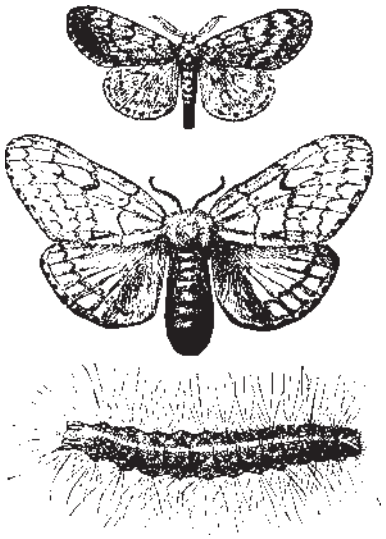
RUTGERS COOPERATIVE EXTENSION AT THE NEW JERSEY AGRICULTURAL EXPERIMENT STATION

PLANT & PEST ADVISORY

LANDSCAPE, NURSERY & TURF EDITION $1.50 MAY 15, 2003



INSIDE

Weather Effects on Plants and Insects/Mites

Steven K. Rettke, Ornamental IPM Program Associate

The old saying that "everyone talks about the weather" is certainly true when it involves landscape plant managers. Professional landscapers and their clients are always discussing how their plants are being affected by various weather factors. New Jersey weather trends are often variable from one growing season to the next. How do rain, wind and temperature changes impact plants and insects/mites?

Hot-Dry Weather Pests

Some of the common landscape pests that are most active in Hot-Dry conditions are listed in Table 1 on page 2. It is well known that **lacebugs** reach their highest populations on plants located in sunny-dry locations. There are few predators in these areas, and the shallow rooted azalea is often under drought stress. Lacebugs typically thrive under these conditions.

Scale insects also generally will do better in hot-dry weather primarily because the immatures are not knocked off the plants by raindrop "bombs." Recently hatched scale crawlers are unprotected for several days as they move about the plant looking for a place to settle down. If rains do cause the crawlers to fall to the ground, it is unlikely they will be able to climb back up the plant before they die (their short-stubby legs do not work very well). The timing of the rainfall to suppress the scale crawlers is critical, because they typically are active for only a few days. Once they settle down and insert their mouthparts into the plant tissue, they are less vulnerable to the raindrops.

Various **leaf beetles** and **caterpillars** usually prefer hot-dry conditions - not because they may get knocked off the plants (they will often simply climb back up), but since they can be infected by fungal diseases if a lot of free moisture is present. For example, the *Entomophaga* fungus that has been decimating most of the **Gypsy Moth** populations for more than a decade does an excellent job of keeping these caterpillar populations in check during cool, moist springs. However, when warm and dry springs occur, this pest will undoubtedly return to become a problem again in certain areas.

The most common of the warm season pests are the **two-spotted mites**. These pests thrive in very dry conditions, and they will reproduce

SEE WEATHER ON PAGE 2

WEATHER FROM PAGE 1

more rapidly when it is warmer. Mites are vulnerable to being dislodged by heavy rains unless they are under protective leaf covering. Invariably, the worst spider mite populations within the landscape occur when plants are sited under over-hanging structures.

Cool Weather Pests

The insects listed in column "B" are some of the common landscape pests most active during cool weather. Many **aphids** are the earliest insects noticed in the spring, feeding on new, soft and succulent plant growth. Additionally, some species of aphids are more active in the cooler weather in order to avoid predation (many common beneficial insects [i.e., lady beetles, lacewings, and sryphid flies] perform best in hot temperatures!). These aphids will disappear when warmer weather persists, but will return the following fall season as the cooler conditions develop again.

Most of the **adelgids** will do well in cool weather. The immature **spruce gall adelgids**, for example, overwinter on the terminal buds and are not adversely affected by extremely cold temperatures. Also, **pine bark adelgids** seem to have their greatest populations on pines that are in shaded locations. Often, a mass planting of pines too closely spaced in the landscape will have these adelgids infested on the interior trees.

