RUTGERS COOPERATIVE EXTENSION AT THE NEW JERSEY AGRICULTURAL EXPERIMENT STATION

PLANT & PEST ADVISORY

VEGETABLE CROPS EDITION $1.50 JULY 8, 1998

INSIDE

Manganese Management 1

Veg Crops Diseases 2

Pest Notes 3

IPM Update 4

Weekly Weather Summary 6

Manganese Management

Joseph Heckman, Ph.D., Soil Fertility

Manganese (Mn) is a micronutrient that is often deficient in many coarse-textured soils of South Jersey but is seldom found deficient in fine-textured soils of North Jersey. Sandy soils typically have a low Mn content and are very susceptible to Mn deficiency if too much limestone is applied. As soil pH increases, plant availability of soil Mn decreases. Liming practice is therefore an important part of Mn management.

The objective of the liming program, to be consistent with the objective of maintaining soil Mn availability, is to raise the soil pH to the preferred pH level of the crop to be grown but no higher. Because sandy soils require less lime to change soil pH than soils higher in clay content, it is important to carefully apply only the amount of lime that is needed.

In recent years, increasing amounts of limed-sludge (biosolids) products are being marketed. Heavy applications of limed-sludge have in some instances resulted in excessive soil pH elevation and Mn deficient crops. Beneficial use of limed-sludge products requires the same attention to application rate as other traditional liming materials. The application rate of any liming material should be based on the calcium carbonate equivalent as listed on the product label and the soil test recommendation. Refer to Rutgers Cooperative Extension Fact sheets 635, 767, 902, 903, 904, and 905 for further information about liming and soil pH management.

Another aspect of Mn management is an awareness that different crops vary in sensitivity to Mn deficiency. Many legume crops, such as soybean, snap bean, lima bean, and alfalfa, easily become Mn deficient when grown on soils low in Mn. Small grain crops are also susceptible to Mn deficiency. Wheat is especially sensitive to the deficiency and low Mn availability from soil also favors the development of take-all disease. Bentgrass grown on golf course fairways is also more susceptible to take-all disease when Mn availability is low. Corn is generally less susceptible to Mn deficiency than most other field crops but deficiencies will occur on soils more conducive to Mn deficiency. Manganese deficiencies are occasionally observed on fruit crops, such as strawberry and peach, and some ornamentals.

Manganese deficiency symptoms often appear in random patterns across fields (symptoms may range from mild to severe). In most crops the diagnostic symptoms of Mn deficiency are exhibited as interveinal

SEE MN ON PAGE 2

MN FROM PAGE 1

chlorosis: the area between the veins of the leaves turn yellow while veins remain green. The oat plant is an exception – gray oval-shaped specks appear on the edges of leaves.

Cultural Practices to Protect Against Manganese Deficiency

- Avoid excessive application of lime.
- Maintain an optimum pH for the crop.
- Ammonium sulfate is a fertilizer that causes soils to become acid. If soil pH is too high and Nitrogen fertilizer is needed, consider using ammonium sulfate fertilizer.
- Use an acid forming starter fertilizer containing ammonium sulfate or monoammonium phosphate.
- Soil test to identify fields low in Mn availability.
- Grow crops that are less susceptible to Mn deficiency in fields with a history of Mn deficiency.

Treatment of Manganese Deficiency

- Manganese sulfate is an excellent fertilizer source for correction of Mn deficiency.
- Begin foliar treatment of Mn deficient crops as soon as symptoms appear. Plants deficient in Mn will noticeably green up within a few days after treatment.
- For foliar treatment, apply 0.5 to 2.0 lbs. of elemental Mn per acre at each spraying.
- Foliar Mn application on soybean may be applied as a tank mix with postemergence herbicides (Blazer, Classic, Pursuit or Basagran).
- Applications of Mn to soil are generally less effective than foliar treatment. When broadcasting Mn, apply 15 to 20 lbs. Mn per acre. When banding Mn at planting, apply 6 lbs. Mn per acre with the starter fertilizer.

