UMASS EXTENSION

VEGETABLE IPM MESSAGE

JULY 17, 2003 VOLUME 14, NUMBER 9

Crop conditions

Sweet corn from the Connecticut Valley has been reaching farmstands all over the state as other farms wait for corn to come in. Quality is excellent. Other areas of the state are starting to pick corn. Keeping up with stringing on the stake and weave tomatoes and with the weeds between the rows is a weekly affair. Tunnel tomatoes are in, but field tomato harvests are still rare. Peppers and eggplants are growing well and fruit is developing. Cabbage is being harvested and quality is excellent. Much of the state has had some substantial rains over the past week, which saved on the need for devoting time to irrigation. Temperatures have been great for growing – hot sunny days with relatively cool nights (60's or 50's). Cool nights help reduce disease pressure – many bacteria and fungi slow down when nights are cool.

We have a wide range of Nitrate-N levels in PSNT tests from different fields – some very high, some very low, -- and once in a while, one that's just right! Side dressing – how much, when, with what – has been tricky in some cases. See article on pH, soluble salts and fertilizers. Take the time to use this tool which can help you decide what is really needed. If you send in a test, the lab will turn it around in 24 hours.

This week 40 growers enjoyed an informative twilight meeting at Ward's Berry Farm. Mark your calendar for two more UMass Vegetable Program Twilight meetings: Four Town Farm on Wed., August 6 and UMass Research Farm on Wed, August 13.

--R Hazzard with contributions from D. Rose, J Golonka, E. Droescher, E. Matuszko,R Bonanno, and NASS Crop Weather Report 7/14/03

How state budget cuts are affecting UMass Extension: a letter from the director

This following letter to stakeholders from UMass Extension Director Steve Demski was issued in late June:

Dear Friends of UMass Extension,

On Tuesday, June 24, UMass Chancellor John V. Lombardi announced that UMass Extensions budget allocation for fiscal year 2004 is being reduced by $1,253,000--a loss of about 55-percent of our state funding, and a cut that is $1 million deeper than had been outlined earlier. Tuesday's announcement came after the House-Senate Conference Committee forwarded to Governor Romney a state budget reducing University of Massachusetts funding by 18.5-percent, compared with the Senate's proposed 12-percent cut, which formed the basis of our Chancellor's earlier plan. The Conference Committee also eliminated a Senate provision which capped Extension's loss at the percentage sustained by the entire UMass system.

This is difficult and disappointing news for all of us. To lose more than half of our state funding clearly represents a major challenge to our staff, to our Fruit Program, and ultimately to those of you served by that program.

We are not alone in this challenge as the campus leadership struggles to accommodate a loss of $41,000,000. In recent weeks, cuts totaling $21,500,000 have been announced, including $2,550,000 in support to athletics, $2,533,000 for academic programs and the elimination of all state support to many campus units including public radio station WFCR and the University Press. Over the past three years, UMass Amherst's state allocation has been reduced by 29-percent.

With a total budget of $11 million for the coming fiscal year, however, UMass Extension will survive, change and continue to seek new, more efficient, well-targeted ways to provide the most valuable research and expertise to our campus and our constituents -- that is, to fulfill the land grant mandate that has been our guide for nearly a century.

Very shortly, I expect to announce the first steps of a plan to manage our budget reduction and continue building a stronger, smarter, albeit somewhat smaller organization. We are accelerating the process 'already underway' of sharpening our focus on what we can do best and most effectively. We have been given the assurance of 'bridge financing' that will allow us to be more thoughtful in that transformation.

There are things you can do to help the Vegetable Program and UMass Extension. Tell your legislators and the Governor about the value of the work we have done with you. Let them know that UMass Extension, UMass Amherst, and the state's public higher education system are important to you, and need their support. This message must be echoed throughout the year if we hope to avoid cuts of this magnitude next year.

Please do not call Chancellor Lombardi. The University's situation is so grave just now that such communication will not be helpful to Extension or the specific programs you value. Thank-you for your ongoing interest in and support for UMass Extension.

