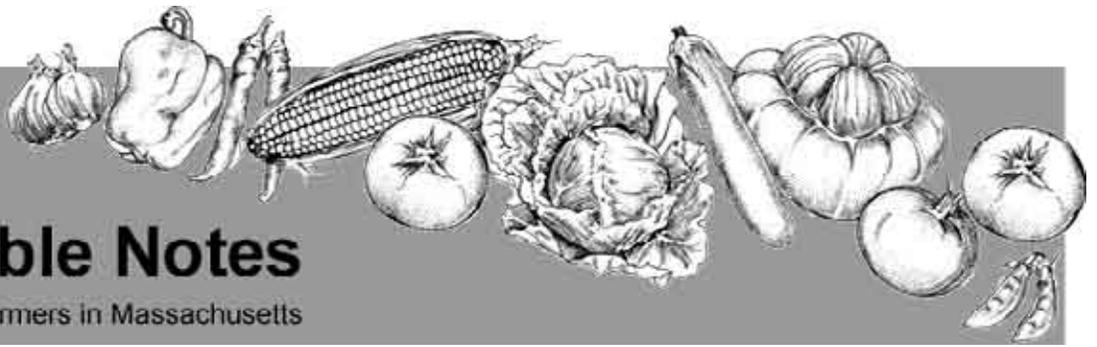




UMASS  
**EXTENSION**

# Vegetable Notes

For Vegetable Farmers in Massachusetts



Volume 17, Number 16

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## CROP CONDITIONS

Dry, clear weather has been holding steady for over a week now. Fields are generally dry, and irrigation is being applied by drip or overhead wherever it is available. Growers report variable pace on their tomatoes, eggplants and peppers – some have been picking heavily and steadily, others have had gaps in production or are still waiting for the avalanche of fruit to arrive. Demand for produce is excellent especially at retail stands and farmers markets. Sweet corn plantings have ripened at variable rates and that, combined with the uneven planting schedule, has forced many growers to buy corn from other farms in order to keep up with demand. Fortunately, someone always seems to have an ample supply. Fall pumpkins and squash have set fruit well, grown well, and some fields are ripe and ready for picking. It seems like the experiences of the past few years, fraught with hurricanes and diseases, has primed everyone to get the fruit out of the field as soon as possible. We seem to write about pumpkin and winter squash harvest a week earlier every year. Plan for harvest and storage (or sales) now so that you are ready as soon as the fruit is ready.

More and more fields are harvested, disked and done for the year. Granted, no one has spare time or energy right now. Nonetheless, its time to think about planting cover crops, to take advantage of good growing weather to pick up leftover nitrogen, keep weeds from regrowing, and hold the soil in the rains that will surely come. Oats planted in the second half of August will have ample time to grow before freeze kills them. Oats are inexpensive, easy to plant, effective at taking up nitrogen, and easy to manage in the spring. Combined with hairy vetch, they will provide nitrogen for next year's crop as well. We have been recommending 100 lb/acre for oats alone, or 40 lbs./acre of oat or rye with 30-40 lbs./acre of hairy vetch for a mix. Be sure to use the appropriate rhizobia species as an inoculant with hairy vetch.

## BROX FARM TWILIGHT COVERS LOTS OF GROUND

We'd like to express thanks to the farm crew and Dumaresq family for hosting a successful twilight meeting at Brox Farm on August 15. Over thirty farmers toured greenhouses, fields, and irrigation wells on a clear, beautiful August evening. Dave Dumaresq explained his aji dulce pepper crop and why he's planting these peppers in



*Dave Dumaresq exhibiting Aji Dulce peppers*

the greenhouse for fall harvest. Rich Bonanno and Dave discussed which varieties of lettuce do best in the summer heat, and whether lettuce does better on a four-row or two row raised bed. Dan Lenthal from NRCS described how EQIP has helped design and fund a system of shallow

wells, underground lines and hydrants to supply six different fields with drip irrigation on this farm that has two streams, wetlands, sloping fields, and sandy soil underlain with



