RUTGERS COOPERATIVE EXTENSION AT THE NEW JERSEY AGRICULTURAL EXPERIMENT STATION

# PLANT & PEST ADVISORY

LANDSCAPE, NURSERY & TURF EDITION $1.50 MAY 13, 2004

## INSIDE



## Accurately Timing Pesticide Applications by Using Plant Phenological Indicators (PPI)

*Steven K. Rettke, Ornamental IPM Program Associate*

Accurately timing a control tactic against the most vulnerable stage of an insect's development allows for the use of biorational pesticides as well as less use of traditional pesticides. Unfortunately, accurately timing controls is difficult because of the complex array of landscape plants and pests that can be present on any one site. IPM methods require knowledge of the pest's life cycle stages and when the vulnerable stage occurs for *each* pest. It requires knowledge of what pesticides will suppress the pest as well as their relative toxicities. This extensive amount of information can become overwhelming, especially to the less experienced landscaper or arborist.

Some landscape managers often have to resign to the easy, yet environmentally unsound practice of using four or more preventative cover sprays of pesticides each year. Studies have shown that typically only 2% of a blanket spray actually hits a targeted pest, with the remaining 98% contaminating the surrounding environment. Is there another way pesticides can be applied more intelligently?

The concept of Growing Degree Days (GDD) or the daily accumulation of heat units to predict pest activity is used frequently within this newsletter. It can be a valuable tool to determine when a pest is active as well as its most vulnerable stage of development. However, most landscapers do not calculate the GDD units themselves (requires a Min-Max thermometer or a relatively expensive biophenometer) and many do not use the weekly GDD information provided by RCE/NJDA. Therefore, without the access and constant updating of GDD information, the landscaper will find this important tool to be of little practical value.

Another method is the possibility of timing pest activity via ornamental plant development. Using **Plant Phenological Indicators (PPI)** involves observing certain plants whose bloom time (flowers, leaves, fruit, etc.) coincides with a life stage event of a specific pest. As temperatures rise in the spring, both plants and insects/mites begin development and continue throughout the growing season in response to this accumulation of heat units (GDD). Therefore, the development of plants can be correlated to insect activity. A PPI that nearly all turf managers are familiar with states: "To control crabgrass, apply a pre-emergent herbicide when the forsythia blooms."

SEE PPI ON PAGE 2

*PPI from page 1*

**Specific, Localized Conditions Generally Favoring *Later* and *Slower* Development of PPI & Pests When Compared to "Average" Conditions**

- ✔ Nearer the Coast
- ✔ Further North
- ✔ In the Shade
- ✔ Under Cloudy Skies
- ✔ On a North Slope
- ✔ At Higher Elevations
- ✔ Cooler than Average Years

Landscapers know that white-barked birches (especially European and Asian species) are sensitive to environmental stresses that make them susceptible to bronze birch borer infestations. For most practical situations these trees should probably be allowed to die and then replaced with a more appropriate species. In some special situations, a client may have a valuable white birch in a key location that may warrant protective sprays. If general cover sprays are applied based on the calendar (i.e., early June), the birch may still succumb to the bronze birch borer because of inaccurate spray timing. Since insect pheromones are not available to time adult emergence, PPI can be especially valuable. Since the most vulnerable stage of this pest is the newly hatched larvae, it is necessary to apply an appropriate pesticide (e.g., Astro) to the bark just *prior* to egg laying. Based upon many years of field observations, it has been determined that the first pesticide application should be sprayed when *Spirea X vanhouttei* (Bridal Wreath Spirea) finishes bloom. A few other alternative plant indicators for the first spray include:

- ❖ *Viburnum dentatum* (Arrowwood Viburnum) at beginning bloom stage
- ❖ *Weigela florida* (Old-fashioned Weigela) at the blooming stage
- ❖ *Aesculus hippocastanum* (Horse Chestnut) at the late bloom stage with some blossoms brown

The enclosed "Box" contains a listing of some Key Pests and a few of their corresponding Plant Phenological Indicators (PPI). These plants bloom during the presence of the pest's most vulnerable stage. Although only a few pests and their plant indicators are identified here, all of the common landscape pests have identifiable PPI.

A possible advantage of using PPI over GDD is the direct observation of plant development at your landscape site. When using PPI, the observer is not dependent upon the need to constantly update GDD information. Plant indicators are an obvious signal, because you see them on site inspecting for pest problems, or they literally "hit you in the face" when doing your regular scheduled maintenance.

