



UMASS  
**EXTENSION**



# Vegetable Notes

For Vegetable Farmers in Massachusetts

Volume 23, Number 4

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## CROP CONDITIONS

The weather has shifted from hot to excessively dry to cooler than average with more precipitation. Despite the cooler weather we are still at a higher than average accumulation of degree days due to the unseasonal heat early in the season (see chart below). This will likely result in early emergence of numerous pests.

<u>DATE: 5/10/2012</u>		<u>GDD</u>	
<u>Location</u>	<u>Base 4C</u>	<u>Base 40F</u>	<u>Base 50F</u>
<b>Belchertown</b>	419	700.7	247.5
<b>S. Deerfield</b>	397.3	666	234.4
<b>Stow</b>	403.3	675.3	232.2
<b>Bolton</b>	406.3	679	238.5
<b>Dracut</b>	377.1	628.5	210.5
<b>Tyngsboro</b>	367.3	611	202
<b>East Bridgewater</b>	386.7	642	195
<b>Boston</b>	483.8	806.9	259.8
<b>Pittsfield</b>	313.9	518.1	164.9

If you would like to follow degree day accumulations and see how they're used for pest forecasting you can access data from a number of different weather stations across the state at <http://newa.cornell.edu/index.php?page=degree-days>

## MEXICAN BEAN BEETLE: PLAN AHEAD FOR EFFECTIVE BIOLOGICAL CONTROL

If Mexican bean beetles have historically been a problem on your farm, you will very likely see them again this year. They may be pests on snap beans, lima beans, and, more recently, soybeans. While they are not a pest on every farm, some farms report significant damage from these pests and have to take action to prevent crop loss. Using biological control can reduce the need for insecticides.

Mexican bean beetle (MBB) adults are coppery brown with black spots. They look very much like large ladybeetles and in fact are closely related – but unlike lady beetles they feed on leaves, not other insects. Shortly after adults arrive in a bean field, they lay yellow-orange egg masses on the underside of bean leaves. These hatch into bright yellow, spiny, oval larvae, which feed, molt several times as they grow, and pupate on the underside of leaves. Feeding damage from adults and larvae can reduce yield and injure pods if numbers are high. There are 2-3 generations per season, usually increasing in numbers with each generation.

*Pediobius foveolatus* is a commercially available biological control agent for Mexican bean beetle control and has a good track record in the mid-Atlantic states and among New England growers who have tried it. (*Pediobius* is pronounced “pee-dee-OH-bee-us”). It is mass-reared and sold by the New Jersey Dept. of Agriculture and is also available from other beneficial insect suppliers. This small (1-3 mm), non-stinging parasitic wasp lays its eggs in Mexican bean beetle larvae. Wasp larvae feed inside the MBB larva, kill it, and pupate inside it, forming a brownish case or ‘mummy’. About twenty five adult wasps emerge from one mummy. Adult wasps will emerge from mummies within 2-3 days of receipt. The parasitoids are shipped to farms as mummies or as adults.

*Pediobius* is well suited to our succession-planted snap bean crops. The first bean planting serves as a ‘nurse crop’ to

establish the population of *Pediobius* that will be hard at work in successive plantings all summer. Control continues and in fact gets better as the season progresses and successive generations of the wasp emerge and search out new bean beetle larvae. Planning 2-3 releases at 7-10 day intervals will help ensure good timing and coverage on several plantings. After a release in the first planting, it is advisable to leave that planting intact for a while, until the new generation of wasps has emerged from their mummies.



*Parasitized Mexican Bean Beetle larvae (red circle)*

As with any biological control, make releases as soon as the pest is present, not after it has built up to damaging numbers. The New Jersey Dept. of Agriculture Beneficial Insect Rearing Laboratory recommends two releases, two weeks in a row, coinciding with the beginning of Mexican bean beetle egg hatch. Wasps will lay their eggs in larvae of any size, but it is best to target the newly-hatched young MBB larvae. This will give control before damage has been done. Thus, timing is important. Watch for eggs and time the shipment for the first hatch of eggs into larvae. If in doubt about the timing of the hatch, release as soon as you see the eggs – if you wait for the larvae you may be playing catch-up. The release rate should be at least 2000 adult wasps per field for less than an acre, or 3,000 per acre for fields of one acre or more. Mummies are frequently shipped in screen bags. Simply secure to the underside of a bean plant. IPM Laboratories recommends 160 mummies/A, split between 2 releases for light infestations, 640 mummies/A, split between 2 releases for heavy infestations and for the home garden, a minimum of 10 - 15 mummies.

