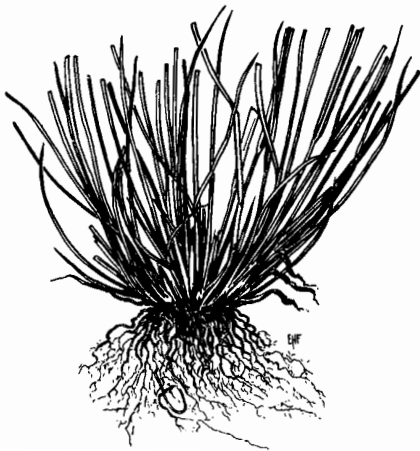


PLANT & PEST ADVISORY

LANDSCAPE, NURSERY & TURF EDITION \$1.50

JUNE 17, 1999



Diseases of Turfgrass

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

General

Brown patch has been quite severe on greens and tees during the past few days. This disease should continue to be troublesome as long as the weather remains hot and humid. **Take-all patch** is still apparent on bentgrass turf. **Anthracnose, dollar spot** and **red thread** are also very prevalent on golf and landscape turf at this time. Since all three diseases are stimulated by environmental and cultural stress, maintain optimum turf vigor (i.e., provide adequate soil fertility and moisture) to reduce disease severity. Refer to recent issues of this newsletter for complete disease control recommendations.

Anthracnose

This disease, caused by the fungus *Colletotrichum graminicola*, is apparent on bentgrass, annual bluegrass, fine fescue, perennial ryegrass, and Kentucky bluegrass at this time. The fungus typically attacks turf growing under low soil fertility and/or heat and drought 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, and raise the cutting height (when possible). Apply Banner, Bayleton, Cleary 3336, Daconil, Eagle, Fungo, Heritage, Manicure, Rubigan, Sentinel, or Thalonil on a preventive basis, per manufacturer's recommendations. Once the disease develops, good results have been obtained with a tank mix combination of Bayleton 50DF (1 oz/1000 ft²) + Daconil Ultrex 82.5 WDG (2.8 to 5.5 oz /1000 ft²) or Cleary 3336 50W (4 to 6 oz) + Daconil Ultrex 82.5 WDG (2.8 to 5.5 oz/1000 ft²).

Brown Patch

This disease, caused by the fungus *Rhizoctonia solani*, developed recently on tees, greens, and home lawns due to the hot, humid weather. To reduce the incidence and severity of **brown patch**, avoid nitrogen applications during hot weather, irrigate between midnight and 8 a.m. to reduce the period of leaf wetness, and spray turf with Banner (preventive only), Chipco 26019, Cleary 3336, Curalan, Daconil, Eagle, Fungo, Heritage, mancozeb, Manicure, Prostar, Sentinel, Thalonil, or Touche per manufacturer's recommendations.

SEE TURFGRASS ON PAGE 2

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Fairy Ring

This disease, caused by a group of fungi known as *basidiomycetes*, is starting to show up on golf greens and home lawns at this time. Symptoms typically 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 chemicals have been relatively ineffective against these fungi in the past, Prostar has shown promise in university tests. For best results, maintain adequate soil moisture and fertility to mask symptom expression. Spike affected turf prior to irrigation or the application of fungicides to enhance water movement into the soil profile.

Powdery Mildew

This disease has been identified on landscape turf recently. In most cases, **powdery mildew** occurs in shaded areas and on lawns with poor air circulation. Although control is usually not required, present infections may be checked with Banner, Bayleton, Eagle, Rubigan, or Sentinel, if desired.

Summer Patch

Now is the best time to apply a second preventive fungicide application for the control of **summer patch** in areas prone to this disease. For optimum results, apply Banner MAXX 1.3MC (4 fl oz product/1000 ft²), Rubigan 50W (4 oz product/1000 ft²), Bayleton 50DF (2.0 oz product/1000 ft²), or Heritage 50WG (0.4 oz product/1000 ft²) in 4 to 5 gal of water/1000 ft² every 28 days.. If fungicides cannot be applied with that much water, irrigate them into the thatch immediately with 1/16 to 1/8 inch of water. Aerification and improved drainage will also aid in disease suppression. Soil pH should be maintained at or slightly below 6.0 for best results.

