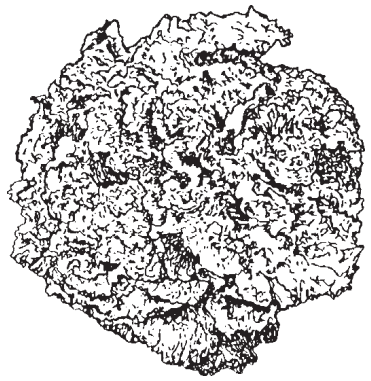
RUTGERS COOPERATIVE EXTENSION AT THE NEW JERSEY AGRICULTURAL EXPERIMENT STATION

PLANT & PEST ADVISORY

VEGETABLE CROPS EDITION $1.50 JULY 23, 1997



INSIDE

Physiological Disorders in Peppers and Tomatoes

Stephen A. Garrison, Ph.D., Vegetable Crops

The high temperatures and high evapotranspiration rates during the past several weeks have increased the incidence and severity of several physiological disorders in peppers and tomatoes.

Peppers, even under drip irrigation, are showing blossom end rot, characterized by a black, dry, sunken area on the lower portion of the fruit. The symptoms are located on the blossom end, on the lobe or side wall at the lower end of the fruit. The disorder is due to a temporary deficiency of calcium in the cells. Under moisture stress conditions, there is inadequate movement of calcium into the fruit, and possibly some movement of calcium out of the blossom end causing injury to the cells. Even with good soil moisture, temperatures in the upper 90's with air movement can cause loss of moisture from the pepper plant at a higher rate than the plant can take up water.

The controls for blossom end rot are: (1) growing on heavier soils with more water holding capacity; (2) adequate, uniform watering; (3) adequate levels of soil calcium; (4) balance of Ca^{++} with K^{+}, Mg^{++}, and Mn^{++}; (5) the use of varieties that have greater resistance.

Varieties that have shown resistance to blossom end rot in trials in southern New Jersey include: Bell Captain, King Arthur, Galaxy, and Bell King. Varieties that have shown greater susceptibility to blossom end rot include: Camelot, Capistrano, Jupiter, and Ranger.

Blossom end rot has also been more severe in tomatoes for the same reasons as outlined above for peppers.

High temperature injury has been observed in tomatoes under continuous 90° F+ conditions. The fruits have thin walls and soften rapidly. The fruit wall may have a translucent appearance, with the vascular system partially visible. Internal tissues are easily bruised during harvesting and handling. The disorder occurs primarily on exposed fruits.

One control for the disorder is to maintain good fruit cover by managing water and fertility to produce a vigorous plant with good foliage. Also select vigorous, firm-fruited varieties with good fruit cover. ❑

Pest Notes

Gerald M. Ghidiu, Ph.D. Vegetable Entomology

✔ **Correction:** Last week's newsletter had an error under the General section. The only miticide that is available for use by growers who do *not* have a pesticide license is Kelthane. All other miticides (Vydate, Dibrom, AgiMek, dimethoate) are restricted use pesticides in the State of New Jersey. Consult label before use of any pesticide for all rates and restrictions.

✔ **General:** The black light trap at the RAR&EC has caught it's first **fall armyworm** adult and **beet armyworm** adult **moths**. IPM Program Associate S. Walker has also been catching **beet armyworm** adults in a BAW pheromone trap. This **moth** activity indicates that **beet armyworm moths** are active in our area, but only low numbers are being detected. We will notify growers as the population increases.

Also, **grasshoppers** are still small but starting to appear in greater numbers. These pests often cause economic damage in fields that are near grain fields or other field crops that were just harvested. The **grasshoppers** build up in those fields, then migrate to vegetable fields after the grains are harvested. Many insecticides are labeled for **grasshoppers**, including materials such as carbaryl (Sevin). Consult labels for all rates, restrictions and labeled crops.

✔ **Cole Crops: Diamondback moth** populations are high in southern New Jersey fields (collards, cabbage) and larvae and pupae are easily found. These pests are easier to manage when the population is still low, and are very difficult to control after the population is high. Monitor your fields for these pests. The pyrethroids may be effective when populations are low, but do not overuse the pyrethroids. Various alternatives are available that will control **diamondback moth** larvae, including the B.t.'s, Dibrom, Lannate, and Thiodan. Consult label for all rates, restrictions and labeled crops.

