

PLANT & PEST ADVISORY

VEGETABLE CROPS EDITION \$1.50

AUGUST 8, 2007

Vegetable Disease Briefs

Andy Wyenandt, Ph.D., Specialist in Vegetable Pathology



Downy mildew on cucumber leaf

News Alert - Cucurbit Downy mildew confirmed on cucumber in southern New Jersey.

Cucurbit Downy mildew was confirmed on cucumber in a field near East Vineland on August 8th. This is the first report of cucurbit downy mildew in New Jersey. Cucurbit growers in New Jersey should continue to scout on a regular basis and consider switching to a fungicide program which contains downy mildew specific fungicides if they already haven't already done so. For more information on Downy mildew control for specific cucurbit crops please see the 2007 New Jersey Commercial Vegetable Production Recommendations Guide.

Cucurbit Downy mildew reported in Delaware and Maryland.

Cucurbit Downy mildew was confirmed in Delaware (Sussex County) and Maryland (Caroline and Dorchester Counties) on August 3rd. This is the first report of cucurbit Downy mildew in either state this production season. Cucurbit growers in New Jersey should continue to scout on a regular basis and consider switching to a fungicide program which contains downy mildew specific fungicides if they already haven't already done so.

Tank mix one of the products listed below with a protectant fungicide such as chlorothalonil (M5), or maneb (M3), or mancozeb (M3) (see label for rates and specific crop uses):

Ranman (cyazofamid, 21) at 2.1 to 2.75 fl. oz. 400SC/A, or

Previcur Flex (propamocarb HCL, 28) at 1.2 pt 6F/A, or

Gavel (zoxamide + mancozeb, 22 + M3) at 1.5 to 2.0 lb 75DF/A (some muskmelon may be sensitive)

Curzate (cymoxanil, 27) at 3.2 oz 60DF/A, or

Tanos (famoxodone + cymoxanil, 11 + 27) at 8 oz 50WDG/A, or

Downy mildew materials should always be tank mixed with a protectant fungicide and rotated weekly with fungicides from a different FRAC code to reduce the chances for fungicide resistance development.

Cucurbit growers who suspect downy mildew should contact their county agricultural agent. To track the progress of Downy mildew in the eastern US and to keep up with reports of Downy mildew from other states please visit North Carolina State University's Cucurbit Downy

SEE DISEASE BRIEFS ON PAGE 5

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Vegetable Disease Update

Andy Wyenandt, Ph.D., Specialist in Vegetable Pathology and Wesley Kline, Ph.D., Cumberland County Agricultural Agent

✓ **Carrot – Leaf blight caused by *Alternaria* or *Cercospora*** - Apply Amistar 80WDG (azoxystrobin, FRAC code 11) at 3 to 5 oz/A or Quadris (azoxystrobin, 11) at 9.2 to 15.4 fl. oz 2.08F/A, or Cabrio 20EG (pyraclostrobin, 11) at 8 to 12 oz/A, or Pristine (pyraclostrobin + boscalid, 11 +7) tank-mixed or alternated with Bravo, Echo, Equus (chlorothalonil, M5) at 1.5 to 2 pt/A or OLF, or Endura 70W at 4.5 oz/A. Apply Rovral 50WP (iprodione, 2) at 1 to 2 lb/A or Switch (cypridonil, 9) at 11 to 14 oz/A for *Alternaria* only. Do not make more than one sequential application of Amistar, Pristine or Cabrio (FRAC code 11). For more information on tolerant varieties and control please see the *2007 New Jersey Commercial Vegetable Production Recommendations*.

✓ **Cucurbits – Powdery mildew** - Powdery mildew typically occurs from mid-July until the end of the season. 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 strobilurin (Pristine, FRAC code 11) should be tank mixed with a protectant fungicide such as chlorothalonil (M5) or sulfur (M2) and rotated with fungicides of a different chemistry such as chlorothalonil + Nova or Procure (FRAC code 3). FRAC code 3 fungicides are also high-risk and should never be applied alone. 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 *2007 New Jersey Commercial Vegetable Production Recommendations Guide*.

