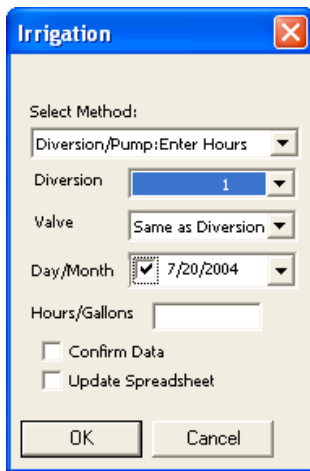


PLANT & PEST ADVISORY

VEGETABLE CROPS EDITION \$1.50

AUGUST 4, 2004



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Conserving Water and Easier Irrigation Compliance Record Keeping with Handheld Module

Aaron Starr, Program Associate in Precision Agriculture and Jack Rabin, Associate Director – Farm Services, NJAES

In 2003 the NJ Department of Agriculture provided Rutgers Cooperative Extension a Precision Agriculture pilot grant. Our project brings cost effective, easy to use precision agriculture applications to diversified New Jersey farmers while simultaneously reducing the drudgery of environmental compliance recordkeeping.

As part of this project, this season we have developed and released to our cooperating pilot growers a significantly improved application, which includes irrigation record keeping, meeting NJ DEP requirements. This usually burdens growers during the season and when they are due February each year.

Our irrigation module allows farmers to easily record irrigation water usage by method, diversion, date, and even valve. The application runs on a field rugged hand held unit. Farmers or their employees enter the information *only once*, in the field or back in the office, and it's there the rest of the year and at reporting time. Most information entry does not even require writing. Dates, diversions, etc., are *entered by simply tapping a pointer* to select preset irrigation system choices.

For our pilot project growers, clicking the 'irr' button on the tool bar brings up the irrigation form (pictured to the left). The form prompts the user for 1 of 4 typical irrigation methods under 'select method': diversion/pump, drip tape, flow meter or valve/nozzle.

Next, the user selects the diversion from a list provided by the grower and built into the application. If the grower also wants to record the valve used during irrigation, this can be done by selecting a valve from the next field, but this is not required. The user is then prompted for the date of irrigation. Clicking the down arrow on the right opens a calendar, allowing the grower to select any date. If no date is selected, the application assumes the irrigation was done on the day recorded.

The grower then enters a value in the hours/gallons field. This value will either be the number of hours irrigated if the diversion/pump, drip tape or valve/nozzle methods were selected above. If the user employs flow meters (if they are participating in USDA EQIP Water Manage-

SEE PRECISION AG ON PAGE 2

Vegetable Disease Update

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

✓ **Tomato - Late Blight -- Late Blight has now been confirmed in New Jersey on processing tomatoes in western Cumberland County.** Weather this past week and over the weekend has brought periods of humid, wet weather to the area ideal for Late blight development. **Growers should continue to scout their fields on a regular basis and continue preventative fungicide application programs.** Previcur Flex has just been approved for Late Blight control in tomatoes. Contact your local pesticide supplier for a copy of the label. If Late Blight is suspected in a tomato or potato field, contact Dr. Andy Wyenandt, at 856-455-3100 ext. 4144 or your local county agricultural agent. For more information on control please see the *2004 New Jersey Commercial Vegetable Production Recommendations*.

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*.

✓ **Peppers - Bacterial Spot** – Symptoms of Bacterial spot on pepper leaves include small, brown water-soaked lesions that turn brown and necrotic in the centers. Spots may coalesce and form large blighted areas on leaves and premature defoliation can occur. On fruit, brown lesions can form which have a roughened, cracked wart-like appearance. High temperatures, high relative humidity and rainfall favor Bacterial spot development. Plant varieties resistant to races 1, 2 & 3 for best control. Loss from Bacterial spot can be reduced somewhat by maintaining high levels of fertility, which will stimulate new growth. For more information on control of Bacterial spot of pepper 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 both 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 scouting for symptoms and weekly fungicide applications. Fungicide resistance management of the fungus which causes Powdery mildew is critical. Fungicides with a high risk for resistance development such as the strobilurins (Cabrio, Flint, Amistar, Quadris) should be rotated on a weekly basis with fungicides of a different chemistry (Chlorothalonil + Nova). Nova (myclobutanil) is also included as high-risk and should be tank mixed. Growers need to read and follow restrictions on labels carefully. 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*.

