

PLANT & PEST ADVISORY

VEGETABLE CROPS EDITION \$1.50

JUNE 30, 1999

Double Cropping Fall Cabbage

Joseph R. Heckman, Ph.D., Soil Fertility



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Land that becomes available after the harvest of early spring vegetable crops may be double cropped by planting cabbage or other cole crops for a fall harvest. Double cropping increases the productivity of land resources but to do it successfully requires planning and consideration of production inputs. Research by Rutgers Cooperative Extension has demonstrated that excellent yields of fall cabbage can be obtained by attending to the following production practices:

1. Fall cabbage should be transplanted into the field no later than August 15. Earlier planting is recommended for northern New Jersey.
2. Fall cabbage can be planted following the harvest of a wide range of early vegetable crops such as sweet corn, snapbeans, lettuce, and peas.
3. The weed control program must be compatible for double cropping. The herbicides used to control weeds in the spring vegetable crop must allow the field to be planted in fall cabbage.
4. The crop residues left in the field from the spring vegetable harvest should be chopped and incorporated with tillage. Nutrients released from the decomposing residues become available for cabbage uptake.
5. Soil test before planting. Cabbage grows poorly in acid soils. Apply lime as needed. The target soil pH for cabbage is 6.5.
6. Cabbage has a relatively high requirement for plant nutrients. On soils that test high-optimum in P and K, apply enough of these nutrients to replace the amount removed in the harvested heads. Each ton of cabbage heads removes per acre 0.9 lbs P_2O_5 and 4.4 lbs K_2O . Thus, for a 35 ton/acre yield goal, apply about 30 lbs of P_2O_5 , and 150 lbs K_2O per acre. Also apply about one pound of boron per acre if the soil test for this nutrient is low. On sandy soils that may be low in sulfur, the application of a sulfur fertilizer is recommended. Apply about 20 lbs S per acre.
7. Following the harvest of early vegetable crops, soils often have some leftover N fertilizer that is useful to the following double crops. Some N also becomes available from the breakdown of crop residues. Use the presidedress soil nitrate test (PSNT) to

SEE FALL CABBAGE ON PAGE 3

Pest Notes

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

✓ **Cucumber:** **Cucumber beetles** are found on many cucurbits throughout southern New Jersey on both the foliage and flowers. **Cucumber beetles** transmit **bacterial wilt disease**. Spraying for **beetles** will reduce the spread of the disease throughout the field. Adios, Asana, Guthion, Lannate, methoxychlor, Ambush, Pounce, Sevin, and Thiodan are registered for control of **cucumber beetles** on most cucurbits. Consult label for specific crop, rates, and restrictions.

✓ **Corn:** Very few **corn earworms** and **European corn borers** have been caught in the blacklight traps recently. These pests will likely not reach thresholds for several weeks; thus treatments are not necessary for corn in the whorl stage of development.

✓ **Potato:** High numbers (beyond threshold) of **potato leafhoppers** are being found in potato and alfalfa fields throughout the mid-Atlantic region, and the populations will rapidly increase especially if the hot, dry weather continues. Thresholds for **potato leafhopper** are low, and Rutgers IPM recommends treatment if **leafhopper** counts exceed 1 adult per sweep or 1 nymph per 10 potato leaves. Labeled insecticides include dimethoate, Ambush, Asana, Furadan 4F, Guthion, Imidan, Lannate, Pounce, Thiodan and Vydate. Although Provado is also labeled, it is not recommended at this time because of the potential of increasing insecticide resistance with the **Colorado potato beetle**. Consult label of specific material for rates and restrictions. □

Soil Compaction

Raymond J. Samulis, Burlington County Agricultural Agent

The benefits of tillage are well known and have been documented for years. Weed control and soil aeration are but a sample of the justification for tillage. In an effort to keep planting schedules and constant market supply, we are forced to work soils under less than ideal conditions. Ironically, although the overall season this year has been extremely dry, just this week I have encountered field problems that resulted from the heavy (up to 4 ½") rainfalls that occurred in isolated cases. The soils were extremely crusted and hard enough that corn roots could not penetrate them. Couple this with shallower than normal seeding depth and subsequent drought conditions. Without the needed anchorage to withstand winds, etc., what you get is corn that lodges.

