UMASS EXTENSION

Vegetable Notes

For Vegetable Farmers in Massachusetts

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In this issue:

Crop conditions

Welcome to the 2008 UMass Vegetable Notes! We'll be publishing twice in May, then weekly all summer. An extended warm spell in the second half of April dried out fields for soil prep and early planting, and gave the season a boost. This was good news in a year when the high price of inputs is a challenge for every grower. Harvest of asparagus began a few days early. Early sweet corn under plastic may have broken some records for planting date. Fortunately early corn is still under plastic and should survive the hard frost (maybe better termed a freeze) that heralded the first hours of the month of May. Other crops may not be so lucky: fruit buds may have been damaged, and any above-ground asparagus spears were killed.

Greenhouses play a big role in vegetable production at this time of year. We have observed green peach aphid outbreaks in houses that were transitioned from overwintered greens into spring transplants without a break. Aphids can also be a problem in greenhouse tomatoes. An excellent fact sheet about aphid biocontrol can be found at www.omafra.gov.on.ca/english/crops/facts/06-081.htm. Regular updates on greenhouse issues can be found at the New England Greenhouse Update (http://www.negreenhouseupdate.info/index.php). Is the bill for greenhouse heat threatening to drive you out of business? Check out the article on opportunities for using shelled corn (and other locally grown biofuels) as a practical alternative.

-R. hazzard, UMass Extension

New England vegetable management guide

Have you purchased your 2008-2009 edition of the New England Vegetable Management Guide yet? If your barn or truck is carrying an older edition, you are missing a lot of up to date information! As always, all pesticide information has been updated. The vegetable bedding plant and irrigation sections were updated and expanded, and new information about IPM for each insect was added. New crops have been added, including basil, mesclun, sweet potato, and okra. To assist organic growers in selecting approved pesticides, all materials which are approved for use in organic production are identified as "OMRI listed." The Northeast Pest Identification Guide has twice as many photos and is bound with the Management Guide for easy reference. Contact the UMass Extension Bookstore at 413-545-2717 or online at http://umassextensionbookstore.com/catalog/.

Asparagus: beetles and frost

Welcome May! A heavy frost hit much of the state in the first hours of the month of May, killing asparagus spears that were out of the ground. Trim off the dead spears and keep picking. Temperatures reached the mid to upper 20's. Growers began harvesting a few days early this year, around April 24, but harvest has not reached full steam yet.

Common asparagus beetles will show up soon. The spotted asparagus beetle tends to become active somewhat later in the spring. These two beetles are closely related and have similar life cycles but it is the common asparagus beetle that is most damaging to the cut spears.

Common asparagus beetle (*Crioceris asparigi*) is blue-black, shiny, smooth and about 6 to 9 mm (1/4 inch) long, with three large yellow, squarish spots with red margins along each wing cover. (see photo). Eggs are black, laid standing on end in rows along the spears, and hatch in 3-8 days. Larvae are wrinkled, plump, hump-backed, and dull gray with black head and legs. They grow up to 1/3 inch. These larvae feed in spears and in fern. Eggs and larval damage makes spears unmarketable. Larval feeding damage in the ferns can cause sever defoliation and weaken the stand. When full grown, larvae drop to the soil and pupate underground. New adults emerge in July, feed in ferns, and by September are looking for overwintering sites.

Spotted asparagus beetle (Crioceris duodecimpunctata) is reddish orange or tan, with six black spots on each wing cover (hence its other name, 12-spotted asparagus beetle). Eggs are greenish, glued singly on their sides to leaves. Eggs are laid on fronds, not on spears. Larvae are similar to those described above, but are orange colored, and feed almost entirely inside the berries so they affect seed production but do not hurt the plants.

Grey larvae of the common asparagus beetle.

Winter habitat: Both species spend the winter as adult beetles either in field borders or within the asparagus field. Sheltered sites such as under bark or in the stems of old plants are preferred. Some burrow into the soil.

