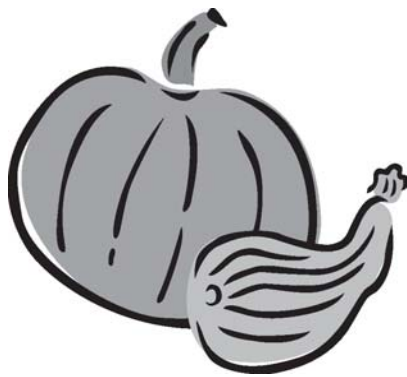


PLANT & PEST ADVISORY

VEGETABLE CROPS EDITION \$1.50

AUGUST 25, 2004



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Vegetable Disease Update

Andy Wyenandt, Ph.D., Post Doctoral Associate in Vegetable Pathology and Wes Kline, Ph.D., Cumberland County Agricultural Agent

✓ **Cucurbits – Choanephora fruit rot of pumpkin** – also known as Choanephora wet rot or blossom end rot is a disease which affects blossoms and young developing fruit. Infected female flowers may turn brown, 'mushy' and fall off prior to fruit set. Blossom infection can lead to fruit infection. Young fruit may turn a yellowish-brown with **masses of dense, white fungal growth with black 'pinpoint' spores developing on infected fruit**. Long periods of wet weather with excessive rainfall and high relative humidity favor the development and spread of Choanephora fruit rot. Unfortunately, control of Choanephora is difficult due to the constant development of new flowers and fruit, canopy production by the plant, and the ability of the fungus to survive saprophytically. Drier weather this week should help reduce Choanephora development.

✓ **Cucurbits – Bacterial leaf spot** – Symptoms of Bacterial leaf spot are beginning to show up in pumpkin fields. On foliage, Bacterial leaf spot will produce small, circular water-soaked lesions (1 to 3 mm) on the lower leaf surface. With age, lesions can become dry and angular developing a translucent center accompanied by yellow 'halos'. Early control is extremely important because foliar infections can lead to fruit infections. On fruit, small-sunken circular spots with a scabby, dry appearance can develop ruining aesthetic quality. Fixed coppers can be applied when Bacterial leaf spot is first detected on foliage and repeated every 7 to 10 days. For more information on control please see the 2004 New Jersey Commercial Vegetable Production Recommendations.

✓ **Cucurbits – Powdery mildew** – Powdery mildew has now been identified in southern and northern New Jersey on a variety of winter squash and pumpkin. Powdery mildew typically occurs from mid-July until the end of the season. Powdery mildew can cause 100% defoliation very quickly if not controlled properly. The diagnostic characteristics of Powdery mildew are pure white 'fuzzy' growth on the upper and lower leaf surface, petioles and stems. Symptoms typically begin on older, lower leaves and can develop and spread rapidly under dry, humid conditions. Control of Powdery mildew begins with regular

SEE DISEASES ON PAGE 2

Fungal Leaf Blights of Carrot

Andy Wyenandt, Ph.D., Post Doctoral Associate in Vegetable Pathology

Alternaria and Cercospora are two soil-borne fungal pathogens that may cause early defoliation in carrots reducing yields and making harvest difficult. Both pathogens produce distinct symptoms on carrots. Symptoms of **Alternaria** include irregular, dark brown to black spots which **typically show up on older leaves first**. **Cercospora** leaf spots are round, grayish-brown and **are more prevalent on younger foliage**. Both leaf blights typically start at the margins of leaflets and as more spots develop leaflets begin to wither and die. Symptoms similar to leaf infections can develop on stems and petioles. Control of both diseases begins with regular scouting and preventative fungicide applications on susceptible varieties. Amistar or Quadris 80WDG at 3 to 5 oz/A or OLF, or Cabrio 20EG at 8 to 12 oz/A, or chlorothalonil (Bravo, Echo, Equus) at 1.5 to 2 pt/A or OLF, or Endura 70W at 4.5 oz/A or Rovral 50WP (Alternaria only) at 1 to 2 lb/A or OLF are control measures. Do not make more than three sequential applications of Amistar or Quadris before alternating with chlorothalonil. Several carrot varieties exhibit leaf blight tolerance and should be grown where adapted. For more information on tolerant varieties and control please see the *2004 New Jersey Commercial Vegetable Production Recommendations Guide*. □



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scouting for symptoms and weekly fungicide applications. Fungicide resistance management of the fungus which causes Powdery mildew is critical. For more information on control of Powdery mildew and other important diseases of cucurbits please see the *2004 New Jersey Commercial Vegetable Production Recommendations Guide*.