The **root weevil grubs** actually prefer cool-moist conditions within the soil. If the soils become too wet, however, they become susceptible to fungal and bacterial infections. The larvae will often be forced to feed higher up the stem of the plant, where it is not as wet. This may cause the stem to be girdled, causing death to the plant.

The cool season **mites**, such as the **spruce spider mite**, are happiest when temperatures are 60°F or less. During the late spring, populations explode and webbing may be highly noticeable. By July, mite damaged conifer foliage often desiccates, turning from yellow to brown or orange in color. Only new tip growth remains. Come the hot summer months, spruce mites disappear and only the eggs will be present on the foliage (however, if the daily high temperatures remain consistently below 85°F for extended periods of time, then spruce spider mites may continue activity). These cool season mites begin to rebuild their populations in September, and reach their peak in November. The last active spruce mites may be present into the month of December, and the overwintering eggs are not laid until nighttime temperatures consistently drop below freezing.

Some of the **eriophyid mites**, such as the **hemlock rust mite**, are adapted to temperatures even colder than the spruce spider mite. They may actually begin activity as early as late-February in some situations.

Insects Damaged by Excessive Rains

The insects and mites listed in column "C" are some of the pests that may be adversely affected by excessive rains. These pests have already been discussed in the above sections. Rain can be detrimental to pest survival and proliferation because of the insect disease fungus it promotes, as well as the physical impact it causes (direct kill).

Stressed Plant Pests

The insects listed in column "D" are examples of pests that are actually attracted to stressed plants. **Aphids** and **whiteflies** are apparently drawn to plants with yellowing foliage. Plants under stress often lose some of their chlorophyll and become yellowish in color. Yellow sticky cards are often hung in greenhouses to monitor for some of these pests.

Some species of **caterpillars** (not gypsy moth) are "samplers" when they feed. These caterpillars will sample individual leaves to determine if they contain plant defensive chemicals such as alkaloid toxins. If these toxins are contained within the leaves, the caterpillar may find it distasteful and move on to sample other leaves. A weakened plant under stress may not have enough energy to produce these defensive chemicals and therefore, be more attractive for these caterpillars.

The greatest concern with stressed plants in the landscape is from **borer** infestations. The best examples of borer-prone plants are when drought conditions and high temperatures stress non-native plants. **Pine bark beetles**, **bronze birch borers**, and the two-lined **chestnut borers** are all encouraged when stressed trees are forced to "shut-down" their vascular systems. When trees have low sap pressure, the borers can easily penetrate and cut through vascular tissue.

Source: Adapted from a presentation delivered by Dr. David Shetlar (The Ohio State University Extension) @ the RCE IPM Symposium, Nov. 1995.

Table 1
Pests Affected By Specific Conditions

"A" Hot/Dry Weather Pests	*"B" Cool Weather Pests*	*"C" Pests Damaged by Excessive Rains*	*"D" Pests Attracted to Stressed Plants*
Lacebugs	**Aphids (some)**	**Lacebugs (fungus)**	**Aphids (some)**
ScalesLeaf	**Adelgids**	**Aphids/Mites (impact)**	**Scales (some)**
Beetles	**Root Weevils**	**Scale Crawlers (impact/wind)**	**Whiteflies**
Caterpillars	**Cool Season Mites**	**Caterpillars (fungus)**	**Caterpillars (some)**
Warm Season Mites	**Eriophyid Mites (some)**	**Black vine Weevils (fungus)**	**BORERS!!!**

