



UMASS  
EXTENSION



# Vegetable Notes

For Vegetable Farmers in Massachusetts

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## CROP CONDITIONS

Two more bouts of heavy rains and successive rainy days have soaked fields and filled streams and rivers again. The Southeast has been hardest hit with 3-4 inches over the weekend and another 6-8 inches this week. Other parts of the state have received rainfall ranging from 3 to 6 inches in the past week. Soils are sodden, saturated, cool and too wet to work. Soils with sand or gravel beneath and good drainage dried out last week, and were in good shape for field work. Fields with clay underneath and poor drainage remained wet, are now full of puddles, and will be probably be wet now for quite a while. Some crops – potatoes, corn, and carrots, for example —have failed to germinate and will emerge after a long wait in saturated soils. Acres have been replanted. However, some crops have hit the right combination of moisture and heat and have popped out of the ground in great shape. Transplants, and crops that are up and growing are holding on, for the most part -- unless they are under water! Surprisingly enough, thanks to April's warm weather, early corn in the Ct Valley might be about on schedule for early July harvest. Greens are doing well. Asparagus, greens, lettuce, bok choy, green onions, and radishes are being harvested. The first strawberries are ripening.

We can assume that nitrogen fertilizer that was applied to direct seeded crops before the rains has leached out. With cool, saturated soils, microbes will not be very active in mineralizing nitrogen from organic matter in the soil. The combined effect is that very little N is available to crops. As soon as fields are dry enough to work, top dress or side dress with additional N. If this is the last chance to get into a crop, which might be the case with early corn, then use 50-70 lb actual N. If crops are small and a second side-dress will be possible in a couple of weeks, use 40-50 lb and follow with a second application. It is too wet to incorporate the fertilizer; ammonium nitrate or calcium nitrate can be used because they do not volatilize from the soil surface. Ammonium nitrate is less expensive. After warmer, drier weather arrives, which we hope is soon, higher temperatures and more oxygen in the soil will activate the microbes and get the N-producing systems going again.

Catching up on cultivation is impossible when fields are

soaked, but will be high on the list as soon as it dries out a bit. Last week's heat jump-started the egg-laying activities of European corn borer, imported cabbageworm and Colorado potato beetles.

## SWEET CORN

Corn growth is variable. Corn in light soil with adequate drainage is growing well, but where soils are heavy and rainfall has been extremely high, growth is suffering. Entire fields had to be replanted. Fertility and weed management are difficult under such conditions.

European corn borer moth captures in pheromone traps have been reported from seven locations, all in the Connecticut River Valley, and all are increasing. Some early corn will have tassels beginning to poke out of the whorl. These blocks should be scouted this week. Look for pinhole feeding damage, frass, or the small black-headed larvae. To scout, pull out the emerging tassels to look for tiny black-headed white larvae or frass (white to brown material about the size of fine sand). Or, pull back the leaves to search tassels. Before any insecticides have been applied, scouting is fast and easy because any sign of feeding is an almost sure sign of live larvae, so it's not necessary to spend time finding the larvae. After the initial insecticide application, feeding damage may be from a borer that has already been killed, so finding the critter is more important for an accurate estimate of the number of infested plants.



*European Corn Borer moth in grass*

We did find tiny first-instar borers at one location this week. A spray is recommended if >15% of the plants have borers. The ideal time to control ECB is as the green tassel pokes up out of the whorl. Borers will leave the tassel as it opens up, and move down the plant looking for protected feeding sites. At that time, they are exposed and are more easily reached by pesticides. Before that time, borers are protected inside the whorl and after, they may be protected inside the stalk or ear.

Scout again 3-4 days after spraying. At high levels of infestation, where new eggs are still hatching, or in fields with uneven development, it often takes two sprays 5-7 days apart to bring the population under control. One spray may be when approximately 25-50% of the tassels have emerged, and the second 5-7 days later or after 75-100% of the tassels have emerged, if the field is still over threshold.