✓ **Cucurbits – Downy Mildew** – Downy mildew continues in cucurbit plantings. In some fields Downy mildew has caused 100% loss. Growers should take great precautions to keep Downy mildew under control. If Downy mildew has been a problem in fields, growers should scout and continue on a weekly fungicide maintenance program. There are a number of fungicides labeled for control of Downy mildew and many will help control other important diseases in cucurbits. For information on control of Downy mildew and other important diseases of cucurbits please see the *2004 New Jersey Commercial Vegetable Production Recommendations Guide*.

✓ **Eggplant – Phomopsis blight** – can affect all above ground portions of the plant. Symptoms include well-defined circular lesions on infected leaves with **diagnostic black fruiting bodies** developing within the lesion. If disease progresses, infected leaves may turn yellow and die. Fruit lesions are similar to leaf infections, but lesions may become much larger causing fruit to become soft. Wet weather and high temperatures favor Phomopsis blight development. Control of Phomopsis blight begins with weekly preventative fungicide applications which may include Amistar or Quadris 80WDG at 2 to 5 oz/A, or Flint 50WDG at 2 to 4 oz/A, or Cabrio 20EG at 8 to 12 oz/A or maneb 80WP at 1.5 to 2 lb/A or OLF.

✓ **Peppers – The fruit rot phase of Phytophthora blight** continues in some pepper fields. Weather conditions have been favorable for the development and spread of the aerial phase of the disease. Protect the upper portion of the plant with fixed copper sprays or Ridomil Gold Copper sprays. Make 3 to 4 applications at 10-14 day intervals. See page F70 of the *2004 Commercial Vegetable Production Recommendations Guide* for more details.

✓ **Tomato – Anthracnose** – or red fruit rot is now showing up on mature tomato fruit. Symptoms of Anthracnose are easily diagnosed. Symptoms on ripe fruit appear as water-soaked circular lesions that often have a lighter colored tan center. Black fruiting bodies are often visible in the center of Anthracnose lesions. Control of Anthracnose begins with preventative fungicide applications. Fungicides labeled for other important foliar and fruit diseases of tomato will help control Anthracnose. If a fruit-ripening agent has been used, additional fungicide applications may be necessary to help control Anthracnose. For more information on control please see the *2004 New Jersey Commercial Vegetable Production Recommendations Guide*.

✓ **Tomato – Buckeye Rot** – Wet weather and wet soils favor the development of Buckeye rot. Symptoms of Buckeye Rot on green fruit include brownish-tan lesions that have a **definitive concentric appearance**. As lesions form, the fruit will begin to soften up, this is quite different than Late blight which will cause a dark brownish/black lesion with the fruit remaining somewhat firm. Unlike Late blight, Buckeye rot won't attack the foliage. For more information on control please see the *2004 New Jersey Commercial Vegetable Production Recommendations Guide*. □

Pest Notes

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

✓ **Corn (sweet):** Trap catches of **corn earworm** moths are high, and corn in the silking stage will need to be protected to prevent corn earworm damage to the ears. Moths deposit eggs directly on the corn silks, so direct sprays around the entire ear zone, especially the silks. Follow corn earworm moth activity in local blacklight or pheromone traps to stay current on numbers of moths trapped each night, which is an indication of moth activity in corn fields. As activity increases (or as the number of moths trapped each night increases) you may need to shorten the spray interval for best results. Use Asana, Baythroid, Fury, Mustang Max, Lannate, Larvin, Pounce, Ambush, SpinTor, or Warrior for protection from corn earworms. Remember that many of these materials are toxic to bees. Refer to Table D-6 (pages D-11 thru D-18) for a listing of each insecticide and the toxicity to bees.

✓ **Pepper: Beet armyworm** activity is increasing, and more larvae are now being found in many crops, including pepper. These pests are managed more easily while they are still small; larger worms are much more difficult to control than small larvae using the same insecticides. Also, pyrethroids do not work very well against beet armyworms. For best results, use Avaunt, Confirm, Intrepid, Lannate, Proclaim, or SpinTor with a high volume, high pressure spray to penetrate the plant canopy. Monitor pepper fields closely, at least twice per week, looking for small larvae in the upper leaves of the pepper plant (near the very top of the plant). Treat as soon as larvae are found (while still small).