Diseases of Turfgrass

Bruce B. Clarke, Ph.D., Plant Pathology

Anthracnose

This disease, caused by the fungus *Colletotrichum graminicola*, is apparent on annual bluegrass at this time. The fungus typically attacks turf growing under stress (i.e., low soil fertility and/or heat and moisture stress). Low cutting height can also enhance symptom development. To identify **anthracnose** in the field, look for small black fruiting bodies with protruding black spines. For best results, increase turf vigor with light applications of nitrogen, maintain adequate irrigation, reduce thatch, avoid wounding (e.g. switch to smooth rollers on mowers), and raise the cutting height (whenever possible). Apply Banner, chlorothalonil, Compass, ConSyst, Eagle, Heritage, Rubigan, Spectro, or thiophanate-methyl on a preventive basis per manufacturer's recommendations. Recent research has indicated that Medallion, Chipco 26GT, and Endorse can effectively suppress this disease when used on a preventive basis at brown patch rates. More research is needed, however, before these compounds can be labeled and recommended for the control of Anthracnose. For best results, alternate fungicides with different modes of action every 14 to 28 days.

Aschochyta leaf blight

Several reports of **leaf blight,** caused by the fungus *Ascochyta*, have been received recently. Kentucky bluegrass that has a thick thatch layer (2" to 3") is most susceptible to attack. Upon close inspection, both healthy and diseased leaves are evident within blighted areas. Infected blades typically appear "white" from the "tip down". Under certain conditions, lesions may extend all the way down to the leaf sheath. As lesions age, prominent black pycnidia (fruiting bodies) develop along the bleached portion of affected tissue. Unlike **anthracnose** fruiting bodies, these structures lack visible black spines. During moist conditions, spores are released and infect healthy turf. Since *Ascochyta* enters grass through wounds, infection is most severe just after the grass is mowed. For best results, avoid frequent mowing, raise the height of cut, use a "sharp mower blade" to avoid wounding, water as deeply and infrequently as possible without causing moisture stress, water in the early morning hours, avoid excessive applications of nitrogen, and remove excess thatch. Although fungicides are not currently labeled for the control of this disease, mancozeb has shown promise in research trials. Chemical control, however, is rarely warranted since affected turf typically recovers with proper maintenance.

Dollar Spot

Dollar spot has developed recently on golf and landscape turf. To prevent this disease from causing severe damage to susceptible turf again in 2003, maintain adequate nitrogen fertility, water in the early morning hours, reduce thatch, avoid the sole use of any fungicide for prolonged periods of time (to reduce the possibility of fungicide resistance), and apply Banner, Bayleton, Chipco 26GT, chlorothalonil, ConSyst, Eagle, mancozeb, Rubigan, Spectro, or vinclozolin. Repeat fungicides as needed through late-October.

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, Prostar, Rubigan, or vinclozolin per manufacturer's recommendations.

Turf Field Day

Mark your calendars now for this year's Rutgers Turfgrass Research Field Days which will be held on July 30, 2003 (Landscape Turf Research Field Day at Adelphia, NJ) and July 31, 2003 (Golf Turf Research Field Day at Hort Farm II, Ryders Lane, North Brunswick, NJ). Details will appear in future issues of this newsletter. ❑

Ornamental Fungicides - Common Names and Trade Names

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

The following list of trade names includes those most-readily available for use on ornamental plants in New Jersey. It may not include all brands that are sold, nor does it imply any preference whatsoever.

azoxystrobin
- Heritage
- Quadris 2.1F (Christmas trees)

captan
- Captan 50W
- Captan 50 Wettable Powder
- Captec 4L
- Captan 80-WP

chlorothalonil
- Bravo 500, Ultrex, WeatherStik (conifers)
- ChloroStar 6F
- Concorde 6F, DF, SST
- Daconil Ultrex, WeatherStik (commercial use)
- Daconil Zn 4F
- Echo, 720, Zn (conifers)
- Exotherm Termil (fumigant)
- Manicure, Ultrex (commercial use)
- Manicure T/O (not for commercial use)
- PathGuard 6F, 90DF
- Thalonil 90DF, Excell

copper hydroxide[1]
- 3 LB Copper Flowable Fungicide (professional use)
- Champ Dry Prill, Formula 2 (production)
- Champion Wettable Powder (professional use)
- Kocide 101, 2000, T/N/O
- Nu-Cop 50WP, 50DF, 3L

copper, metallic[1]
- Copper-Count-N (professional use)

copper oxychloride[1]
- C-O-C-S WDG
- Microsperse COC 53 WP

copper salts of fatty and rosin acids[1]
- Camelot

copper sulfate[1]
- Basicop 50WP
- Cuprofix Disperss
- Phyton 27

debacarb
- Fungisol

etridiazole
- Terrazole 35W (nursery and greenhouse)
- Truban 30WP, 25EC, 5G (professional use)

fenarimol
- Rubigan A.S., E. C.