Life cycle: Beetles feed as soon as they become active, and begin laying eggs after several days of feeding. Eggs hatch in 3 to 8 days depending on temperature. Larvae feed for 10 to 14 days, molt four times, then crawl into the soil to form chambers in which they spin cocoons and pupate. After 5 to 10 days, new adults emerge. There are probably two generations in this part of New England.

Scouting: At this time in the season, look for adult beetles, for feeding damage and for eggs laid on spears. Michigan State recommends a treatment threshold of 5-10% of the plants infested or 1-2% of the spears with eggs or damage.

Common asparagus beetle adult

Cultural and biological controls: This time of year you can greatly reduce the population by harvesting all of the spears every day. Pick the field clean to reduce the number of stems where eggs will survive long enough to hatch and grow up into summer-generation beetles. If you harvest all of the spears right to the ground during the harvest period you will starve many of the beetles and fewer will make it to the time you stop harvesting and let the fronds grow. In the fall remove all of the crop residue and other refuse nearby that may provide shelter for adults over winter, by disking lightly or burning stalks and fronds.. Maintaining a clean environment in the fall will force beetles to seek shelter outside the field or burrow in the soil, where many predators reside.

The most important natural enemy of Common asparagus beetle is a tiny parasitic wasp (*Tetrastichus asparagi*) that attacks the egg stage. Wasps kill eggs by feeding on them (sucking them dry), and also lay their own eggs inside the beetle eggs. The immature wasps grow inside the beetle larvae, killing them when they pupate. Studies have found >50% of eggs killed by feeding and half of the surviving larvae parasitized. Providing a nearby nectar source such as umbelliferous flowers may enhance wasp populations.

Mointoring and chemcial control: Scout fields regularly. Treat spears if >10% of the plants are infested with beetles or 2% have eggs or damage. The daily harvest makes treatment difficult; 1 dh products are available and can be used immediately after picking to allow harvest the following day (Pounce 3.2 EC, Lannate LV, Sevin XLR Plus; see 2008-2009 New England Vegetable Management Guide) although some growers seek to avoid applications during harvest. More selective products (Entrust, Spintor 2EC) may be used on fronds after harvest; treat ferns if 50 to 75% are infested. Organic options on spears include Surround WP as a repellent, Pyganic EC5.0, or products containing capsaicin (check for certification status).

Growers I've spoken with report that treatments on spears are needed not more than one or two times per season, and not every season. Treated spears were washed before sale.

-R Hazzard. References: Handbook of Vegetable Pests by John Capinera; 2008-2009 New England Vegetable Management Guide;

WHAT YOU'LL NEED TO START A SCOUTING PROGRAM

Are you interested in starting your own sweet corn IPM program this year? If so now is the time to start ordering supplies you will need to get started for the 2008 season. Throughout the season, trap captures and field infestation levels can be very different from one location to the next. By monitoring flight patterns and caterpillar activity on your own farm you may be able to save yourself some time, money and stress! Now it is easier than ever before to get you own scouting kit that will get you started with traps and lure for an entire season by requesting the New England sweet corn scouting kit from Great Lakes IPM. By ordering the kit, you will have everything you need to start monitoring for the typical pests of sweet corn including European corn borer, corn earworm and fall armyworm. Soon to be included in the kit is a free UMass Vegetable Program publication entitled Using IPM in the field a Sweet Corn insect field Management Guide along with a record keeping book. Our hope is that through the availability of the kit and scouting tools, more growers will adopt scouting programs of their own and see the many benefits a scouting program can have. For information on how to set up a scouting program feel free to contact Amanda Brown, UMass Vegetable Extension Program at 413-577-3976 or visit the Great Lakes IPM website at www.greatlakesipm.com. Specifics on ordering information is below or inquire about the New England sweet corn scouting kit when you call.

