

PLANT & PEST ADVISORY

VEGETABLE CROPS EDITION \$1.50

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Building Soil Quality to Reduce Drought Stress

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The amount of drought stress exhibited by crops is not entirely due to lack of rainfall. The degree of wilting or leaf rolling expressed over a field during a drought is often a reflection of differences in soil type and soil quality. Symptoms of drought stress are partly related to soil properties that influence the ability of soils to absorb rainfall, store water, and deliver it to the growing crop. Soils that are sandy or shallow are inherently drought prone whereas deep loamy soils are better able to sustain crops through a drought. Soil physical properties such as texture cannot be easily changed, but soil quality can nearly always be improved with good soil management. Soil quality (sometimes referred to as soil health) is the capacity of a soil to function as medium for plant growth.

Attention to the soil management practices listed below can lead to enhanced soil quality and enable crops to better withstand drought.

1. Adopting cultural practices that build and maintain soil organic matter content are key to building soil quality. Things you can do to increase soil organic matter content:

- Grow sod crops in rotation with grain crops
 - Grow cover crops. Refer to Rutgers Cooperative Extension Fact Sheet FS 849 "Cover Crops and Green Manure Crops, Benefits, Selection and Use."
 - Add organic matter to soil in the form of livestock manures, municipal shade tree leaves, and compost.
 - Control erosion. Soil erosion must be controlled to keep top soil rich in organic matter in place. Leave crop residues on the soil surface to control erosion.
2. Soil fertility impacts plant water relations. Things you can do:
- Maintain soil pH in the desired range for the crops being grown. Allowing soil acidity to develop to the point where root growth is inhibited limits the volume of soil that can be explored for moisture. A regular soil testing and liming program helps to ensure that roots will be able to explore the entire soil profile for available water.
 - Potassium nutrition is closely linked to plant water relations. Optimum levels of potassium supplied in the soil improve crop tolerance to drought stress.

SEE SOIL ON PAGE 2

3. Soil compaction destroys good soil structure and restricts root growth. Things you can do to avoid or correct problems related to soil compaction:

- Avoid driving farm equipment over wet soils. On dairy farms, running a manure spreader over wet soil often is a cause of soil compaction. Keep manure in storage until soil conditions are favorable.
- Avoid tillage operations when soils are too wet.
- Examine soil profiles for hard layers that are restricting root growth. Perform deep tillage with a subsoiler to break up a hard pan. The soil must be sufficiently dry for the subsoiling operation to cause shattering of the compacted layer.
- Leave crop residues on the soil surface to encourage earthworm activity. Earthworm channels improve rainwater infiltration and root development.

Droughts occur for varied durations during most growing seasons. Through good soil management practices, growers can help sustain crop growth during periods of low rainfall. □

Festivals Seek Farmers to Sell Fresh Produce

There are two upcoming festivals with opportunities for farmers to attend and sell fresh produce. Both the festivals are well attended and farmers may make significant revenue.

1. St. Elizabeth's College, Morristown
Peddlers Square Festival, 14th annual Alumni event - hundreds of people attend
Sat. Sept. 11, 9 to 4:30
Fee for 20'X10' space
Call Corrine Martinell (973) 235-4206

2. Upper Delaware Watershed Festival
Hampton Borough Park, Hampton Borough
Sun. Oct. 3, 10 to 4
Call Fran Varacalli (609) 633-0533 for more information on space, cost, etc.

Pest Notes

Gerald M. Ghidiu, Ph.D., Vegetable Entomology

✓ **Leafy Vegetable:** Confirm 2F is now labeled for **worm** control in leafy vegetables and cole crops. Confirm is effective against **beet armyworms, loopers, webworms**, and the **armyworm** complex (**fall, yellow-striped, southern armyworm** and **true armyworm**). Apply 6-8 fl oz per acre no closer than 7 days apart. Do not apply more than a total of 56 fl oz per acre per season. Consult label for all rates and restrictions (a copy of this label must be in the possession of user at time of application).

✓ **Lettuce/Greens:** **Corn earworm moth** activity is high, based on the very high number of **moths** caught nightly in the blacklight traps and favorable weather. Lettuce seedlings in the 7-18 leaf stage are susceptible to **corn earworm (lettuce headworms)** attack at this time. Control *must* be achieved before the center leaves start to form a head (between the 15- 18 leaf stage). Lannate is effective if applied every 2- 5 days; Premarin is effective if applied every 5- 10 days. Ammo, Fury, Mustang and Warrior are effective when applied every 5- 10 days.