Sincerely,

Steve Demski,

Director, UMass Extension

HIGH SOLUBLE SALTS FROM BANDED FERTILIZER

A grower has a pumpkin field with a large percentage of stunted plants. Most of these plants have a small root system with no tap root. The grower applied about 250 lb/A of 15-15-15 starter fertilizer in bands at planting. This is about 75 lb/A of N and K combined. This is acceptable for a crop such as corn planted at a three-foot row spacing. At this spacing there would be between 5.0 and 5.5 lb per 1,000 feet of row. However, in this pumpkin crop, the spacing is six feet, meaning that the fertilizer is twice as concentrated in the band or between 10 and 11 lb per 1,000 feet of row. At such concentrations, the soluble salt level in the root can become high enough to damage roots. In this field the soluble salt level in the area around the plants is about seven times the normal level. Where no fertilizer was applied in the middle area between rows, the salt level is within the normal range. In addition, the soil pH in the root zone is 5.5 and in the row middles it is 6.3. Since starter fertilizers usually contain nitrogen in the urea or ammonium form, this is not surprising. Urea converts to ammonium. The ammonium is then converted to nitrate-N, creating soil acidity in the process. It is important to keep in mind that even if soil pH is OK at the time the soil is tested, the addition of urea or ammonium fertilizers will lower it. For this reason, it is wise to add lime according to soil test recommendations. In this case, lime would have been recommended. Even though the overall soil pH for the field (6.3) is not especially low, the small root systems of young plants are confined to a small area around the fertilizer band where the pH is much lower.

When planting corn, the total amount of N plus K in the band should not exceed 80 lb/A. If the same planter is used for more widley spaced vine crops, simply shut off the fertilizer applicators that are not in use. That way those that are being used will apply the correct amount in the row, but since the row spacing is greater, there will be less used per acre.

–John Howell

FERTIGATION

Nitrogen (N) is subject to leaching. If the total amount is applied at or before planting heavy rainfall can leach away a great deal of it. This risk can be minimized by applying N in a split application, with a small amount put down at planting and the rest sidedressed several weeks later when the crop demand is high. The other nutrients are normally applied in total at or before planting because they are not subject to leaching. However, on sandy soils with low organic matter, K may be subject to some leaching, and in such situations, a split application is useful. The traditional method of applying additional N (and possibly K) during the growing season is to sideddress or topdress.

A convenient way of applying supplemental nutrients is with fertigation. This is the injection of chemical fertilizer into irrigation water. Most fertigation in Massachusetts is done with trickle irrigation. By using a fertilizer injector, trickle irrigation can be used effectively to apply N and/or K to crops during irrigation. The need for supplemental N can be determined using the preside-dress soil nitrate test (PSNT) as it is with other application methods. If used, samples for the PSNT should be taken from under the plastic. The best way is to use a soil sampler, which will punch a small hole in the plastic and remove a core of soil. Be sure to avoid cutting the irrigation tape when sampling under plastic. For more information on the PSNT, see the June 14, 2001 Vegetable IPM Message.

With conventional topdressing or side-dressing, it is common to apply all the N in one or two applications. With trickle irrigation, it is convenient to apply small amounts of N weekly or even daily, which is desirable from a nitrogen management standpoint. For example, if you want to apply about 50 lbs N per acre, you can inject a little over 7 lbs N per acre per week for seven weeks, or about 1 lb per day if you prefer. Small weekly applications provide for more efficient crop use of N than one or two larger applications. Daily application offers little advantage over weekly application, but may be necessary if the injector cannot inject a week's worth of N during the appropriate irrigation run time. To do this, measure out the desired amount of fertilizer for the area to be covered at one time. Dissolve it in a bucket or barrel of water. In the example above, dissolve 7 lbs of N for each acre to be covered at one time in water. Use enough water so that it will take about 20 to 40 minutes to complete the injection. If injection occurs more rapidly, the application may not be uniform. On the other hand, a longer injection time may result in excess water being applied. To prevent leaching, the irrigation system should not be run longer than necessary to effectively wet the root zone of the crop. This will distribute the material throughout the rooting area. Excess water will leach some of the N below the root zone. If there is not enough time to inject all the fertilizer needed for the week in one injection, then smaller, more frequent injections are preferable. Before injecting fertilizer, the entire system should be filled with water and at full operating pressure. When all the fertilizer has been injected, the system should be run long enough to flush all fertilizer from the lines. If fertilizer is left in the lines, clogging may occur due to chemical precipitates or growth of bacterial slimes.