Along with GDD information, the use of PPI replaces the general calendar recommendations for timing pesticides that are only based on averages. These averages can often be too early or too late by two weeks or more, depending upon if the year is cooler or warmer than usual.

General calendar spray recommendations also do not compensate for localized microclimates that can experience considerable variation from a regional average. In fact, PPI are often superior to GDD for pest management timing microclimates when the GDD calculations are determined from an off-site location. Therefore, PPI can act as a refinement to improve the accuracy of GDD data when traveling from one landscape site to another during the day. The primary requirement for successfully using PPI is the ability to identify common landscape plants, usually to the species level.

Remember, to use PPI practically the indicator plants must be readily available to be observed. The plant should be common, have a relatively short (well-defined) bloom period that is easily recognized from a distance. Also the plant should not be easily confused with other plants blooming. It is important to be aware that some biological uncertainty with PPI can exist and the development of an individual plant will not always exactly coincide with temperature and pest emergence.

***(Reference: Coincide: The Orton System of Pest Management*, *Donald A. Orton; 1989)***

*See Key Pests and Common PPI Table on page 3*

## Netting to Protect Small Trees and Shrub from Cicadas

A source for tubular netting that can be used to cover small trees and shrubs is available on the Rutgers Cooperative Extension web site at: http://www.pestmanagement.rutgers.edu/NJinPAS/postings/netall.pdf

*Submitted by Peter Shearer, Specialist in Entomology.* ❑

*Lab Highlights from page 3*

diagnosed were Calibrachoa from Somerset County, and ivy from a Sussex County grower. **Downy mildews**, which are caused by fungus-like organisms that are cousins of *Pythium* and *Phytophthora*, were very active in select crops this period. **Downy mildew of impatiens**, which is caused by *Plasmopara obducens*, was diagnosed in a Monmouth County greenhouse operation. **Downy mildew of rose**, caused by *Peronospora sparsa*, was identified on potted rose plants from another Monmouth County operation. ❑

### Key Pests and Common Plant Phenological Indicators

**BAGWORM**
(Most vulnerable stage is the young or newly hatched larvae)
*Catalpa speciosa* (Northern Catalpa) = FULL BLOOM
*Syringa reticulata* (Japanese Tree Lilac) = FULL BLOOM
*Philadelphus* (Mockorange) = BLOOMING

**BIRCH LEAF MINER**
(Most vulnerable stage is the young larvae inside leaf)
*Spirea X vanhouttei* (Bridal Wreath Spirea) = EARLY BLOOM
*Acer saccharinum* (Silver Maple) = DROPPING SEED
*Pinus mugho* (Mugho Pine) = CANDLES 1-6″ LONG; NEEDLES NOT EXTENDED

**EUONYMUS SCALE**
(Most vulnerable stage is the newly hatched crawlers)
*Syringa reticulata* (Japanese Tree Lilac) = EARLY BLOOM
*Cornus kousa* (Kousa Dogwood) = BLOOM
*Crategus crus-gali* (Cockspur Hawthorn) = BLOOMING

**EUROPEAN PINE SAWFLY**
(Most vulnerable stage is young larvae)
*Magnolia X soulangiana* (Saucer Magnolia) = DROPPING PETALS
*Amelanchier* (Serviceberry) = BLOOMING
*Acer platanoides* (Norway Maple) = LATE BLOOM; LEAFING OUT

**PINE NEEDLE SCALE**
(Most vulnerable stages are 1st instar crawlers & stationary 2nd instar nymphs)
(1st generation)
*Spirea X vanhouttei* (Bridal Wreath Spirea) = BLOOMING
*Aesculus hippocastanum* (Horse chestnut) = BLOOMING
(2nd generation)
*Daucus carota* (Queen Anne's Lace) = BLOOMING
*Sorbus aucuparia* (European Mountainash) = FRUIT TURNING ORANGE

**SPRUCE SPIDER MITES**
(Newly hatched nymphs are easiest to suppress)
(Spring Sprays)
*Magnolia X soulangiana* (Saucer Magnolia) = PINK BUD STAGE
*Acer saccharum* (Sugar Maple) = BEGINNING BLOOM
*Acer saccharinum* (Silver Maple) = LEAF BLADES ARE 1-2″ LONG
(Fall Sprays)
*Acer saccharum* (Sugar Maple) = FOLIAGE BEGINNING TO COLOR
*Cretaegus phaenopyrum* (Washington hawthorn) = FRUIT BEGINNING TO RIPEN