*Close-up of European Corn Borer egg mass*

The UMass Vegetable Program, in partnership with the New England Vegetable and Berry Growers Association, is encouraging growers to test out the new lower-risk products for ECB. These are 'lower risk' for humans and for beneficial insects, but not lower risk for corn borers! That is, they work! However, the best way to all of us to gain confidence in these products. In research field trials, Spirosad (Spintor, Entrust) and indoxycarb (Avaunt) provide equal control of ECB compared to the current standard products, including Warrior. Farmers who tested the products in New England last year reported the same result. Early corn is a high value crop and no one wants to risk having wormy early corn. However, if you try something new on just one block of corn that gets sprayed for ECB in June, you may discover a valuable tool. We'll have more information about these products in next week's Vegetable Notes. Please call if you would like more information about

this project.

•European Corn Borer Trap Counts From This Week:

Location	ECB II	Z I	Total ECB
Hadley (1)	3	37	40
Hadley (2)	17	0	17
N. Hadley	82	18	100
Easthampton	47	37	84
S. Deerfield (UMass)	8	2	10
S. Deerfield	27	24	51
Whately	95	22	117

## **CONSERVATION APPROACHES TO AGRICULTURAL WATER USE**

As producers throughout the nation grow increasingly concerned about water scarcity, farmers, ranchers and agricultural educators are beginning to explore new, conservation-oriented approaches to water use. They are managing soil to improve infiltration, selecting drought-tolerant crops and native forages, and designing innovative runoff collection systems. "Smart Water Use on Your Farm or Ranch," a new 16-page bulletin from the Sustainable Agriculture Network, spotlights innovative, SARE-funded research into a range of conservation options including soil management, such as using compost, conservation tillage and cover crops; plant management, featuring crop rotation, water-conserving plants and rangeland drought mitigation; and water management strategies such as low-volume irrigation and water recycling. Preview or download the entire publication at [www.sare.org/publications/water.htm](http://www.sare.org/publications/water.htm). To order free print copies, please visit [www.sare.org/webstore](http://www.sare.org/webstore), call 301/504- 5236 or email [san\\_assoc@sare.org](mailto:san_assoc@sare.org). Please provide the title requested, your name, shipping address, and telephone number when placing your order. For a full list of resources available from SAN, visit [www.sare.org/publications](http://www.sare.org/publications). "Smart Water Use on Your Farm or Ranch" is published by the Sustainable Agriculture Network (SAN) for the Sustainable Agriculture Research and Education (SARE) program. SARE is funded by the Cooperative State Research, Education, and Extension Service (CS-REES), USDA, and works with producers, researchers, and educators to promote farming systems that are profitable, environmentally sound, and good for communities. SAN operates under Cooperative Agreement with CSREES to develop and disseminate information about sustainable agriculture. For more information about grant opportunities and other resources, visit [www.sare.org](http://www.sare.org).

## SPINACH LEAF MINER ON CHARD, BEETS OR SPINACH

Spinach leafminer is a fly larva that burrows between the layers of a leaf eating everything but the epidermis. Early damage is a slender, winding 'mine,' a tunnel, but later these expand and become blotches on the leaves. Inside the mine is a pale, white maggot. The fly overwinters as pupae in the soil and hatches in late April and May. The adult fly then lays eggs on the leaves and the resulting larvae begin their damage. The oblong white eggs, less than 1 mm long, are laid in neat clusters on the underside of the leaves. They are easy to spot if you scout by looking under the leaves. The maggots may migrate from leaf to leaf down a row. They become fully grown in just a few weeks and drop into the soil to pupate. The entire life cycle is 30-40 days. There are three to four generations per season. Typically mid-late May, late June and mid August are peak activity periods.

In most seasons the damage is minimal and the plants will out grow it leaving only early leaves with cosmetic damage. In other years, or other fields in the same year, the damage may be great and if the plants are hit early and growth is slow because of weather conditions, the loss may be great. Treat when eggs or first tiny mines are noticed. See the *New England Vegetable Management Guide* for products; there are both conventional and organic product available. (See [www.nevegetable.org](http://www.nevegetable.org)) An adjuvant is recommended to improve efficacy. The spinach leaf miner also feeds on beets, chard and many weeds including chickweed, lamb's quarters and nightshade. Weed control and



*Leafminer eggs on beet*

crop rotation are the first line of defense. Row covers can also be used to exclude flies if placed over the crop before flies are active. "Spinach" and "beet" leafminers are very similar species in behavior, appearance, and damage.

