UMASS EXTENSION

Vegetable Notes

For Vegetable Farmers in Massachusetts

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CROP CONDITIONS

Much-needed rain blanketed the state this past week. Frost threatened any crops that were seeded early and emerged quickly in the warm periods of April. Growers have been busy covering what they could, holding off on removing plastic from early corn, and using irrigation as needed on berries. The frosts of May 9 and 10 this past week damaged tree fruit, asparagus, and other crops in some locations, but many crops came through safely. High winds raised dust storms, threw row covers around, and caused abrasions to seedlings, along with damage to trees and powerlines. Harvest of early lettuce that was row-covered has been reported, while harvest of spinach and Brassica greens, rhubarb, and asparagus continues. Sweet corn is pushing out of clear plastic. Seeding and transplanting of cucurbits, tomatoes, and beans, usually under row covers, is on the rise and planting of cool season crops like lettuce and Brassicas continues. Early-planted potatoes are emerging – watch for any volunteer potatoes from last year and get rid of them! Cabbage and onion maggots were found to be already feeding by about May 6 and growers are using soil drenches on infested plantings and row covers on new plantings to protect crops. Weekend bedding plant sales have not been as strong as hoped, but warmer weather should awaken the green thumb of home gardeners everywhere and increase sales through the second half of May. Locally-grown tomato plants (grown from seed in New England) are the best insurance of late blight-free transplants! Fact sheets on late blight for home gardeners and retailers are available at the UMass Vegetable late blight alert page (look for 2010 Articles).

Mark your calendar for Wednesday August 11, UMass Field Day at the South Deerfield Research Farm. The next twilight meeting on the horizon is June 2, Wilson Farm in Litchfield, NH (see last week's issue for details), but stay tuned for more twilight meetings TBA.

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, typically an early-season pest, is active now, and may cause damage to early greens. It attacks crops and weeds in the plant family Chenopodiaceae which includes the crops chard, beets, spinach as well as weeds like lamb's quarters and pigweed. 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.

The fly overwinters as pupae in the soil and hatches in late April and 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. The maggots may migrate from leaf to leaf 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.

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 be-

cause of weather conditions, the loss may be great. Treat when eggs or first tiny mines are noticed. See the New England Vegetable Management Guide for products (http://www.nevegetable.org/index.php/crops). There are both conventional and organic products available. An adjuvant is recommended to improve efficacy. Some soil-applied systemic neonicotinoids are registered, but be sure to observe the long days to harvest restrictions. Most of the products labeled are for foliar applications.

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. "Spinach" and "beet" leaf miners are very similar species in behavior, appearance, and damage and can't be distinguished in the field.

-Adapted by R Hazzard from Eric Sidemann, Maine Organic Farmers and Gardeners Association

NEW INSECTICIDE CHEMISTRY: DIAMIDES

The diamides are a brand new class of insecticide chemistry, introduced in the past 3 years. These 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. Mammalian toxicity is low, making these products safe for applicators and field workers. Impact on beneficial insects and pollinators is also low. They are toxic to aquatic invertebrates and it has potential for both surface runoff and leaching, so groundwater contamination may be a concern where water tables are shallow or surface water is nearby; a 15-ft buffer strip is required.

These products can be applied as foliar sprays, through sprinkler irrigation, or in some cases through drip irrigation where root uptake distributes the material throughout the leaf tissue. This makes for flexible application options, especially in fruiting crops grown on plastic. Effective levels of insecticide were found in tomato for >60 days after a drip application of Coragen (Kuhar et al). The insecticide resistance group is 28 and they are not-cross resistant with other insecticide classes.

There are now several diamide products with vegetable registrations: Coragen, Belt, and Synapse. This class is particularly effective against caterpillars, but in some cases also works against Colorado potato beetle and leafminers. There is great interest in these products in southern areas where there are more caterpillar pests of fruiting crops, such as tomato fruitworm (= corn earworm) in tomato and pickleworm on cucurbits, and growers need to use repeated foliar insecticides to keep these under control. Even though we don't have as many caterpillars in fruiting crops, these products still have many potential uses in New England. Below is a summary of these products and their labeled uses.

Coragen (common name chlorantraniliprole or RynaXypyr), made by Dupont Crop Protection. Crops on the label include fruiting crops, leafy greens, and Brassicas and the target pests include all the caterpillar pests of these crops, silverleaf whiteflies, and leafminers. Hard-to- control caterpillars like beet armyworm are included for many crops.

