UMASS EXTENSION

Vegetable Notes

For Vegetable Farmers in Massachusetts

Volume 16, Number 16 August 18, 2005

Crop conditions

This past weekend saw a dramatic decrease in temperatures and some welcome rain for many growers. For those growers who had been very dry, the rains may not have been enough, but some showers are expected this weekend. At least we are getting some rain that is not in the form of a leftover hurricane which can bring excess water, wind damage, diseases, and summer insects. On the crop side, virtually all crops are ready, with the possible exception of tomatoes on some farms. Pepper yields look good in many areas. Summer squash and zucchini yields are down with the lower temperatures and increases in foliar diseases in these crops. Fall produce is beginning to arrive as some growers are selling their first pumpkins. Scattered frost is expected in northern Maine tomorrow morning (8/19) and one town in NH had a low of 35 this morning. I hope that Fall is much further away than this!

Sweet corn update

This week we have seen a rise in **Corn earworm** trap captures as can be expected for this time of year. The pressure is on! The storm which came through the valley this past weekend delivered 3" of rain and also a population of CEW. Unfortunately, this means shorter intervals between sprays. Most of the growers here in the valley have trap counts above thresholds which are putting them on 3-5 day spray schedules in fields with silking corn. High sprayer pressure with drop nozzles is the best for targeting areas where the CEW larvae like to hang out in the silks.

European corn borer second generation larvae have been seen feeding on green tassels in some fields this week. The larvae seen are still small but they will get bigger and move down the stalks and into the ears if not controlled soon enough. If you are finding infestations of borers over 15% you should spray when the tassels fully emerge to get the best control. ECB trap counts are continuing to be high this week but are expected to begin tapering off soon.

Fall armyworm was reported above threshold in many areas last week. This week the trap counts have come down somewhat and control has been very successful in fields sprayed with Avaunt. Most of the damage seen this week was old and lots of dead FAW were found. A lot of the plants seem to be growing out of the old damage and doing so quickly with the high temperatures we have been having. If you are still having a problem with FAW one good spray with the right material can take care of a good portion of your problem. Avaunt is best for whorl application only, Spintor, Lannate and Warrior are also good control measures. Always scout you fields for damage and spray when you have reached infestations of 15% or higher. These materials can also help clean up ECB in the tassels.

Fall armyworm adult feeding on tip of corn ear

Overall we have heard from many growers that this has been a good year for sweet corn. The temperatures have been consistently high with an adequate amount of rain to keep plants growing fast. People are buying on both the wholesale and retail level and the caterpillar pressure has not been too bad either. Sounds too good to be true! One complaint that seems to be reoccurring is bird damage.

From what we know birds like to feed on ears of corn about three days before harvest. If you are going to try to control them at any point, 3 days before harvest is a good time. The birds will at first go for the easy target ears which are opened from worm or sap beetle feeding, then they will move on to other ears. Of course good worm control will mean fewer birds! Some other methods include: chemical baits which may require special permits and are very toxic to anything that may feed on them, shell crack-

ers shot through a 12 gauge or any kind of a distress call, and also scare eye-spot balloons and/or reflective flare tape. Raccoons can also be a familiar problem in sweet corn. For controlling raccoons trapping works but not as well as an electric fence or the good old family dog! If you are having problems with these pests spend some time this winter researching more thoroughly what options are available to you.

--Amanda Duphily

SWEET CORN TRAP COUNTS 8-12 TO 8-17

LOCATION	DATE	ECB Z1	ECB EII	CEW	FAW
Berkshires, W. MA/ Champlain Valley					
Westeminster, VT	8-17	0	34	1	-
Brandon, VT	8-17	-	-	0	-
Sheffield, MA	8-17	20	2	3	-
CT River Valley					
Old Deerfield	8-17	65	110	27	5
S. Deerfield	8-17	4	73	14	0
Hadley	8-17	57	74	23	0
N. Hadley	8-17	121	39	10*	2
Feeding Hills	8-16	5	35	15	1
C.& E. MA					
Dracut	8-16	22	20	3	-
Concord	8-15	12	12	5	0
Tyngsboro	8-15	6	30	5	1
Northbridge	8-17	11	17	12	0
Spencer	8-17	43	21	5	0
Still River	8-17	2	6	26*	-
Monson	8-17	12	6	5	0
Dighton	8-17	65	25	25	30
Sharon	8-17	-	-	37	-
N.H.					
Litchfield, NH	8-17	-	-	2	0
Hollis, NH	8-17	-	-	6	6
Mason, NH	8-17	-	-	7	1
R.I.					
Coventry	8-17	2	9	16	2

**Avg of 2 traps*

CORN EARWORM THRESHOLDS

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

--R.Hazzard, A.Duphily, B.Hunsdorfer, J.Mussoni, D.Dumaresq, D.Rose, J.Otto, B.Howden, S. Clegg, T.Gallagher, J.Golonka, W.Kingsley, P.Willard, G.Hamilton

ADJUSTED GROSS REVENUE PROGRAM IN MA

"My friends tell me that AGR doesn't work. The diversity of crops will almost never result in a huge loss of income. I might lose all my tomatoes, but if I have a good year in Sweet Corn I might not lose enough revenue to qualify for a loss payment. Are there any "tricks" to buying the right kind of AGR policy?"

