UMASS EXTENSION

Vegetable Notes

For Vegetable Farmers in Massachusetts

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CROP CONDITIONS

Crop growth is proceeding well. The heat wave gave way to cooler nights and lower humidity. Harvest jobs are accelerating at the same time that planting of succession and fall crops is still underway. Pumpkin and winter squash plantings that went in early are starting to fill the rows, while later planted crops are still getting established. The first early corn harvest, mostly in the Connecticut Valley not far from the river, has started this week. In many other parts of the state, first corn harvest is still 10-14 days away. Tomatoes are setting fruit well and growing fast; tomato staking ,pruning, and weaving or tieing are critical jobs at this time. Irrigation has been needed this past week in some fields. Sweet potato plants that were set early are sending out runners. Potatoes are filling in rows and tuber growth is underway. Garlic is starting to mature. Cover crops might get short shrift at this time of the season, but can provide useful role in unused niches during the summer (see article). However, keep an eye on cover crops to be sure that they don't produce unwanted seed. This applies to overwintered crops such as hairy vetch which is maturing now, as well as short-term summer covers such as buckwheat. Mow-kill or incorporate before seeds become viable to avoid a future weed problem from these crops.

If you did not make it to the vegetable and fruit program at Wards Berry Farm June 26, but would like to know what was discussed, please visit www.umassvegetable.org for the link to Wards Berry Farm meeting on the home page. Many thanks to Wards Berry Farm for hosting this successful event!

PEST ALERTS

Spotted Wing Drosophila: Positive identification of Spotted Wing Drosophila (SWD) is pending in Massachusetts but has been confirmed in CT for over a week and has just been confirmed in RI. It is highly recommended that fruit growers put out traps to pinpoint the onset of an infesting population. This is important so pesticide applications aren't wasted since it may be necessary to make frequent applications and some materials have limits on the amount that may be used in one season. See last weeks VegNotes for more on how traps are made and where they should be placed. There are also links to identification keys to help determine if SWD is among the fruitflies caught in the traps. See chart on the UMass Vegetable Website for materials with high efficacy on SWD grouped according to their IRAC resistance groups.

https://extension.umass.edu/vegetable/alerts/spotted-wing-drosophila-update-%E2%80%93-june-28-2012

It is important to rotate among these groups in order not to generate resistance to currently effective materials. Also, be very aware of the REI and PHI for each material in the crop being treated as it is not always the same for different crops. A 7 day spray program may be needed to keep this pest in check. More on this pest will be posted as we go through this growing season.

Downy Mildew of Cucurbits (DM): The closest new reports of DM were in North Carolina,and the closest occurence this year is in Maryland. Given stable high pressure system over the Northeast the risk of DM reaching new England in the next week is low. Scouting for diseases including DM is recommended, but targeted DM fungicides are not needed at this time. See overview article on disease symptoms.

Scarab Beetles: Japanese Beetles have begun flying this week. Oriental Beetles and Asiatic Garden Beetles are also actively flying now (mostly at night) and, though less damaging, may appear in vegetable fields as well. All species will be feeding, mating and starting to lay eggs.

Potato: CPB first generation beetles are nearly full grown, those that were not controlled will drop to the soil and pupate. Expect new adults by the second week of July.

Growing Degree Days, Late and Early Blight Forecasts for Week Ending June 28

DATE:	6/28/2012		Blitecast for Late Blight		Tomcast for Early Blight	
Location	GDD Base 50F	7-Day Rainfall (in)	LB Severity Values - season*	LB Severity Values - 7 day	Tomcast DSV's - season since 5/14**	Tomcast Severity Values - 7-day
Belchertown	1032	0.29	49	0	43	8
South Deerfield	871	0.41	46	0	24	6
Stow	1038	0.78	57	2	38	9
Bolton	939	2.25	57	0	31	8
Dracut	902	1.23	51	2	23	6
Tyngsboro	946	1.11	50	1	19	2
E. Bridgewater	857	1.58	68	7	24	9
Boston	927	2.48	41	3	36	5
Pittsfield	807	0.67	74	3	30	3
Sharon	883	1.91	59	4	34	7

*Values accumulated since May 1. See NEWA for Blitecast values for later emergence or TP date.

Potato leafhopper is present in beans, potatoes, eggplant and other favorite hosts. Numbers are low where adults were cleaned up earlier, but watch for some additional adults that may have arrived. Where adults were not controlled, nymphs are likely to be building up.

