



UMASS
EXTENSION



Vegetable Notes

For Vegetable Farmers in Massachusetts

Volume 18, Number 1

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NEW ENGLAND BRASSICA SCHOOL

GROWING & MARKETING HIGH QUALITY BRASSICA CROPS

**Sturbridge Host Hotel
Sturbridge, MA**

Tuesday, March 6 2007

Over the past two years UMass extension has been working closely with nine growers to help them improve some aspect of their Brassica crop production. These growers, together with UMass Extension personnel and consultants, came together in the winter of 2005 to set goals and determine a course of action that would allow them to meet those goals. The topics covered included marketing niche crops, season extension, fertility management, pest and disease control, and improved cultural practices for specific crops. Over the next two years these growers implemented their strategies and kept records to chart their progress. We visited growers periodically throughout the season to offer information and advice where we could, as well as conducting some formal research into production questions. As the culmination of this two year project, we are putting on a 'Brassica School' to share the experiences of these nine growers and to bring in speakers to explore some of these topics in more depth. We think that we've put together an agenda for the day that will be of interest to all growers of these crops, from the small scale farm stand grower to the large wholesale operation; conventional, IPM, and organic farms; and anyone else who has an interesting in growing and marketing high quality brassicas.

Grower Panel

Join a cross section of growers who participated in this intensive two year project to improve various aspects of their brassica production. They will describe their work in season extension, specialty marketing, and production strategies for root crops, heading crops, and greens.

The growers involved in this project are:

•Edwin Matuszko, Twin Oaks Farm
Growing and Marketing 'mini' cabbages

•Amy Klippenstien, Sidehill Farm
Season extension for brassica greens and developing an effective system for crop by crop financial analysis

•Jamie Barret, Appleton Farm
Improved cultural strategies for broccoli and brussels sprouts and improved management of cabbage maggot in root crops

•Sam Hammer, Holcomb Farm CSA
Season extension in brassica greens and improved management of cabbage maggot in root crops

•Nou Yang, New Entry Sustainable Agriculture
Improved pest and weed management, improved understanding of fertility management

•Dave Dumaresq, Brox Farm
Extending the broccoli harvest through selection of heat and cold tolerant varieties

•Ricky Baruc, Seeds of Solidarity Farm
Pest identification and control in organic brassica production and season extension for leafy brassicas

•Kathy Caruso, Upper Forty Farm
Improved cultural methods for broccoli production

•Walter Griest, Mill River Valley Garden CSA
Developing a novel system for securing row cover

In addition to a round table discussion featuring a representative sample of these growers, topics and speakers will include:

Proper Nutrition for Brassica Crops

Join Vegetable Specialist John Howell for a discussion of the particular nutrient requirements for growing high quality brassicas

Physiology of Flowering in Brassica crops

Thomas Bjorkman from Cornell University discusses the effects of temperature on the flowering of various brassicas, and presents his research on the effects of heat on broccoli head development

Marketing Panel Discussion

Discuss marketing trends and strategies with the people who buy your produce. Featuring representatives from the wholesale, restaurant, farm-to-school, and specialty branding markets. Panel will include:

•Max Brody, The Montague Night Kitchen – Chef Max uses as much local produce as possible to create a stunning seasonal menu at one of the most picturesque upscale restaurants in Massachusetts

•Mike Rozyne, Red Tomato - Specialty marketing organization for local produce

•Kelly Erwin, Farm to School program – Learn about this unique marketing niche

•Representative from Whole Foods Local Forager program

Managing Insects & Diseases

•Ruth Hazzard and Bess Dicklow from UMass Extension present the latest word in both conventional and organic insect & disease management in Brassica crops

Broccoli Variety Selection

Andy Cavanagh from UMass Extension presents two years of research into both heat and cold tolerant broccoli varieties

New Markets

Frank Mangan of UMass Extension discusses the opportunities presented by changing market demographics in New England

Season Extension & Winter Production

Lisa Turner from Laughingstock Farm in Maine discusses winter production and alternative heating sources. This session is supported by the UMass Extension Floriculture Program and NE SARE.

This meeting will be held at the Sturbridge Host Hotel in Sturbridge, MA on Tuesday, March 6, 2007. Lunch and refreshments are included in the registration fee. Walk-ins are welcome, but pre-registration is required to guarantee a meal and a handbook. Attached you will find a flier with more information and a registration form. If you would like more information, please contact Andrew Cavanagh at acavanagh@psis.umass.edu or by phone at 413-577-3976.

