UMASS EXTENSION

Vegetable Notes

For Vegetable Farmers in Massachusetts

Volume 23, Number 5 May 25, 2012

In this issue

Crop conditions

We've had a fair balance of rainfall and sun over the past week, good for growth of both crops and weeds. Growers are busy keeping up with field preparation and planting as well as cultivations, herbicide applications and side dressing fertilizers. Growing degree days are ahead of average and as a result, pest activity is early. Crops may not be as advanced as the pests so watch out for high numbers that may build up rapidly at earlier crop stages than usual.

Transplanting has been a major focus of the past two weeks and will continue at a steady pace until planting of warm-season is completed. Greenhouses that have been bursting with transplants are emptying out as peppers, eggplants, tomatoes, squashes, greens and Brassicas go out into the field. Don't forget to scout your transplants in the greenhouse; pest problems that cause losses in the field may start in the greenhouse. This includes spinach leaf miner and the spring maggot flies (cabbage, seedcorn, onion) which find their host plants in the greenhouse, lay eggs on the seedlings, and the eggs (and maggots) travel out to the field unbeknownst to the grower. In this case, protection with a row cover protects the pest as well, and serious damage can result. On the other hand, green peach aphids that are starting to build up in spring vegetable transplants in the greenhouse are usually knocked back by natural enemies once they get out into the field environment. Shore flies that build up in transplant greenhouses will not likely cause serious harm to the transplants, but should be managed by reducing their food source which is algae. Avoid over-watering, over-fertilizing, and eliminate areas of standing water. In addition, greenhouse walls, benches, gutters, and floors should be cleaned of algal growth as often as possible. A steam cleaner or chemical sanitizer can be used.

The New England Greenhouse Update, published by the UMass Floriculture Program, has excellent alerts and background information on pest and fertility issues in greenhouses. The May alert as well as archives (including an article on shore flies) can be found at http://www.negreenhouseupdate.info/index.php/updates.

Pest forecasts

Late Blight

Potatoes are emerging. Next week we will start publishing late and early blight forecasts. There are no reports of late-blight infected field tomato or potato in New England to date this season, although there has been a confirmed case on potato in New Jersey. We will provide alerts and forecasts based on regional reports and in-state weather monitoring.

European corn borer

We have broad indication that European Corn Borer (ECB) flight has begun across Massachusetts, with reports of trap captures from Connecticut Valley to Southern NH. Current degree day forecasts (see table, GDD base 50 F) indicate that the threshold for ECB emergence (375 GDD) has been reached at all locations in MA except Berkshires (Pittsfield)

DATE: 5/23/2012	GDD
Location	Base 50F
Belchertown	419.7
S. Deerfield	393.1
Stow	435.5
Bolton	398
Dracut	362
Tygnsboro	368
East Bridgewater	339
Boston	397.9
Pitsfield	296.9

ECB first generation development	
GDD (base 50F)	
emergence	375
first eggs	450
egg hatch	550

and close to the SE coast (East Bridgewater). Egg laying can be expected to begin within the next week at most locations. Sweet corn is in whorl stage so eggs laid now will result in feeding in whorl and tassel corn. *Trichogramma ostriniae* releases should begin early next week.

GETTING TUNNEL TEMPERATURE RIGHT FOR TOMATOES

Managing temperature in unheated and manually vented tunnels is one of the key challenges of growing tomatoes in tunnels. This article reviews tomato responses to temperature as summarized by J.M. Kinet and M.M. Peet in The Physiology of Vegetable Crops (H.C. Wien ed., 1997), and discusses implications for production in tunnels.

For tomato stems and leaves, the main effect of temperature is on rate of growth: the warmer it is, the faster the plant grows, up to an optimum of about 75°, as long as other conditions are satisfactory. Ideally tunnel temperatures would remain around 70-75° for best tomato growth. Below 50°, tomatoes will grow very little. And of course below 32°, depending on conditions, leaves or plants may be killed by freezing. At this time of year temperatures in a tunnel might be too hot or too cold (less likely in late May and June).

The temperature before tomato plants bloom can influence the number and timing of fruit as well as fruit quality. It is important to reduce exposure to temperatures over 90° by timely venting of tunnels and hoophouses. Flowers and flower parts on many varieties do not develop properly at high temperatures, resulting in aborted buds or flowers or poor pollination and fruit set. Cloudy weather exacerbates the detrimental effects of high temperatures. These high temperatures are most damaging to flowers soon after the buds are visible. After flowers have opened, the high temperatures are also detrimental to pollination and fruit set.