Turf Field Days

The **Landscape Turf Research Field Day** will be held July 29, 1999 at the Plant Science Research Farm in Adelphia, NJ. Registration will begin at 8:00 AM. Guided field tours will commence at 9:00 AM and will conclude at 3:30 PM, "rain or shine". The **Golf Turf Research Field Day** will be held on August 5, 1999 at the Turf Research Farm (Ryders Lane) in North Brunswick, NJ. This event starts at 12:30 PM (registration); field tours will run from 1:30 to 5:00 PM. The cost of registration will be \$20 (\$30 with lunch) for the July 29 field day and \$25 for the August 5 event. Recertification credits will be available at the conclusion of each program. Call (732) 932-9400 Ext. 339 for further information or directions. □

Plant Diagnostic Lab Highlights

Richard Buckley, Laboratory Coordinator

Turfgrass

The last two weeks brought on our first taste of summer heat stress. The impact on turf was predictable. Golf greens with high populations of annual bluegrass thinned and yellowed. The fungus *Colletotrichum graminicola*, the cause of **anthracnose**, took advantage of the situation. **Anthracnose** was diagnosed on samples of golf greens from Middlesex, Burlington, Atlantic, Camden, and Cape May Counties. High populations of **plant parasitic nematodes** were also associated with some of the samples with **anthracnose**. **Fairy ring** symptoms also kicked in on several golf greens. Problems were most severe on golf greens that were being prepared for tournaments. Samples of **fairy ring** were sent to the laboratory from Somerset County, and from golf courses in New York, Pennsylvania, and Connecticut. **Take-all patch**, caused by the fungus *Gaeumannomyces graminis*, continued to be a problem during the period. Samples of bentgrass with **take-all** were submitted from Mercer and Sussex Counties. On landscape turf, **leaf spot diseases**, caused by *Drechslera poae* (Kentucky bluegrass), *Drechslera dictyoides* (fescues), and *Drechslera siccans* (perennial ryegrass) continue to dominate submissions to the laboratory.

Landscape

One might call this the year of the mite! Several samples of Bradford pear with **pearleaf blister mite** were submitted this week alone. This **eriophyid mite** causes scabby growths on the leaf surface. **Nail galls**, caused by another eriophyid, were identified on a linden leaf from Somerset County. **Spruce mite** was also quite active this spring. The laboratory gets samples of various pines, firs, and spruces each day with symptoms of mite activity. **Globose scale**, *Sphaerolecanium prunastri*, was active on two samples of purple-leaf plum sent to the laboratory from Middlesex County. Other insect problems of note this period include **oleander aphids**, **pine needle scale**, **pine bark adelgid**, and **iris borer**.

On the disease front, **ash rust** is the disease of the week. Several samples of the disease were submitted from Middlesex County. Although it was relatively dry during budbreak this spring, two samples of **oak anthracnose** were diagnosed on leaf tissue from trees in Mercer and Middlesex Counties. **Shade tree anthracnose** has not been the problem it was last year. **Cytospora canker** was diagnosed on red maple samples from Atlantic, Bergen and Mercer Counties. **Nectria canker** was identified on contorted filbert twigs sent to us from Union County. Samples of lily from Bergen County, elephant ears from Monmouth County, and periwinkle from Camden County had **rhizoctonia root and crown rot**. **Dutch elm disease** was confirmed in samples of elm from Mercer and Union Counties. □

Diseases of Ornamentals

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

Powdery Mildew in Landscape Ornamentals

Summer is the time for one of the most common diseases of woody shrubs and shade trees - **powdery mildew**. Look for this disease on hosts such as ash, azalea and rhododendron, catalpa, flowering cherry, crabapple, crape myrtle, dogwood, elm, euonymus, hydrangea, lilac, oak, and rose. The fungi that cause **powdery mildew** grow superficially on leaf surfaces in light-colored, "powdery" mats. In many cases, **powdery mildew** does not result in serious harm to the host plant.