The following items are available from:

Great Lakes IPM, Inc.
10220 Church Rd NE
Vestaburg, MI 48891
989-268-5693/989-268-5911 phone
800-235-0285/989-268-5311 fax
e-mail: glipm@nethawk.com
www.greatlakesipm.com

Below is a list of the traps and lures that will be included in the New England Sweet Corn Kit, which provides 2 traps for ECB, 2 traps for CEW, 1 trap for FAW and enough lures for one season (16 weeks for ECB, 10 weeks for CEW and FAW), for a package price of $265. Store lures in the freezer until use; if kept in the freezer, lures will stay fresh for many years. Brands listed have proven reliable in the New England. The thresholds listed in this guide are based on using these trap and lure combinations.

1. Scentry Helitothis net traps for monitoring both European corn borer (2 traps) and corn earworm (2 traps) (total: 4 traps)
2. Universal Moth Trap for monitoring fall armyworm (1 trap)
3. Trécé lures for European corn borer (Iowa strain, IA or ZI; and New York strain, NY or EII)
4. Scentry lure for Fall armyworm (type: 2 component PSU lure)
5. Hercon lure tape for corn earworm
6. Hercon vapor tape for Unitrap

-A. Brown, UMass Extension

BIOLOGICAL CONTROL OF ECB WITH TRICHOGRAMMA OSTRINIAE IN SWEET CORN: BE READY FOR EARLY RELEASES!

A tiny wasp – smaller than the dot at the end of the sentence – that will search out and kill the egg masses of one of our major sweet corn pest – can this really work? A number of sweet corn growers around the state have been testing Trichogramma ostriniae* parasitic wasps over the past five years and have found that they do help to control European corn borer (ECB) in both corn and peppers. The use of these wasps in commercial sweet corn fields in Massachusetts has resulted in the reduction or elimination of foliar insecticide sprays, saving time, labor, pesticides, and fuel, reducing soil compaction, and maintaining and improving ear quality. This method is an ideal IPM practice because it prevents the

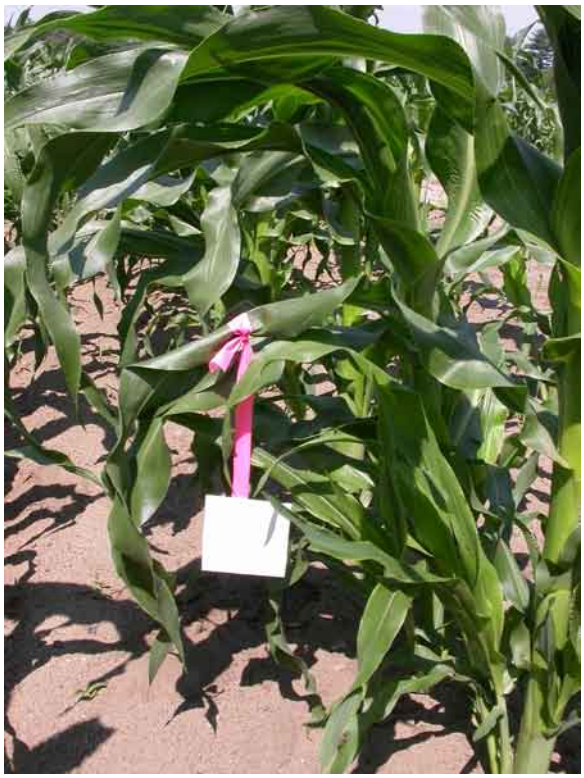
emergence and feeding of caterpillars in the first place, as opposed to rescuing the corn with sprays after the caterpillars have become a problem. Using Trichogramma to control ECB in early corn (corn to be harvested in July) is especially useful because timing sprays in the early corn can be tricky. Also, most of the caterpillar damage in early sweet corn is from ECB - thus, wasp release control measures are not complicated by the need to control other major caterpillar pests. Trichogramma can also be used for second generation ECB, which attacks both peppers and corn.

The UMass Vegetable Program will continue to work with growers this summer to learn how to use these wasps. We also encourage growers to purchase them on their own from the sole commercial supplier, IPM Laboratories. Order now to release when corn borer flight starts – which will likely be the last week of May in the warmer parts of the state! See below for details.