At the other end of the mercury, cool temperatures about 4 to 5 weeks before flowers open, when flower development has begun but is too small to see, can lead to additional branching on a cluster, more locules inside the tomato fruit, and a higher percentage of catfaced fruit. While additional branches on a cluster may mean more tomatoes, it could also lead to a smaller average tomato size for that cluster. Closer to flowering, after buds are visible, temperatures below 50° can prevent proper pollen development. The result is poor pollination and fruit set.

Growers who manage temperatures in high tunnels to meet the needs of tomatoes will reap rewards of good yield, reduced crop stress, and better fruit quality. It is worth the effort.

- adapted from Liz Maynard, editor, Vegetable Crops Hotline, No. 549, April 6, 2012

PREPLANT CHECKLIST FOR CUCURBIT AND PEPPER FIELD

How can I prevent Phytophthora blight this year?

Phytophthora blight is the most destructive disease of cucurbits and peppers in the Northeast, and is getting worse each year. Growers' selection of fields for cucurbit and pepper crops is increasingly determined by which fields have a history of or a potential for this disease. Sub-soiling has become a standard practice for field preparation. Growers are looking for more rotation crops which are not susceptible. Some vegetable growers' interest in growing grain corn or small grains seems to be driven mainly by the need for rotation crops.

No single method will guarantee control of this disease, but cultural practices are essential to reduce the risk of crop loss caused by Phytophthora blight. Pre-plant is the time to focus on prevention. There is a lot that you can do while preparing the field and planting the crop.

How it moves around. The pathogen, *Phytophthora capsici*, is soil-borne and will remain in the soil for years, in the form of long-lasting oospores. The pathogen is most likely moved around by human activity: in soil on farm equipment, in irrigation water, or in infected crops that are discarded in the field. It is best suited to moving in water and with soil rather than through the air. P. capsici does not appear spontaneously, but the source of contamination on particular fields is difficult to determine.

The pathogen can become established on isolated fields or farms. Once a site becomes contaminated it will remain so, but nearby fields remain free of the pathogen as long as farm machinery, run-off, or irrigation from a contaminated water source doesn't introduce the pathogen.

The pathogen is dependent on water to initiate disease and to move it from plant to plant. Phytophthora produces zoospores that can swim to susceptible hosts (very short distances). Splashing rain and irrigation water can easily move zoospores from plant to plant. The disease will always begin in low spots or areas that do not drain readily. Improving drainage in fields will prevent the disease from getting started.

If you must grow crops in a field with a past history of Phytophthora blight, there are some management practices that will help reduce disease. Some growers have found that it is possible to grow susceptible crops in fields infected with Phytophthora without a disease outbreak.

Whether you are in an infected or uninfected field, the critical goal is to manage water so that there is never standing water for longer than 24 hours anywhere in the field. Extended periods of rain are very likely to result in significant disease development if the pathogen is present no matter what you do, but the practices outlined in the following check list may help your crops survive under moderate conditions.

Growing in infected fields and preventing infection in new fields: a checklist.

Keep track of sites that are contaminated with *P. capsici*. Do not rent land for susceptible crops without investigating the history of disease problems (including other soil-borne pathogens as well).

Power-wash all tillage equipment between fields – this is inconvenient and time-consuming, but worth the effort as it may be the only way to prevent contamination of new fields.

Rotate to non-host crops. Wherever possible, avoid planting susceptible crops in contaminated soil. Practice long rotations and do not grow cucurbits, peppers, eggplant or tomato for at least five years after infections occur.

Improve drainage before planting. Use subsoiling or deep vertical tillage to break up hard pans and to improve drainage. Avoid heavy tillage operations after subsoiling to avoid re-compacting the soil. For raised beds, some growers partially draw up a raised bed, then subsoil or deep zone till in the bed, then pull the bed and lay plastic. Between-row ripping can be repeated during the season after heavy rains to speed drainage of water.

Use resistant varieties. Pumpkins with hard, gourd-like rinds or shells have been shown to be less susceptible to Phytophthora fruit rot when mature than pumpkins with conventional, softer rinds. Resistant varieties include Apprentice, Lil' Ironsides, Iron Man, Rockafellow, and Cannon Ball. Among bell peppers, the cultivars Conquest, Paladin, and Emerald Isle have some level of resistance to *Phytophthora* (however, none of these have resistance to Bacterial leaf spot), especially the crown rot phase.