✓ **Cucurbits – ‘White speck’ of Pumpkin** – also known as *Microdochium* or *Plectosporium* blight causes small, distinct lesions on infected vines, petioles, leaves, handles and fruit (see VDOW). Symptoms include light tan to pure white ‘spindle-shaped’ lesions that have a dry, scabby appearance. These small ‘white specks’ often coalesce to form large, dry scabby whitish-tan areas on infected plant parts. Heavy vine infection can lead to complete defoliation and handle and fruit infection can ruin aesthetic fruit quality. Control of White speck begins with proper rotations with crops other than cucurbits. Maximum coverage with fungicide applications is necessary for control of White speck. For more information on control please see the *2007 New Jersey Commercial Vegetable Production Recommendations*.

✓ **Lettuce – Bottom Rot/Drop** – For Bottom Rot, Endura 70W (boscalid, 7) at 8 to 11 oz/A, or Rovral 50WP (iprodione, 2) at 1.5 to 2 lb/A or OLF should be applied one week after transplanting or thinning and 10 and 20 days later. For Drop, the biological Contans 5.3WG at 2 to 4 lbs/A pre-plant can be incorporated at a depth of 1 to 2 inches, or Rovral 50WP (iprodione, 2) at 1.5 to 2 lb/A beginning one week after transplanting or thinning and again at 10 and 20 days later. For more information on control of Bottom Rot and Drop and other important diseases of lettuce please see the *2007 New Jersey Commercial Vegetable Production Recommendations Guide*.

✓ **Pepper - Bacterial leaf 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. Loss from Bacterial spot can be reduced somewhat by maintaining high levels of fertility, which will stimulate new growth. Applying a fixed copper (M1) at labeled rates plus maneb (M3) at 1.5 lbs 75DF/A or 8 to 10 oz Tanos (famoxadone + cymoxanil, 11 + 27) may help suppress spread. For more information on control of Bacterial spot of pepper please see the *2007 New Jersey Commercial Vegetable Production Recommendations*.

✓ **Pepper – Anthracnose** - Symptoms of fruit infection include sunken, circular spots which develop blackish-tan to orange concentric rings as lesions develop. Lesions on stems and leaves appear as grayish-brown spots with dark margins and can easily be overlooked. Control of Anthracnose begins with using clean-free seed and/or transplants. A three-year crop rotation with non-solanaceous crops is recommended. After the harvest season, pepper fields should be disced and plowed under thoroughly to bury crop debris. Beginning at flowering, alternate one of the following FRAC code 11 fungicides: azoxystrobin (Amistar 80WDG at 2 to 5 oz/A or Quadris at 6.2 to 15.4 fl oz 2.08F/A), or Flint (trifloxystrobin) 50WDG at 2 to 4 oz/A, or Cabrio (pyraclostrobin) 20EG at 8 to 12 oz/A with maneb (M3) 75DF at 1.5 to 3 lb/A or OLF.

✓ **Tomato – Bacterial spot, speck and canker** – Bacterial diseases can cause serious problems in the field if infections are allowed to spread. Apply Actigard (P) at 0.33 oz 50 WG/A, or fixed copper (M1) at 1 lb a.i./A plus a mancozeb (Dithane, Manex II, Manzate, Penncozeb, M3) at 1.5 lb 75DF or OLF, or ManKocide (M1 + M3) at 2.5 to 5.0 lb 61WP/A, or Cuprofix MZ (M1 + M3) at 1.75 to 7.25 lb 52.5DF/A on a 7 day schedule. □

Pest Notes

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

Spider mites are becoming a problem in cucurbit, eggplant, tomato, and other crops. The very hot, dry weather is favorable to their reproduction and development, and their life cycle is completed in just several days. It is important to utilize a complete management system to prevent spider mite damage, including spot-treating the "hot" spots of mite infestation, monitoring nearby soybean fields and other non-vegetable crops, letting grass alleyways grow in mid-summer (mowing forces the mites to seek alternative food sources), treating before the mite population explodes and the mites web leaves together, using effective miticides when needed, and obtaining thorough spray coverage to all leaf surfaces (high pressure, high volume, spray agitation of the crop canopy).

