*Heat Damage on Broccoli*

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**Cabbage root maggot** can cause root injury in fall turnips and rutabagas as well as daikon and radishes. Occasionally maggots cause injury to fall broccoli or cabbage, but that is less common. Root crops are more sensitive to injury since the root is marketed. Damage includes both superficial scarring and tunneling in the root. Feeding injury allows entry of soft rot and other pathogens. The timing of control measures is more difficult than in spring crops, because the flight periods are less well defined. In this region there are probably four full generations of cabbage root maggot, with the third flight period taking place in mid August and the fourth in September. Based on research done forty years ago in New York, the third adult flight would be predicted to begin at the same time that the early goldenrod blooms, which in the Connecticut Valley occurred last week. At the UMass Crops research farm we are looking at a number of alternative controls both chemical and cultural. Of course in our trials we are trying to plant just in time to get lots of damage. We will be putting turnip transplants out early next week and applying controls at planting or soon after. Will it be too soon, too late, or just right?



*Cabbage Maggot Damage on Daikon*

Monitoring for adults is fairly easy using yellow sticky cards placed in the crop. Monitoring for eggs is the same as in the spring: search soil at the base of the stem and look for tiny oblong white eggs in the soil. Application of controls depends on method to be used. For conventional root crops, application of Lorsban at seeding or transplanting is an option. Since this is a long-lasting material, it is likely to provide control of eggs laid by the third flight.

Non-chemical options include drenches with *Steinernema feltiae* nematodes at planting or at detection of eggs; this method has been researched enough to know that this species of nematode is the most effective and the field damage can be reduced though most of the research has been on spring cabbage. Sources include IPM laboratories Locke, New York, phone 315-497-2063 and BioLogic Company, Willow Hill, PA, phone 717 349-2789. Non-heating row covers also have some potential, if they are applied at planting before any aphid populations get established and do not overheat the crop. We are conducting trials at UMass on controls for fall cabbage maggot and will be looking at lightweight spunbonded row cover, 'Proteknet' from Dubois Agrinovation in Quebec, and another non-heating woven type of cover.

**Imported cabbageworm (ICW), Diamondback Moth and Cabbage Looper.** Loopers, which migrate in from the south, are here now. The same conditions that favor large influx of corn earworm also bring loopers. Last week we found loopers in beans; finding them in non-Brassica crops is often an indication that numbers are high. Loopers will grow rapidly and cause a large amount of damage. Look for the 'inch-worm' style of movement.

In fact, all three of types of caterpillars that we find in Brassicas are active now, and numbers are increasing. It is a critical time to scout Brassicas and control caterpillars. If 15% of plants have caterpillars at the time when heads form or when leaves are being marketed, a spray is warranted. Look on the undersides of leaves for new feeding damage and young (well-camouflaged) caterpillars.



*Cabbage Looper in Beans*

**Flea beetles.** In late August, flea beetles are still very active and feeding heavily. In September, flea beetle activity will drop off as adult beetles leave the field to find overwintering sites in leaf litter in field borders. They lose interest in feeding and focus on finding a safe spot for the winter. This is a relief for Asian greens, Nappa cabbage, arugula and all the other favorite greens that are often severely damaged earlier in the season. It is a relief for the farmer also, because this is the time when high quality greens can usually be produced without row cover. Take note of where you last saw heavy flea beetle feeding during August. Since flea beetles will most likely overwinter near that field, that is the field to avoid next year when you decide where to plant your early spring Brassicas!

## **BACTERIAL DISEASES OF ONION**

Onions and garlic are subject to numerous leaf and bulb diseases that occur both in the field and in storage, and can be caused by both fungi and bacteria. Below are descriptions of several bacterial diseases. Look for more on storage diseases in upcoming issues. Both of the bacterial diseases described below have been confirmed in at least one field of onions in MA. With growers increasing their fall & winter storage crops, onion production is increasing in Massachusetts.

Slippery skin is a bacterial disease caused by *Pseudomonas gladioli pv alliicola*. In the early stages of the disease, affected bulbs may show no external symptoms except softening of neck tissue. If the bulb is cut longitudinally, inner fleshy scales are soft and water-soaked. The rot progresses from the top of the infected scales downward and eventually the whole internal tissue may rot. The bacterium is primarily a wound pathogen and attacks leaves and bulbs in the field or after harvest. Infection often occurs just before or at harvest time. The disease is more severe when tops are damaged by high winds and hail. Mature bulbs are very susceptible. To control this disease, onions should be harvested just after tops lodge. Avoid wet and rainy conditions at harvest. Preventing injury, drying bulbs after topping, and storing bulbs at 32-34 F will help reduce disease.