Tarnished Plant Bug adults active in vegetables such as basil, pepper, sweet corn, potato as well as small fruits. They are likely more damaging where fruits and leaves are the market crop, and these new tissues are developing now.

LATE BLIGHT AND EARLY BLIGHT UPDATES

There have been no additional reports of late blight in NY or New England in the past week. Three new reports came in from central and western PA affecting primarily in potatoes but also tomatoes on some farms. Continue to scout potato and tomato crops on a weekly basis especially in low-lying and shady areas. Weather conditions over the past week have NOT been favorable for late blight, resulting in low severity values for the week. Rainfall has been slight. Recommended fungicide schedules: for SV under 3, a 10-14 day fungicide schedule; SV 3, 10 day schedule; SV 4, 7 day. Similarly, disease severity values for early blight were low for the week. Note that If you have already applied fungicide to tomato and potato, s Following the recommended spray schedule of 15 new DSV between sprays would extend spray intervals to pray interval can be extended to 10 days if current conditions continue. Check www.usablight.org for updates during the next week.

COVER CROPS FOR EARLY SUMMER

Summer may seem an odd time to use cover crops, because it is the time when the main crops are growing. However, sometimes summer is the right season to improve fields with a cover crop. If the soil is wearing out, summer is when a soil-building crop can be a lot more beneficial. Also, when you harvest early crops (early short season vegetables, early snap beans or sweet corn, wheat) you may have bare fields before wheat or fall cover crops can be planted. Bare soil is subject to pounding rains, erosion and weeds going to seed. Fill that open niche by planting a soil-improving, short-cycle cover crop.

There are two early summer opportunities to sow cover crops: one is in late May or early June before vegetables such as

pumpkins, broccoli, or late cucumbers; the other is late June or early July after lettuce, peas, early beans, spinach or small grains are sown.

For planting in late June or early July, two good choices are sudangrass, or sorghum-sudangrass, and the other is buckwheat. Both grow rapidly in the summer warmth.

Making the choice: buckwheat or sudangrass. Buckwheat and sudangrass have different properties, so the management goal and field condition will determine which is the right one to use.

What does your soil need? Sudangrass is often chosen for improving soil organic matter. It produces a strong root system and lots of biomass. The deep root system helps reduce subsurface hardness. Sudangrass is also a good choice for reducing root-knot nematode pressure. Sudangrass can produce a huge amount of organic matter, and if incorporated green before frost has biofumigant properties. However, it needs about 40 lbs/acre of nitrogen and the plant crowns take time to decompose.

If weed suppression is the main goal, buckwheat is preferable. Buckwheat is best known for weed suppression and mellowing the soil. It covers the ground earlier than sudangrass, especially in early June, and outcompetes weeds that may establish in sudangrass. A good stand of buckwheat improves soil tilth in the top-soil, and produces more biomass than any other cover crop in the short time it grows. It needs no fertilizer, but doesn't do well if the plow layer is compacted. Sudangrass requires a higher seeding rate for effective weed suppression.

When will the cover crop be planted? The amount of time until the fall crop is to be planted is a significant decision factor. As a cover crop, buckwheat is in the ground for 35-40 days. It can be sown as early as May 20. Sudangrass needs 60-70 days to be effective, and is most worthwhile if planted once June has become thoroughly warm.

What is the current condition of your soil? If the soil is hard or the field is prone to standing water, sudangrass is a good choice, as buckwheat will do poorly. However, if the field is low in nitrogen and phosphorous, buckwheat will do well without additional fertilizer, while sudangrass needs about 40 lb of nitrogen to give satisfactory performance.

What are the needs of the fall crop? If the crop to follow the cover crop needs a fine seedbed, it will be easier to produce after buckwheat. Buckwheat mellows the soil for easy working and decomposes quickly after incorporation. Sudangrass crowns take some time to break down, so the following crop needs to be one that can be sown in a somewhat lumpy field.

What production risks are you willing to take? The main production risks associated with buckwheat are a failed stand and letting it go to seed. The failed stand usually follows a heavy rain around the time of emergence. It will be obvious two weeks after planting. If the seedlings are not doing well then, till them in and plant again. To avoid volunteer buckwheat seed, kill the crop before there are filled green seeds on the plant. This takes about 40 days from a July planting or 50 days from a June planting.