There are no tricks to buying the right kind of insurance. Although there are steps to identifying which insurance product will best fit your needs.

-Step #1: Identify your risks (Market fluctuation, production, quality, weather)

-Step #2: Identify your exposure to the risks (High, medium, low)

-Step #3: Contact a crop insurance agent who you trust and has a solid reputation

-Step #4: Look at all of your crop insurance options

-Step #5: Put together a risk management plan and review it with a knowledgeable third party

Helpful Tip: To assist you in identifying your risks and your risk exposure use the Risk Management Check-up that is available to Massachusetts producers free of charge:

(http://www.firstpioneer.com/notebook/L3/RMA/index.htm)

I can not let this question go without addressing the true statement: "My friends tell me that AGR doesn't work." As a crop insurance agent these statements make me work hard. I am not trying to prove that every crop insurance program works, because not ever yone does. Regarding the performance of the Adjusted Gross Revenue program with Massachusetts the facts are loud and clear. Over the past 6 years Massachusetts producers have paid $213,414 in premiums, while receiving $932,797 in paid losses. This is a 437% loss ratio. Without the commitment of the U.S. Congress to subsidize the Federal Crop Insurance Program like they do, this would program would no longer be available.

--Jeremy Forrett, Crop Growers Insurance Services

DISEASE UPDATES:

DOWNY MILDEW

Downy mildew caused by *Pseudoperonospora cubensis* is one of the most important foliar diseases of cucurbits. It occurs worldwide where conditions of temperature and humidity allow its establishment and can result in major losses to cucumber, melon, squash, pumpkin, watermelon, and other cucurbits. Symptoms of downy mildew are confined to the leaves and their appearance varies widely among cucurbit species. On most species, lesions are

first visible on the upper leaf surface as small, irregular to angular, slightly chlorotic areas. Symptoms appear first on older leaves and progress to younger leaves as they expand. When conditions (leaf wetness and humidity) favor sporulation, the production of fruiting bodies (sporangia) on the lower leaf surface gives the undersides of the lesions a downy appearance, varying in color from light gray to deep purple. Lesions can coalesce and result in large areas of dead tissue which exposes the fruit to sunscald.

Pseudoperonospora cubensis infects only members of the cucurbit family. Its survival depends on the presence of cucurbit hosts, either in climates which permit their growth year round or in greenhouse culture. The source of primary inoculum in cold climates is windblown sporangia from areas where plants survive the cold season. Generally, downy mildew of cucurbits does not arrive in southern New England until September. However, in some seasons it can move up the eastern seaboard early and arrive in July. So far this season, it has not yet been seen anywhere north of New Jersey. The progress of downy mildew is tracked by the North American Plant Disease Forecast Center and warnings are issued based on disease progression and weather *(www.ces.ncsu.edu/depts/pp/cucurbit/)*. Spread of downy mildew within a field can be caused by air currents, rain splash, workers, and tools.

Downy mildew can cause large-scale destruction on cucurbit crops

The main means of control are fungicide applications, the use of resistant cultivars, and cultural practices. Maximum control can be achieved only with a combination of these measures.

- Maximize the distance from potential inoculum sources.
- Use plant spacings which reduce the density of the plant canopy. Avoid overhead irrigation. Both these practices are aimed at minimizing the length of leaf wetness periods.
- Many commercial cultivars of cucumber have good levels of resistance to downy mildew. Watermelon and melon cultivars are available with low levels of resistance. Squash and pumpkin cultivars are resistant to some pathotypes but are very susceptible to compatible pathotypes.

Chemical recommendations:

azoxystrobin (Quadris): 11 to 15.4 oz/A (1 dh, REI 4 h). Apply when disease first occurs. Alternate with another fungicide with different mode of action after 5-7 days (not Cabrio or Tanos).

famoxadone plus cymoxanil (Tanos): 8 oz/A (3 dh, REI 12 h).Make preventive applications on a 5-7 day schedule before disease development. Tanos must be tank mixed with a contact fungicide (mancozeb, chlorothalonil, copper). Alternate with another fungicide with a different mode of action (not Quadris or Cabrio).

foestyl Al (Aliette): 2 to 5 lb/A (0dh, REI 12 h). Apply when conditions are favorable for disease development on a 7-14 day schedule. Use high rate when Downy mildew is active.

maneb/mancozeb (Maneb, Penncozeb, Manzate, Dithane): Rates vary according to formulation. See labels.