Sour skin is caused by *Pseudomonas (Burkholderia) cepacia*. Losses appear in storage, but infection usually occurs in the field. Primary symptoms include a light brown decay and breakdown of one or a few inner bulb scales. The bulbs appear intact and remain firm, but rot proceeds internally. The bacterium is a versatile organism, found in soil and water or as a pathogen of plants and/or animals. The bacteria exist as pathovars or strains. Onions are relatively resistant to infection before bulb formation. Infection occurs through a wound either when free water causes water congestion of the bulb, when onion tops are cut at harvest, or when wounds occur when the foliage falls at maturity. Disease can also begin when contaminated water flows down the neck, but plants remain symptom-less until bulb formation. *P. cepacia* development

is favored by high temperatures. The disease is usually more severe where tops have been damaged by high winds, hail, or wet, rainy conditions just before or at harvest. Contaminated irrigation water is a potential source of the pathogen and agent of its spread. Methods of irrigation have a large impact on disease incidence. Season-long overhead irrigation provides a favorable environment for *P. cepacia*.

Control measures consist of proper maturing of the crop, quick drying after topping and harvest, and proper storage at 32-34 °F.

- M. Bess Dicklow, R.Hazzard,

## **ONIONS: HARVEST AND CURING TIPS FOR BEST QUALITY**

As onions mature, their dry matter content and pungency increase, with a resulting increase in storage potential. Onions are ready for harvest when at least half the leaves are dead. Tops are beginning to fall in early direct seeded onions and many transplanted fields. Pull the bulbs by hand, or use equipment such as a potato digger or undercutter to cut the roots and lift the bulbs. If you wait until all the leaves are dead and dry, it's likely that the outer skins will be loose rather than firm. This may not hurt the keeping quality, but the onions will not look as nice. However, pulling too green will make it difficult to cure them well. Harvest when the weather is dry; harvesting after a rainfall or when the humidity is high increases susceptibility to post-harvest disease. There may be instances when leaves are declining in quality due to insect, disease or growing conditions and the crop is not growing, but necks are still green. In this case pay special attention to curing under optimum conditions until necks are dry and closed.

For optimum storage quality, onions must be cured soon after harvest. Optimum conditions are 68-86°F and 70% relative humidity for at least 12 to 24 h. Curing decreases the incidence of neck rot, reduces water loss during storage, prevents microbial infection, and is desirable for development of good scale color. Curing can be done in the field, preferably when the weather is warm and dry. If it rains, let them dry fully before handling – don't handle the bulbs when they are wet. A greenhouse or hoop house also provides good conditions for curing. Temperatures in the 80's will enhance the bronze color in the skins. Sunshine is good as long as it is not too hot. Extremely hot sun, with temperatures in the 90's, can produce sunscald. Onions curing on a sandy soil will get hot quicker than those lying on a heavier soil. In a greenhouse, temperatures should be held below 85 degrees F, which will probably require leaving everything wide open. Using a black shade curtain over the house can help moderate temperature. Ensure good air movement. Curing is complete when the neck is completely dry and tight. If the neck remains open, it allows entry of pathogens such as *Botrytis* neck rot.

The next step is topping. Mechanical onion toppers are essential for larger plantings. For the needs of a small diversified farm, they are probably best obtained second-hand. Check your favorite used equipment dealers! Onions can also be topped by hand using clippers. Handle gently to avoid bruising. Avoid cutting tops too close to the bulb, especially if there is any chance of disease entering bulbs from the leaves. Leave 2-3 inches of stem. Defective onions (i.e. sprouted, insect damaged, sunscalded, green, bruised, soft) should be discarded. Grade for size according to your markets.