The main production risk associated with sudangrass is that the crop gets too big to mow or to incorporate after frost has killed it. This crop grows very fast, so keep an eye on it. Mow the first time when it reaches 3 feet and the second time while the flail mower can still chop it well. If sudangrass gets too big to control, it will be killed by frost and make a nice winter mulch. However, the biofumigant effect will be lost.

Seed sources. Buckwheat seed is available from some local farm seed retailers. The variety does not matter, and many suppliers don't identify any variety. Regional suppliers include The Birkett Mills in Penn Yan, NY, Ernst Conservation Seed in Meadville, PA, AgriCulver in Trumansburg, NY, and Lakeview Organic Grain in Penn Yan, NY. Buckwheat generally costs between $15 - $20/50 lb bag. A bag is enough to seed an acre.

Sorghum and sorghum-sudangrass are widely available. Varieties suitable for cover crops must be selected carefully. Grain types are inappropriate and some new forage varieties (described as sweet or with brown midrib) are low in dhurrin, which is the biofumigant in sudangrass. Piper sudangrass is readily available and has a similar composition to Trudan 8, the classic sudangrass for biofumigation. Sorghum-sudangrass hybrids are more vigorous and will produce more biomass than sudangrass, but the seed is also more expensive. Appropriate, locally

available varieties include Sordan 79, Green Grazer, and Special Effort. Regional suppliers include Seedway in Hall, NY, Agriculver in Trumansburg, NY, and UAP in Sodus, NY. With a modest seeding rate of 30 lb/ac, sudangrass can cost as little as $10-$20/ac. Weed suppression requires 50 lb/ac.

Management. Mow both buckwheat and sudangrass at 40 days from planting. For buckwheat this is essential to prevent it from going to seed. The residue decomposes rapidly and is easy to manage for the next crop. For sudangrass, which grows rapidly, this is necessary to manage the large amount of plant material. Flail mowing spreads the residue more evenly. Mow sudangrass no shorter than 8" and top and root growth will resume. Mow it again in September and immediately incorporate for biofumigation. Plan to plant a large seeded crop next spring, or use a transplanter that can handle trash well.

Additional Information. For more details on buckwheat, sudangrass, and many other cover crops, including seed sources, seeding rates, tips for getting a good stand, etc. go to http://www.covercrop.net.

In trials at Cornell since 2005 for organic production systems, many cover crops have been grown during different seasonal time windows. How well they grew, how they competed with weeds, and the amount of biomass and nitrogen they produced, are described at:

http://www.hort.cornell.edu/extension/organic/ocs/reports/Cover%20Crops%20Planting%20and%20Termination.pdf

Adapted from article by C. MacNeil, CVP, with info from Thomas Bjorkman and Brian Caldwell, Cornell

Vedge Edge Weekly, June 27, 2012 Volume 8, Issue 14.

WATCH FOR SQUASH VINE BORER

Squash vine borer moths are active. The moth flight period starts around 1000 base 50 degree day accumulation or when chicory starts to flower. Pheromone traps deployed in NH and central NY have captured moths starting late last week. See also GDD table which shows most sites close to 1000 GDD. These pests are day-flying moths with a 1.0 to 1.5 inch wingspan and bright orange markings. In flight, they look like wasps. There is one generation each year. Moths lay eggs within a foot of the soil in the stems of squash plants. Upon hatching, larvae bore into stems, where they are protected from insecticides. Large cream-colored larvae are 1 to 1 ½ inch long and 3/8 inch wide. Thick-stemmed squashes are preferred, and non-vining crops such as summer squash and zucchini may be heavily damaged. Unless you use traps or scout fields for evidence of eggs or larvae, the first sign of squash vine borer infestation can be wilting vines in July and August. By that time, it is too late to do anything.

Many smaller scale farms have problems with squash vine borer year after year. Cultural practices can help, especially disking in abandoned crops to prevent larvae from maturing and overwintering. However, an effective insecticide is also needed. Conventional growers have several options, including several pyrethroid products and Assail, a nicontinoid that has a lower bee toxicity than most. Some selective materials, such as spinosad (Entrust) or spinetoram (Radiant), provide excellent control of hatching SVB larvae. Abby Seaman of Cornell University Cooperative Extension conducted a trial last season and showed that two products allowed for organic production, a Bt aizaiwi product (they used Agree, Xentari is another option) and Entrust both provided reasonably good control. Agree reduced damage to an average of 12% infested plants, and Entrust to 18% compared with 60% damage in the untreated control. Squash vine borer is not on the label for any of these products. For New York growers, there is a 2(ee) recommendation that must be in your possession for a legal ap-

Squash vine borer larva in zucchini stem.

plication. Download the 2(ee) recommendation here: http://www.nysipm.cornell.edu/news/SVB2ee.pdf.

