UMASS EXTENSION

Vegetable Notes

For Vegetable Farmers in Massachusetts

Volume 20, Number 8 June 25, 2009

IN THIS ISSUE:

Crop Conditions
Late Blight Alert in Potatoes and Tomatoes
Organic Fungicides
Thrips in Onion and Brassicas
Black Aphids in Greens
Corn Report
Upcoming Meetings

CROP CONDITIONS

Soils are soaked, crops are behind in their growth, and worries about diseases are growing. The past week has brought frequent rains and 3-4 inches of rain accumulation. Berkshire county farms suffered hail damage. Everyone is ready to see the sun and get out to cultivate, sidedress, and plant the next succession crop. The report on harvest is about the same as it has been for two weeks: greens, lettuce, rhubarb, peas, early turnips and radishes. Summer squash has been trickling in but cold nights (and days) and poor conditions for pollinators have shut it down. Hopefully some sun and warmth will push it along and get our first fruiting vegetable pumping. Actually it's not the first: greenhouse tomatoes have been in the marketplace for several weeks, along with that other red fruit, strawberries. The rain has hurt strawberry season, but it's not over yet so there's hope. Corn growth has been delayed and July 4 sweet corn is going to be rare (it always is, but some years more rare than others) although there are a few growers still counting the days and hoping for a burst of hot weather.

You may not need a pre-sidedress nitrate test to know that your crops need some additional nitrogen, but it is available from the UMass Soils Lab if you want a next-day response.

Soils lab: http://www.umassvegetable.org/growers_services/soils_lab/index.html

(413) 545-2311

Plant Problem Diagnostics Lab: http://www.umass.edu/agland/diagnostics/veg_flori.html

(413) 545-3208

LATE BLIGHT ALERT! PROTECT POTATOES AND TOMATOES.

Late blight caused by *Phytophthora infestans* was identified last week on potato and tomato in commercial and home garden sites in Pennsylvania, in potato on Long Island, NY, on tomato transplants at a garden center in central New York, in Delaware, and on tomato in Southern New Jersey and Maryland. The fact that it is occurring so widely suggests that inoculum is widespread and that conditions are favorable all over the region. The fact that it is showing up as close as New York is a serious threat to all of New England.

Late blight is the most famous and most important disease of potatoes world-wide. It is a threat wherever potatoes are grown, but is particularly important in rain fed and irrigated fields at moderate temperatures. Late blight also infects tomatoes and many different Solanum species including hairy nightshade, petunia, and bittersweet. The ideal conditions for an epidemic of late blight are when night temperatures drop to 50 to 60° F, daytime temperatures range from 60 to 75° F, along with fog, heavy dew, rain, long periods of leaf wetness, and cloudy skies. Four to five continual days of such weather are an open invitation for an outbreak. This describes exactly what we had in the Connecticut Valley and in much of New England last week. In addition, it is very possible that last year's late blight outbreak has left us with a high level of inoculum from cull piles and infected volunteer plants. With over 3,000 acres of potatoes, mostly centered in the Con-

necticut Valley, an outbreak of late blight is a serious concern. With a tomato-active strain active in the Northeast, it is especially serious.

It's time to scout and spray!

Take Action. Late blight spores are produced rapidly and are dispersed regionally by wind and rain. Growers in western and central Massachusetts, southern Vermont and Connecticut should consider their tomato and potato crops to be at risk of infection with late blight and should apply protectant fungicides. If we assume that the inoculum may be present locally, then we should consider ALL OF NEW ENGLAND to be at risk. Scout your fields.

Also be sure that all cull piles have been buried, and if volunteer plants are found in fields that had potatoes last year, remove and destroy them.

Contact the Diagnostic Lab. If you suspect late blight in your field, it is important to confirm the diagnosis by contacting the UMass Diagnostic Lab at 413-577-3209. See symptoms listed below. It is important that farms within a few miles of your farm are aware of the risk. Place suspected samples (include several stems plus leaves and/or fruit) in a closed plastic bag and bring or mail overnight to the lab. Refrigerate sample if there's more than a 2 day delay in getting the sample to the lab.