Application uniformity is affected by field topography. Water gains pressure going down hill and loses it going uphill. There is a gain or loss of 1 lb per square inch for each 2.4 ft of change in elevation. There is also pressure loss due to friction. This loss is greater in small pipes than larger ones. If possible, the system should be set up so that water runs down hill to roughly offset friction loss. It is difficult to achieve even application of water and fertilizer in fields with knolls and dips, but reasonable uniformity can be achieved in most cases.

Back flow preventors must be used so injected materials cannot flow back into the water source if the pump shuts off. The filter should be down stream from the injector so it can remove any undissolved particles.

Calcium nitrate is the most popular source of N for injection. However, it is important to use the greenhouse grade, which dissolves readily, or buy the material already in the liquid form. Field grade granular calcium nitrate is usually coated with wax to reduce caking in the bag. It is difficult to dissolve in water and may clog emitters

There is a potential for certain fertilizer materials to react with chemicals in irrigation water. If the water pH is below 7.0, there is little potential for problems, but at pH 8.0 and above, the risk is high. At levels above 40 to 50 ppm, calcium and magnesium are likely to react with phosphorus, if present in the fertilizer, causing precipitation of phosphates. If fertilizer-containing calcium is added to water with concentrations of bicarbonates above 2 meq/liter, calcium carbonate may precipitate. Sulfates in fertilizers can react with calcium in the water resulting in the precipitation of gypsum. These precipitates can clog emitters.

Phosphorus- and sulfate-containing fertilizers, if needed should be applied before planting because there is no concern about these leaching. Nitrogen is the element that is most appropriate for injection into trickle irrigation water. Calcium nitrate has the potential to cause clogging if the water pH and bicarbonate levels are high as noted above. If calcium nitrate causes clogging, potassium nitrate, ammonium nitrate or urea can be used as an alternative N source. Urea converts to ammonium in the soil. High amounts of ammonium can inhibit calcium uptake, causing certain physiological disorders such as blossom end rot of fruits and tip burn of leafy crops. It seems likely that weekly application of small amounts of urea would not result in high levels of ammonium at any one time, but there is little data to confirm this.

Water testing labs can analyze water for pH, calcium, magnesium and bicarbonates. You can also perform a simple test: Mix fertilizer into a container of irrigation water at the same concentration it will be after injection into the trickle system. Cover the mixture to exclude dust and let it sit for at least the length of time it will be in the system before it reaches the soil. If the water becomes cloudy or a precipitate collects on the bottom of the container, you can expect this to happen in the irrigation system with the likelihood of clogging. If it is necessary to lower the water pH, acid can be injected into the irrigation water. This requires special handling precautions and special injection equipment. Be sure to carefully follow directions to avoid personal injury or damage to crops or equipment.

--John Howell

Disease diagnostics and soil testing

This is a time of year when many vegetables begin to show symptoms of disease. Effective disease management begins with an accurate diagnosis because selection of pesticides and cultural practices should be made to target a particular pest. One correct diagnosis at the right time can save you thousands of dollars in crop losses or wasted sprays or fertilizers. Some diseases are easily recognized in the field but many are not. Fungi, bacteria, nematodes, viruses, chemical or environmental injury, and nutritional disorders can produce symptoms that are difficult to distinguish from one another.

We are fortunate to have diagnostic and soil testing services in this state and we urge you to use them. Diagnostic samples can be sent overnight from anywhere in the state. Call first: Rob Wick, Disease diagnostic Lab, 413-545-1045; Steve Bodine, Soil Testing Lab, 413-545-2311. Or, check our website for more details on submitting samples (www.umassvegetable.org, click on Soil Testing or Disease Diagnostic Lab). If you are within an easy drive of the Amherst campus, samples can be dropped off at the lab, on the first floor of Fernald Hall (Disease samples) or West Experiment Station (soil samples). There is metered parking beside the building. It's not hard to find from Routes 116, Rte 9, or I-91!

Postemergence weed management advice

It is getting close to the point of no return for emerged weeds. Crops are growing quickly and decisions need to be made soon as to what to do with those weeds that are still small but have the potential to take over during August.

