UMASS EXTENSION

VEGETABLE IPM MESSAGE

# Vegetable Notes

SEPTEMBER 18, 2003 VOLUME 14, NUMBER 17

## Crop conditions

Growers are harvesting fall crops as fast as possible, and fortunately, conditions have been excellent for fieldwork over the past two weeks. Late sweet corn is of excellent quality and may continue for a couple more weeks. Production rates in fruiting crops such as peppers and eggplant has declined as we experience more cool nights. Tomato harvest is winding down but some growers report good late-season production – better than they expected. Brassicas are growing well, but growers should pay attention to scouting for caterpillars, especially imported cabbageworm. While caterpillars feed and develop more slowly when its cool they can still do significant damage. Fall tasks such as tillage of harvested crops, planting cover crops, and taking care of problem weeds are important.

## Preparing greenhouses for a hurricane

**By Skip Paul, Wishingstone Farm, Little Compton, RI.**

This week a large hurricane is heading toward New England. My farm is a half mile from the coastline with not much between us and the sea. Dealing with the inevitable showdowns with hurricane force winds has been an obsession of mine since I built my first greenhouse. Now we have six with over 20,000 square feet. Here is some advice I've collected about preparing greenhouses for a powerful storm.

1.) Clean and check all the plastic inflation fans, and open their reduction apertures as the storm approaches. You want the two layers of plastic extra tight and rigid so the greenhouse superstructure moves as little as possible. Have a backup generator ready so if you loose power you won't lose your inflation fans and then have a loose gigantic sail smashing into your greenhouse adding to its misery.

2.) Be sure all connectors are tight. As the years go by and wind storms come and go your greenhouse moves and shakes. These small movements can unwind some critical bolts that could lead to failure of major structural components. (Every time you change your greenhouse covering, take an hour to check critical bolts and points of stress. It is much easier then when it is all clear and exposed).

3.) Don't let the wind get inside the structure. That means check that all doors are secured; check all intake and fan output louvers are locked down and can't flap open. Duct tape on the bottom three fins works well.

4.) Check your system for securing the plastic. If it fails wind will get in. Don't rely on weak twine or single strands of rope to hold everything in place; add a second rope here and there across the run for added security.

5.) Install diagonal wind braces during initial construction at both ends of the greenhouse. Insist that the greenhouse manufacturer make them to fit. Don't assume they will be included; it is cheap insurance.

6.) Take a minute to contemplate the environment immediately outside your greenhouse. It will do you no good to go through all these preparations of you don't notice a loose metal object like a trash can top and it gets sent through the greenhouse walls.

7.) We've built lean-to sheds on the north end of our newest greenhouses. They are 18' by 12' and serve many purposes: a home for furnaces and indoor oil storage, storage for chemicals and misc. pots, and most importantly they add considerable rigidity to greenhouses.

8.) We cement in every other ground post and add cement filled sonotubes to the end walls which increase greenhouse rigidity and act as anti-lifting anchors.

*Editor's note: whether Hurricane Isabel reaches New England or not, it's a good idea to include preparing for high winds in your greenhouse design!*

## PUMPKIN HARVEST AND SQUASH BUGS

Squash bug adult.
*Photo by R. Hazzard*

Growers are juggling labor, impending storms, maturity, disease, insects, deer, woodchucks, and markets, to mention a few factors, in harvesting their pumpkins and winter squash. In many pumpkin fields it appears that the fruit set is light, but fruit quality and size are excellent. Given the conditions that we faced in June, the yield is better than expected; though still lower than usual. However, there are still fields where losses to Phytophthora are serious. Wherever possible, it is advisable to bring fruit in out of the field for storage on pallets or under cover – to protect it from the whole range of types of damage (see August issue for more details on harvest and storage). Leave behind in the field any fruit of questionable quality, and till under the crop residue as soon as harvest is complete.

Squash bugs and cucumber beetles can be found on fruit at

Nymphs congregate on pumpkin fruit. - *Photo by R. Hazzard*

this time of year. Squash bug nymphs and adults congregate and feed on stems and rinds, causing scarring that reduces marketability. (see photos) It is debatable whether, or at what density, it is worthwhile to attempt to control these populations with insecticides. If you are concerned about the level of fruit damage and cannot harvest soon, consult the New England Vegetable Management Guide for recommended materials. Squash bugs seek out protected

Squash bug feeding damage on pumpkin stem
*Photo by R. Hazzard*

locations under crop residue, leaves and stems, etc. – they prefer protected habitats within the field. We have seen higher numbers of squash bugs in reduced-tillage or mulched fields compared to cultivated fields.

