UMASS EXTENSION

VEGETABLE IPM MESSAGE

Vegetable Notes

JULY 3, 2003 VOLUME 14, NUMBER 7

CROP CONDITIONS

What a difference a week makes! Field soils have changed from sodden, to just nicely dry enough to cultivate, to baked dry enough to get the irrigation going. Growers are shaking their heads as they set up irrigation, which seemed unthinkable just 10 days ago. The week ending June 29 was 4-8 degrees above normal throughout New England, with highs between 95 and 100 ºF. Clear sunny skies continue.

Field activities include transplanting pumpkins, tying and mulching tomatoes, spraying corn, cultivation and weed control, making final plantings of pumpkins and corn. Everything is still behind, and gaps in scheduling plantings may turn into gaps in supply.

Growers are harvesting cucumbers, radishes, beets, Swiss chard, peas, summer squash, broccoli, cauliflower, cabbage, Chinese cabbage, lettuce, carrots, diakon, turnips, fennel, and tunnel tomatoes, and even a few very early row-covered field tomatoes. Asparagus season is over. Retail sales are very strong and we finally had a sunny weekend. However, late strawberries may not draw as many pickers, who expect berries in June, not July.

Colorado potato beetle larvae have been hatching fast. **Cuke beetles** seem to have stopped colonizing new fields, and if controlled once the numbers have stayed down. Watch for **potato leafhopper** in potatoes and beans –they are just starting to arrive.

TOMATO: UPDATE ON TOM-CAST

The TOM-CAST disease forecasting model is a tool for helping tomato growers decide when to apply fungicides for control of **early blight** and **Septoria leaf spot**. Managing these common tomato diseases includes cultural practices such as crop rotation, good nitrogen management, making multiple plantings, or using stake-and-weave trellising. Stake and weave provide significant benefit compared to ground cultivation, in early blight control. However, most growers find that fungicides also play a role in keeping foliage and fruit healthy for as long as possible to get top yields. TOM-CAST can help decide when fungicides are needed -- and when they are not.

Table 1. TOM-CAST Model: Leaf Wetness Hours and Temperature >>> Daily DSV

Avg. Temp during Wetness Period (°F)	Number of hours of leaf wetness/day				
<55	0-24				
55 - 63.9	0-6	7-15	16-20	21+	--
64 - 68.9	0-3	4-8	9-15	16-22	23+
69 - 77.9	0-2	3-5	6-12	13-20	21+
78 - 85	0-3	4-8	9-15	16-22	23+
>85	0-24				
Daily Disease Severity Value (DSV)	0	1	2	3	4

Table 2: TOM-CAST DSV's for Summer 2003					
Month	Day	DSV/ Day	Accumulated DSV	Avg. Wet Temp F	Wet hrs/day
May	24	0	0	50	18
	25	0	0	54	7
	26	0	0	54	9
	27	1	1	57	10
	28	1	2	56	14
	29	1	3	58	10
	30	0	3	55	12
	31	2	5	60	17
June	1	1	6	55	9
	2	0	6	47	9
	3	0	6	0	0
	4	1	7	56	8
	5	1	8	57	9
	6	0	8	57	13
	7	4	12	60	21
	8	1	13	58	7
	9	0	13	57	6
	10	1	14	57	10
	11	3	17	68	15
	12	0	17	65	10
	13	4	21	59	23
	14	1	22	58	9
	15	0	22	53	5
	16	1	23	57	7
	17	0	23	56	7
	18	1	24	62	13
	19	0	24	63	4
	20	2	26	61	14
	21	3	29	59	19
	22	2	31	60	21
	23	2	33	67	14
	24	2	35	65	9
	25	2	37	69	8
	26	2	39	72	10
	27	0	39	59	1
	28	1	40	63	11
	29	1	41	65	4
	30	1	42	58	8
July	1	1	43	59	11
	2	0	43	0	0

A "calendar spray" approach achieves high levels of early blight control by using fungicides on a weekly schedule throughout the season. Equal levels of disease control can be achieved with fewer sprays, if those sprays are timed according to the TOM-CAST model. When environmental conditions favor the germination of early blight spores or the growth of lesions and production of new spores, fungicide coverage is recommended at shorter intervals. When conditions do not favor disease, the TOM-CAST model recommends more extended spray intervals. Many growers use their own assessment of the weather conditions to time their sprays – using fewer sprays when conditions are dry, and more when conditions are wet. TOM-CAST gives an objective measure of leaf wetness and temperature and can help growers validate their 'intuition' on how much to spray.

