**Insect control guide:**

**Extreme heat compounds insect problems**

*We can't control the weather, but an understanding of its effects on pests and their control can be useful.*

*by R.L. BRANDENBURG, Ph.D./N.C. State University*

Why would a sudden change of weather create unusual insect problems? The answer goes beyond insects being cold-blooded and controlled by temperature. Some insects simply survive better on stressed turf. At other times, certain insects will become a problem because the unusual weather patterns may allow them to escape their natural controls.

Hot and dry weather favors chinch bugs because a fungal disease that often keeps them in check doesn't perform well under those conditions. Cool, wet springs may lead to more cutworm problems in the summer. Unusually hot, dry conditions may result in more armyworms in the turfgrass as other food sources are depleted. This alerts us to potential pest outbreaks, but does not replace the need for turf monitoring and scouting.

**How to calculate degree-days**

1) Record the maximum and minimum temperature for the day.
2) Add the two numbers.
3) Divide by 2 for an “average temperature.”
4) Subtract 50°F (insect development threshold temperature).
5) The sum is the number of degree-days for that day.

A negative number is not used since it means no development occurred. If the minimum temperature for a day was 60°F, and the temperature was 80°F, then the average would be 70°F (80+60=140÷2=70).

Subtracting the 50°F threshold would yield 20. This is the number of degree-days recorded for that day.

The effectiveness of various control measures can be dramatically affected by the weather. Cool weather may render the insects less active and the insecticides less effective. Rainy weather can reduce the effectiveness of insecticides applied for control of foliar pests. However, the hot, dry conditions we had during 1995 often have the greatest impact on control efficacy. The management of soil pests such as grubs and mole crickets is adversely affected in a number of ways. The hot, dry soil surface may cause insecticides to bind to organic matter or to vaporize. Either way, less insecticide is available to the target site.

Control of soil insects requires that the insecticide be moved down into the soil. The longer the insecticide is on a hot, dry surface, the more likely it is to be degraded by sunlight.

**Irrigation**

Moisture from rainfall or man-made irrigation systems is made even more impor-
A - White grub populations and the efficacy of control can be affected by weather.

B - Natural enemies, such as this beetle larva dining on a caterpillar pupa—can be affected by weather.

C - The hot, dry weather of North Carolina caused sporadic outbreaks of sod webworms, as the moths laid eggs in drought prone areas.

Biological materials, such as entomogenous nematodes are just as susceptible (if not more so) to hot, dry conditions as conventional synthetic insecticides.

A good scouting program and attention to detail while applying insecticides can help you manage insect pests through adverse weather conditions. 

**TURFGRASS PEST CONTROL CALENDAR**

When to scout for insects and mites

<table>
<thead>
<tr>
<th>Pests</th>
<th>I*</th>
<th>P**</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
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<td>Armyworms and cutworms</td>
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<td>Bees and wasps</td>
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<td>Chinch bugs</td>
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<td>Green June beetles</td>
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<td>Ground pearls</td>
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<td>Leafhoppers and spittlebugs</td>
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*Degree of importance as pest: I= Important pest, frequent occurrence; II= Usually present, but generally not a pest; III= Occasional pest, treat when detected.

**Preferred grass species: A= Centipedegrass, fescue, and many other grasses; B= Saint Augustinegrass; C= Fescue; D= Bluegrass; E= Bermudagrass; F= Zoysiagrass; G= Bentgrass; H= Bahiagrass.

S= Sprays; Gr= Granules; Ba= Baits; M= Maintain the turf in healthy condition, irrigate.
Disease control guide:

For warm-season disease control: know your turf!

by BRUCE MARTIN, Ph.D. / Clemson University

Diseases can seriously limit the successful culture of warm-season turfgrasses. Fungi are most of the living causal agents of disease in warm-season grasses, but nematodes are a problem, too, particularly in sandy soils.

Successfully managing diseases in warm-season grasses depends on knowing the requirements of the particular grass in question, the biology of the pathogens, and good turf horticultural practices. Pesticide applications are valuable in an overall integrated pest management system, but they must be used responsibly.

Brown patch

A major disease of cool-season grasses, brown patch also commonly attacks warm-season grasses, including bermudagrass, St. Augustinegrass, centipedegrass and zoysiagrass. The primary causal agent is Rhizoctonia solani, but the strain which causes the disease differs from those encountered as pathogens of cool-season grasses.

Brown patch symptoms appear in the spring, as the turfgrass is breaking dormancy, or in the fall, as the turfgrass approaches dormancy. Individual disease patches may be 20 or more feet in diameter. Shoots along the outer border of patches usually are yellow due to rotted leaf sheaths near the soil surface.

Dollar spot

This disease occurs on all of the warm-season turfgrasses, but gets severe in bermudagrass.
and zoysiagrass. Best conditions for dollar spot are warm, humid weather. Dollar spot can be more severe on nitrogen-deficient turf or turf that has become drought stressed before rain or high humidities occur.