--Andrew Cavanagh UMass Extension

SWEET CORN PROJECT 2005-2006 : USING NEW MATERIALS AND BIOCONTROLS FOR INSECT MANAGEMENT IN SWEET CORN

For the past two years the UMass Extension Vegetable Program has been working on a project funded by the EPA Region I and the New England Vegetable and Berry Growers Association to introduce sweet corn growers in Massachusetts to new methods of pest monitoring and control. The objectives of the program were to work with growers to improve on-farm scouting of sweet corn pests and to increase the use of reduced-risk biopesticides and biological control for control of European corn borer (ECB) and fall armyworm (FAW). Similar projects have been underway in New Hampshire, Maine and Connecticut.

A New England survey of sweet corn growers, conducted in 2004, showed that the majority of sweet corn acreage was treated with pyrethroids and carbamates, and the most common materials used for control of caterpillar pests (including corn earworm, as well as European corn borer and fall armyworm) were Warrior (a synthetic pyrethroid) and Lannate (a carbamate). Reliance on the same types of chemistry for control of these pests is likely to select for resistance to that chemistry, resulting in reduced effectiveness.

In the survey, growers were also asked what factors influenced their choice of pesticides in sweet corn. The most important factor was insecticide efficacy compared to other products, followed by the toxicity of the product to humans. Cost was less important (see Table 1). The two reduced risk products tested in this project were Avaunt (indoxycarb) and Spintor (spinosad), both of which have lower human toxicity than carbamates and synthetic pyrethroids. They also offer alternative chemistries (modes of action) against pests, thus providing an important tool to delay insecticide resistance in the pyrethroids and carbamates. They do,

however, cost more per acre.

Table 1.

Factors for choosing Pesticides in Sweet Corn	Rank	Score*
Effectiveness against pest compared to alternative products	1	670
Applicator hazard (toxicity to humans)	2	646
Customer relations (food safety concerns)	3	566
Label restrictions (REI, PHI, protective equipment)	4	522
Impact on beneficials (parasites, predators, pollinators)	5	516
Other potential nontarget and environmental impacts	6	492
Cost per treatment	7	482
Formulations (liquid vs dry, water soluble bags)	8	366
Storage requirements	9	336
Size or type of packaging	10	334

How important are these factors to you when choosing pesticides for use on your farm? (Please circle your answers) (N=203)

**The score was determined by multiplying very important by 4, somewhat important by 2, and not important by 0.*

Alternative methods introduced through this project included training in IPM scouting, using reduced-risk pesticides, and releasing the parasitic wasp *Trichogramma ostriniae* as a biological control for ECB. While some growers have used IPM in sweet corn for many years, others have never tried it on their own farms. The training program focused on working one-on-one with growers to learn how to identify each of the sweet corn pests and the damage they cause in the field. Growers met with extension staff in the field, to learn techniques used in scouting corn at various stages throughout the season, learn proper trap placement and maintenance, and learn how and when to apply pesticides based on what they found in scouting and in traps. Growers who were interested in trying biological control for ECB learned how to handle and release *Trichogramma ostriniae*. Trap captures were reported to the sweet corn trapping network and were published in Vegetable Notes on a weekly basis.

Ten growers in 2005 and seven growers in 2006 tested Avaunt

(indoxycarb) for control of fall armyworm. All of these farms had a history of high armyworm pressure late in the season. Avaunt is not a contact poison, and must be ingested by caterpillars to be effective. When ingested, it is converted to a toxin that causes paralysis and death. It is effective on all caterpillars but has proven to be especially effective against fall armyworm when used in corn from whorl to tassel emergence. It is not labeled for use during silking, because it is not effective against pests that move into the ear without feeding (such as corn earworm). Avaunt is easy on predators that keep aphid populations under control. We recommended a rate of 3oz per acre, after FAW infestation levels were found to be 15% or higher in whorl stage corn. A second spray was applied if the field was still over the threshold 1 week later. Of the growers who tested it, 94% reported that Avaunt worked and said they would use it again. Some reported that they felt it worked better than their standard product. Others noted that it worked better on smaller caterpillars, so they needed to be alert to catching the problem early when FAW were small. One grower started using a FAW pheromone trap to detect when these migratory moths arrive and time his sprays better, and was very pleased with the results.