Scouting and Symptoms. Field scouting will help you to catch the disease early, which will reduce losses and increase your options for control. Check fields twice a week. Look at leaves and stems under the canopy, as this is where the disease gets established first. Classic symptoms are large olive green to brown spots on otherwise healthy, green leaves with slightly fuzzy white fungal growth on the underside when conditions have been humid (early morning or after rain). There is a water-soaked appearance to the leaves, which, in dry weather, quickly turn dark brown and brittle. Very young lesions occur as irregularly shaped, small black areas, often with an adjacent area of light green and collapsed tissues. Under favorable environmental conditions, lesions enlarge rapidly resulting in the blighting of entire leaves and plants. Infected areas may be surrounded by a halo of chlorotic, or yellowed, tissue. Under moist conditions, the pathogen sporulates producing a white, cottony growth especially on the underside of the leaves. Infected stems and petioles will turn dark brown or black.

Symptoms first show up around low-lying areas, ponds or creeks, near center-pivot irrigation rigs, and in places protected from wind. Early-planted fields are likely to be affected first.

Tuber infections appear as brown, dry, angular lesions which can extend well into tubers. Late blight lesions on tubers allow secondary organisms like soft rot bacteria to develop. Tubers can be infected whenever they come in contact with sporangia, which can occur during tuber growth or during harvest. Spores may be washed into soil and through the soil to tubers. Cool wet soil conditions favor infection; higher soil temperatures (>65 F) apparently suppress infection. Tubers infected with late blight are highly susceptible to soft rot; store in cool, dry conditions.

Symptoms on Tomato. Leaf symptoms are similar to potato. On green fruit, gray-green water-soaked spots form, enlarge, coalesce, and darken, resulting

in large, firm, brown, leathery-appearing lesions. If conditions remain moist, cottony white mold will develop on the lesions, and secondary soft-rot bacteria may follow, resulting in a slimy wet rot of the entire fruit. On ripe fruit, lesions have cream-colored concentric zones which eventually coalesce and affect the entire fruit.

Life Cycle. Sources can include infected seed stocks and over-wintered infected plant material. The pathogen overwinters in volunteer host plants, potato (and tomato) cull piles, and may occur in both commercial fields and residential gardens. When moderate temperatures (50-80 ˚ F) and high humidity occur, sporangia are produced, released in the air, and blown onto susceptible crops. When cutting seed, infection can be spread from a few tubers to additional seed.

Unlike other Phytophthora species, *P. infestans* is not considered to be a soil borne pathogen, although this assumption may change if both mating types are present and sexual spores (Oospores) are formed which can persist in the soil. A notable feature of this disease is the speed of disease development and spread. Under conducive conditions, entire fields can become infected after only a few days.

Fungicides - Conventional. Fungicides are a critical tool for managing late blight. Protectant sprays work well, with chlorothalonil (ie. Bravo or comparable material) continuing to provide excellent control. However if you are late in getting either a chlorothalonil, metiram or mancozeb spray on, then the combination of Curzate (cymoxanil, fungicide group 27) mixed with a protectant is helpful to provide some kickback activity. Curzate works well when plants are actively growing and temperatures are cool, conditions that exist now for both potatoes and tomatoes. Previcur Flex has similar activity, and should be mixed with chlorothalonil. The pathogen has developed resistance to some fungicides such as metalaxyl and mefenoxam (Ridomil, Ridomil Gold), so these are no longer effective. If environmental conditions remain conducive for late blight, apply a fungicide from a different mode of action class every 5-7 days such as Ranman, Forum, Tanos, Gavel, Reason (each mixed with a protectant), Revus Top,or a phosphorous acid fungicide (ProPhyt, Fosphite, Phostrol).

Fields with significant disease should be burned down with herbicide or plowed under. Each infected field is producing spores that will move to other farms in the area.