The TOM-CAST model is based on the parameters that most affect the rate of infection and growth of the disease: the length of time that the leaf surface is wet, and the temperature during the leaf wetness period. Leaf wetness from dew and from rainfall are treated the same way. Long periods of leaf wetness and temperatures between 64ºF and 85ºF are most favorable for germination, growth and spore formation. Below 55 ºF and above 85 ºF, no disease development occurs. The model combines the length of leaf wetness with temperature to provide a daily Disease Severity Value (DSV) (see Table 1). Daily DSV's are summed on successive days, to give an accumulated DSV (Table 2).

Our DSV count begins on May 24, because from that date on we do sometimes see night temperatures above 55ºF, and because growers may plant their earliest tomatoes in May. This season we saw wet, cool weather through May until June 22, then suddenly dry, hot conditions after June 23. Some of those wet days in early June logged high DSV's – but some were too cool for early blight to develop. By contrast, these hot sunny days have logged steady DSV values, because of warm nights with long dew periods.

The optimal time for initiating fungicides is before the disease gets established, before foliage is so thick it is difficult to penetrate, and when environmental conditions combined with plant maturity increase the risk of disease development. We recommend the first fungicide when cumulative DSV's reach 35, or during the first week in July -- whichever comes first. This year, 35 DSV's were reached on June 24. **If you have not applied fungicide to your tomatoes, it is certainly time to begin.**

After the first fungicide, subsequent fungicide applications are recommended when cumulative DSV's reach 15 since the last spray. Ideally, this would be based on measurements taken at

or close to your farm. To use regional data, you have to use your judgment on how conditions at your farm might compare to conditions at stations used for regional forecasting. If you are at a high elevation with cooler nights or tend to have winds that dry the foliage quickly, DSV's would accumulate more slowly. A valley with earlier dewfall, frequent fog or slow drying period in the mornings would chalk up higher DSV's. The South Deerfield research farm is located near the Connecticut River where morning fog can linger, so DSV's may be higher than many other parts of the state.

Within the next few weeks we will probably start to see early blight and Septoria symptoms in the field. We will be publishing weekly updates from the TOM-CAST model to assist growers in deciding their fungicide schedule. Keep in mind that this model applies only to early blight and Septoria leaf spot. If bacterial diseases have been a problem on your farm, a tighter spray schedule with products that will suppress bacteria is recommended. See the New England Vegetable Management Guide for recommended products.

TWILIGHT MEETING TUESDAY JULY 15, WARD'S BERRY FARM

Join us for an exciting twilight meeting at Ward's Berry Farm in Sharon MA, hosted by Jim and Bob Ward and their family. Close to the junction of I-495 and I- 95, this farm is easy to reach from all over the state. We've had great meetings at this innovative and successful farm before – and there's plenty of new things to see!

Mini trade show: We have invited commercial agricultural suppliers to set up displays from 4-5:30. More details on this next week.

Food: Refreshments at 4:45 compliments of Ward's Berry Farm.

Farm Tour: starts promptly at 5:30. Topics:

1. Farmstand, rebuilt two years ago, open year round. Features: 3 coolers with distinct temperatures, commercial kitchen (Jam, baked goods, etc), berry smoothie bar; sandwich counter; loading docks for palletized product.
2. Ebb and flow benches in gutter-connected greenhouse;
3. Hosting space for a 4H Club to raise animals – great for the farm, great for the club.
4. Corn maze;
5. No-till sweet corn;
6. Strawberries including post harvest techniques and applying nematodes through drip to suppress strawberry root weevil
7. tomato: managing bacterial diseases; using stake and weave with 60" stakes for indeterminate varieties; heirlooms for restaurant sales; drip on bare ground
8. Hosting beehives
9. Melons and squashes: striped cucumber beetle management using Admire transplant drench, perimeter trap crops, and timing.
10. Pumpkins: no-till pumpkin system – how to manage planting, nutrient, weeds and insects
11. Farming in a Zone II – living with the regulations.
12. Developing the business by making the farm a destination for families, school tours, birthday parties.

The tour will be on foot but a wagon will be provided for those not comfortable with walking. Donations will be requested to help cover the costs of the meeting. Pesticide applicator contact hours have been requested.

Directions: Take Exit 8 off I-95 (This is the section of I-95 between old Rte 128 in Boston and Providence. Can be accessed from I-95 (old 128) or I-495), go east toward Sharon ½ mile past shopping plaza. Farm is on the right.

UPCOMING TWILIGHT MEETINGS

Taking an evening to see another farm operation can give you new ideas that are worth a lot to your business. The following list is compiled from several sources. More tours will be taking place in late August and September. Check our website (http://www.umassvegetable.org) for a complete list.