Like beans, *Pediobius* wasps are killed by frost so annual releases are necessary. Most fungicides will not be harmful. Many insecticides will be harmful.

If you would like assistance in using these biocontrols in your bean crops please call the UMass Extension Vegetable Program at 413-577-3976 or 413-545-3696 or email at [umassvegetable@umext.umass.edu](mailto:umassvegetable@umext.umass.edu)

Plan ahead by contacting a supplier to inform them of your expected release dates and acreage. Contact information for New Jersey source: Tom Dorsey, 609-530-4192; address; NJDA, Phillip Alampi Insect Lab, State Police Drive, W. Trenton, NJ 08628. <http://nj.gov/agriculture/divisions/pi/prog/beneficialinsect.html>. You'll also get advice on how to use the wasps from this office. *Pediobius* is also available from the following suppliers: Green Spot Ltd., NH., [www.green-methods.com](http://www.green-methods.com) 603-942-8925; IPM Laboratories, NY 315-497-2063; ARBICO, 800 -827-2847 (AZ), <http://www.arbico.com/>; Network (TN), 615-370-4301, <http://www.biconet.com/>.

-- A.Brown, R. Hazzard

## **CHOOSING THE BEST SOURCE OF NITROGEN FOR THE CROP'S NEEDS**

Increasing global demand for nitrogen fertilizers with limited increase in production capacity has resulted in much higher prices and limited availability of some nitrogen fertilizer materials. Also, safety, security and insurance concerns have resulted in very limited availability of ammonium nitrate, which over the years has been a favorite sidedress and topdress material in vegetable production. Urea, urea-ammonium-nitrate, calcium nitrate and ammonium sulfate are the nitrogen materials most likely to be available for use this year. Growers may also want to consider the use of one of the slow release nitrogen materials. The following are a few comments about each of these materials.

**Urea** (46 percent N) will be one of the primary materials available. It is a synthetic organic nitrogen material (contains carbon as part of the base structure) that forms ammonia as it is broken down. If the urea is incorporated into the soil, the ammonia reacts readily with water to form the ammonium (NH<sub>4</sub><sup>+</sup>) form of N that is held on the exchange sites of the soil. However, when urea is applied on the soil surface some of the N in urea may be lost by volatilization of the ammonia before it moves into the soil. The percent of N lost in this way from surface applied urea is more of a concern on soils with a pH near or above 7.0. If incorporated within two days after application, loss in most situations will be less than 2 percent. A rain or irrigation providing over 0.5 inch water will move the urea into the soil sufficiently to minimize loss.

Loss does increase with temperature. In a pH 6.5 loam soil at 45oF, N lost during the first four days after application will be less than 3 percent and at 75oF lost during this time period may range from 5 to 10 percent. Potential for loss is also much greater in sandy soils than in loam and clay loam soils. Urea broadcast over plants usually results in minimal injury to the leaves. For crops such as lettuce, where any damage to the leaves is a quality issue, nitrogen materials should be sidedressed alongside the row.

**Urea-ammonium nitrate** (UAN or 28 percent N) is a liquid material that is approximately a 50:50 blend of urea and ammonium nitrate. This material is a good material for sidedressing N. It can also be sprayed or dribbled in a band on the soil surface between rows of plants, but care needs to be taken to minimize the amount of material that gets on the foliage of plants. Spraying more than 3.5 gallons per acre directly over the foliage will cause some burn. Since half of the N is in the urea form, applying this material to the soil surface has the same risk of volatile N loss as with granular urea.

Ammonium and urea sources of nitrogen also have the potential to aggravate calcium disorders in certain vegetables. These disorders include blossom end rot of tomatoes, tip burn of leafy crops and cavity spot of carrots and parsnips. In the soil, urea is converted to ammonia and then to ammonium (NH<sub>4</sub><sup>+</sup>). Ammonium competes with calcium for uptake by the plant. Large amounts of ammonium are present for several days (or longer) after application and can cause calcium disorders which may not be noticed immediately. Periods of heat and moisture stress or insufficient calcium soil levels contribute to the problem.