ECB egg mass:
Trichogramma wasp on ECB egg mass.
Photo

Biology

Trichogramma species are tiny parasitic wasps, smaller than the period at the end of this sentence. Female wasps lay their eggs in the egg masses of host insects. Trichogramma larvae feed and pupate inside the egg, killing the egg and preventing hatch. Trichogramma ostriniae lays its eggs in ECB egg masses. As they mature, unparasitized ECB egg masses turn from a cream color to white, to white with a black head mass in the center of each egg. When parasitized by Trichogramma, the entire egg turns black. T. ostriniae have excellent dispersal and ability to search for egg masses in the field. They do not overwinter but they will reproduce and contribute to the control of ECB throughout the season.



Card hanging on corn.

Release timing

While some native species of Trichogramma persist in the wild, T. ostriniae need to be reared at an insectary, shipped to the farm and released each season. Since Trichogramma control ECB by parasitizing egg masses, knowing when to release the wasps requires knowing when the ECB moths are laying eggs. Thus, knowing when ECB flight begins, reaches a peak, and ends in a given field is key to the proper timing of Trichogramma releases. You can use regional information about flight activity; however, to get the best coordination of timing on your farm, we recommend that you monitor ECB flight in your own fields.

ECB moths have two generations per growing season in Massachusetts; the first one emerges in late May or early June, while the second generation begins to emerge in late July and early August. Time the first release of T. ostriniae to the beginning of ECB egg laying, which will begin within a week after the first ECB moths are caught in traps. If the corn is less than 6 inches high, you may want to wait a few days. For corn maturing in the middle of moth flight, target releases to corn that is in the 4-6 leaf stage (12-16 inches tall).

To help align the concentrated presence of T. ostriniae with ECB host egg laying we recommend two to three releases, each approximately 7 days apart. Our current recommended release rates in early corn are 60,000 wasps per acre per release.

Degree days (DD) can help with timing. Using a base temperature of 50 degrees F, the first spring moths will emerge

at 375 DD50 (when Spiraea x vanhouttei in full bloom), and the first eggs are laid at 450 DD50 (Pagoda dogwood late bloom). Eggs require 100 degree days to hatch. Releases should be made when eggs are in the field, but before eggs hatch.

Handling Trichogramma

Trichogramma are shipped from the insectary as pupae inside protective cards. They are ready to emerge upon arrival, although there will be a range of pupal age so they will emerge gradually, over 1-7 days, depending on temperature. It's best to put the cards out in the field the same day as they arrive. If you cannot release them upon their arrival, keep the cards in their shipping box in a cool location at about 50°F – not in the refrigerator! The insects are alive: avoid exposing them to extreme temperatures (below 40°F or above 90°F) so they will still be alive and in good shape when you put them in the field.

Releasing Trichogramma

Place the proper number of cards to provide the desired release rate in the center of the field, or at regular intervals through the field, away from the field edges. Trichogramma wasps will disperse well throughout the field- one to four release sites per acre is adequate. Tie cards securely to corn leaves or on a stake. Do not put them on the ground. Leave the packet stapled shut so that other insect predators do not consume them.

ECB white and black egg mass:
Healthy ECB egg masses are white, then develop tiny black spots which are the head capsules of soon-to-hatch caterpillars. Parasitized egg masses turn uniformly black when T. o. pupate inside.
Photo by Sylvie Chenus, Cornell University.

Scouting release fields

Where Trichogramma has been released, you can scout as usual. Eggs that were parasitized and did not hatch will never reach the larval stage, resulting in a lower rate of infestation with caterpillars. Use the standard ECB threshold (15% infestation in caterpillars or fresh damage) to decide whether to spray.

Spraying release fields

T. ostriniae will suppress ECB, but will not always provide complete control. In addition, an early corn earworm flight may arrive during silking. Thus, insecticide applications may still be needed to achieve high levels of clean corn. Use selective insecticides with low impact on natural enemies (aka beneficials). Trichogramma that are inside host eggs are somewhat protected from the spray and many will survive, but adult wasps may be killed by insecticides that are harsh on beneficial organisms.