Don't plant low areas to susceptible crops — plant a cover crop, corn or another non-susceptible crop, or leave it bare. (Better a small loss in yield than a total loss of the crop.)

Build dome-shaped raised beds of at least 9 inches height for non-vining cucurbits such as summer squash and for peppers. Use a transplanter that does not leave a depression around the base of the plant.

Make breaks in raised beds—where beds run across the slope, cut breaks to allow water to drain. Don't led beds become dams that hold water.

Clear away soil at the ends of rows. Where raised beds reach the field edge, open up the end of the row to create drainage ditches.

Make sure the flow of water from within the field leaves the field – dig ditches if necessary!

Set up your irrigation system carefully to avoid leaks --– whether drip or overhead. Fix problems that arise. Don't allow puddles of water to build up near pumps or lines.

Avoid soil compaction by reducing passes through the field with farm machinery throughout the season, and never work in fields when the soil is wet.

Separate different susceptible crops (if possible) such that there is no opportunity for water to move from one planting to another.

Avoid irrigation with contaminated water. If contaminated fields drain into an irrigation pond, then irrigation can easily disperse it throughout the crop or onto another field. Rivers and streams can also be sources of inoculum, though not usually until mid to late summer when there are contaminated fields upstream and river water is warm.

Preplant, transplant or furrow drench – early season chemical control in pepper and cucurbits. Chemical applications alone will not control P. capsici but may reduce disease severity when used as part of an overall management program. Phosphoric acid fungicides (ProPhyt, Phostrol and Fosphite) (Group 33) are labeled for control of *P. capsici* on cucurbits, and often used by growers in an attempt to control this disease. These materials have been tested in many states, and while a few trials have shown some efficacy against *P. capsici,* in many trials these materials failed to offer any significant level of control. Of these materials, only ProPhyte is labeled for use as a drench treatment. Research is being conducted on applying ProPhyte through drip irrigation during the season. This is an option that may provide early-season protection for crops grown in infected fields, though the effectiveness of any of these materials remains uncertain.

The prospects for effective control of the crown rot phase of Phytophthora blight are better in pepper than in cucurbits. Apply 1.0 pt Ridomil Gold 4E/A or 1.0 qt. Ultra Flourish 2E/A (mefenoxam, Group 4). Apply broadcast prior to planting or in a 12-16 inch band over the row before or after transplanting. Make two additional post planting directed applications with 1 pint/A Ridomil Gold 4E or 1 qt./A Ultra Flourish 2E to 6 to 10 inches of soil on either side of the plants at 30-day intervals. For banded applications, divide the band width in inches by the row spacing in inches and multiply that times the rate per acre to get the amount needed for the banded application. When using polyethylene mulch, apply Ridomil Gold 4E at the above rates and timing by injection through the trickle irrigation system. Dilute Ridomil Gold 4E prior to injecting to prevent damage to the injector pump.

-- Rob Wick, Bess Dicklow, Andrew Cavanagh and Ruth Hazzard, Dept. of Plant Soil and Insect Science, UMass;

UPDATES ON USEFUL TOOLS THAT YOU WILL FIND IN THE NEW ENGLAND VEGETABLE MANAGEMENT GUIDE

Each time the Vegetable Guide is published, we add something new that growers will find useful – usually based on requests from farmers. As pests begin to stake their territory in our fields, it seems like a good time to highlight some tools that are in the 2012-2013 NEVM Guide that could help growers answer pest management questions.

Pest Management Section. Growers often turn directly to specific crops for IPM, but don't overlook pages 28-68 in the front section on Pest Management. You'll find information on how to reach Diagnostic labs, pesticide safety and the worker protection standard, calibration for field sprayers, backpacks, and granular applications; a section on 'biorational' (lower risk, biologically-based, and organic OMRI-approved) pest management products with tables of insect and disease management products, and sections for weed, disease and insect management including cultural and IPM practices. In each of these sections, also look for key tables that can help you find your way through the maze of trade names, common names, chemistries, safety issues, registrations and other issues that face you when selecting pesticides to use. Note that for all pesticides, we identify those that are approved for organic production as 'OMRI-Listed', see page 37 of the guide for details.

Herbicide tables include Table 17: Common and trade names, Table 18: Vegetable herbicide registrations, and Table 19: Relative effectiveness of herbicides on weed species.