Urea and ammonium fertilizers can be safely applied as a pre-plant broadcast. The ammonium will be converted to nitrate before plants are in a sensitive stage. Pre-plant applications should be minimal; just enough to give small plants and seedlings a good start. More nitrogen can be applied later as a sidedress. Warm soils with over two percent organic matter may supply enough nitrogen to make sidedressing unnecessary. The Pre-Sidedress Soil Nitrate Test (PSNT), available at most soil test labs, can help you decide if you need so sidedress nitrogen.

**Calcium nitrate** (15.5 percent N, 20 percent Ca) is a good material to use when additional calcium is need. The N is all in the nitrate form which is readily available for plant uptake, but is also more at risk for loss by leaching or denitrification with heavy rainfall events. Most vegetable growers use calcium nitrate to sidedress sensitive vegetables. Nitrate nitrogen does not inhibit calcium uptake. The calcium in calcium nitrate is helpful, but the main benefit comes from the lack of ammonium. Calcium nitrate is more expensive than urea and ammonium forms, but it doesn't take many boxes of high value vegetables to pay this back.

**Potassium nitrate** (13 percent N, 42 percent K<sub>2</sub>O) is a good material for supplying some additional potassium.

**Ammonium sulfate** (21 percent N, 23 percent S) is becoming more available in the market place. It is a good N source, especially where additional sulfur is needed. There is no concern for volatile N loss when this material is broadcast on the soil surface.

Slow-release N materials tend to release N over a 75 to 90 day period depending on the properties. With these materials, all of the fertilizer can be applied just prior to planting, and the N will gradually be released over the growing period of the crop, eliminating the need for sidedressing. Since the N is gradually released over time, the potential for N loss is reduced.

Cost of the various nitrogen materials vary considerably. Be sure to compare the costs of materials on the cost per pound of N, not per ton of material. The way to do this is as follows:

Cost per lb N = (Price per ton material) divided by (lbs of N in a ton of material).

For example, one ton of urea costs \$598 and contains 920 lbs N (2000 x 46%N)

Therefore cost per lb N = (\$598) ÷ 920 lbs N = \$0.65/ lb N.

*--Adapted from Darryl Warncke, Crop and Soil Sciences, Michigan State University. Reprinted from Michigan State Crop Advisory Team (CAT) Alert, Vol. 23, No. 4, May 14, 2008 with additions from John Howell, University of Massachusetts Extension*

## ASPARAGUS BEETLES

Common asparagus beetles tend to arrive in early May. The spotted asparagus beetle generally becomes 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 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. 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 ferns. Eggs and larval damage makes spears unmarketable. Larval feeding damage in the ferns can cause severe 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.



*Common Asparagus Beetle*

**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.



*Striped 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.

**Scouting.** Early 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.

**Cultural controls.** During harvest, 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 or larvae can feed and grow up into summer-generation beetles. In the fall remove all of the crop residue and other refuse

nearby that may provide shelter for adults over winter, by disking lightly (avoid crown damage) or burning crop 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.

**Monitoring and chemical 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 although some growers seek to avoid applications during harvest. More selective products 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, Entrust, or products containing capsaicin (check for certification status).

**carbaryl** (Sevin XLR PLUS): 1 qt/A prior to fern growth; 2 qt/A on ferns (1 dh, REI 12h, Group 1A). Limit of 3 pre-harvest and a total of 5 applications.

**chlorpyrifos** (Lorsban 75WG): 1.33 lb/A (1 dh, REI 24h, Group 1B). Apply during the fern stage.

**dimethoate** (Dimethoate 4EC): 1 pt/A (180 dh, REI 48h, Group 1B). Apply after last harvest.

**kaolin** (Surround WP): 12.5 to 25 lb/A or 0.25 to 0.5 lb/gal (0 dh, REI 4h). Suppression and repellence only. Generally compatible as a tank mix with other insecticides. OMRI listed.

**methomyl** (Lannate\* LV): 1.5 to 3 pt/A (1 dh, REI 48h, Group 1A).

**permethrin** (Pounce\* 25WP): 3.2 to 6.4 oz/A (1 dh, REI 12h, Group 3A).

**petroleum oil** (Suffoil X): 1 to 2 gal/100 gal water (0 dh, REI 4h). Apply as needed. For beetle larvae only.

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

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

**spinetoram (Radiant SC)**: 4 to 8 oz/A (60 dh, REI 4h, Group 5). Post-harvest protection of ferns from asparagus beetle only. Not for Japanese beetle.