In areas at the ends of rows or in spray rows, cultivation or tilling is likely the best option. In most cases, this can be done throughout the growing season. The advantage of this option is that it requires no special preparation. It is common that growers are in adjacent fields and can easily run equipment in these areas. The downside is that this option encourages successive flushes of weeds that will again need to be

controlled.

For areas between plastic, cultivation, mowing, and herbicide applications are all options. Cultivation is most effective in areas where the crop (cucumbers, squash, or pumpkins) will be growing over the row middles. The faster the crop is growing, the more effective this option will be. Mowing works for some growers but does not eliminate the competition from weeds. It is also very time consuming and expensive. For some crops, herbicide options do exist. A shielded application of Gramoxone (paraquat) can be used in the row middles of pepper, tomato, and eggplant. Sandea (halosulfuron) can be used in cucurbits. In most crops, Poast (sethoxydim) or a similar product can be used to control emerged grasses. Read the herbicide labels, past newsletters, and the New England Vegetable Management Guide for additional information.

-R. Bonanno, Weed Scientist, University of Massachusetts

SUCCESSFUL TWILIGHT MEETING AT CARETAKER FARM

On June 26, a group of farmers from as near as five miles down the road and as far as Rehoboth in Southeastern MA enjoyed a tour of Caretaker Farm in Williamstown.

Sam and Elizabeth Smith continue their tradition as intrepid pioneers. Initially an organic vegetable farm with roadside stand, about 12 years ago Caretaker Farm became one of the early CSA farms in the US. More recently Elizabeth has integrated livestock on the farm to provide compost as well as grass-fed lamb and poultry to CSA members' share. To protect the herd from predators in the hills of the Berkshires and to provide water to distant pastures, the Smith's have now installed solar powered electric fence and water feeders. The tour highlighted the rotational grazing paddocks for sheep and cattle, each separated by electric fencing and watered by tanks filled using a solar-powered pumping system. Electric fence also protects the vegetable fields from deer. Smiths also showed their system for using their pigs to help turn the winter's sheep and cattle bedding into compost – free of charge.

Elizabeth Smith describes the solar array that provides power to the farm's electric fencing.

Despite the cold wet spring, this farm high in the Berkshire was ready to supply lettuce, greens and early squash to shareholders, vine crops were bursting out of their row covers, and potato plants were large and healthy. It was an inspiring tour, well worth the ride out into the Berkshires for those of us from far away, and offered new ideas to everyone who attended.

Winter squash fills out under row cover next to the potato field. Black bags and soil hold the row cover down.

--R Hazzard and Cathy Roth, University of Massachusetts.

ANNOUNCING: SUSTAINABLE AGRICULTURE GRANTS FOR NORTHEAST FARMERS

Farmers in the Northeast who are interested in conducting innovative production and marketing projects are encouraged to apply to the Sustainable Agriculture Research and Education (SARE) program for grant funds for projects starting in the spring.

Applications can address a broad range of agricultural issues such as pest management, soil and water conservation, aquaculture, marketing, grazing, bee health, no-till, pasture management, agroforestry, and other sustainable farming techniques. Northeast SARE defines sustainable agriculture as agriculture that is profitable, environmentally sound, and good for the community. In 2003, the average grant was about $5,200; grants are capped at $10,000.

Any full- or part-time farmer in the Northeast SARE region can apply. The region is made up of Connecticut, Delaware, Massachusetts, Maryland, Maine, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia, and Washington, D.C. Applications and more information about the requirements of the Farmer/Grower Grant program are available on the Northeast SARE web site at www.uvm.edu/~nesare/. You can also call 802/656-0471 to request a printed application. The proposal deadline is December 8, 2003.

Contact Helen Husher , NE SARE, Universityof Vermont. 802/656-0554, or 802/223/7923; email helen.husher@uvm.edu

TOM-CAST DSV's for Summer 2003

Month	Day	DSV/ Day	Accumulated DSV	Avg. Wet Temp F	Wet hrs/day
July	3	2	45	68	12
	4	2	47	72	9
	5	2	49	72	11
	6	2	51	66	11
	7	2	53	72	8
	8	2	55	70	11
New Data Set					
July	9	1	56	67	7
	10	2	58	63	18
	11	3	61	63	24
	12	0	61	65	3
	13	1	62	64	14
	14	1	63	59	13
	15	1	64	62	13
	16	2	66	65	11

TOMCAST UPDATE

Conditions have been relatively dry, with cool nights that reduce the risk of both fungal and bacterial diseases. TOM-CAST DSV's accumulated steadily, but slowly. It took 10 days to accumulate 15 DSV's, starting July 7 to July 16. Note how one long day of rain (July 11) provided very favorable conditions for early blight (3 DSV's in one 24-hr leaf wetness period).