✓ **Pepper:** High numbers of **European corn borer moths** are being caught in the area blacklight traps. **Moth** activity is high with the current favorable weather, and oviposition on peppers will continue for a while. Effective materials for **corn borer** control in peppers include: Asana XL, Baythroid EC, Lannate L, Orthene S, permethrin (Ambush/ Pounce) and SpinTor. **Corn earworm** counts are also very high, and if **corn earworms** are entering pepper fruit, Asana and SpinTor are most effective.

Beet armyworm damage is sporadic in peppers, but very evident when present (large, gaping holes in leaves). These pests enter the fruit eventually, and effective management must begin when the **worms** are small and still feeding on the foliage. SpinTor 2SC and Confirm 2F are both labeled in peppers and both are also effective against the **beet armyworm** larvae. Note that virtually all of the other insecticides labeled in pepper are not effective against this pest. Use a sprayer that will deliver thorough coverage of the plant, and use a high volume (40-200 gallons per acre).

✓ **Tomato: Stinkbugs** are still active in and around tomato fields. The southern states agree that Warrior 1T is about the most effective material available for **stinkbug** control in tomatoes. Thorough coverage is important, especially towards the inner portion of the plant where the bugs hide and fruit are well concealed.

Hornworms are still being trapped in high numbers, and their activity has been fairly consistent for the past several weeks. Monitor fields for damaged stems, stalks, leaves and fruit, and apply a corrective measure before the **worms** get large. Many materials are effective, including all of the labeled biological insecticides (*B.t.'s*). Other materials include Asana, Baythroid, Danitol, Guthion, Lannate, Monitor, SpinTor, and Warrior. Consult the label of the specific material for all rates and restrictions. □

A Drip Irrigation Management Example for Vegetables

Jack Rabin, Assistant Director, New Jersey Agricultural Experiment Station

Before soils are half depleted of their available soil water, irrigation wetting to the proper soil rooting depth (which varies by crop) is recommended. For example, wetting soil to 12 inches for shallow rooted crops needs from 1/3 inch of water on coarse sandy loam soils to 3/4 inch on loams. This affects how many hours the drip system should run. The *Rutgers Commercial Vegetable Production Recommendations* has tables to simplify calculations.

Drip emitter rates vary. A typical 0.5 gpm/100 row ft drip line on 5 ft row centers is about 8,500 row ft/acre and uses 42.5 gpm (2,550 gph).

One acre inch of irrigation water is 27,150 gallons. Using the above example of 0.5 gpm drip line we can calculate the gallons needed and run time.

27,150 g/acre inch x .33 inch = 8,960 g/acre needed per irrigation to irrigate sandy soils and 20,363 g/acre (27,150 g/acre inch x .75 inch) to wet loam soils to 12 inch depth.

8,960 g/acre ÷ 2,550 gph emitted = 3.5 minimum hours run time for 1/3 inch irrigation. More frequent irrigations of less duration will not wet soil to desired rooting depth.

During peak summer growth with no rainfall, the crop soils will need at least 1.4 inches/week (0.2 inch/day) of water. If 3.5 hours delivers .33 inch, then it requires a minimum of about 15 hours weekly run time to deliver 1.4 inches. For more convenient management, this could be done with 5 hours on alternate days. Check soil by feel or with tensiometers to adjust irrigation run times as needed.

Generally, when drip irrigating New Jersey coarse soils, we do not consider infiltration rates. Do not over-wet (i.e., use excessive run times) on clay or compacted soils or if there is risk of *Phytophthora* blight.

Resources: *1999 Rutgers Commercial Vegetable Production Recommendations*, pages 38-39 and *Knott's Handbook for Vegetable Growers, 4th Ed.*, pp. 219-266 and 511-512. □

Weekly Weather Summary

Keith Arnesen, Ph.D., Agricultural Meteorologist

Temperatures averaged near normal. Extremes were 92 degrees at Pemberton and Canoe Brook on the 18th and 48 degrees at Charlotteburg on the 23rd. Weekly rainfall averaged 0.44 inches north, 0.87 inches central, and 0.80 inches south. The heaviest 24 hour total was 1.89 inches at Pemberton on the 20th to the 21st. Estimated soil moisture, in percent of field capacity, this past week averaged 86 percent north, 79 percent central and 73 percent south. Four inch soil temperatures averaged 72 degrees north, 74 degrees central and 76 degrees south.