During the last three growing seasons, we observed an increase of **powdery mildew** on flowering dogwood (*Cornus florida*) in New Jersey landscapes. By late summer, leaves on affected trees were covered with the white, powdery growth of the mildew fungus. Other symptoms associated with the disease included leaf yellowing, reddening, blotch, distortion, and scorch. Since the growth of severely diseased trees may be adversely affected, watch susceptible trees closely this year for the mildew fungus. Dogwoods that appear to be less troubled by this disease include *Cornus kousa* and *C. florida* X *C. kousa* hybrids.

To manage **powdery mildew** in ornamental plantings, reduce humidity through proper spacing and weed control. Practices that promote succulent growth, including pruning and nitrogen fertilizing, should be avoided on susceptible hosts. There are a number of fungicides labeled for control of this disease on one or more hosts. These compounds, including AQ10 (*Ampelomyces quisqualis*), chlorothalonil, copper (Champ, Kocide, Phyton 27), dinocap, fenarimol, horticultural oil (neem, JMS Stylet-Oil, or SunSpray Ultra-Fine Oil), myclobutanil, propiconazole, thiophanate-methyl, triadimefon, triforine, Ziram, or combination products that contain thiophanate-methyl (Benefit, Zyban, or Duosan), are best applied at the first sign of disease and repeated according to label recommendations. Other compounds labeled for control of powdery mildew only in enclosed structures, include kresoxim-methyl (greenhouse only) or triflumizole. Most of these compounds are applied at the first sign of disease; however, consult the label for timing, rates, and appropriate hosts.

Anthracnose of Shade Trees

Look for **anthracnose** this year on sycamore, ash, maple, oak, and walnut. Diseased leaves appear "scorched" along veins and leaf margins, and twig and branch dieback may occur on trees in poor health. Leaves infected with anthracnose are often shed by mid-summer. It is too late to spray for this disease now. If desired, some control of this disease can be

obtained *next season* with foliar applications of fungicides. Refer to previous issues of this newsletter for further information.

Black Spot of Elm

Look for **black spot** on elms infected this past spring with the black spot fungus, *Gnomonia ulmea*. It's too late to spray for this disease now; for management *next season*, apply mancozeb to emerging leaves and repeat 10 and 20 days later.

Dutch Elm Disease

In New Jersey, **Dutch elm disease** appears on affected American elms in June, July, and August. Affected branches throughout the crown will rapidly turn yellow and wilt (or flag). Black streaking may be evident in the vascular tissue just beneath the bark. The most effective means of saving infected trees includes prompt removal of diseased limbs up to 10 feet behind yellowed foliage. For best results in the future, control bark beetles with dormant applications of methoxychlor, remove dead or dying elms as soon as they are noticed, and debark or burn dead wood prior to beetle emergence next spring. To prevent root graft transmission of this disease, dig a trench (3 ft. deep) midway between diseased and healthy elms, or apply Vapam per manufacturer's recommendations. In addition, valuable trees may be injected on a preventive basis with Alamo, Arbotect, or Phyton 27 as per manufacturer's recommendations. When trees exhibit more than 5% crown symptoms, fungicide injection may be ineffective.

Fusarium Wilt of Mimosa

In southern counties, mimosa trees that have not broken bud may exhibit symptoms of **Fusarium wilt**. This disease is characterized by a dark brown to purple-colored streaking in the sapwood. Fungicides are not effective against this disease. In the future, prune dead wood during dry weather and increase tree vigor through proper fertilization and irrigation. □

Ornamental Insect/Disease Clinic

June 23, 1999, 9:30 am – 11:30 am

Rutgers Display Gardens, New Brunswick, NJ

- ❖ A hands-on two hour walking tour featuring key ornamental insects and diseases
- ❖ Learn to identify and monitor pests in the field, up close and personal with Rutgers Cooperative Extension faculty
- ❖ IPM control measures and monitoring will be discussed

Rain or shine. Cost \$5.00. Pesticide credits in category 3A. Call for reservations and directions, Rutgers Cooperative Extension of Ocean County (732) 349-1246

Managing Two Spotted Spider Mites on Garden Flowers

Jim Willmott, Camden County Agricultural Agent

Flowering annual plants such as impatiens, begonias, marigolds, and perennials such as daylilies, and rudbeckia are popular choices for color in residential and commercial landscape plantings. Unfortunately pests often spoil the display. Spider mites are one of the most common. When it's hot, populations build quickly. Management requires a proactive, comprehensive, integrated management strategy. First, consider important facts about mites.