Materials specifically for mites include Acramite, Agri-Mek (abamectin and generics), Kelthane (still registered but production is discontinued), and Vendex. Materials that control mites and other insect pests include dimethoate (ex-Cygon), Metasystox-R, Oberon, and Vydate. Several pyrethroids, including bifenthrin (Capture and generics, and Danitol) will suppress early mite infestations, but are less effective, or not effective, as the population increases and as air temperature increases.

With the current hot weather conditions on-going still, it would be best to use a material specifically for spider mites. The initial costs are higher to purchase these materials, but the results are the best available.

Colorado potato beetles are causing significant damage to eggplant leaves and fruit in southern New Jersey. Small and large larvae as well as adults are still actively feeding on all the plant parts. Effective materials for control of potato beetles include *Bacillus thuringiensis* or Bt (for larvae only), cryolite, SpinTor /Entrust, Thionex, and Vydate. Several neonicotinoids (Actara, Assail, imidacloprid and generics, and Venom) are available and would be effective, but are **not** recommended after mid-June to reduce the occurrence of insecticide resistance by the beetles to these products. Thus, a material other than a neonicotinoid (Group 4A on the label) should be used.

Stink bug populations and damage are increasing in tomatoes and peppers. Damage appears as whitish to yellowish irregular spots on the fruit, and may be individual spots or cover large areas of the fruit. Stink bugs are often difficult to detect, and shy away from movement or shadows, thus are seldom easily seen. If either the damage or the population is increasing, treat with either Monitor or Thionex, or the pyrethroids Baythroid, Danitol, Mustang MAX, Proaxis, or Warrior/lambda-cyhalothrin generics. Preliminary research suggests that

Vegetable Diseases of the Week

Andy Wyenandt, Ph.D., Specialist in Vegetable Pathology



Late blight on green tomato fruit.



White speck of pumpkin.

Danitol is slightly more effective against stink bugs than other pyrethroids, although this difference may not be significant (more research is still needed). Thorough coverage of the canopy is important, especially to the interior of the plant canopy and even to the base of the plant and in soil cracks under the plant where stink bugs may hide in the heat.

A second **brown marmorated stink bug** was caught in the black light trap at the Rutgers Agricultural Research and Extension Center at Bridgeton, NJ (Cumberland County), showing that this pest is now in that area.

IPM Update

Kristian Holmstrom, Research Project Coordinator II, Vegetable IPM Program

Sweet Corn

European corn borer (ECB) adult numbers have increased in the northern and central counties over the past week (see ECB map). Numbers remain relatively stable at moderate levels in the south. Larval feeding is present in whorl stage-plantings in many areas now. For sweet corn in the whorl stage, check 5 consecutive plants each in 10 random locations throughout the planting. Look for the presence of "shot-hole" type feeding that is characteristic of ECB larvae. On pre-tassel stage plants, look for discoloration or actual caterpillars in the emerging tassels. Consider treating if fresh damage is found on 12% or more plants. Be sure to treat again at the full tassel to first silk stage to protect the forming ears from ECB larvae that are leaving the tassel and traveling down the stalk.

The highest nightly ECB catches for the previous week are as follows:

Crosswicks	4	Indian Mills	3	East Vineland	2
Little York	4	Phillipsburg	3	Elm	2
Belvidere	3	Sergeantsville	3	Hammonton	2
Downer3		Califon	2	Lawrenceville	1

Fall armyworm (FAW) feeding in whorl-stage plantings is now occurring all over the state. In some fields (particularly along the coast) FAW feeding has reached threshold levels. FAW feeding initially is found on small groups of plants in the field. This is due to limited numbers of adult females laying eggs on consecutive plants. As the adult population increases, feeding will become more consistent throughout the field. FAW is capable of causing significant injury to sweet corn plants and will feed on all stages, including seedlings. For this reason it is necessary to check all pre-silking fields for signs of FAW feeding. Look for large, ragged holes and lots of caterpillar droppings in the whorl. Consider treating if 12% or more FAW injury is found alone, or in combination with ECB injury in a planting.

Corn earworm (CEW) catches have increased significantly in central and parts of the northern counties over the past week. Highest activity continues to be from Burlington County south (see CEW population map), but damaging moth levels have moved north. CEW adults pose a significant threat to silking sweet corn. The shaded area on the map (blue on the web version, found at: www.pestmanagement.rutgers.edu/IPM/Vegetable/Pest%20Maps/maparchive.htm) corresponds to a 5-day silk spray schedule. The cross-hatched area (green on the web) corresponds to a 3-4 day silk spray schedule.