Ten growers tested spinosad in 2005 & eight in 2006 for control of European corn borer in early corn. We focused on early corn because ECB is a major problem, and corn earworm is less likely to be a problem. Most growers tested Spintor, the liquid formulation of Spinosad, but some used Entrust, a dry formulation that is allowed in organic production. Both formulations are general-use with a caution label and one day preharvest interval. Spinosad acts as both an ingested poison and a contact poison and can be effective against caterpillars, beetles, thrips and leaf miners. It can be used on all stages of corn. It is less toxic to beneficial insects than the carbamates and pyrethroids, though not as easy on predators as Bt products. We recommended a Spintor rate of 4oz/acre, when ECB infestation levels were 15% or higher. Spintor is only effective against low to moderate levels of corn earworm during silking; in our tests, growers generally used conventional products if corn earworm threatened their corn at the silking stage. Of the growers involved in the program, 88% reported that Spintor and Entrust worked to control ECB, and said they would use it again.

Four growers released *T. ostriniae* in 2005 and four in 2006, on a total of 56 acres of early corn. This tiny parasitic wasp (which is not the kind of wasp that stings people!) works by laying its eggs into the ECB eggs; the *T. ostriniae* larvae feed and develop inside of the ECB eggs. This prevents hatch of the ECB larvae that would feed on the corn stalks and ears. New adult wasps emerge and search for new egg masses, continuing to reproduce and control ECB throughout the season.

Timing is everything when releasing a biocontrol. Since the wasps lay eggs inside of ECB eggs you must release the wasps when the ECB is laying eggs. ECB flights should be monitored starting in the end of May and releases made after flight begins. Two or three releases at weekly intervals are needed to cover the whole period when ECB eggs are present in the field. In 2006, we made releases the weeks of June 6, 13, and 21.

One major difference between *Trichogramma* and insecticides is that the *Trichogramma* are alive! You want to be sure that they

are still alive and in good shape when you put them in the field. That means not letting them get too hot (don't leave them in the truck in the hot sun if you get sidetracked on the way to the field), not letting them get too cold (they should not be refrigerated), and not letting the wasps emerge before you put them in the field. It's best to put them out in the field the same day as they arrive from the insectary. Cards will arrive in a cold pack in the mail, and should be placed in the field the same day. The wasps will arrive from the insectary as pupae inside grain moth eggs they were reared on, glued inside cardboard release packets. Each packet contains 15,000 pupae. We recommend a release rate is 30,000 to 60,000 wasps per acre, meaning that 2-4 cards should be placed per acre. We have found that the higher release rate gives better control.

The release packets are important because predators like lady beetles and lacewing larvae will feast on *T. ostriniae* pupae if they get the chance -- and there can be a lot of these predators in a corn field. The adult wasps will emerge from the pupae and escape from the release packet along the open edges. Distribute the packets as evenly as possible throughout the field, starting about 50 feet in from the field edges. If you have a long narrow field less than 125' wide, distribute them evenly along the middle row. For wider or more square-shaped fields you'll need to use more than one row. Flat wooden stakes can be used to put the release containers on if the plants are too small to attach them to. Do not put them on the ground, and when hung from a plant, locate them in the shade, such as under a leaf or on the north side of the plant.

Trichogramma suppress ECB populations, but may bring the population down to the level needed. Fortunately, regular scouting procedures at pretassel stage will determine if a spray is needed. Some of the insecticides labeled for sweet corn are less toxic to *Trichogramma* than the others. Bt products do the least harm to *Trichogramma* in the field, and Spintor and Avaunt are less harmful than pyrethroids, so these products help you get the most out of your investment in *Trichogramma*.

Every grower who released *Trichogramma* in 2005 and 2006 reported it reduced ECB infestation, resulted in very clean early corn, while reducing (though not eliminating) their need for sprays in early corn. All are interested in trying it again. They also reported that the impact continued into late season, where their late corn was fairly close to the fields where *Trichogramma* had been released in June. For example, one farm in Hatfield has records of weekly ECB moth captures for previous years as well as for 2006 when *Trichogramma* was released. The peak of the ECB flight in August ranged from 29-37.6 moths per night in past years, but only reached 1.3 moths per night in 2006. While this was not a controlled experiment, it was a dramatic change from moth capture data taken over a 10 year period.