The trick is to time insecticide applications to prevent newly hatched larvae from boring into the stems and feeding, which causes wilting and eventual plant death for non-vining type varieties. Two to four weekly applications during the flight period may be needed. Apply a spray within one week after flight begins.

- Adapted by R Hazzard from Abby Seaman, Vegetable IPM Coordinator, NYS IPM Program, Veg Edge Weekly, Volume 8, Issue 14, June 27, 2012; New England Vegetable Management Guide; Handbook of Vegetable Pests, A Capinera.

SYMPTOMS OF COMMON CUCURBIT DISEASES

Over the next few weeks, all the various cucurbit crops will begin to show symptoms of disease and possibly of abiotic disorders. The following is a summary of symptoms for the most common diseases.

Powdery Mildew

Powdery mildew caused by *Podosphaera xanthii* one of othe most common diseases in cucurbit crops in the Northeast. All cucurbits are susceptible, but the disease is less common on cucumber and melon due to the prevalence of resistant cultivars. Symptoms usually appear first on early summer squash and zucchini plantings. Watch these crops for first occurrence of this disease on your farm.

Symptoms occur on both leaf surfaces, stems, and petioles as white, powdery fungal growth. It begins as circular colonies then expands in irregular white patches. Symptoms develop first on older leaves, shaded lower leaves, lower leaf surfaces, and on older fruit-bearing plants. Yellow spots may form on upper leaf surfaces opposite powder mildew colonies on the underside. Infected leaves shrivel and die; plants may senesce prematurely, and sunscald of fruit may occur. Fungicides for powdery mildew should begin after the first sympoms are found.

Plectosporium

Plectosporium blight is favored by cool, rainy weather. Plectosporium has not been reported to be seed-borne. Tiny spores are formed in lesions on vines, stems, fruit, leaves and leaf petioles. Spores are dispersed by wind over long distances and by rain splash within fields. Lesions are small (<1/4 inch) and white. On vines, petioles and leaf veins, the lesions tend to be diamond to lens-shaped; on fruit and leaves lesions are usually round. The lesions increase in number and coalesce until most of the vines and leaf petioles turn white and the foliage dies. On fruit, P. tabacinum causes white, tan, or silver russeting which can merge to form a continuous dry, scabby surface.

Black Rot

Symptoms vary on different cucurbits. On pumpkin and winter squash, symptoms on the leaves begin as a marginal necrosis followed by larger, wedged shaped necrotic areas, often with a yellow halo. Stem cankers develop in the cortical tissue and a brown, gummy exudate is produced. Small fruiting bodies (pycnidia or perithecia), may appear as black specks in diseased tissue. Stems may be girdled on seedlings and the plant dies, or on older plants stem cankers lead to wilt and decline. Small, water-soaked spots develop on fruit, enlarge, and exude gummy material and contain many black, fruiting bodies.

Scab

Scab, caused by *Cladosporium cucumerinum* can be a significant problem for summer and winter squash, pumpkin, melon, and watermelon. Resistant cultivars of cucumber are widely available. The fungus can infect all above ground portions of the plant, but is most serious when it occurs on fruit. Scab is favored by fog, heavy dew, light rains, and cool temperatures. On leaves, symptoms consist of gray to brown lesions with a yellow halo that may become shot-holed in appearance (Figure

Scab on zucchini. Photo by T. Zitter, Cornell Univ.

1). Numerous lesions may cause leaf twisting and deformation. Fruit lesions at first resemble insect stings and appear as small, sunken, gray areas. Dark green sporulation may occur in the lesions. A sticky substance may ooze from infected tissue and secondary decay organisms may invade.

Downy mildew on winter squash, underside of leaf

Phytophthora Blight

P. capsici can cause both root and crown rot as well as fruit rot in all species of cucurbits. Initial symptoms of crown rot are a sudden, permanent wilt of infected plants. The roots and stems near the soil line become water-soaked, dark brown, and soft. Infected stems collapse rapidly and the root system is completely destroyed. Fruit can become infected at any stage of maturity by soil contact or rain-splash. Initial symptoms on the fruit are small areas of water-soaking that quickly enlarge and become covered with sporangia which give the fruit a yeast-like, gray to white appearance.

