UMASS EXTENSION

VEGETABLE IPM MESSAGE

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CROP CONDITIONS

June is ending with a blast of heat and humidity. Crops have been growing well over the past couple of weeks, but soils have been getting steadily drier in the heat and growers have been gearing up for irrigation. The thunderstorms of last night (June 27) brought welcome, if perhaps too heavy, rainfall. Harvest now includes zucchini and summer squash, lettuce, chard, and other greens, bok choi, broccoli, radishes, greenhouse tomatoes. Weed growth is terrific and growers are busy with all of their old and some new cultivating equipment. Final plantings of sweet corn will be going in this week, along with late crops of summer squash, cucumbers, cabbage and other brassicas, beans, and greens. Cucumber beetles are all over the vine crops. Conditions have been favorable for **early blight** in tomato (see article on Tom Cast).

FREE ONLINE HOMESTUDY COURSES OFFERED BY UNIVERSITY OF CONNECTICUT

As a follow up to an article in last week's newsletter titled: "Food Safety During Harvest" we wanted to inform our readers of a new course offered by the IPM staff at University of Connecticut that is available on line for free. In last week's article, we suggested that you should "Take a walk through your packing facility and check for signs of potential food safety hazards: signs of rodent, bird or insect infestation; holes in screens, windows and doors…". UConn's web course titled "Beasts Begone! A Practioner's Guide to IPM in Buildings", covers inspection, identification and controls for animal pest in buildings. It features three parts and an ID and Inspection multiple-choice quiz along with flashcards.

In addition, the site offers a course covering the fundamentals of IPM; IPM for Ants/Termites; Minimizing Pests in the Garden, as well as several others. It should be noted though, that these self-paced courses are non-credit. The site is located at www.hort.uconn.edu/ipm/homecourse/coursinfo.htm.

Stephanie DeGray

TOMATO: TOM-CAST REACHES THRESHOLD FOR FIRST FUNGICIDE

BACKGROUND ON TOM-CAST: The TOM-CAST disease forecasting model is a tool for helping tomato growers decide when to apply fungicides for control of **early blight** (caused by the fungus *Alternaria solani*) and **Septoria leaf spot** (caused by the fungus *Septoria lycopersici*). Managing these common tomato diseases includes cultural practices such as crop rotation, good nitrogen management, making multiple plantings, or using stake-and-weave trellising. However, most growers find that fungicides also play a role in keeping foliage and fruit healthy for as long as possible to get top yields. TOM-CAST can help decide when fungicides are needed -- and when they are not.

A "calendar spray" approach achieves high levels of early blight control by using fungicides on a weekly schedule throughout the season. Such a fixed-schedule spray program maintains a residue of protectant fungicide on the foliage at all times, whether conditions are favorable for disease or not. This may require eight or more fungicide applications per season.

Equal levels of disease control can be achieved with fewer sprays, if those sprays are timed according to the TOM-CAST model. When environmental conditions favor the germination of early blight spores or the growth of lesions and production of new spores, fungicide coverage is recommended at shorter intervals. When conditions do not favor disease, the TOM-CAST model recommends more extended spray intervals.

The TOM-CAST model is based on measuring the parameters that most affect the rate of infection and growth of the disease. These are the length of time that the leaf surface is wet, and the temperature during the leaf wetness period. Leaf wetness from dew and from rainfall are treated the same way. Long periods of leaf wetness and temperatures between 64° F and 85 ° F are most favorable for germination, growth and spore formation. Below 55° F and above 85° F, no disease development occurs. The model combines the length of leaf wetness with temperature to provide a daily Disease Severity Value (DSV) (see Table). Daily DSV's are summed on successive days, to give a cumulative DSV for the season.

THE TOM-CAST MODEL: LEAF WETNESS HOURS AND TEMPERATURE PRODUCE A DAILY DSV VALUE

AVG. TEMP DURING WETNESS PERIOD (°F)	NUMBER OF HOURS OF LEAF WETNESS PER DAY				
<55	0-24				
55 - 63.9	0-6	7-15	16-20	21+	--
64 - 68.9	0-3	4-8	9-15	16-22	23+
69 - 77.9	0-2	3-5	6-12	13-20	21+
78 - 85	0-3	4-8	9-15	16-22	23+
>85	0-24				
DAILY DISEASE SEVERITY VALUE (DSV)	**0**	**1**	**2**	**3**	**4**

In Massachusetts, most nights in May and early June are too cool to generate DSV values. Cumulative DSV values usually remain low into mid June. Our DSV count began on May 24, because from that date on we do sometimes see favorable conditions, and because many growers plant their early tomatoes at about that time. Even if plants are set out in mid-May, they generally are not subject to conditions favorable for early blight until after May 24.