Insecticide tables include Table 20: Information on insecticides and miticide, as well as an Alphabetical listing by trade name. If you have the trade name and want to know more about how it works, start with the Alphabetical List. Go to Table 20 for the common name listing and the EPA Signal Word, Resistance Group, Dermal and Oral LD50, and Toxicity to Bees.

Fungicide information includes Table 21: Information about fungicides and bactericides as well as Alphabetical listing by trade name.

Recognizing the growing number of products with two or more active ingredients, we now list all Mixtures (M) under

both AI's in Table 20, as well as in the Alphabetic Listing. Generics for products that have reached the end of the patent period (such as imidacloprid, lambda-cyhalothrin, bifenthrin, chlorpyrifos) are also listed under both common and product names.

Resistance Management Groups are given for all pesticides both in tables and under each pest/crop listing. This helps you determine which products have the same mode of action and would not be good for successive treatments to the same crop. For Insecticides, the following are key resistance groups (groups of similar chemistry and mode of action that will have risk of cross-resistance). There are numerous other groups based on various modes of action -- including some of the newer, safer chemistries. For more details on insecticide resistance groups visit the Insect Resistance Action Group, IRAC: http://www.irac-online.org/eClassification/.

Group 1A- Carbamates

Group 1B- Organophosphates

Group 3- Pyrethroids, Pyrethrins

Group 4- Neonicotinoids

Group 5- Spinosyns (Entrust, Radiant)

Group 9 – Homopteran feeding blockers (Fulfill, Beleaf)

Group 23-Tetronic acid derivatives (Movento, Oberon)

Group 28-Diamides (Coragen, Synapse, Belt)

Vegetable Transplant Production. The 'bedding plant' section has been updated and covers both cultural and pest management aspects of transplant production. You'll find fertility, pest ID and management, biocontrol, sanitation, scouting – a wide range of topics are covered and there are excellent tables on products to use for pest management.

Crops and Pests. For each crop, the important weed groups, diseases, and insects are listed. A concise summary of life cycle and biology, scouting, thresholds, and cultural controls are provided for each pest. The list that follows this includes products (by common name) that are labeled for that crop and pest. Often there is more than one formulation or product for each type of active ingredient. In that case, one product is listed as an example. Table 20 (p 54) will give you other products with the same AI. Some details on how to use the product are included.

Northeast Vegetable and Strawberry Pest ID Guide - for every weed, disease and insect listed (and some that are not, such as strawberry pests!), there is a full color photo in the Pest ID Guide section at the back of the Guide. This is a great reference for quick ID of problems you find in the field.

If you don't have one yet -- the 2012-2013 New England Vegetable Management Guide is available from the UMass Extension Bookstore, http://www.umassextensionbookstore.com/store.php?crn=238 as well as from Extension offices in each New England state. The full content is also found online at www.umassvegetable.org.

LOOKING FOR GROWERS INTERESTED IN DEEP ZONE TILLAGE

Use of deep zone tillage for primary field preparation enhances soil health, protects surface water quality and provides numerous management benefits to vegetable growers. Five years of trials both on farms and at research stations in New York, Connecticut and other states in the Northeast have found that deep zone tillage supports similar yields to conventional tillage for sweet corn, dry beans, cabbage, squash and pumpkins. Cornell has tested reduced tillage for organic pepper and cabbage production with positive results. Growers who have tested deep zone tillage have found savings in labor (between 25 and 60%) and fuel costs (between 25 and 70%) compared to their conventional tillage systems (moldboard plow plus other passes). While cost savings are significant, growers report the most important benefit of reduced tillage is the greater flexibility afforded early in the season. By speeding up primary tillage and field preparation, growers can be timelier with planting, be more efficient with labor, have lower equipment maintenance needs, and improve early-season cash flow. In some cases, growers have been able to expand total farmed acres because of the efficiencies and benefits afforded by reduced tillage systems.

With support from SARE and the UMass Center for Agriculture, we have been experimenting with deep zone tillage

(DZT) in vegetable crops here in Massachusetts. In addition to the research farm trials, we are partnering with growers who are interested in experimenting with this system in their own fields. If you have a field where Phytophthora blight has been a problem, where the drainage has been poor or compaction is an issue, or if you're just curious to see if this system can benefit your farm, we'd be happy to help you experiment with this system. We have deep zone tillage equipment that we'd be willing to trailer to your farm if necessary. If you are curious about how DZT would work on your farm and would like to try the equipment, or would just like to learn more about DZT, please contact Andy Cavanagh at 413-658-4925 or email at acavanagh@psis.umass.edu.