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*.

✓ **Peppers, Cucurbits -Phytophthora blight** continues to be a problem in many pepper and cucurbit fields. To control the crown rot phase apply mefenoxam (1 pt Ridomil Gold 4E/A or 1 qt Ultra Flourish 2E/A) through the drip system. Additionally, the fruit rot phase will continue to be a problem, especially with the warm and moist weather conditions seen this week. Protect the upper portion of the plant with fixed copper sprays or Ridomil Gold Copper sprays. Make 3 to 4 applications at a 10-14 day intervals. See page F70 of the *2004 Commercial Vegetable Production Recommendations* for more details. □

PRECISION AG FROM PAGE 1

ment), they would enter the value of the flow meter after irrigation is done. The program then either calculates the volume of water based on the pump rate, drip rate or valve capacity times hours run or subtracts the previous flow meter reading from the new reading, the difference being the volume used that day. The last step is to click the 'update spreadsheet' box. This records the irrigation information.

Totals are *automatically* written to two spreadsheets. One spreadsheet contains columns for each day of the month plus additional columns for diversion name and monthly total. The second spreadsheet contains columns for each month plus columns for diversion name and a yearly total. The user therefore can see daily, monthly and yearly totals at a glance. These records provide valuable information to the user regarding water usage which can then be compared with yield and disease rates. The year end total spreadsheet can also be submitted to the DEP which eliminates usage guesswork and reduces time spent calculating usage. □

Physiological Diseases of Tomatoes

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

These are really not diseases and applying a fungicide cannot control them. We have been seeing several disorders this summer with the adverse weather conditions. Following are some of the disorders found in early tomatoes this year.

Puffiness - If fruits appear square or angular cut some open to see if there are seeds inside. The fruit that is set may have few seeds resulting in poorly shaped fruit. Cavities may be empty or with little jelly. The reason is inadequate pollination caused by low (less than 55°F) or high (100°F or over) temperature, or improper fertilization (high nitrogen or low potassium). Proper fertilization with help minimize the disorder.

Gray wall, Blotchy Ripening or Yellow Eye - Irregular, grayish-brown blotchy areas (GW) can occur on the upper half or side of fruit. On ripening, fruit with GW or blotchy ripening (BR) have blotchy areas of green and yellow tissue surrounded by areas of normal red tissue. Greenish-white and white tissue is usually present in the fruit walls, and brown necrotic areas may be located around the vascular system of the fruit. Yellow-eye, a ring of yellow tissue surrounding the stem scar, often occurs in fruit with BR and internal white tissue.

GW and BR symptoms often appear on shaded fruit growing in the interior of dense, vegetative plants. Cloudy, moist, cool weather, high soil moisture, high nitrogen, soil compaction; and low potassium increase the incidence and severity of the disorders. Varieties differ in their susceptibility. Maintaining proper nutrient levels and variety selection will help reduce these problems. This is a good year to check how the early varieties perform.

Catfacing - Catfacing has been observed on first harvested fruit. The symptoms are enlarged scars and holes in the blossom end. Cold weather about three weeks before flowering starts has been shown as one cause. There are differences among varieties for this disorder. Check to see if there are differences among the varieties being grown. □

Pest Notes

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

✓ **Cucurbits: Spider mite** populations were starting to build up in cucurbits, but recent heavy rainfalls may reduce these populations. Monitor fields after these storms to determine pest status, and if the population persists, consider spot treating the areas of high infestations. Recommendations are to treat if 50% of the terminal leaves are infested at this time. It is important that this pest be managed before population levels reach high levels, as it very difficult to reduce the population once this happens. If the populations are low, or just starting to increase, use Capture or Danitol. If the populations are high or rapidly increasing with damage starting to appear, use a miticide such as AgriMek or Kelthane. High pressure, high volume will assist in getting the spray material to the leaf undersides to reach the mite feeding zones. The recommendation book suggests that the use of dimethoate for **leafminer** control will also control spider mites, but reports from New Jersey as well as Delaware suggest that dimethoate is variable in its effectiveness against mites.