Supplemental labels have been issued for foliar applications on sweet corn (CEW, ECB, FAW), tuberous and corm vegetables, asparagus, beans and peas; foliar application in potato (for CPB, ECB and cabbage looper); at-planting soil application for Brassicas, cucurbits, fruiting crops. REI is 4 hours; preharvest interval ranges from 1 to 3 days.

Likely uses in New England include:

Colorado potato beetle (CPB) and European corn borer (ECB) on potato

ECB in pepper

CPB in eggplant

Imported cabbageworm, cabbage looper and diamondback moth in Brassicas

Caterpillars in sweet corn – fall armyworm (FAW), CEW, ECB

Beet armyworm in pepper or Brassicas

Synapse (common name flubendiamide), made by Bayer Crop Science, is labeled for caterpillar control in fruiting vegetables (eggplant, pepper, tomato), cucurbits, leafy vegetables and Brassicas. REI is 12 hours; preharvest interval is 1 day. Foliar application is allowed as well as chemigation through sprinkler systems (not trickle).

Belt (common name flubendiamide), made by Bayer Crop Science, is labeled for foliar application in sweet corn to control caterpillars (ECB, CEW, FAW). Because it must be ingested, it should be targeted at early stages of caterpillars. REI is 12 hours; preharvest interval is 1 day. This new chemistry provides another option in sweet corn, especially for fall armyworm and European corn borer.

All of these products can be found in the 2010-2011 edition of the New England Vegetable Management Guide.

--R Hazzard. References: TP Kuhar, J F Walgenbach and H B Doughty.

KEEPING LATE BLIGHT IN YOUR REAR VIEW MIRROR – PLANNING FOR HEALTHY TOMATOES IN 2010

The 2009 season was very challenging for most commercial tomato growers (both conventional and organic) because of weather conditions unsuitable for tomato growth and because of the widespread occurrence of late blight in much of the Northeast US and beyond. Late blight (LB), the fungal-like disease responsible for the Irish Potato Famine, occurred on tomato transplants much earlier in the season (mid-June) compared with all previous recorded occurrences. And environmental conditions in 2009 during June and July, and continuing into August were very conducive for the occurrence and spread of late blight inoculum, since the organism responsible, *Phytophthora infestans*, prefers cool and wet conditions for its reproduction and spread. Thus in 2009, tomato growers were required to make numerous fungicide sprays of the best products available to control LB, and do this on a very tight schedule if they expected to harvest any marketable fruit.

The more frequent occurrence and the presence of more virulent genotypes (isolates) of LB has been a continual progression which began in the 1990's and has continued to the present day. Two different genotypes of LB occurred in areas of the Northeast in 2009, and these genotypes fit the category of being more virulent for potato, tomato or both. Genotype US8 is quite specific for potato, has an A2 mating type and is metalaxyl resistant. Is has become nationally predominant since 1995 (locally present 1992-present) and is easily disseminated on infected potato tubers used for seed. Infection of potato with US8 was a concern for potato growers in 2009, especially for acreage located in western NY. The genotype responsible for widespread losses for tomato and some potato fields was a new isolate called US22. US22 is also mating type A2, but is actually metalaxyl sensitive. This genotype, though quite severe on tomato, is not as severe as previous occurring genotypes in the state (US11 [locally present 1994-1998] and US17 [locally present 1996-97], both mating type A1 and metalaxyl resistant). The greatest fear is when both mating types (A1 and A2) occur at the same time in a location, this would lead to sexual recombination, the production of overwintering oospores, and the creation of new genotypes which could break currently identified genetic resistance in tomato and potential resistance for current fungicides. Unfortunately, this fear is being realized, since both mating types have been found in several states in the same year (PA, VA, and FL).

Many fungicides are labeled for the control of late blight, and some if mixed with a protectant (contact) fungicide, will also provide control of early blight (EB, Alternaria tomatophila) and Septoria leaf spot (SLS, Septoria lycopersici)(see Table 1). If LB is reported in your area and you are uncertain of the spray coverage you are achieving, then fungicides with translaminar or systemic mode of action (MOA) should be selected over contact fungicides. Note that many fungicide MOAs (different FRAC numbers) exist among products used for LB control, and will be expanding for EB and SLS products in the near future. MOA selection is particularly important when needing to protect both foliage and developing fruit. Apply the sprays preventively and on a shortened spray schedule. The fungicide available for organic control of LB, EB and SLS is limited to fixed copper; in 2009 with US22 genotype present, organic growers and experiments in our own plots demonstrated that copper was effective when used preventively and on a shortened schedule for all three diseases. Almost all fungicides are effective for EB control, with this precautionary note: First, repeated use of chlorothalonil as the single choice fungicide is not recommended because the EB fungus (*A. tomatophila*) will develop tolerance by the middle of the season when chlorothalonil is used repeatedly. Thus it is important to rotate products even among contact fungicides. Secondly, isolates of *A. tomatophila* exist that are resistant for strobilurin fungicides, meaning that group 11 fungicides (ie. Quadris, Cabrio, Flint, Reason and others) should never be used alone, but always mixed with a contact fungicide (ie. Quadris Opti).