How do you know if soil compaction is hurting your crops? Digging plants and observing the arrangement of the root system will tell you a lot. Another way to tell is the ease of penetration when taking soil samples for analysis. I personally have bent more than a few soil probes when trying to take samples in some soils. Probably the best and most accurate method to test for compaction is to use a soil penetrometer. This device measures the force in foot pounds of pressure needed to penetrate the soil. This force can then be correlated to the range of measurements we know roots can grow through. For example, readings over 200 psi will begin to inhibit root growth. Readings over 300 will basically stop root growth from occurring. Extensive surveys I have done show some compaction readings over 600 psi, with more than half of the total readings over 300 in the danger zone.

Soil compaction is quite insidious. Growers often overlook the impact of soil compaction because it is not as obvious as an insect or disease that they can see. If the same crop were planted side by side in an adjacent but uncompacted area the results would be more evident.

The problem is real, but where do we go from here? Here are a few suggestions I have to lessen the problem:

1. Be sure to avoid overly saturated soils when working the ground. This will greatly depend on soil texture type. We have sandy fields that are good the next day after rain while others need a full 5 – 7 days after heavy rain. Remember that this applies to irrigation as well as rain. Keep in mind that soil is 50% pore space, and it takes 1,000 years to form an inch of topsoil from indigenous materials.
2. Subsoiling can help. Be sure the depth of the shank is deep enough to break through the hardpan layer. This layer often is variable, but usually is in the 9" – 12" depth and may be 5" thick or more.
3. Alternate travel rows when spraying. Repeated passes in the field in the same rows greatly contributes to soil compaction.
4. Resting ground with some aggressive rooting rotational crop like alfalfa can also help compaction. The roots will help break the hardpan layer.
5. Soil compaction greatly influences the disease pressure we experience. Phytophthora and other root diseases are extremely moisture dependent. Reducing soil compaction will aid in soil drainage and subsequent disease spread.

Soil compaction is complex, insidious, and at least partially avoidable if some simple precautions are practiced.

SEE PHOTOS ON PAGE 6

Vegetable Crops Diseases

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

✓ **Carrot:** Begin foliar applications of Bravo during the first two weeks of July, and repeat every 7-10 days until frost for control of **leaf blights**.

✓ **Cole crops:** **Downy mildew** is present on cabbage at this time. Infected leaves have numerous diffuse necrotic lesions on the upper surface with an appressed white sporulation on the underside of the leaf beneath the lesion. Apply Ridomil Gold/Bravo as a foliar spray every 14 days or apply maneb as a foliar spray every 7-10 days for control. **White Mold (Sclerotinia)** is prevalent in some fields of cabbage at this time. Infected plants are completely wilted, and a dense mass of white mycelium is present at the base of the stem. No control measures are available at this time. Infection took place during a 5-10 day period of saturated soil conditions. Benlate can be applied to Chinese cabbage and Brussels sprouts as a foliar spray in future plantings for this use pattern.

✓ **Cucumber:** Some fruit being harvested at this time are curved and shrunken on one end. This is the result of **poor pollination**, and is not due to a disease. Be sure to have at least 1-2 bee hives/acre to insure adequate pollination occurs. Maintain foliar applications of Bravo + Benlate or Topsin M every 7-10 days for control of **foliar diseases**.

✓ **Eggplant:** **Verticillium wilt** is present at this time in some fields. Infected plants have leaves that are chlorotic and wilted. In many cases only a portion of the plant exhibits symptoms. Eventually the entire plant wilts. No control is available at this time. In future plantings, preplant soil fumigate to reduce the population of the pathogen in the soil prior to transplanting.

✓ **Muskmelon:** **Bacterial wilt** is severe in some fields at this time. Infected plants turn chlorotic and leaf margins become brown with the entire plant wilting. Control of this disease involves control of the **cucumber beetle** from emergence until flowering to prevent transmission of bacteria from the beetles to the plants. Maintain applications of Bravo or mancozeb as a foliar spray every 7-10 days to control **Alternaria leaf spot**.

✓ **Pepper:** Some fields with polyethylene mulch have stunted and wilted plants present. No black girdling lesion is present on the stem, and roots are brown with the cortical tissue slipping from the steale. These plants are infected with **Pythium root rot**. Maintain applications of mefenoxam (Ridomil Gold or Ultra Flourish) via injection into drip irrigation systems every 21 days for control of **Phytophthora blight** and **Pythium root rot**. In some fields with polyethylene mulch plants are falling over and wilting leaving a narrow constriction at the base of the stem. This is not the result of a disease, but is due to injury from wind damage or fertilizer burn.