Silking Spray Schedules*:

North – 3-5 days
Central – 3-4 days
South – 3 days

* Note: These are general recommendations. Local trap catches may indicate some variation in the frequency of insecticide applications to silking corn.

The highest nightly CEW catches for the previous week are as follows:

Eldora	11	New Egypt	5	Centerton	3
East Vineland	7	Elmer	4	Hammonton	3
RAREC	7	Indian Mills	4	Shirley	3
Mannington	5	Beckett	3	Tabernacle	3

Tomatoes

A few plantings in the northern and central counties have developed **bacterial infections** recently. All infections are characterized by very dark, often wet looking lesions on leaves of any age. In the case of bacterial canker, lesions often start at leaf margins but may also be found on petioles. Bacterial speck results in a dark blister-like lesion on infected fruit, while bacterial spot causes a more severe dark fruit lesion. Bacterial canker causes a whitish blister referred to as "bird's-eye spot" on fruit. If these symptoms appear in a planting, consider regular applications of copper if this is not already part of the program. Avoid fields when wet. Always work in younger plantings first if activity is planned in multiple plantings. This will prevent the distribution of bacteria from older infected plants to younger ones. The younger the plants are when they are infected, the more likely economic injury is to occur. Consider placing buckets with a 5-10% bleach solution in water at the end of rows when tying or pruning. This will enable workers to dip wands or pruning tools in the solution between rows to limit spread among plants.

Peppers

With the second generation **ECB** adults now active, it is important to check peppers weekly for the presence of ECB eggmasses, as well as aphids and TSSM. ECB eggmasses are flat and waxy looking, having the appearance of fish scales on the underside of the pepper leaf. As the larvae emerge, they will bore into the fruit where the cap meets the shoulder of the pepper. Uncontrolled infestations will result in many fruit developing soft rot. Check 5 consecutive plants each in 10 random field locations. Look at the underside of 2 leaves per plant. If 2 or more ECB eggmasses are found in the total sample, consider an insecticide application to minimize plant injury. Additionally, a weekly spray schedule is warranted on fruiting plants when ECB adult numbers reach 1 or more per night in local blacklight traps. At present, adult

SEE IPM ON PAGE 5

ECB activity at this level exists in all southern and central counties. All shaded and cross-hatched areas on the ECB map (blue and green on the web version) correspond to a weekly spray schedule on fruiting peppers.

Beet armyworm (BAW) adult catches have declined to nearly nothing this week in the pheromone network in the southern counties. Numbers are averaging well below 5 per night except near Jones Island in Cumberland County. Even in this vicinity, however, numbers are below those considered potentially damaging. As numbers consistently exceed 5 per night in the traps, a BAW population map will be published in this newsletter.

Pumpkins and Winter Squash

Many fields are now in the vine-run (or bush) stage at this time, and are less affected by **cucumber beetle** feeding. Often, **western corn rootworm (WCR)** beetles will be found feeding on blossoms. These are similar in appearance to striped cucumber beetle, but do not pose a threat to the plants. WCR range from mostly black to mostly green-yellow, rather than having distinct stripes like the cucumber beetle. Additionally, a WCR beetles' abdomen protrudes past the end of the shell, unlike the cucumber beetle. It is very important to scout fields weekly, for the presence of pests including aphids and **TSSM**. Check 10 mature leaves per site in 10 random sites throughout the field. Consider treating if leaves with an average of approximately 25 aphids are found in each of 10 sample sites. Populations this high can result in deposition of droppings onto the surface of maturing fruit, as well as overall stress to the plants. Melon aphids have been found on some northern pumpkin plantings this week. TSSM occasionally becomes an economic pest on smaller plantings under hot, dry conditions. If TSSM is found in more than one site in the field, and the overall trend is increasing, consider treating.