Mites are not insects. They are more closely related to spiders. Several types are economically significant including spider, false spider, broad, cyclamen and eriophyid mites. While all of these may be troublesome, the two spotted spider mite (TSSM), *Tetranychus urticae*, is the most common, attacking over 300 species of plants by piercing plant cells and sucking up the contents. At first, only a few tiny spots or stipples may be evident, but soon plants appear bronzed or white with "spider-like" webbing.

Two spotted spider mites have a simple life cycle beginning with eggs and then passing through two nymphal stages before reaching the adult stage. During hot summer conditions, a complete generation takes as few as 5 days. With females laying as many as 100 eggs, populations can build in a very short time. Mites move quickly, especially if plant spacing is close. They can be transported by air currents, animals or plant handling.

Preventative management begins with exclusion from landscape plantings. Inspect plants carefully before purchasing. Mites are small and hard to see, so look for symptoms of feeding damage. Use of a magnifying glass helps to see tiny mites – examine the lower leaf surfaces. Next, clean up your planting site. Prior to planting, eliminate all weeds! Finally, monitor plants frequently. Early mite detection is critical to preventing damage. Again, since mites are so small, magnification is necessary. Plants can also be sampled by shaking them over white paper or cloth. Mites are more noticeable against the contrasting white background.

Pesticides used to control mites are called miticides. Avoid unnecessary treatments that are costly and increase the chances for resistance. *Be sure that products are labeled for application to infested plants and that all precautions are followed prior to treating.* Generally applications should be repeated at least two times at 5-7 day intervals. Rotate to a new chemical class after 3 to 4 weeks. Most miticides are contact

pesticides with no systemic activity. Since spider mites mostly feed on lower leaf surfaces, spray coverage of lower leaf surfaces is essential!

Some insecticides also control mites. Several products are available. In recent years, Avid has been the standard with excellent control. Its "translaminar" activity allows movement from upper to lower leaf surfaces where mites feed. Many pyrethroids including Battle, Tempo, Mavrik, Scimitar and Talstar are effective in suppressing populations, but two spotted spider mites are often resistant. Kelthane is in the chlorinated hydrocarbon class and is among the oldest pesticides. It is still effective. Malathion, Diazinon and Dursban are organophosphates that may suppress populations. With good coverage, insecticidal soaps and horticultural oils are very effective and there is no resistance. Use caution since soaps and oils may injure plants. Use the lowest possible concentration, never more than a 2% spray volume, and avoid treating plants under heat or moisture stress. Both soaps and oils can increase the effectiveness of other miticides when tank mixed.

For the future, Cinnamite, a new product derived from cinnamon oil, shows good promise. It works quickly and is effective on thrips, aphids and mites. It has a pleasing cinnamon smell and is safe to applicators and the environment. Early university research shows excellent results with Cinnamite on greenhouse crops. Unfortunately, there have been some phytotoxicity problems and the label does not clearly permit landscape applications. Expect the manufacturer, Mycotech, to straighten out these problems.

Biological control is a management alternative, but requires knowledge of the various mite predators. Several species of predatory mites are commercially available with each having unique qualities affecting performance. The most commonly used is *Phytoseiulus persimilis* which aggressively pursues and consumes up to 20 young mites per day. *Mesoseiulus longipes* survives lower humidity and higher temperatures. *Neoseiulus californicus* is slower acting, but can survive longer periods without prey. Releasing a mix of different species offers adaptability to changing environmental conditions and prey populations. Success with predatory mites requires early spider mite detection and prompt release of predators on infested plants. Since most miticides and insecticides are toxic to predators, they should be avoided both before and after release of predators. Applications of insecticidal soaps or horticultural oils may be made prior to releases since they have no residual activity after drying. Other compatible pesticides include insect growth regulators, *Bacillus thuringiensis* and entomopathic nematodes. In landscape plantings, naturally existing beneficial mites and insects may suppress spider mite populations. