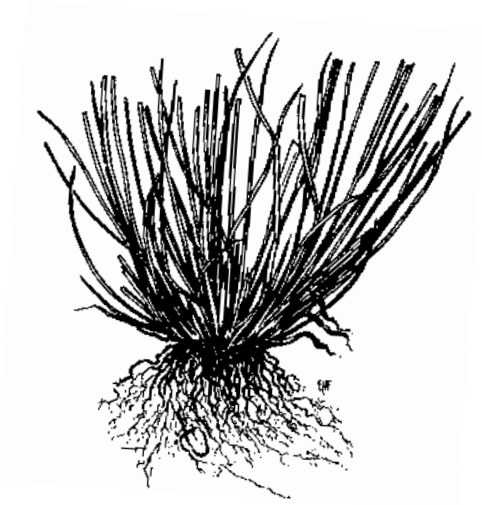
RUTGERS COOPERATIVE RESEARCH & EXTENSION AT THE NEW JERSEY AGRICULTURAL EXPERIMENT STATION

PLANT & PEST ADVISORY

LANDSCAPE, NURSERY & TURF EDITION $1.50 JULY 28, 2005



INSIDE

"Soft" Turf on the Golf Course: What Can You Do About It?

James A. Murphy, Ph.D., Specialist in Turfgrass Management

The recent warm-to-hot temperatures combined with high humidity and, in some cases, heavy rain have made it difficult to produce firm fast playing surfaces. We have observed a number of problems this summer related to growth spurts, soft surfaces, and scalping/mechanical damage. Rich Buckley recently received 51 samples in a 24 hour period, most of which were scalping problems. It appears that turf has been damaged with the first or second mowing after a heavy rain.

This general problem is related to the annual growth cycle of cool season grasses as well as the weather and other edaphic factors. Vertical extension of leaf blades and sheaths is the dominant type of shoot growth that occurs this time of year, while shoot density (tillering) tends to decrease or remain unchanged. Thus, management inputs to increase density are often frustrating in July and August because the inputs typically increase vertical leaf growth more than density. This is one reason for why growth regulator use is so popular in the summer; regulation is one of the most effective management inputs that maintains or increases tillering (shoot density) without encouraging vertical shoot growth during summer months.

The "softness" problem on putting greens or any low-cut turf is very challenging because once the condition exists it usually takes time and potentially a number of adjustments in cultural practices to correct it. Moreover, some disruption of the surface may be needed when a rapid change in surface firmness is desired. All options described below need to be considered in the total context of your situation, some will be more appropriate than others depending on your specific conditions. Also recognize that many of the options discussed below can interact with others and a combination of options may be the best approach to manage the conditions on your putting greens. The best combination will depend on the conditions of the turf and soil, time, available resources, and skill level.

Some immediate action options to consider relative to softness of the putting greens include:

- light-weight rolling,
- adjusting mowing equipment, and
- grooming the turf.

SEE SOFT TURF ON PAGE 2

Soft Turf from page 1

Rolling the surface with light-weight rollers before mowing will help re-firm the surface and reduce the tendency to scalp. Certainly the quality of cut will be compromised if rolling is done before mowing but this a lesser evil than scalping. Consider this adjustment in the cultural program when surface conditions are soft and uneven yet you are pressured to mow. During a period of persistently soft and uneven conditions, consider rolling everyday to firm and re-smooth the surface. Under severe conditions (heavy rain and "soft" turf), you may want to roll the putting greens and skip mowing that day – hopefully rolling will keep the playability acceptable to the golfers.

Anticipating mower adjustments is a critical skill for a golf course superintendent, particularly when environmental conditions cause rapid and dramatic changes in shoot growth and the firmness in the underlying organic matter rich surface. Substantial mower adjustments may not be needed every year, but recognizing those circumstances that do require changes can make all the difference. Options for responding to large growth spurts and soft surfaces include switching from heavy and/or grooved front rollers to lighter and/or smooth front rollers on the mowers. Another option is to change to a lighter-weight mower or a mower that places less weight on the front roller (less forward weight bias). These adjustments, however, can be problematic longer term because these ultimately encourage more puffiness to develop at the surface of the putting greens, but in the short term these adjustments maybe enough to save the greens from scalp damage under severe conditions. Raising the cutting height ever so slightly is another option, particularly for those that do not have the resources to make the mower adjustments previously mentioned. A 1/32-inch or 0.03-inch increase in mowing height may be all that is needed to minimize scalping damage. This option is also problematic longer term for the reason discussed above; over the short term, however, it maybe enough to save the greens. It should be recognized that the mower adjustment options need to be implemented (anticipated) before the problem becomes severe, or at least very soon after it is identified. Mower adjustments can not bring grass back from the dead (that is, turf that has suffered repeated severe scalping damage)!