✓ **Tomato: Tomato and tobacco hornworm** larvae are reaching maturity (3-4" long). They will be easy to find because of the large amount of foliage they consume when they are this large. Many pest management materials control this pest, including the biological insecticides (Bt's) such as Agree, Biobit, Cutlass, DiPel, Javelin, Lepinox, Mattch, Prolong, or XenTari. Other new insecticides that are either natural products, or act as an insect growth regulator, include Confirm, Intrepid, Proclaim, and SpinTor are also effective. Remember that thorough coverage is important when using these materials because the active ingredient must be ingested for the insect to be killed. Use high pressure, high volume to penetrate the leaf canopy.

✓ **Corn earworm**, also called the **tomato fruitworm**, moths are reaching high numbers in local blacklight and pheromone traps. These pests readily invade the fruit, leaving 1/4" diameter holes or larger in

Managing Lettuce Drop

Sally Miller, OSU Associate Professor, Plant Pathology, Ohio State VegNet Newsletter #18, 2004

Reprinted from Ohio State VegNet Website, <http://vegnet.osu.edu>

Midwestern vegetable growers have reported increasing losses due to drop in lettuce during the past several years. Cool, wet weather is very favorable for lettuce drop, caused by *Sclerotinia minor*, and in some areas *Sclerotinia sclerotiorum* as well. Both pathogens produce structures called sclerotia that can survive for many years in soil. These structures are small (< 1/16 inch) and generally round in *S. minor*, and irregularly shaped and considerably bigger (about 1/16 – 1/4 inch x 1/8 – 3/4 inch) in *S. sclerotiorum*. All lettuce cultivars are susceptible to this disease, which has been managed in the past using applications of the fungicides Rovral and/or Ronilan. However, growers are seeking alternative products for effective, long-term management of this disease. New products for lettuce drop management. Research in 2002 and 2003 in Arizona (Dr. Mike Matheron, University of Arizona) has shown that the fungicide Endura (boscalid, BASF) significantly reduced drop caused by both *S. minor* and *S. sclerotiorum* in lettuce, and was more consistent from year to year than Ronilan or Rovral. In our on-farm trial in Ohio in 2003, under very severe disease pressure (60% incidence of drop in the untreated control), Endura applied twice (alternated with Rovral) did not significantly reduce drop. In the Arizona trials, the biofungicide Contans (distributed by Sylvan Bioproducts, contact Bill Stoneman (billstoneman@charter.net)), a fungus ("mycoparasite") that kills sclerotia of both *S. minor* and *S. sclerotiorum*, was highly effective in controlling drop caused by *S. minor* when combined with an application of Endura. Recent results by researchers studying white mold (caused by *S. sclerotiorum*) of canola in Germany have shown that the best time to apply Contans is just after harvest, when sclerotia are on the surface and can be readily attacked by the Contans fungus. Reducing the population of sclerotia of either pathogen using Contans may take several years: deeply buried sclerotia may not be exposed to the Contans mycoparasite at the time of application. As sclerotia are continually mixed and brought to the soil surface through cultivation, they will be exposed to the mycoparasite and eventually sclerotia numbers will decrease. According to the manufacturer, Contans MUST be incorporated 4-8 inches into the soil after application in order to maximize contact of the mycoparasite with sclerotia. They also concur

the fruit. These holes also allow disease organisms to enter, rotting the tissue and collapsing the fruit walls. The biological insecticides (Bt's) are effective, as well as the pyrethroids (Asana, Baythroid, Danitol, or Warrior) and many other different class insecticides (Cryolite, Kryocide, Confirm, Intrepid, Lannate, Monitor, Proclaim, SpinTor). Monitor these pests by looking for larvae, damage, or following the trap catch results for the local area in the IPM newsletters.

✓ **Beet armyworms** have arrived, and larvae are reaching the larger instars. The larger larvae bore into the fruit of tomatoes and peppers, causing significant damage. These pests are difficult to control, and pyrethroids have little effect against them. For best results, use Avaunt, Confirm, Intrepid, Proclaim, or SpinTor. As with the other worm pests, use high pressure, high volume on the sprayer to penetrate the crop canopy with the material. □

MANAGING LETTUCE DROP FROM PAGE 3

that the product should be applied after harvest (with incorporation) in order to allow plenty of time for the mycoparasite to find and kill the sclerotia.

