UMASS EXTENSION

Vegetable Notes

For Vegetable Farmers in Massachusetts

Volume 21, Number 8 June 10, 2010

In this issue

Crop conditions

Crops are growing well. Growers are still busy with transplanting and succession seedings and keeping up with weeds. The week brought both sun and rain. No major new milestones in crop harvests or pest conditions took place. Potato leafhopper was observed at low numbers in potatoes. For the moment, no news is good news.

Watch for thrips in onion and brassicas

Onion thrips (*Thrips tabaci*) were first observed in onions in the Connecticut Valley -- at very low numbers – about two weeks ago. Other Ct Valley fields that have been scouted over the past two weeks suggest that numbers are gradually increasing. Other parts of the region and more isolated farms may have very different populations, but seasonally it is time to scout onions for this pest. In Brassicas, we typically do not see damage until later in the season but growers should be aware that thrips can move into cabbage and other cole crops. Peas are also sensitive to feeding damage. Onions are the preferred host crop.

Thrips

Onion thrips are tiny insects that 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. Adults lay eggs singly in the epidermis, nymphs feed on leaves, and pupation occurs in the soil. There are at least two generations per year in the Northeast. Thrips have rasping mouth parts which they use to tear open plant cells to feed on plant juices. Populations are favored by hot, dry weather. Heavy rain or overhead irrigation can lower populations.

Cultural practices that have been shown to reduce the thrips include sanitation at the end of the season, avoid use of last year’s onions for sets, avoid imported transplants which may be infested with thrips from southern areas, eliminate volunteers, use straw mulch, and alternate onion rows with carrot rows. Avoid planting onions near alfalfa, wheat or clover, because these crops can harbor large populations of thrips, which may migrate to onions when these crops are cut or harvested.

Thrips Damage on Onion

In onions feeding occurs in protected, succulent areas where new leaves are emerging, deep between the leaf blades. Damage may appear as silver lines, white patches, tip dieback and curling, slowed growth, reduced bulb size and yields, or if severe enough can result in plant death. Plants are most sensitive when still small and when bulbs are forming. Healthy vigorous plants can tolerate moderate populations. Scallions are particularly sensitive because the whole plant is marketed. Lacewing larvae, pirate bugs and predatory thrips are important natural enemies. Thrips damage can increase occurrence of purple

blotch (*Alternaria porri*), as fungus can penetrate the plant through wounds caused by feeding.

Scout plants along field margins where infestations build early, as well as checking across the field.

Scout weekly to determine if populations are increasing. Look closely between the leaf blades to find the light yellow nymphs or darker adults. Though tiny, they are visible moving about on the leaf when the leaves are parted. Count number per plant and note number of leaves per plant to determine if thresholds are reached. The number that constitutes an economic threshold varies with the stage of plant growth, efficacy of insecticide to be used, water availability, health of the plants. A widely used threshold is three thrips per leaf or 30 per plant.

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. Wetting agents or spreader-sticker are recommended to improve coverage and control. Apply in early evening, using moderate to high pressure, 100 gal water/A, and appropriate nozzle spacing to achieve best possible control. 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 2010-2011 New England Vegetable Management Guide for more details on rates.

Selective 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); spinetoram (Radiant SC); pyrethrin (PyGanic EC5.0, OMRI listed); pyrethrins + piperonyl butoxide (Pyrenone). Note that Spintor 2SC is no longer on the market, having been replaced by Radiant, a closely related material, which has activity against adults and larvae.

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 generally 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; has both contact and ingestion toxicity); spinetoram (Radiant SC); novaluron (Rimon 0.83EC, insect growth regulator, not for mustard greens); pyrethrin (PyGanic EC5.0, OMRI listed); Insect growth regulators affect immature stages only, causing death during molts.

Thrips Damage on Broccoli

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.

FDA EXTENDS COMMENT PERIOD FOR FRESH PRODUCE SAFETY STANDARDS

The Food and Drug Administration (FDA) is extending to July 23, 2010, the comment period for a notice that appeared in the Federal Register of February 23, 2010. In that notice, FDA established a docket (FDA-2010-N-0085) to receive comments and information about current practices and conditions for the production and packing of fresh produce. The Agency is extending this comment period to give all interested parties additional time to provide the information requested by FDA in that notice. Comments will inform the development of safety standards for fresh produce at the farm and packing house and strategies and cooperative efforts to ensure compliance. The Agency will use all comments and perspectives to develop a proposed rule on safety standards for fresh produce.

