



UMASS
EXTENSION

Vegetable Notes

For Vegetable Farmers in Massachusetts



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CROP CONDITIONS

The following report was provided by Richard Bonnano, off campus educator for UMass Extension.

Field conditions vary widely throughout the state. In the southeast, heavy rains this week have soaked already wet fields. In the west and northeast, rain has been sparse over the past week. It is not uncommon to find drought conditions and fields still too wet to plant on the same farm. The dryer conditions in most of the state have allowed some much needed field work to be done including cultivating and sidedressing.

In most of the state, many crops are ready to harvest including summer squash and zucchini. Sweet corn harvest is very close for some farmers, although gaps will be common as planting schedules were very disrupted this spring and summer so far. Many fields planted early to greens, including lettuce, have been harvested. Reworking those fields and replanting them to other crops will bring a sense of renewal to farms devastated by spring floods.

The following observations and advice were provided by Jim Mussoni, who scouts crops all across Massachusetts.

Jim reports that people are pretty much caught up and that fields are beginning to dry up. Consequently, irrigation may need to be utilized in the coming days and weeks. Colorado potato beetle is still a problem, since the second generation is now beginning to hatch. Jim found that tomatoes that have not yet been sprayed have early blight; if it hasn't been done already, now would be a good time to begin spraying. Some summer squash has black rot and Jim advises to keep an eye out for phytophthora as well. Beans and eggplants may have infestations of leafhopper, which should be treated if a large population is present.

CUCURBIT UPDATE

Cucurbit conditions are more or less the same as last week, with summer squash and zucchini being harvested and winter squash in varying stages of development. The only real difference is that we saw the first powdery mildew of the season show up in South Deerfield this week. Keep an eye on your squash, and spray at the first sign of the disease. Organic growers can apply a copper

product. Visit www.nysaes.cornell.edu/pp/resourceguide/mfs/06copper.php for more information on which copper products to use. For non-organic growers Cabrio, Flint, and Quadris fungicides all have the same mode of action, and therefore should be rotated with other labeled fungicides such as Bravo, Nova, and Topsin-M to delay resistance. Please consult the *2006-2007 New England Vegetable Management guide* for more detailed information.

-- Andy Cavanaugh, UMass Extension

SWEET CORN UPDATE

European corn borer trap captures are declining from last week- the peak of the first flight seems to be over. In more than one location trap captures were at zero. Scouting has shown that there are still a high number of borers feeding in pretassel and tasseling corn. Many fields are still above threshold and "clean up" from the first generation is needed. All corn where tassels are beginning to emerge from the whorl should be scouted. This is the best stage to control ECB before caterpillars start moving down stalks into the ears. Look for feeding damage, frass or ECB larvae. At 15% of plants infested or more, spray. Scout again 3-4 days after spraying. It may take two sprays 5-7 days apart to bring infesting populations under control. This may be a good time to test out new biorationals (reduced risk) products such as spinosad (Spintor and Entrust, which is organic) or indoxycarb (Avaunt). Both have shown to be effective against ECB and can also be used on cabbage and other brassicas as well as peppers where caterpillars are important pests.

Corn earworm has made appearances in a number of locations. See trap counts on the following page. To be on the safe side, treat silking corn for CEW this week, or if using Zea-later, wait until 5-7 days after 50% of the field is silking.

It is best to monitor for caterpillars in your own fields. CEW traps should be placed in fields where there is fresh silk. Watch for coastal storms which may bring greater numbers up to the Northeast. See the table below for CEW numbers and thresholds.

Some growers were able to hand pick a few ears of sweet corn for the July 4th boom. Some growers are reporting

small ears with unfilled tips. Cool wet conditions for the past few weeks are to blame for the ear length and also for the lack of sales. Hand picking can be costly in terms of labor and discouraging to say the least! Hang in there, the second harvest will be better.