**TWO-SPOTTED SPIDER MITES**
(Immature stages and adults are vulnerable to chemical controls)
(Begin summer spray period)
*Hydrangea arborescens* 'Grandiflora' (Hills of Snow Hydrangea) = EARLY BLOOM
*Daucus carota* (Queen Anne's Lace) = BLOOMING
*Yucca fiamentosa* (Adam's Needle) = BLOOMING
(End summer spray period)
*Sorbus aucuparia* (European Mountainash) = FRUIT VERY ORANGE
*Solidago* (Goldenrod) = SOME BLOOMING

# Plant Diagnostic Laboratory Highlights

*Richard J. Buckley, Laboratory Coordinator*

## Turf

Winter turf diseases still cling to life on golf courses in the tri-state area. **Pink snow mold** continues to flare-up every few days in the northern part of the region in tandem with periods of cool, wet weather. Careful with the **snow mold** diagnostics – two superintendents swore they had **Pythium blight** that turned out to be **snow mold** when the turf got into the laboratory. The fungus that causes **pink snow mold**, *Microdochium nivale*, produces huge numbers of conidia that are dragged all over by the mowers. Some name for a turf disease – it is 85°F out there today! The other cool weather pathogen of note, *Rhizoctonia cerealis*, has also been busy. **Yellow patch** (a.k.a.: **cool season brown patch**) was diagnosed on golf turf samples from Passaic and Essex Counties as well as from courses in Connecticut, Delaware, and Philadelphia. Last but not least on the turf scene is **anthracnose**. Active disease was identified on samples from Pennsylvania, and from Atlantic and Essex Counties.

## Ornamentals

**Winter injury** remains a problem for landscape plantings. Enough of the winter injury already - the real cool thing about submissions this week was the **Rhabdocline needlecast**. The fungus *Rhabdocline pseudostugae* is finally sporulating vigorously in all of the samples submitted. Now, of course, is the time to protect the new growth from the fungus with your fungicide treatments. Other problems of note this period include **inkberry leafminer**, *Phytomyza glabricola*, on inkberry (duh) from Atlantic County; **spruce scale**, *Carulaspis minima*, on spruce (duh) from Bergen County, and **holly pitmaking scale**, *Asterolecanium puteanum*, on holly (duh) from a Salem County landscape.

## Greenhouse and Nursery

**Pythium root and crown rot** is currently active in greenhouse production at this time. This week the samples

SEE LAB HIGHLIGHTS ON PAGE 2

# Rusts: Those Fascinatingly Complex Diseases of Plants

*Ann B. Gould, Ph.D., Specialist in Plant Pathology*

Rust diseases are a commonly occurring phenomenon in New Jersey landscapes. Some of the most troublesome rusts include **ash rust**, **hollyhock rust**, and **cedar-apple, hawthorn, and quince rusts** (known collectively as the **Gymnosporangium rusts**). These organisms are fascinatingly complex because some of them require more than one host to survive, and all produce in succession two or more types of spores.

The fungi that cause rust diseases are actually related to the common mushroom, but the spores produced by these organisms are found in "rusty" pustules on leaves, stems, needles, and fruit. Some rust fungi have a unique life history, requiring more than one host plant to grow and reproduce. These different hosts are called alternative hosts, and without them the fungus cannot survive. Examples of these "heteroecious" rusts diseases include the Gymnosporangium rusts and ash rust. Alternatively, other rust fungi do not require more than one host plant to survive and hence do not have alternative hosts in their life cycle. These rust fungi are "autoecious" and include *Puccinia malvacearum*, the cause of hollyhock rust.

All rust fungi produce two types of spores: i) basidiospores, which result from genetic recombination, and ii) teliospores, spores that support the development of basidiospores. Many other rust fungi also produce additional spore types such as spermatia, aeciospores, or uredospores. Each of these spore types are found in a specialized pustule (fruiting structure) that develops on a given host during a certain point in the disease cycle.