It is important for the particular needs and concerns of the diversified, smaller growers of New England to be considered in development of these safety standards. Many comments have already come in -- but there's still time to make your voice heard and to share with FDA your views and specific recommendations in categories such as:

--The role of the Good Agricultural Practice (GAP) guidelines, "Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables"

--How to coordinate produce food safety practices with

-- sustainable and/or organic production methods

-- environmental and/or conservation goals or practices

-- existing Federal, state, local and tribal government statutes and regulations

Comments can be submitted electronically at www.Regulations.gov.

The multi-agency Web site, Regulations.gov serves as a clearinghouse for materials related to FDA rulemaking and is the FDA's official on-line comment system. The easiest way to get to the docket is to enter the docket number. On the Regulations.gov home page, enter the following in the 'Keyword' field: FDA-2010-N-0085

To submit written comments, mail comments to:

Division of Dockets Management

HFA-305

Food and Drug Administration

5630 Fishers Lane, Room 1061

Rockville, Maryland 20852

(NOTE: Be sure to include the docket number at the top of the pages in your written submissions. The docket number is FDA-2010-N-0085.)

The comment period for this docket ends on July 23, 2010.

The New England Vegetable and Berry Growers Association has submitted comments and can serve as a resource if you would like more information about the proposed regulations. Contact Steve Verrill, President (verrillfm@aol.com) or John Howell, Secretary/Treasurer (howell@umext.umass.edu)

AGRICULTURAL WORKER PROTECTION STANDARD (WPS) FOR PESTICIDES

The WPS applies to all pesticides whether restricted or general use. You will know the pesticide product is covered by the WPS if you see the following statement in the "Directions for Use" section of the pesticide labeling:

Agricultural Use Requirements

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. This standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal

protective equipment, notification of workers, and restricted-entry intervals.

The primary WPS resource is the How to Comply manual, developed by EPA. The manual is available from your State Lead Agency (SLA), the pesticide education office of the Cooperative Extension Service, the EPA Region 1 office and EPA's National Agricultural Compliance Assistance Center. See resource list, below. It can also be obtained from agricultural suppliers such as Gemplers. Every agricultural producer should have a copy of the EPA How to Comply manual.

The WPS is a US EPA regulation, 40 CFR Part 170. It covers pesticides that are used in the production of agricultural plants on farms, forests, nurseries, and greenhouses. The WPS requires the owner or employer to take steps to reduce the risk of pesticide-related illness and injury: 1) if pesticides are used on the farm or 2) workers or pesticide handlers are employed who may be exposed to such pesticides.

Here's a brief summary of the major elements of the WPS. Each one of these categories is described in greater detail in the EPA How to Comply manual. Producers should refer to the How to Comply manual for complete explanations of the requirements of the Worker Protection Standard.

Information

To ensure employees will be informed about exposure to pesticides, the WPS requires:

- Pesticide safety training — for workers and handlers,
- Pesticide safety poster — to be displayed for workers and handlers,
- Access to labeling information — for pesticide handlers and early-entry workers, and
- Access to specific information — a centrally located Application List of pesticide treatments on the establishment.

Protection

To ensure employees will be protected from exposures to pesticides, the WPS requires employers to:

- Prohibit handlers from applying a pesticide in a way that will expose workers or other persons,
- Exclude workers from areas being treated with pesticides,
- Exclude workers from areas that remain under a restricted entry interval (REI) with narrow exceptions,
- Protect early-entry workers who are doing permitted tasks in treated areas during an REI — requirements include special instructions and duties related to correct use of Personal Protective Equipment (PPE),
- Notify workers about treated areas so they can avoid inadvertent exposures, and
- Protect handlers during handling tasks — requirements include monitoring while handling highly toxic pesticides and duties related to correct use of PPE.

Mitigation

To mitigate exposures that employees receive, the WPS requires:

- Decontamination sites — providing handlers and workers an ample supply of water, soap and towels for routine washing and emergency decontamination,
- Emergency assistance — making transportation available to a medical care facility if an agricultural worker or handler may have been poisoned or injured by a pesticide and providing information about the pesticide(s) to which the person may have been exposed.

Additional resources:

The recently published Massachusetts Best Management Practices for Vegetables, posted at http://www.umassvegetable.org/BestManagementPractices.htm. has a section on pesticide safety and worker protection standard.

EPA Web Site for WPS: http://www.epa.gov/agriculture/twor.html.

--Excerpted from the 2010 New England Vegetable Management Guide, www.nevegetable.org.