TOM-CAST has been tested and successfully implemented throughout the major tomato growing areas of the U.S. and Canada, including here in Massachusetts. At our South Deerfield Research Farm, five years of trials have demonstrated that when the TOM-CAST system is used, fungicide use is reduced by 10-50% compared with weekly sprays, with no reduction in quality or yield.

In the early stage of vegetative growth and initial fruit set, tomato plants are less susceptible to early blight and **Septoria leaf spot**. Fungicide protection is less critical early in the season than later. There is little benefit from fungicides applied shortly after planting. As plants develop a heavy fruit load and fruits ripen, susceptibility increases. Once early blight or Septoria leaf spot lesions are established, new spores are rapidly produced. These disperse onto healthy leaves, where new infections can begin. The optimal time for initiating fungicides is before the disease gets established, before foliage is so thick it is difficult to penetrate with a spray, and when environmental conditions combined with plant maturity increase the risk of disease development.

We recommend the first fungicide when cumulative DSV's reach 35, or during the first week in July -- whichever comes first. Plants that were set out in late May or early June usually have one or more clusters of green fruit and are beginning to develop dense foliage by the first week of July. During July, conditions grow more favorable for the disease, with higher night temperatures and longer leaf wetness periods. The first symptoms of early blight generally do not appear until mid to late July.

After the first fungicide, subsequent fungicide applications are recommended when cumulative DSV's reach 15 since the last spray. You can use a chart of daily DSV's to figure the best timing for your next spray. Note the date of the previous spray, and calculate how many days pass before 15 more DSV's accumulate.

Ideally, this would be based on weather measurements taken at or close to your farm. A relatively low-cost weather module, which reports out daily DSV's at your field location, is now commercially available for grower use. (For more information, contact Ruth Hazzard at 413-545-3696). The UMass Extension Vegetable Program currently runs one weather station at the South Deerfield Research Farm. This station was initially funded by the Mass. IPM program and is currently funded through a combination of grower contributions and Extension funds. To use this data, you have to use your judgment on how conditions at your farm might compare to conditions at the station. If you are at a high elevation with cooler nights or tend to have winds that dry the foliage quickly, DSV's would accumulate more slowly. Our weather station is in a river valley with early dewfall, frequent fog and a slow drying period in the mornings, and tends to chalk up higher DSV's than many other areas of the state.

Bacterial disease not included! It should be noted that the spray intervals recommended by TOM-CAST are not necessarily sufficient for control of bacterial diseases such as bacterial canker or bacterial leaf spot. If these are present, then applications of a copper-based product at 7-10 days intervals is recommended to suppress the disease development.

DSV VALUES, JUNE 12 - 27, 2002
SOUTH DEERFIELD RESEARCH FARM

Date	DSV's/Day		Date	DSV's/Day
June 12	0		June 20	1
June 13	0		June 21	1
June 14	1		June 22	2
June 15	2		June 23	3
June 16	0		June 24	2
June 17	1		June 25	1
June 18	0		June 26	0
June 19	1		**Cumulative DSV's since May 24**	**35**

DSV's for 2002. High humidity, warm night temperatures, and some lengthy periods of rainfall have combined to make conditions favorable for early blight and Septoria leaf spot. Symptoms of **Septoria leaf spot** have been observed in tomato in the Connecticut Valley. **This year we reached the threshold of 35 DSV's on June 25**. We would recommend that the first fungicide be applied to tomatoes this week. See the *New England Vegetable Management Guide* for recommended products. **This newsletter will publish weekly updates** on DSV accumulations daily for the previous 14 days.

R.. Hazzard & R. Wick

SUMMARY OF THE 2002 FARM BILL

Below are some of the provisions of the new 2002 Farm Bill:

Conservation Security Program: This is a new program that rewards stewardship of working land by farmers and ranchers of all types. It recognizes the practices used and the environmental benefits derived from these practices rather than the crops or livestock being produced. It provides financial incentives for conservation on working lands and needed support for family farms and ranches.

Beginning Farmer and Rancher Provisions: This establishes the Beginning Farmer and Rancher Development Program but funding will be discretionary (annual appropriation). It also reforms the credit title to improve programs for beginning farmers and ranchers, and includes cost-share assistance to help farmers and ranchers participate in conservation programs.