fenhexamid
- Decree 50WDG (horticultural use)

ferbam
- Ferbam Granuflo (commercial use)

fludioxonil
- Medallion

flutolanil
- Contrast

fosetyl-Al
- Aliette WDG
- Prodigy 80 DG

iprodione
- 18 Plus 2F (commercial use)
- Chipco 26019 (commercial use)
- Sextant 2F (commercial use)

kresoxim-methyl
- Cygnus 50 WDG, 50WG (commercial use)

mancozeb
- 4 Flowable Mancozeb (professional use)
- Dithane 4SC, 75DF, T/O, WF (professional use)
- Fore, Rainshield, 80WP, WSP (professional use)
- Manzate 80WP (professional use)
- Penncozeb 75DF, 80WP (conifers)
- Pentathlon, DF, LF (professional use)
- Protect T/O 80WSB

maneb
- Maneb 75DF, 80WP (commercial use)

mefenoxam
- Mefenoxam 2
- Subdue 2X, MAXX
- Subdue GR (professional use)
- Quell

myclobutanil
- Eagle WSP (landscape)
- Nova 40W (conifer nursery use)
- Systhane, Systhane* greenhouse or nursery)

oxycarboxin
- Plantvax 75W (enclosed structures)

oxytetracycline-calcium complex
- Mycoject

PCNB (quintozene)
- Engage 10G, 75W
- Engage 75W
- Revere 10G
- Terraclor 75WP, 400
- Turfcide 10G

phosphite
- Magellan

CONTINUED ON PAGE 5

CONTINUED FROM PAGE 4

piperalin
Pipron 2LC (enclosed structures)
Propamocarb-HCl
Banol 6S (not for field nursery)
propiconazole
Alamo
Banner GL, MAXX
Propiconazole Pro
streptomycin sulfate
Agri-mycin 17
Sulfur, dusting[2]
Dusting Sulfur
Sulfur, elemental[2]
Sulfur 90W (may be used on home grounds)
Sulfur Fungicide (not for commercial)
Sulfur, flowable[2]
Suffa 6F (may be used on home grounds)
Sulfur Flowable 6
Sulfur, wettable[2]
Microfine Sulfur
Microsperse Wettable Sulfur
Micro Sulf
Microthiol Disperss
80% Thiosperse
Wettable Sulfur
tebuconazole
Tebuject
thiabendazole
Arbotect 20 S
Mertect 340-F
thiophanate-methyl
3336F, WP, G, GC
Cavalier Flowable 4F
Fungo 50, Flo
OHP 6672 50W, 4.5L
Systec 1998 4.5F
Topsin M 70WP (conifers only)
Topsin M WSB
triadimefon
Bayleton 50WSB (non-commercial use)
Bayleton 50% 50DF (Christmas trees)
Strike 50WDG (commercial use)
Systemic Fungicide 50 WSB (non-commercial use)
trifloxystrobin
Compass 50WDG
Compass O 50WDG
triflumizole
Terraguard 50W (enclosed structures)
vinclozolin
Touche EG (professional use)
ziram
Ziram 76DF, Granuflo (not for residential use)

