UMASS EXTENSION

Vegetable Notes

For Vegetable Farmers in Massachusetts

Volume 16, Number 19 September 9, 2005

CROP CONDITIONS

Labor Day weekend gave farmers the dry sunny weather that draws crowds to farmstands and farmers markets for the end of summer and start of fall. This good long run of sunny days makes it possible to windrow and harvest butternut and other winter squash, sugar pumpkins and Halloween pumpkins without the devastating losses from heavy rain that we've seen other years. Late planted vine crops – planted after that long cold spring -- may still need time to mature but hopefully growers can harvest before another heavy rain hits.

Farmers are starting to clean up harvested fields, disk and plant cover crops. Try to get rye in as soon as possible to get the benefit of tying up leftover nitrogen that you can recycle back into the soil next season. Tomatoes and peppers are still coming in, though ripening will slow down as nights reach into the fifties and forties. Corn quality is good as long as the persistent corn earworms are controlled. Greens and brassicas are growing well, though broccoli harvested now is showing some signs of the heat stress that it suffered four to five weeks ago. Watch for activity of cabbage root maggot in fall root crops – scout for eggs.

MARK YOUR CALENDAR: THE NEW ENGLAND VEGETABLE AND FRUIT CONFERENCE

December 13-15, 2005
Manchester, NH

The New England Vegetable & Berry Conference and the New England Fruit Meeting have officially merged into the New England Vegetable and Fruit Conference, which will be held every two years. The conference will be held this December 13, 14, 15 at the Radisson Hotel in Manchester, NH and will include 24 educational sessions over 3 days, covering major vegetable, berry and tree fruit crops as well as various special topics. A Farmer to Farmer meeting after each morning and afternoon session will bring speakers and farmers together for informal, in-depth discussion on certain issues.

This conference is put together with close collaboration between growers and Extension from across the region. The steering committee gathers the best speakers from within our region and across the country to let you know about the latest innovations and advances in the fruit and vegetable industry. Educational sessions over three days will mix the best theory and practice regarding major fruit, berry and vegetable crops. Virtually every session – from "Strawberry I" on Tuesday morning to "Sweet Corn School" on Thursday afternoon will include the perspective of both farmers and Extension staff and researchers.

There is also an extensive Trade Show with over 100 exhibitors. We hope that you will take time to attend, and meet with fellow growers, advisors, researchers, and industry representatives. We want you to leave with new ideas and new information that will have a positive impact on your farm.

The event is sponsored by the New England Vegetable & Berry Growers Association and the Massachusetts Fruit Grower's Association in conjunction with the Universities of Connecticut, Massachusetts, New Hampshire, Rhode Island, Vermont and Maine, as well Cornell University and the Connecticut Agricultural Experiment Station – in cooperation with the U.S. Department of Agriculture.

The 3-day educational program offers 4 concurrent sessions each morning and afternoon. On Tuesday, December 13 the sessions are on strawberries, tomatoes, biorational and biological pest control, potatoes, leafy greens, root crops, and tree fruit. On Wednesday, December 14 sessions are on tree fruit, pumpkins, blueberries, soil health, greenhouse tomatoes, and organic. The sessions on Thursday, December 15 are on viticulture, sweet corn, cucurbits, brambles, winter growing, sweet corn, peppers and eggplant, and cut flowers.

The Annual Banquet of the New England Vegetable and Berry Growers Association will be held during the conference, on Wednesday evening. The speaker is Roger Swain, former host of Victory Garden and currently with People, Places, and Plants.

The pre-registration fee to attend any part or all of the conference or trade show is $50 for the first member of a farm business and $25 for each additional member (family or employee) when pre-registered with first member. The pre-registration fee for students (high school or college) is $20 each when pre-registered by the instructor. There is an

additional fee of $10/$5 for 1st/2nd person for late registration or walk-ins. Pre-registration must be received by November 30, 2005.

Additional information on the New England Vegetable and Berry Conference and the New England Fruit Meeting, including downloadable registration material, may be found at *http://www.newenglandvfc.org/*.