Weather Summary for the Week Ending 8 am Monday 8/23/99										
WEATHER STATIONS	RAINFALL			TEMPERATURE				GDD BASE50		MON %FC
	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	
BELVIDERE BRIDGE	.46	13.71	-9.44	89	54	69.	0	2364	319	82
CANOE BROOK	.55	14.73	-9.56	92	54	72.	2	2675	619	87
CHARLOTTEBURG	.37	16.22	-8.31	90	48	67.	0	2018	391	85
FLEMINGTON	.35	11.98	-11.44	91	52	70.	0	2466	357	79
LONG VALLEY	.47	13.61	-11.68	85	54	68.	1	2134	311	86
LONG BRANCH	.08	15.61	-7.44	89	58	72.	1	2408	240	55
NEW BRUNSWICK	.42	15.34	-7.66	90	55	72.	0	2601	264	87
PEMBERTON	1.89	18.04	-5.30	92	52	72.	0	2680	388	89
TOMS RIVER	1.29	9.76	-13.83	89	62	72.	1	2403	253	89
TRENTON	.67	18.37	-3.49	88	53	70.	-3	2399	-43	79
CAPE MAY COURT HOUSE	.13	11.30	-9.07	91	62	75.	1	2582	460	37
DOWNSTOWN	1.64	18.81	-2.74	89	59	73.	0	2601	154	95
HAMMONTON	.81	17.05	-5.48	89	58	72.	-1	2593	165	83
POMONA	.08	16.17	-4.57	90	55	73.	2	2557	293	57
SEABROOK	1.71	18.74	-1.90	90	57	74.	1	2755	295	90
ATLANTIC CITY MARINA	.40	14.54	-5.34	87	63	74.	2	2596	404	69
WES KLINE — GDD BASE 40 PINEY HOLLOW Last Week 257 (Ending 8/16/99) This Week 234 (Ending 8/23/99)										

IPM Update

Kristian Holmstrom and Sarah Walker,
Program Associates in Vegetable IPM

Lettuce

Adult blacklight trap levels of **corn earworm (CEW)** are high in most areas of the state (see map). Scout fields at least weekly for the presence of larvae and consider treatment if 1 larva or more is found on 30 plants (check 5 consecutive plants in 6 locations in the planting). The critical time for control is during the 11-15 leaf stage, prior to head information.

Peppers

Weekly treatments for both **European corn borer (ECB)** and **corn earworm (CEW)** are recommended for fields with fruit at least one-half inch in size. The **CEW** adult population remains high throughout most of the state (see map) and with the decline in sweet corn acreage pepper fruit will likely be at risk. The adult **ECB** population has declined to low levels throughout most of the state, except in parts of Salem, Cumberland, and Gloucester counties (see maps). Local blacklight trap catches of 1-2 per night are still high enough to result in fruit infestation (see sweet corn section for highest local counts). Cooler nights will delay egg hatch, resulting in an extended period of fruit infestation.

Tomatoes

Both fresh-market and processing tomatoes continue to be at risk from **CEW** (also called the **tomato fruit-worm**) infestation due to the high populations throughout the state. For processing tomatoes, consider a treatment if 5 **CEW** damaged fruit are found out of 200 inspected in the field. Monitor tomato fruit at least weekly for the presence of larvae or signs of feeding damage, and to evaluate control effectiveness.

Two-spotted spider mites continue to be found in tomato plantings. Check the undersides of leaves for the presence of mites and damage, and consider treatment if plant injury is increasing throughout the field and live mites are easily seen on the leaves. Cooler wet weather should help decrease mite activity.

Sweet Corn

Adult blacklight trap catches of **ECB** have declined in most areas (see map). **Fall armyworms (FAW)** are active at low to moderate levels in whorl and pretassel corn. Continue to monitor fields through the pretassel stage for the presence of fresh feeding damage and treat when 12% of the plants are infested with either **ECB** or **FAW** larvae. Tight silking spray schedules for **CEW** (see below) will provide control of **ECB** and **FAW** ear infestations.

The highest average nightly **ECB** blacklight trap catches are as follows:

Shirley	22	Mullica Hill	7	Elmer	3
Woodstown	12	Cranbury	6	Millstone	3
Centerton	9	Laurel Hills	6	Sheppards Mill	3
Cohansey	7	Beckett	4	Phillipsburg	2

Adult **CEW** catches remain high in most areas throughout the state. Silking sweet corn is at great risk for infestation at this time. Due to the extremely high adult levels, any missed sprays will likely result in most ears being infested. Numerous small **CEW** larvae were found early this week in a planting in which the silking spray schedule was extended due to last week's rain. In areas where the average nightly trap count is greater than 8 per night (the area represented by the darkest shade on the **CEW** map), a 2-3 day spray schedule may be necessary to prevent **CEW** infestation.