Spinach leaf miner on chard, beets or spinach

It's disappointing to discover that your high-value early spinach and chard leaves are showing ugly feeding mines just as they are ready for harvest. Spinach leaf miner, one of the first early-season pests in vegetable crops, has been active since early May and is still laying eggs. It attacks crops and weeds in the plant family Chenopodiaceae which includes the crops chard, beets, and spinach as well as weeds like lamb's quarters and pigweed. A leafminer is a fly larva that burrows between the layers of a leaf eating everything but the epidermis. Early damage is a slender, winding 'mine' or tunnel, but later these expand and become blotches on the leaves. Inside the mine is a pale, white maggot – no legs.

The fly overwinters as a pupa in the soil and hatches in late April and early May. The adult fly then lays eggs on the leaves and the resulting larvae begin their damage. The oblong white eggs, less than 1 mm long, are laid in neat clusters on the underside of the leaves. They are easy to spot if you scout by looking under the leaves because, though tiny, they are bright white and are lined up in rows. Don't limit your scouting to plants in the field! Scout transplants of chard, beet and spinach in the greenhouse. If eggs are present, apply insecticides before setting out, and especially before sealing up the plants under a row cover.

The maggots may migrate from leaf to leaf on a single plant or down a row. They become fully grown in just a few weeks and drop into the soil to pupate. The entire life cycle is 30-40 days. There are three to four generations per season. Typically mid-late May, late June and mid August are peak activity periods (but these peaks will likely be earlier this year).

In most seasons the damage is minimal and the plants will outgrow it leaving only early leaves with cosmetic damage. In other years, or other fields in the same year, the damage may be great and if the plants are hit early and growth is slow because of weather conditions, the loss may be great. Treat when eggs or first tiny mines are noticed.

Insecticides labeled for this use include Agri-Mek, Coragen, Radiant. Neem products and Entrust may be used in organic production. See the New England Vegetable Management Guide for more details. (http://www.nevegetable.org/index.php/crops).

Because the spinach leaf miner feeds on one crop family and also on many weeds including chickweed, lamb's quarters and nightshade, weed control and crop rotation are the first line of defense. Row covers can also be used to exclude flies if placed over the crop before flies are active or immediately after planting – except watch for eggs laid in the greenhouse. "Spinach" and "beet" leaf miners are very similar species in behavior, appearance, and damage, and can't be distinguished in the field.

- R Hazzard, adapted by from Eric Sidemann, Maine Organic Farmers and Gardeners Association, Pest Alert.

Managing major beetle pests

Colorado potato beetle, striped cucumber beetle, and flea beetles are active. These insects can be challenging to manage and often cause severe damage when left unchecked. See May 10 issue for details on flea beetles in Brassica crops.

Colorado Potato Beetle

Scouting and thresholds. Walk your fields and look for CPB adults and eggs. Eggs hatch in 7-10 days depending on temperature. A treatment should be considered for adults when you find 25 beetles per 50 plants or defoliation has reached the 10% level. The spray threshold for small larvae is 4 per plant; for large larvae, 1.5 per plant (or per stalk in midseason), based on a count of 50 plants or stalks.

Controls are needed on eggplants when there are 2 small or 1 large larvae per plant (if plants are less than six inches) and 4 small larvae or 2 large per plant (if plants are more than six inches).

Control. Cultural controls include crop rotation, early planting, late planting, straw mulch, and conserving beneficial insects. Populations will be lower in fields where good cultural controls are in place.

Resistance management must be part of every potato grower's plan. Colorado potato beetle has a remarkable capacity to develop resistance to insecticides. Wherever possible, growers should rotate classes of insecticides and avoid using the same chemistry more than once per year or even better, once every other year. Do not use the same chemical class on successive generations in the same year.

There are numerous options for conventional growers. Current recommendations can be found in the New England Vegetable Management Guide (see article on the Guide for more details).

Organic options for CPB are limited. In a recent study on the efficacy of three common OMRI listed materials (PyGanic, Entrust, and Surround) only Entrust showed efficacy against CPB. Finding a rotational partner that is effective will be challenging for organic growers, and overuse of Entrust will inevitably result in resistant populations.

Striped Cucumber Beetles

In addition to direct damage, these beetles are a vector for the bacterium responsible for Bacterial Wilt. Cucurbit plants at the cotyledon and first 1-2 leaf stage are more susceptible to infection with bacterial wilt than older plants, and disease transmission is lower after about the 4-leaf stage.