(5 dh, REI 24 h).

mefenoxam plus chlorothalonil (Ridomil Gold, Bravo WP): 2 lb/A (7 dh, REI 48 h). Apply preventively or as soon as disease appears. Repeat at 14 day intervals. Avoid late season applications. Do not plant any crop not registered for Ridomil Gold in treated soil for 1 year.

mefenoxam plus Manzate (Ridomil Gold MZ): 2.5 lb/A (7 dh, REI 48 h). Apply preventively or as soon as disease appears. Repeat at 14 day intervals. Avoid late season applications. Do not plant any crop not registered for Ridomil Gold in treated soil for 1 year.

pyraclostrobin (Cabrio EG): 8 to 12 oz/A (0dh, REI 12 h). Apply at the first sign of disease and alternate with chlorothalonil after 7-14 days. Do not apply more than three times a year or 48 oz/A. Do not rotate with Quadris or Tanos.

zoxamide plus mancozeb (Gavel 75 DF): 1.5 to 2.0 lb/A (5 dh, REI 48 h). Apply preventively at 7-10 day intervals. Do not make more than eight applications or apply more than 16 lb/A . Tank mix only if a partner is required to control other diseases.

--Bess Dicklow,
UMass Plant Disease Diagnostics Lab

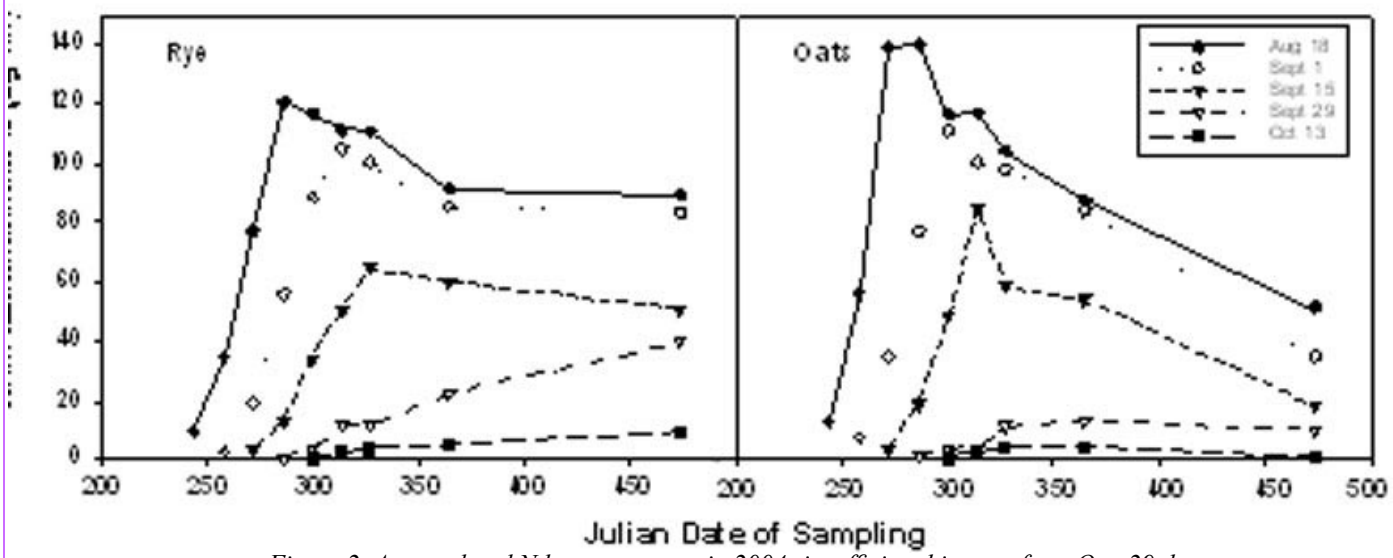

Figure 2. Accumulated N by cover crops in 2004; insufficient biomass from Oct. 29 date

DETERMINING EFFECTIVE COVER CROP SEEDING DATES

Well-established cover crops are effective in reducing residual soil nitrate after the harvest of corn or other crops, and nitrate released from applied manure. They hence minimize the nitrate leaching to ground water during the fall and winter months. Numerous studies have also shown that effective cover crops prevent erosion and loss of reactive phosphorus in runoff from fall applied manure. Our studies and those of others have shown that cover crops also reduced nitrate leaching in subsurface soil layers. However, the ability of the cover crop to absorb nitrate from the soil is affected by the degree of colonization of the soil by roots.

