

PLANT & PEST ADVISORY

A RUTGERS COOPERATIVE EXTENSION PUBLICATION

Diseases of Turfgrass

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*Brown ring patch in annual bluegrass.
Photo by Richard Buckley, Rutgers Plant
Diagnostic Lab*

General

Red thread, **brown ring patch** and **dollar spot** are very active at this time. The continued cool (upper 60s to low 70s), wet and overcast weather over the last two weeks has definitely encouraged all three diseases. *Ascochyta* blight is also prevalent on Kentucky bluegrass turf in the tri-state region. **Anthracnose** and **fairy rings** are starting to develop on golf course greens throughout the state and should intensify with a return to hot, humid weather.

Ascochyta leaf blight

Although previously mentioned in the May 28th issue of the Plant and Pest Advisory newsletter, **Ascochyta Leaf blight**, caused by several species of the fungus *Ascochyta*, is still prevalent on Kentucky bluegrass plantings due to the continued cool, wet weather. Turf that has a thick thatch layer (2 to 3 inches) 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 leaf “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 black spines. During moist conditions, spores are released and infect healthy turf. Since *Ascochyta* enters grass through wounds, infections are most common just after the grass is mowed. For best results, avoid frequent mowing during wet weather, use a “sharp blade” to avoid excessive leaf shredding, raise the height of cut, water as deeply and infrequently as possible without causing moisture stress, irrigate in the early morning hours, avoid excessive applications of nitrogen and remove excess thatch. This disease was recently added to the 3336 (thiophanate-methyl) label; however, fungicide applications are rarely warranted since affected turf typically recovers with proper maintenance and warmer weather.

Brown Ring Patch (A.k.a. Waitea Patch)

This disease has redeveloped on golf course greens in the region during the past week. **Brown ring patch** is a relatively new disease of annual bluegrass putting greens caused by the fungus *Rhizoctonia circinata* var *circinata* (= *Waitea circinata* var *circinata*). Bentgrass can also be affected, however, annual bluegrass is typically much more susceptible. This disease is similar in appearance to yellow patch, but it can occur at much higher air temperatures (50 to 85°F for brown ring

SEE TURF DISEASES ON PAGE 2

INSIDE

Diseases of Turfgrass.....	1
Plant Diagnostic Lab High- lights	3
Timing of White Grub Treatments in Turfgrass	4
Landscape IPM Pest Notes	4
Botrytis Blight of Peony and other Ornamental Plants.....	6
Weekly Weather Summary	7

patch, compared to 50 to 65°F for yellow patch). We last saw a major outbreak of this disease in late April and early May, but the recent cool, wet and overcast weather has encouraged a resurgence of this disease on many courses. Infested patches become chlorotic and range in size from several inches to three feet in diameter. The centers of patches are frequently green, resulting in a “frog-eye” or “donut-shaped” effect. The outer ring turns necrotic during warm, wet weather and may become depressed as the thatch is decomposed. Since the leaves, crowns and thatch are often infested, **brown ring patch** can be difficult to control with one fungicide application. Azoxystrobin, chlorothalonil, fludioxonil, flutolanil, iprodione, polyoxin-D, propiconazole, and pyraclostrobin have provided good control when used on a curative basis at brown patch rates, but this disease is most effectively suppressed when fungicides are applied on a preventive basis (mid- to late-April in the tri-state area). Multiple applications may be needed and fungicides must be applied in sufficient water to ensure good penetration into the crown and thatch (i.e., at least 2 gal water/1,000 sq ft at 40 to 60 psi). Once controlled with fungicides, symptoms may take 14 to 28 days or more to recover. It is important to note that brown ring patch is not controlled with benzimidazole fungicides.

Dollar Spot

Major **dollar spot** (caused by the fungus *Sclerotinia homoeocarpa*) outbreaks have been reported on greens, tees and fairways over the past few weeks. The recent cool weather and frequent rainfall have encouraged infection, often resulting in reduced intervals of control for many fungicides. To prevent **dollar spot** from causing severe damage again this season, remove dew in the early morning hours, maintain adequate nitrogen fertility, avoid irrigation toward sunset, reduce thatch and apply Armada, Banner, Bayleton, Chipco 26GT, chlorothalonil, ConSyst, Curalan, Eagle, Emerald, Headway, mancozeb, Rubigan, Spectro, thiophanate-methyl, Tartan, Touche, Tourney or Trinity, per manufacturer's recommendations. Repeat fungicide applications as needed through mid-October. To reduce the possibility of developing fungicide resistance, alternate or tank mix fungicides with different modes of action.