✔ **Corn:** Northern New Jersey reported **aphid** and **spider mite** problems in sweet corn this past week, which is directly related to the long spell of hot, dry weather. **Mites** were found under the flag leaves, in the husks, under the sheaths and collars, etc., sucking plant sap. Some of the corn plants had leaves that dried, looking similar to severe drought symptoms. **Aphids** can be controlled with diazinon, Thiodan, Lannate of methyl parathion 4EC. **Spider mites** can be suppressed with Metasystox-R (no other alternatives are currently labeled).

✔ **Cucurbit:** The small oval, bronze-colored eggs found on cucurbit leaves at this time are those of the **squash bug**. These eggs will soon hatch into light colored, spiney **nymphs** that suck the sap from the leaves. Control can be obtained using materials such as Sevin, Asana, Ambush, and Pounce. Treatments should start after vines begin to run, and may be needed every 7-10 days after that.

✔ **Eggplant:** Second generation **Colorado potato beetle** adults are in the fields. Growers that treated eggplant transplants with Admire 2F in the greenhouse must monitor the fields for **potato beetles** because the treatment will be ineffective at this time. Alternative spray materials include the B.t.'s (Raven, Novodor), cryolite (Kryocide or Prokill cryolite), Guthion, Thiodan, or Vydate L. Although the pyrethroids are labeled (Asana, permethrin), they will likely not be very effective. You must closely monitor your fields for **potato beetles** not only because the Admire treatment is no longer effective, but also because the potato fields will soon be harvested and any **beetles** present in those fields will migrate to eggplant and/or tomato fields.

✔ **Pepper:** Low numbers of European corn **borer moths** are being caught in the black light traps at this time (less than 1 per night), but this could change at any time. These pests do not normally reach peak activity levels until around the first week of August, but **moth** activity may begin sooner than normal as a result of the summer heat units we had in this area for the past several weeks.

✔ **Tomato: Stink bugs** have been active in tomato fields, and many adults of the green **stink bug** are being trapped in our black light traps. Effective treatments include Baythroid 2E, Monitor 4E, Thiodan EC or WP, and Warrior 1E. Note that Monitor 4E is a Special Local Needs Label 24(c), and a copy of the label must be in possession of the user at time of application. Damage from **stink bugs** appears as circle- or asterisk-shaped yellow or white spots, and damage can be seen on both green and red fruit. **Stinkbugs** are often difficult to detect or observe, and readily fly into the fields from other crops (harvested field crops, etc.). Thorough spray coverage is important.

Also in tomato, monitor the **hornworm** activity (tomato, tobacco **hornworms**). These pests cause a lot of damage because they grow so large, but nearly all labeled insecticides are effective in controlling the **hornworms**. Any of the pyrethroids are effective (Asana, Warrior, Danitol), as well as the B.t.'s (Agree, Condor, Cutlass, DiPel, Javelin, XenTari, etc.), Guthion, Lannate, Penncap-M, Baythroid, or Monitor. Control is much easier to obtain if the **worms** are smaller. ❑

Vegetable Crops Diseases

Stephen A. Johnston, Ph.D., Plant Pathology

✔ **Asparagus:** Monitor fields during the summer for insect pests (**asparagus beetles, aphids, etc.**), diseases (**rust, purple spot**), **weeds**, and **drought stress**. Control insects with appropriate insecticides. Once diseases are detected begin a protective fungicide program with mancozeb, and repeat every 7-10 days. Control weeds with herbicides and timely cultivations, and supply supplemental irrigation as needed. Avoiding the **stress** associated with these factors will decrease the incidence of **Fusarium root & crown rot**, which will result in greater yields in 1998, and longer life of the planting.

✔ **Bean (Snap & Lima):** The last plantings of the season are being seeded at this time. Be sure to apply Ridomil Gold 4E in a 7-inch band over the row after seeding for control of **damping-off**. For fields approaching bloom, the recent rainfall will result in wet soils. If soil has been wet for 6-10 days prior to bloom, apply a fungicide (Benlate, Topsin M, Rovral or the recently labeled Ronilan DF) when there is 10% bloom and repeat in 5-6 days if the soil remains wet for the control of **white mold** (**Sclerotinia**). Ronilan DF is to be used at 1 lb/A at both applications, and is not to be applied within 10 days of harvest.

✔ **Carrot:** Maintain applications of Bravo every 10 days for the control of **leaf blights**.

✔ **Cole crops:** Maintain applications of Bravo or maneb on a 7-10 day schedule for the control of **Alternaria leaf spot**.

✔ **Corn (Sweet):** Some fields have plants with bleached tassels and off color (dull green) ears. These plants are infected with **bacterial wilt** that was transmitted by **flea beetles** when the planting was in the seedling stage. There is no control measure available at this time. Control **flea beetles** early in the season on future plantings. Scout fields for the presence of **rust**. If **rust** is observed prior to the whorl stage of growth, apply a fungicide for control.