--Amanda Duphily, UMass Extension

Weekly European Corn Borer and Corn Earworm Trap Counts:

Location	Z 1	E II	Total ECB	CEW
Pittsfield	0	1	1	1
S. Deerfield (UMass)	6	1	7	-
S. Deerfield	0	0	0	0
Sunderland	0	2	2	0
N. Hadley	1	11	12	0
Whately	1	5	6	4
Hadley (1)	10	0	10	0
Hadley (2)	0	3	3	0
Feeding Hills	4	6	10	4
Easthampton	1	0	1	4
Dracut	16	22	38	-
Dighton	4	4	8	-
Rehobeth	31	41	72	-
Still River	3	2	5	-
Concord	8	2	10	2
Leicester/Spencer	0	1	1	1
Tyngsboro	1	3	4	5
Coventry, RI	22	18	40	-

Corn Earworm Thresholds:

Moths/Night	Moths/Week	Spray Interval
0-0.2	0-1.4	no spray
0.2-0.5	1.4-3.5	6 days
0.5-1	3.5-7	5 days
1.0-13.0	7-91	4 days
Over 13	Over 91	3 days

Note: spray intervals can be lengthened one day if daily maximum temperatures are below 80 degrees F.

--Thanks to our scouting network: R.Hazzard, A.Duphily, K. Reidel, J.Mussoni, D.Dumaresq, D.Rose, J.Otto, T.Gallagher, J.Golonka, W.Kingsley, P.Willard, G. Hamilton

MANAGING BACTERIAL CANKER IN TOMATO: KEY STRATEGIES

Bacterial canker (*Clavibacter michiganensis* pv *michiganensis*) is one of the most destructive and puzzling tomato diseases in Massachusetts. One grower sets out a vigorous crop of transplants that grows into healthy-looking plants full of green fruit, only to see “marginal scorch”

appear throughout the field and his yields decline despite regular copper sprays. Another has never had it on the farm before, and finds an outbreak that starts in one cultivar and spreads throughout the field. Another has had it for years, and can’t seem to escape it no matter how many different strategies he tries.

Everyone would like a simple answer to the canker problem. There isn’t one. However, in recent years we have seen some growers having more success in bringing this disease under control. Research at several universities is revealing more about how the pathogen may be arriving on the farm and what the critical practices are to keep it under control.

Three key principles for preventing losses to bacterial canker can be summed up as follows:

1. Use disease-free seed
2. Control bacterial populations that may be present on the leaf surface of transplants in the greenhouse.
3. Plant into a clean field.

Each of these protects your plants at a different stage of growth -- and all are important.

Seeds as a source. The bacterial canker pathogen can be seed-borne, both on the surface of the seed and under the seed coat. Although seed companies take many precautions to produce disease-free seed and test seed for the presence of disease, it is possible for some commercial seed to be infected. The bacterial canker pathogen is more difficult to detect reliably than many other disease organisms. According to recent research at the University of Iowa, the limit of detection using standard testing procedures was 1:3,000 to 1:10,000 (one infected seed per 10,000).

One precaution that growers can take to improve the assurance that their seed is disease-free is to use hot-water treated seed. Some companies offer hot water treatment as an option (this includes Johnny’s Selected Seed and Stokes Seed). It is also possible to hot-water treat one’s own seed, but this must be done carefully with the proper equipment. See the fact sheet entitled, *Preventing Bacterial Diseases of Vegetables with Hot-water Seed Treatment* for further details.

If you are concerned about bacterial canker, do your best to ensure that all of the seed you start in your greenhouse is clean --including the plants that are destined to be sold as bedding plants.

Greenhouses: what you can’t see is what you get. Research at the University of Michigan has shown that: 1) the pathogen can move readily from infected plants onto clean plants in the course of regular greenhouse activities, and 2) carryover in the greenhouse from one season to the next may not be as important as was once thought. In

one experiment, seedlings that carried systemic infections with bacterial canker were placed in known locations in a grid of transplants in the greenhouse. Watering was from hand-held sprinklers; no special precautions were taken to prevent disease spread. Plants nearest the infected plants developed bacterial canker symptoms (wilting) and died in the greenhouse. Many other plants showed no symptoms in the greenhouse, but the bacteria could be found residing on the surface of the leaves. When these healthy-looking plants were set out in the field, they developed symptoms during the season and the yield losses were serious. This type of infection -- bacteria that enter from the surface of the leaf through natural leaf openings or wounds -- causes the "marginal scorch" symptoms that are so common in Massachusetts. Once the bacteria enters the plant -- which could occur in the greenhouse or in the field -- it can take anywhere from 7 to 84 days for symptoms to appear.