July 8, Tuesday: New Hampshire Vegetable & Berry Growers' Twilight Meeting Moulton Farm, hosted by John Moulton, farm owner Meredith, NH in Belknap County Contact: UNH Cooperative Extension (603) 673-2510

July 10, 5:30-7:30 PM, Thursday: Season Extension on a Southern Vermont Organic Farm. Clearbrook Farm, Shaftsbury, VT. Host: Andrew Knafel. Co-sponsored by NOFA-VT. Andrew Knafel grows 20 acres of certified

organic vegetables, as well as bedding plants, spring seedlings, and strawberries. The farm has nine greenhouses, totaling roughly 18,000 sq. ft., three of which are devoted solely to tomatoes. Andrew will explain his tomato system, from grafting rootstock to buying bumblebee hives. Other topics of interest will include producing organic seedlings and their market, transplanting untreated corn, and general organic vegetable management. Contact: Brandon Shimoda (518) 271-0744

July 10, 6:00 PM, Thursday: Tour of the Cecarelli Farm, Northford, CT. Nelson Cecarelli grows 40-60 acres of sweet corn, plus a mix of lettuce, peas, beans, vine crops, cabbage, and solanaceous crops. He is transitioning from growing fruiting vegetables on bare-ground to using plastic mulch/trickle/raised beds, and has a new bed maker that compensates for tractor slippage to keep the bed straight, even on side hills. This season he is using Perimeter Trap Cropping to protect his cabbage, cucumbers and summer squash and employs an IPM consultant to scout and monitor for pests on the farm. He recently bought a vegetable washer, built a loading dock, expanded his irrigation ponds, and surrounded a 45-acre field with a deer fence. Nelson will lead us on a tour of the farm and describe his crop production methods.

Directions: From the North: Go south on I-91 to Wallingford and take the E. Center Street Exit (for Rt. 150). At the top of the ramp, take a left onto E. Center St. and cross back over the highway. Go 0.6 miles and turn right onto Northford Rd. Go 2.2 miles to the stop sign at Rt 17. Go right on Rt. 17 for 0.2 miles and take your first right onto Old Post Rd. The farm is 2 mile up on the right. From the South: Go north on I-91 to Exit 8 (Rt 80 Exit). Take a left onto Rt. 17 (north) and proceed several miles to Northford town center (intersection of Rt. 22 and 17). Take a left at the second traffic light in the town center onto Rt. 22 and immediately (about 30 feet) take a right onto Old Post Road. The Cecarelli Farm is located on Old Post Road (bare right when the road forks), 0.8 miles north of the Northford town center. Contact: Dr. Mary Musgrave (860) 486-3435

July 15, Tuesday: Ward's Berry Farm in Sharon, MA. ***See above.***

July 15, 11 AM to 1 PM, Tuesday: Designing and Building Containment Facilities for Pesticide Storage and Mixing/Loading. The University of Massachusetts Cold Spring Orchard Research and Education Center, Belchertown, MA. See this issue's insert. Contact: Natalia Clifton (413) 545-1044 or Bill Coli (413) 545-1051

July 17, 6-8 PM, Thursday: A Thriving CSA With Strong Member Support. Poughkeepsie Farm Project, Poughkeepsie, NY (Dutchess County). Hosts: Wendy & Asher Burkhart-Spiegel and Karen Nichols. The Poughkeepsie Farm Project provides an excellent example of a member-owned CSA committed to sustainable food production and outreach to the local community. Contact: Brandon Shimoda (518) 271-0744

July 17, 6:00 PM, Thursday: UConn's Plant Science Research Farm, Storrs, CT. Dr. Tom Morris (Soils Specialist) will talk about phosphorus use on vegetable farms. Dr. Frank Himmelstein (Field Crop IPM Coordinator) will show you the results of different herbicide combinations for sweet corn. Dr. Jude Boucher (Agricultural Educator/Commercial Vegetables), will walk you through experimental plots for a variety of cucurbit and solanaceous crops protected by Perimeter Trap Cropping (seeing is believing). Touring experimental plots allows you to observe the results of several different treatments in side-by-side comparisons.