## Heteroecious rusts

**The Gymnosporangium rusts.** Rusts caused by fungal species in the genus *Gymnosporangium* are some of the most interesting of diseases that affect landscape trees and shrubs. The alternative hosts of this group of fungi include rosaceous hosts such as apple, crabapple, hawthorn, and quince, and juniperous hosts, such as eastern red cedar and juniper.

Gymnosporangium rusts overwinter in galls on the juniperous host. Galls of the cedar-apple rust fungus grow to several inches in diameter, whereas galls of the quince rust fungus are small and spindle-shaped. Bright orange, gelatinous "horns" of spores (teliospores) ooze from galls during rainy weather in the spring. Teliospores give rise to basidiospores which can only infect rosaceous hosts and are spread by wind to newly developing tissues. By mid-summer, rusty orange pustules (called aecia) containing aeciospores appear on infected leaves (cedar-apple rust and quince rust) and young stems, petioles, and fruit (quince rust). By mid- to late-summer, the aeciospores are carried by the wind to infect cedar and juniper. Although these rusts are rarely destructive on cedar and juniper, they can cause premature defoliation, stunted growth, swollen and distorted twigs and petioles, and poor quality fruit on susceptible rosaceous hosts.

If desired, protect susceptible rosaceous hosts with chlorothalonil, Consyst*, fenarimol, flutolanil, mancozeb, maneb, myclobutanil, Manhandle*, propiconazole, Spectro*, sulfur**, thiophanate-methyl, triadimefon, trifloxystrobin, or triflumizole applied at 7- to 21-day intervals (see label for specific timing) from pink-bud until two weeks after petal fall. With the exception of triadimefon, these compounds may also be used to manage apple scab on susceptible hosts. When possible, use cultivars of crabapple and other rosaceous plants that are resistant to rusts. To help protect valuable landscape plantings, do not plant juniperous species near rosaceous hosts such as crabapple, hawthorn, or quince.

To manage the Gymnosporangium rusts on cedar and juniper, prune affected branches 6 to 8 inches below galls during dry weather with surface-sterilized pruning tools. Fungicides such as azoxystrobin, copper, ferbam, flutolanil, Junction*, mancozeb, myclobutanil, sulfur**, thiophanate-methyl, triadimefon, or Zyban* may be applied on a preventive basis to these hosts beginning in July.

**Ash rust.** The alternate hosts of ash rust, caused by the fungus *Puccinia*, are ash trees and salt marsh or cordgrass. Fungal spores (basidiospores), produced on marsh grass in the spring, are carried by wind to susceptible ash foliage. Yellow spots quickly form on the upper surface of infected leaves and on petioles and stems. Within two weeks, bright orange infection cups (aecia) develop on infected petioles, stems, and the lower surface of leaves. Affected tissue puckers and swells. Bright orange/yellow aeciospores produced within the aecia become windborne in early summer and infect the leaves of marsh grass along the coast. Severely infected leaves on ash trees die prematurely and drop. What happens to the marsh grass? Uredospores develop in pustules (uredia) within the newly infected grass and continue to reinfect this host the remainder of the summer. Just before the end of the season, teliospores develop and overwinter within infected plant material. The cycle starts anew the following spring.

Chemical control for ash rust is usually not necessary in the landscape. To protect highly susceptible trees, however, apply flutolanil, mancozeb, Manhandle*, myclobutanil, or Spectro*, sulfur**, thiophanate-methyl, triflumizole at budbreak and repeat at intervals on the label. Ash rust is more severe on trees in coastal areas close to the alternate host.

## Autoecious rusts: Hollyhock rust

Hollyhock rust is one of the most common and disfiguring diseases of hollyhock (*Althaea* spp.) in New Jersey. The fungus that causes this rust, *Puccinia*

*See Rusts on page 5*

# Diseases of Turfgrass

*Bruce B. Clarke, Ph.D., Turfgrass Pathology*

## General

**Dollar Spot** made an early appearance on golf course turf over the last few days. With the current, hot, humid weather, **brown patch** and **pythium blight** may develop soon as well. These diseases will be highlighted in future issues of this newsletter.