Soil Testing for Manganese

The Mehlich-3 soil test along with a soil pH measurement provides an index of soil Mn availability. Manganese availability index is calculated as follows:

Mehlich-3 Mn Availability Index = 101.7 – 15.2 (soil pH) + (Mehlich-3 Mn in ppm)

SEE TEST ON PAGE 6

Vegetable Crops Diseases

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

✔ **Beans, snap:** For all fields seeded after July 1, be sure to apply Ridomil Gold 4E in a 7-inch band over the row after seeding for control of **damping-off** caused by **Pythium.** In fields where there is some plant debris from the previous crop, moldboard plow the field to bury the debris, and apply Ridomil Gold PC 11G as an in-furrow treatment at seeding for control of **damping-off** caused by **Rhizoctonia,** as well as **Pythium**.

✔ **Cole Crops:** Maintain applications of maneb or Bravo as a foliar spray every 7-10 days for control of **Alternaria leaf spot**.

✔ **Cucumber: Bacterial wilt** is present in some fields at this time. Initially infected plants have a few wilted leaves that turn necrotic, then the entire plant wilts. The disease is caused by a bacterium that is transmitted by the **cucumber beetle**. Control of the **cucumber beetle** from plant emergence until flowering is essential for preventing **bacterial wilt** from developing. **Phytophthora fruit rot** is present in some fields at this time. Infected fruit are covered with a white, slimy mold, and the fruit collapse. Apply a copper fungicide every 7-10 days for control. Maintain foliar applications of Bravo + Benlate or Topsin M every 7-10 days for control of **anthracnose**.

✔ **Eggplant: Verticillium wilt** is present in some fields at this time. Infected plants have a portion of the plants with chlorotic leaves, and the stem eventually wilts. Control measures involve crop rotation away from eggplants for several years and preplant soil fumigation.

✔ **Muskmelon:** Maintain applications of mancozeb or chlorothalonil every 7-10 days for control of **Alternaria leaf blight**.

✔ **Pepper:** After applying Ridomil Gold 4E at transplanting, 30 and 60 days later, wait 2 weeks and start to apply a copper fungicide + a spreader sticker every 7-10 days for control of **Phytophthora blight**.

✔ **Potato, (White): Early dying disease** is present in some fields of 'Superiors' at this time. Infected plants have one or more branches with chlorotic leaves, numerous leaflets have a black tip-burn, and eventually the plant dies. Control measures involve crop rotation away from potatoes, and control of the **lesion nematode** with preplant soil fumigation, or an at planting application of Mocap.

✔ **Pumpkins & winter squash:** When the vines begin to run, apply maneb as a foliar spray and repeat once in 7 days. Then apply Bravo every 7-10 days until the end of the season. Scout fields for the presence of **powdery mildew**, and once observed, add Bayleton to the Bravo application, and repeat once in 14 days.

✔ **Squash (Summer):** Apply Ridomil Gold/Bravo as a foliar spray every 14 days for control of **Phytophthora blight.**

✔ **Tomato:** Quadris is being used by many growers for disease control. It is important to note that Quadris is extremely phytotoxic (causes defoliation) to certain apple varieties; therefore, do not spray tomato fields with Quadris where there is a possibility of spray drift on apples. Also, sprayers used for spraying Quadris should not be used to spray apples. **Thrips** are present in some fields at this time (see **Pest Notes** from last week, 7/1/98). Be sure to control them to prevent spread of **Tomato Spotted Wilt Virus** into the field. Once crown fruit are 1/3 their final size, apply Bravo every 14 days and Quadris every alternate 14 days for control of **foliar** & **fruit diseases**.

✔ **Watermelon:** Maintain foliar applications of Bravo + Benlate or Topsin M every 7 days for control of **anthracnose** & **gummy stem blight**. ❑

Pest Notes

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

✔ **General:** Scientists have cloned a bioluminescent enzyme in jellyfish that give off light, and now are adding it to such toys as a squirt gun that shoots glowing water. Profits from these sales will help fund medical research such as a "tumor light" that makes cancer cells visible. Perhaps these ideas can be extended to plants so plant-feeding insects ingest the enzyme and give off light, allowing for easy scouting of these pests!

Due to the cost of registration, DuPont will cancel the registration of Lannate insecticide on all greenhouse food crop uses. This cancellation will be effective September 14, 1998.