For more information, contact: **Frank Mangan** (978) 422-6374; fmangan@umext.umass.edu

FALL FLOWER GROWER PROGRAM

Wednesday, October 5, 2005
Pioneer Gardens, Inc, Deerfield, MA
9:00 AM - 3:45 PM
Sponsored by: University of Massachusetts and Massachusetts Flower Growers Association

Growers of greenhouse crops are invited to attend the Fall Flower Grower's Program at Pioneer Gardens Inc. Deerfield, MA. The program will include a tour of Pioneer Gardens, full-day educational program and catered lunch. The morning session will focus on energy conservation and alternative fuel for greenhouse production. The afternoon session will include marketing, customer service and displaying for retail sales. There will also be a session on worker protection standards and what to expect from an inspector's visit. Pioneer Gardens is a wholesale herbaceous perennial plant producer with forty acres of field grown perennials and 72,000 sq.ft. of greenhouse perennial plug production, that produces more than 300 varieties of plants.

Registration and Details:
http://www.umass.edu/umext/floriculture/upcoming_events_archive/05_fall_mtg.htm
For more information, contact **tsmith@umext.umass.edu** or **lopes@umext.umass.edu** or **bluczai@ballseed.com**

GREENHOUSE TOMATO CONFERENCE

Thursday, November 10, 2005
Tolland County Agricultural Center, 24 Hyde Ave (Route 30), Vernon CT
Sponsored by: University of Connecticut , University of Massachusetts , Northeast SARE

Come hear Vern Grubinger, from University of Vermont speak on **Organic Greenhouse Production** , Cathy Thomas from PA Department of Agriculture speak on **Biocontrol of Insect Pests**, John Bartok from University of Connecticut speak on **Selecting the Best Structures**, **Environmental Controls and Energy Conservation Measures** , Richard McAvoy from University of Connecticut speak on **Managing Light, Temperatures and Nutrients for Maximum Yields** , Rob Wick from University of Massachusetts speak on **Greenhouse Tomato Diseases and their Management**.

Learn more about the new technique of grafting to increase yields and tips on marketing greenhouse tomatoes from a grower panel.

Three contact hours toward pesticide recertification have been approved for this conference.

Registration and Details:
http://www.umass.edu/umext/floriculture/upcoming_events_archive/05_gh_tomato_conf.htm

For more information contact:
-**Leanne Pundt**, University of Connecticut , 860-626-6240, **leanne.pundt@uconn.edu**
-**Tina Smith**, University of Massachusetts , 413-545-5306, **tsmith@umext.umass.edu**
-**Paul Lopes**, University of Massachusetts , 508-295-2212, ext 24, **lopes@umext.umass.edu**

SWEET CORN AND PEPPER UPDATE

Sweet corn may need irrigation to get the best ear quality during this latest dry spell. It will also need sprays, as corn earworm is still at damaging levels throughout the region. A four-day spray schedule is needed in many parts of Massachusetts, from Pittsfield to Deerfield to Concord to Dighton. That interval may be lengthened if the maximum temperatures are 80 degrees F or below for two or three days. European corn borer is finally dropping, especially in central and southeastern Massachusetts. The continuing flight in the Connecticut River Valley may reflect a partial third flight – that is, emergence of moths that are the offspring of the second generation. Captures in that region are high enough (>20 moths/week) to warrant continued sprays in peppers – though spray intervals can be lengthened. In most parts of the state, peppers don't need further sprays. Fall armyworm captures have also dropped in most of the state except for the northern CT Valley in Mass. Sprays for CEW should control FAW and ECB. Most corn is into silk now.

For organic growers, use of oil treatments with the Zealater are still needed on silk, at 5-7 days after silk initiation, to prevent CEW damage. As ECB and FAW pressure drops, Entrust or Bt sprays to prevent tunneling into the side of the ears are less likely to be needed. Alternatively, at lower CEW levels, Entrust sprays at the intervals recommended above may be sufficient to prevent ear damage.