As fruit set occurs and fruit begin to gain size, **powdery mildew (PM)** infections will develop. This fungal pathogen first appears as a dime-sized lesion that looks like white powder. They can develop on either leaf surface as well as the petioles. While scouting, look on mature leaves, particularly those within the canopy for PM lesions. When the threshold of 1 lesion per 50 older leaves is reached, begin the regular, weekly protectant fungicide program.

Be alert for the possibility of **downy mildew (DM) infections**. As of July 31, DM has been detected in states to our north, west and south. DM first appears as sharp yellow lesions on the upper surface of leaves. Veins are yellow and constricted on the lower leaf surface. Shortly after this, dark sporulation occurs along veins on the lower surface beneath the lesion. This sporulation will be present when conditions are wet or very humid. In a matter of several days, significant defoliation can occur. Fungicides specific to DM and related fungi are required for good control of this pathogen. For recommended fungicide rotations for DM and PM, consult the *2007 Commercial Vegetable Production Recommendations*.

SEE ECB AND CEW DISTRIBUTION MAPS ON PAGE 7

Mildew Forecasting Center at <http://www.ces.ncsu.edu/depts/pp/cucurbit/>. For more information on Downy mildew control for specific cucurbit crops please see the *2007 New Jersey Commercial Vegetable Production Recommendations Guide*.

Late Blight on Tomato

Late blight has been reported on tomato in Lancaster County, PA. This is the first report of Late blight on tomato or potato this growing season in the mid-Atlantic region. No other information on the outbreak was available. Tomato and potato growers should scout on a regular basis for symptoms of Late blight. If Late blight is suspected on either crop, growers should contact their county agricultural agent. □

Annual RAREC Vegetable Twilight Meeting and Research Tour

Thursday, August 16, 2007

5:00 – 8:00 PM

Rutgers Agricultural Research & Extension Center
121 Northville Road, Bridgeton, NJ (Upper Deerfield)

This is the 3rd meeting for the 2007 season. We will tour the following research plots and have presentations by the investigators:

Breeding open pollinated tomato varieties for early production

The tomato advisory committee has recommended that NJAES work to develop varieties for early production under New Jersey conditions. Dr. Tom Orton has been working on this project. He will show some of the early results.

Pepper fertility

There are six different fertility treatments to look at the effect of fertilizers on bell pepper varieties and fruit silvering. – Wes Kline and Andy Wyenandt

Early hybrid tomatoes

The New Jersey Vegetable Growers Association sponsored this research to evaluate early commercial hybrids for flavor and yield. This trial is especially applicable to roadside marketers. – Michelle Infante-Casella

Specialty vegetables

Rick VanVranken has a project to evaluate ethnic vegetables for Southern New Jersey. You will be able to see the following trials: peppers (Jalapenos, serranos, poblano and aji dulce); tomatillos; calabaza varieties; Asian cucurbits; ethnic eggplants; and summer greens for the African ethnic market.

Pepper phytophthora studies

Dr. Andy Wyenandt continues to evaluate new breeding material and varieties for tolerance to phytophthora which is the number one disease problem in New Jersey peppers. Twenty-one materials are being evaluated this year.

Pepper silvering

With the introduction of phytophthora tolerant pepper varieties, silver streaking has been observed on some fruit. This has led to peppers being rejected in some markets. Andy Wyenandt will help growers identify silvering and discuss the results of his trials with different production systems and colored mulches.

Pumpkin powdery and downy mildew control

These are the two main foliar diseases of pumpkins in New Jersey. Andy Wyenandt has been evaluating spray combinations for the last two years. Growers will have the opportunity to see the results of this year's trial and Andy will discuss past results.

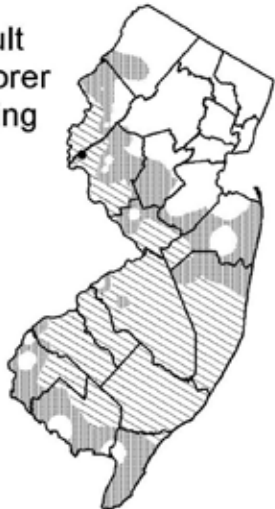
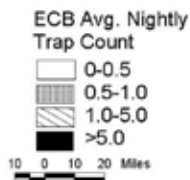
Insect control through drip systems

Drip applications are more efficient, may reduce the amount of chemicals required and places the chemical where needed. Dr. Jerry Ghidui has been evaluating new chemicals that will be on the market next year for control of insects in peppers and other vegetables. Growers will be able to observe this year's plots and discuss application methods with Dr. Ghidui.