Directions: From I-84, take exit 68 for Route 195 and proceed south to the University of Connecticut. Continue on Rt 195 through the campus and through the intersection with Rt 275 (South Eagleville Road). Turn left off of Rt 195, at the blue "A Plant Science Research Teaching Facility" sign (about 0.8 miles south of the Rt 275 intersection). The research farm is at the end of the road. Contact: Dr. Mary Musgrave (860) 486-3435

Mark your calendar for three more Extension Twilight meetings:

July 30, Wednesday: UNH Vegetable/Berry Twilight Farm Meeting Roots & Fruits: hosted by David Craxton, farm owner Dalton, NH Contact: (603) 673-2510

August 6, Wednesday: Four Town Farm, Seekonk, MA

August 13, Wednesday: South Deerfield Research Farm,

Field Day – with Trade Show and Local Foods Dinner!

UPDATE ON SWEET CORN INSECTICIDES FOR CORN EARWORM AND EUROPAN CORN BORER.

Growers have asked for an update on sweet corn insecticides. The following information is based on a review of current labels for two key pests: European corn borer and corn earworm. This is provided as an update to the **2002-2003New England Vegetable Management Guide.**

The information here is correct to the best available knowledge at the time of printing, but always read and follow the label before using any pesticide. The label is the legal document for product use. Products may be labeled for additional vegetable crops or additional pests; refer to label for details. Disregard any information if it is in conflict with the label. No company or product endorsement is implied or intended.

European corn borer

***Restricted Use Pesticide**

***Bacillus thuringiensis kurstaki*:** Follow manufacturer's directions regarding rates. Ensure good coverage and use a spreader sticker. Use a shorter spray interval (four to five days) and high rates under high borer pressure. *Some Bt products meet USDA Organic Certification Standards; check your state certification agency for specific products.*

bifenthrin (Capture* 2EC): 2.1 to 6.4 oz/A (1 dh, REI 12h). Use prohibited on corn in all coastal counties.

cyfluthrin (Baythoid* 2): 1.6 to 2.8 oz/A (0 dh, REI 12h).

esfenvalerate (Asana* XL): 5.8 to 9.6 oz/A (1 dh , REI 12h).

indoxacarb (Avaunt): 2.5 to 3.5 oz/A (3 dh, REI 12h for mechanical harvested and 14 days for hand harvested). Whorl application only.

lambda-cyhalothrin (Warrior*): 2.5 to 3.8 oz/A (1 dh, REI 24h).

methomyl (Lannate* SP): ¼ to 1/2 lb/A (0 dh for ears; 3 dh if used for feed or forage, REI 48h). Treat a small area of the field to determine cultivar sensitivity before spraying entire field. Phytotoxicity may occur on some varieties. More severe damage may occur with the Lannate* LV formulation than with the Lannate* SP (Soluble Powder) formulation.

methoxyfenozide (Intrepid 2F): 4 to 8 oz/A (3 dh, REI 4h). Insect growth regulator. Stops larval feeding within hours but takes several days to cause complete mortality.

permethrin (Ambush*): 6.4 to 12.8 oz/A (1 dh, REI 12h).

spinosad (Entrust): 0.5 to 2 dry oz/A (1 dh, REI 4h). Do not feed ears/stalks to animals for 28 days. Meets USDA National Organic Standards.

spinosad (SpinTor 2SC): 1.5 to 6 oz/A (1 dh, REI 4h).

thiodicarb (Larvin* 3.2): 20 to 30 oz/A (0 dh, REI 48h). DO NOT feed silage to livestock.

Corn earworm

***Bacillus thuringiensis aizawai* (XenTari):** ½ to 2 lb/A (0 dh, REI 4h). Use alone to control light to moderate populations and add a contact insecticide to control moderate to heavy populations. Follow manufacturer's directions.

***Bacillus thuringiensis kurstaki* (Dipel ES):** 0.75 to 4 pt/A (0 dh, REI 4h). Can be tank mixed with other insecticides. Follow manufacturer's directions.

bifenthrin (Capture* 2EC): 2.1 to 6.4 oz/A (1 dh, REI 12h). Use prohibited on corn in all coastal counties.

cyfluthrin (Baythoid* 2): 1.6 to 2.8 oz/A (0 dh, REI 12h).

esfenvalerate (Asana* XL): 5.8 to 9.6 oz/A (1 dh , REI 12h).

lambda-cyhalothrin (Warrior*): 2.5 to 3.8 oz/A (1 dh, REI 24h).

methomyl (Lannate* SP): ¼ to ½ lb/A (0 dh, for ears, 3 dh if used for feed or forage, REI 48h). Some sweet corn varieties may be damaged by methomyl. More severe damage may occur with the Lannate* LV formulation than with the Lannate* SP (Soluble Powder) formulation. May not provide effective control under high corn earworm pressure.

permethrin (Ambush*): 6.4 to 12.8 oz/A (1 dh, REI 12h).