✓ **Potato (white):** **Late blight** has appeared on the Eastern Shore of Virginia. Fields should be protected with foliar applications of mancozeb every 7 days for prevention of this disease in New Jersey. **Rhizoctonia stem canker** is present in some fields at this time. Infected plants are wilted, and contain numerous brown, sunken lesions on the lower stem above and below ground with white mycelial growth on the stem below ground. Use of Maxim seed piece treatment at planting will assist in control.

✓ **Squash (summer):** Maintain applications of Ridomil Gold/Bravo every 14 days for control of **Phytophthora blight**.

✓ **Tomato:** **Pythium root rot** is present in some fields produced on black polyethylene mulch, and transplanted during hot weather. Infected plants wilt, and a necrotic lesion is present at the base of the stem extending upwards. Avoid excessive soil moisture via irrigation, and apply mefenoxam (Ridomil Gold or Ultra Flourish) via injection through the drip irrigation system to assist in control. **Septoria leaf spot** is present in some fields at this time. Infected leaves have numerous circular spots with black specks present in the center. Apply Quadris as a foliar spray for control. **Tomato Pith Necrosis** is present in some fields produced on black polyethylene mulch and drip irrigation. Infected plants wilt, and a dark lesion is present along the stem with the internal stem tissue (pith) completely black. The disease is favored by high soil moisture and high soil fertility levels. The disease does not spread during the season. All fields with fruit present should be on a 7-10 day fungicide schedule in which Bravo is alternated with Quadris for control of **foliar and fruit diseases**.

✓ **Watermelon:** Maintain applications of Bravo + Benlate or Topsin M every 7-10 days for control of **anthracnose & gummy stem blight**. □

FALL CABBAGE FROM PAGE 1

determine if sidedress N fertilizer is needed to grow fall cabbage. Take soil samples from the 0 to 12-inch depth for the PSNT soil sample. The PSNT test should be performed just prior to the time for sidedressing. Sidedress N, if needed, should be applied about two to three weeks after cabbage has been transplanted into the field.

PSNT Interpretation

PSNT Interpretation	
NO₃-N, ppm	
Greater than 25	No sidedress N recommended
Less than 25	Sidedress N fertilizer is recommended

IPM Update

Kristian Holmstrom and Sarah Walker, Program Associates in Vegetable IPM

General

With the recent period of hot, dry weather, **two-spotted spider mites** have begun to appear in host crops throughout the northern counties. These pests infest many crops including cucurbits, tomatoes, peppers, and eggplant. **Mite** injury often first appears as small white flecks on the upper surface of leaves. This injury, known as "stipple", indicates that mites are feeding on the lower surface of the affected leaves. Upon turning over the leaves, **mites** and their webbing may be observed near the larger veins in early infestations. As the infestation progresses, **mites** increase to cover leaves and fruit. Lately, **mites** are appearing in trickle-irrigated peppers and eggplants in fields with adjacent areas of grasses and weeds. As these border areas dry up, **mites** are migrating into the irrigated crops. They may often be found first in eggplant. Be sure to check areas of plantings that border weeds. Avoid mowing grassy borders, as this encourages migration into adjacent crops. If infestations are found early, spot treatments may be effective.

Sweet Corn

European Corn Borer (ECB) adult activity is relatively low throughout the state now, with a few hot spots in Mercer and lower Hunterdon counties. Sweet corn plantings now entering whorl stage should remain free of this pest for a period of two to three weeks. Plantings now beginning to tassel should be considered for treatment if they continue to be infested with **ECB**. Larvae will be visible within emerging tassels. Withholding treatment until the field is in full silk may permit **ECB** to leave tassels and infest the forming ears. The highest nightly **ECB** blacklight trap catches are:

Sergeantsville	6	Sewell	2	Denville	1
Cohansey	3	Belvidere	1	Drakestown	1
Hopewell	2	Centerton	1	Hackettstown	1
Little York	2	Chester	1	Long Valley	1

Corn earworm (CEW) adult activity continues to be low to moderate throughout southern and central New Jersey. This pest represents a threat to silking sweet corn plantings at this time. Areas on the **CEW** map that indicate a weekly average population of 0.25 to 0.8 adults per night roughly correspond to a 4-day silk schedule. The highest nightly **CEW** blacklight trap catches are:

Centerton	3	Fishing Creek	1	Medford	1
Sewell	3	Hackettstown	1	Pedricktown	1
Chapel Heights	1	Hammonton	1	Sergeantsville	1
Cohansey	1	Indian Mills	1	Shirley	1

General Sweet Corn Spray Schedule

Silking corn: North 6 days
Central 4 – 5 days
South 3 – 4 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.