✔ **Cucumber:** Once vines begin to run, apply Bravo + Benlate or Topsin M every 7-10 days for control of **anthracnose**.

✔ **Eggplant: Phytophthora blight** is present in some fields of black polyethylene mulch and drip irrigation. Infected plants completely wilt and die. Apply Ridomil Gold 4E via the drip irrigation system 30 and 60 days after the transplant application for control. Beginning 2 weeks after the last Ridomil Gold application, apply a copper fungicide + maneb every 7-10 days for control of the aerial phase of the disease and **fruit rots**.

✔ **Muskmelon:** Maintain applications of Bravo or mancozeb every 7 days for the control of **Alternaria leaf blight**.

✔ **Pepper:** Apply Ridomil Gold 4E via drip irrigation 30 and 60 days after the transplant application for control of **Phytophthora blight**. Two weeks after the last Ridomil Gold application, apply a copper fungicide + maneb every 7-10 days for control of the aerial phase of the disease and **fruit rots**.

✔ **Potato (White): Ozone damage** (black flecks covering the upper leaf surface of older leaves), **leafhopper burn** (marginal necrosis of leaves), **drought stress** (marginal necrosis of leaves), and **early blight** (target shaped brown lesions on leaves) are all working together to decrease the vigor, and increase senescence of early varieties. Apply the appropriate insecticide for control of **leafhoppers**, and apply Bravo Zn, Bravo or mancozeb on a 7-10 day schedule for the control of **early blight**. Remember that mancozeb can not be applied within 14 days of harvest.

✔ **Pumpkin & Winter Squash:** Once the vines begin to run and no later than fruit set, apply Bravo for control of **foliar diseases** & **fruit rots**. Make two applications 7-10 days apart. The next two applications should be with Bravo + a copper fungicide, and the last few applications should be with Bravo + a copper fungicide + Benlate or Topsin M. Good fungicide coverage is essential for effective control to be achieved. This is best accomplished with ground equipment.

✔ **Squash (Summer):** Maintain applications of Ridomil/Bravo every 14 days for the control of **Phytophthora blight**. Observe fields for the presence of **powdery mildew**. Once 1 lesion is observed in 45 older leaves, apply Bayleton twice at 14 day intervals for control.

✔ **Tomato:** Acrobat MZ and Curzate M-8 have just received a Section 18 Emergency Exemption for the control of **late blight** in New Jersey. See separate article in this issue for details. All fields with crown fruit 1/3 their final size should be on a 7-10 day fungicide program with Bravo, mancozeb or Quadris for control of **leaf spots** and **fruit rots**. An alternate spray guide is to follow the TOM-CAST system (where available in the state) for fungicide timing.

✔ **Watermelon:** Once vines begin to run, apply Bravo + Benlate or Topsin M every 7 days for the control of **anthracnose**. ❑

IPM Update

Kristian E. Holmstrom, Vegetable IPM Program Associate and Sally Walker, Vegetable IPM Program Associate

◆ Pepper

Low numbers of **beet armyworm (BAW)** adults are beginning to show up in pheromone and blacklight traps in Salem and Cumberland Counties. In the initial stages of the infestation, **BAW** can be found feeding on leaves in the upper canopy.

Of important concern at this time are increasing levels of **European corn borer (ECB)** adults. In one field in Salem County, eggmasses were found on fruit. Developing fruit should be protected at this time.

◆ Snap Bean

European corn borer (ECB) adult activity is beginning to increase. The critical time for **ECB** treatment is at the bloom and pin pod stages. Check blacklight trap counts in your area and refer to the 1997 New Jersey Commercial Vegetable Production Recommendations for threshold and control information.

◆ Tomato

Tomato fruitworm (corn earworm CEW) larvae were found on a few fruit in an early tomato planting in northern Morris County. Look for larval feeding on fruit at upper levels of the canopy. As adult **CEW** populations increase, so will the potential for fruit damage. Watch local blacklight catches for rising **CEW** populations.

The incidence of **bacterial speck** has increased in some plantings in central and northern counties recently. Scouting activity should be restricted when plantings are wet.