Fairy Ring

This disease, caused by a group of fungi known as Basidiomycetes, is visible on golf greens and home lawns at this time. Symptoms may appear as continuous or interrupted rings of dark-green turf. Mushrooms, which are often associated with fairy ring, usually develop in the spring and the fall. Although fungicides are not effective against all of the fungi that cause fairy rings. Bayleton, Headway, Heritage, Insignia, and ProStar have provided good control in many university tests. Moreover, Endorse now registered for the suppression and short term control of this disease. For best results, main-

tain adequate soil moisture and nitrogen fertility to mask symptom expression. Spike affected turf prior to irrigation or the application of fungicides to enhance water movement into the soil profile. The use of surfactants on affected areas may enhance fungicide efficacy and aid in improved water penetration and symptom suppression.

Red Thread

We are seeing major outbreaks of **Red Thread**, caused by the fungus *Laetisaria fuciformis*, on perennial ryegrass, tall fescue, and even Kentucky bluegrass at this time. The cool, wet weather during the last two weeks have provided ideal conditions for disease development. Infections are characterized by the appearance of short red threads (1/16-1/4 inch long) emerging from tan-colored leaf blades. Affected patches are typically pink in color and range from 1 to 6 inches in diameter. Although perennial ryegrass and fine fescue are most susceptible, Kentucky bluegrass, velvet bentgrass and tall fescue may also be affected. **Red thread** is typically found on “hungry” (low fertility) turf during 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 Armada, Banner, Bayleton, Chipco 26GT*, Compass, Curalan*, Eagle, Endorse, Headway, Heritage, Insignia, ProStar, Rubigan, Tartan, Trinity or Touche* per manufacturer's recommendations (*not for use on residential properties).

Turf Field Day

Mark your calendars now for this year's Rutgers Turfgrass Research Field Days which will be held on August 4, 2009 (Golf and Fine Turf Research Field Day at Horticultural Farm II, New Brunswick, NJ) and August 5, 2009 (Landscape and Sports Turf Research Field Day and Equipment Demonstrations at Adelphia Research Farm, Freehold, NJ). Additional information, on-line registration and directions to each location may be obtained at www.njturfgrass.org.



Red thread in higher input turfgrass. Photo by Richard Buckley, Rutgers Plant Diagnostic Lab

Plant Diagnostic Laboratory Highlights

Richard J. Buckley, Director, Soil Testing and
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General interest

Interesting weather pattern we are in - April (cloudy and wet) during the week and June (warm and sunny) on the weekend. While the regular periods of cool, wet weather cramp our style, it is really nice for fungal and bacterial pathogens. Of course, what is good for the fungi is good for the lab!

Turf

We can start with landscape turf and mention the abundance of **red thread** (see photo on page 2) and **dollar spot** in home lawns. It is just amazing how much red thread is out in the landscape. Conventional wisdom suggests that red thread is only found on slow growing grass or in low input turfgrass situations. Most turf pathologists have abandoned that idea, but the conventional wisdom still exists, so some turf managers are surprised when they find the disease on higher input or vigorous turf areas. Here are a couple of things to think about: The fungus does not discriminate and is active when temperature and moisture conditions dictate and is doing its thing regardless of your involvement with the turf stand. The manifestation of disease is the result of the interaction between the fungus, host plant, and environment. Symptom expression is the observable manifestation of disease in the host plant. Symptoms are more visual in slower growing grass than actively growing grass because a vigorous turfgrass has the capacity to replace blighted leaves at a pace equal to or faster than the fungus can take them. In fact, in a higher input turfgrass one might not even notice disease activity without a trained eye and patient observation of the lower canopy. The fungus is there, but most folks can't see it working. Furthermore, low input turf sustains more damage for precisely the same reason. An inability to tolerate the attack is really a reduced ability to replace the blighted canopy and recover from the damage. Pathologists often call the ability of a plant to tolerate and recover from fungal attack a form of resistance. The take home is that sound agronomic practice to sustain an active and vigorously growing turf will reduce the impact of red thread disease by improving the recuperative potential and tolerance of the host and thereby reduce the symptom expression. Make the grass grow faster than the fungus can eat and we all can live happily ever after.