Revus Top is a newly registered fungicide labeled for potato (14 days PHI) and tomato (1 day PHI) as well as pepper. It is unique in that it consists of two new fungicide chemistries, mandipropamid Group 40 and difenoconazole Group 3. This combination is labeled for the control of six diseases of potato and 9 diseases in tomato. It appears to be in short supply in the Northeast, but if it is available it would be a good choice.

Fungicides – Organic

There are some OMRI (Organic Material Review Institute) approved products that list late blight as a target disease. However there is limited information on their efficacy, and the information available usually indicates that they are not as efficacious as “conventional” non-organic materials. With those caveats, the OMRI approved materials include basic copper sulfate (NuCop 50w and Champ WG are OMRI approved formulations; many others are not) and Sonata. Use a 5-10 day schedule

Characteristic symptoms are illustrated at: http://vegetablemdonline.ppath.cornell.edu/DiagnosticKeys/TomLeaf/Late_Tom.htm and elsewhere on the Veg MD web site.

ORGANIC FUNGICIDES

Last year, organic growers were faced with a catch-22 situation in which none of the approved copper hydroxide fungicides that were allowed for organic production were labeled or available in Massachusetts. This year, fortunately, there are products that are approved, registered, and available. One is NuCop 50W (EPA Registration Number: 45002-7), and we know that suppliers in MA are carrying this product. Champ WG (EPA Registration No: 55146-1) is a new formulation of Champ that is approved for use in organic production. We have been informed by the company that Champ WG is registered in MA, but the state database does not yet list it, so check with your supplier or check the Massachusetts Pesticide Product Registration database.

Hydrogen peroxide products (OxiDate) will kill the pathogen spores that it contacts, but has no residual (protective) or curative activity.

Biological products that help stimulate, induce, or enhance plant resistance to disease can also be used. These include Bacillus subtillis products such as Serenade and Champion. This past winter, the UMass vegetable extension plant disease diagnostician conducted a thorough review of published literature on these products. Unfortunately, she found very few instances in which their efficacy was significantly better than the control.

WATCH FOR THRIPS IN ONION AND BRASSICAS

Onion thrips have been observed in onions. Onion thrips range in color from yellow to black and are only 1/16" in length. They spend the winter as adults in crop remnants, alfalfa, wheat, greenhouses and weeds along the border of crop fields. Thrips have rasping mouth parts which they use to tear open plant cells and feed on inner juices. Populations are favored by hot, dry weather. Heavy rain or overhead irrigation can lower populations quickly. In onions, they are usually found deep between leaf blades. In Brassicas, they typically feed on the undersides of leaves.

In onions feeding occurs in protected areas between leaves. Damage may appear as silver lines, white patches, tip dieback and curling, slowed growth, reduced bulb size and yields, or result in plant death. Plants are most sensitive when bulbs are forming and still small. Healthy vigorous plants can tolerate moderate populations. Lacewing larvae, pirate bugs and predatory thrips are important natural enemies. Planting onions near alfalfa or clover, that can harbor large populations of thrips, may increase thrips problems because they migrate to onions when these crops are cut or harvested.

Scout plants along field margins where infestations build early, as well as checking across the field. Begin applications when damage is first noticed or when there are three or more thrips per leaf. If repeat applications are needed, use a 7 to 10 day spray interval. Rotate between insecticide groups after 2 applications to help prevent resistance. Use a shorter interval in hot weather. Use of a crop oil, methylated seed oil or silicon adjuvant is suggested to improve coverage and control. Apply in early evening, using high pressure and 100 gal water/A for best results. Note that products labeled for thrips control are not exactly the same for onions and Brassicas.

Insecticides for onions

Broad-spectrum products include numerous synthetic pyrethroids (including Warrior, Pounce, Decis, Ammo, Proaxis, Mustang) and carbamates (Lannate, Malathion 57E). See 2008-2009 New England Vegetable Management Guide for more details on rates. Biorational or organic products include Beauveria bassiana (Mycotrol O, takes 7 to 10 days after application to see control. OMRI listed); kaolin (Surround WP, suppression/repellence only. OMRI listed); pyriproxyfen (Esteem 0.86EC, insect growth regulator, dry bulb onions only, suppression only); spinosad (Entrust, OMRI listed; Spintor 2SC, has both contact and ingestion toxicity); pyrethrin (PyGanic EC5.0); pyrethrins + piperonyl butoxide (Pyrenone). NOTE that the 2008-2009 edition of the New England Vegetable Management Guide did not list Spintor and Entrust in the list of labeled products for onion thrips, but they are labeled for this use (with a supplemental label.)