The second part of this experiment was to leave the weeds and residue in the greenhouse over the winter, and put new, clean transplants into the house the following year. The second crop of plants did not develop symptoms either in the house or the field, and the bacteria was not found on the plants. Does this mean you should stop your greenhouse sanitation practices? No! It is important to use standard disinfectants to clean benches, trays, hoses, etc. But this may not be the most important source of the problem.

If infected plants are present, the movement of bacteria from one plant to another during normal watering, handling, and ventilating activities occurs readily. Controlling the bacteria at this stage can prevent yield losses. Bacteria on the surface of transplants can be effectively controlled by sprays of copper hydroxide or streptomycin in the greenhouse. Kocide DF, Agri-Strep and Agri-mycin 17, and Dithane F-45 are labeled for greenhouse use on tomato.

In another experiment at the University of Michigan, Kocide 40DF, alone or mixed with Dithane F-45, or Agri-Mycin 17 was applied on a five-day schedule from the first true leaf stage until transplanting. Bacteria on leaf surfaces were effectively suppressed. Plants were not sprayed after being set out in the field. Yields of sprayed, exposed transplants were equal to clean plants that were grown in a separate greenhouse and had never been exposed to the bacteria. Unsprayed, infected plants had lower yields.

It is possible that a less intensive spray schedule would have similar results, but this was not tested. In an experiment conducted at UMass in 1994, weekly sprays of streptomycin on greenhouse-inoculated plants eliminated all bacteria on sprayed plants until mid July.

Using bactericide in the greenhouse means a lower volume of chemical is used compared to multiple copper sprays in the field. Check the label carefully for required

REI and personal protective equipment.

Rotate your tomatoes to a different field. Setting clean transplants into a field where canker-infected tomato was grown the previous year will result in early infection with canker and reduced yields. This has been documented by research, and by grower experience in Massachusetts.

Bacterial canker survives in the field as long as there is any infected crop debris. It lasts longer in debris on the surface than it does in buried debris. Plowing after harvest will help to speed up the decomposition. Keep each field out of tomato (and related crops such as potato and eggplant) for two to three years.

We have seen outbreaks of canker where tomatoes are planted in rotated ground that is adjacent to last year's tomato ground. New fields should, as much as is possible, be located at a distance from last year's fields -- as far as possible given the choices available on your farm.

Prevention is cost-effective. All of these tactics focus on prevention -- ensuring that disease-free plants go out into a "clean" environment. Bacterial canker outbreaks in the field require regular sprays with a copper or copper/maneb mix, with limited success. Prevention strategies are both the least expensive and the most effective way to "beat bacterial canker".

Chemical recommendations:

- acibenzolar-S-methyl (Actigard 50 WG): 0.3 to 0.75 oz/A (14 dh, REI 12 h). Do not apply more than six times per crop season or on less than a 7 day schedule. Under certain conditions, this product, when used on tomatoes, may lead to reductions in yield.
- copper hydroxide (Champ, Champion WP): 4 tbs/1000 sq ft (0 dh, REI 24 h). Greenhouse and Shade house crops .Begin applications when disease first threatens and repeat at 7-10 day intervals as needed. Do not apply in a spray solution with pH less than 6.0 or phytotoxicity can occur.
- copper hydroxide (Kocide 2000, KOP-Hydroxide): 1.5 to 3.0 lb/A (0 dh, REI 24 h). Begin applications when disease first threatens and repeat at 5-10 day intervals. Use higher rates when conditions favor disease development.
- copper salts of fatty acids (Tenn-Cop 5E): 3 pts/A. (0 dh, REI 12 h). Apply at the first sign of disease and repeat at 7-10 day intervals. Enhanced control obtained by tank mixing with Manzate 75 DF. Avoid spray solution with pH of less than 6.5 as phytotoxicity may occur.
- copper sulfate monohydrate, tribasic (Basicop): 2-4 lb/A (0 dh, REI 24 h). Begin when disease normally appears and repeat at 7-10 day intervals. Use higher rate when disease pressure is heavy.
- ethylene bisdithiocarbamate plus manganese plus zinc

(Manzate 75 DF): 0.75-1.5 lb/A (5 dh, REI 24 h). Start applications at transplant. Repeat at 3-7 day intervals throughout season. Do not apply more than 22.4 lbs per acre per crop.