*Aji Dulce Pepper*



*Lettuce and Corn Fields at Brox Farm*

gravel. We discussed the challenges of laying drip-line and using a water wheel transplanter on rocky, hilly ground. Ruth Hazzard sent everyone out in the fall broccoli field to search for caterpillars,

and they found all stages and sizes along with a few surprises. Dave described his experiences with Trichogramma wasps and reduced-risk sprays for European corn borer control, and noted that he's sold on using them, after



*Broccoli Scouting at Brox Farm (photos by Andrea)*

harvesting 100% clean early corn. Lynn Hartman of MARS provided delicious broccoli soup (with a recipe) and zucchini bread, and Brox farm provided the corn, for an excellent supper.

## **SWEET CORN UPDATE**

Its getting harder to find the late fields that are still in whorl or pretassel stage. There is a lot of silking corn out there, but cool temperatures have slowed crop development. Hopefully, customer demand for corn will hold into September.

Trap counts have decreased across the board this week. **Corn earworm** is still present, but counts were lower. Again no massive new flight has come in. CEW eggs, which are laid on the silks, hatch in 3-7 days depending on the temperature. Development will take longer with lower

daily temperatures and lower night temperatures. This week, temperatures ranged from low to mid eighties during the day to forties and fifties at night. This stretches the time that it takes for eggs to hatch to 5-6 days, and also slows down moth egg laying activity during the night. Thus, in addition to lengthening the spray interval because captures are lower, growers can add a day because of lower temperatures. Note counts and spray intervals in table below. Jude Boucher from University of Connecticut notes that the corn earworm spray intervals can also be lengthened one day if growers use Warrior, because of its long residual activity.

We may still see big flights of corn earworm. It is helpful to watch weather patterns to see where storms are originating. Storms from the south have a tendency to bring with them a higher population of CEW. Pheromone traps should be monitored closely after such a storm.

As expected from last week, the **European corn borer** flight has decreased. The second generation seems to be tapering off, and also night activity is lower due to cool temperatures. Tasseling corn should still be scouted for damage and sprayed if more than 15% of the field has live worms. Remember to only count live worms. You don't want to be spraying again for a problem you have already solved! It is important to know that the ECB overwinters here in New England in corn stalks and stems of other host plants. If you are finished picking in a field make sure to chop stalks and till in the plant debris to cut down on next year's population.

**Fall armyworm** damage may still be out there causing an unsightly mess. However this does not mean the caterpillars are still feeding. As with the borers, on a second count only base your infestation rating on live worms found. It is easy to spot the frass left by this pest and then find who is causing the damage seen. High infestations of FAW can delay growth and lower overall yield. If you are finding FAW in your late season whorl stage corn, a single drop nozzle can deliver a direct spray down into the whorl for excellent coverage and control. If using chemical controls try and configure the control method to cover all of your pest problems in one spray. Some growers have reported less than effective control using Warrior against fall armyworm. If you are looking for alternatives, Avaunt and Spintor have given consistent control of this pest.

Overall things have improved for most sweet corn growers since a rocky start in the beginning of the season. A lot of this improved success has to do with the fact that prices are still up and people are still buying. Sounds too good to be true for this time of year!

*-R Hazzard and A. Duphily*

•Weekly European Corn Borer and Fall Armyworm and Nightly Corn Earworm Trap Counts

Location	Z I	E II	CEW (per night)	FAW
Sheffield	17	1	0.40	-
Pittsfield	-	-	0.28	-
S. Deerfield (UMass)	3	19	0.50	5
Deerfield	2	15	2.87	26.5
Whately	1	8	0.85	-
Hadley (1)	3	1	0.94	-
Hadley (2)	20	8	2.33	24
N. Hadley	63	13	0.81	25
Sunderland	5	0	0.14	5
Easthampton	3	2	0.50	41
Feeding Hills	11	12	3.14	2
Still River	2	6	0.21	-
Rehobeth	10	12	0.57	-
Seekonk	-	-	6.57	164
Concord	4	3	0.57	0
Leicester/Spencer	5	4	1	0
Northbridge	6	8	1	0
Tyngsboro	2	8	0.71	5
Mason, NH	0	0	0	1
Hollis, NH	0	11	1.71	2
Litchfield, NH	1	2	1.14	42

**European Corn Borer Thresholds**

Pre-tassel-Silk: 15% or more of plants scouted are infested .