Field sanitation is a successful strategy to manage the overwintering squash bug populations and in large pumpkin fields. The unmated adults, including both male and female, overwinter in all kinds of protective shelters, including dead leaves, vines, stones, buildings, and dwellings. After the crop is harvested, vines and non-harvested fruits should be removed from the field or destroyed by thorough cultivation. Field margins should be as free as possible of rubbish, piles of leaves, boards, and other shelters.

In a small planting, boards can be used as traps – place boards in the field, and look underneath in the morning for a collection of squash bugs.

*--R. Hazzard & P. Westgate, with reference from F. Lam, Purdue University.*

# 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*

## CALENDAR

**September 17-18 Food Business Incubation Summit**, Clarion Hotel, One Atwood Drive, Northampton, MA. Cost is $75 per registrant. Contact Cheryl Leach at 315-787-2622 or cal35@cornell.edu for more information. The symposium will re-unite food processing technical and business support professionals from across the country to review best practices for food venture enters and incubation facilities. There will be several workshops that will review and explain some of the new and revised requirements of food processors.

**September 26 Fall High Tunnel Workshop**. at the High Tunnel Research and Education Center, Horticulture Farm, Rock Springs, PA. Contact: Lisa White 814-692-4635.

**October 13 Innovative Cropping Systems For Organic Vegetable Production.** Nordell's Farm in Beech Grove, PA. Part of the North East Organic Network (NEON) field days with the Pennsylvania Association for Sustainable Agriculture (PASA). Showcasing innovative cropping systems for organic vegetable production. Eric and Anne Nordell will present their cover-crop intensive rotation for optimal weed and soil

moisture management, while NEON researchers will address findings from a number of other local vegetable farms. Lunch will be available. Contact Maxine Welcome at 607-255-5439 for registration.

**Thursday, October 23, 4:00pm : Twilight meeting at Cider Hill Farm.** Glenn and Karen Cook are the owners of Cider Hill Farm. Their farm provides orchard tours, hayrides, cider pressing, animals and pick your own. There will be a talk on the variety of apples that are grown on the farm and about storage of pesticides. One pesticide credit will be given for attending the meeting. Jon Clements Umass Extension Tree Fruit Specialist will be on hand. For questions or more information call Jon Clements at (413) 323-4208 or email clements@umext.umass.edu. For directions visit www.ciderhill.com

**October 27-29 Compost Advanced Short Course.** Cornell Waste Management Institute, Holiday Inn, Ithaca, NY. This is a practical guidance workshop using technical information to improve composting systems and compost marketing. Registration Fee: $275 before September 15th ($325 after September 15th), includes materials, lunch, breaks, social hour. Optional Tour: October 26 (Sunday): We will visit a variety of sites using different compost feedstocks, different composting methods and different end-product uses. $55 before September 15th ($75 after September 15th, includes lunch. For more information and to register, go to http://cwmi.css.cornell.edu. or call (607) 255-1187 or www.cfe.cornell.edu/wmi.

**Saturday November 1. New England Vegetable & Berry Growers fall meeting. Westport, MA.**

**December 16, 17 & 18. New England Vegetable and Berry Conference and Trade Show and New England Fruit Meetings.** Larger facility and full three-day program in Manchester New Hampshire. For more information contact Frank Mangan (fmangan@umext.umass.edu) or see **www.nevbc.org** for complete program. Programs will be mailed in early October.

# CLARK NICKLOW

Clark William Nicklow, 67, of Ashland, died Thursday, July 31, 2003, at Eliot Healthcare Center in Natick. He was the husband of Rosemary Nicklow and the late Mary Kelly Nicklow, his first wife. Born in Upper Turkeyfoot Township in Pennsylvania, he was the son of the late Orion and Nannie Nicklow. A graduate of Rockwood High School, Class of 1953, he received a Bachelor's Degree from Pennsylvania State University and both a Master's Degree and a Ph.D. from Cornell University.

Clark had developed brain cancer, which was discovered during an MRI following an automobile accident earlier in the year. It progressed quickly, and although he had surgery and radiation treatments ultimately the doctors had to give up. His wake and funeral were heavily attended, as he was quite active in his church, with the Lions Club, and with the Community Harvest Project.

He was employed as an Extension Specialist at Michigan State University and later at the University of Massachusetts. Clark took over Bob Young's position at Waltham and continued in the footsteps of Young's breeding program. He developed a bush type Waltham butternut as well as other breeds of squash and tomatoes. He ran the soil testing lab in Waltham and brought new, state of the art equipment into the lab for soil processing. He felt strongly about being in touch with growers at all times, and was one of the first to use the earliest type of cell phone which he carried with him into the field. Clark also worked to establish the first New England Vegetable and Berry Conference in the 1970's.