Combination Products

chlorothalonil + fenarimol
TwoSome Flowable Fungicide 4F (not for commercial use)
chlorothalonil + thiophanate-methyl
ConSyst 50 WDG
Spectro 90WDG
flutolanil + thiophanate-methyl
SysStar 28WDG
mancozeb + copper hydroxide
Junction DF (professional use)
mancozeb + myclobutanil
Manhandle
mancozeb + thiophanate-methyl
Zyban WSB
propamocarb hydrochloride + chlorothalonil
Banol C 6WDG
thiophanate-methyl + etridiazole
Banrot 40W, 8G

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[1]Check for phytotoxicity before large-scale use of copper fungicides; to prevent residues on many plants, avoid use of copper compounds just before sale.
[2]DO NOT apply sulfur over 90°F, in full sun, or 3 weeks after an oil spray.

Plant Diagnostic Laboratory Highlights

Richard J. Buckley, Laboratory Coordinator

General Interest

Cold, Cold, Cold is how the Little Feat song goes and so goes the recent (all spring) weather. The gray and the wind really can beat you down and is having a negative impact on sample submissions. This spring has been our slowest spring for diseases and insect pests in several years. Of course, regular spring rains usually lead to lots of leaf spots!

Turf

Speaking of cold weather, we have not been seeing much in the way of turf disease. A few conversations with turf managers and researchers suggest that there is some **leaf spot** and **red thread** working in residential turf. We have also seen some active **dollar spot** on the turf farm, but not much is happening on golf turf. Yesterday we had an interesting sample from a North Jersey golf course. The greens were a mix of bentgrass and Poa annua, so the superintendent used **Embark** for Poa seedhead suppression. He made the application on 4/28 and used the product at the label rate of 40 ounces. According to those more familiar with this product than I am, using the material at that rate often causes some **phytotoxicity to the bentgrass**. There was also some question of the timing being that 4/28 was a bit late. The trade-off between bentgrass phytotoxicity and Poa seedhead reduction is normally a risk worth taking, because the bentgrass will recover easily and things will be fine. In fact, it is not uncommon to add an iron product to the tank to mask the damage and mitigate recovery. The problem this season for our client was the cold. His treatment caused significant phytotoxicity on his site and two weeks later the turf had not recovered. The cumulative effects of cold soils, below average temperatures, and regular overcast skies, and *the bentgrass won't just grow out of the damage*.

Ornamentals

Winter Injury was the winner for most common submission this week for woody ornamentals. Symptoms

See Lab Highlights on page 7

Weekly Weather Summary

Keith Arnesen, Ph.D., Agricultural Meteorologist

Temperatures averaged below normal. Extremes were 84 degrees at Hammonton, on the 8th and 32 degrees at Pomona on the 6th. Weekly rainfall averaged 0.74 inches north, 0.35 inches central, and 0.56 inches south. The heaviest 24 hour total reported was 0.88 inches at Hammonton on the 7th to 8th. Estimated soil moisture, in percent of field capacity, this past week averaged 80 percent north, 72 percent central and 57 percent south. Four inch soil temperatures averaged 55 degrees north, 56 degrees central and 56 degrees south.