Ordering Trichogramma

Trichogramma ostriniae may be ordered from IPM Laboratories in Locke, New York; 315-497-2063 www.ipmlabs.com (see article below). Order well in advance; it is a good idea to call IPM Labs with a general order in the early spring. Tell them the expected acreage, release rate and dates of release. A more specific date and amount can be ordered closer to the release time, but expect a 2-week turn around.

*(pronounced ah-STRIN-ee-ay)

-Ruth Hazzard and Pamela Westgate, Extension Vegetable Program, University of Massachusetts-Amherst

ORDER TRICHOGRAMMA NOW FOR RELEASE IN EARLY CORN!

A reliable commercial source of Trichogramma ostriniae for European corn borer control is now available. IPM Laboratories, Inc. is rearing the wasps themselves and will ship for weekly release. T. o come as parastitized eggs of another host, in the pupal stage. These tiny dark pupae are glued onto a card so the adults will emerge in the field – ready to go out in search of ECB egg masses!

IPM Labs can produce cards with 15,000 per card for those who wish it. This would mean using two cards per acre for the 30,000/acre release rate, or 4 cards per acre for 60,000 release rate. Cards can be spread out through the block of early corn. The cost for 30,000 is $14.95 with discounts for volume orders within the same shipment. The discounts start at 300,000 eggs ($13.80 per 30,000). 300,000 eggs would be 20 cards, enough for 5-10 acres depending on release rate).

Order now (Ph 315 497 2063) for release at the last week of May or first week of June! Carol Glenister prefers to get the orders when the corn is planted, since she has to raise the parents prior to producing the product to ship, which requires ordering in the eggs for the parents 2 weeks before she begins parent production. So the more orders that that she can forecast with early in the season, the more likely she will be able to fill whatever orders come in. People can forecast their orders and call and shift them forward or back. Also she will try to accommodate other orders as she can.

On the shipping, it is usually priority mail and in the $5.65 range for packages that can be tracked. First class mail is a possibility, but untracable once sent, so we are steering away from that.

-Carol S. Glenister, Entomologist. IPM Laboratories, Inc, Locke, NY, 13092. Ph 315 497 2063; Fax 315 497 3129; carolg@ipmlabs.com

BUILDING MODEL NETWORKS AMONG DAIRY, VEGETABLE AND FLORICULTURE OPERATIONS TO GROW AND USE SHELLED CORN FOR GREENHOUSE HEAT IN MASSACHUSETTS

In spring 2008, UMass extension is beginning a project that will focus on using locally grown shelled corn as an alternative fuel to heat greenhouses. Corn is a renewable heat source that can be grown and used in Massachusetts more cheaply than fossil fuels, using available and proven technology. The production of shelled corn for feed was largely abandoned in New England because of cheap corn available from the Midwest. As the cost of corn from outside the region rises along with fossil fuels, the equation shifts. Several dairy and vegetable farmers who have returned to the production and use of shelled corn for feed and/or for heat are finding a positive net income from their investments. Former and current dairy farmers can use or sell shelled corn for either feed or fuel. Vegetable farms that have started growing grain corn find benefits to their crop rotation systems, reduced costs of fuel for their greenhouses, as well as a new crop to sell. However, barriers in equipment, knowledge and marketing links need to be overcome to bring this fuel into more widespread use. Producers need to be assured of a market, users need to know there will be adequate supply, and both need to know that the system will be reliable, profitable and sustainable. This project will help develop the necessary links between producers and users, and will evaluate the cost and benefits for both.

Benefits of using shelled corn. At current prices, corn compares very favorably with the standard fossil fuels that are used for greenhouse heat (see Table 1). Changing to energy sources that can be produced locally, travel a short distance from producer to user, and that have a high ratio of energy output to fossil fuel input is key to a viable future for farming in Massachusetts. While shelled corn is not the only renewable fuel option available, we believe that it is an important one. Growers who shift to a source of carbon that is sequestered from sunlight and burned for fuel on an annual basis can reduce the load of carbon dioxide emissions from fossil fuels and reduce our reliance on foreign sources of petroleum. These growers can also reduce their own fuel costs, and by purchasing a locally produced fuel, will provide increased revenues for farms that grow this new crop. If this system meets expectation, it will be a win-win economic development for both producers and users of shelled corn.