**spinosad (Entrust)**: 1.25 to 2 oz/A (60 dh, REI 4h, Group 5). Post-harvest protection of ferns from asparagus beetle. Not for Japanese beetle. OMRI listed.

## **FOOD SAFETY MODERNIZATION ACT – PRODUCE SAFETY RULE UPDATE**

In January of 2011 the Food and Drug Administration was given the task of implementing the Food Safety Modernization Act. This is the largest change to the FDA since its inception, and is intended as a prevention measure to reduce food illness outbreaks. The Act will include science based standards for soil amendments, worker hygiene, packing, temperature controls, animals in the field, and water. The Produce Safety Rule draft has yet to be released and it is uncertain when it will be. Once released there will be a 75 to 90 day comment period as well as three listening sessions held regionally throughout the country. Once the Produce Safety Rule draft is released, all growers, exempt or not, are encouraged to read the draft and make comments. Comments may be made anonymously.

Growers utilizing large packing houses, major distributors, and commodity specific organizations are receiving education on conforming to third-party audit specifics as well as how to adhere to industry standards. Where does this leave the small and medium scale farms? Those growers not currently required to have an audit, and not meeting the exemption requirements listed below, will undergo their first audit within three years of the Act becoming law. It is expected that the rule will affect large scale farms first by giving them one year to comply; medium scale farms two years to comply; and small scale farms three years to comply. There is not yet a definition as to what constitutes a large, medium, or small scale farm.

Many small farms in the state are exempt from these coming FDA regulations due to the Tester-Hagan amendment. A farm that has average sales of \$500,000 or less a year, sells the majority of its products via direct sales, and sells product within 275 miles of the farm is exempt from the Act. Exemption from complying with the Food Safety Modernization Act means that qualifying farms will not have to prepare a food safety plan, will not have to keep detailed records, and will not have to comply with food safety rules set by the FDA. The ability of this exemption to remain in place will be based on research into past food illness outbreaks as well as any future outbreaks that may occur. Because of this, all produce growers should be thinking about their current food safety activities and where there is room for improvement.

Creating a farm food safety plan is the first step in preparing for the Food Safety Modernization Act as well as fully documenting your farm's commitment to food safety.

*-- Meredith Melendez, Mercer County Senior Program Coordinator and Wes Kline, Ph.D., Cumberland County Agriculture Agent; edited by A. Cavanagh and reviewed by Rich Bonanno, UMass Extension*

## **PIONEER VALLEY COMMUNITY GRANARY 2012**

There is growing consumer interest in locally produced grains, freshly milled flour, and locally produced baked goods made with them. Pioneer Valley farmers, artisan bakers, and food entrepreneurs can find a ready market for these products. The Pioneer Valley Community Granary offers affordable access to and mentoring in shared use of grain processing equipment to local farmers who want to explore grain production and marketing but cannot, on their own, bridge the gap

between field and market without access to these tools.

For the 2012 season, the Granary will be organized and managed as an equipment-sharing “co-op.” Adam Dole at White Oak Farm, Belchertown, will take the lead as Granary Manager. Processing equipment will be housed at NESFI’s Lampson Brooks Farm site, 295 Jackson Street, Belchertown. Participating growers will be asked to pay an annual “co-op membership fee,” to be held on account to support equipment maintenance and repair. A \$2.00/hour equipment use fee will cover the cost of utilities. Members will receive training in equipment operation; processing assistance may be available for an additional charge.

#### **Available equipment includes:**

- Grain-Seed Cleaner Clipper M-2B Grai (with multiple screens)
- Trailer Mounted Grain Aerator/Dryer (2 ton capacity/Butterworks Farm design)
- Luffland Jet Flow Utility Auger with Tail Cage and Flex Hopper
- Forsberg Model 2 Huller/Scarifier
- Meadows 8” Grist Mill (stone burr: electric)
- B & W Grain Single Bin Aerator (12’)
- Haban Portable Corn Husker-Sheller
- Hance Small Farm Seed Cleaner
- FarmEx MT-PRO Grain Moisture Tester (multi grain)
- Reo-Temp Thermometers
- Family Grain Mill and Flaker (motorized)

Interested growers are encouraged to contact the Granary as early in the spring as possible. Information about crops and acres to be harvested and processed will provide co-op planners with a “best guess” for projecting type and hours of equipment use. If interested, contact Adam Dole, 2012 Granary Manager at [writeadamdole@gmail.com](mailto:writeadamdole@gmail.com) or leave a message at 413-323-4531.