Amazing things are also happening on the golf course during this transition period into summer. **Anthraxnose** was identified on annual bluegrass greens from three Pennsylvania golf courses. **Take-all** was diagnosed on bentgrass greens and fairway turf from

golf courses in Virginia and New Jersey. **Annual bluegrass weevil larvae** were found in great abundance in a sample of annual bluegrass from a Philadelphia golf course. We found more than 15 larvae in a single cup cutter plug, which equates to about 150 per square foot in the field – wonder why that grass was dead? The newly hired superintendent said that almost every green was affected. **Brown ring patch** (see photo on page 1), caused by *Rhizoctonia circinata* var. *circinata* (at least that is what we think it is) flared up in a big way on the Rutgers Turfgrass Research farm after the last round of rain. Temperatures during the storm were in the higher 60's. Lastly and perhaps the most bizarre were the samples of **pink snow mold** and **summer patch** in the same week! The pink snow mold was submitted from a golf course in the Pocono's where the temperatures ranged in the higher 40's and lower 50's during the recent rains. The summer patch samples were from an Ocean County residential site and from an Orange County New York golf course. In each case the grass was off color and then wilted in distinct patches during minor heat stress. Quick thinking turf managers recognized the mild symptoms and sent samples for diagnosis.

Ornamentals

Fire blight is once again the disease of the week for ornamentals. There is just a huge amount of disease out there and we receive samples of ornamental pears almost every day from locations statewide. Fire blight has also been diagnosed on crabapple, but to a lesser degree than on the pears. The crabs have their own problems this year with **cedar-apple rust** and **scab**. In fact, many leaf diseases in shade trees are showing up in epic proportions. The **anthracnose** in sycamore, ash, and oak is spectacular. Speaking of rust, the laboratory had a couple samples of **quince rust** this week. One sample came from service berry and another from hawthorn. Quince rust is a *Gymnosporangium* rust like cedar-apple rust or hawthorn rust and it forms similar reproductive structures. The quick and dirty way to separate quince rust from the other two is to locate the aecia on the fruit and green stems. Cedar-apple rust and **hawthorn rust** form their aecia on the undersides of the leaves. As a result of quince rust activity on the green shoots there will be some branch dieback. Rob Kopf of Dubrow's reminded me the other day, when he brought in a sample of both quince rust and fire blight, that several years ago during a similar spring the quince rust went largely unnoticed and was frequently misdiagnosed as fire blight. Now I can remind you - If you have dieback in a rosaceous host be sure to look closely for stem swellings and the classic orange-spore filled aecia of quince rust before assuming that you have a case of fire blight. □

Timing of White Grub Treatments in Turfgrass

Albrecht M. Koppenhöfer, Ph.D., Specialist in
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Soon they will be flying again, the adults of those pesky white grubs, like **oriental beetle, Japanese beetle, masked chafers, Asiatic garden beetle, European chafer, and green June beetle**. Adult oriental beetles typically peak in abundance from late-June into early July, followed by Japanese beetles about mid-July. Peak adult activity means peak egg-laying which is followed 2-3 weeks later by peak hatching off the eggs. The young first stage larvae are the stage that is the most susceptible to insecticides, and numbers of this stage peak from mid-July to early August.

If an applicator chooses to preventively treat turf for white grubs, the ideal time to do an application would be somewhat earlier than the time of peak first larval stage density to allow the insecticidal active ingredient to reach peak concentration in the target zone, i.e., the thatch and top 1-2 inches of the soil. How much earlier depends on how fast the active ingredient will move through the thatch. Generally, the more water soluble an active ingredient is, the faster it will move downwards into the soil with rain and irrigation water.

However, the application window of most of the newer white grub insecticides is rather wide and many of them can be applied from May into August with little differences in control rates. Reasons for these wide windows are that (1) the active ingredient has a long half-life in the soil allowing earlier applications, (2) the second larval stage of the white grubs is generally still very susceptible to the active ingredient allowing later applications, and/or (3) the recommended application rates are high enough to compensate for 1-3 months of slow active ingredient breakdown in the soil or the lower susceptibility of the larger white grubs.

Imidacloprid (Merit) and thiamethoxam (Meridian) seem to be very effective when applied from May through August, clothianidin (Arena) even from May into September, halofenozide (Mach2) from June through August, and chlorantraniliprole (Acelepryn) from April at least into mid-August.