Lettuce drop is a persistent problem that may require a multi-year, multi-tactic approach to management. The high levels of drop that have occurred in lettuce fields over the past three years in many Midwestern growing areas have contributed to increasing numbers of sclerotia in soil, which will increase disease pressure. Now is the time to start thinking about managing lettuce drop for next year and years to come.

Submitted by Richard VanVranken, Agricultural Agent. □

IPM Update

Kristian Holmstrom, Program Associate in Vegetable IPM

Sweet Corn

European corn borer (ECB) activity is moderate to high in parts of central and northern New Jersey, and although it is generally low in the southern counties, there is increased adult activity in parts of Cumberland and Salem counties. The highest catches are occurring along the Hunterdon/Warren County border and in Monmouth County (see ECB map). Activity in the southern areas may represent a third flight, and resulting larvae will present a threat to host crops for much of the remainder of the season. Continue to check all plantings weekly for the presence of ECB and other pest injury both in the tassels and on the leaves. If feeding exceeds 12% in a 50 plant sample, consider treating. As plantings progress to full tassel, it is still wise to treat for ECB if larvae are present. The highest average nightly ECB blacklight trap catches are:

| | | | | | |
|--------------|---|-------------|---|---------------|---|
| Georgetown | 9 | Little York | 6 | Woodstown | 4 |
| Crosswicks | 8 | Wall | 6 | Flanders | 3 |
| Allentown | 7 | Centerton | 5 | Lawrenceville | 3 |
| Jones Island | 6 | Matawan | 4 | Phillipsburg | 3 |

Fall armyworm (FAW) continues to infest whorl stage sweet corn plantings in all counties. In the northern counties, feeding is quite high in some whorl plantings. Look for heavy "window-pane" type feeding on whorl and seedling corn. This feeding is caused by young FAW. As the larvae grow, the feeding becomes more ragged, with large holes and accumulations of droppings in the whorl. When FAW is present, thorough spray coverage is critical. Be sure to use as much water with the spray material as possible, and increase pressure to permit the insecticide to penetrate the layer of caterpillar droppings.

The large increase in **corn earworm (CEW)** adult activity that began earlier has stabilized at moderate to high levels throughout the state. This population represents an extreme threat to silking sweet corn, and growers should respond with tight silking spray schedules. High catches are to be found in all regions of New Jersey, but notable hot spots are in parts of Mercer, Burlington and Monmouth counties (see CEW map). Tighter silk spray schedules are required in all parts of the state. All silking spray schedules should be tightened to 3 days at this time. In certain areas, a 2-day schedule may be warranted if economically feasible. The crosshatched area on the CEW map (green on the web) represents a population requiring a 3-4 day silk spray schedule and the black areas (red on the web) represent a 2-3 day silk spray schedule.

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

| | | | | | |
|---------------|----|------------|----|---------------|----|
| Medford | 41 | Wall | 21 | Princeton | 16 |
| Lawrenceville | 30 | Folsom | 18 | Springdale | 16 |
| Elm | 29 | Georgetown | 18 | East Vineland | 15 |
| Tabernacle | 26 | Hopewell | 18 | Woodstown | 15 |

General Sweet Corn Spray Schedule

| | | |
|---------------|---------|----------|
| Silking Corn: | North | 3 days |
| | Central | 2-3 days |
| | South | 2-3 days |

SEE IPM ON PAGE 5

Corn leaf rust continues to be found on sweet corn, particularly as it passes into the late whorl and pretassel stages. Some varieties are susceptible to this pathogen. While scouting for insects, be sure to look at lower leaves for pustules on the surface. As pustules mature, they will burst, releasing reddish colored spores. If this disease is first found in the seedling or whorl stage, consider a fungicide application to limit spread on plants. Rust infections, if allowed to progress on susceptible varieties, can stress plants and reduce ear size.

Tomatoes

Late blight is in Hunterdon and Sussex counties on fresh market tomatoes. With the previous infection reported by Dr. Andy Wyenandt from Cumberland County, we now have local occurrences of the organism confirmed in several parts of the state. It is critical that all tomatoes be on regular protectant fungicide programs now. If symptoms should appear in local fields including rapid defoliation of entire leaves (with or without obvious sporulation) or green fruit turning brown but remaining solid for some time, immediately include a fungicide that specifically targets the group of fungi to which late blight belongs. These materials are in the *2004 New Jersey Commercial Vegetable Recommendations Guide*. Contact Dr. Wyenandt at 856-455-3100 ext. 4144 or your county agent to report the occurrence of symptoms consistent with late blight.