✓ **Pepper (Bell): European corn borer** infestation is about 5-6% on untreated peppers at the Rutgers Research and Extension Center in Bridgeton. These peppers were likely infested by the summer generation of the corn borer, which is active during July in New Jersey. However, the current hot, humid weather is ideal for the mating, oviposition and larval survival of second-generation borers, which normally appear in New Jersey around the first week of August. Borers are active at this time, and adult females and males are being trapped in local black light traps. Effective materials include Asana, Baythroid, Confirm, Intrepid, Lannate, Pounce, Ambush, SpinTor, or Warrior. Remember to alternate class of insecticide to avoid overuse of pyrethroids. During the late summer period, overuse (several sprays in a row) of pyrethroids may quickly lead to either **spider mite** infestations or aphid infestations. Non-pyrethroids include Confirm, Intrepid, Avaunt, Lannate, and SpinTor.

Monitor closely for **beet armyworm** in pepper fields. Virginia reports high numbers of this pest are being trapped in various beet armyworm traps, and larvae are causing damage to many different crops. Wind currents (storm fronts) bring this pest into New Jersey each year, and we have seen many storm fronts pass through recently (the most recent storm front came up along the coast, which is ideal for beet armyworm invasions of New Jersey). Look for groups of small larvae feeding on the leaves of the upper 1/3 of pepper plants, with damage appearing as small leaf skeletonizers, especially to the smaller leaves on the very top of the plant. As larvae

SEE PEST NOTES ON PAGE 4

become larger, they migrate to other parts of the plant and invade the fruit. **It is important to control this pest while it is still small and a leaf feeder.** Effective control of beet armyworm, especially small larval stages, can be obtained using a material such as Avaunt, Confirm, Intrepid, Lannate, Proclaim, or SpinTor. **Note: pyrethroid insecticides have generally been ineffective against this pest, even when larvae are still small.**

Also in peppers, multiple small, yellow blotches caused by **stink bug** feeding are appearing at low levels on green fruit. Both adult and nymphal stages of several species of stink bugs can be found on plants at this time. Actara, Fury, Mustang, Mustang Max, or Warrior are effective materials for stink bug control. Note that Fury, Mustang Max and Warrior will also control worms such as the **European corn borer** and **fall armyworm**.

✓ **Corn (sweet): Grasshopper** populations are increasing in corn fields throughout the state. Generally not a problem unless the population is high, grasshoppers can be controlled using either Capture, Fury, Mustang, Penncap-M, Sevin, or Warrior. Monitor fields to determine if the population is high enough to cause significant damage to the foliage, depending on crop stage.

Late-planted sweet corn fields at RAREC have relatively high populations of **fall armyworm** in the plant whorls. If more than 15% of the whorls are infested (with any of the worm pests), treatments are recommended. For whorl sprays, direct sprays over the plants using high volume, high pressure to ensure that the material is forced down into the whorl, where the pests are feeding. Application during the early morning hours, when dew is present on the leaves, will assist in getting the spray material into the heart of the whorl. Use Avaunt, Baythroid, Capture, Fury, Mustang Max, Lannate, Larvin, or Warrior for effective fall armyworm control.

Also, **European corn borers** are being trapped in blacklight traps. The second-generation borers should be appearing about this time, so it is important to monitor this pest through trap catches or through the IPM update to know what the pest is doing in your area. For information on when to spray, as well as other management tips, consult page 104 of the *2004 Commercial Vegetable Production Recommendations for NJ*; for information on selection of best management materials for European corn borers, see pages 102-103. With low populations, spray schedule can remain at 4-5 days, but as population increases, spray schedule should likewise increase to 3-4 days, or 2-3 days under very high pressure. □

IPM Update

Kristian Holmstrom, Program Associate in Vegetable IPM

Sweet Corn

European corn borer (ECB) activity has increased significantly in northern and central counties of New Jersey, and declined somewhat in the southern counties. Very high catches now are occurring in Hunterdon and Warren Counties (see ECB map). The second ECB flight is underway throughout the state, and feeding is showing up in all areas. 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:

Phillipsburg	27	Cranbury	4	Milford	3
Little York	25	Lawrenceville	4	Hackettstown	2
Georgetown	7	Wall	4	Matawan	2
Allentown	4	Elmer	3	Sykesville	2

Fall armyworm (FAW) continues to infest whorl stage sweet corn plantings in all counties. In the northern counties, feeding is not excessive, but threshold levels are reached periodically. Typically, FAW infestations are heaviest in coastal areas, and infestations of over 50% in whorl stage sweet corn have been reported by Garden State Pest Management in eastern Monmouth County. 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.