LATE BLIGHT UPDATE

There have been no new reports of late blight in the Northeast in the past week. The previous occurrences were in PA and MD. Inspection of tomato transplants in large retailer outlets have not turned up any late blight. Continue to watch for and destroy potato volunteers and scout tomato and potato fields for symptoms. Contact the UMass Disease Diagnostic clinic (413-545-3209) for confirmation if you suspect late blight. Thanks to funding from the EPA Region 1 SAI program, we are able to offer late blight diagnostics free of charge at this time. We urge you to use this resource – for the benefit of your own farm and the whole region!

The output from late blight forecasting models – based on airport weather station data from around Massachusetts -- shows considerable variation in the accumulation of Severity Values (SV). SV do not accumulate at extremely low or extremely high temperatures; it is when RH is >90 and temperatures are between 59F and 80F that conditions are most favorable to the disease and shorter leaf wetness periods result in higher SV. Only Nantucket has exceeded the 18 SV threshold for initiating fungicides, but several other locations have reached 12-14 SV. See accompanying article on fungicides for tomato and potato diseases. If the coming week brings periods of wet, cool weather, we recommend starting fungicides on tomato and potato. The 18 SV threshold indicates that any sources of inoculum, especially potato foliage that has grown from overwintered, infected tubers, could be developing lesions and producing spores. Thus, protecting crops from potential spore dissemination is critical at that point. Given last season's epidemic, it is impossible to be sure that all infected volunteers will be destroyed.

If you are dealing with the public and get questions about late blight, encourage gardeners to destroy any potato volunteers. They should have avoided replanting stored tubers.

TOMATO FUNGICIDES

Many fungicides are labeled for the control of late blight, and some will also provide control of early blight (EB, Alternaria tomatophila) and Septoria leaf spot (SLS, Septoria lycopersici) if mixed with a protectant (contact) fungicide (see list below). If LB is reported in your area and you are uncertain of the spray coverage you are achieving, fungicides with translaminar or systemic mode of action (MOA) should be selected over contact fungicides. Note that many fungicide MOAs (designated by 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 preventatively 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 NY plots demonstrated that copper was effective when used preventively and on a short schedule for all three diseases. Most of the fungicides listed below will also control EB and SLS, with these precautionary notes: 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 in the state 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.

Alternate among fungicides in different chemical groups (as indicated by FRAC Code) to manage resistance. The late blight pathogen has demonstrated ability to develop resistance; Ridomil fungicides are no longer recommended because of resistance. Include in each application a protectant fungicide like maneb (registration has been canceled, but you can use it until your current supply is exhausted), mancozeb or chlorothalonil. This is important for resistance management and ensuring effective control, and is specified on the label and thus is a requirement. A spray program with just protectant fungicides applied regularly starting before late blight begins to develop can provide adequate control, but this is challenging to achieve when plants are actively growing and conditions are very favorable for disease development.

Curzate (FRAC Group 27 fungicide) or Tanos (also contains cymoxanil, active ingredient in Curzate) can be a good choice for the first application because these fungicides have some kickback activity, thus they can suppress some new lesions. The maximum kickback is about two days when it is cool, declining with increasing temperatures to about zero above 80 degrees F. Cymoxanil has little residual activity, therefore, five days later apply another fungicide. Tanos must be tank mixed with another mode of action and alternated with a fungicide from another FRAC group after one applica-

tion. Do not alternate with Quadris, Cabrio, or Flint.

Previcur Flex (Group 28) has some systemic activity, which is an important attribute even though it is not as systemic as Ridomil. It was the only fungicide rated good for symptoms on stems and also for protecting new growth in a bulletin from the University of Maine; it is not known how effective many of the other products are on new growth that develops after the application. The product was not rated as highly as other late blight fungicides for leaf symptoms (good versus excellent). It is considered a good choice for an application made right before rain, as the product is rainfast in 30 minutes. According to the manufacturer, Previcur Flex provides best control when applied in blocks of two applications alternated with two applications of other fungicides.

Revus Top (Group 40 + 3) is a newer fungicide that has excellent activity for late blight. It gets into plants fast, in about 30 minutes, then slowly moves in the plant providing good residual. It has some kickback activity. It does not need to be applied with a protectant fungicide. This fungicide, especially when mixed with other products, should not be left in the spray tank as irreversible settling can occur.

Other fungicides to consider including in the fungicide program are Gavel (Group 22), Forum (Group 40), and Ranman (Group 21) plus Presidio (Group 43) for tomatoes and Omega (Group 29) for potatoes. Gavel is the only late blight fungicide formulated with a protectant. Group 11 fungicides (Headline, Quadris, Reason, etc) and Group 33 (phosphorous acid) fungicides may not be as effective for late blight as the other products, though some trials have shown good control of foliar symptoms.