soybean oil (Golden Natural Spray Oil): 0.5 ml applied by hand directly to silk within 6 days of first ears silking (REI 12 h). Caution: Avoid foliar applications to prevent phytotoxicity. Apply at least 4-6 days after silk initiation to avoid tip injury, and before 6-7 days after silk initiation to gain optimum control. Can be mixed with *Bacillus thuringiensis* (i.e. XenTari, Dipel DF) for improved control. One application per field. Commercial oil applicators (i.e. Zea-later) are available.

spinosad (Entrust): 1 to 2 dry oz/A (1 dh, REI 4h). Do not feed ears/stalks to animals for 28 days. Effective for low CEW pressure. Switch to another product when CEW pressure is high (> 13 moths/night in pheromone trap) or a 3-day spray schedule is warranted. Meets USDA National Organic Standards.

spinosad (SpinTor 2SC): 3 to 6 oz/A (1 dh, REI 4h). Effective for low CEW pressure. Switch to another product when CEW pressure is high (> 13 moths/night in pheromone trap) or a 3-day spray schedule is warranted.

thiodicarb (Larvin* 3.2): 20 to 30 oz/A (0 dh, REI 48h). DO NOT feed silage to livestock.

zeta-cypermethrin (Mustang*): 3 to 4.3 oz/A (3 dh, REI 12h).

SWEET CORN

Weekly Trap Captures for European Corn Borer in Sweet Corn					
		Iowa	NY		
Town	**Date**	**ECB Z1**	**ECB E2**	**Total ECB**	**% PT**
Walpole, NH	7/1/03	0	2	2	19%
Plainfield, NH	7/1/03	0	0	0	1%
Westminster, VT	7/1/03	0	22	22	19%
South Deerfield	7/2/03	11	1	12	
Sunderland	7/3/03	1	11	12	28%
Hatfield	7/2/03	20	8	28	37%
Hadley	7/1/03	40	76	116	12%
Feeding Hills	7/1/03	2	7	9	30%
Lancaster	7/2/03	6	14	20	28%
Still River	7/3/03	8	11	19	
Concord	6/30/03	1	0	1	43%
Leicester/Spencer	7/3/03	0	0	0	18%
Northbridge	7/3/03	0	2	2	33%
Rehoboth	6/30/03	4	3	7	
Sharon	7/2/03	5	33	38	
Kingsboro	6/30/03	4	7	11	27%

Tassels are popping up all over. More and more farmers are seeing silk, but there are still plenty of (frustrated) farmers where silk won't show for another week or so. **European corn borer** (ECB) flights are declining everywhere. However, most areas still have captures above 10 moths per week (see table). **Silking corn** that was never sprayed in tassel should be sprayed in early silk. In corn that has been in silk for over a week where flights are >10 moths per week, a second spray 5-7 days later is recommended. The big news is **newly hatched ECB larvae in the emerging tassels**. For corn just reaching pretassel stage, sprays should begin based on scouting for young larvae in the emerging tassel. The threshold for ECB and armyworms at tassel emergence is 15% infested plants. Infestations reported to us range from 1% to 43% infested plants. Best control is achieved when sprays are applied just as the green tassels pokes up out of the whorl. At this time, ECB larvae more downward out of the tassel and are easily reached by sprays. Check the block again after 3-4 days to see if there is still fresh feeding or live larvae in >15% of the tassels.

No **corn earworm** has been reported yet, but it is high time to get those traps up! Best to have one up before silk starts! Spend $70 on a trap and lures, and save yourself hundreds in losses from wormy corn that you sprayed too late after a flight arrived! It is one of the best investments you can make. Place the trap in freshly silking corn with the base at ear height. There are many brands of lures; we can report that Hercon lures (for corn earworm, H. zea) have proven extremely reliable for years. Two sources for traps and lures: Great Lakes IPM (1-517-268-5693) and Gemplers (1-800-382-8473).

Save those **aphid predators**! If you've ever scouted your early corn, you know how many ladybeetle larvae and adults congregate there. Letting these good bugs live long and prosper can save you trouble with aphids later on. We've had positive reports on excellent control from growers who have tried spinosad. And, there are plenty of organic growers who have been happy with their ECB control with Bt's for years.

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

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

Harris Seeds, 355 Paul Rd., P.O. Box 24966, Rochester, NY 14624-0966 Phone 585-295-3600. Contact: Karen McGuire. **"A grower-friendly company."**

Superior Scale Company, 154 Grove St., Chicopee, MA 01020. Phone 800-719-9040. Contact: Jerry Gamache. **"The farmer's friend."**

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.

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