To ensure maximum storage life, onions must be promptly stored after curing. Get them out of the sun; exposure to light after curing will induce greening of the outer scales. The optimum temperature for long-term storage of onions is 32°F with 65-70% relative humidity, but it is important to bring them down to this temperature slowly. In fact, holding onions in a barn or garage so that they cool along with the average outdoor temperature in late summer and fall works quite well. Avoid cooling bulbs to well below the average daily temperature, because they will draw moisture from the warmer air, which can lead to disease. If you are selling them within a couple of months, keeping them in an un-insulated barn is fine. An insulated storage room is needed for longer storage.

### **Harvest Tips for Best Quality**

- 1) Be sure onions are well dried and necks are tight (i.e. the tissue does not slide when you roll your neck between your fingers) before topping. Bacterial diseases and *Botrytis* Neck rot can move through green tissue into the bulbs. These diseases do not move in dry tissue.
- 2) Leave 2-3 inches of neck on the bulb. This increases the distance from the cut surface to the bulb for these pathogens to travel.

3) Minimize mechanical injury during harvest & topping. Reduce drops to 6" and pad sharp surfaces. Bruises provide direct entry points for diseases to get started.

4) Grade out damaged onions before putting them into storage. Damaged bulbs give off moisture, which is favorable for development of diseases in storage.

- John Howell, Andrew Cavanagh, & Ruth Hazzard. Resources: CSU Extension and the University of Saskatchewan Vegetable Program.

## **POWDERY MILDEW & FULVIA LEAF BLIGHT ON TOMATO**

### **Powdery Mildew (*Oidium neolycopersici*)**

Powdery mildew of tomato is emerging as an important disease of greenhouse crops. It has been found in at least one high tunnel in Massachusetts this season. Unlike most Powdery mildews that are host specific, this pathogen has a wide host range of at least 13 plant families including the Solanaceae (nightshades), Alliaceae (onion family), and Cucurbitaceae (vine crops).

**Identification.** Symptoms appear on foliage as light-green to bright yellow lesions on the upper leaf surface. The spots enlarge and become necrotic. Lesions may exhibit concentric rings similar to early blight. A light, powdery coating may be seen on leaf undersides. Under conditions favorable for disease development, a dense, white layer of growth may develop on both leaf surfaces. Entire leaves wither and die, but remain attached to the stem. There are no symptoms on fruit or stems, but loss of foliage may result in sunscald.

**Life Cycle.** *O. neolycopersici* does not overwinter outdoors in northern climates. The pathogen overwinters in weed or crop hosts in the greenhouse. Spores produced in southern areas are blown north by prevailing winds. This pathogen is favored by low light and cool temperatures. In contrast to other fungal plant pathogens, it does not require free water to germinate and cause diseases.

### **Cultural Controls & Prevention.**

- Control weed hosts both inside and outside the greenhouse.
- Improve air circulation and light penetration by plant spacing, proper irrigation practices, and the use of fans in the greenhouse.
- Pruning and staking improve ventilation in both the greenhouse and field.
- DeRuiter's Seeds has recently released the cultivar, Grace, which has resistance to powdery mildew.

### **Fulvia Leaf Mold (*Fulvia fulva*)**

**Identification.** Foliage is usually the only tissue affected. Symptoms begin as pale green or yellowish spots without well defined margins on the upper leaf surface, which turn a distinctive yellow. Lesions coalesce when disease is severe and the foliage dies. An olive, green mold on the lower leaf surface is visible. Infected foliage curls and withers and may drop from the plant. Blossoms, stems, and fruit are occasionally attacked and blossoms may be killed. Fruit symptoms consist of a dark, leathery rot at the stem ends. Leaf symptoms can occasionally be mistaken for late blight; proper diagnosis is critical.

**Life Cycle.** *F. fulva* survives on infected plant debris as spores, or as sclerotia in the soil. Seed can be contaminated and serve as the initial source of disease. Spores, which are readily spread by rain and wind, can survive up to one year. Spores may also be spread on tools, workers' clothing, and insects. The pathogen is dependent on high relative humidity and high temperatures. Leaf mold does not occur where relative humidity is less than 85%.



*Fulvia on Tomato*

## Cultural Controls & Prevention.

- Crop residue should be deeply incorporated or removed and destroyed after harvest.
- Start with certified, disease-free seed or treat seed with hot water.
- Sanitize greenhouse thoroughly in between crop cycles.
- Minimize long periods of leaf wetness through the use of fans to circulate air and avoiding wetting the foliage.
- Staking and pruning to increase ventilation reduces disease spread.
- Maintain night temperatures in the greenhouse higher than outside temperatures.
- Fungicides effectively control this disease.