Silk: 5 or more moths caught in pheromone traps in one week, or 5% of plants are infested.

**Corn Earworm Thresholds**

Moths/Night	Moths/Week	Spray interval
0-0.2	0-1.4	no spray
0.3-0.5	1.5-3.5	every 6 days
0.6-1	3.6-7	every 5 days
1.1-13.0	7.1-91	every 4 days
Over 13	Over 91	every 3 days

Corn Earworm thresholds apply only to silking corn up to 5-7 days before harvest. Lengthen spray intervals by one day if maximum daily temperature is less than 80 degrees F.

**Fall Armyworm Spray Thresholds for Pheromone traps and Field Scouting**

Whorl Stage: 30% or more of plants are infested

Pre-tassel stage to emerging tassel 15% or plants are infested (add # plants infested with ECB)

Silk: 3 or more moths captured per trap per week: Spray silk every five to seven days; five days if captures continue to be over 3 moths per week.

--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, C. Leich, B. Howden, S. Clegg, J. Ward

**CUCURBIT UPDATE: DOWNY MILDEW IS CLOSER**

Summer squash and zucchini may be producing more slowly under cool temperatures, but they are still producing and the demand is still good. Growers are into second or third plantings for harvest. A ten day schedule of fungicide, selected to rotate among classes and types of fungicides, is recommended to control the multiple diseases we face in these crops. The exception of course is Phytophthora, which really cannot be controlled with chemicals. We are seeing Phytophthora take down cucurbit fields this year, as in the past.

**Powdery mildew** is widespread, but fortunately we have not yet seen **downy mildew** in the state yet. The longer the season goes on without appearance of downy mildew in cucurbits, the better off we are. Since it is only a foliar disease and does not affect fruit, if the fruit is ripe, the damage is minimal. However, we are not quite home free yet! Last week it was found in eastern and central New York, and it has also been reported on Long Island. Especially in western Massachusetts, scout your crops for this disease. Once the spores land in the field and symptoms begin, the disease can wipe out the foliage within five days if the crop is not protected with fungicides.

In Washington County in New York, downy mildew was found only on cucumbers, and did not affect squash crops nearby – so it appeared to be a strain that only infects cucumbers. In other counties, downy mildew was found on pumpkins and winter squash. With cucumbers, the spots are small, about an eighth of an inch in size. They generally do not connect and look like a checker board on the leaf. Early on in the infection the color of the spots is dark green but they then turn tan and the leaf dies. On pumpkins, the spots are larger, usually about a half inch in size and again, they are angular, limited by the veins in the leaf. As the disease progresses, leaves wilt and turn crisp. Photographs are posted at <http://vegetablemdonline.ppath.cornell.edu>.

We are also seeing a lot of **Plectosporium blight** in zucchini, summer squash and pumpkins. Search petioles and stems for the diamond shaped lesions and fruit for the spotting that are symptoms of this disease. (see previous issues, or find photographs and articles at [http://www.umassvegetable.org/soil\\_crop\\_pest\\_mgt/disease\\_mgt/squash\\_summer\\_plectosporium.html](http://www.umassvegetable.org/soil_crop_pest_mgt/disease_mgt/squash_summer_plectosporium.html)).