Mandatory Country of Origin Labeling: The program calls for the labeling of meats, fruits, vegetables, peanuts and farm raised fish by its country to allow U.S. consumers to know and choose the origin of their food. Labeling will be voluntary this year and in 2003, but then it will be mandatory.

USDA Equity and Justice Reforms*:* The farm bill authorizes the creation of a USDA Assistant Secretary for Civil Rights and puts in place important reforms for County Committee election procedures. The USDA will also be required to better track and evaluate participation by limited resource and socially disadvantaged farmers in USDA programs.

National Organic Certification Cost Share Program: The program provides assistance to small farmers who choose to

implement environmentally sound practices in compliance with the USDA's National Organic Program. The bill allows a maximum cost share of 75%. The maximum payment made to a producer or handler under this provision is $500. Funding for this program is $5 million over the life of the farm bill. This is in addition to $1 million already made available through the crop insurance bill for the Northeastern states.

Community Food Projects: Community Food Projects will receive $5 million in mandatory funding over year for the next six years of the Farm Bill. The farm bill improves the program by allowing for planning grants for comprehensive, multi-stakeholder solutions including support for a national clearinghouse on "innovative Programs to Address Common Community Problems."

Purchase of Locally Produced Foods: Institutions participating in the National Satchel Lunch and Breakfast programs are encouraged to purchase local foods where practicable, and a seed grant fund was authorized for 200 institutions. This funding will need to be appropriated by a separate appropriations bill.

Farmers' Market Nutrition Program (FMNP): The WIC (Woman, Infant, and Children) FMNP will receive am additional $15 million in the current fiscal year. Along with the $10 million released in January, this funding brings the total to $25 million, allowing current states and tribes to expand their programs. The Senior FMNP is authorized for the next full six years of the bill, with mandatory funding of $15 million per year.

Farmers Market Promotion Program: The FMPP is established to make grants eligible to establish, expand and promote farmers' markets but the funding is discretionary (requires an annual appropriation).

Anne Carter, UMass Veg. Crops Management & Food Systems

2002 VERMONT TWILIGHT MEETINGS: MONDAY JULY 15, 5-7 PM IN ESSEX CENTER

The next VT twilight meeting will be at Paul Mazza's Fruits and Vegetables in Essex Center in central Vermont, near I-89. Paul started as a commercial grower when he was quite young and he has been at it for 15 years. He now farms 150 acres at 3 locations, growing a wide variety of vegetable crops plus 10 acres of strawberries and 7 acres of blueberries. Paul markets about half his crops through his farm stand, and wholesales the rest. He has had success in managing strawberries for early yield, controlling birds in blueberries, and he does a beautiful job maintaining older farm tractors. Recently he has been working to manage a **Phytophthora** problem that affects peppers, tomatoes and cucurbits, something that is becoming more commonplace in the northeast.

Directions: Take Exit 11 (Richmond) off I-89, go north on Route 117 about 6 miles. The farm is on the left.

DISEASE DIAGNOSTIC UPDATE: TOMATO SPOTTED WILT VIRUS

There is an apparent outbreak of **tomato spotted wilt virus** (TSWV) in field tomatoes at a farm in eastern Massachusetts. Testing was carried out with immunostrips from Agdia, Inc. **Impatiens necrotic spot virus** (INSV) was negative, TSWV was positive. The tomato planting had about 40,000 plants, five or six cultivars. Incidence of TSWV varied from 18 to 50% depending on cultivar. The highest incidence of disease occurred in the open pollinated 'Gold Nugget', 'Yellow Pear' and 'Washington Cherry'. The source of virus not clear but greenhouse also contained hanging baskets of diascia, portulacca, baucopa and monopsis. The grower reported that ornamental plants appeared very healthy, and no thrips were evident in the greenhouse. Symptoms occurred in tomato plants about three weeks after planting.

Rob Wick, UMass Disease Diagnostic Lab

CRUCIFERS

Scout for caterpillars (especially **imported cabbageworm** and **diamondback moth**). High soil temperatures mean that cabbage maggot eggs will not survive. However, watch for moisture-related diseases such as **Rhizoctonia** and **Sclerotinia**.