SWEET CORN TRAP COUNTS 9-1 TO 9-8

LOCATION	DATE	ECB Z1	ECB EII	CEW	FAW
Berkshires, W. MA/ Champlain Valley					
Pittsfield, MA	9-1	-	-	44	-
CT River Valley					
Old Deerfield	9-7	12	12	64*	-
S. Deerfield	9-7	3	44	12	-
Hadley	9-7	44	15	65*	-
N. Hadley	9-7	12	10	60**	23
Feeding Hills	9-6	6	3	93	4
C.& E. MA					
Concord	9-5	2	3	33	0
Dracut	9-6	15	7	14	-
Tyngsboro	9-5	10	15	15	2
Northbridge	9-7	1	0	16	2
Lancaster	9-7	6	0	6	0
Spencer	9-7	6	1	30	0
Still River	9-7	0	0	15*	-
Monson	9-7	1	0	28	0
Dighton	9-8	7	2	24	6
N.H.					
Litchfield, NH	9-2	-	-	1	1
Hollis, NH	9-2	-	-	6	6
Mason, NH	9-2	-	-	2	0

**Avg of 2 traps*
***Avg of 3 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

NOTE: SPRAY INTERVALS CAN BE LENGTHENED BY ONE DAY IF DAILY MAXIMUM TEMPERATURES WERE BELOW 80O F FOR THE PREVIOUS 2-3 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

ONIONS: HARVEST AND CURING TIPS FOR BEST QUALITY:

Editor's Note: the following article from CCE talks about the technology used by large-scale onion growers, but the crop needs are the same on small farms – except that growers often have to improvise to achieve the best conditions. A relative humidity sensor and maximum-minimum thermometer would be useful tools for growers aiming for good curing and long term storage of onions or other root crops.

Harvest Tips for Best Quality

1) Be sure onions are well dried and necks tight (i.e. the tissue does not slide when you roll your neck between your fingers) before harvesting/topping. Bacterial diseases and Botrytis Neck rot can move through green tissue into the bulbs. These diseases do not move in dry tissue.

2) Leave 2-3 inches of neck on the bulb. This increases the distance from the cut surface to the bulb for these pathogens to travel.

3) Minimize mechanical injury during harvesting by adjusting the chain speed to make sure the chain is always full. This will help reduce rolling and bumping of the bulbs. Reduce drops to 6" and pad sharp surfaces. Bruises provide direct entry points for diseases to get started.

4) Grade out damaged onions before putting them into storage. Damaged bulbs give off moisture, which is favorable for development of diseases in storage.

Curing Onions for Maximum Quality: Temperature

Quick curing can be done with outside air, which is heated to approximately 77ºF. Higher temperatures, up to 90ºF can be used if onions are of high quality with several layers of good skins. Higher temperatures are favorable for development of bacterial diseases. Black mold is more likely to develop when temperatures exceed 82ºF. A lower temperature, down to 68ºF should be used if onions are poorly skinned or if they have been touched by frost. Best skin color develops at 75-90ºF. **Relative humidity** - should not fall below 65% or exceed 80%. RH going into the boxes should ideally be 50%. **Airflow** - should be no less than 3 cubic feet per minute per cubic foot of product. Be aware that when bulb size is down, air circulation through the boxes is reduced (onions pack tighter with smaller air spaces in between). An empty bushel crate can be placed into the onion boxes while filling to increase air circulation. **Dryer Volume** - the wetter/greener the onions going into a dryer, the fewer should be put into it. Stack no more than 3 boxes away from the plenum. Check Conditions – RH and temperature of the air going into and out of the boxes should be monitored and adjustments made accordingly. Check air flow. Air will take the path of least resistance. Use a smoke test to show you where and how the air is moving.

--September 7, 2005 PestMinder 12.19 1, A publication of the Cornell Cooperative Extension Vegetable Program

BRASSICAS: FALL DISEASES

Alternaria Leaf Spot (ALS) is showing up, encouraged by the cooler night time temperatures and heavy dews. At least three species of Alternaria can cause serious losses in cruciferous crops. These pathogens may be seed-borne, both as spores on the seed surface and as mycelium within the seed. Symptoms of ALS are circular, small, dark spots with concentric rings (target spots) on the upper surface of leaf. Older leaves are more susceptible to infection. When