To assess the effectiveness of the program, we surveyed the participants at the end of each season. Responses showed that by adopting these practices growers were able to improve their crop and farm in many different ways. Growers reported the following as a result of the program; improved crop quality and yield (100%); learned more about IPM techniques (100%); fewer pesticide applications were made (77%); reduced environmental impact (77%); increased applicator and worker safety (67%); public relations improved among customers (55%). Releasing of

Trichogramma ostrinae cut down on the occurrence of European corn borer in the early season as well as the late season, therefore reducing pesticide applications and achieving cleaner corn.

Growers reported that the overall advantages of the new practices were (in order of response): fewer sprays needed, cleaner corn, and less toxicity to applicator. Problems reported were that Spintor was not effective against sap beetle, Avaunt is less effective against large fall armyworm than small caterpillars, and that the new products are more expensive. The cost per acre at the rates used in these trials would be approximately \$18 for Avaunt and \$21 for Spintor. Every grower needs to weigh the factors of efficacy, safety, cost, and impact on beneficial insects for their own farm. The alternative products worked as well as conventional products in most situations. *Trichogramma* reduced need for sprays in both release blocks and in later corn. The majority of the growers who participated plan to keep on using these new practices on their own.

For more information about using *Trichogramma*, IPM, or new products, please feel free to call the UMass Vegetable Program office (413-545-3696 or 413-577-3976) or visit the UMass Vegetable website, www.umassvegetable.org and search for sweet corn or European corn borer. This project will continue in 2007. We appreciate the support of EPA Region I, the New England Vegetable and Berry Growers Association, and especially thank the cooperating growers who were willing to try something new!

--Amanda Brown and Ruth Hazzard

UNIVERSITY OF VERMONT EXTENSION GREENHOUSE TOMATO SCHOOL

March 14, 2007

Sponsored in part by USDA Risk Management Agency
DoubleTree Hotel, Burlington, Vermont

From I-89 take Exit 14E onto Route 2 East. Go straight through traffic light, the hotel is approximately 1/10 of a mile on the right.

Overnight room rate is \$93. Call 802-658-0250.

8:30 Registration and Coffee

9:00 Update on greenhouse tomato production practices in Quebec - Andre Carrier, Horticulture Specialist, Quebec Ministry of Agriculture

10:30 Break

10:45 Best management practices for biocontrol of greenhouse tomato pests - Les Shipp, Agriculture and Agri-Food Canada

11:30 Grafting tomatoes, hands-on session - Experienced grafters mentor beginners with live plants (provided).

12:00 Lunch – included in registration fee

1:00 Greenhouse tomato diseases and their management - Ann Hazelrigg, University of Vermont Extension

1:45 Bees, a new way to deliver microbes for pest control and disease suppression - Les Shipp, Agriculture and Agri-Food Canada

2:15 Grower Panel - innovative greenhouse practices

Skip Paul, Wishingstone Farm, Little Compton RI

Mike Collins, Old Athens Farm, Westminster VT

Dave Colson, New Leaf Farm, Durham, ME

3:00 Questions, answers, discussion

3:30 Adjourn

This meeting is worth 4 Credits for Private Applicators and Commercial applicators in categories 1A and 10.

\$30 pre-registration per person includes lunch. Pre-registrations must be received by March 12. At-the-door registration will be \$40 per person.

Send check to 'UVM Extension' c/o Vern Grubinger, 11 University Way, Brattleboro VT 05301-3669.

For more info 802-257-7967 ext. 13, or vernon.grubinger@uvm.edu

NEW ENGLAND FARMERS' DIRECT MARKETING CONFERENCE & TRADE SHOW, SUCCESSFUL STRATEGIES FOR GROWING YOUR FARM BUSINESS

February 28 – March 1, 2007, Sturbridge Host Hotel, Sturbridge, Massachusetts

The New England Farmers' Direct Marketing Conference and Trade Show is your best opportunity in 2007 to learn new marketing ideas and fine-tune strategies for your business success. You should attend if you are a grower, value-added producer, planner, economic developer, government leader, farmers' market manager or interested in agriculture!

Register Now On-Line:

<http://www.harvestnewengland.org/conference/index.htm>

Vegetable Notes, Ruth Hazzard, editor, Kate Reidel and Amanda Brown, Assistant Editors. *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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