✔ **Corn (Sweet):** The numbers of **fall armyworm** have slowly been increasing in the blacklight trap at RAREC. Corn fields around the research farm have isolated areas of corn with whorls infested by **fall armyworm** larvae, and damage is just beginning to appear. If damage increases and exceeds 15% infestation, then control measures should be initiated. Refer to the sweet corn section "Decision Making" for more information on when and how to treat for this pest.

The **corn earworms** and **European corn borer** populations are still low, based on black light trap catches. Both species of moths are being trapped, indicating that **moths** are in the area. The number of **moths** should begin increasing within the next week or so.

✔ **Onion: Onion maggot flies** are still being trapped, and numbers are heavy in some areas of Cumberland and Atlantic Counties. The Section 18 Label for Trigard-treated seed has expired, and the only control material left now is either diazinon for soil treatments or a pyrethroid for adult **fly** control. Neither of these is effective, and currently there are no labeled alternatives. We can expect **fly** activity to last through the fall, though.

✔ **Potato:** The second generation **Colorado potato beetles** are infesting potatoes in plots treated with Admire at planting on the research farm. Although in low numbers, this indicates that Admire is no longer at an effective level within the plant. Monitor the potatoes for any increase in **potato beetle** numbers, as well as **potato leafhoppers**, especially in varieties that will be in the field for the next several weeks or longer. Provado should not be considered at this time of the year in order to prevent or reduce the development of insecticide resistance, even if Admire was not applied at plant. Other effective alternatives include AgriMek, cryolite , Thiodan, Vydate, or a B.t. (Raven or other) for small larvae if present.

IPM Scout S. Walker brought to the lab several potato plants that were damaged at the stems. Some of the damage was caused by **European corn borer** larvae, while some looked like **borer** damage but was not. Any damage to the plants done earlier in the season (mechanical damage such as cultivator, tire bumping, sprayer, etc.) will have the appearance of **borer** damage at this time (hollow stems, black areas or black stems) because of disease organisms entering the stem. To best determine type of damage, look closely within the stem for feeding damage or frass left from the **corn borer** larvae. Plots on the research farm only have about 30% damage caused by **corn borer**. ❑

Deer Fencing Installation Seminars

August 4, 1998
4 PM - 8 PM
Rutgers University, Snyder Research Farm
140 Locust Grove Road
Pittstown, NJ 08867

August 5, 1998
4 PM - 8 PM
Rutgers University, Agricultural Research and Development Center
121 Northville Road
Bridgeton, NJ 08302

The New Jersey Department of Agriculture and the New Jersey Division of Fish, Game and Wildlife in a cooperative program will be awarding over 700,000 feet of deer fencing to New Jersey farmers.

The Snyder Research Farm will be hosting the above noted seminars to educate farmers and other interested parties in the proper installation procedures. Representatives from the fence manufacturer and distributor, as well as commercial installers will be on hand to demonstrate fence installation.

Call the Snyder Research Farm at 908-730-9419, ext. 11, to register for either seminar. ❑

Vegetable IPM Update

Kristian E. Holmstrom and Sally Walker, Program Associates in Vegetable IPM

Peppers

Two-spotted spider mites were found in an unsprayed test plot in Cumberland County. Check the undersides of leaves in the lower canopy for stippling, white speckling of the leaf surface and webbing between the leaf veins. Mites are about the size of a pinhead and are visible with the naked eye, although a hand lens is helpful in confirming mite presence. Mites usually move in from field edges, especially after edges are mowed. The population can explode in hot dry weather. Early detection may make controlling this pest possible with spot treatments. **European corn borer** (**ECB**) counts are beginning to increase in the pheromone traps located in pepper plantings in the southern counties. Larger plants and more foliage make egg masses difficult to find so we rely on the traps to indicate when the adult population is active. These larvae are likely to infest fruit directly so as the population increases, fruit will need to be treated on a preventative basis on a 7 to 10 day schedule.