This is your opportunity to have plant, insect, disease, or weed samples identified. Pesticide Recertification Credits have been requested for this meeting. Hope to see you there!

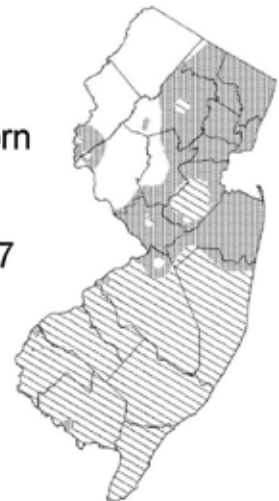
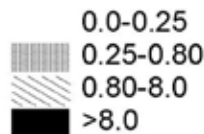
For further information contact Rutgers Cooperative Extension of Atlantic, Cumberland or Gloucester Counties. Directions to RAREC are on-line at: <http://njaes.rutgers.edu/centers/quickinfo.asp?RAREC> or by calling 856-455-3100.

Distribution of Adult European Corn Borer for the Week Ending August 08, 2007



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 08, 2007



Data collected and processed by: Kris Holmstrom,
Rutgers Cooperative Extension Pest Management Office

Weekly Weather Summary

Keith Arnesen, Ph.D., Agricultural Meteorologist

Temperatures averaged much above normal, averaging 77 degrees north 78 degrees central and 80 degrees south. Extremes were 96 degrees at Hammonton, Seabrook and Pomona on the 3rd, 4th and 5th, and 59 degrees at Newton on the 6th. Weekly rainfall averaged 0.59 inches north, 0.01 inches central, and 0.66 inches south. The heaviest 24 hour total reported was 1.04 inches at Cape May Courthouse on the 30th to 31st. Estimated soil moisture, in percent of field capacity, this past week averaged 82 percent north, 72 percent central and 56 percent south. Four inch soil temperatures averaged 76 degrees north, 77 degrees central and 78 degrees south.

Weather Summary for the Week Ending 8 am Monday 8/ 6/ 7

WEATHER STATIONS	RAINFALL			TEMPERATURE				GDD BASE50		MON %FC
	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	
CANOE BROOK	.91	34.69	13.09	95	65	79.	6	2107	417	78
CHARLOTTEBURG	.92	25.85	4.07	91	60	75.	4	1826	506	80
FLEMINGTON	.07	27.16	6.26	95	62	78.	5	1988	252	76
NEWTON	.45	21.42	1.40	89	59	75.	3	1796	258	74
FREEHOLD	.00	27.52	7.23	94	63	77.	3	2166	308	71
LONG BRANCH	.00	27.51	7.26	91	63	77.	3	1947	168	52
NEW BRUNSWICK	.05	30.75	10.44	93	63	78.	4	2095	152	77
TOMS RIVER	missing									
TRENTON	.00	24.25	4.84	94	66	79.	3	2186	159	36
CAPE MAY COURT HOUSE	1.46	13.80	-4.18	92	66	78.	2	2072	172	67
DOWNSTOWN	.10	17.36	-1.64	96	64	79.	3	2197	158	39
GLASSBORO	.60	21.44	1.47	95	69	82.	6	2435	422	58
HAMMONTON	.77	17.60	-2.43	96	65	80.	4	2259	247	55
POMONA	.07	17.45	-.70	96	66	79.	5	2193	315	39
SEABROOK	.42	17.79	-.54	96	67	81.	5	2433	387	49
SOUTH HARRISON	.46	20.73	.63	95	67	80	NA	2341	NA	NA
WES KLINE -- GDD BASE 40 PINEY HOLLOW										
LAST WEEK	239 (Ending 7/30/07)									
THIS WEEK	279 (Ending 8/6/07)									

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Pesticide User Responsibility: Use pesticides safely and follow instructions on labels. The pesticide user is responsible for proper use, storage and disposal, residues on crops, and damage caused by drift. For specific labels, special local-needs label 24(c) registration, or section 18 exemption, contact RCE in your County.

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