Grooming, if done correcting, thins out the canopy of putting greens thus removing the puffy growth responsible for some of the "softness" observed at the surface of putting greens. Note: grooming will not address softness issues caused by problems below the surface (zone of organic matter rich soil). Those unfamiliar with grooming should be careful; aggressive grooming to correct excessive spurts of growth can cause more harm than good - don't be greedy and attempt to correct the problem in one pass of the equipment. Grooming is best done lightly and gradually or the surface will be "frazed" off and it will be a disaster. Keep in mind a "shallower" depth setting for the groomer may be advisable when putting greens are very wet (soft) or the greens have strong undulation. Grooming is best used as a preventative practice rather than a curative, thus recognizing and anticipating the growth and vigor of the putting green turf is a valuable skill.

There other cultural options that are better viewed longer term (a week or more) options for improving surface firmness and reducing mower scalp. These include:

- suspending application of fertilizers and biostimulants,
- keeping the turf and soil dry and allow it to dry (i.e., do not water),
- applying growth regulator,
- verticutting, and
- topdressing.

Suspension of fertilization, especially natural organics and slowly available synthetics as well as biostimulants, is important since soft puffy and slow playing surfaces are partly due to too much shoot growth. Warm wet conditions in the summer can readily stimulate rapid vertical extension of leaf sheaths and blades; these environmental conditions combined with fertilizer or biostimulants may produce too much growth and consequently scalping.

While the statement to keep the turf and soil dry seems rather obvious, it is important to recognize that a dry soil has the potential to receive (accept) more water from rain before it becomes too wet than a soil that is routinely maintained at a moist (wetter) level. Keeping the soil dry gives you that much more time before the situation becomes difficult to control. It is apparent that pressure from golfers results, too often, in the decision to mow turf when surface conditions are not acceptable for mowing. Skipping a mowing when the greens are too wet, while it may be unpopular, is sometimes the best decision for the putting greens' health. Thus, there are times, albeit infrequent, when this option should not be under-appreciated and brushed aside as a non-option. As mentioned above, it may be possible to maintain acceptable playability by rolling the greens when mowing needs to be suspended for the day.

Applying a growth regulator every 1-2 weeks can minimize the problem of excessive shoot growth by reducing the extension of leaf sheaths and blades. As mentioned above, growth regulator is also very effective in maintaining or increasing shoot density during the summer. The more compact growth stature of the turf produced by growth regulation will be much less likely to scalp especially when environmental conditions may be encouraging spurts of rapid lush vertical growth.

Verticutting, which is more aggressive than grooming, can be used to keep the turf canopy from becoming too thick and puffy. Verticutting is best used as a prevention practice but it may also be used in a curative

See Verticutting on page 3

VERTICUTTING FROM PAGE 2

approach. If you are attempting to "cure" a problem you will need to be as aggressive as possible without ruining the putting surface – a challenging balance to find. A relatively shallow verticutting every week or so can be effective in thinning the canopy and reducing puffiness of the surface. Caution will be needed on strongly undulating areas of putting greens since the effective verticutting depth will increase over the mounded areas (knobs) on greens. Deeper verticutting to address organic matter richness below the surface should be delayed until late summer or autumn when circumstances are more acceptable for this practice.

Sand topdressing can be very useful in firming putting surfaces and correcting puffiness during mid-season. The goal of sand topdressing is to "fill" the openings of the turf canopy and surface thatch that create the softness or puffiness. Topdressing during the summer is best applied lightly and frequently; a light "dusting" of the greens every 5-7 days has worked very well on many golf courses. A light frequent topdressing program during summer is labor intensive but it minimizes the interference to ball roll and mowing equipment compared to heavier less frequent applications of topdressing to improve firmness.

Since mid-season does not allow much time to comprehensively review the overall maintenance program, this should be done as the season begins to wind down. Persistently soft and puffy putting greens are likely to have conditions just below the surface that are contributing to the problem, primarily organic matter accumulation. Assess your cultivation program and determine whether the current techniques and intensity should be modified. An aggressive deep verticutting and hollow quadtine cultivation program should be used if the mat layer that underlies the thatch and turf canopy of the greens is contributing the problem. Remove the hollow tine cores and topdress to fill verticut channels and coring holes. Repeat the verticutting, hollow tine cultivation and topdressing program in the spring (March or April) if the mat layer is very "thatchy" (very little topdressing mixed with the organic matter).