Dr. Nicklow was a member of the Fiske UM Church. Besides his wife Rosemary, he leaves his son, Joel Nicklow of Denver, a stepson, Daniel Kelly and his wife, Chieko, of Hawaii; a stepdaughter, Shaunne Moscatelli and her husband, Kenneth, of Cape Cod; his brothers, Howard of Markleton, Pa., Everett of Berlin, Pa., and Dale of Markleton; three sisters, Louise Kreger of Markleton, Shirley Hoffman of Somerset, Pa., and Cora Lee Tressler of Markleton; and three grandchildren,

Michelle and Gina Moscatelli and Mayuka Kelly.

A funeral service was held Tuesday, Aug. 5, at the Chapel of the Matarese Funeral Home, 325 Main St., Ashland, MA. Memorial donations may be made to the American Cancer Society, 6 Strathmore Rd., Natick, MA 01770.

# POTATO DISEASE MANAGEMENT DURING HARVEST AND STORAGE

The cool wet season in Pennsylvania has provided suitable conditions for many diseases that could become a problem in storage. Even if the proper controls have been implemented to protect plants during the growing season, without careful management during harvest and storage these pathogens can infect and spread rapidly.

**Rots**

Bacterial soft rot, Fusarium dry rot, pink rot, and Pythium leak are four serious tuber-rotting pathogens that cause the most significant losses in storage. These diseases can be brought in on infected tubers or survive on storage debris. Many of them take only a few weeks to destroy a tuber and then spread through the storage pile. Due to excessive moisture periodically throughout the growing season, we expect higher than normal levels of soft rot and pink rot.

Two of the main management practices that will reduce losses to these diseases after harvest are allowing tuber skins to mature in the field before harvesting and eliminating free moisture in storage areas. However, Rhizoctonia black scurf and silver scurf may be at high levels on the tubers and will increase in severity the longer the tubers remain in the soil. Therefore to avoid these diseases, as soon as skins are set, harvest should begin. If the weather remains wet during the harvest, soil may adhere to the tubers during harvest. This soil will promote conditions for soft rot.

**Blights**

Due to the amount of rainfall during the planting and early growing season every county in the state reached the threshold for late blight development when plants were young. Late blight has been reported in several regions of Pennsylvania found on both potatoes and tomatoes. For those regions where no late blight has been reported so far, precautions to avoid or reduce late blight infections needs to continue through the vinekill process. Fungicides such as the coppers or Previcur can be tank mixed with a chemical desiccant to protect the plants during the desiccation period. Late season infections even though the disease severity may not be high can result in high levels of late blight tuber rot. If late blight is found to be moderate to high in severity in a field, we recommend harvesting that field last. This will reduce the spread of late blight via equipment to tubers from non-infested fields. Also, tubers that were highly infected will decay in the field and therefore less disease will be brought into the storage. We also recommend not storing tubers from infested fields but rather marketing as soon as possible.

Below is a list of guidelines that can be used during harvesting and storage to help prevent the spread of the diseases mentioned above and to maintain high quality potatoes:

**Vine killing**

* Vine kill stops tuber growth at the desired maturity, stabilizes the tuber solids, and promotes skin set.
* Mechanical or chemical methods or a combination of the two can be used to kill potato vines.
* More than one application of a chemical desiccant may be required.

**Disease management**

* Foliar diseases, especially late blight are still a threat as vines begin to die or vine killing methods are implemented.
* These pathogens can spread to tubers and cause problems in storage if they are not controlled prior to harvest.
* Application of a desiccant followed by a fungicide application a few days later is recommended instead of applying the desiccant and fungicide at the same time. This way, thorough coverage of the remaining plant material can be achieved.

**Skin set**

* Most tuber diseases require a wound to get into the potato. Good skin set greatly reduces the amount of wounding at harvest and increases the storage ability of the tuber.
* Allow for skin set on the tubers in the field for at least 10-14 days before harvesting.

**Wounding and bruising prevention**

* Check harvesting and transporting equipment to make sure it is working properly and that it causes minimal damage to tubers
* Harvest when the soil is moist but not too wet and when tuber pulp temperatures are around 60-65°F will make the potatoes less susceptible to bruising and wounds.

**Grading**

* Grade out diseased tubers as quickly as possible. The longer they are mixed with healthy tubers, the higher the chance of disease spread.

**Healing period**

* Store tubers at about 50-55°F for 10-14 days to allow wounds to heal before placing potatoes into colder storage.

**Storage**

* Before storing potatoes, facilities should be cleaned thoroughly and inspected. Make sure to check the insulation, fans, humidifiers, and ventilation system. If any of these are in poor condition it could result in losses due to disease.

References:

Rowe, R.C., Ed. 1993. Potato Health Management. The American Phytopathological Society. St. Paul, MN.

Stevenson, W.R. Loria, R., Franc, G.D., Weingartner, D.P., Eds. 2001. Compendium of Potato Diseases. 2nd edition. The American Phytopathological Society. St. Paul, MN.