Cover crop seeding date is important for adequate canopy and root development before cool weather slows or stops growth. In an earlier study at the University of Massachusetts Agronomy Research Farm this was shown to be mid-September or earlier for southern regions of New England (Figure 1). Later seeding dates in most years will result in less than adequate leaf growth to reduce the erosive force of rain and runoff, and the small root growth will not contribute much to stabilizing the soil or for nutrient uptake. The mid-September seeding dates for cover crops were established for their effectiveness for erosion control. Whether effective dates for erosion control are similar to effective dates for preventing leaching are unknown. However, any delay in establishment of cover crops beyond the effective date will increase the amount of nitrate and phosphorus leaching.

Very little is known about the factors controlling growth and actual effectiveness of cover crops planted at different dates on ground water quality. It has been reported that cover crops planted in August had 50% more nitrogen accumulation than cover crops planted in mid to late September. Our results from 2004, which was milder than the normal fall, seem to confirm these reports for both rye and oat cover crops (Fig. 2). Also, rye retained more of the accumulated N through the winter than oat.

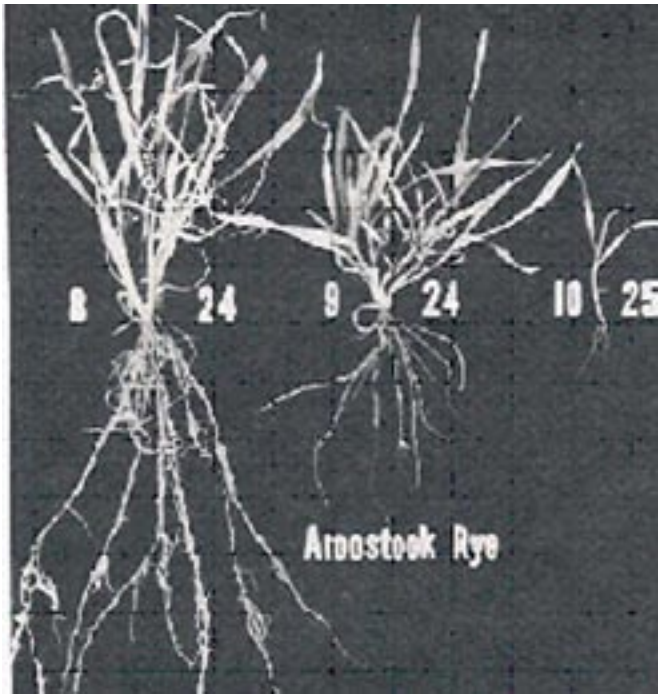

Figure 1. Cover crops on December 27; seeded on dates shown in Amherst MA

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 heavy weather events -- 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 Phytophthroa 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, Fusairum, 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 Phythophthora 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 a 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, in Vegetable Growers News, August 2004; and Liz Maynard, Purdue University

UPCOMING TWILIGHT MEETING REMINDER:

Thursday, August 25, 2005
Verrill Farm
11 Wheeler Road, Concord, MA 01742
Refreshments at 5:00. Meeting starts 5:30.

Verrill Farm grows 140 acres of berries and vegetables for sale in their own farm stand, to restaurants in the Boston area, and to other farmstands. Steve and Joan Verrill became full time vegetable farmers in 1991. They built their farmstand in 1994 and expanded it in 1999. They are open year round, and try to carry something of their own to sell twelve months of the year including stored root crops, early asparagus, and a full line of produce all summer. They complement the produce with a bakery and prepared meals.

Program will include:

- Heirloom tomatoes sold by variety
- Covercrops for weed management and organic matter/nitrogen additions
- Cultivation equipment
- Flame weeder
- Use of plug transplants throughout the year to better manage weeds
- Tour of farmstand (layout, displays, kitchen)

DIRECTIONS TO VERRILL FARM:

--If you are traveling **West** on Rt 2, turn LEFT at the intersection AFTER Rte. 126. That is Sudbury Rd. We are 2+ miles on the Right

--If you are traveling **East** on Rt 2, turn RIGHT at Emerson Hospital. Approx. 2+ miles on RIGHT.

--From Rte. 117, traveling **WEST** - go through the intersection of Rte. 126, cross the river, and take a **RIGHT** at the next intersection, Sudbury Rd. We are on the left one block down.

Contact:
Verrill Farm (978) 369-4494 or
Rich Bonanno, UMass Vegetable program (978) 361-5650 (http://www.verrillfarm.com/) for more info

Vegetable Notes, Ruth Hazzard, editor and Ben Hunsdorfer, 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.