- From the New England Small Farm Institute website, [www.smallfarm.org](http://www.smallfarm.org).

## **FLEA BEETLES IN BRASSICAS**

Flea beetles have arrived in spring plantings of brassica crops. Beetles overwinter as adults in field edges, and locate seedlings with uncanny speed and accuracy. Not only do they affect greens such as arugula, tatsoi, mizuna, and bak choi but also the more waxy crops such as broccoli, cabbage and collard. This pest has been steadily growing more numerous and difficult to manage in New England over the past two decades, possibly as a result of more production of more types of Brassica crops, and continuous succession planting from early spring through fall which encourages reproduction with multiple generations each year. The crucifer flea beetle (*Phyllotreta cruciferae*) is uniformly black and shiny, about 2 mm in length, while the striped flea beetle (*Phyllotreta striolata*) has two yellow stripes on its back.

**Crop Rotation.** If you are growing succession plantings of Brassicas all season, you are likely fostering a second generation of adults that will emerge from their immature stages spent underground on your early crop, and look for new food to eat sometime in late July and August. That is when your fall crop will be young and especially susceptible. Plan now for where you can put those fall crops, to locate them as far as possible from spring brassicas. Next spring, plan to use a



*Striped Flea Beetle*



*Crucifer Flea Beetle*

field that did not have any late-season Brassica crops. After harvest, till crop residue immediately to uproot and kill underground larval populations. Note that rotating with other crop families that may also sustain flea beetle injury is not a problem – those are different flea beetles that feed on Solanacea, corn, or other crop families.

**Row covers.** Floating row cover provides the most effective protection from flea beetles, especially in spring and early summer. It is expensive in materials and time, but it works. It is critical to seal the edges immediately after seeding, because Brassica seeds germinate quickly and beetles rapidly find the cotyledons. Flea beetles can fit through extremely tiny cracks – not to mention the fist-sized holes and tears that often develop in row cover over time. Edges of the cover must be sealed on all sides using soil, black plastic bags filled with soil, or some other method. Fortunately hoops are not needed on brassica crops. Nonetheless, management is time-consuming because the cover has to be removed for cultivation. Replace it as soon as possible to avoid letting beetles in.

There are new products on the market for use as insect barriers. These are marketed as non-heating covers with high light transmission (>95%) and with the strength for multiple uses. Such insect barrier can be obtained from Dubois Agrinovations (ProtekNet Insect/Pest Control Netting) or from Texiinov Agrotexiles (Biothirps, Filbio). One can purchase a mesh size suitable to your pest conditions, ranging from extra-fine to exclude thrips, medium fine for flea beetle, or less fine for maggot flies and cucumber beetles. For early spring crops, the additional warming benefit of traditional row covers of various weights may be preferred.

**Chemical control.** There are many synthetic pyrethroids and carbamates which are labeled for flea beetle in Brassicas and which can give effective control of flea beetles. However, repeated use over multiple generations on the same farm is likely to select for resistance. Growers who have used these extensively have reported reduced efficacy over time. Two neonicotinoids are labeled, one as a foliar (imidacloprid, Povado 1.6F) and one as a soil drench (thiomethoxam, Platinum) which can provide alternative chemistry. Another type of chemistry that is available for flea beetles in MA is spinosad, Entrust, which is allowed for organic production; it is labeled for use on flea beetle in MA (check for supplemental label in other states). Among organic products that were tested in UMass trials, this showed the greatest efficacy in suppressing flea beetles and reducing damage. Another organic product, Pyrethrin (Pyganic EC 5) showed poor to moderate efficacy in our trials but is reported by growers to cause a significant short-term knockdown.