◆ Sweet Corn

Adult **corn earworm (CEW)** activity is still fairly light in the southern and central counties. Sporadic blacklight catches continue as far north as Monmouth County. Blacklight trap catches are somewhat higher in Atlantic and southern Burlington Counties. Very light pheromone trap catches are occurring as far north as Morris County. The highest nightly **CEW** blacklight trap catches are as follows:

Hammonton	2	Folsom	1	Sewell	1
Egg Harbor	1	Indian Mills	1	Tabernacle	1
Farmingdale	1	Manalapan	1		

Adult **European corn borer (ECB)** activity is on the increase as indicated by higher blacklight trap catches throughout the southern and central counties this week. Activity in the northern counties is still low, but should increase shortly. The highest nightly **ECB** blacklight trap catches are as follows:

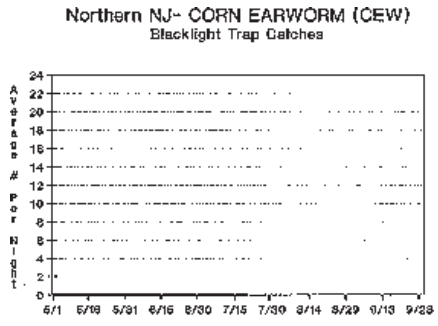
Cinnaminson	5	Tabernacle	3	Little York	2
Georgetown	4	Woodstown	3	Fishing Creek	1
Pemberton	4	Denville	2	Hopewell	1
Allentown	3	Indian Mills	2	Manville	1

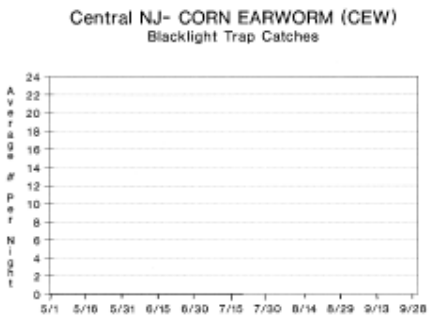
At this time plantings should be scouted regularly for **ECB** infestations. Particular attention should be given to young whorl stage sweet corn as **ECB, fall armyworm (FAW)** and **corn leaf rust** are all potential problems at this time. Insecticide applications may be warranted for larval control when 12% or more plants are infested with **ECB** and/or **FAW**.

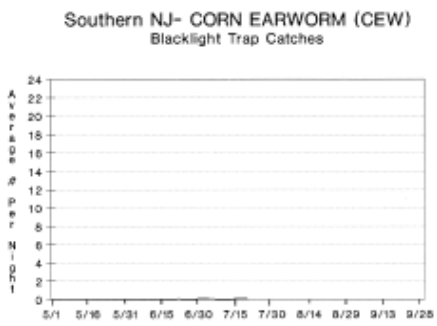
◆ General Sweet Corn Spray Schedule

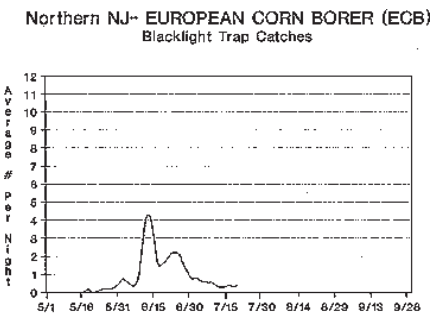
Silking stage: Central 5 - 6 days*
South 4 - 5 days*

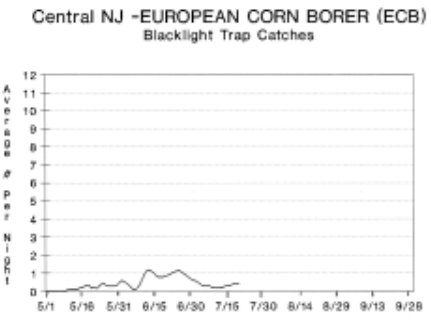
*These are general spray recommendations for large areas of the state. Growers can increase or decrease the intervals based on their own local situations.

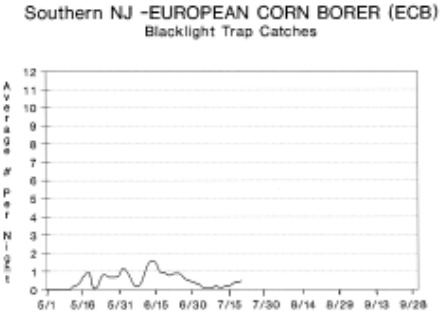












Section 18 Exemption for Acrobat MZ and Curzate M-8 on Tomatoes

Stephen A. Johnston, Ph.D., Plant Pathology

The U.S. Environmental Protection Agency recently granted to the NJ Department of Environmental Protection the use of Acrobat MZ and Curzate M-8 on tomatoes for the control of **late blight**. The specific use pattern for each fungicide is listed below:

Acrobat MZ:

- Apply at the rate of 2.25 lb/A for a maximum of 5 times/season.
- Do not apply within 5 days of harvest.
- May be applied with ground or aerial equipment.
- Applying the maximum amount of Acrobat MZ per season will result in the application of 6.75 lb of mancozeb.