Also, review soil fertility test results along with the fertility program (materials, amounts and timing) and determine if fertility inputs should be cut back or the timing should altered. It is quite feasible that a very "healthy" soil with high soil fertility will produce too much growth under warm humid wet conditions in the summer. This will not only result in turf that is too succulent but will also build more organic matter in the form of thatch. Obviously, putting greens need to have a dense and complete turf cover but during the summer the playing conditions will be best when the grass is managed in an "impoverished" manner - applying only that which is needed to hold density and cover through summer play. Thus, spring fertilization needs to be designed to avoid excessive soft puffy growth in the summer; late summer and autumn are a much better time of year to "push" the turf with fertilizer. This may sound easy but this can be a difficult balance to find, especially when Mother Nature is rainy, humid and warm - a climatic condition that stimulates growth. ❑

Diseases of Turfgrass

Bruce B. Clarke, Ph.D., Specialist in Turfgrass Pathology

Pythium Blight

Pythium blight has been very active on golf and landscape turf during the past two weeks. Since pythium thrives in low or poorly drained areas, especially when the night temperatures are above 70^{0}F, we should see a lot more of this disease as the "hot muggy" weather continues this summer. For best results, improve drainage, water in the early morning hours, avoid over fertilization, and apply Alude, Banol, Chipco Signature, Heritage, Insignia, Koban, Magellan, Prodigy, Quell, Subdue MAXX, or Terrazole, according to the manufacturer's recommendations. Apron may be used as a seed treatment to prevent damping-off. Mancozeb can be used to control this disease but it is generally less effective than the other products mentioned above. Use of Koban and Terrazole on fairways is prohibited and should be used with caution on other areas due to the potential for foliar burn during hot weather.

Summer Patch

Summer patch is a serious problem now on many turf areas containing Kentucky bluegrass, annual bluegrass, and fine fescues. To control existing infections, apply Banner, Bayleton, Compass, Eagle, Heritage, Insignia, Rubigan or thiophanate-methyl (e.g. Cleary's 3336, Fungo 50 etc.) in 4 to 5 gal of water/1000 ft^2. Repeat every three to four weeks (every two weeks if using thiophanate-methyl). If fungicides cannot be applied with this much water, irrigate them into the thatch immediately with 1/16 to 1/8 inch of water. Aerification (when symptoms are not present) and improved drainage will also aid in disease suppression. Soil pH should be maintained at or slightly below 6.0 for optimum disease control.

Yellow Tuft

This disease, caused by the fungus *Sclerophthora macrospora*, is present on greens and irrigated landscape turf at this time. **Yellow tuft** (=Downy Mildew) occurs on almost all cool-season turfgrasses; however, it is usually only a serious problem on turf maintained at a low cutting height. Poorly drained or heavily irrigated sites are often associated with disease development. Infected turf appears stunted, off color (yellow to light green), and may exhibit slightly broadened leaf blades and dense

SEE TURF DISEASES ON PAGE 4

TURF DISEASES FROM PAGE 3

clusters of shoots. Patches ranges in size from 0.25 to 1 inch in diameter for bentgrass and red fescue turfs, and 0.5 to 3 inches for Kentucky bluegrass and perennial ryegrass areas. Tufts are easily removed from the soil due to the absence of adventitious roots. To control, improve drainage, avoid over watering, mow only when the grass is dry, apply iron sulfate to mask symptom expression, and spray turf with Chipco Signature, Prodigy, or Subdue MAXX now or on a preventive basis late March to early June.

Turf Field Day

Mark your calendars now for this year's Rutgers Turfgrass Research Field Days which will be held on August 3, 2005 (Landscape Turf Research Field Day at Adelphia, NJ) and August 4, 2005 (Golf Turf Research Field Day at Hort Farm II, Ryders Lane, New Brunswick, NJ). This year's Lawn and Landscape Research Field Day & Trade Show will be held in cooperation with the New Jersey Turfgrass Association (NJTA) and the Sports Field Managers Association of New Jersey (SFMA). Highlights of this event will include: (1) trade show and equipment demonstrations, (2) new herbicides for landscape turf, (3) major advances in turfgrass breeding – "See tomorrow's cultivars today", (4) identification and control of grubs and other insects, and (5) latest efforts for disease control on lawns. The Golf and Fine Turf Research Field Day highlights will include: (1) latest on the management of anthracnose on *Poa annua*, (2) current efforts to convert *Poa* fairways and greens to bentgrass, (3) new bentgrass cultivars for greens and fairways, (4) irrigation management and wetting agent studies on bentgrass, and (5) advances in spray application technology. On site registration will be $45 (member of NJTA, NJ, or SFMANJ), $60 (non-members). For directions to the field days or to access the registration form go to www.njturfgrass.org. Contact: Michelle Rickard, Executive Director, NJTA, PO Box 340, Milltown, NJ 08850, phone (215) 757-6582, or FAX (215) 741-6582. ❑