- mancozeb plus copper hydroxide (ManKocide): 2.5 to 5.0 lb/A (5 dh, REI 24 h). Begin applications when disease threatens and repeat at 7-10 day intervals as needed. Use higher rates and 3-7 days when disease pressure is severe.
- streptomycin sulfate (Agri-mycin 17): 200 ppm (REI 12 h). Use only up to transplant.

The information in this material is for educational purposes. The recommendations contained are based on the best available knowledge at the time of printing. Any reference to commercial product, trade or brand names is for information only, and no endorsement or approval is intended. The user of this information assumes all risks for personal injury or property damage.

-- Ruth V. Hazzard, Robert L. Wick, and M. Bess Dicklow

SUMMER COVER CROPS

I know this is not the usual time to be thinking about cover crops, but it should be any time of the year you have bare ground for an extended period of time. This could be land that you were not able to put a cover crop on last fall or land that might be coming out of production with spring crops like lettuce. If you do not plan on double cropping you should think about putting down a cover crop. Many growers are in the habit of leaving fallow land until September when they will seed it with winter rye. Seeding a cover crop now will produce lots of organic matter; add soil nitrogen (if you use a legume) and help to keep weeds from going to seed. All of the cover crops mentioned above will perform much better if they are seeded with a grain drill.

Here are some options:

Oat - This is a very useful cover crop for us in Massachusetts. Unlike winter rye, oat will grow very vigorously and straight up when seeded in the spring or summer. We frequently seed this cover crop during the summer months at the Research Farm in S. Deerfield on land that is not in production. It is readily available, but beware that you do not get oats that have been cooked (used for animal feed). Oat seeded this early will probably produce viable seed before frost. For this reason you might want to incorporate it (or simply mow it) before it goes to seed. Seeding rate is 100 lbs/acre.

Sorghum x sudangrass - As the name implies, this cover crop is a cross between sudangrass and forage sorghum. Different companies use different trade names ('sudex' being one). One nice characteristic of this cover crop is that it

produces a sterile seed so there is no concern of it re-seeding. This plant is frost sensitive, so it can be seeded any time now. If you have land that you are trying to 'build up' this is a good choice since it produces a tremendous amount of organic matter. When seeded in mid-June it can get eight feet high by the fall. We did some work at the UMass Research Farm demonstrating that the addition of a small amount of nitrogen at planting can produce a much bigger plant. I would not apply more than 50 lbs/acre. Sorghum X sudangrass does not grow well at low pH. Do not plant after July since it will die with a frost and not grow enough to justify the cost of the seed. There has been some concern about how to manage sorghum x sudangrass in the fall. My experience with this cover crop was that it was not difficult to manage, however you may want to seed a little of it the first time in order to get some experience with it. It will die with a hard frost. You can either leave it until the following spring or incorporate it after a frost and seed rye. After a hard frost I let the plant residue dry down and then mowed it with a brush hog and then disked it in to seed winter rye. Seeding rate: 40 - 50 lbs/acre.

Hairy Vetch - Hairy vetch is a cover crop that is being used by a lot of growers in the late summer and fall. This crop can also be planted in the spring and early summer and will do well. When vetch is seeded this early it will not usually survive the winter (whereas it will survive the winter when seeded in late August or September). The following spring the nitrogen from the dead vetch will become available, so this is when we want the cash crop in the ground to be able to take up the available nitrogen. It can be seeded alone or in combination with oat. Seeding rates: 25-30 lbs/acre (using a grain drill); 35-40 lbs/acre (broadcast); 40 lbs/acre of oat when seeded with vetch.

Buckwheat - This is another cover crop that growers will seed in the summer months. It is frost sensitive so it can be planted any time now. It is used by some growers to suppress weeds since it grows very quickly, however it will not add much organic matter. Be sure to mow or incorporate before it goes to seed. Seeding rates: 60 - 70 lbs/acre.