-- adapted from John Mishanec, Cornell Coop. Ext. Downy Mildew August 10, 2006

## **PUMPKIN AND WINTER SQUASH HARVEST AND STORAGE**

Although there are many fields with immature fruit, pumpkins in some fields are orange. Sugar pumpkins, especially, are ready early. Butternut in some fields is showing the dull, dry skin that characterizes mature fruit. If the current warm sunny days continue, more and more pumpkin fruit will color up in the next several weeks. Fruit sitting in the field faces a daunting list of diseases and insects – not to mention possible passing hurricanes -- that could threaten fruit quality. Early harvest and careful storage is preferable to leaving fruit in the field. This is especially true if you know that your pumpkins or squash are in fields that are infected with *Phytophthora* blight.

Pumpkins may need to be held for several weeks before they can be marketed. There can be extra work involved in bringing fruit in early, especially for growers who normally have pick-your-own harvest, but we recommend that growers harvest as soon as crops are mature and store under proper conditions, if it is feasible. Attention to curing and handling will go a long way toward improving the life of winter squash and pumpkin fruit.

What about pumpkin stems, ie, handles? In some cases, it's the handle that sells the pumpkin. Pumpkins are not marketable if the handle is broken off or dried up. Ideally, if the timing is right, pumpkins would be cut one to two weeks prior to marketing. However, if they are harvested now they may sit much longer before being sold. The discussion of how early to cut handles is an old one with many different opinions. One view is that it is advisable to cut the handles from the vine to save them from advancing powdery mildew and reduce shrinkage. Whether or not handles shrink and shrivel after cutting is affected by plant stress, genetics (variety), moisture and temperature conditions, and disease. There are many diseases that can affect handles, including *Plectosporium*, *Fusarium*, Black Rot, and *Alternaria*. Again, proper curing and storage conditions are key.

Ideally, pumpkins should be harvested when fully mature, with a deep orange color and hardened rind. However, as long as pumpkins have started to turn color, they will ripen off the vine if held under the proper conditions. While not ideal, this may be preferable to leaving them in the field if conditions are not favorable. If necessary, pumpkins can be ripened in a well-ventilated barn or greenhouse. The best temperatures for ripening are in the seventies to low eighties. Night temperatures should not drop below the sixties. Even if pumpkins are ripe, a period of curing can improve storage life. The curing period should be about 10 days. During this process, the fruit skin hardens, wounds heal and immature fruit ripens – all of which prolongs the

storage life.

Pumpkins should be stored in a cool, dry place. Ideal temperatures are between 50° and 60° F and relative humidity of 50 - 70%. Higher humidity allows condensation on the fruit with risk of disease, and lower humidity can cause dehydration. Higher temperatures increase respiration and can cause weight loss. Temperatures lower than 50° F cause chilling injury (see squash, below). In a greenhouse, temperature can be managed with ventilation on sunny days. Unless it is quite cool, heat is not likely to be needed if the house is closed up at night.

Often it is not feasible to harvest pumpkins early and store them until they can be marketed, and so they must be 'stored' in the field. If vines and fruit are healthy, storage in the field can be successful for a few weeks. If the vines die back, damage to the fruit from sun, disease and insects is more likely. In any case, it is important to scout for insects feeding on the fruit and handles, which may include squash bug nymphs or adults, or striped cucumber beetle. Control them if damage is evident. In fields that have a history of *Phytophthora* blight, *Fusarium* fruit rot, or black rot, field storage may increase the incidence of these problems, particularly if we have a period of wet weather or a major storm while fruit is sitting in the field. This has been one of the causes of significant losses in recent years, and one reason that we recommend bringing fruit in as soon as it is mature.

Winter squash is also maturing in some fields. Fruit that are free from disease and haven't been subject to much chilling (below 50°F ) should be selected for long-term storage. Fruit from fields where *Phytophthora* is present are not the best choice for storage.