Fall armyworm (FAW) adults are being captured in pheromone traps throughout southern New Jersey. Recently, individuals have appeared in traps as far north as Hunterdon County. As yet, no **FAW** feeding has been reported. Within the next 1-2 weeks, **FAW** feeding should appear on whorl and seedling stage sweet corn plantings. This typically occurs first in the southernmost counties in coastal areas.

Tomato

Tomato hornworm larvae were found feeding in tomatoes in Cumberland County. The larvae are light green and have a distinctive curved spine ('horn') on one end. They can be hard to find in the foliage because they blend in well. It is often easier to spot the large brown/green droppings on the leaves and around the base of the plant. The larvae usually do not cause economic damage, and they are easily controlled with the insecticides being used now in tomatoes. **Stinkbugs** continue to be active and are difficult to monitor in the field. As fruit size up, plantings should be treated periodically to minimize damage from these insects.

Peppers

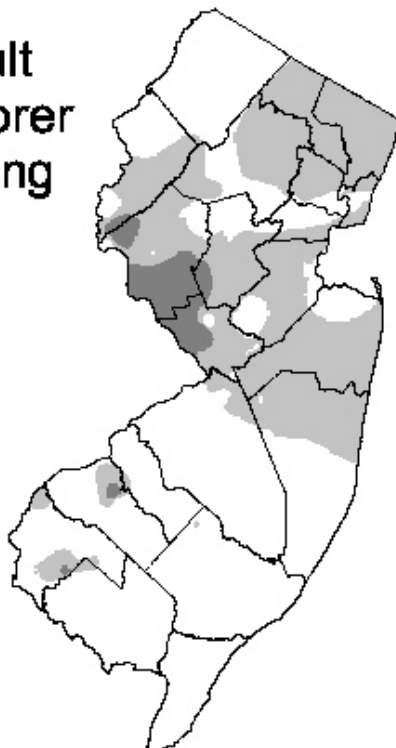
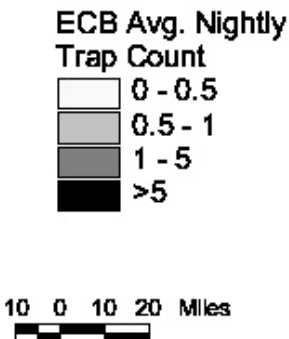
ECB adult counts are low in most of the state. As adult counts in local blacklight traps increase to one to two per night, pepper fruit that is at least ½ inch in size should be protected on a 7-10 day spray schedule. These areas are represented by all shaded portions on the **ECB** map. Continue to monitor leaves for **aphids**, **two-spotted spider mites** (see General), **ECB** egg masses, and larvae feeding in the foliage (see tomato section about hornworms). In areas where **pepper maggots** have been a problem, small fruit should be protected at this time. See the *Commercial Vegetable Production Recommendations* manual for materials.

Snap Beans

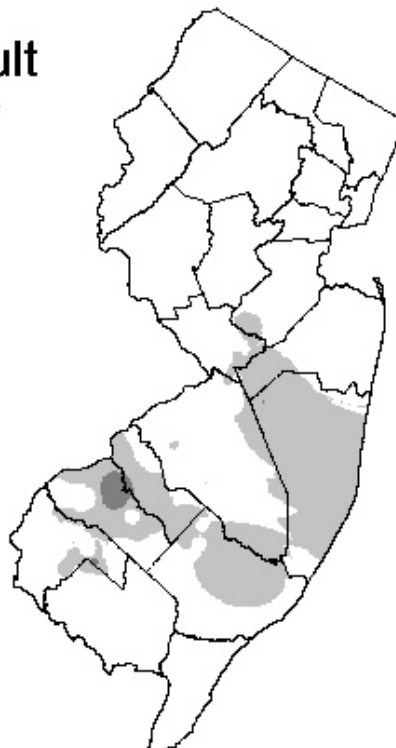
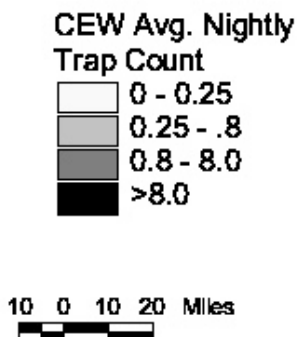
ECB adult counts remain low in most areas. As adult counts increase to 2 per night, it is critical to treat for **ECB** at the bloom and pin stages. Also check fields for **potato leafhoppers (PLH)**. Make 10 sweeps in 10 random locations in the field and consider a treatment if the number of **PLH** exceeds 5 per sweep (500 per 100 sweeps). If a sweep net is not available, check the undersides of leaves for the presence of **PLH nymphs** and **adults**. Newer plantings may be at risk for **thrips**, as **thrips** are being found in other vegetable and field crops. From emergence through bloom count the number of **thrips** on 5 leaves in 10 locations and consider treatment if **thrips** exceed 6 per leaflet, especially if the plants are drought stressed or other insects are present.