MEASURING SMALL AMOUNTS FOR SPRAYS.

New products tend to be used in far smaller quantities per acre than the pesticides that were develop 15 or 20 years ago. Growers who are using spinosad for the first time – mainly organic growers who now have Entrust available—may not have used a material with such a low rate per acre. For example, Bt products tend to be applied in quarts or half-pounds per acre, compared to 2 oz (dry) or 3 oz (liquid.) required for this product. When measuring the tiny amounts needed for small plantings over several hundred square feet, it can be difficult to measure accurately. This is especially true with a solid that is measured in grams or tenths of grams such as Entrust. We have made some weight measurements to assist growers in making conversions into a measure that is easy to use: teaspoons. These conversions are specifically for Entrust 80WP. Liquids may be easier to measure in small quantities, if you have access to a small measuring device such as a syringe that measures ml or tenths of ounces. I have found such devices at the local drug store in the children's medicine department.

The following table is provided for informational purposes. No endorsement is implied.

Entrust Spray Rate Conversions*

Acreage	Square Footage	Entrust (grams)	Entrust (approximate spoon measure**) Teaspoons
1/4	10,890	14.2	9.5
1/8	5,445	7.1	4.75
1/16	2,722	3.5	2.5
1/30	1,500 (300' by 5' bed)	1.95	1.5
1/44	1,000 (200' by 5' bed)	1.3	1
1/88	500 (100' by 5' bed)	0.65	0.5

** All area rates based on 2 oz./acre*

*** All spoon measures loosely filled (not packed) and shaved even (not heaped)*

SWEET CORN

Sweet corn harvest has started in more parts of the Northeast this week, including Vermont and New Hampshire. Quality is excellent. This is the time to 'enjoy the lull' between European corn borer generations. Flight counts are at rock bottom and infestation levels in pretassel corn declined. Locally there are some ECB counts above 7 per week which would suggest a weekly spray on silk is needed, but in many areas flights are low enough that no sprays are needed. Except in the Southeast, corn earworm counts are zero. With captures of 5 or 6 in the Southeast, 6-7 day spray intervals are recommended. The southeast also reported Fall armyworm captures. Keep a close watch for earworm arrival. They may begin to trickle in at low numbers, as we see in Plainfield NH. A great resource for an 'early warning system' on migratory flights, and a regular update on trap counts is the Pest Watch site (http://www.pestwatch.psu.edu/sweetcorn/tool/tool.html).

Weekly Trap Captures of Corn Earworms, European Corn Borers, and Fall Army Worms in Sweet Corn

Town	Date	CEW	ECB Z1	ECB Z2	TOTAL ECB	FAW	% PT
North Bennington,V	7/10/03		7	0	7		
Walpole, NH	7/17/03	0	0	2	2	0	5%
Plainfield, NH	7/17/03	1	10	0	10	0	11%
Westminster, VT	7/17/03	0	4	0	4	0	12%
South Deerfield	7/15/03		0	0	0		
Sunderland	7/15/03	0	0	1	1		
Hatfield	7/16/03	0	1	3	4		18%
Hadley	7/15/03		1	4	5		
Feeding Hills	7/14/03	0	1	0	1		2%
Lancaster	7/16/03	0	0	2	2		11%
Concord	7/13/03	0	0	0	0		16%
Leicester/Spencer	7/15/03	0	0	0	0		32%
Northbridge	7/15/03	0	0	0	0		15%
Dighton	7/14/03		0	1	1		
Rehoboth	7/15/03	5	1	0	1		
Sharon	7/15/03	6	9	2	11	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

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

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."

Empire Packaging Co., 311 North Plank Rd., Newburgh, NY 12550. Phone 800-562-5520. Contact: Dave Enos. "Retail & Wholesale Packaging for the Farm & Orchard."

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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