*- Sara R. May and Dr. Barbara Christ, Department of Plant Pathology, Penn State University, from the*
*The Vegetable And Small Fruit Gazette September 2003 Volume 7, No. 9*

# WOULD YOU LIKE TO PARTICIPATE IN THE BRASSICA – FLEA BEETLE PROJECT?

Are brassica crops important to your operation – whether as salad mix, bunched greens, or heads of bok choi, cabbage, or broccoli? Are flea beetles causing damage to your crop – possibly even getting worse as the years go by? Is your ability to grow high quality brassicas limited by flea beetle pressure at certain times of year? Are there other production concerns – water, nutrients, weeds, season extension, other insects or diseases – where would you like to see improvements in your system?

If your answer is "yes" to any of these questions, we would like to invite you to participate in an ongoing project in Massachusetts and Connecticut. The project is a joint effort by the UMass Extension Vegetable Program and the Connecticut Agricultural Experiment Station. For several years, growers have been trying out new brassica species and various strategies for managing flea beetle. We are planning the next steps in this project and welcome growers who would like to participate in the planning process, in a grower forum this winter, or in field trials next season.

To contact us for more information or to express interest, please email Ruth Hazzard at rhazzard@umext.umass.edu or phone 413-545-3696.

*--R. Hazzard, University of Massachusetts, & Kimberly Stoner, CT Agricultural Experiment Station*

# SWEET CORN & PEPPER

Insect pressure is down – but not over. Fewer sites are reporting, but those that we have trap counts for show low levels of **European corn borer** (ECB). It is possible that we are seeing a partial third generation where the Z1 counts are still high. There may still be borers entering the tips of ears during silking. **Corn earworm** (CEW) and **fall armyworm** (FAW) are still around, especially in southeastern Massachusetts. Many growers have finished picking, but there are still some late fields with excellent quality corn that will be harvested within the next couple of weeks. Given cooler temperatures, use an extended spray schedule, depending on CEW counts in your area. The final spray may be applied 5-7 days before harvest.

**Table 1: Trap Counts for European Corn Borer, Corn Earworm and Fall Army Worm in Sweet Corn**

| | | Iowa | NY | | | | |
|---|---|---|---|---|---|---|---|
| **Town** | **Date** | **ECB Z1** | **ECB E2** | **TOTAL ECB** | **CEW** | **FAW** | **% PT** |
| Hatfield | 9/11/03 | 37 | 2 | 39 | 4 | | |
| Still River | 9/11/03 | 0 | 2 | 2 | 19 | 8 | |
| Dighton | 9/10/03 | 7 | 0 | 7 | **28** | 0 | |
| | | | | | | | |
| Walpole, NH | 9/17/03 | 1 | 7 | 8 | 9 | 3 | |
| South Deerfield | 9/17/03 | 5 | 22 | 27 | | | |
| Feeding Hills | 9/16/03 | 0 | 2 | 2 | 35 | 10 | |
| Tyngsboro | 9/14/03 | 7 | 5 | 12 | 15 | 0 | |
| Lancaster | 9/18/03 | 0 | 0 | 0 | 6 | 1 | |
| Still River | 9/17/03 | 0 | 2 | 2 | 19 | | |
| Concord | 9/15/03 | 0 | 0 | 0 | 2 | 0 | |
| Leicester/Spencer | 9/17/03 | 3 | 2 | 5 | 3 | 1 | |
| Northbridge | 9/17/03 | 1 | 5 | 6 | 9 | 0 | |
| Dighton | 9/18/03 | 2 | 3 | 5 | **28** | 0 | |
| Rehoboth | 9/18/03 | 7 | 11 | 18 | **28** | 52 | |

*Note: Counts in **bold** represent an average count from two traps.*

*--R Hazzard with contributions from A. Duphily, J. Golonka, J Mussoni, R. Pestle,P. Westgate, and P. Willard*

**Table 2: 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 | 3.5 – 7 | 5 days |
| 1.0 - 13.0 | 7 – 91 | 4 days |
| Over 13 | Over 91 | 3 days |

*Vegetable Notes, Ruth Hazzard, Editor. Nicholas Connor, Assistant Editor. Vegetable Notes is published weekly from May to September and includes contributions from the UMass Extension Vegetable Program faculty and staff, growers, and private IPM consultants. Authors of articles are noted; author is R. Hazzard if none is cited.*

We would like to thank the following businesses for their sponsorship of *Vegetable Notes*:

**Crop Production Services**, 25 Elm St., South Deerfield, MA 01373. Phone 413-665-8775. Contact: Mike Barlow. "Profit from our experience."

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**Family Farm Life and Casualty Insurance Co**., 88C Main St., Northboro, MA 01532. Phone 508-393-9327. Contact: Dick Simonian. "Call for the

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