Weather Summary for the Week Ending 8 am Monday 5/12/ 3

	RAINFALL			TEMPERATURE				GDD BASE50		MON
WEATHER STATIONS	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	%FC
BELVIDERE BRIDGE	.93	7.19	-2.00	81	37	56.	-3	208	91	84
CANOE BROOK	.60	9.14	-.98	83	44	58.	0	221	121	83
CHARLOTTEBURG	1.00	9.63	-.34	82	37	55.	-1	111	61	85
FLEMINGTON	.54	8.52	-1.12	83	41	57.	-1	226	118	73
LONG VALLEY	.65	8.29	-2.05	80	34	53.	-3	120	50	85
NEWTON	.75	6.36	-2.51	82	34	56.	-1	184	113	80
FREEHOLD	.16	8.29	-1.29	80	45	58.	-2	252	106	67
LONG BRANCH	.28	8.78	-1.12	71	40	55.	-3	181	61	59
NEW BRUNSWICK	.40	7.93	-1.39	79	38	57.	-3	221	51	84
TOMS RIVER	.36	7.26	-2.37	77	34	57.	-3	228	97	57
TRENTON	.55	7.31	-1.37	79	37	56.	-5	230	36	75
CAPE MAY COURT HOUSE	.18	7.56	-.86	74	33	56.	-4	185	16	29
DOWNSTOWN	1.19	7.60	-1.06	82	33	58.	-3	273	69	83
GLASSBORO	.54	8.20	-.97	81	40	59.	-2	298	104	74
HAMMONTON	1.27	7.00	-1.97	84	33	58.	-3	278	91	72
POMONA	.09	7.10	-1.32	76	32	57.	-3	217	68	40
SEABROOK	.54	8.20	.37	80	46	60.	-2	318	110	56
ATLANTIC CITY MARINA	.12	6.16	-1.80	71	49	57.	-2	179	31	35
SOUTH HARRISON	1.42	8.69	.10	80	38	59	NA	315	NA	NA

WES KLINE — GDD BASE 40 PINEY HOLLOW Last Week 146 (Ending 5/5/03) This Week 127 (Ending 5/12/03)

Spring Issue of Bilingual Newsletter

Check out the Spring issue of Pastos & Paisajes, a quarterly bilingual (Spanish/English) newsletter serving the green industry. This issue includes articles on Managing Crabgrass Without Herbicides, Moon Gardens, and bilingual resources on the web. Articles will prove useful to both English-speaking and Spanish-speaking members of the green industry.

An English-Spanish glossary of terms and phrases is included for those interested in improving their language skills in a second language. Also, the newsletter is formatted with English and Spanish versions of the same article appearing side by side. This gives the reader the opportunity of picking up words and phrases in a second language.

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LAB HIGHLIGHTS FROM PAGE 6

of **winter injury** were identified on samples of rhododendron, holly, juniper, hemlock, acuba, and spruce. Other winter related problems were diagnosed as well including; damage from **de-icing salts** on pear trees along a Bergen County street, and **frost cracks** on a cherry submitted from a Middlesex County residential client. **Cytospora canker** was the disease most identified this period. It was found on apple samples from Mercer County, maple from Ocean County, and spruce from Morris County. Another canker causing fungi *Phomopsis* was identified on holly. It is not uncommon for this fungus to invade winter injured tissues.

Nursery and greenhouse

A Bergen County greenhouse grower submitted begonia that had stunted and yellow leaves. The pH of the potting mix turned out to be very low, which caused **calcium deficiency** symptoms. A simple change in fertilizer formulations and a good liming significantly improved the performance of the crop. A Cumberland County grower sent samples of euonymus to the laboratory that had a number of spots on the new growth. Under the microscope, each spot was ringed with an orange residue. The grower had sprayed the planting with **Surflan** (orange), which apparently was **phytotoxic** to the new shoots. The active ingredient in Surflan would not cause a contact phytotoxicity, but the formulated product could burn certain tissues. Granular products are often used by nurserymen to avoid this situation. ❑

Landscape IPM Manual Available

Landscape IPM: An Alternative Approach to Traditional Landscape Maintenance

This comprehensive 258-page manual includes detailed chapters filled with information from Rutgers Cooperative Extension professionals and others in the field. The easy-to-read text spells out the steps needed for getting started in Landscape IPM, while dozens of figures, drawings and examples help illustrate these practices.

Here is just a sampling of some of the items you'll find in the manual:

- Employee Training: is it Worth it?
- Guide to Insect Pests by Host Plants
- Pest Appearance & Management Timetable
- Growing Degree Days for Key Pests
- Pheromone Traps
- Sample IPM Monitoring and Reporting Forms
- Decision Making Guidelines for Monitoring Beneficial Insects
- Effective Use of Biological Controls
- Turfgrass IPM
- Marketing
- Customer Education

The Manual is available for $10, postage included. Send checks payable to Rutgers, the State University of New Jersey to:

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