Potato

Early potatoes are flowering and growing well. **Colorado potato beetles** are hatching out and the oldest larvae have reached the fourth (final) stage, in which they do the most feeding damage. Foliar sprays to control CPB should be applied to fields where larvae are above threshold (1.5 large, 3-4 small larvae per plant, or per vine after vining). **Potato leafhopper** is present and should be controlled if numbers are above threshold (1 adult or nymph per 10 leaves). Conditions have been favorable for fungal diseases; the first fungicides for **early blight** and **late blight** should be applied. Two instances of late blight have been reported in mid-Atlantic states, but crops have been destroyed. Watch fields for late blight symptoms and contact the Disease Diagnostic (413-545-1045) lab if you suspect this disease. It was reported at four locations in western Massachusetts in tomato late in the season in 2001.

Cucurbits

Earliest cucumbers are approaching harvest. **Cucumber beetles** are active. As vine crops reach the 5-leaf stage (butternut and pumpkin) or flowering (cucumbers, summer squash) they are less susceptible to direct feeding damage as well as to transmission of the **bacterial wilt**, and the threshold for controls is based on seeing significant leaf or flower damage.

You can still call John Howell for advice! (and other vegetable team members, too)

As you know, John Howell retired from UMass Extension on June 15 as part of the State's early retirement incentive plan. As will a large proportion of the positions lost to the early retirement program, John Howell's vegetable extension position cannot be refilled in the foreseeable future. However, we are arranging make it possible for John to continue to work for the Extension Vegetable Program the equivalent of about a day a week on a consulting basis. He will be available for consultations by phone or email and will be working on some projects and participate in some grower meetings. It is not clear at this time if there will be enough time to make any farm visits. You are welcome to call me at (413) 259-1203 or email jhowell@umext.umass.edu. He will not be on a set schedule, so if you don't reach him, please leave a message and he will get back to you as soon as possible. He does not anticipate any long trips this summer, but will be away for a few days on occasion. He looks forward to hearing from growers.

You can also contact other Vegetable Team members or the Disease Diagnostic Lab with concerns about vegetable production and marketing issues. See www.umassvegetable.org for contact information.

R Hazzard, Vegetable Team Leader

Does spraying for aphids control virus & when should I spray?

Last summer John Howell reported this story: "I was recently talking with a vegetable grower who mentioned that he thought it was about time to start spraying for **aphids**. I asked if they were starting to build up in the field. He didn't know, but said he wanted to use preventive treatments to control aphids so they would not bring a virus disease into his crop. We checked plants randomly throughout the field and found no aphids. The grower decided not to spray at that time. This saved him a few hours of time, the cost of material and equipment operating costs. It only took us about ten minutes to check the field."

This is not an uncommon situation. At this point in the season, aphids are showing up in many crops, and growers are concerned about whether and when to spray. Many growers feel they must have a rigorous spraying program for aphids to protect their crops from virus diseases. All too often this practice is not effective in preventing the occurrence of virus diseases, but it is expensive and time consuming and can lead to further outbreaks of aphids. Below is a brief review some of the basics of how viruses are spread. Virus diseases require a living host, and when the host plant dies, any virus within the host plant cannot survive. (An exception is **tomato/tobacco mosaic**, which can survive in dead host tissue.) For the most part, viruses survive the winter in certain perennial weeds. During the growing

season, viruses can be transmitted from perennials to a susceptible vegetable crop.

Most vegetable virus diseases that are important in New England are spread by insects (see Table 2). Cucumber beetles, **thrips**, **leafhoppers**, and **nematodes** can spread certain viruses, but aphids are the most important vectors (carriers). Viruses can be classified as persistent and nonpersistent (see Table 2). This is related to the manner in which they are spread by insects and is important in choosing an appropriate management strategy. An insect must feed for a minimum of ten minutes to an hour to pick up a **persistent** virus from an infected host. The virus must then undergo a dormant period of at least 12 hours within the insect before it can be transmitted to another plant. Aphids will remain infective (able to vector a virus) for at least a week and maybe throughout their life. A good insect management program including pesticides can be very helpful in dealing with **persistent** virus diseases.

Aphids pick up **nonpersistent** viruses by merely probing (exploring) an infected leaf. This happens rapidly--within seconds or minutes. A dormant period is not required and the aphid can immediately transmit the virus by probing another plant. Aphids remain infective with nonpersistent viruses for a short time (minutes). **Nonpersistent viruses** are very difficult to manage. We have no pesticide that kills viruses and, as we have seen, insecticides may actually make matters worse. Eradication of perennial weeds around fields can reduce the source of the virus. The green peach aphid is not the only aphid that transmits viruses, but it is important because it is a universal vector. *Prunus* species (peaches, cherries etc) are attractive to green peach aphids. Removal of wild prunus such as wild cherry trees from around fields can make the area less attractive to green peach aphids.