In Brassicas, thrips are primarily a problem on cabbage where they feed on inner leaves which are difficult to target by spraying. Thrips cause rough, golden or brown scars to form on leaves or produce a discolored layer within cabbage heads. Thrips damage can be confused with edema. Controls must be applied before head formation in order to be effective.

In Brassica crops such as broccoli, kale, collard or cabbage, thrips are more often a late-season problem. They may damage open leaves and cause scarring, rust or yellow-colored areas and general reduced vigor in the plants. Do not plant cabbage or other Brassicas near Alliums (onion family), alfalfa, or clover, that can harbor large populations of thrips, which may migrate into Brassicas when these crops are cut or harvested. Onions tend to dry down around the same time that late Brassicas are put out, so close plantings can be a source of high and damaging populations of thrips.

Insecticides for Brassicas: Broad-spectrum products include numerous synthetic pyrethroids (including Warrior, Pounce, Capture, Baythroid, Ammo, Proaxis, Mustang) and one neonicotinoid, imidacloprid (Admire Pro). Biorational or organic products include spinosad (Entrust, OMRI listed; Spintor 2SC, has both contact and ingestion toxicity); novaluron (Rimon 0.83EC, insect growth regulator, not for mustard greens); pyrethrin (PyGanic EC5.0, OMRI listed); spinosad (Entrust, OMRI listed; Spintor 2SC, has both contact and ingestion toxicity). Insect growth regulators affect immature stages only, causing death during molts.

If thrips are a perennial problem on cabbage on your farm, plant more tolerant varieties (Bobcat, Ducati, Fresco, Little Rock, Matsumo, Rio Verde, Ruby Perfection, Solid Blue 770 or 780, Blue Pack, Ruby Ball, Heads Up, Bravo, Brutus,

Green Cup, Roundup, Superette, Vantage Point, and Zerlina). Avoid planting highly susceptible varieties, such as Atlantis, Columbia, Morris, Ramada, Supergreen, Market Prize, Princess, Charmant and Solid Blue 690.

--R. Hazzard, adapted from the onion thrips sections of the updated New England Vegetable Management Guide. Special thanks to Jude Boucher, UConn. Available online at www.nevegetable.org

BLACK APHIDS ON GREENS – WHAT'S GOING ON?

Growers and crop consultants are reporting outbreaks of a black aphid on crops such as Swiss chard, beets, lettuce, spinach, and radishes. Leaves are covered with aphids, making the greens unmarketable. They are also on weeds such as lambsquarters and pigweed – in fact, they inhabit those weeds every year. On close inspection, the species appears to be chickpea aphid, one of two black aphids that would likely be found in vegetables (the other is bean aphid). It has a wide host range, but is most abundant on leguminous plants. Vegetables attacked include asparagus, carrot, cowpea, kidney bean, lettuce and lima bean – and, apparently, vegetables in the Chenopodiaceae family (chard, spinach, beets. Field crops include many types of clover, alfalfa, hairy vetch, and wheat.

Chickpea aphid is found on every continent, in both temperate and tropical areas. Adults and nymphs are black, with a slightly gray or shiny appearance from a dusting of white wax. Like most aphids on our vegetable crops, they reach crops in winged form and quickly reproduce as wingless forms that produce live nymphs, building up into dense colonies very rapidly. Some aspect of weather conditions probably favored these checkpea aphids over their many predators and parasites, resulting in unusually high numbers on crops as well as weeds.

They have many predators especially ladybeetles and a large outbreak of aphids will induce a comparable flush of ladybeetles. That seems to be the good news: ladybeetles will reproduce in those colonies and head out around the farm.