Plant Diagnostic Laboratory Highlights

Richard J. Buckley, Laboratory Coordinator

Golf Turf

I think I will start this week's newsletter with a paragraph from the last one. I wrote this in the midst of a sample rush that brought 51 golf turf plugs in a 24 hour period.

We are seeing a number of plugs with problems due to various cultural, site related, and environmental factors. Of particular note is the number of plugs with grass that has been scalped or damaged by mowers. As the rains increased through most of our area over the last three weeks, superintendents began to report puffy grass, growth spurts, and an increased need for mowing. One gentleman told me he double cut in the morning and then had to cut again at 10 AM. We can speculate over the cause of the increased growth with everything from extra water, pent up fertility, growth regulators, high soil temperatures, or whatever, but the result is soft grass that is easily damaged by traffic and turf culture. The numbers of collars we see that are completely dead is alarming. Furthermore, many of these plugs are subsequently colonized by algae, or opportunistic fungi like *Curvularia*, or *Leptosphaerulina*. I would bet that a lot of our current **anthracnose** samples also started as water logged and scalped turfgrass.

Since I wrote that piece, our area has been subjected to an extended period of tropical moisture and equatorial heat. Repeated localized downpours, high relative humidity, 90°F days and 70 to- 80°F nights, and extra high soil temperatures hammered tri-state golf turf. Annual bluegrass, our favorite winter annual grassy weed, took it on the chin. Ever increasing and compounding extremes in temperature and moisture pushed many turf stands to the edge. The grass never had a chance to recover from the initial water logging and scalping. Finally, on Saturday July 23rd the humidity and temperature dropped and the wind picked up. In a matter of a few hours all of that stressed grass cooked. If the turf did not die outright, it was knocked off by any one of a whole assortment of fungi. Our lab has been going at break neck pace since Monday morning – a rough count has the submission rate at 143 plugs for Monday, Tuesday, and Wednesday. Dr. Bruce Clarke suggested that this was the worst period since 1988. I remember Tuesday, July 6th, 1999 – the day of death – when the temperature was 106°F. The lab did 140 samples in three days that week. At any rate, samples were submitted from Virginia, Delaware, Maryland, Pennsylvania, New Jersey, New York, Ohio, Connecticut, West Virginia, Texas, and Minnesota. Extreme temperature and moisture stress was the primary issue with almost every sample; however, the fungi were also along for the ride. We repeatedly identified *Colletotrichum graminicola* (**anthracnose**), *Rhizoctonia solani* (**brown patch**), *Curvularia* spp. (**fading out**), and **Pythium root dysfunction** in the plugs. There were 27 samples diagnosed with **summer patch**, caused by the fungus *Magnaporthe poae*, alone. **Take-all**, **fairy ring**, **dollar spot**, **slime mold**, **nematodes**, **bacterial wilt**, and a host of **opportunists and saprophytes** were all well represented in the parade of samples. One superintendent, after a frustrating day of hand watering, told me that he might as well spend the weekend polishing up his resume, because it was going to be more valuable than his sprayer!

One last thing about that dead ryegrass in your fairway – don't rush to reseed – we have a confirmed a case of **gray leaf spot** from a Long Island golf course. Seedling ryegrass is especially appealing *to Pyricularia grisea*, the cause of gray leaf spot, and it is here, active, and ready to add insult to injury! ❑

The Douglas-fir Needle Midge

Jenny Carleo, Agricultural Program Associate, Rutgers Cooperative Research & Extension of Atlantic County

In the past two years samples with **Douglas-fir Needle Midge** have begun to trickle in to the RCRE office in Atlantic County. *Contarinia pseudotsuga*, is a little known insect in New Jersey. The Pennsylvania Department of Agriculture (PDA), however, issued a pest alert in December 2003.