An interesting new finding is that chlorantraniliprole (Acelepryn) actually tends to be more effective when applied earlier. Due to its very low water solubility (> 5 ppm) chlorantraniliprole takes around 50 days to reach peak concentration in the thatch and 100 days to reach peak concentration in the soil. However, chlorantraniliprole clearly is effective enough to compensate for this slow movement. Averaged over dozens of research trials for each application timing, chlorantraniliprole at 0.1 lb active ingredient per acre applied in April, May,

SEE WHITE GRUB TREATMENTS ON PAGE 6

Landscape IPM Pest Notes

Steven K. Rettke, Ornamental IPM Program Associate

✓ AZALEA LACE BUGS & CULTURAL CONTROLS:

1) When populations are low and plants are small, simply crush the bugs by pressing leaf parts together between the thumb and forefinger. 2) Dislodge nymphs (no wings) with a strong jet spray of water (syringing). Many may not be capable of crawling back to suitable leaves to feed upon and will soon die. 3) Azaleas are rarely excessively damaged by lace bugs when watered sufficiently and planted in shady areas of the landscape. Lace bugs thrive in sunny locations where predators are less numerous. 4) There are several beneficial insects such as spiders, lacewings, assassin bugs and the minute pirate bug that can effectively reduce lace bug populations. Encourage and conserve these predators by avoiding unnecessary cover sprays with broad-spectrum insecticides. Syringing may allow time for beneficials to build-up, and keep damage to a minimum until significant predators arrive.

✓ APHID PREDATORS: Foliar predators of aphids,

such as ladybeetles and big-eyed bugs, cause aphids to drop off plants as a self-defense mechanism. Researchers in Wisconsin showed that up to 60% of aphids will tuck their legs and drop to the ground within 1 hour of exposure to ladybeetles. Meanwhile, there are ground predators of aphids just waiting for a snack, including ground beetles, spiders, ants, and tiger beetles. This combination effect of predators in different habitats is synergistic. Without the foliar predators causing aphids to drop, the ground predators ate few aphids. Alternatively, when foliar predators were present, ground predators ate many aphids. An experiment caging predators and aphids showed a 50% control of aphids with only ground predators, 75% control with only foliar predators, and almost 100% control with both. (Reference: Losey J., IPM Pract. Sept. 97)

✓ SPIDER MITES ON WINGED EUONYMUS: Dur-

ing the hot summer months, two spotted spider mites can cause significant damage to winged euonymus/burning bush (*Euonymus alatus*). Infestations begin to build-up during the month of June on the lower, inner leaves, causing a pale white discoloration. With high populations, foliage throughout the plant turns a reddish-brown coloration by July/August. Note that these same symptoms can be similar to plants experiencing physiological stress. When monitoring these plants, always check for spider mite presence by using a beating tray and a magnifier (10x-15x). Make sure live mites are present before treating!

Early detection of two-spotted mites on burning bush is critical to prevent the discoloration and premature

SEE LANDSCAPE IPM ON PAGE 5

defoliation. Plants known to have had a history with this pest should be monitored at least every two weeks throughout the summer months. Proper timing of chemical controls should give excellent results. The many-labeled contact miticides will usually work well when coverage is complete. Horticultural oil can be effective if used cautiously (be careful of drought stressed plants and hot/humid weather). Target the spray treatments to the under sides of leaves.

✓ **OAK SPIDER MITES:** The infestation and damage levels by most of our “warm season” spider mites typically become active during June and continue throughout the summer months. When monitoring oaks, look for the characteristic bronze discoloration on the upper leaf surfaces of mostly red oak group species (can also occasionally be found feeding on birch, chestnut, beech, elm and hickory). Eggs are generally deposited on upper leaf surfaces, along the mid-vein. Multiple generations occur with peak populations in mid to late summer. After egg hatch in the late spring (e.g., June), controls should be applied before large populations build-up by mid-summer. Over-wintering eggs can be controlled with dormant horticultural oil. Elongated silk webbing may protect over wintering egg masses during very heavy infestations. Areas of the trunk and branches can have the appearance of rusty fiberglass. This silk webbing may be difficult to penetrate with horticultural oils.