The highest average nightly **CEW** blacklight trap catches are as follows:

East Vineland	60	Millstone	43	Mullica Hill	34
Fishing Creek	57	Cohansey	42	Elmer	33
Eldora	54	Elm	35	Milltown	33
Crosswicks	49	Hammonton	35	Medford	32

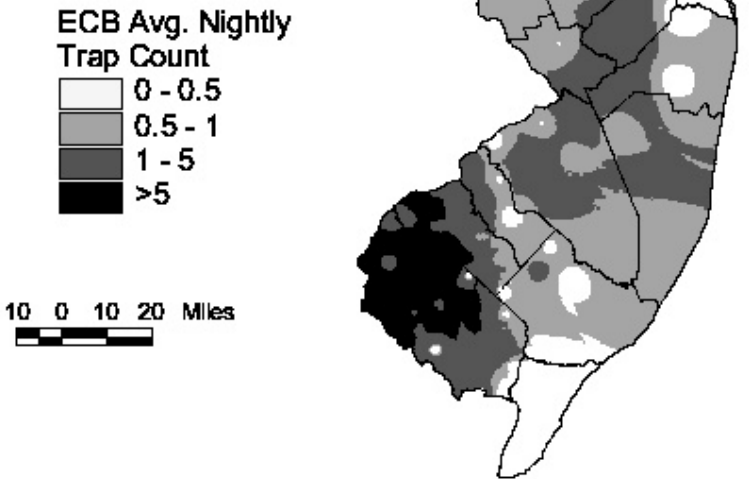
General Sweet Corn Spray Schedule

Silking corn: North 3 days
Central 2 - 3 days
South 2 - 3 days

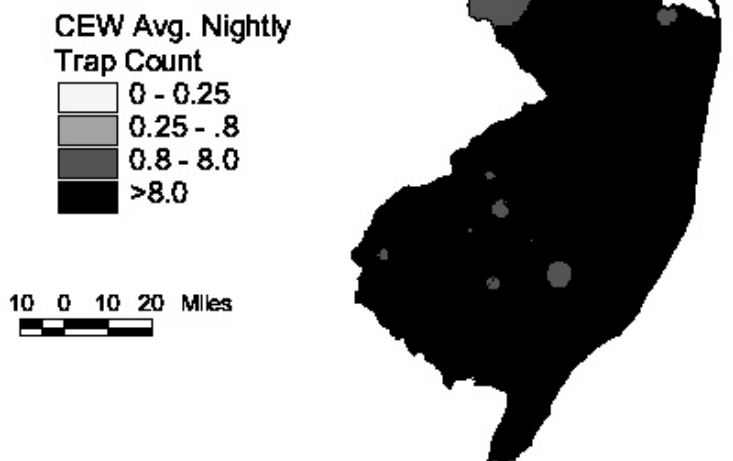
*These are general spray recommendations for large areas of the state. Growers can increase or decrease the intervals based on their own local situations.

SEE **ECB AND CEW DISTRIBUTION MAPS ON PAGE 5**

Distribution of Adult European Corn Borer for the Week Ending August 25, 1999



Distribution of Adult Corn Earworm for the Week Ending August 25, 1999



*Date collected and processed by: Kris Holmstrom, Selly Walker, Marilyn Hughes
Rutgers Cooperative Extension & Center for Remote Sensing*

Northeast CSA Conference II

A Future for Farming
Nov. 11-13, 1999
Tamiment, PA

Community Supported Agriculture (CSA) is a growing movement that connects consumers and regional farmers in a direct season-long relationship. CSAs provide consumers with affordable, fresh organic vegetables and fruits, while providing local farmers with the support they need to sustain their farms and build a regional food system.

The conference goals are:

- ◆ To provide a learning forum where ideas, information, and experiences are exchanged.
- ◆ To promote new CSAs in the Northeast region, and further the development and long-term sustainability of existing ones.
- ◆ To strengthen the network among CSA and other farms, supportive organizations, and the general public.
- ◆ To raise media awareness of and public involvement in CSA.

The Northeast CSA Conference is part of a two-year grant from the NE Regional Sustainable Agriculture Research and Education Program to the NE Sustainable Agriculture Working Group.

For further information, contact: Just Food, 625 Broadway Suite 9C, NY, NY 10012. □

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