## SWEET CORN

The latest plantings of sweet corn are now entering pretassel stage. Early and mid season fields are being tilled under and are ready for cover crops. The sooner that rye or oats are planted, the more nitrogen you will recover from the soil and hold over for next year. Cover crops planted in August develop larger, deeper roots and more canopy – providing better Nitrogen uptake and more protection of soil from erosion.

The second generation of European corn borer flight is dwindling down in most areas. If you are still catching adults then there are still eggs being laid. Hatch and feeding damage will continue to occur in these spots. It may be necessary to spray for ECB even if you are not spraying for CEW – though CEW is driving most spray schedules now. Continue scouting if weekly flights are above 12 and spray when damage is 15% or greater in the field. It is also important to know that the ECB overwinters here in New England in corn stalks and in the stems of other host plants. If you are finished picking in a field make sure to chop stalks and till in the plant debris to cut down on next year's population. Pepper growers can stop ECB sprays one week after counts drop below 20 moths per week.

Corn earworm flight is still present at all reporting locations. Even the Berkshires are reporting trap captures high enough to warrant a four day spray schedule. Cooler night temperatures can allow spray schedules to be stretched out a day. If maximum daily temperatures are below 85° F for 2-3 days, spray intervals may be extended by one day. If you have caught under 7 moths per week you can move to a five day spray schedule. Make sure to move your CEW traps into fresh silk so that your counts reflect current moth activity. Base spray decisions on the average number of moths caught in two traps. Most growers rely heavily on synthetic pyrethroids such as Warrior for CEW control, but reliance on a single type of chemistry is not the best

Location	Z1	EII	Total ECB	CEW	FAW
<b>CT Valley</b>					
Sunderland	1	0	1	45	0
Hadley	6	4	7	17	0
Feeding Hills	0	3	3	26	1
Amherst	0	0	0	8	0
Hatfield	0	2	2	9	0
<b>Berkshires</b>					
Sheffield	1	0	1	31	0
<b>Central &amp; Eastern MA</b>					
Lancaster	3	1	4	12	0
Still River	0	0	0	50	0
Tyngsborough	10	0	10	67	2
<b>NH</b>					
Litchfield, NH	0	31	31	32	0

Corn Earworm Threshold		
Moths/Night	Moths/Week	Spray Interval
0-0.2	0-1.4	no spray
0.3-0.5	1.5-3.5	every 6 days
0.6-1	3.6-7	every 5 days
1.1-13.0	7.1-91	every 4 days
Over 13	Over 91	every 3 days

approach for any insect or disease pest. For rotation of insecticide chemistry, alternate synthetic pyrethroid products with Lannate (a carbamate) or a new insecticide, Belt SC (flubendiamide) which is used at 2 to 3 oz/A (1 dh, REI 12h, Group 28). Trials in mid-Atlantic states indicated that this new chemistry is very effective. Synthetic pyrethroids are generally cross-resistant; that is, if resistance to one pyrethroid is present in a population, then that population will also be resistant to other pyrethroids. Spinosyn products (Entrust, and Radiant) have efficacy against corn earworm at moderate pressure so could provide

another rotation product under some conditions. The dry formulation (Entrust) that is allowed in organic production has been working well for growers, when used in an IPM program in organic fields. Organic growers should try using direct oil treatments for CEW control as well. See our Organic Control for CEW in Sweet Corn article published in last weeks issue of Veg Notes.

Fall armyworm trap captures are low. Scouts for FAW feeding in the tassels should coincide with ECB scouts. Recommended materials include Avaunt at 2.5-3.5 oz/acre in whorl stage corn. Radiant SC at 3-6 oz/acre can be used in silking corn where sprays are warranted.

- A. Brown

## **UPCOMING MEETINGS**

### **Boston Premier Tour de Hives**

**August 20, 2011. 9:30am to 8pm.**

**Tour starts at City Natives Apiary 30 Edgewater Drive, Mattapan**

Visit 5 apiaries, different types of hives and apiary management styles while biking through the city (Mattapan, Roslindale, Jamaica Plain, Brookline). Honey tasting. Tour ends in Cambridge at the opening of 'Follow the Honey' store.