Storage life depends on the condition of the crop when it comes in and your ability to provide careful handling and a proper storage environment. All fruit placed in storage should be free of disease, decay, insects, and unhealed wounds. When harvesting squash and pumpkins, it is important to handle the fruit with care to avoid bruising or cutting the skin. Despite its tough appearance, squash and pumpkin fruit are easily damaged. The rind is the fruit's only source of protection. Once that rind is bruised or punctured, decay organisms will invade and quickly break it down. Place fruit gently in containers and move bins on pallets. Use gloves to protect both the fruit and the workers. Removal of the stem from squash (butternut, Hubbard, etc.) will also decrease the amount of fruit spoilage because the stems frequently puncture adjacent fruit, facilitating infection.

A period of curing after harvest can help extend storage life of squash. This may be done in windrows in the field -- especially with a series of warm, dry days -- or by plac-

ing squash in a warm dry atmosphere (70-80°F) with good air circulation, such as a greenhouse, for up to two weeks. This pre-storage treatment permits rapid drying of the outer cell layers, and when combined with a dry atmosphere for storage inhibits infections that can take place at this time. Any clean cuts during harvest are likely to heal over and are no longer a source for injury or infection.

Take care to avoid subjecting squash to chilling injury. Chilling hours accumulate when squash or pumpkin is exposed to temperatures below 50°F in the field or in storage. Injury increases as temperature decreases and/or length of chilling time increases. Chilling injury is of particular concern with squash intended for storage because it increases the likelihood of breakdown. If squash has been exposed to chilling injury it should be marketed first and not selected for long-term storage. Remove squash from the field if temperatures likely to drop below fifty degrees for any length of time.

After curing, move squash or pumpkins to a dry, well-ventilated storage area. Pressure bruises can also reduce storage life, so avoid rough handling, tight packing, or piling fruit too high. Fruit temperature should be kept as close to the temperature of the air as possible to avoid condensation, which can lead to rot. Ideally, the storage environment should be kept at 55-60°F with a relative humidity of 50-70%. Lower relative humidity increases water loss, resulting in reduced weight, and if excessive, shriveling of fruit. High relative humidity provides a favorable environment for fungal and bacterial decay organisms. Under ideal conditions, disease-free pumpkins should have a storage life of 8-12 weeks and butternut squash up to three or four months. Even if it is difficult to provide the ideal conditions, storage in a shady, dry location, with fruit off the ground or the floor, is preferable to leaving fruit out in the field.

As you plan for storage and marketing, keep in mind that the market for pumpkins seems to get earlier every year. Fall decorative displays include pumpkins, and those displays begin showing up as Labor Day approaches. One of the best solutions to early-maturing pumpkins may be finding an early market. With so many late-planted field this year, early pumpkins are likely to be in demand.

--R. Hazzard; many thanks to the following sources: J. Howell, A. Carter, and Robert Wick. *University of Massachusetts*; Dale Riggs & Robert Rouse, *Pumpkin Production Guide, NRAES*; Maurice Ogutu, *University of Illinois Extension*; and Liz Maynard, *Purdue University*

## **BRASSICAS UPDATE**

Fall Brassica crops are doing well, but certainly need irrigation to keep good quality and ample pace of growth.

**Flea beetles** are still actively feeding in Brassica crops. As usual, they are selecting the *Brassica rapa* type greens over late cabbage or broccoli leaves, but they can be found in both. We are testing a perimeter trap crop of komatsuna around late broccoli and cabbage, and we do see a concentration of flea beetles on the komatsuna. Flea beetle activity generally drops off after Labor Day, but we are not quite there yet.

**Diamondback moths** and **imported cabbageworms** are still active, along with a low number of **cabbage loopers**. Be sure to check broccoli and cabbage as the crops begin to form heads, as this is the critical stage to control caterpillars.

Successive generations of **cabbage root maggot fly** generally result in a period of fly activity in late August. Cooler soils allow for better survival of eggs and maggots than during the heat of midsummer. Growers of fall turnips, radishes, and daikon, as well as sensitive crops like Chinese cabbage, should scout these crops for root maggot eggs. Root crops may survive maggot feeding damage and grow well, but a small amount of feeding damage on the roots renders them unmarketable. A single soil drench directed at the root zone should be adequate if eggs are found. Pay attention to "days to harvest" intervals.