humidity is high, lesions can be covered with a sooty black mass of spores. The pathogen sporulates abundantly on foliar lesions and centers may fall out to give a 'shot-hole' appearance. Lesions can grow together leading to large necrotic areas and early leaf drop. Symptoms on cauliflower and broccoli heads begin as browning at the margins of individual flowers. ALS requires leaf wetness for 16 hours to initiate infection and at least 12 hours of continuous humidity at >90% RH to develop. ***Note that if ALS does not have the required amount of leaf wetness, it will appear as tiny black "sooty" dots (not as the characteristic target-spot lesions).*** ALS can cause economical loss in storage if infection spreads into the upper frame leaves or head due to additional trim loss, the production of ethylene, and invasion by secondary fungi and bacteria. Fungicides are most effective if applied before disease gets established. Bravo, Amistar, Quadris and Maneb are control options. The major source of inoculum is crop debris in soil. Therefore crop debris should be destroyed as soon as possible after harvest and a minimum 3- year rotation out of crucifers should be used. For rotation to be effective, cruciferous weeds need to be controlled during the rotational period. Buy seed from a reputable source or treat with hot water to eliminate Alternaria from seed. Eliminate cull piles. Avoid overhead irrigation during head development.

--Adapted from September 7, 2005 PestMinder 12.19 1, Cornell Cooperative Extension Vegetable Program

Downy mildew of crucifers. This disease, caused by the fungus Peronospora parasitca, should not be confused with downy mildew of cucurbits (caused by Pseudoperonosproa cubensis), which is related but does not infect brassica crops. Downy mildews tend to be specific to a certain plant family or even species within a plant family. They are in the same group of fungi (Oomycetes or 'water molds') that cause late blight of potato and tomato and blue mold of tobacco.

Downy mildew is an important disease of broccoli, collards, kale, cabbage, cauliflower and Brussels sprouts. It can also infect rutabaga, turnip and radish. It is encouraged by cool, moist conditions (from rain, heavy dew or fog), which are more typical in late August, September and October in our region. Infection can occur at any stage of growth. Severe infections can kill seedlings, but stem, leaf and flower/head infections can cause crop injury and loss at later stages.

The most distinctive symptom is grayish white, fluffy growth on the undersides of leaves. Irregular, angular yellow to brown spots develop on both top and bottom of the leaf. In the floral parts of broccoli or cauliflower, dark brown areas develop internally in curds or floral buds of the head. Stems and stalks of the flower head may be darkened or have black streaks, and this may be the first sign of infection in broccoli. In cabbage, internal darkening and purplish spots appear in the inner layers of the head or move upward in the head from stem infections. Secondary infection with soft rot bacteria (always smelly!) may follow the downy mildew. In cabbage, systemic invasion of the stem may occur after infection of the lower leaves. The fungus may then invade the head leaves and sporulate after the cabbage has been stored.

The fungus survives from season to season as thick-walled resting spores, called Oospores. These sexual spores can survive in the soil for extended periods and produce sporangia when conditions are moist and cool, especially at night. Disease development is favored by abundant moisture on leaves provided by dew, drizzling rain, or heavy fog. Sporulation, germination, and reinfection can occur in four to five days. The fungus may also survive in a latent state within systemically infected plants. Oospores and mycelium can be carried in and upon seed. Sporangia are carried on air currents and on wind-blown rain and when conditions are right, will germinate on leaves and produce new infections.

Cultural controls: Rotation out of brassicas for at least two years; removal of crop residues which contain Oospores (may not be practical!); adequate crop spacing to encourage drying of leaves. Control in the seed-bed is very important and includes the use of clean growing medium, good drainage, and an avoidance of overhead irrigation. Resistant or tolerant varieties of broccoli have been developed; our sources list Marathon and Arcadia among these.

Fungicides for downy mildew include Prophyt, Alliette, Ridomil or Ridomil/Bravo. Preventive spraying of protectant foliar fungicides may be necessary if environmental conditions favor disease development.

Non-pathogenic disorders of broccoli: Brown bead, heat injury, hollow stem. As part of the Brassica project, we are working to gain a better understanding of these disorders. Each can be caused by a combination of factors – heat stress during head initiation, excessive water especially after a dry period, excessive nitrogen, rapid growth during head formation, deficiency of boron, and varietal susceptibility. Heat injury is most often manifest as unevenness of the crown and uneven bud size on the head, as well as small head size. Brown bead appears as heads approach maturity and is usually associated with rapid growth during periods of high temperature followed by abundant rainfall. Floral buds turn tan or brown and become easily detached. These may then become infected with soft rot bacteria, Erwinia species. Boron deficiency, which shows up as hollow stem of broccoli or cauliflower, brown discoloration of turnip or rutabaga roots, or internal discoloration of cauliflower, can be more severe if plants are water stressed or pH is greater than 7. Adequate sup-

plies of soil organic matter, consistent and adequate water levels in the soil, and supplemental boron applied before planting if boron levels are low can all help in avoiding these problems.