High CEW activity (approaching 20 per night in local traps) can result in significant fruit injury if protectant insecticide applications are not made. If catches are high, consider treating weekly to limit damage. Often CEW larvae may be found boring into fruit in the outer canopy of the plants.

Peppers

With ECB adult numbers moderate to high in parts of the state, peppers need regular protectant insecticide treatments. On the ECB map, areas shaded in green (web version) or crosshatched (in the newsletter) indicate adult ECB populations that require weekly preventive sprays to minimize fruit injury. Monitor local ECB populations to determine when to begin regular preventive insecticide applications. Be aware that repeated use of synthetic pyrethroid materials are likely to result in increased aphid infestations. It is a good idea to rotate materials for ECB control to prevent this from happening.

Be aware that high CEW populations (greater than 10 moths per night consistently in local blacklight traps) can result in injury to peppers and tomatoes. If ECB adult catches decline to non-economic levels, it may still be necessary to treat peppers and tomatoes weekly to prevent CEW injury. Be sure to monitor local trap catches to see if CEW populations threaten these crops. Damaging populations would show up as black on the CEW map (red on the web version).

Pumpkins

Cucurbit downy mildew (DM) will be an ongoing problem on vine crops throughout the state for the duration of the season. Growers should be on their regular protectant fungicide programs to limit damage from this disease as well as **powdery mildew (PM)**. If wet weather makes it impossible to maintain a regular 7-day program, it may be advisable to switch to a material that specifically targets the water molds with the next possible application. Materials like Ridomil Gold Bravo or Tanos fall into this category (See the *2004 New Jersey Commercial Vegetable Recommendations Guide* or the mid-July edition of the University of Delaware Crop Update <http://www.rec.udel.edu/update04/Issue%2017%202004.htm> for further selections and suggested rotational materials). It is critical to check fields at least weekly for the presence of sharp yellow spots on the upper leaf surface. The veins will be yellow on the underside of the leaf. Shortly after these symptoms appear, dark colored spores will be produced along the sides of veins in infected tissue. This disease can rapidly defoliate fields, and should be treated quickly. At the present time, fields of the smaller, sugar type pumpkins appear to be in worse condition than the larger jack 'o lantern types. This has much to do with the earlier maturity of those smaller varieties, in combination with heavy disease pressure. In many cases, the fruit are mature. The loss of foliage above mature fruit can result in sun scald and consideration should be given to removing fruit from the field to prevent this type of injury. On later-maturing types, it is critical to maintain foliage to allow for full fruit development.

Snap and Lima Beans

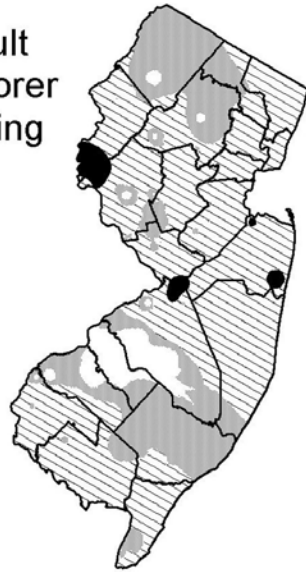
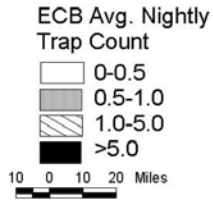
With high CEW activity, growers should consider treating fields weekly when local trap catches approach 20 moths per night. If sampling is to be conducted, consider treating when numbers exceed 1 larva per 6 feet of row and 50% or more of the larvae in samples are greater than one half inch in length.