Although shelled corn is certainly not the only viable or promising choice as a source of biomass for fuel, it does have many advantages. It is one of the most clean-burning fuels, producing few particulates, no carbon monoxide and virtually no environmental pollution. Corn sequesters carbon in a single growing season, making rapid use of solar energy. The ratio of fossil fuels invested (as fertilizer and fuel to grow, harvest, dry, store and transport) for energy gained (as BTUs of heat) ranges from 1:5 to 1:10 depending on yield, quality, weather and other factors. Fertilizer inputs can be partially offset with organic sources such as manure and legume cover crops. When grain is harvested, over half of the biomass is re-

Table 1. Heating Fuel Cost Analysis Massachusetts April 2008

Fuel Source	BTU's /unit	Units/Million BTU	Fuel Price/ unit	Cost per Million BTU's	Efficiency	total cost/ million BTU's
Shell Corn	**7500** lb*	133.33	$0.09	$12.00	75.00%	$16.00
Electricity	**3413** KWH**	293.00	$0.16	$46.88	100.00%	$46.88
Fuel Oil	**139000** gal***	7.19	$3.75	$26.98	85.00%	$31.74
LP Gas	**91690** gal***	10.91	$2.75	$29.99	85.00%	$35.29
Wood Chips	**4600** lb	217.39	varies*****	varies	70.00%	no estimate
Hardwood Pellets	**9000** lb****	111.11	$0.13	$14.39	87.00%	$16.54

*Costs analysis is based on price of $180/ton. BTU/lb is based on corn dried to ~15% moisture content.
**price: WEMCO small business rate as of April 21, 2008, BTU data from J. Bartok, Uconn.
***Oil and LB prices:Whitings Energy Fuels, Amherst, as of April 8 2008; BTU data from J. Bartok, Uconn.
*****Wood pellet price:Amherst Farmer Supply, April 8 2008; pellet company guarantees at least 9K BTU/lb
*****Wood chip sources vary: some are free, others have variable prices; quality is not consistent.

turned to the soil, helping build organic matter. As an annual crop, grain corn provides flexibility for selecting fields and can be worked into existing rotation strategies on vegetable and dairy farms. On vegetable farms, corn is a valuable rotation crop because it is not susceptible to the same diseases and insect pests as cucurbits, tomatoes, peppers, or most other vegetables. Cucurbits (squash, pumpkins, melons and cucumbers) comprise nearly 40% of our vegetable acreage, and are subject to a growing number of serious diseases. Growing fuel corn in rotational system allows growers to take fields out of production of these crop groups while still providing income.

How will the shelled corn project work? We will work with vegetable, floriculture, and dairy farmers to build at least two model networks (one in the Connecticut Valley and one in Central/Northeastern MA) of producers and users that will work together to establish an economically viable, sustainable system for producing and/or using shelled corn as a crop for greenhouse heat. Each of these networks will consist of at least one producer and at least four users, but more participants are possible. We will provide limited cost sharing to help up to ten participating growers purchase and install the equipment necessary to burn corn in return for their help in evaluating this system and promoting the resulting information. We will also provide cost share to several producers, to help with infrastructure costs for combining, drying or transporting shelled corn.

In addition to helping build and evaluate these model networks, we will host several education programs. Educational programs will include a one-day conference each year highlighting not only corn fuel but also wood, wind, solar, waste vegetable oil, methane and other renewal sources for heat, electricity, fuel, refrigeration, ventilation, and other farm uses. Speakers with expertise in these areas (both farmers and researchers) will be part of the program, as well as speakers that will present information on state and federal programs that assist with funds to help growers make the transition to sustainable energy sources. One on-farm meeting each year will highlight a shelled corn producer and a nearby greenhouse grower who burns corn.