*-Adapted by R Hazzard from Eric Sidemann, Maine Organic Farmers and Gardeners Association*

## ROW COVER FOR MIDSUMMER – WANT TO TRY NONHEATING COVERS?

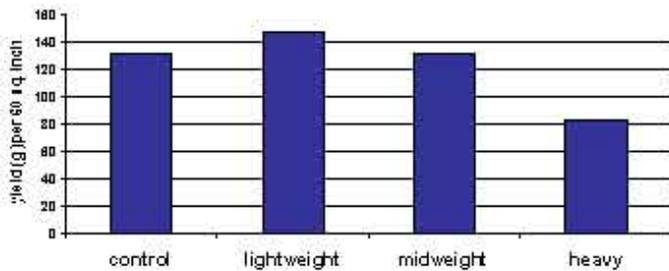
Many growers use 'floating' or 'spun-bonded' rowcover, for the combined benefits of extra warmth and protection from insect pests. Growers select the weight best suited for their needs – for the degree of light transmission, the durability, cost, and heat benefit. Different weights are typically measured in ounces per sq. yard. Materials that are 0.5-0.6 oz/sqyd (e.g., Reemay, Agrofabric Pro 17, Covertan Pro 17) provide warmth and insect control, have high light transmission (85-90%), and are less expensive than heavier materials, but are more likely to rip from wind or sharp objects (fingernails, boots, deer hooves, stakes, and the like). Slightly heavier are those that are 0.7 to 0.9 oz/sqyd (eg, Covertan Pro 22, Agriforce) with 75-83% light transmission. Heavier still are those at 0.9 (Covertan Pro-30) to 1.25 oz/ sqyd (Tygar 518) which are more tear resistant, have light transmission of about 70%, and will last for several years.

All of these covers increase temperature, provide some amount of frost protection, and decrease light. As a result, crops are not only earlier, but more tender, the leaves more elongated. That is great for early and late in the season. But what about midsummer? Humidity remains high under the covers, which increases disease. Aphids can build up under the cover. At a certain point, excessive heat results in less crop growth, not more -- especially for greens (see graph)



*Leafminer damage on spinach*

Comparison of 21 day harvest yield of Arugula grown under different row cover weights 2003, Westport, MA



*In a 2003 pilot study, arugula was grown under three row cover weights during July: lightweight (0.3 oz/sq yd.), midweight (0.5 oz/sq yd.), heavy (0.9 oz/sq yd.), or no cover as a control. Heavy weight cover clearly reduced yield. Lightweight cover had the highest yield. Further studies need to be done to explore this effect.*

However, some growers find that row covers are critical for their pest management needs. Flea beetles, in particular, can be difficult to control with insecticides but are very effectively controlled with a well-sealed row cover. This is particularly useful in certified organic crops, where the insecticide options are limited. Crop quality may suffer under the cover, but flea beetles don't go away just because the temperatures are high.

Non-heating row covers may provide a good option for this situation. These are 0.3 to 0.35 oz/sq yd, with >90% light transmission. They are sold as insect barrier, not for their heat-conserving properties.

This summer, the UMass Extension Vegetable Program is making non-heating row cover available in small amounts (50-100 feet X 83 inch sections) for farmers to test. We'll provide you with the non-heating cover and we'd like you to compare the growth of a crop under non-heating cover, your regular cover, and no cover, during July



Row covers protect arugula from flea beetles (but make sure the ends of the rows are sealed!)

or August. We'll ask you to report back on how the crop quality compares. This is supported by a donation from Johnny's Selected Seeds, and by our Northeast SARE-funded High Quality Brassica Project. If you would like to try it, please contact Andy Cavanagh at 413-577-3976 or Ruth Hazzard at 413-545-3696.

*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.*

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