## Red Thread

This disease, caused by the fungus *Laetisaria fuciformis*, is prevalent on sensitive turf at this time. Infections are characterized by the appearance of short red threads (1/16″-1/4″ long) emerging from tan-colored leaf blades. Affected patches are typically pink in color and range from one to six inches in diameter. Although perennial ryegrass and fine fescue are most susceptible, bluegrass, velvet bentgrass, bermudagrass, and tall fescue may also be affected. Red thread is most severe on low fertility turf during periods of cool, wet weather. Well-fertilized turf, however, may also be attacked. To obtain optimum disease control, maintain adequate fertility levels, avoid drought stress and excessive thatch, and apply Banner, Bayleton, Chipco 26GT, chlorothalonil, Compass, Eagle, Heritage, Insignia, Prostar, Rubigan, or vinclozolin per manufacturer's recommendations.

## Stripe Smut

Symptoms of this disease, caused by the fungus *Ustilago striiformis*, are starting to appear in infested Kentucky bluegrass lawns. To identify stripe smut in the field, look for clumps of black spores protruding through "shredded" leaf blades. Although fungicides are most effective when applied once in mid-October, present infections can be controlled now with the application of a penetrant fungicide such as Banner, Bayleton, Eagle, Rubigan, or thiophanate-methyl. Follow label directions carefully for best results.

## Summer Patch

Although it is still spring, now is the time to initiate an integrated summer patch control program. This disease, caused by the fungus *Magnaporthe poae*, can be controlled through the use of good cultural practices and the application of penetrant fungicides. For best results, maintain soil pH at or slightly below 6.0, fertilize turf with ammonium sulfate (during cool weather only) or sulfur-coated urea, avoid the use of nitrate-based fertilizers (which can enhance symptom severity), and aerify (before symptoms develop) to reduce compaction and to decrease disease severity. Fungicides are most effective when applied in mid- to late-May (i.e., when the soil temperatures at a 2 inch depth exceed 65$^0$F for 5 to 6 consecutive days) and then repeated two additional times at 28 day intervals. To optimize control, apply Banner, Bayleton, Compass, Eagle, Heritage, Insignia, Rubigan, or one of the benzimidazoles (i.e. – Fungo or Cleary 3336) in 4 to 5 gal water/1000 ft$^2$). If fungicides are delivered in low water volumes (1 to 2 gal water/1000 ft$^2$), irrigate with 1/8 inch of water immediately following application to enhance disease control.

## Turf Research Field Days

Mark your calendars now for this year's Rutgers Turfgrass Research Field Days which will be held on July 28, 2004 (Landscape Turf Research Field Day at Adelphia, NJ) and July 29, 2004 (Golf Turf Research Field Day at Hort Farm II, Ryders Lane, New Brunswick, NJ). Additional information and directions to each location will appear in future issues of this newsletter. ❑

*Rusts from page 4*

*malvacearum*, has only one host. In spring, spores that have overwintered in plant debris are disseminated to newly developing tissues. Waxy, circular, yellow to brown lesions appear on the lower leaf surface of infected plants. Soon, swollen orange pustules appear on the corresponding upper leaf surface. Teliospores produced in these pustules quickly spread to other leaves, stems, and green floral parts. Leaves on severely affected plants turn yellow and drop prematurely.

To control hollyhock rust, remove and discard all infected leaves and stalks when pustules are evident. In the fall, cut plants to the ground, carefully removing all plant debris. In the spring, consider applying a fungicide to newly expanding leaves and repeat at intervals stated on the label. Compounds including chlorothalonil, ferbam flutolanil, mancozeb, maneb, Manhandle*, myclobutanil, oxycarboxin (enclosed structures only), Spectro*, sulfur**, thiophanate-methyl, triadimefon, or triflumizole are labeled for hollyhock rust. Common mallow is also susceptible to this disease and may serve as a source of infection. If common mallow is in the vicinity of hollyhock beds, it should be removed.

*Combination products.

**Do not apply sulfur in full sun or when the air temperature exceeds 85$^o$F. Do not apply sulfur within 2 weeks of an oil spray. ❑

# Rutgers EcoComplex Hosts Northeastern Branch Agronomy-Soils Meeting

## along with Certified Crop Advisor Training Programs in Nutrient Management and in Turfgrass Science

*Joseph Heckman, Ph.D., Specialist in Soil Science*

You are invited to attend the 2004 Branch American Society Agronomy-Soil Science Society America meeting on July 11 - 14, 2004 at the Rutgers EcoComplex, Bordentown, NJ. The meeting features an optional pre-meeting tour and a Sunday evening lecture on renewable energy, followed by a reception.