Systemic materials are generally the most effective insecticides available for aphid control. Systemic insecticides are taken into the plant and become present in the plant juices. Aphids feed by sucking juices from the plant, and when they do so they also ingest some of the insecticide. However, when probing a leaf an aphid is not feeding and does not ingest plant juices or insecticide. In fact, the presence of an insecticide may actually stimulate probing and cause aphids to move from plant to plant in an effort to fine a suitable feeding site. This can increase the spread of **nonpersistent viruse**s.

Reflective mulch such as aluminum foil on paper has been used successfully to repel aphids and can be effective in reducing virus problems. However this material is expensive and tears easily when laying. Some of the light colored plastic mulches may be worth a try. Row covers such as Remay can keep aphids off a crop, but they are generally used during the cool days of spring whereas aphids are most active during warm weather.

Direct damage from aphids: Besides spreading virus diseases, aphids in high numbers can cause economic damage by their feeding activities. Leaf curling and yellowing, or deposits of honeydew on leaves or fruit or husks can affect crop quality or yield. For this reason it is important to manage aphids even if virus is not a concern. However, beneficial insects such as ladybeetles, spined soldier bugs, insidius flower bugs, spiders, lacewings, and parasitic wasps often keep numbers low enough to prevent direct damage. These insects move around a lot, and build up wherever they find aphids to feed on. Early sprays targeting aphids may actually result in further aphid outbreaks, because the natural enemies that keep them in check are killed.

Scouting across the field gives you an estimate of current numbers. If aphids are present, check back in a few days to see if the numbers are increasing or decreasing. Note which natural enemies are present. It is not unusual for numbers to decrease as natural enemies build up. Check the <u>undersides</u> of leaves, including lower and mid level leaves. The following thresholds can be used to determine if insecticides are needed (sampling routine in parenthesis): **Pumpkin and winter squash:** 20% of leaves have more than 10 aphids (based on 50 leaves). **Pepper:** 10 per leaf (based on 4 leaves per plant, 25 plants). **Tomato:** 6 per leaf (based on 2 leaves per plant, 25 plants). **Potato:** 4 to 10 per leaf (based on 25-50 compound leaves; higher threshold near harvest). **Sweet corn:** 50% of plants with >50 aphids at emerging tassel (based on 100 plants). When spraying for aphids, whenever possible select a systemic insecticide or one that will conserve natural enemies.

John Howell, Rob Wick, Ruth Hazzard

TABLE 2: EXAMPLES OF VIRUS DISEASES THAT OCCUR IN MASSACHUSETTS

HOST/VIRUS	VECTOR, OR OTHERWISE	PERSISTENT (P) OR NONPERSISTENT (N)
Beans		
Bean Common Mosaic Virus (BCMV)	Aphids, seed-borne	N
Bean Yellow Mosaic Virus (BYMV)	Aphids	P
Tobacco Ring Spot	Nematodes	P
Tomato Ring Spot Virus	Nematodes	P
Cucurbits		
Cucumber Mosaic Virus (CMV)	Aphids, cucumber beetle	N
Watermelon Mosaic Virus (WMV)	Aphids	N
Papaya Ringspot Virus (PRSV-W)	Aphids	N
Zucchini Yellow Mosaic Virus (ZYMV)	Aphids	N
Tobacco Ring Spot	Nematodes	P
Tomato Ring Spot Virus	Nematodes	P
Turnip Mosaic Virus	Aphids	N
Peppers		
Cucumber Mosaic Virus (CMV)	Aphids	N
Tobacco & Tomato Mosaic Virus (TMV, TomMV)	Mechanical	N
Tomato Spotted Wilt Virus (TSWV)	Thrips	P
Tobacco Ring Spot	Nematodes	P
Tomato Ring Spot Virus	Nematodes	P
Potato		
Potato Leafroll Virus (PLRV)	Aphids	P
Potato Virus S (PVS)	Aphids	N
Potato Virus A (PVA)	Aphids	N
Potato Virus X (PVX)	Aphids, mechanical	N
Tobacco Ring Spot Virus	Nematodes	P
Tomato Ring Spot Virus	Nematodes	P
Tomato Ring Spot Virus	Nematodes	P
Corn		
Maize Dwarf Mosaic Virus (MDMV)	Aphids	semi-persistent
Tobacco Ring Spot	Nematodes	P
Tomato		
Cucumber Mosaic Virus (CMV)	Aphids	N
Tobacco & Tomato Mosaic Virus (TMV, TomMV)	Mechanical	N
Tomato Spotted Wilt Virus (TSWV)	Thrips	P
Tobacco Ring Spot	Nematodes	P
Tomato Ring Spot Virus	Nematodes	P
Brassica (cabbage family)		
Tobacco Ring Spot	Nematodes	P
Turnip Mosaic Virus	Aphids	N
Ornamentals		
Tomato spotted wilt virus (TSWV)	Thrips, cuttings	P
Tobacco mosaic virus (TMV)	Mechanical	N
Cucumber mosaic virus (CMV)	Aphids	N
Tomato Ring Spot Virus	Nematodes	P
Fruits		
Tomato ringspot virus (TMRSV)	Nematodes, grafting	
Tomato Ring Spot Virus	Nematodes	P