-R Hazzard, Bess Dicklow, A. Cavanagh. .

EFFICACY RATINGS FOR INSECTICIDES OF CATERPILLARS IN CABBAGE AND OTHER BRASSICAS

Worm pests in cabbage and other brassicas will continue to feed in September. Following is a list of insecticides labeled for use on various cole crops with tentative efficacy ratings for control of **imported cabbage worm (ICW)**, small and **large cabbage looper (CL)** and **diamondback moth (DBM)** put together by Cornell researchers in Long Island. Growers and other researchers may have somewhat different opinions and results vary according to rates, application method and frequency, location, etc. so selection of controls should not be made solely based on this chart.

Not all materials are labeled for all crops or areas - check labels. For most cole crops, addition of a spreader-sticker is advised.

Formulation & Rate	**ICW**	**CL, Sm**	**CL, Lg**	**DBM3**
SpinTor 2SC (1.5 – 10 fl oz)	xxx	xxx	xx1	xxx
Proclaim 5G (2.4 – 4.8 oz)	xxx	xxx	xx2	xxx
Avaunt 30WG (0.15 – 0.22 lb)	xxx	xxx	xxx	xxx
Pyrethroids				
Asana XL 0.66EC (5.8 – 9.6 fl oz)	xxx	x2	x2-	
Pounce/Ambush (0.05 – 0.2 lb ai)	xxx	xx	x	x
Warrior T 1CS (1.92 – 3.2 fl oz)	xxx	xxx	xx	x
Ammo 2.5EC (2.5 – 5 fl oz)	xxx	xx2	x2-	
Capture 2EC (2.1 – 6.4 fl oz)	xxx	xx	xx	x2
Mustang 1.5EW (2.9 - 4.26 fl oz)	xxx	xx2	x2	-
Bts				
Bt kurstaki (see labels)	xxx	xx2	x2	x2
(Biobit, Javelin, DiPel, Condor, Crymax)				
Formulation & Rate	**ICW**	**CL, Sm**	**CL, Lg**	**DBM3**
Bt aizawai (see labels)	xxx	x	x	xx4
(Xentari, Agree, Ketch)				
OPs				
Orthene/Address 75S/97 (1.3 lb)	xxx	xx	xx	x
Carbamates				
Lannate LV 2.4L (1.5 – 3 pt)	xxx	x2	x2	x2
Larvin 3.2F (16 – 40 fl oz)	xxx	x2	x2	x2

xxx = most effective (usually good control expected); x = least effective (fair or poor control); - not labeled or noteffective. Not all formulations listed. Rates in amount of formulated product unless otherwise indicated.
1 6 oz rate for BAW, 4.5 – 6 oz for CL;
2 higher rates needed;
3 Where insecticide resistance is not a problem better control of DBM with some materials may be expected;
4 Bt aizawaimay provide better control of DBM where populations are resistant to Bt kurstaki;
5 some incidental control;
6 Avaunt is not labeled for use on Long Island

--From Dan Gilrein, Long Island Fruit and Vegetable Update; published in September 7, 2005 PestMinder 12.19 1, Cornell Cooperative Extension Vegetable Program

FALL WEED MANAGEMENT ADVICE

Weed management is still important at the end of the season. There are three main activities that need to be completed. They are: fall field scouting, preventing weed seed production, and controlling perennial weeds.

End of Year Weed Scouting

It is worthwhile to take the time to check fields for weed problems at this time of year. A quick scouting can identify problems that will be expensive to solve if they get out of control and can provide clues that will help in designing a weed management program for next year. Mapping weedy spots, and keeping some kind of permanent record of weed surveys, can help you evaluate your weed management over the years. Make a map of each field and fill in the following information:

How Many? How dense are the weeds? If weeds are very dense, they may be having an impact on yields. This is especially true if these weeds emerged early in the season, when competition is greatest. If weeds were actively growing during the period of greatest crop growth, consider

changing the weed management program.