Corn earworm (CEW) catches have increased to damaging levels throughout New Jersey now, with most locations recording catches. The highest catches are presently in Cape May and north along the Delaware Bay shore, with higher catches in coastal Monmouth County as well. Low to moderate numbers of moths are being captured all over the state however (see CEW map). Catches are increasing north of Trenton, and tighter silk spray schedules are required in all parts of the state. North Carolina IPM is recording high catches, and Virginia Tech indicates that their flight is underway. Delaware IPM and Maryland Dept. of Ag. are recording increasing catches in their light trap networks as well. We should see significantly higher CEW catches in New Jersey sometime next week if the current pattern holds. It is important to monitor local blacklight trap catches now, as CEW adults can increase quickly and will cause

SEE IPM ON PAGE 5

considerable injury to silking sweet corn. The shaded area on the CEW map (blue on the web) represents a population requiring a 5-6 day silk spray schedule and the crosshatched areas (green on the web) represent a 3-4 day silk spray schedule. The highest average nightly **CEW** blacklight trap catches are:

Mannington 8	Fishing Creek 5	New Egypt 4
Matawan 8	Sykesville 5	Farmingdale 3
Seeley Lake 7	Hammonton 4	Georgetown 3
Wall 7	Jamesburg 4	Hopewell 3

General Sweet Corn Spray Schedule

Silking Corn:	North 5 days
	Central 3-4 days
	South 3-4 days

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

Be sure to check plantings for **two-spotted spider mite (TSSM)**. TSSM will cause a whitish pin-spot or “stipple” on the upper surface of infested leaves. They often start at field edges, or where tomatoes border eggplants (eggplants are a common host for TSSM). When scouting, be sure to check older leaves for the presence of TSSM colonies. Consider spot treating if they are found in specific locations in the field.

Brown stinkbugs have been increasing in blacklight traps, and adults continue to be found in tomato, pepper, and sweet corn plantings. Overall, there seems to be heavier than normal activity this season. These pests can cause significant injury to tomatoes; particularly when very dry conditions are prevalent. In August, adults and nymphs cause the large yellow spots on the fruit. Beneath these spots the fruit tissue is hard and pithy. If adults or nymph groups are found in the field, or fruit injury is increasing, consider treating to minimize damage.

Peppers

With **ECB** adult numbers increasing, peppers will again 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.

No new **cyclamen mite** infestations have been detected over the past week, but growers should be on the lookout for the symptoms it causes in peppers. Look for dramatic distortion of the youngest leaves on affected plants. This distortion resembles herbicide injury and is often accompanied by bud proliferation (10-20 or more buds in a cluster), and heavy scarring (russet) on fruit, stems and buds. A microscope must be used to actually see the mites. If proper magnification is available, remove several buds from affected areas and look for a clear to slightly white, elongated mite. Miticides that are used for **two-spotted spider mite (TSSM)** control will be effective against cyclamen mite.

There are reports of **beet armyworm (BAW)** on a few southern New Jersey farms. This pest comes up from southern states and occasionally causes injury to peppers and tomatoes in our state. Look for foliar injury to the leaves near growing terminals. If this is found, look for small greenish caterpillars curled up in and around the buds. If allowed to linger on the plants, the worms will grow, becoming dark colored, and can cause significant injury to pepper fruit.

Pumpkins

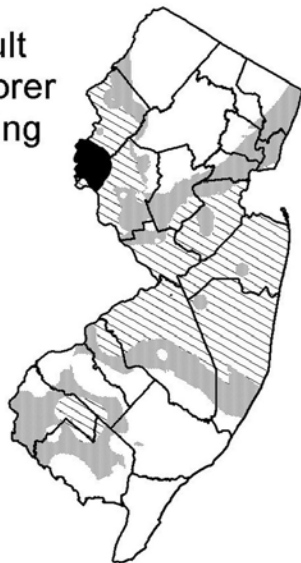
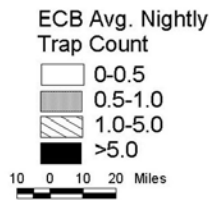
Cucurbit downy mildew (DM) is present on vine crops throughout the state. Growers should be on their regular protectant fungicide programs to limit damage from this disease as well as **powdery mildew (PM)**. If wet weather makes it impossible to maintain a regular 7-day program, it may be advisable 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.