Genetic resistance for plant pathogens, including late blight, is known and is being incorporated into tomato varieties using conventional plant breeding techniques. The web site http://vegetablemdonline.ppath.cornell.edu/NewsArticles/Tomato_Performance_Late%20Blight_Mar2010.pdf lists the performance of tomato cultivars for late blight, and includes

the performance of reds, heirlooms, large cherry and small-fruited types, some with known genes for resistance or tolerance for LB. The most widely known genes for LB resistance are Ph1, Ph2 and Ph3. The Ph3 gene provides the strongest protection since it confers resistance for multiple LB genotypes including last years' US22, unlike Ph1 or Ph2 which are very genotype specific, and thus do not provide control of for all known LB genotypes.

Where do we stand for the 2010 growing season? Choosing cultivars with resistance or tolerance is always a good starting point for disease control. For tomato growers in the affected areas (most of the Northeast in 2009), the slate is wiped clean in terms of survival of LB inoculum from last year. The late blight organism is an obligate parasite, meaning it must survive on living tissue. The source of inoculum can be LB-infected potato tubers that were saved or survive in compost piles or appear as volunteers that overwintered in the soil from last year. In the case of potato tubers as a potential source, make sure none survive in compost piles or as volunteers, and if present, dispose of them properly before you begin preparing the soil this spring. Use clean tubers to establish your new crop in 2010. Tell your neighbors to do the same! The late blight isolate (US22) is not capable of surviving in the soil and is not seedborne in tomato. So growers do not need to rotate away from the planting area they used in 2009 specifically for LB control. However, I suspect most growers also have disease problems with two common fungal diseases, EB and SLS, for which rotation is critical. A few cultivars on the tomato list also have good resistance or tolerance for early blight and should be considered. Starting with disease-free transplants is important. The development of triple resistant tomato varieties (LBR, EBR and SLSR) is currently under-

MOA (esp. for LB)	[1]Group Fungicide[DTH]	LB - foliar	LB - stem	LB new growth	EB control	SLS control
Contact	[M5]Bravo[0] or OLF (*chlorothalonil*)	G	P	No	G (tolerance if used repeatedly)	E
	[M3]Dithane[5] or OLF (*mancozeb*)	G	P	No	G	G
	[M3]Maneb [5] or OLF (*maneb*) (use till product is exhausted)	G	P	No	G	G
	[M1]Kocide[0] or OLF (*fixed copper*)	P-F	P	No	F-G	F
	[22+M3]Gavel[5] (*zoxamide* + *mancozeb*)	E	P	No	E	G
	[21]Ranman[0] + contact [0 or 5](*cyazofamid* + *chloro* or *mz*)	E	P	No	G (with contact)	G (with contact)
	[7]Endura[0] (*boscalid*)	--	--	--	G	G
	[9]Scala[1] (*pyrimethanil*)	--	--	--	F-G	--
Trans-laminar	[27]Curzate[3] + contact[3or5] (*cymoxanil* + *chloro*, *mz* or *copper*)	G	F	?	G (with contact)	G (with contact)
	[11+27]Tanos[3] + contact[3or5] (*famoxadone* + *cymoxanil* + above)	G	F	?	G	G
	[40]Forum[4] + contact[4or5] (*dimethomorph* + *chloro* or *mz*)	G	F	?	G (with contact)	G (with contact)
	[40+3]Revus Top[1] (*mandipropamid* + *difenoconazole*)	E	F	?	E	E
	[11+M5]Quadris Opti[0] or [11+ 3]Quadris Top[0] (*azoxystrobin* + *chloro* or *difenoconazole*)	G	F	F	E	E
	[11]Flint[3], [11]Cabrio[0], [11]Reason[14] + contact [varies] (*trifloxystrobin*, *pyraclostrobin*, *fenamidone*)	G	F	F	G (with contact)	G
Systemic	[28] Previcur Flex[5] + contact[5] (*propamocarb*)	G	G	G	G (with contact)	G (with contact)

Table 1. Mode of Action (MOA) for fungicides registered (MA) for tomato foliar diseases; -- no effect; ? = not known; P = Poor; F = Fair; G = Good; E = Excellent; OLF = other labeled formulations or products are available. 1 Group No. as assigned by FRAC (Fungicide Resistance Action Committee) and used by EPA; DTH = days to harvest for main product.

way at Cornell, with important field trials for selection of resistance and multiple fruit types set for 2010. Many commercial seed companies are also working with genetic resistance for LB and EB, and these should be available in the near future.