Symptoms differ depending on the grass's height of cut. On turf cut low, patches of about one to two inches in diameter develop. On higher-cut turf, patches may exceed five inches in diameter. Characteristic leaf lesions are a bleached tan with distinct reddish brown or purplish margins. Leaves may become girdled. In early morning, it is not uncommon to see a gray mycelial growth.

**Spring dead spot**

Spring dead spot of bermudagrass occurs in transition zone areas of the U.S. It is common in the Piedmont and mountain areas of the Carolinas and Georgia, but rare in the coastal regions. Hybrid bermudagrasses are particularly susceptible, but common types may also be afflicted. Several fungi probably cause this disease. All are relatively slow-growing, root-colonizing fungi.

Symptoms include dead circular areas of turf, two or three feet in diameter, found in spring as bermudagrass breaks dormancy. Patches of diseased turf may persist for several years. Older patches develop a “frog-eye” symptom with poor air movement. Infections occur on leaves and stolons, first as small brown spots with a distinct brown color, to a purple border around the infected tissue. Lesions may become very numerous and expand to completely consume leaves and girdle stolons. Severe infections may leave turf with a scorched appearance. The disease is sometimes called “blast” due to this symptom.

**Leaf spot**

*Bipolaris sorokiniana* causes leaf, crown and root diseases of bermudagrass and zoysiagrass during warm, wet weather in midsummer. The diseases start as leaf spots, and may progress to crown and root rots. *Exserohilum rostratum* has been reported to cause a leaf spot of St. Augustinegrass and bermudagrass. However, these diseases are rarely severe where these grasses are cultured in open, sunny locations, with good soil drainage. If they occur, it may be a sign of other stresses to the turf that can be managed culturally.

On bermudagrass or zoysiagrass, small dark brown lesions appear on leaf blades and sheaths and may expand to larger, irregular, straw-colored lesions. Stolons and roots may develop a dark, or dry rot. The turf may brown and thin, over a period of weeks or months.

**Pythium diseases**

More of a problem in cool-season grasses, some Pythium species cause general decline by infection of roots.

St. Augustinegrass is susceptible during prolonged warm, wet periods. Poor surface and subsurface drainage favors pythium fungi, and encourages algae in areas where disease has weakened the grass.

**Fairy ring**

Symptoms appear as rings or arcs of green, stimulated turf which may be accompanied by declining grass and mushroom formation. Problems develop when mushroom mycelia accumulate in the soil and dry it out. Fairy rings may persist and increase in diameter over years. The fungi may colonize old roots, stumps, or thatch, or may be mycorrhizal on living trees. Newly-constructed putting greens may develop infestations after only a few months or years.

**Nematodes**

Turf infested with damaging nematode species appears unthrifty; weeds invade weak or dead areas. Infested areas tend to wilt prematurely, even when adequate soil moisture is available. In most cases, nematodes occur in very sandy soils. LM

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**CONTROL PRODUCTS FOR WARM-SEASON TURF DISEASES**

<table>
<thead>
<tr>
<th>Disease</th>
<th>Products</th>
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<tr>
<td>Brown patch</td>
<td>Eagle WSP; Daconil 2787F; Daconil 90WDG;</td>
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<td>Daconil Ultrex; Prostar 50 WP; Bayleton 25</td>
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<td>WP; Banner 14.3EC; Rubigan AS; Chipco 26019</td>
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<td>50WP; Chipco 26019 23.3%F; Fore 37%F; Fore</td>
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<td>80WP; Terraclor 75 WP; Turfside 10G; Curalan</td>
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<td>41.3% F; Curalan DF; Cleary's 3336 50WP;</td>
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<td>Cleary's 3336 46%F; Sentinel 40WG</td>
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<tr>
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<td>25WP; Curalan 50WP; Curalan DF, Rubigan AS;</td>
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<td>Chipco 26019 50WP; Chipco 26109; 23.3%F;</td>
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<td>Fore 80WP; Cleary's 3336 50WP; Cleary's 3336</td>
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<td>46%F; Vorlan DF; Vorlan Flo; Sentinel 40WG</td>
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<tr>
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<td>Gray leaf spot</td>
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<td>Ultrex; Banner 14.3%EC; Sentinel 40WG</td>
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<tr>
<td>Leaf spot</td>
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<td>Chipco 26019 50WP; Chipco 26109 23.3%F;</td>
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<td></td>
<td>Banner 14.3%EC; Curalan 50WP; Curalan Flo;</td>
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<td>Vorlan DF; Vorlan Flo; Fore 37%F; Fore 80WP</td>
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<td>Eagle WSP</td>
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<tr>
<td>Pythium diseases</td>
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<td>Subdue 2G; Banol 6E</td>
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<tr>
<td>Fairy rings</td>
<td>Prostar 50WP</td>
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<tr>
<td>Nematodes</td>
<td>Mocap 10G; Nemacur 10G; Nemacur 3E</td>
</tr>
</tbody>
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Note: each product has specific use rates and intervals. Read labels and follow specifications as listed on label.

SOURCE: DR. MARTIN