Black Cutworm Activity

Pitfall traps in carrots continue to trap significant numbers of **black cutworm** larvae in the southern counties. Cutworm damage in white potatoes and sweet potatoes is very dramatic with large excavated areas of the potato evident. Overall the damage tends to be minor though in some years damage may be more extensive. Mid-season control of cutworms has always been difficult because we didn't know when the caterpillars were active in the field. Based upon the pitfall catches it would suggest that cutworm damage to potato crops and carrots is occurring in the early half of August. Growers with these crops may want to examine the soil around the hills and look for the gray-black caterpillars. During daylight hours they normally reside in the soil at the juncture of dry and moist soil and will curl up when disturbed. There are no recommended thresholds for treatment. □

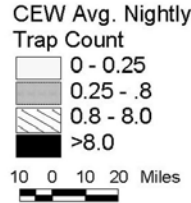
SEE IPM MAPS ON PAGE 6

Distribution of Adult European Corn Borer for the Week Ending August 25, 2004



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

Distribution of Adult Corn Earworm for the Week Ending August 25, 2004



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

Weekly Weather Summary

Keith Arnesen, Ph.D., Agricultural Meteorologist

Temperatures averaged slightly above normal, averaging 70 degrees north, 73 degrees central and 74 degrees south. Extremes were 92 degrees at several locations on the 21ST, and 48 degrees at Newton on the 22ND. Weekly rainfall averaged 2.06 inches north, 0.97 inches central, and 0.85 inches south. The heaviest 24 hour total reported was 2.21 inches at Belvidere on the 21ST to 22ND. Estimated soil moisture, in percent of field capacity, this past week averaged 88 percent north, 88 percent central and 79 percent south. Four inch soil temperatures averaged 71 degrees north, 73 degrees central and 74 degrees south.

Weather Summary for the Week Ending 8am Monday 8/23/04

| WEATHER STATIONS WEEK | RAINFALL | | | TEMPERATURE | | | | GDD | BASE50 %FC | MON |
|-----------------------|----------|-------|-------|-------------|-----|-----|-----|------|---------------|-----|
| | TOTAL | DEP | MX | MN | AVG | DEP | TOT | | | |
| BELVIDERE BRIDGE | 3.41 | 26.17 | 3.02 | 88 | 51 | 70. | 1 | 2277 | 232 | 97 |
| CANOE BROOK | .48 | 28.76 | 4.47 | 92 | 50 | 72. | 2 | 2328 | 272 | 88 |
| CHARLOTTEBURG | 1.73 | 27.04 | 2.51 | 88 | 48 | 69. | 2 | 2137 | 510 | 97 |
| FLEMINGTON | 1.09 | 32.08 | 8.66 | 90 | 51 | 71. | 1 | 2341 | 232 | 84 |
| LONG VALLEY | 1.68 | 25.92 | .63 | 84 | 50 | 70. | 3 | 2040 | 217 | 97 |
| NEWTON | 3.98 | 25.77 | 3.13 | 87 | 50 | 69. | 2 | 2158 | 290 | 98 |
| FREEHOLD | .39 | 23.50 | .67 | 91 | 50 | 71. | 0 | 2510 | 264 | 74 |
| LONG BRANCH | 1.45 | 24.26 | 1.21 | 89 | 54 | 72. | 1 | 2319 | 151 | 95 |
| NEW BRUNSWICK | .49 | 27.00 | 4.00 | 90 | 52 | 72. | 0 | 2487 | 150 | 87 |
| TOMS RIVER | 2.02 | 27.65 | 4.06 | 92 | 56 | 73. | 2 | 2583 | 433 | 97 |
| TRENTON | .51 | 24.63 | 2.77 | 92 | 54 | 73. | 0 | 2561 | 119 | 69 |
| CAPE MAY COURT HOUSE | .76 | 20.47 | .10 | 88 | 56 | 72. | -2 | 2461 | 339 | 69 |
| DOWNSTOWN | .47 | 21.11 | -.44 | 91 | 55 | 74. | 1 | 2648 | 201 | 59 |
| GLASSBORO | 1.48 | 36.55 | 14.04 | 90 | 59 | 75. | 2 | 2798 | 373 | 87 |
| HAMMONTON | 1.29 | 23.72 | 1.19 | 92 | 56 | 75. | 2 | 2745 | 317 | 70 |
| POMONA | .51 | 21.69 | .95 | 89 | 55 | 74. | 3 | 2617 | 353 | 60 |
| SEABROOK | .58 | 25.75 | 5.11 | 91 | 58 | 75. | 2 | 2902 | 442 | 62 |
| SOUTH HARRISON | .77 | 27.24 | 4.92 | 89 | 57 | 74. | NA | 2764 | NA | NA |

WES KLINE — GDD BASE 40 PINEY HOLLOW Last Week 241 (Ending 8/16/04) This Week 240 (Ending 8/23/04)

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