So why all the fuss? Nineteen southeastern Pennsylvania counties are having more frequent outbreaks. These include Monroe, Northampton and Bucks (bordering Warren, Hunterdon, Mercer and Burlington Counties, NJ) and Philadelphia County (bordering Burlington, Camden, Gloucester and Salem Counties, NJ). Pennsylvanian farmers have been keeping an eye on the devastation this tiny midge has had in the western US. In Washington State, needle midges reduce the value of harvested trees by about $763,000 each year. The value of trees destroyed by midges each year is over $634,000. Repeated damage may result in twig death creating an unsightly and irreparable tree. (Figure 1 on page 6) According to a recent survey of New Jersey Christmas tree growers, about 58% of the trees currently in their cultivation are Douglas-firs. This is due to consumer demand attributable to their attractive form and soft foliage- traits that make them desirable landscape plants as well. The aptly named Douglas-fir Needle Midge (DFNM) preys solely on Douglas-fir. (As if Rhabdocline were not enough!) We need to keep our eyes peeled in order to protect our Douglas-fir crop.

The DNFM is known to reside in the Pacific Northwest, Michigan, Pennsylvania, New Jersey, Long Island, NY and possibly Maryland. Thankfully there is only one generation per year. The life cycle goes as follows: Adults emerge from the ground beneath the tree in April, at or just after bud break. Single eggs are deposited on elongating needles or unopened buds. When the eggs hatch the larvae bore inside and gall formation is initiated (Figures 2 and 3). The gall becomes evident about three weeks after larval entry. It appears as a swollen, bent and pale region on the needle. The damage resembles that of **Rhabdocline needlecast** and **Cooley adelgid** feeding, but not to be mistaken!

With some dexterity, the larva can be revealed by carefully examining the needle. Take the "pregnant" part and carefully snap it open or use a pin to cut a slit near the most swollen area and pry up the epidermis. This "jaws-of-life" technique works best. If possible, try to find the entry scar and use that as a starting point. In order to see the insect, a sure bet is to use a dissecting microscope; the midge larva is unmistakable under magnification. (Figure 4) Although with the naked eye, it may be so camouflaged by the plant tissue it appears as a part of the needle. If all of a sudden you notice additional moisture leaking from the tissue you have probably punctured the larva.

Larvae feed entirely within the needle, going through three instars ending in mid August, mid September and the third continuing from October through December. During this third instar needles become purple, then brown (Figure 5) and the larvae emerge. It drops from the needle to the ground around November creating a distinctive triangular hole or slit on the leaf underside (Figure 6). There the larvae pupate in early spring and emerge as adults, small flies only about 1/8" long (Figure 7). They congregate in mating clouds similar to gnats and begin to lay eggs once again.

That is the opportune time to use chemical controls. Biological control is not practical for this species native to western North America. Note that trees that break bud later on are less susceptible. So how do we get a head start on this pest before it ravages our Douglas-fir crop? You probably already know the answer - scout in August to determine the need to trap in the spring. If you suspect that this is a problem on your farm you will want to assemble a few traps and monitor the populations in close proximity to the infested trees.

To make detection traps (Figure 8) you will need: a plastic recycling bin or wax coated cardboard box, an empty jar, paper towel and a rock (we're high tech). Cut a hole in the side of the box to screw the jar into. Place a dry, crumpled paper towel in the jar to absorb moisture. The box should be upside-down on the ground with the rock securing it. When Midges emerge they are attracted to the light coming from the hole in the box and become trapped in the jar. Place boxes under the trees before seasonal weather climbs to 60°F. Make sure your traps are in place by early April. Control measures should be taken within one week of the first catch. There is no threshold for the number of midges caught per trap. Chemical control materials that are registered for use in New Jersey in 2005 are acephate (Orthene TT&O, 75 S), chlorpyrifos (Lorsban, Pilot) and endosulfan (Phaser 3EC, Endosulfan 3EC).

For more information and great pictures you can go to: www.aclink.org/rce-atlantic. Click on "Programs", "Agriculture" then "Ornamentals" and look for the links on DFNM.