✓ **PREDACEOUS MITES:** Be on the lookout for beneficial mites that can commonly be found in and amongst two-spotted spider mite populations. These “good” mites naturally keep the “bad” two-spotted mites under control. Common predaceous mites are in the family *Phytoseiidae*. Phytoseiid mites lay their eggs singly in spider mite populations on the bottom surface of leaves along the veins. Their eggs are about the same size as spider mite eggs. All stages of Phytoseiid mites are oval and shiny-white to tan in color. These adult predaceous mites can be distinguished from adult spider mites by their shiny, unspotted pear shape with hairs that are less noticeable than spider mites. On a beating tray, they also move *much faster* than spider mites.

During a lifetime, a predaceous mite can consume an average of 20 pest mites, with some species consuming more than 100 each. Adult females lay about 60 eggs over several days, and even more if a greater number of prey mites are present. Mated females over-winter in deep bark crevices. (Reference: Davidson, J.; *Landscape IPM Guidelines for Trees & Shrubs, U. of MD. Bull. 350*)

✓ **SOFT SCALE SPECIES CONTROLS (JUNE & JULY):** Compared to armored scales, the soft scales are relatively easy to suppress with either contact sprays or systemic treatments. Some of the common landscape soft scale species include *Calico*, *Fletcher*, *Wax*, *Terrapin*, *Cottony Maple*, *Lecanium*, *Cottony Taxus*, *Pine Tortoise*, *Striped Pine*, and *Spruce Bud*. Although large soft scale

adult females are more difficult to control, the immature nymphs are highly vulnerable to sprays when good coverage is achieved.

There are numerous windows of control opportunities when applying sprays or systemic treatments against soft scales. (1) The best window for control when using spray treatments is toward the crawler emergence period. With only two major exceptions (*Magnolia* & *Tuliptree* scales), all other soft scale species produce crawlers during the months of June or July. Although scale crawlers are only 2 to 3 times the size of spider mites, they are usually clearly visible without magnification. Most crawlers have a yellowish or reddish coloration. (2) Sprays can also be successfully targeted against the settled 1st instar nymph stage feeding on foliage or bark during the growing season. Achieving adequate coverage to foliage is the major challenge with large deciduous shade trees since the settled nymphs feed on the undersides of leaves along major veins. (3) In addition, dormant oil treatments can be applied in the late fall or early spring to the over-wintering 2nd instar nymphs on deciduous hosts. These nymphs have a black or brown coloration and are considerably larger than the crawlers and 1st instar nymphs. They can be observed in clusters on the bark of twigs, branches or trunks. (4) Finally, since soft scales are vascular feeders (phloem or xylem), root absorbed systemic insecticides such as imidacloprid (Merit) or dinotefuran (Safari) have provided better than 90% control rates. Root systemic treatments can be applied as a drench or be soil injected any time during the year as long as the ground is not frozen. Fall or spring applications are most typical. Having adequate soil moisture is a key factor to ensure success when applying root systemic treatments.

✓ **JUNIPER SCALE (707-1260 GDD):** This imported armored scale insect is found on the foliage and twigs of juniper (occasionally arborvitae). The female covers are circular and white (1/16 inch in diameter); the male covers are white and elongated and are even smaller in size. With light infestations there is often no apparent symptoms. Significant populations of 10 or more scales per 1/2 inch of twig can result in yellowed foliage and needle drop. Dieback can occur with high populations. Scales usually build up first on the south side of shrubs or on the side against buildings.

Adult females over-winter on the foliage and there is only one generation each year. Crawlers start hatching by mid-June and can continue well into July. Controls may not be required if many beneficials are present (monitor for parasitoid exit holes in covers and for dusty-wings and ladybeetles). Dormant oil sprays can be used and summer oils or insecticidal soaps can be targeted against the crawlers. A late summer systemic insecticide such as acephate (Orthene) can be applied if the crawler stage is missed.

SEE SCALES ON PAGE 7

Botrytis Blight of Peony and other Ornamental Plants

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

Before recent rains pummeled the peonies in many landscapes (mine, included), many shrubs were also affected by **Botrytis blight**, a fungal disease that is most prevalent during overcast and wet or humid weather.

Botrytis blight (gray mold) in general

Botrytis blight is a very common disease of many landscape, nursery, and greenhouse ornamentals. The widely distributed cause of Botrytis blight, *Botrytis cinerea*, readily colonizes dead organic matter and, under the right conditions attacks many different species of plants (e.g., begonia, carnation, chrysanthemum, cyclamen, geranium, impatiens, marigold, peony, petunia, and tulip). Although symptoms most often appear on flowers and leaves, other plant parts, such as stems, buds, and roots, can also be attacked by the pathogen.