As noted above, the only proven option for organic control of late blight is copper applied on a short schedule, beginning before the disease is present in the field. Please see the accompanying article on using copper for more details.

Good fungicide coverage is critical. Pathogen spores can be moved on equipment and workers, therefore spray and work in affected fields last and clean equipment between fields.

- adapted from work by Tom Zitter and Meg McGrath, Cornell University

Location	Z1	EII	Total ECB
CT Valley			0
South Deerfield	1	1	2
Sunderland	0	2	2
Hadley	0	2	2
Southwick			0
Granby	0	0	0
Hatfield	9	3	12
Feeding Hills			0
Central & Eastern MA			
Rehobeth	0	1	1
Concord			0
Northbridge			0
Lancaster			0
Littleton			0
Dracut			0
Ipswich			0
Framingham			0
NH			
Litchfield, NH	1	19	20
Hollis, NH	1	2	3

CORN REPORT

Early plantings are at least 12-18 inches tall, with some now reaching pre-tassel or tassel stage. The rain has helped to deliver side-dressed fertilizer to the root zone and plants are looking dark green and flourishing. Row cover has been removed from early fields and later succession plantings are going in including bare ground and transplants. Farms that are using the biological control for European corn borer, Trichogramma ostrinea, are into their second week of releases with at least one more release to go.

European corn borer trap counts remain moderately low in Massachusetts this week, however a new site in southern New Hampshire rose into the double digits. High temperatures that are forecasted for this weekend will push ECB development and trap counts are anticipated to rise over the weekend.

No field damage from ECB feeding has been seen yet,

but scouting has begun in pre-tassel or tasseling fields. Infestation levels found in the field in southern New Hampshire ranged from 2-10%. It is best to control ECB caterpillars when they are feeding on emerged tassels. This is when the caterpillars are most vulnerable to sprays which can easily target the exposed tassels. Many early plantings will be reaching this stage soon, so now is a good time to think ahead and consider a less toxic spray material to conserve the population of beneficial insects that feed on the aphids in your fields. Conserving beneficials may save you from having to spray for aphids later on in the season. Now is also a good time to develop your weekly scouting and monitoring routine.

For information on scouting procedures and implementing a sweet corn IPM program on your farm, visit www.umassvegetable.org to download a copy of the UMass Extension publication Using IPM in the Field Sweet Corn Insect Management Field Scouting Guide or email umassvegetable@umext.umass.edu to request a free hard copy.

COPPER FUNGICIDES FOR ORGANIC FARMS

Late blight has not been reported in New England at this time, but it has showed up in isolated spots already this year – we've had reports from MD, LA, KY, and PA. Given the widespread epidemic in the Northeast last season, the likelihood that infected overwintered potato tubers will grow new infected plant tissue somewhere in New England is a fairly high. If these are not destroyed it is likely that we will see this disease again this season.

Now is the time to make decisions about how to handle the disease if and when it shows up in our area. Conventional growers have access to fungicides that can effectively slow or control the disease. Organic growers have more limited options. The only material available to organic growers that has proven effective in preventing late blight is copper. Despite being 'organic' and less toxic than many conventional materials, copper is not without its dangers. Organic growers who sell primarily to retail or wholesale markets may feel that they have no choice but to do what is necessary to try to save their crop in order to recoup their investment. Organic CSA's have a different set of considerations and may find themselves on the horns of a dilemma. On the one hand, shareholders may not want anything sprayed on their produce, no matter how benign. On the other hand, shareholders will be very disappointed if there are no tomatoes, which is almost certain to be the result if we see late blight show up here early in the year again and copper isn't applied preventively on a regular schedule. Even more importantly, if we do see late blight this year and crops are not treated preventively or destroyed at the first sign of infection, they will become reservoirs of disease and serve to prolong and worsen the epidemic and will contribute to crop losses and increased fungicide use at other farms.

This article provides some detailed information about the copper products available to you so you can make more informed decisions. Copper has no curative value, and once an infection is established in your fields spraying copper will do little to slow it's spread. The time to decide whether and how to spray copper is now, before we see the disease in our local fields. Using copper will also reduce incidence of other tomato diseases such as early blight, Septoria leaf spot, and bacterial diseases.