-Frank Mangan, Department of Plant, Soil and Insect Sciences, University of Massachusetts

ORGANIC GROWING, TRANSITIONING AND CERTIFICATION

Here at the University of Massachusetts Vegetable Extension Program we continue to do research on organic methods of insect control in various crops, most notably sweet corn. Moving forward with the times, the University of Massachusetts Agricultural Research Center in South Deerfield, Massachusetts has 6 acres of transitional organic land. The following is a list of some of the resources we

have found to help us in our management of this land and in growing crops organically.

There are some great resources out there for growers on organic growing, organic Certification, and transitioning fields to organic. Some are local in scope, while others are national. The best way to obtain a lot of information in a little amount of time is to get online and browse some websites. For Massachusetts growers seeking certification one place to start is **Baystate Organic Certifiers**, the official organic certifier for Massachusetts; check out their website at www.baystateorganic.org, email them at baystateorganic@earthlink.net, or call Don Franczyk at (978) 297-4171.

The **Northeast Organic Farming Association** (NOFA, www.nofa.org) has winter and summer conferences every year, as well as informational material on growing organic crops. There are NOFA chapters in most of the Northeastern states. For more information on NOFA/Mass and available publications direct your request to:

NOFA
Massachusetts Chapter
411 Sheldon Rd
Barre, MA 01005
(978) 355-2853.
www.nofamass.org

For information on organic practices and transitioning to organics contact:

Ed Stockman
NOFA/Mass Organic Extension Educator
413-634-5024
stockman@bcn.net

The **Northeast Organic Network** (NEON, www.neon.cornell.edu), is a “consortium of farmers, researchers, extension educators and grassroots nonprofits working together to improve organic farmers’ access to research and technical support.” Their website includes a Who’s who guide to Northeast Organic farming expertise (www.neon.cornell.edu/whoswho/alpha.html). The site also includes their *Resource Guide for Organic Insect and Disease Management* (www.nysaes.cornell.edu/pp/resourceguide/). For those of you who do not use computers a limited number of guides can be purchased for \$19 (including shipping) from the New York State Agricultural Experiment Station (NYSAES). Send request and payment to:

Gemma Osborne
NYSAES
630 W. North Street
Geneva, NY 14456
phone: (315) 787-2248.

The NEON website also has many useful links and materials on organic farming that are part of a training

curriculum developed with SARE (Sustainable Agriculture Research and Education) funding (www.neon.cornell.edu/training/resources.html).

Another useful resource is ATTRA- the **National Sustainable Agricultural Information Service** (www.attra.org). It was created and is managed by the National Center for Appropriate Technology (NCAT) and is funded under a grant from the United States Department of Agriculture’s Rural Business-Cooperative Service to provide information and other technical assistance those involved in sustainable agriculture. Many publications are available through the website or by contacting the organization at:

ATTRA - National Sustainable Agriculture Information Service
P.O. Box 3657
Fayetteville, AR 72702
800-346-9140 (English) 7am to 7 pm Central Time
800-411-3222 (Español) 8 am to 5 pm Pacific Time.

The **Organic Material Review Institute** (OMRI, www.omri.org) can also be an important resource for growers, providing guidance on the suitability of material inputs in organic in light of the USDA National Organic Program standards. OMRI is a 501(c)(3) nonprofit organization that reviews substances for use in organic production, processing, and handling, and publishes the OMRI Generic Materials List and the OMRI Products List. Materials on these lists can be used in organically certified operations.

Back to the local resources, the Vermont Vegetable and Berry web site (www.uvm.edu/vtvegandberry) has many links to organic farming information, as well as fact sheets on organic production.

The New England Extension Systems’ *2006-2007 New England Vegetable Management Guide* includes information on organic vegetable production. The guide, including a photo ID supplement is available for viewing online (www.nevegetable.org) or for purchase through the:

University of Massachusetts Outreach Bookstore
101 University Drive
Suite A4
Amherst, MA 01002-2385
(413) 545-2717.

--Pam Westgate, UMass Extension

PLECTOSPORIUM BLIGHT OF CUCURBITS

Plectosporium blight (*Microdochium blight*) caused by *Plectosporium tabacinum* (*Microdochium tabacinum*) was first observed in Tennessee in 1988 and has since been reported throughout pumpkin growing regions of the United States. The most susceptible cucurbits to Plectosporium blight are pumpkin, yellow squash, and zucchini.