Which Weeds? Identifying weeds can help identify potential problems before they get out of hand, and can help you decide if you need to modify your weed control program. Weeds like yellow nutsedge, field bindweed, and quackgrass are spreading perennials, which have underground parts that enable them to spread throughout whole fields. Because these weeds can be very damaging, and are very difficult to control, they are worth "nipping in the bud". In addition, keep an eye out for annual weeds that are new to a field or are increasing in numbers. Some weeds can be very difficult to control in some or all of the crops in your rotation. Galinsoga, for example, is hard to control in cole crops, peppers, and squash. Nightshades are difficult to control in tomatoes for growers who rely on herbicides for control, because they are in the same family as tomatoes. Velvetleaf is hard to control in sweet corn.

What worked? It is also useful to look at the whole field and evaluate the effectiveness of your weed control efforts. If some weeds are generally escaping, identify them. They may point to weaknesses in your herbicide or cultivation program. If mostly grasses, or mostly broadleaves are escaping, it may require an adjustment of either the rates or the timing of grass or broadleaf herbicides. You may also find the New England Vegetable Management Guide useful. This manual contains a chart listing the effectiveness of vegetable herbicides on most of the common weeds in New England. Use this guide to find an herbicide labeled for your crop that might give better control than the one which was used.

Where are the weeds? Weeds in the rows or planting holes are much more damaging to crop yields than between-row weeds. Weeds in rows may be an indication that cultivation equipment needs adjustment, or cultivation needs to be done earlier.

Preventing Weed Seed Production

Annual weeds produce incredible amounts of seeds. Annual grasses normally produce 3000 to 5000 seeds per plant, small seeded annual weeds such as pigweed and lambsquarters can produce 100,000 to 250,000 seeds per plant, and larger-seeded broadleaf weeds such as velvetleaf and smartweed can produce 5,000 or more seeds per plant. Perennial weeds can also produce seeds or other reproductive structures. For example, one yellow nutsedge plant can produce 2000 tubers. Perennial weed management is covered below.

Once fields are harvested, they should be tilled or disked as soon as possible to prevent seeds from maturing. Be especially concerned with weeds that are new to a field or are in abundant supply. If time is short, one alternative is to mow the weeds. This will remove the primary seed stalk but will also encourage lateral branching. Eventually, however, these branches will produce seeds and must be destroyed.

Perennial weed management

The best time to control perennial weeds is in the Fall. All perennial weeds have storage structures (tap roots or rhizomes) below ground that enable these plants to survive the winter and regenerate themselves the following year. Fall tillage of perennial weeds will kill top growth and fragment the storage organs but will not kill the weed. Frequent tillage will, over a long period of time, control perennial weeds but, in most cases, this is not practical.

Perhaps the best control technique for perennial weeds is an application of glyphosate (Roundup) before the plant goes dormant. Perennial broadleaf weeds such as bindweed or dandelion should be sprayed while they are still actively growing which is usually before a hard frost. Perennial grasses, such as quackgrass, can be sprayed as late as mid-November. Use 10 to 20 gallons of water per acre when spraying Roundup. Two quarts of the herbicide will provide much better control at 10 gallons of water per acre than at 40 gallons of water per acre. Spraying on a mild afternoon following a cold or cool morning is best to encourage translocation of the herbicide to the below-ground storage structures. Disking or tilling two weeks after application will also improve control of the weeds.

Many growers fight perennial weeds such as quackgrass in corn fields year after year because their primary goal in the Fall is to plant a cover crop. This is usually followed by a Spring application of Roundup which provides top kill but does not kill the whole weed. Applying Roundup at the proper time is the only way to achieve good control. Delaying the seeding of a cover crop may be a necessary evil in the fight against perennial weeds.

In conclusion remember to scout and map your fields, prevent weed seed production, and apply Roundup at the right time to control perennial weeds.

--Rich Bonanno, UMass Extension Weed Specialist

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.

Where trade names or commercial products are used, no company or product endorsement is implied or intended. Always read the label before using any pesticide. The label is the legal document for product use. Disregard any information in this newsletter if it is in conflict with the label.