Tomatoes

Cabbage looper (**CL**) and **tomato hornworm** (**THW**) larvae were found at low levels in an unsprayed test plot in Cumberland County. These pests are not typically a serious problem, feeding mainly on foliage and not damaging large numbers of fruit. Check for larvae on the undersides of leaves where signs of feeding are seen. Feeding damage by hornworms will be heavier than that of CL. A few **tomato fruitworms (CEW)** were also found feeding on fruit in the same plot. At this time the blacklight and pheromone trap counts indicate that we are between generations of this pest, so we should not see much new damage until the adult counts increase. In Hunterdon and Cumberland counties **stinkbugs** continue to be trapped in both blacklight and pheromone traps associated with tomato plantings. As of this week, **stinkbugs** have been caught in pheromone traps placed within plantings as well as at field edges. Although thresholds for this pest are not available, the combination of developing fruit and **stinkbug** activity within plantings is an indication that tomatoes should be treated periodically for this pest.

Sweet Corn

Blacklight trap catches of ECB remain low throughout most of the central and northern regions. In the southern region a few traps are picking up moderate catches. Southern region pheromone traps are now recording moderate numbers of male ECB indicating a new generation may be starting. Some pretassel stage plantings of sweet corn may still have larval infestations and should be treated if 12% or more plants are infested.

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

Shirley	8	Shiloh	1
Cohansey	5	Ellisdale	1
Cedarville	2	Fishing Creek	1
Centerton	2	Hammonton	1
Crosswicks	2	Medford	1
Egg Harbor	2	New Egypt	1

Corn earworm (**CEW**) adult catches have recently fallen off in all areas of the state. We are likely between adult generations of CEW at this time. See general silk spray recommendations below.

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

Burlington	1	New Egypt	1
Flagtown	1	Rosenhayn	1
Indian Mills	1	Shirley	1
Jamesburg	1	Tansboro	1
Matawan	1		

Fall armyworm (**FAW**) may be found at low to moderate levels around central and southern counties. This pest has a preference for younger corn and foliar feeding is much more ragged looking than that of ECB. Plantings should be treated when 12% or more plants are infested with FAW alone or in combination with ECB.

When scouting for worm pests, be sure to check the lower leaves for corn leaf rust pustules. Fungicide applications may be necessary on susceptible varieties in the whorl stage (3 to 9 leaf) or younger, especially if rust is found on older plantings locally. The conditions that may result in severe damage include a large quantity of spores with cool wet weather and successive plantings of susceptible varieties.

General Sweet Corn Spray Schedule

Silking stage:	North	6 day *
	Central	5 – 6 days*
	South	5 – 6 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.