Plectosporium tabacinum is a common fungus in the soil and on decaying plant material and is favored by warm, wet weather. The spores are spread by rain-splash and wind. Many strains of the fungus are weakly parasitic.

The fungus infects stems, leaf veins, petioles, and fruit causing light tan to bleached, sunken, spindle-shaped lesions. Initial lesions are small, but they soon coalesce and the entire surface of a stem or leaf vein turns white. Infected stems are dry and brittle. Severely infested leaves can die and result in complete defoliation. On fruit, *P. tabacinum* causes white, tan, or silver russetting which can merge to form a continuous dry, scabby surface.

Management

- When Plectosporium blight occurs, rotate away from summer squash and pumpkins for two years.
- Choose sunny, well drained sites for cucurbit production.
- No resistant cultivars of pumpkins have been reported.
- Scout for disease and apply protectant fungicides when the disease first occurs. The disease is readily controlled by fungicide applications. Thorough coverage of foliage, vines, and fruit is necessary for good control.

Chemical recommendations:

- azoxystrobin (Quadris): 11.0 to 15.4 fl oz/A (0 dh, REI 4 h). Apply at the first sign of disease and repeat with a fungicide other than a strobilurin in 7-14 days. Do not rotate with Flint or Cabrio.
- chlorothalonil (Bravo): 1.8 to 2.7 lb/A (0 dh, REI 12 h). Apply when conditions are favorable for disease development. Repeat no sooner than a 7 day interval. Do not apply more than 19.1 lb/A per growing season.
- maneb/ mancozeb (Maneb, Penncozeb, Manzate Dithane): Rates vary depending on formulation. See label. (5 dh, REI 24 h).
- pyraclostobin (Cabrio EG 20 %): 12 to 16 oz/A (0 dh, REI 12 h). Apply at the first sign of disease and repeat with a fungicide other than a strobilurin in 7-14 days. Do not rotate with Flint or Quadris.

-- M. Bess Dicklow, UMass Extension

PRE-SIDEDRESS NITRATE TEST: NOW IS

THE TIME FOR SAMPLING

Many crops have reached or will soon reach the stage when it's time to decide whether, and how much nitrogen to apply as a side dress or top dress. The pre-sidedress nitrate test (PSNT) (also known as the June Nitrate Test) can help you to determine the current level of nitrogen in the soil. If you have a soil probe, the sampling takes about 20 minutes per field. (Probes are available from many ag suppliers for \$40 to \$75.) The amount of nitrate-N (reported as parts per million N03-N) in the soil is a good indicator of whether more N will be needed to complete crop growth.

To take a sample for nitrate testing, take 15 to 20 subsamples or cores from the field. Sample slices or cores should be taken to a depth of twelve inches if possible. Avoid sampling fertilizer bands or other areas, which have high concentrations of N fertilizer. Generally the best place to sample is between the rows. If plastic mulch is used, samples should be taken from under the plastic. With a soil probe you can just sample through the plastic, leaving small holes that cause no problem. Be sure to avoid any trickle irrigation tape under the plastic. Mix all the samples together and submit about one cupful to the UMass Soil Testing Lab, West Experiment Station, University of Massachusetts, Amherst MA 01003. You may contact the soil testing lab (413) 545-2311 or consult their website at www.umass.edu/plsoils/soiltest

Cloth bags are ideal for sending PSNT samples to the Soil Testing Laboratory. These bags are more convenient to use because it is not necessary to dry the samples, as long as the laboratory receives them within four days. With plastic bags you should dry the samples unless you can deliver them within 24 hours, and ship overnight, or next-day delivery. The lab will do the PSNT within one working day of receipt and inform you of the results. The charge for this test is \$6.00 (include a check made out to the University of Massachusetts). Be sure to request a Nitrate (PSNT) test. Frank Mangan (978-422-6374) is available to consult with growers about the test results.