At UMass Extension, the team that is managing this project includes vegetable specialists Ruth Hazzard and Andy Cavanagh, floriculture specialist Tina Smith, livestock/dairy specialist Masoud Hashemi, and agricultural economist Dan Lass. We also have a group of advisors with expertise relevant to the project. This project is supported by funding from the Agricultural Innovation Center, Massachusetts Department of Agricultural Resources, University of Massachusetts College of Natural Resources and the Environment, and UMass Extension.

This shelled corn project intends to build the knowledge, the experience base and the economic linkages necessary to bring shelled corn into the marketplace as a reliable fuel source. The project will also create a sound base of information about the costs, returns and techniques to produce and burn grain corn for greenhouse heat, and will foster networks within the agricultural community for sharing information and marketing shelled corn.

-Ruth Hazzard and Andrew Cavanagh, Extension Vegetable Program, University of Massachusetts-Amherst

HELP AVAILABLE FOR FARMERS FROM THE MASSACHUSETTS FARM ENERGY PROGRAM

Electricity and fossil fuel costs have increased by 30% or more in the last few years. The impact on farms has been dramatic -- prices have risen for power, refrigeration, heating, ventilation, lighting, transportation, fertilizer and feed. These rising energy costs reduce the profit margin for all farmers and directly threaten the viability of farms across the Commonwealth.

There is a tremendous loss of energy savings in the agricultural community because:

- many Massachusetts farmers are unaware of current energy programs available to them;
- farmers do not have access to a simple, streamlined process of applying for technical and financial assistance;
- the current pool of financial incentives is not large enough to encourage widespread implementation.

The Massachusetts Farm Energy Program (MFEP) is a two-year statewide effort, bringing together federal, state, industry, and private support to streamline technical and financial assistance available to Massachusetts farmers for reducing their energy demand, increasing their profits, and reducing greenhouse gas emissions. It is a joint project of the Massachusetts Dept. of Agricultural Resources, the USDA-Natural Resources Conservation Service, Berkshire-Pioneer Resource Conservation & Development Area and Patriot Resource Conservation & Development Area.

If you are a Massachusetts farmer, here are ways you can participate in the Massachusetts Farm Energy Program:

- Explore the web pages for the MFEP at Berkshire-Pioneer RC&D's website: http://www.berkshirepioneerrcd.org/mfep
- Fill out the farmer questionnaire at the MFEP website: http://www.berkshirepioneerrcd.org/mfep/forms/questionnaire.php
- Enroll in the MA Farm Energy Discount Program. For more information see: http://www.berkshirepioneerrcd.org/mfep/existing.php#discount
- Contact your electric and gas public utilities about their energy conservation and efficiency programs. For more information and utility contact people see: http://www.berkshirepioneerrcd.org/mfep/existing.php#public
- Contact MA Technology Collaborative about their Renewable Energy Initiatives and funding they have available. For more information see: http://www.berkshirepioneerrcd.org/mfep/existing.php#renewable
- Apply to the USDA-Rural Development's Energy Efficiency and Renewable Energy programs. The Mass Farm Energy Program offers grant writing services for the Rural Development grants. Since the deadline for these applications is June 16th, interested farmers need by this point to have a project design well underway, and have engaged and be working with a contractor. For more information see: http://www.berkshirepioneerrcd.org/mfep/existing.php#usda For eligibility requirements and to fill out the grant writing application please see: http://www.berkshirepioneerrcd.org/mfep/forms/grant_writing_req.php

Phase Two of the Mass Farm Energy Program, expected to begin in the summer of 2008, will

- provide assistance for obtaining energy audits, renewable energy assessments, and incentives to farmers
- document best management practices for Farm Energy Systems for use in future federal and state cost-share programs

For further information about the Massachusetts Farm Energy Program, please visit the website at http://www.berkshirepioneerrcd.org/mfep or call the Berkshire Pioneer RC&D office in Amherst, MA at 413-256-1607.

- Ann Gibson, Berkshire Pioneer & Patriot RC&D

Vegetable Notes, Ruth Hazzard, editor and Amanda Brown, 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.