Downy Mildew

Downy mildew caused by Pseudoperonospora cubensis can result in major losses to cucumber, melon, squash, pumpkin, watermelon, and other cucurbits, although specific strains may affect only some cucurbits and not others. Symptoms of Downy mildew are confined to the leaves and their appearance varies widely among cucurbit species. Symptoms appear first on older leaves and progress to younger leaves as they expand. On most species, lesions are first visible on the upper leaf surface as small, irregular to angular spots, initially pale green becoming yellow or slightly orange. On the leaf undersigd, spots typically appear water-soaked before a downy growth of gray to purplish sporangia is evident. These develop when conditions (leaf wetness and humidity) favor sporulation. Lesions can coalesce and result in large areas of dead tissue which exposes the fruit to sunscald. Extensive defoliation can occur when conditions are favorable.

Fungicides specific to downy mildew should be applied when risk for the state or region is high based on foreasting of movement from infected areas to the south.

Virus

Leaves are severely distorted, reduced in size, and develop dark green blisters, serrated edges, and other deformations. Plants can be stunted and develop shortened internodes. Fruit can be greatly distorted.

Angular & Bacterial Leaf Spot

Cucurbits are subject to both angular leaf spot (Pseudomonas syringae pv. lachrymans) and bacterial leaf spot (Xanthomonas campestris pv. cucurbitae). Angular leaf spot and bacterial leaf spot are diseases of the foliage and fruit; their symptoms are similar and easily confused with each other and with those of downy mildew. Bacterial leaf spot of cucurbits does not infect other crop families. Angular leaf spot (ALS) is generally only a problem under warm and wet conditions. Symptoms of bacterial leaf spot (BLS) appear similar to those of ALS and the disease occurs sporadically on squash, cucumbers, gourds and pumpkins. Bacterial leaf spot can potentially affect the fruit more seriously than ALS, but is not a common problem in the Northeast.

Angular leaf spot on cucumber leaves. Photo from IPM Images.

Both ALS (P. syringae pv. lachrymans) and BLS (X. campestris pv. cucurbitae) can be seed-borne and can cause cotyledon spot. The bacterium

that causes ALS survives in infected crop residue and in dry leaves for up to three years. It can be seed-borne and spread between plants once it is established in the field. Both bacterium are spread within the field by splashing rain, windblown sand containing infested debris, insects, humans, and equipment. Spread is enhanced when the foliage is wet from rain, dew, or irrigation. Neither foliage disease is normally a serious threat to cucurbit production in the Northeast.

Angular leaf spot symptoms first appear as small, water-soaked lesions which expand until they are limited by secondary veins, often accompanied by a clear to milky exudate. Lesions dry, turn brown, and may fall out giving leaves a tattered appearance. Lesions may also be surrounded by yellow margins. The bacteria can also infect petioles, stems, and fruit and the exudate may be present here. Fruit lesions can penetrate deeply causing an internal rot allowing the invasion of secondary soft rot organisms. Symptoms of bacterial leaf spot appear similar to those of ALS. Fruit lesions vary in size and appearance depending on rind maturity and the presence of moisture. Initial small, slightly sunken, beige lesions with a dark, brown halo can expand, become sunken, and cause the cuticle and epidermis to crack. Fruit rot in the field or in storage may be significant. Both of these diseases can only be confirmed in the laboratory.

SWEET CORN REPORT

Scout any corn where tassels are beginning to poke up out of the whorl. Look for feeding damage, frass, or the small black-headed larvae. If you pull out the tassel and its tightly-wrapped leaves you may see tiny feeding holes. Borer caterpillars are usually in one of the layers of whorl leaves, or inside feeding on the young tassel. When 15% of plants are infested, a spray is recommended. The best time to control ECB is as the green tassel pokes up out of the whorl. Borers are moving out of the tassel at that time, and easily reached by pesticides. Scout again 3-4 days after spraying. At high levels of infestation or where new eggs are still hatching, it often takes two sprays, 5-7 days apart to bring populations under control.

The first European corn borer flight has started to go up since last week, in some locations. Is it possible that the second flight is beginning before the beginning of July? While some spots remained at zero or less than 3 moths, others captured 12-14 moths this week. Scouting has shown that there are still a high number of borers feeding in pretassel and tasseling corn. Fields sprayed should be scouted 4-5 days after application to ensure that another “clean up” is not needed. Remember to only count new feeding damage and live caterpillars when scouting after a spray has been applied to get an accurate picture of current infestation levels.