The PSNT is a tool growers can use to optimize Nitrogen application. Research conducted for several years at UMass, along with several years of on-farm experience, indicates that an appropriate threshold for peppers and winter squash is about 30 ppm nitrate-N. Above this level, side-dressing or topdressing supplemental N would be of no value and will likely decrease yield of butternut squash and peppers. Research in Connecticut has shown similar results in pumpkins. There is increasing agreement that a threshold of 30 ppm is appropriate for most vegetables except for sweet corn, for which the threshold is 25 ppm. Using the

PSNT can save money and time, improve crop yield, and reduce the likelihood of N leaching and water contamination. Barring unusual weather conditions, PSNT levels in a field tend to be fairly consistent from year to year. Once these values are known for a field, a grower probably does not need to test every year. As a tool, the PSNT should be used along with a grower's experience and knowledge of fields. Interpretation of PSNT results should be made with regard to weather conditions such as leaching rains or soil temperatures.

--John Howell, Frank Mangan, and Ruth Hazzard,

UPCOMING TWILIGHT MEETINGS

Massachusetts

•Tuesday July 18th 2006

Twin Oaks Farm, 116 Stockbridge Rd. Hadley, Ma. This twilight meeting will be hosted by Edwin and Joe Matuzsko along with Linda Kingsley, from 5pm-8pm. Topics include: new or specialized equipment, packing and storing facilities, growing and selling minor crops, IPM in peppers, managing phytophthora blight through rotations and water management, and more. Contact Ruth Hazzard at (413) 545-3696 for more information. Also for directions and more information, see the June 22, 2006 Vegetable Notes Newsletter, available online in the newsletter archives, at <http://www.umassvegetable.org/newsletters/archived.html>.

•Wednesday July 26th 2006

Renewable Energy Series. Solar Energy, at Riverland Farm in Sunderland, from 4pm-7pm. Hosted by Scott Reed. Topics include: the installation process, using solar electric systems to power drip irrigation, using solar power to pump water and for electric fencing, and getting started, getting funded, getting power.

•Thursday September 7th 2006

Renewable Energy Series. Wind and Solar Energy, at Lion Spring Farm, Dover, from 3pm-6pm. Hosted by Bob Loebelenz. Topics include: state funding opportunities for renewable energy, small wind turbines for farms and greenhouses, and more.

•Wednesday October 4th 2006

Renewable Energy Series. Field Corn Biomass for Heating Greenhouses, at Kosinski Farm, Westfield, from 3pm-6pm. Hosted by Mike Kosinski. Topics include: cutting energy costs with renewable energy, growing and selling corn for energy use, benefit of burning corn, and more.

For more information on the Renewable Energy Series twilight meetings, contact:

Ruth Hazzard (413) 545-3696 or

Tina Smith, (413) 545-5306

New Hampshire

•Wednesday July 12th 2006

Tree Fruit Twilight Meeting Windy Ridge Orchard, North Haverhill, NH. The NH Fruit Growers Association is sponsoring this commercial tree fruit growers twilight meeting with University of Vermont. UVM and UNH Cooperative Extension Specialists will be discussing pest management options and orchard management. For more info, contact Tom Buob at (603)787-6944. TF, PAT credits.

•Thursday July 20th 2006

Fruit & Vegetable Twilight Meeting, Perkins Farm, Plymouth, NH. For more info, contact Tom Buob at (603)787-6944. V, PAT credits.

•Wednesday August 9th 2006

Tree Fruit Twilight Meeting, UNH Woodman Horticultural Research Farm, Durham, NH. Topics will include assessing damage for crop insurance claims and cultural practices to reduce risks. For more info, contact George Hamilton at (603)641-6060. *TF, PAT credits.

•Thursday August 24th 2006

Vegetable Twilight Meeting, Kieth Farm, N. Haverhill, NH. more info, contact Tom Buob at (603)787-6944. V, PAT credits.

•Thursday September 14th 2006

Vegetable and Tree Fruit Twilight Meeting, UNH Woodman Horticultural Research Farm, Durham, NH. Topics will include UNH-bred pumpkin and winter squash varieties, apple scab management, and much more. For more info, contact Becky Grube at (603) 862-3203. V, TF, PAT credits.

Vegetable Notes, Ruth Hazzard, editor and Kate Reidel, Assistant Editor. *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.

Where trade names or commercial products are used, no company or product endorsement is implied or intended. Always read the label before using any pesticide. The label is the legal document for product use. Disregard any information in this newsletter if it is in conflict with the label.