Curzate M-8:

- Apply at the rate of 1.5 lb/A for a maximum of 7 applications/season.
- Do not apply within 5 days of harvest.
- May be applied with ground or aerial equipment.
- Applying the maximum amount of Curzate M-8 per season will result in the application of 6.7 lb of mancozeb.

Prior to use in the following counties, the regional office of the U.S. Fish and Wildlife Service must be contacted in order to assess the potential exposure to the indicated species:

Atlantic, Monmouth and Ocean - Swamp pink and Knieskern's beaked-rush
Burlington - Swamp pink, Knieskern's beaked-rush, American chaffseed and Sensitive joint vetch
Cumberland - Swamp pink and Sensitive joint vetch
Gloucester, Middlesex, Morris and Salem - Swamp pink
Sussex - Small whorled pogonia

Earlier in the season the fungicide, Tattoo C, received a Section 18 Emergency Exemption for the control of **late blight** on tomatoes. The recommended fungicide program for tomatoes in New Jersey is as follows: Once crown fruit are 1/3 their final size, protectant fungicides (Bravo, Quadris or mancozeb) should be applied and continued on a 7- to 10-day schedule (or according to TOM-CAST, if using this predictive system) until the end of the season for the control of **foliar** and **fruit diseases**. If **late blight** occurs within the state, then the fungicide program should shift to the Section 18 materials. The suggested use for the Section 18 fungicides is as follows: If tomatoes are in the active growth phase (prior to heavy fruit load), then apply Tattoo C because of its systemic qualities. If the regular fungicide schedule is extended due to rain or wet soils, then switch to Curzate M-8 due to its after-infection activity. If there is active **late blight** (sporulating lesions on the leaves) in the field, then use Acrobat MZ due to its anti-sporulation activity. It is imperative to *READ THE VEGETABLE EDITION OF THE PLANT & PEST ADVISORY* to know if **late blight** has been detected in the state, in order to know when to switch to the Section 18 fungicides. Also, it is important to stay on schedule with protectant fungicides full season to prevent the development of **late blight** in tomatoes. ❑

Weather Summary for the Week Ending 8 a.m. Monday 7/21/97

	RAINFALL			TEMPERATURE				GDD BASE50		MON
WEATHER STATIONS	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	%FC
BELVIDERE BRIDGE	.42	14.05	-4.13	94	51	75.	2	1223	-83	65
CANOE BROOK	.65	13.36	-5.91	101	56	81.	7	1490	180	65
CHARLOTTEBURG	.12	16.16	-3.29	95	47	74.	3	1144	80	57
FLEMINGTON	.09	13.78	-4.82	98	48	76.	2	1267	-85	59
LONG VALLEY	missing									
NEWTON	.11	13.93	-3.82	94	48	74.	2	1032	-136	66
FREEHOLD	missing									
LONG BRANCH	.00	14.12	-3.89	98	54	78.	3	1391	11	22
NEW BRUNSWICK	.28	17.70	-.24	97	50	78.	2	1428	-111	70
PEMBERTON	.01	14.41	-3.54	101	52	80.	5	1630	135	20
TOMS RIVER	.00	13.82	-4.58	99	54	79.	5	1432	44	25
TRENTON	.14	17.29	.22	97	49	77.	1	1420	-181	44
CAPE MAY CRT HSE	.00	14.41	-1.57	96	59	81.	5	1488	7	19
DOWNSTOWN	.41	13.64	-3.08	98	55	81.	5	1512	-102	41
GLASSBORO	.37	15.81	-1.94	99	57	81.	5	1640	47	38
HAMMONTON	.20	14.18	-3.49	99	54	81.	5	1499	-89	29
POMONA	1.33	16.03	.10	98	55	81.	6	1506	31	66
SEABROOK	.84	15.26	-.90	98	58	82.	6	1624	3	59
ATLANTIC CTY MRNA	.56	11.39	-3.87	95	60	80.	5	1484	92	43
WOODSTOWN	.38	14.16	-3.76	101	56	83	NA	1652	NA	NA

WES KLINE — GDD BASE 40 PINEY HOLLOW
Last Week 248 (Ending 07/14/97)
This Week 286 (Ending 07/21/97)

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