Table Prepared by: Dr. Robert Wick, Plant Pathologist, University of Massachusetts, Amherst.

SWEET CORN

Eurpoean corn borer larvae are hatching and some pretassel fields are exceeding the threshold for sprays. And some are still below threshold! Scout fields at pre-tassel to determine if ECB infestations are over 15%. Some fall armyworm damage has been seen in whorl corn; use the 15% threshold for ECB + FAW combined. Fields that reach fresh silk this week and have never been sprayed, where ECB captures are still above 5 moths/week, should receive a single spray to prevent ECB entry directly into ears. Use a material that is easy on natural enemies (Spintor, Avaunt, Dipel ES or DF) to prevent aphid outbreaks. Ray Pestle reported from New Hampshire on a field of transplanted corn that was grown under row cover. The row cover was removed two weeks ago and the field is currently clean with no ECB infestation found as the corn tassels out. Bare ground corn in the same region is at late whorl or pretassel. The transplanting technique seems to be producing some excellent early corn stands, and the row cover left on during ECB flight gives protection from egg laying. *Trichogramma ostriniae* wasps are being used at various locations in New England for European corn borer control, so we will begin to get results back from the field. From a field in Vermont, Ray Pestle reports low infestations (2%) in a field where releases were made. Dale Riggs, another private consultant, is making releases at several farms. One farmer in Hadley where releases were made in every planting reports that he has only sprayed once thus farm, on his earliest silking corn – fewer sprays than in most years. Trials comparing release and non-release plots are being conducted by UMass Extension at four farms in Massachusetts, in cooperation with private consultant Jim Mussoni, in a multi-state project with NYS, Maine, and Pennsylvania. Unfortunately for growers in the Southeast Mass, private consultant Mike Yates is no longer available. Thanks to David Rose of Farm Services Agency, Steve Clegg of Four Town Farm, and grant funds which enable UMass to establish traps in Rehobeth and Sharon, we will be reported trap captures from 4 sites in the SE. * Field border was mowed, possibly reducing capture numbers.

SWEET CORN WEEKLY PHEROMONE TRAP CAPTURES

TOWN	DATE	ECB Z1	ECB Z2	TOTAL ECB
		IOWA	NEW YORK	
Sheffield, MA	June 26	2	0	2
Hatfield, MA	June 25	2	3	5
Walpole, NH	June 26	1	3	4 *
Plainfield, NH	June 26	18	12	30
Westminster, VT	June 26	7	4	11
South Deerfield	June 27	3	12	15
Sunderland	June 27	5	0	5
Hadley #1	June 27	5	3	8
Hadley #2	June 26	31	19	50
Feeding Hills	June 26	1	10	11
North Andover	June 27	10	17	27
Dracut	June 27	6	3	9
Lancaster	June 25	10	17	27
Still River	June 26	0	16	16
Concord	June 24	3	31	34
Northbridge	June 25	10	7	17
Belchertown	June 27	4	7	11
Rehobeth	June 26	16	2	18
Dighton	June 26	7	30	37
Sharon	June 26	5	1	6

-R.Hazzard, P. Willard, M Rulevitch, D. Dumaresq, D. Rose, P. Westgate, J Mussoni, D. Riggs, R. Pestle.

Vegetable IPM Newsletter, Ruth Hazzard, Editor and Stephanie DeGray, Assistant Editor. The Vegetable IPM Newsletter is published weekly from May to September 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 is R. Hazzard if none is cited.

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