**Control Brassica weeds.** Brassica weeds harbor flea beetle (both adults and larvae) and reduce the efficacy of our crop rotation schemes that aim to break the pest cycle by changing crop families. Yellow rocket and wild mustard are familiar weeds that are widespread in fields and roadsides. The list of weed hosts probably also includes garlic mustard (*Alliaria petiolata*), a serious invasive weed in the Brassica family. It is a biennial with white blooms in spring (May), thrives in roadsides and field edges as well as shady woodlands, and has rapidly spread throughout Massachusetts. A good fact sheet on garlic mustard can be found at: <http://www.nps.gov/plants/alien/fact/alpe1.htm> or through the Invasive Plant Atlas of New England (IPANE) website.

**Incorporate crop residue.** Reproduction occurs underground. Any bolted or harvested spring Brassica crops that hosted adult flea beetles most likely also has larvae feeding on the roots. The tiny white larvae and pupae will dry out and die if crop residues are incorporated as soon as possible after harvest.

## UPCOMING MEETINGS

**Livestock Farm Day**

**Tufts Cummings School of Veterinary Medicine, Grafton MA,**

**May 12 9:30am-3:30pm**

Come for the short hands-on workshops held throughout the day and for the opportunity to meet and learn from experts, and both experienced and beginning farmers. Guest speakers will lead workshops on raising poultry, sheep, goats, pigs, and cattle. Day is free and open to the public – everyone is welcome! Boxed lunches will be available to buy at the event. Please RSVP at <https://events.r20.constantcontact.com/register/eventReg?oeidk=a07e5qcd49n403329c6&oseq=> (so we have enough lunches!). For questions, email [sanderson@comteam.org](mailto:sanderson@comteam.org) or call 978-654-6745.

### **Fruit Twilight Meetings**

**Apex Orchard, Carlson Orchards, Noquochoke Orchards**

**May 15, 16, 17, 5:30-7:30pm**

Contact Jon Clements- [clements@umext.umass.edu](mailto:clements@umext.umass.edu) or 413-478-7219

### **Small Equipment Demonstrations for Vegetable Farms**

**May 15 5:00 PM - 7:00 PM**

**Tuckaway Farm - 59 Randall Road, Lee, NH, 03861**

Chris Hiller, Commercial Sales Rep, and Adam Lemieux, Tools Product Manager from Johnny's Selected Seeds, will demonstrate hand tools for gardeners and commercial growers during this evening event. The following weeding, seeding, transplanting, cultivating, and harvesting tools will be demonstrated, and we will get some hands-on practice with them. We'll hammer in a few ground posts to show the beginning of setting up a high tunnel. Some of the tools being demonstrated include: Six-row seeder, Four-row pinpoint seeder, Jang seeder, Greens harvester, Hatfield transplanter, Selection of hand hoes, Low tunnel bender, High tunnel bender, Tilther, Broadforks, Harvest and seedling cart

The Demonstrations will take place at the Tuckaway Farm in Lee, NH. Dorn Cox has successfully integrated the disciplines of plant biology and environmental engineering and is constructing a near complete carbon cycle making the Tuckaway Farm largely self-sufficient, reducing productions costs, and limiting off farm purchases.

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

**May 24 5:30 PM - 8:00 PM**

**Brookdale Fruit Farm, 36 Broad Street - Route 130, Hollis, New Hampshire, 03049**

A special farm twilight meeting will be taking place at Brookdale Fruit Farm in Hollis, NH. We will be reviewing drip irrigation options and strategies for vegetable and fruit production. Trevor Hardy, of Brookdale Fruit Farm, will present a hands on demonstration on setting up a drip irrigation system. Starting from the pond, Trevor will work his way to the field describing the various components of the drip irrigation system.

Individuals who require special accommodations to participate should contact UNHCE - Hillsborough County, Goffstown Office (phone 603-641-6060 or Email <[george.hamilton@unh.edu](mailto:george.hamilton@unh.edu)>) by May 11, 2012. If you need more details on the meeting, call or email me at the UNH Cooperative Extension office in Goffstown. Two (2.0) New Hampshire pesticide-license recertification credits will be offered. You must sign in by 5:30 p.m. to receive pesticide credits!

### **High Tunnel Meeting**

**June 11**

**Flatts Mentor Farm, Lancaster Mass.**

Save the date - details to be announced.

*Vegetable Notes. Ruth Hazzard, Amanda Brown and Andrew Cavanagh, co-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.*

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