Scouting and thresholds. Beetle numbers should be kept low, especially before the 5-leaf stage. Scout frequently (at least twice per week for two weeks after crop emergence) and treat after beetles colonize the field (unless a systemic insecticide treatment is in place). The threshold depends on the crop. To prevent bacterial wilt in highly susceptible crops (including cucumber), we recommend that beetles should not be allowed to exceed one beetle for every 2 plants. Less wilt-susceptible crops (butternut, most pumpkins) will tolerate 1 or two beetles per plant without yield losses. Spray within 24 hours after the threshold is reached.

Controls. Crop rotation is the primary cultural tool for reducing early exposure to beetles. Perimeter trap crops can be used to reduce pesticide use by up to 90%.

Proper timing of foliar insecticide applications is key. There are a number of broad spectrum insecticides which can be used for foliar control (including Capture 2EC, Decis 1.5EC, Asana, and Sevin). See the New England Vegetable Management Guide for current recommendations.

Please note that bees are very susceptible to imidacloprid and thiamethoxam and could be affected by its presence in pollen if it is still at high levels in the plants at the time of flowering. In addition, over-use of the systemic materials without a rotation to a different mode of action will result in the development of resistant populations.

Organic growers have several options for control. We recently tested the efficacy of three of the most common OMRI listed materials – Entrust, Pyganic, and Surround. Our findings indicate that regular applications of Surround are the most effective method for controlling SCB populations and reducing SCB herbivory in the test system. There is some indication that combining Entrust or PyGanic with Surround may increase its efficacy, but these materials alone are not likely to provide sufficient control.

Flea Beetle

Flea beetles (potato and/or eggplant flea beetle) have been active on solanaceous crops such as eggplant, tomato and potato. Numerous tiny feeding "shot holes" can injure leaves and stunt or kill plants, especially seedlings.

Scouting & Management. Damage thresholds depend on plant size and presence of other stresses. Treat newly set eggplant transplants if they have 2 flea beetles per plant, seedlings 6" tall if they have greater than 4 beetles per plant, and plants over 6" tall if they have 8 beetles per plant. Full size plants rarely require treatment for flea beetles.

Controls. Management practices include clean cultivation, crop rotation, removing or avoiding spring weed hosts, use

of row covers, and applying spot treatments targeting plants along the field edges. Spun-bonded row covers, well sealed, effectively protect eggplant and tomato seedlings. Covers should be placed over hoops or other supports to prevent crop injury. Covers can be left on till eggplants are well established. Ensure adequate soil moisture so that plants can tolerate higher temperatures on sunny days.

There are several pyrethroids, carbamates and neonicotinoids which can give effective control of flea beetles. However, repeated use over multiple generations on the same farm is likely to select for resistance. Growers who have used one chemistry extensively have reported reduced efficacy over time. Another type of chemistry that is available for flea beetles is spinosad, Entrust, which is labeled for flea beetle on eggplant, tomato and Brassicas. For organic growers, pyrethrin, spinosad and kaolin are options that are OMRI listed. Kaolin (Surround WP) protects seedlings by acting as a feeding deterrent. We have observed effective control in eggplant from applications of a mixture of kaolin and spinosad.

UPCOMING MEETINGS

High-Tunnel Season Extension Training

Mon, June 11, 2012, 3pm – 7pm

Flatts Mentor Farm, Seven Bridge Road, Lancaster, MA 01523

Start early and extend your growing season!

3:00 PM – 4:00 PM High Tunnel Construction with Ledgewood Farm

4:00 PM – 5:00 PM Growing in High Tunnels: FMF farmers share their experiences

5:00 PM – 6:00 PM Thinking Ahead to Fall and Winter: Crop Planning and Health for extended-season crops presented by guest speakers Ruth Hazzard, Danya Teitelbaum, and Amanda Brown

6:00 PM – 7:00 PM Farm Tour

Refreshments will be provided! For more information, please contact: Peter Jakubowicz, Farm Manager, Phone: 978-479-0661. Visit us at www.flatsmentorfarm.org

Vegetable Program Twilight Meeting

Ward's Berry Farm, 614 South Main Street, Sharon, MA 02067

Topics will include Deep Zone Tillage and No-Till strategies & equipment, Using biocontrols for European Corn Borer, fungicide scheduling and using weather data for disease forecasting, managing Spotted Wing Drosophila, and soil health strategies. Pesticide credits have been requested.

Vegetable Notes. Ruth Hazzard, Amanda Brown and Andrew Cavanagh, co-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.