Snap Beans

With **ECB** adult activity increasing, it is important to monitor local catches and treat snap beans to prevent injury and contamination from ECB larvae. This is particularly important where beans are harvested mechanically. If local traps indicate ECB adult activity, treat beans in the bloom stage, and again when they reach the pin pod stage. After this, consider treating at 5-7 day intervals if local traps average 2.5 moths or higher per night.

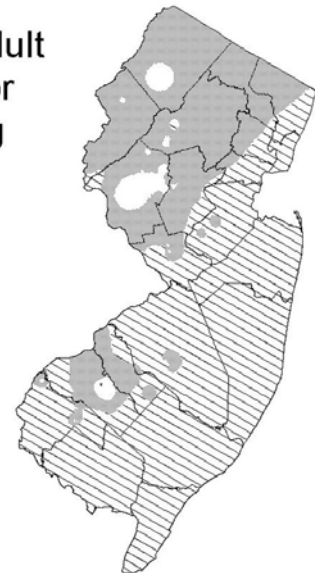
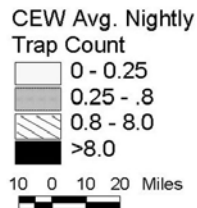
SEE ECB AND CEW DISTRIBUTION MAPS ON PAGE 6

Distribution of Adult European Corn Borer for the Week Ending August 04, 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 04, 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 near normal, averaging 73 degrees north, 75 degrees central and 76 degrees south. Extremes were 91 degrees at Freehold on the 1st, and 59 degrees at Charlotteburg on the 28th. Weekly rainfall averaged 2.40 inches north, 2.03 inches central, and 1.35 inches south. The heaviest 24 hour total reported was 2.30 inches at Glassboro on the 27th to 28th. Estimated soil moisture, in percent of field capacity, this past week averaged 94 percent north, 76 percent central and 48 percent south. Four inch soil temperatures averaged 73 degrees north, 74 degrees central and 75 degrees south.

Weather Summary for the Week Ending 8 am Monday 8/02/04

WEATHER STATIONS	RAINFALL			TEMPERATURE				GDD BASE50		MON %FC
	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	
BELVIDERE BRIDGE	3.60	20.72	.84	88	61	73.	0	1844	243	100
CANOE BROOK	2.68	24.84	3.87	89	61	75.	1	2003	408	91
CHARLOTTEBURG	1.13	23.51	2.38	87	59	73.	1	1719	485	80
FLEMINGTON	2.60	29.73	9.42	89	60	74.	0	1893	252	98
LONG VALLEY	2.32	22.12	.36	86	60	71.	-1	1634	222	90
NEWTON	2.07	20.82	1.42	86	60	73.	0	1738	289	96
FREEHOLD	.71	21.64	1.95	91	62	75.	0	2043	284	71
LONG BRANCH	2.67	20.86	1.27	84	63	74.	-1	1853	172	100
NEW BRUNSWICK	2.15	24.14	4.46	89	63	75.	0	2008	161	93
TOMS RIVER	2.51	23.59	3.37	88	65	75.	1	2099	413	100
TRENTON	2.11	21.05	2.22	89	61	75.	-1	2076	153	86
CAPE MAY COURT HOUSE	.12	16.70	-.71	86	65	74.	-2	2002	206	19
DOWNSTOWN	.55	19.38	.98	89	61	76.	0	2160	225	47
GLASSBORO	4.22	32.23	12.85	88	67	78.	2	2290	381	100
HAMMONTON	.72	20.75	1.31	90	62	77.	1	2234	326	44
POMONA	2.05	18.70	1.16	87	61	76.	1	2137	357	94
SEABROOK	.46	23.64	5.85	88	66	78.	2	2391	449	41
SOUTH HARRISON	2.95	25.66	6.08	88	63	76.	NA	2268	NA	NA
WES KLINE — GDD BASE 40 PINEY HOLLOW	Last Week 211 (Ending 7/26/04) This Week 206 (Ending 8/02/04)									

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