For more information and to pre-register, check [www.nofamass.org](http://www.nofamass.org)

### **Solar Thermal Workshop**

**Crossroads Farm, 1231 West Road, Ashfield**

**Monday, August 22nd, 6:00-8:00pm**

Join Community Involved for Sustaining Agriculture (CISA) and MA Farm Energy Program for a Summer Workshop - Solar Thermal – hot water & space heating

Come learn the basics of energy efficient solar hot water systems with the Massachusetts Farm Energy Program/Berkshire-Pioneer RC&D and system installers, including the Massachusetts Clean Energy Center, The Solar Store and Coop Power. We will discuss system and equipment options, best management practices for different farm sectors, how to work with an installer, funding opportunities, and take a look at an on-site system. Find out how the MA Farm Energy Program can be a resource for your farm energy project from planning to implementation. Snacks will be served, suggested donation \$5.

Please RSVP by Friday, August 19th to Devon Whitney-Deal at 413-665-7100 x22 or [devon@buylocalfood.org](mailto:devon@buylocalfood.org).

### **Hops: Harvester Demonstration, Storing and Processing**

**Sponsored by University of Vermont Extension**

**Four Star Farms, 496 Pine Meadow Road, Northfield MA**

**Thursday August 25 11:00 - 3:00**

The L'Etoile family has experienced many of the challenges and successes of growing hops since they began producing in 2008. They will host a farm tour, followed by a harvester showcase and networking session.

Please RSVP by August 18th to UVM Extension at (802) 524-6501, or email [rosalie.madden@uvm.edu](mailto:rosalie.madden@uvm.edu) or [heather.darby@uvm.edu](mailto:heather.darby@uvm.edu).

### **MA Tomato Contest for Commercial Tomato Growers**

**Boston City Hall Plaza Farmers' Market**

**August 27, 9:00am**

This year's tomato contest will be held at the Boston City Hall Plaza Farmers' Market. The event is sponsored by the New England Vegetable and Berry Growers Association in cooperation with the Massachusetts Department of Agricultural Resources. This friendly contest is designed to increase consumer awareness of local agriculture. See [http://www.mass.gov/agr/markets/tomato\\_contest.htm](http://www.mass.gov/agr/markets/tomato_contest.htm) for details.

**Irrigation Systems at Harlow Farm**

**Harlow Farm, 117 Deep Root Dr Westminster, VT**

**August 30, 2011 - 4:00pm - 6:00pm**

The Harlow Farm in Westminster is a 150 acre certified organic farm in its third generation of farming. In this workshop, you'll take a tour of Paul Harlow's operation, including his various fields of irrigation. He'll discuss his investment in irrigation equipment, his systems for laying the irrigation (both overhead and drip), timing, and labor and crops that require special attention such as carrots, parsnips, lettuce and strawberries. You'll also visit a neighboring greenhouse. For more information contact [info@nofavt.org](mailto:info@nofavt.org), (802) 434-4122

**4-Town Farm Twilight Meeting**

**4-Town Farm, 90 George St., Seekonk, MA 02771**

**September 14, 2011**

Topics covered will include Deep Zone Tillage, Season extension using minimally heated tunnels and greenhouses, Commonwealth Quality certification, and using the NEWA pest forecasting system.

**New England Vegetable & Fruit Conference & Trade Show****December 13-15, 2011**

**Center of New Hampshire Radisson Hotel, Manchester, NH**

**[www.newenglandvfc.org](http://www.newenglandvfc.org)**

The premier fruit and vegetable conference in New England will once again offer three full days with over twenty educational sessions that cover all of the major vegetable, berry, and tree fruit crops, as well as various special topics.

More details including registration materials will be posted at [www.newenglandvfc.org](http://www.newenglandvfc.org).

For more information contact Jon Clements, (413)478-7219, [clements@umext.umass.edu](mailto:clements@umext.umass.edu).

*Vegetable Notes. Ruth Hazzard, editor and Amanda Brown and Andrew Cavanagh, assistant editors. Vegetable Notes is published weekly from May to September and at intervals during the off-season, and includes contributions from the faculty and staff of the UMass Extension Vegetable Program, other universities and USDA agencies, growers, and private IPM consultants. Authors of articles are noted; author and photographer is R. Hazzard if none is cited.*

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