Images of the diseases mentioned in this report can be found at Tomato Diagnostic Key: http://vegetablemdonline.ppath.cornell.edu/DiagnosticKeys/TomKey.html.

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2010 WEED MANAGEMENT UPDATE

Asaparagus. Callisto (mesotrione) at a rate of 3 to 7.7 oz/acre. Apply prior to spear emergence or after the last harvest or both but apply no more that 7.7 oz max/year. Callisto will also have activity on emerged spears. Need a grass herbicide for annual grass control. Add COC at 1% or NIS at 0.25% for emerged weeds.

Pumpkin. Dual Magnum (s-metolachlor) at a rate of 1 to 1.33 pt/acre between plastic or between bare ground rows. Use a shield and do not treat within 12" of crop foliage. In CT, ME, and NH can mix with Gramoxone Inteon to control emerged weeds. May also want to use other residuals such as Strategy (ethalfluralin plus clomazone) or Sandea (halosulfuron).

Tomato. Dual Magnum (s-metolachlor) at a rate of 1 to 2 pt/acre between plastic or pretransplant on bare ground rows. In CT, ME, and NH can mix with Gramoxone Inteon shielded to control emerged weeds between rows. May want to mix with other residuals to improve broadleaf control. Dual Magnum will control annual grasses, yellow nutsedge, nightshade, galinsoga, purslane, and pigweed.

Pumpkin and Winter Squash. Aim (carfentrazone) at a rate of 0.5 to 2 oz/acre shielded between plastic. Apply before the crop begins to run. Use NIS at 0.25% or MSO (methylated seed oil) at 1-2%. Aim will provide postemergence control of broadleaf weeds: pigweed, lambsquarters, nightshade, common lambsquarters.

Sweet Corn. Laudis (tembotrione) at a rate of 3 oz/acre applied postemergence to control lambsquarters, other broadleafs, and annual grasses. Add MSO or COC at 1% PLUS nitrogen liquid fertilizer at 1.5 qts/acre or AMS at 1.5 lb/acre. Can be tank mixed with 0.25 to 1.0 lb/acre atrazine. Laudis sweet corn precautions include: do not apply to corn greater than 12" tall, do not apply if Callisto, Lumax, or Lexar was used preemergence, only small grasses will be controlled but fall panicum will NOT be controlled, broadleaf weeds should be <6" and grasses should be <2". Check the label for replanting restrictions up to 18 months.

Sweet Corn. Impact (topremazone) at a rate of 0.75 oz/acre applied postemergence to control lambsquarters, other broadleafs, and annual grasses. Add COC at 1% PLUS nitrogen liquid fertilizer at 1.5 qts/acre or AMS at 1.5 lb/acre. Can be tank mixed with 0.25 to 1.0 lb/acre atrazine. Impact sweet corn precautions include: do not apply to corn greater than 12" tall, do not apply if Callisto, Lumax, or Lexar was used preemergence, do not tank mix with Callisto, only small grasses will be controlled, broadleaf weeds should be <6" and grasses should be <2". Check the label for replanting restrictions up to 18 months.

Vegetables (Beets, Cabbage, Broccoli, Greens, Lettuce, Onions, Parsley, Pea). Select (clethodim) at a rate of 6-8 oz/acre. Add COC at 1% by volume. Do not apply when it is unusually hot and humid to avoid crop injury. Select is better than Poast/Fusilade on cool season grasses and possibly perennials. Control of annula grasses is similar.

Sweet Corn. Accent Q (nicosulfuron) is registered for postemergence control of many grasses in sweet corn. Grasses include barnyardgrass, foxtails, fall panicum, and johnsongrass. I have had limited experience with this product but have had good feedback from growers who have used it.

Transplanted cabbage and bell pepper. Dual Magnum 24c Indemnification Labels. This label is for Massachusetts only and can be accessed online at www.farmassist.com . On the web site look under Products and select "Indemnification Labels". Then select Dual 24c Indemnification Labels. Type in Massachusetts and Dual Magnum. READ the Waiver and then select "I Agree". If you agree print out the label. These labels are pending in NH.

- A. Richard Bonanno, UMass Extension

CHECKLIST FOR CUCURBIT AND PEPPER FIELD PREPARATION AND PLANTING: 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 seems to be driven as much by the need for rotation crops as for cheaper fuels for their greenhouses.