The meeting also features a symposium on Monday morning, and volunteered oral and poster presentations on Tuesday and Wednesday. Each afternoon is a choice of tours highlighting New Jersey crops and soils.

On Wednesday, there will be special sessions for certified professionals, including Certified Crop Advisers on nutrient management and turf grass science. Continuing Education Units for Nutrient Management and Soil and Water Management have been submitted.

### Renewable Energy Symposium

The "Harvesting Renewable Energy from Agriculture" symposium will feature several guest lectures on various aspects of renewable energy. Topics will include Producing Methane and Energy from Manure, On-Farm Wind Energy, Soil Electric Energy, and Energy Crops in the form of Ethanol, Bio-diesel, and Biomass.

Rounding out the event is Paper/Poster Sessions, Graduate Student Paper Competition and a Branch Directors Business Meeting.

### New Jersey Area Tours

Participants at this year's meeting have a choice of several tours including field research projects related to vegetables, tree fruit, and field crops; soil conservation, nutrient management, and cultural practices related to production of nursery crops; Rutgers Cranberry and Blueberry Research Station; soil pits and road cuts to allow participants the opportunity to examine several soils; Rutgers Adelphia Research Farm Tour for turfgrass breeding and management, soil fertility research plots, and underutilized perennial food crops. Visit the tour picture gallery on the web site: www.ecocomplex.rutgers.edu/nebasa/.

For registration and accommodations information, go to the meeting website: www.ecocomplex.rutgers.edu/nebasa/. Registration can be done online. To receive a registration form by fax or mail, contact Joseph Heckman at Cook College at 732-932-9711, ext. 119.

## Nutrient Management - Certified Crop Advisor Training Program July 14, 2004

**Sponsored by Northeast Branch, American Society of Agronomy & Northeast Branch, Soil Science Society of America**
**CCA – CEU credits: NM = 2.5; SW = 1.0**

12:25 PM — *Welcome* – Dr. Stephanie Murphy, Director of Rutgers Soil Test Laboratory

12:30-1:00 PM — *Water and Nutrient Management for Nursery Operations*
Dr. Gladis Zinati, Extension Specialist in Nursery Management
Department of Plant Biology and Pathology, Rutgers University

1:00-1:30 PM — *The Need for In-season Application of Nitrogen*
Dr. Tom Morris, Extension Agronomist
Department of Plant Science, University of Connecticut

1:30-2:00 PM — *Optimum Nitrogen Fertilization of Cool-season Grasses*
Dr. Doug Beegle, Professor of Agronomy, Department of Crop and Soil Sciences, Pennsylvania State University

2:00-2:30 PM — Discussion and Coffee Break

2:30-3:00 PM — *Phosphorus Management for Dairy Farms*
Dr. Quirine Ketterings, Extension Soil Scientist, Department of Crop and Soil Sciences, Cornell University

3:00-3:30 PM — *Manure Management*
Dr. Bill Jokela, Professor of Agronomy
Department of Plant and Soil Science, University of Vermont

3:30-4:00 PM — *Climate Change Impacts on Soil Fertility and Soil Quality*
Dr. John Jemison, Extension Soil Scientist, University of Maine

4:00-4:30 PM — *The Phosphorus Index for Agronomic and Environmental Nutrient Management Planning*
Dr. Frank Coale, Professor of Soil Science, Department Natural Resources and Landscape Architecture

4:30-5:00 PM — Discussion and Concluding Remarks

## Recent Advances in Turfgrass Science Certified Advisor Training Program July 14, 2004

**A Turfgrass Management Workshop Sponsored by Northeast Branch - American Society of Agronomy & Northeast Branch - Soil Science Society of America & Rutgers Center for Turfgrass Science**
**CCA – CEU credits: CM = 1.0; SW = 0.5; PM = 1.5**

12:30 PM — Welcome - Bruce B. Clarke, Director, Rutgers Center for Turfgrass Science

12:35-1:00 PM — *Current perspectives in turfgrass management*
Dr. James Murphy, Associate Extension Specialist in Turfgrass Management, Department of Plant Biology and Pathology, Rutgers University

1:00-1:25 PM — S*oil fertility and disease suppression*
Dr. Joseph Heckman, Extension Specialist in Soil Fertility, Department of Plant Biology and Pathology, Rutgers University