Meanwhile, protect crops with insecticides. The following list for aphids registered on Beets and Swiss chard has recently been updated on the website of the New England Vegetable Management Guide . See www.nevegetable.org for products listed for aphids on other crops.

acetamiprid (Assail 30SG): 2 to 4 dry oz/A (7 dh, REI 12h, Group 4).

dinotefuran (Venom 20SG): 7 to 11 dry oz/A foliar or 18 to 21 dry oz/A soil (7 dh foliar, 21 dh soil, REI 12h, Group 4A). For resistance management purposes, do not use foliar spray after soil application or following another nicotinoid (Group 4A) insecticide application on the same crop. For Swiss chard only.

flonicamid (Beleaf 50SG): 2 to 2.8 dry oz/A (0 dh, REI 12, Group 9C). For aphids on swiss chard only.

insecticidal soap (M-Pede): 2.5 oz/gal water (0 dh, REI 12h). Spray to wet all infested plant surfaces. OMRI listed.

imidacloprid (Admire Pro): 0.3 to 0.7 oz/1,000 row-feet, 4.4 to 10.5 oz/A (21 dh beets, 45 dh Swiss chard, REI 12h, Group 4A). See plant-back restrictions. Aphids only.

imidacloprid (Provado 1.6F): 3.5 oz/A (7 dh, REI 12h, Group 4A). For resistance management purposes, do not use a Provado foliar application following another nicotinoid (Group 4A) insecticide application on the same crop. Aphids on beets only.

pyrethrin (PyGanic EC5.0): 4.5 to 18 oz/A (0 dh, REI 12h, Group 3A). For aphids only. OMRI listed.

pyrethrins + piperonyl butoxide (Pyrenone): 1 tsp/gal, or 1 to 12 oz/A (0 dh, REI 12h, Group 3A).

pymetrozine (Fulfill): 2.75 oz/A (7 dh, REI 12h, Group 9A). For aphids on Swiss chard only.

thiamethoxam (Actara): 1.5 to 3 oz/A (7 dh, REI 12h, Group 4). Aphids only.

thiamethoxam (Platinum): 5 to 8 oz/A (REI 12h, Group 4). Aphids on beets only. Systemic insecticide used as an in-furrow, banded, drench, or drip irrigation application to the seed/seedling root zone during or after planting/transplanting operations. DO NOT apply as a foliar spray.

SWEET CORN REPORT

European corn borer flight is winding down in most locations this week. We can assume that as long as there is still fight, egg laying is occurring. ECB caterpillars that we have found are very small and busy feeding on the young tassels inside the whorl. When scouting, it may be necessary to remove the tassels inside of the whorl and inspect leaves closely to find first and second instar caterpillars. As the these caterpillars continue to develop and feed they will move into the stalk of the tassel as it emerges. If not controlled, they will move down the stalk and burrow into the back side of the ear when it forms. For best control, spray when tassels emerge and caterpillars are exposed.

In unsprayed fields this week, our scouting has revealed infestation levels of 18 to 40 percent. Scout your pretassel corn and if >15% have borers, spray as tassels emerge. This is when borers are most exposed and easily killed. If you are still experiencing strong flight above 12 moths per week spray silking corn on a weekly basis. New eggs will continue to be laid until the flight goes down. Scout again 3-4 days after spraying tasseling fields only counting new damage. A second spray may be required if more than 15% of the plants are showing new damage. We are also seeing lots of beneficial insects in fields they are flourishing due to the sudden aphid outbreak that has provided an abundance of food. Hopefully this early season flush of beneficals will cut down on aphid populations later in the season. Try using a less toxic ECB control such as a Spintor or Entrust.

If you have corn in silk and want to monitor corn earworm flight, be sure to get your pheromone traps up soon! The most readily available trap is the Heliothis Scentry nylon net trap. Hercon luretapes for corn earworm (Helicoverpa zea) have proved reliable over many years. Sources include Gemplers and Great Lakes IPM. Place IN the cornfield, with the trap base at ear height. Corn earworm is being captured in low numbers in Pennsylvania and western New York.