Sources:

"Biology and Control of Douglas-fir Needle Midge in Christmas Trees" by Jack D. DeAngelis- Oregon State University Extension Service

"What Now? The Aftermath of a New Pest" Presentation by Rayanne D. Lehman & Sandra Gardosik- Entomology, PA Department of Agriculture

Personal observation

See Figures on page 6

Douglas-fir Needle Midge Gallery

Figure 1: DFNM damage to tree top - PDA

Figure 2: Early DFNM damage to needles - PDA

Figure 3: Midge laying egg on bud - DeAngelis

Figure 4: Close up of larva inside needle - PDA

Figure 5: Late DFNM damage to needles - PDA

Figure 6: Exit hole - PDA

Figure 7: DFNM adults

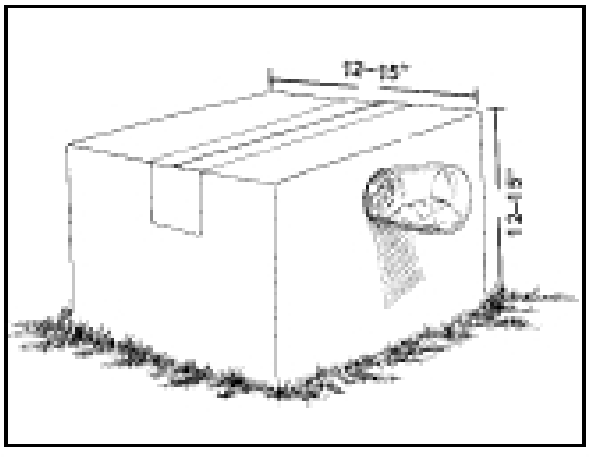


Figure 8: Trap diagram - J.D. DeAngelis

New RCRE Nursery Bulletin Available

Now available at your Rutgers Cooperative Research and Extension county office or on the web at www.rcre.rutgers.edu is the following new Extension Bulletin:

E303 - "Nutrients and Nutrient Management for Containerized Nursery Crops", authored by Dr. Gladis Zinati, Ph.D., Specialist in Nursery Management. This is a ten page publication and is available for $2.00. ❑

Weekly Weather Summary

Keith Arnesen, Ph.D., Agricultural Meteorologist

Temperatures averaged much above normal, averaging 76 degrees north, 79 degrees central and 80 degrees south. Extremes were 98 degrees at Trenton on the 22nd, and 54 degrees at Charlotteburg on the 24th. Weekly rainfall averaged 0.31 inches north, 0.30 inches central, and 0.28 inches south. The heaviest 24 hour total reported was 0.74 inches at Long Branch on the 18th to 19th. Estimated soil moisture, in percent of field capacity, this past week averaged 65 percent north, 69 percent central and 44 percent south. Four inch soil temperatures averaged 77 degrees north, 79 degrees central and 80 degrees south.

Weather Summary for the Week Ending 8 am Monday 7/25/ 5

	RAINFALL			TEMPERATURE				GDD BASE50		MON
WEATHER STATIONS	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	%FC
BELVIDERE BRIDGE	.14	15.93	-2.80	91	58	77.	3	1560	150	61
CANOE BROOK	.30	17.71	-2.11	94	57	79.	4	1768	361	62
CHARLOTTEBURG	.31	19.99	.00	88	54	73.	1	1443	291	50
FLEMINGTON	.13	22.47	3.30	90	56	77.	3	1665	217	71
NEWTON	.65	16.80	-1.49	88	55	75.	2	1575	315	57
FREEHOLD	.09	22.35	3.74	93	55	78.	3	1667	110	71
LONG BRANCH	.78	21.16	2.65	93	62	79.	4	1643	163	58
NEW BRUNSWICK	.52	22.36	3.85	93	58	79.	3	1747	104	81
TOMS RIVER	.10	22.05	3.05	94	58	79.	4	1602	115	36
TRENTON	.00	20.62	2.96	98	62	80.	3	1763	55	38
CAPE MAY COURT HOUSE	.18	18.44	2.00	91	61	79.	3	1426	-159	45
DOWNSTOWN	.43	16.68	-.59	92	59	79.	2	1669	-101	44
GLASSBORO	.13	18.05	-.23	93	64	81.	5	1892	195	38
HAMMONTON	.33	18.81	.55	94	58	80.	3	1737	43	52
POMONA	.32	17.74	1.29	94	59	81.	5	1640	64	28
SEABROOK	.32	17.94	1.24	93	64	81.	4	1920	193	34
SOUTH HARRISON	.00	22.17	3.69	92	62	80	NA	1795	NA	NA

*SOME CUMULATIVE VALUES ESTIMATED DUE TO MISSING PAST DATA

WES KLINE — GDD BASE 40 PINEY HOLLOW

Last Week* 273 (Ending 7/18/05)

This Week 277 (Ending 7/25/05)

* February total base 40 equals 32 units

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Pesticide User Responsibility: Use pesticides safely and follow instructions on labels. The pesticide user is reponsible 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 RCRE in your County.
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