In many ornamental hosts, leaves and petals affected by Botrytis blight may appear faded or have tan, irregular spots. If infected during the bud stage, tissues appear water soaked and the buds will fail to open. Under conditions of high humidity (> 85%), the fungus produces a characteristic gray, fuzzy mycelium on infected tissue. Spores produced on the mycelium move throughout the greenhouse or outdoor planting on air currents. The spores penetrate tissues most often through wounds. During propagation, spores may also lodge on surfaces of stems on stock plants, and when cuttings are taken and stuck in the propagating bench, the spores germinate and cause a basal cutting rot. The fungus persists as small hardy structures called sclerotia and in plant debris as well.

To manage Botrytis blight, manage the moisture and practice good sanitation to remove potential sources of fungal inoculum. Keep relative humidity low (by adequately spacing plants to promote good air circulation) and avoid any type of overhead watering, especially in beds where *Botrytis* has been a problem in the past. When the weather is dry, remove infected blossoms and other plant parts as part of your regular sanitation program—senescent and dead plant tissues are readily colonized and may serve as a “base” from which the fungus spreads to healthy tissue. Avoid mechanical injury. For bulb crops such as tulip, look for diseased bulbs and discard them.

Botrytis blight of peony (since we were speaking of peonies)

Botrytis blight in peony develops in early spring as young shoots affected by the disease wilt, blight, and turn black. In more mature plants, the fungus attacks the flowers (which are blighted or fail to open) and progresses to cause tan-colored lesions on leaves and stems. Affected tissues die prematurely, and you may

see the fuzzy mycelium characteristic of this fungus during very humid weather.

Management of Botrytis blight in peony is best achieved using the moisture management and sanitation methods described above. Carefully inspect, remove, and discard diseased leaves, blossoms, and shoots during dry weather. As part of your routine, remove spent flower blossoms promptly, and cut peony stalks at or below ground level in the fall to remove any fungal sclerotia that might have developed during the summer.

Chemical control

Products labeled for control of Botrytis blight on one or more ornamentals include azoxystrobin, captan, chlorothalonil, ConSyst, copper, dicloran, Exotherm-Termil, fenhexamid, ferbam, fludioxonil, iprodione, Junction, mancozeb, myclobutanil, potassium bicarbonate, Spectro, Sporan, sulfur, SysStar, trifloxystrobin, thiophanate-methyl, triflumizole, or Zyban may be used. Some of these products are for use in enclosed structures (greenhouses) only; check label for hosts, timing, and rates. No endorsement or preference of pesticides is implied. Follow all label directions carefully when applying pesticides.

For peonies, a fungicide labeled for peonies may be considered where Botrytis blight has been a problem in the past. Products include copper, Junction, mancozeb, maneb, and triflumizole. When consistent with the label, apply when shoots emerge through the ground and repeat at the appropriate interval.

NOTE: Although compounds containing thiophanate-methyl or iprodione are registered for control of Botrytis blight or gray mold, isolates of *Botrytis* that are resistant to these compounds may be present. If a treatment applied as per label recommendations is not effective, shortening the interval or increasing the rate will not improve disease control. As a result, another fungicide should be used. To reduce the possibility of fungal resistance in the future, avoid the sole use of any fungicide for extended periods of time when other reliable products are available. □

WHITE GRUB TREATMENT FROM PAGE 4

June, July, and August has provided 96%, 94%, 91%, 88%, and 79% control, respectively, of all the major white grub species. However, even the 79% control in August is at least as good as what one can expect with an application of trichlorfon (Dylox) and certainly good enough to suppress white grub damage.

As always, keep in mind that repeated application of the same insecticide class year after year could lead to insecticide resistance and/or enhanced microbial degradation of the compound. Enhanced microbial degradation would be particularly problematic if the compound is applied several weeks to months before the presence of the target (i.e., before July). Therefore regularly rotate insecticides from different insecticide classes. Earlier applications are also more likely to interfere with naturally occurring predators and parasites of white grubs and other turfgrass insect pests. Applications before July or even June should therefore be reserved for cases where there is some additional benefit such as suppression of other insect pests with damage potential. □

Weekly Weather Summary

Keith Arnesen, Ph.D., Agricultural Meteorologist

Temperatures averaged below normal, averaging 62 degrees north, 65 degrees central and 65 degrees south. Extremes were 90 degrees at Pomona on the 3rd, and 39 degrees at Charlotteburg on the 2nd. Weekly rainfall averaged 1.65 inches north, 2.19 inches central, and 2.38 inches south. The heaviest 24 hour total reported was 1.72 inches at Pomona on the 5th to 6th. Estimated soil moisture, in percent of field capacity, this past week averaged 96 percent north, 93 percent central and 90 percent south. Four inch soil temperatures averaged 61 degrees north, 64 degrees central and 65 degrees south.