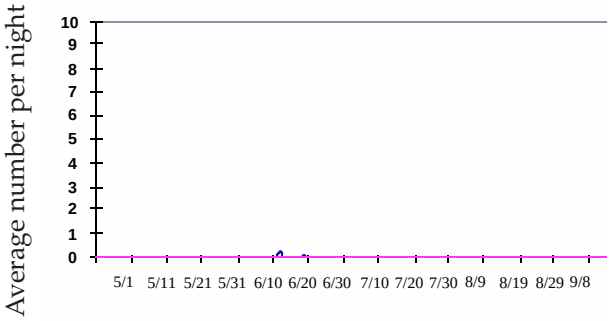
See Blacklight Trap Captures page 5

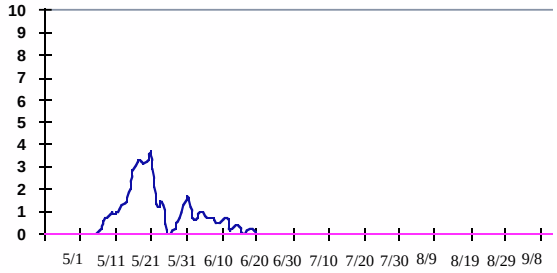
Blacklight Trap Catches

Corn Earworm

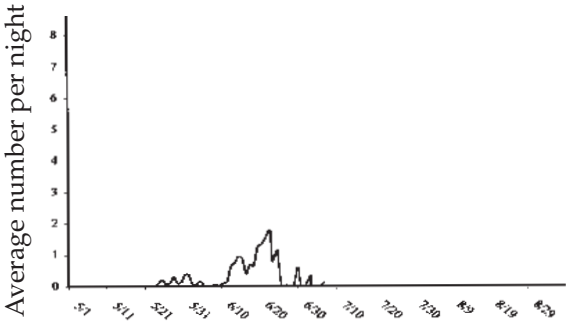
European Corn Borer

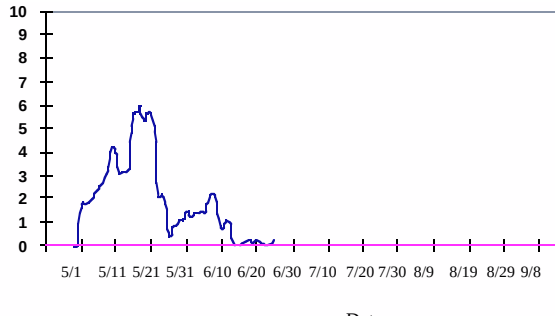
Northern Region



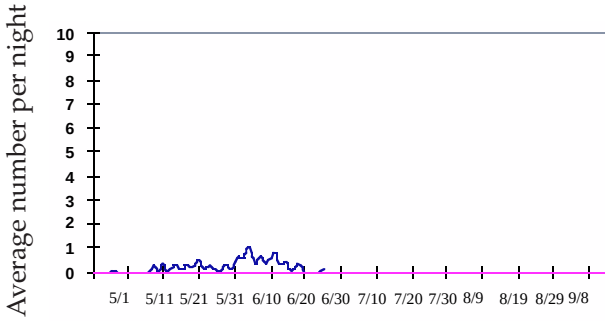


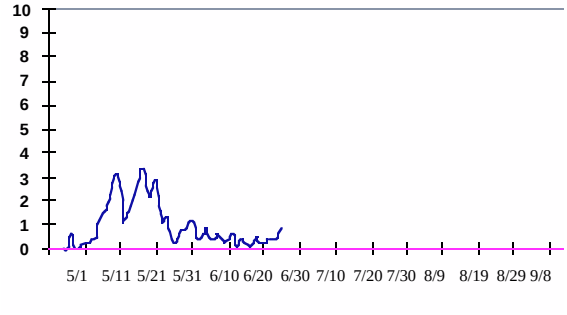
Central Region





Southern Region





Weekly Weather Summary

Keith Arnesen, Agricultural Meteorologist

Temperatures averaged near normal. Extremes were 90 degrees at Canoe Brook and Pembertion on the 4th, and 52 degrees at Charlotteburg on the 6th. Weekly rainfall averaged 0.64 inches north, 0.70 inches central, and 0.21 inches south. The heaviest 24 hour total was 0.86 inches at Charlotteburg on the 30th of June to the 1st of July. Estimated soil moisture, in percent of field capacity, this past week averaged 66 percent north, 61 percent central and 32 percent south. Four inch soil temperatures averaged 70 degrees north, 72 degrees central and 74 degrees south.

Weather Summary for the Week Ending 8 a.m. Monday, 7/ 6/98

	RAINFALL			TEMPERATURE				GDD BASE50		MON
WEATHER STATIONS	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	%FC
BELVIDERE BRIDGE	.43	24.90	8.81	85	56	70.	-1	1198	224	59
CANOE BROOK	.48	24.32	7.12	90	58	73.	1	1404	437	63
CHARLOTTEBURG	1.14	27.13	9.73	85	52	69.	0	1045	279	67
LONG VALLEY	.65	24.88	7.23	80	56	68.	-1	1049	216	64
NEWTON	.48	20.68	4.93	84	56	69.	-1	1058	205	60
FREEHOLD	.66	25.51	9.38	87	60	73.	0	1226	129	65
LONG BRANCH	1.20	28.35	12.22	83	59	72.	0	1170	146	68
NEW BRUNSWICK	.70	25.52	9.70	88	57	72.	-2	1318	150	69
PEMBERTON	.49	18.50	2.76	90	59	75.	2	1441	308	53
TOMS RIVER	.42	32.19	16.04	88	56	72.	-2	1375	347	51
TRENTON	.75	23.87	9.02	86	56	71.	-3	1266	49	57
CAPE MAY COURT HOUSE	.62	18.69	4.45	88	58	74.	1	1370	263	37
DOWNSTOWN	.15	17.93	3.29	88	58	74.	0	1473	239	33
HAMMONTON	.01	17.61	2.15	88	59	74.	0	1426	220	20
POMONA	.21	22.32	8.34	90	57	74.	1	1404	294	30
SEABROOK	.28	20.85	6.74	89	58	76.	2	1561	320	41
ATLANTIC CITY MARINA	.00	22.92	9.55	87	65	75.	3	1338	301	15
WOODSTOWN	.33	17.98	3.28	90	56	74.	NA	1595	NA	NA