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. Now 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, perhaps indefinitely, in the form of long-lasting oospores. The pathogen is most likely moved around by human activity (equipment, irrigation, or people). Keep track of sites that are contaminated with *Phytophthora*. Do not rent land for susceptible crops without investigating the history of disease problems (there are other important soil-borne pathogens as well). Phytophthora blight is particularly important during wet weather or after long irrigations. It is best suited to moving in water and with soil rather than through the air, and human activities that move soil or water from one field to another can greatly facilitate the spread of this pathogen. *Phytophthora capsici* does not appear spontaneously, but the source of contamination on particular fields is difficult to determine. The pathogen can be isolated on specific 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.

Equipment should be power-washed between fields. 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.

This pathogen likes water. 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.

Beware of Contaminated Irrigation Water

Researchers in Michigan have shown that *P. capsici* can move in river water, which is bad news for growers who irrigate out of rivers in MA. Late summer irrigations from rivers with contaminated fields upstream present the risk of contaminating new fields. The pathogen can spread from irrigation ponds that have infected fields draining into them. It is not known if *P. capsici* is able to over winter in ponds or rivers, so the danger of infection from these sources increases later in the season as the disease develops on fields upstream.

Crop Rotation. 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. Before planting, use a chisel plow to break up any hard pans and to improve drainage.

Using 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. These 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.

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

The fact is that many vegetable growers have little choice, they have to use fields that have a history of Phytophthora blight. Some growers have found that it is possible, though not easy, 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. 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. 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.

1. Use a V-ripper or other sub-soiling tool between rows or a deep vertical tillage equipment in-row, to break up hardpan and encourage drainage. Use this pre-plant and as needed during the season, especially after a hard rain to speed drainage of water out of the field.
2. Plant non-vining cucurbit crops (i.e. summer squash) and peppers in dome-shaped raised beds of at least 9 inches height. Use a transplanter that does not leave a depression around the base of the plant.
3. Breaks in raised beds—where beds run across the slope, cut breaks to allow water to drain. Don't allow raised beds to become dams that hold water.
4. 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.
5. Make sure the flow of water from within the field leaves the field – dig ditches if necessary!
6. 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.)
7. Check your irrigation system for leaks and fix them – don't allow puddles of water to sit near your irrigation pumps or lines.
8. Avoid moving soil from contaminated land to clean fields. Use a power washer to remove soil from tillage and planting equipment and tractor tires.
9. Use farm machinery as little as possible throughout the season, to avoid soil compaction, and never work in fields when the soil is wet.
10. Separate different susceptible crops (if possible) such that there is no opportunity for water to move from one planting to another.

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) (Resistance 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 ProPhyt 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, UMass; Sources: Margaret McGrath, LIHREC, Cornell University; Blight Andy Wyenandt, Assistant Extension Specialist in Vegetable Pathology, Rutgers University, NJ

UPCOMING MEETINGS

The Why's and How's of Using Drip Irrigation for Vegetable and Fruit Growers

Wednesday, May 26 5:30 p.m. - 8:00 p.m.

Brookdale Fruit Farm, Hollis, NH

A special farm twilight meeting will be taking place at Brookdale Fruit Farm in Hollis, NH. We will be reviewing drip irrigation options and strategies for vegetable and fruit production.

Zone Tillage and Soil Health Farm Twilight Meeting

Wednesday, June 2 5:30 p.m. - 7:30 p.m.

Wilson Farm, Litchfield NH .

The New Hampshire Vegetable and Berry Growers Association along with UNH Cooperative Extension are sponsoring a commercial vegetable and berry growers twilight meeting. Jude Boucher from UConn Extension will discuss deep zone tillage, and Wilson Farm will be demonstrating the use of zone tillage equipment. UNH Cooperative Extension Specialists will be discussing pest management options and production management. Pesticide applicator recertification credits will be available.

Directions to Farm Stand:

144 Charles Bancroft HWY. (Route 3A), Litchfield, NH 03052

From Route 128

Take 128 to Route 3 N which will bring you to the NH state line (approx. 20 miles), Going North on Route 3, take exit #2 toward Hudson, N.H. straight to the intersection of 3A. Take a left onto 3A North. Stay on road until you get to the farm (on 3A). Approximately 9 miles from Route 3A to the Farm. You will see a large red barn on the left.

From I495

From I495, take Route 93 North to Exit #4. Follow for about 9 miles and take a right onto Page Road. Follow to the end and take a right onto Route 3A. They are 1/4 mile down. You will see a large red barn on the left.

If you would like to become a Vegetable notes sponsor, please contact Jessica Dizek at jdizek@outreach.umass.edu or 413 545 1445

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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