Corn earworm trap counts remained low this week, with no moths caught at most locations and none higher than 3 moths per week. This migratory pest is expected to make an appearance to the Northeast soon. All fields with silking corn should have corn earworm traps. Place two traps per field with lures suspended directly above the freshest silk found. Move traps to fresh silk as needed. No southern storm fronts are anticipated however large populations can arrive overnight and begin laying eggs that will hatch on fresh silk and tunnel into developing ears. Watch for southern coastal storms which may bring greater numbers up to the Northeast. Fall armyworm trap captures were at zero this week as well.

The first sweet corn of the year hit farm stands this week. This mostly represents the early varieties that were started under plastic. Hand picked ears are full and sweet with nice color. The early corn has brought eager customers into farm stands increasing sales of other vegetable crops as well.

Selective insectides, bees, beneficials and efficacy. Selective products for ECB and CEW provide good control while being somewhat easier on natural enemies present in the field. There are many beneficial insects in corn that feed on aphids, small larvae and pollen. Honeybees move into corn when pollen is released. The following recommended ECB control materials are listed as ‘highly toxic to bees’ in the New England Vegetable Management Guide (Table 20, pg.58) and should be avoided at pollen release to protect bees: Avaunt (indoxacarb), Lannate (methomyl), Warrior (and generic products with lamda-cyhalothrin) and Pounce (permethrin). In general, carbamates and synthetic pyrethroids are highly toxic to bees. Some are also very effective against caterpillars that invade corn during silking and have become the standard insecticide for silking corn in New England.

A survey conducted by the New England Vegetable and Berry Growers in 2009 found that Warrior and Lannate were by far the most widely used insecticides in corn, and selectve products were less widely used. That may be changing. Some of these alternative options are proving themselves to be very effective against corn pests.

Efficacy trials are conducted at Universities every year to evaluate insecticides for earworm and ECB in corn. Last winter I reviewed recent trials and found that for several products showed equal, better or nearly equal efficacy compared to Warrior II which could be considered the current standard for CEW. An overview/summary of the results that I read for corn earworm in sweet corn efficacy trials (high pressure) indicated the follwing trends:

Warrior – Radiant: equivalent efficacy, highly effective

Belt – equivalent to Warrior in some, slightly less in others

Coragen alone - slightly less effective than Warrior

Voliam Xpress (a mixture of Coragen + Warrior AI's, each at lower rates) often better than Warrior, often highest level of control.

The spinosyn group -- including the newer product Radiant (spinetoram) and its older counterpart, Entrust (spinosad) -- has a bee toxicity rating of medium, while Coragen (chloran-traniliprole) and Belt (flubendiamide) have low bee toxicity ratings. Belt is diamide, a newer class of insecticide chemistry. Diamide products work by activating insect ryanodine receptors that play a key role in calcium release during muscle contraction. Upon ingestion of treated plant tissue, the insect rapidly stops feeding, then becomes paralyzed and starves to death. This class is particularly effective against caterpillars, but some products also work against Colorado potato beetle and leafminers. Mammalian toxicity is low, making these products safer for applicators and field workers. Impact on beneficial insects and pollinators is also low. It is also labeled for fall armyworm. European Corn Borer and FAW efficacy is good for both spinosyns and diamides. Intrepid (methoxyfenozide) is an insect growth regulator that causes a premature molt, which is lethal. Like Bt (Dipel, Xentari) it is non toxic to bees and beneficials.

-R. Hazzard

SWEET CORN WEEKLY TRAP CAPTURES

Location	Z1	EII	Total ECB	CEW	FAW
CT Valley					
	0	0	0	15	
South Deerfield	0	0	0	0	
Sunderland	0	0	0	1	0
Hadley	4	7	11	0	0
Feeding Hills	0	0	0	3	0
Central & Eastern MA					
Spencer	0	1	1	0	0
Dracut	0	7	7	0	0
Tyngsborough	3	0	3	0	0
Lancaster	3	11	14	1	0
Concord	7	5	12	1	0
Sharon	2	1	3	1	
Northbridge	1	0	1	0	0
East Falmouth	1	3	4		
NH					
Litchfield	0	6	6		
Hollis	0	0	0		
Mason	0	0	0		

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