WES KLINE — GDD BASE 40 PINEY HOLLOW

Last Week 253 (Ending 6/29/98)

This Week 236 (Ending 7/6/98)

TEST FROM PAGE 2

Interpretation of index values:

Below 25: Mn deficient soil

Above 25: Mn adequate

Refer to Rutgers Cooperative Extension Fact Sheets: FS568 and 632 for further information on Mn.

Manganese plant-analysis interpretations for various crops

Crop	Sampling Procedure	Manganese Normal Range, ppm
Alfalfa	Top 6 inches at bud	21-150
Corn	Earleaf at silking	20-200
Soybean	Recent mature trifoliates	21-100
Oat, Wheat, Barley	Top leaves	25-100
Irish Potato	Recent mature leaves	30-250
Onion	Top-no white portions	50-250
Spinach	Recent mature leaves	30-250
Snap bean	Recent mature leaves	50-300
Strawberry	Recent mature leaves	50-200
Peach	Midshoot leaves	40-160

Rutgers Cooperative Extension - NJAES
U.S. DEPARTMENT OF AGRICULTURE
Rutgers -The State University of New Jersey

88 Lipman Drive
Cook College
New Brunswick, N.J. 08901-8525

PLANT & PEST ADVISORY

VEGETABLE CROPS EDITION CONTRIBUTORS

Rutgers Cooperative Extension Specialists
Joseph A. Fiola, Ph.D., Small Fruit & Viticulture
Stephen A. Garrison, Ph.D. Vegetable Crops
Gerald M. Ghidiu, Ph.D. Vegetable Entomology
George Hamilton, Ph.D., Pest Management
Joseph R. Heckman, Ph.D., Soil Fertility
Stephen A. Johnston, Ph.D. Plant Pathology
Bradley A. Majek, Ph.D. Weed Science
Craig A. Storlie, Ph.D. Agricultural Engineering
Rutgers Cooperative Extension County Agricultural Agents, Assistants and Program Associates
Atlantic, Richard W. VanVranken (609-625-0056)
Burlington, Raymond J. Samulis (609-265-5050)
Cape May, Larry E. Newbold (609-465-5115)
Cumberland, Wesley Kline, Ph.D. (609-451-2800)
Gloucester, Michelle Infante (609-863-0110)
Hunterdon, Winfred P. Cowgill, Jr. (908-788-1338)
Mercer, Daniel Kluchinski (609-989-6830)
Middlesex, William T. Hlubik (732-745-3443)
Monmouth, Richard G. Obal (732-431-7260)
Morris, Peter J. Nitzsche (973-285-8300)
Salem, Peter R. Probasco (609-769-0090)
Somerset, Betsey Saul, Agricultural Assistant (908-526-6293)
Warren, William H. Tietjen (908-475-6505)
Kristian E. Holmstrom, IPM Program Associate
Sarah Walker, IPM Program Associate
Newsletter Production
Jack Rabin, Assistant Director, NJAES
Cindy Rovins, Editor and Designer

Rutgers Cooperative Extension provides information and educational services to all people without regard to sex, race, color, national origin, disability or handicap or age. Rutgers Cooperative Extension is an Equal Opportunity Employer.

Pesticide User Responsibility: Use pesticides safely and follow instructions on labels. The user is reponsible for the proper use of pesticides, residues on crops, storage and disposal, as well as damages caused by drift. For specific labels, special local-needs label 24(c) registration, or section 18 exemption, contact Rutgers Cooperative Extension of your County.

Use of Trade Names: Trade names are used in this publication with the understanding that no discrimination is intended and no endorsement is implied. In some instances the compound may be sold under different trade names, which may vary as to label clearances.