SEE IPM ON PAGE 5

Distribution of Adult European Corn Borer for the Week Ending June 30 1999



Distribution of Adult Corn Earworm for the Week Ending June 30 1999



Data collected and processed by: Kris Holmstrom, Sally Walker, Marilyn Hughes
Rutgers Cooperative Extension & Center for Remote Sensing

Commercial Production of Aquatic Plants

Charlene Costaris, Atlantic County Agricultural Agent

This is a new and potentially profitable niche for New Jersey farmers. Backyard ponds and interest in aquatic plants is booming among homeowners, and retailers/distributors are having difficulty finding adequate supply. Rutgers Cooperative Extension and Cumberland County College developed a program for interested growers.

Title: Commercial Production of Ornamental Aquatic Plants

Date: August 6, 1999

Time: 1:00 - 4:30

Site: Cumberland County College, Vineland

Seating here is limited to 28

Distance Education Site: Sandy Hook, Monmouth County

Cost: \$25, \$15 students

Contact: Chris Dubois, Rutgers Cooperative Extension of Atlantic County, 609-625-0056

Registration Deadline: July 30, 1999

IPM FROM PAGE 4

White Potatoes

Continue to monitor fields for PLH. Sweep 5 times in 10 locations and consider treatment if 25 PLH are found in 50 sweeps.

SEE DISTRIBUTION MAPS, LEFT

Weekly Weather Summary

Keith Arnesen, Ph.D., Agricultural Meteorologist

Temperatures averaged above normal north, near normal central and below normal south. Extremes were 100 degrees at Canoe Brook on the 27th and 48 degrees at Charlotteburg on the 22nd. Weekly rainfall averaged 0.04 inches north, 0.22 inches central, and 0.58 inches south. The heaviest 24 hour total was 1.24 inches at Hammonton on the 21st to the 22nd. Estimated soil moisture, in percent of field capacity, this past week averaged 69 percent north, 72 percent central and 79 percent south. Four inch soil temperatures averaged 68 degrees north, 69 degrees central and 68 degrees south.

Weather Summary for the Week Ending 8 am Monday 6/28/99

WEATHER STATIONS	RAINFALL			TEMPERATURE				GDD BASE50		MON %FC
	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	
BELVIDERE BRIDGE	.05	10.51	-4.48	92	54	73.	3	905	75	55
CANOE BROOK	.00	10.61	-5.51	100	55	75.	5	1076	278	66
CHARLOTTEBURG	.07	12.14	-4.16	93	48	69.	2	723	101	57
FLEMINGTON	.05	8.66	-6.74	96	54	73.	2	953	125	62
FREEHOLD	.22	10.39	-4.73	95	53	76.	4	1092	173	63
LONG BRANCH	.07	11.15	-4.02	87	53	72.	1	946	96	57
NEW BRUNSWICK	.06	11.42	-3.33	93	52	73.	-1	1013	37	67
PEMBERTON	.05	12.56	-2.06	93	51	74.	2	1091	138	52
TOMS RIVER	.84	6.16	-8.86	90	51	70.	-1	906	61	55
TRENTON	.08	12.62	-1.12	91	50	72.	-1	901	-125	45
CAPE MAY COURT HOUSE	.37	8.86	-4.48	87	54	70.	-2	1021	95	59
DOWNSTOWN	1.02	12.73	-.88	90	55	71.	-2	1049	4	63
HAMMONTON	1.24	11.66	-2.68	90	54	71.	-2	1043	26	58
POMONA	.14	11.91	-1.08	88	52	70.	-2	1000	69	58
SEABROOK	.11	12.68	-.38	89	55	73.	0	1168	116	62
WOODSTOWN	1.06	13.53	-1.07	91	51	71	NA	1156	NA	NA
WES KLINE — GDD BASE 40 PINEY HOLLOW										
Last Week	189	(Ending 6/21/99)								
This Week	220	(Ending 6/28/99)								



Read-out dial of penetrometer
Photos by Ray Samulis



Measuring soil compaction with penetrometer

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