Using Copper

One copper product that is allowed in certified organic production is registered in Massachusetts: NuCop 50WP. Copper hydroxide is the active ingredient. Copper fungicides are protectants, so they MUST be applied to the foliage before infection. The copper ion is absorbed by the germinating spore, and the copper denatures spore proteins and kills the fungus before it infects the plant. Once infection of the tissue has occurred, copper has no effect on the growth of existing lesions in foliage or stems. In other words, once you can see the disease it's too late for copper to control it, at least on that plant.

Because there is no 'kick-back' or curative action, coppers must be applied regularly throughout the production season, beginning BEFORE the disease becomes established in the field. In dry conditions, coppers persists on plant surfaces. New growth would not be covered. Thus, when the foliage is growing rapidly or when there is frequent rain, applications are required more frequently in order to protect the foliage. Using an approved adjuvant or 'sticker' may help the product be more rainfast.

Human Health Hazards

Read the label and follow directions for personal protective equipment, mixing and handling, restricted entry period, and days to harvest. Skin and especially eye exposure is the most serious risk associated with using copper hydroxide. The greatest health risk is to the person who mixes and sprays the material. Proper protective equipment should be worn when handling or applying any pesticide or fertilizer. The required protective equipment is specified on the label: long-sleeved

shirt and long pants, chemical resistant gloves made of any waterproof material such as polyethylene or polyvinyl chloride, shoes plus socks and protective eyewear. You may also want to consider wearing a respirator or at least a dust mask, especially for mixing. In addition, the product generally comes in a paper bag that has a tendency to leak out the seams. It would be wise to put the container in a double plastic bag. The same set of precautions that apply to conventional pesticides should be observed when applying copper.

Workers or pickers who are in the field after spraying could be exposed to treated foliage or fruit and should not enter the field for routine work 24 hours after use. There is 1 day to harvest restriction, which means no fruit can be harvested for 24 hours after a spray. Even after that waiting period, pickers should wear gloves and long sleeves. Tomatoes should be washed before marketing.

Environmental Hazards

Some farmers have expressed concern about copper toxicity in the soil or with respect to soil microbes. Copper is actually a plant micronutrient; that is, it is an essential plant nutrient at low levels. The amount found naturally in soils in MA ranges from 0.1 to 8 ppm. Deficiency is more common than excess in New England soils. Typical levels found in soils submitted to the UMass Soils Lab samples are 0.2 to 0.3 ppm. The desirable level for agriculture would depend on the crop to be grown and other soil factors such as pH. Plant toxicity occurs at 30-60 ppm.

Copper does not degrade in soil or leach into groundwater, but rapidly becomes chemically bound up, especially with organic matter. An application of 1 lb of active ingredient per acre would raise the copper levels an estimated 0.5 ppm. A single application of Nu Cop at 2 lb per acre with 77% AI adds about 1.5 lb copper per acre to the soil, or could raise the concentration in the soil by 0.5 to 0.75 ppm. Soil tests of fields that used copper extensively last season did not indicate excessive accumulation. Depending on the level in your soil, it would take numerous applications over several seasons to exceed the levels that are in the normal range.

The cumulative effect of copper applications might be more of a concern in perennial planting systems. In annual rotational systems, where copper applications might only be made every 4-6 years, copper accumulation is less of a concern. You probably do more damage to the balance of micro flora and fauna in the soil by plowing your fields than you will by applying copper when you need it. Nonetheless, copper use is regulated and certified organic farmers in the US are required to restrict their use of copper products. Regular soil tests should be taken and copper levels in the soil should be monitored. In addition, copper can be very toxic to fish and aquatic organisms, so care should be taken to apply sprays properly and avoid drift and run off.

The role of copper in plant resistance may be a factor in its influence on development of disease. The following was stated in the text Mineral Nutrition and Plant Disease by L Datnoff, W. Elmer, D. Hubner, published in 2008: ‘Copper is an essential nutrient for plant growth and disease resistance, although direct toxicity was long thought to be the mechanism responsible for disease control with copper. Fertilizer and pesticide applications containing Cu can provide effective control of many diseases by stimulating plant disease mechanisms. This aspect of the effect of Cu is frequently overlooked.”

Copper can be an excellent tool in times when there is really no other way to save a crop. It can be dangerous and is not a tool to be taken lightly, but when applied carefully and correctly it has minimal danger to the applicator or the environment. Copper will not save an infected field, but if we see another late blight epidemic like last year’s it may make the difference between acceptable yields and no crop at all.

--R. Hazzard, A. Cavanagh. Sources: Brady, Nature and Property of Soils; A. Barker, Dept PSIS, UMass, Mineral Nutrition and Plant Disease by L Datnoff, W. Elmer, D. Hubner

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.