1:25–1:50 PM — *New and emerging diseases of cool- and warm-season turf*
Dr. Bruce Clarke, Extension Specialist in Turfgrass Pathology, Department of Plant Biology and Pathology, Rutgers University

1:50 –2:15 PM — *Controlling Poa annua and Poa trivialis with Bispyribac:*
A *new era in golf and sports turf weed control*
Dr. Steve Hart, Assistant Extension Specialist in Turf and Ornamental Weed Science, Department of Plant Biology and Pathology, Rutgers University

2:15–2:45 PM — Discussion and Coffee Break

2:45-3:10 PM — *New developments in the management of turfgrass insects*
Dr. Albrecht Koppenhofer, Associate Extension Specialist in Turfgrass Entomology, Department of Entomology, Rutgers University

3:10-3:35 PM — B*reeding turfgrasses for pest and stress tolerance*
Dr. Bill Meyer, Professor Turfgrass Breeding
Department of Plant Biology and Pathology, Rutgers University

3:35–4:05 PM — W*ater conservation and irrigation management in cool-season turf*
Dr. Bingru Huang, Associate Professor in Turfgrass Physiology, Department of Plant Biology and Pathology, Rutgers University

4:05-4:30 PM — Discussion and Concluding Remarks

**Weather Summary for the Week Ending 8 am Monday 5/10/ 4**

| | RAINFALL | | | TEMPERATURE | | | | GDD BASE50 | | MON |
|---|---|---|---|---|---|---|---|---|---|---|
| **WEATHER STATIONS** | **WEEK** | **TOTAL** | **DEP** | **MX** | **MN** | **AVG** | **DEP** | **TOT** | **DEP** | **%FC** |
| BELVIDERE BRIDGE | 1.21 | 8.60 | -.35 | 82 | 36 | 57. | -1 | 221 | 121 | 95 |
| CANOE BROOK | .91 | 10.10 | .24 | 81 | 37 | 57. | 0 | 229 | 145 | 95 |
| CHARLOTTEBURG | 1.21 | 9.30 | -.41 | 79 | 33 | 55. | 0 | 204 | 164 | 96 |
| FLEMINGTON | .92 | 10.72 | 1.31 | 79 | 38 | 56. | -2 | 223 | 131 | 95 |
| LONG VALLEY | .94 | 8.77 | -1.30 | 78 | 36 | 53. | -3 | 176 | 118 | 94 |
| NEWTON | 1.22 | 8.25 | -.40 | 76 | 37 | 53. | -3 | 179 | 122 | 99 |
| FREEHOLD | .78 | 11.07 | 1.73 | 82 | 38 | 57. | -2 | 278 | 151 | 92 |
| LONG BRANCH | .71 | 11.03 | 1.38 | 82 | 41 | 55. | -3 | 179 | 75 | 86 |
| NEW BRUNSWICK | 1.25 | 9.57 | .50 | 81 | 38 | 57. | -3 | 243 | 93 | 96 |
| TOMS RIVER | .81 | 11.29 | 1.90 | 85 | 39 | 58. | -1 | 286 | 174 | 83 |
| TRENTON | 1.30 | 10.39 | 1.93 | 81 | 39 | 57. | -3 | 259 | 87 | 90 |
| CAPE MAY COURT HOUSE | .34 | 8.97 | .76 | 78 | 40 | 57. | -2 | 237 | 88 | 52 |
| DOWNSTOWN | .70 | 9.23 | .78 | 81 | 40 | 58. | -3 | 314 | 132 | 74 |
| GLASSBORO | 1.33 | 12.44 | 3.50 | 81 | 45 | 59. | -1 | 328 | 156 | 99 |
| HAMMONTON | .55 | 9.80 | 1.11 | 84 | 41 | 59. | -1 | 330 | 164 | 62 |
| POMONA | .35 | 8.00 | -.23 | 84 | 39 | 59. | 0 | 281 | 151 | 62 |
| SEABROOK | .83 | 10.21 | 2.59 | 82 | 44 | 60. | -1 | 361 | 176 | 90 |
| SOUTH HARRISON | 1.00 | 11.79 | 3.18 | 81 | 40 | 59 | NA | 342 | NA | NA |

WES KLINE — GDD BASE 40 PINEY HOLLOW Last Week 153 (Ending 5/3/04) This Week 129 (Ending 5/10/04)

Rutgers Cooperative Extension - NJAES
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