Weather Summary for the Week Ending 8 am Monday 6/ 8/ 9										
WEATHER STATIONS	RAINFALL			TEMPERATURE				GDD BASE50		MON %FC
	WEEK	TOTAL	DEP	MX	MN	AVG	DEP	TOT	DEP	
BELVIDERE BRIDGE	1.53	11.00	-1.41	81	45	62.	-4	528	64	92
CANOE BROOK *	2.56	9.03	-4.56	86	40	61.	-5	472	45	94
CHARLOTTEBURG	1.20	9.40	-4.11	82	39	62.	-1	479	170	94
FLEMINGTON	1.87	12.74	-.16	85	52	64.	-2	622	175	95
NEWTON	1.09	8.31	-3.76	80	41	61.	-3	525	165	94
FREEHOLD	2.38	13.28	.47	84	55	66.	-2	651	131	93
LONG BRANCH	1.93	14.00	.91	82	50	64.	-3	533	67	87
NEW BRUNSWICK	2.62	13.70	1.12	84	54	66.	-3	641	83	95
TOMS RIVER	1.69	12.53	-.22	86	44	64.	-1	571	98	87
TRENTON	2.34	12.08	.48	83	44	64.	-5	708	103	87
CAPE MAY COURT HOUSE	2.27	13.13	1.88	87	48	64.	-3	661	131	89
DOWNSTOWN	2.26	11.14	-.37	86	43	64.	-5	700	81	89
GLASSBORO	2.19	15.09	2.76	84	52	68.	-1	733	134	87
HAMMONTON	2.10	11.22	-.78	88	45	66.	-3	767	177	86
POMONA	2.60	14.07	3.02	90	43	65.	-2	741	226	87
SEABROOK	2.85	12.98	2.24	87	50	64.	-5	699	75	88
SOUTH HARRISON *	1.99	4.80	-7.27	86	47	65	NA	NA	NA	NA

* missing several weeks of data
WES KLINE -- GDD BASE 40 PINEY HOLLOW LAST WEEK 192 (Ending 6/1/09) THIS WEEK 168 (Ending 6/8/09)
TOTAL UNITS BASE 40 FOR FEBRUARY=55

SCALES FROM PAGE 5

✓ **SCALES AND BIOLOGICAL CONTROLS:** It is generally understood that wasp parasitoids are capable of providing effective biological controls for reducing scale pest populations. Research has shown this to be particularly true for the suppression of armored scale insects. The larvae of parasitoids feed on the adult scales beneath their protective waxy cover. It is impractical in the field to monitor for the level of suppression by turning over the covers and examining individual insects with a hand-lens. A more effective method is to observe characteristic circular holes in the scale covers that are created by emerging adult wasps. There is usually only one exit hole per scale cover. If irregular or jagged holes are noticed in the covers, then lady beetle predators were probably present.

When inspecting scale infestations, if a large number of covers are seen having circular exit holes, then it is recommended that insecticide sprays not be made. The conservative use of control sprays is especially suggested if scale population densities are low and no plant symptoms are evident. Numerous studies have indicated that the random or non-timed spraying of various insecticides against armored scale populations in the field is often counterproductive. Many times scale populations can be successfully suppressed by wasp parasitoids, but this ability is compromised when sprays are applied. All too often, improperly applied insecticides destroy beneficial parasitoids, have little impact on the scale pest populations, and actually may cause scale populations to increase.

✓ **MID-SEASON LEAF DROP:** When the leaves of large shade trees drop during mid-season, it typically causes alarm to concerned homeowners/clients. With the ground littered with spent foliage, the conclusion often is that "their favorite shade tree is dying!" Linden, birch, and sycamore trees are often most susceptible to mid-season leaf drop. In a majority of cases, this is a normal physiological growth habit for these species. The trees commonly drop foliage in mid-season in order to reduce leaf surface area and subsequent water loss. This leaf shedding ability is especially important during typical summer droughts or when water availability in soils is limited. Neither tree health nor tree growth is usually affected. □



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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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