Location	Z1	EII	Total
CT Valley			
South Deerfield	0	2	2
Deerfield	0	0	0
Sunderland	2	5	7
Hadley (1)	3	1	4
Hadley (2)	0	0	0
Granby	9	5	14
Hatfield	6	8	14
Easthampton	0	9	9
Central & Eastern MA			
Lancaster	8	0	8
Tyngsboro	18	4	22
Concord	7	1	8
Northbridge	0	1	1
Leicester	1	0	1
Dracut	15	3	18
Rehobeth	2	12	14
NH			
Litchfield, NH	2	5	7
Hollis, NH	0	1	1
Mason, NH	1	3	4
VT			
Westminster, VT	0	8	8

UPCOMING MEETINGS

Aquaculture Workshop: Water Quality and Re-circulating Aquaculture Systems

Location: 302 Agric. Engineering Bldg., UMass Amherst

Saturday, June 27, 9 am - 3 pm

UMass Extension Western Mass. Center for Sustainable Aquaculture 413-545-1055; chollingsworth@umext.umass.edu; www.umass.edu/aquaculture

Vegetables, Energy Crops, Wheat, and Zone Tillage

Field Day at the UMass Crops Research and Education Farm, South Deerfield.

89-91 River Rd, South Deerfield, MA

Thursday July 16, 2009

2:00 Understanding and Using Combines.

3:00 Heritage Wheats – Varieties from gene banks and farmers of the Old and New Worlds

4:00 Zone tillage demonstration

5:00 Supper – will include specialty breads and ethnic crops

6:00 Choose your tour:

1. Energy Crops:

Oilseed Rape: Growth and N accumulation pattern, yield, and Nitrogen Use Efficiency of 2 cultivars at 2 population densities.

Sunflower: Evaluation of yield and growth of 7 sunflower cultivars.

Crambe: Nitrogen effect on yield performance on differing soil types.

Soybean: Narrower planting rows and higher densities for maximizing seed yield.

Grain corn: Yield performance of 15 shorter-season and full-season hybrids.

Switch Grass: Effect of nitrogen application and time of harvest and affect on regrowth.

2. Vegetables:

Ethnic crops including okra, mixixe (spny cucumber), chipilin (legume herb) and taioba. Production and marketing, field and high tunnel. Frank Mangan

Ecology of cucumber yield: cucumber beetles above and below ground, pollinators, and mycorhyzal fungi

Organic beetle controls in eggplant and cucurbits

Brussels Sprouts variety trial for yield and disease resistance

UMass Student Farming Enterprise

Roller-crimper timing to kill cover crops

Edamame variety trials

Pesticide applicator credits have been requested.

This field day is funded through grants from Northeast SARE, Mass Dept of Food and Agriculture, EPA, and other sources.

For more information contact Ruth Hazzard 413-545-3696, umassvegetable@umext.umass.edu

New Hampshire Meetings

NH Vegetable & Berry Twilight Meeting

Piccadilly Farm, Winchester NH

Thursday July 2, 5:30-7:30pm

Integrated pest management (IPM) plans for organic diversified vegetable producers, CSA marketing, and more. For info, contact Carl Majewski at carl.majewski@unh.edu or 603-352-4550.

Grape Twilight Meeting

Haunting Whisper Vineyard, Danbury NH

Monday July 6

For info, contact Amy Ouellette at 603-225-5505 or amy.ouellette@unh.edu.

Farm to Restaurant Twilight Meeting

Monadnock Berries, West Hill Rd., Troy NH

Tuesday July 7, 6:30-8:30pm

Marketing to local businesses, and on giving area businesses and restaurants a view of farm production in NH. For info, contact Carl Majewski at carl.majewski@unh.edu or 603-352-4550.

New Hampshire Tree Fruit Twilight Meeting

Brookdale Fruit Farm, Rte 130, Hollis NH

Wednesday July 8, 5:30-8:00pm

Features Tracy Leskey and Starker Wright from USDA-ARS Appalachian Fruit Research Station in Kearneysville, WV. For info, contact George Hamilton at george.hamilton@unh.edu or 603-641-6060.

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.