*Cabbage Root Maggot damage on Daikon*

Cultural practices that can eliminate root maggot damage to fall root crops are not well developed. In 2005 we worked with growers who tried using row cover to protect fall turnips, and determined that yield was decreased by this practice. This was true even when row cover was only used for part of the growing period. Also, aphids built up under row cover when it was placed on the crop part way through development. We are not aware of any OMRI-listed insecticide products that will effectively control root

maggots.

Watch for buildup of **cabbage aphids** at this time of year. See New England Vegetable Management Guide (online at [www.nevegetable.org](http://www.nevegetable.org)) for conventional and OMRI-listed products. Thrips may also move from onions after harvest if fields are close by (see August 10 article for more details).

**Alternaria leaf and head rot** of brassicas can cause problems at this time of year. See Pest ID Supplement for a photograph. Fungicides that control this include Bravo, maneb and Quadris. Copper products would also help suppress this disease.

## **CROP INSURANCE UPDATE**

The Risk Management Agency Crop Insurance programs offer several options that are particularly useful for vegetable growers. These include crop-specific policies in fresh market sweet corn and in potatoes, the organic policy, as well as the Adjusted Gross Revenue (AGR), and AGR-Lite policy. Previous issues of Vegetable Notes have provided information about the organic and sweet corn policies (July 13 and July 27, respectively). There were 62 sweet corn policies sold to date in '06 in MA. Next week's Vegetable Notes will give you an example of the coverage provided by a sweet corn policy for a farmer with 50 acres of sweet corn.

Given the diversity of crops grown on most of our vegetable farms, the AGR-Lite policy may be more suitable for many vegetable growers in Massachusetts. This issue of Vegetable Notes provides information on the AGR-Lite policy (see enclosed flyer). **Note that the enclosed flyer describes the 2006 policy. There may be minor changes for 2007, but most of the policy framework will be the same.**

The AGR-Lite policy purchase deadline for 2007 crops will be January 31, 2007 for renewal policies and March 15, 2007 for new policies. As this policy is based on Schedule F records, those expecting to purchase AGR-Lite (or regular AGR) will need to have filed this IRS form for the previous 5 years - and they will estimate 2007 figures. It is somewhat complicated to get the records in the right order and reviewed by a CI agent, so those interested should not wait until near the deadlines!

Under AGR-Lite, all crops and animal production can be protected with one policy and only one set of historical records. This increased simplicity, compared to other insurance programs, makes it easier for producers to understand and improve their risk-management decisions. The policy is limited to a maximum protection of \$250,000 annually. Therefore, the target market will be farms with a five-year

average of about \$500,000 or less of gross farm income.

AGR-LITE benefits include

- Whole-farm gross revenue protection with a single policy. The plan also can be used in conjunction with other Multi-Peril Crop Insurance (MPCI) coverage plans as either an umbrella policy or a means to make protection available for crops presently not eligible;

- Statewide availability. AGR-Lite is available in Massachusetts and 11 other northeastern states, and provides an opportunity to producers who previously could not purchase insurance for their operations;

- Only one set of tax records is necessary to make an accurate quote for the policy;

- Producers can purchase coverage levels of 80 percent, 75 percent or 65 percent of their five-year revenue history. Producers avoid the worry of forgetting to buy coverage on one of their crops as the policy covers all farm revenue

Here is a very useful link for those wanting further information or the newest information as it becomes available out of PA (AGR-Lite is actually a PA product endorsed and administered by RMA).

<http://www.agriculture.state.pa.us/agriculture/cwp/view.asp?q=128579>

-R. Hazzard, Rick Chandler (MA Dept of Ag Resources), Kathy Ruhf



*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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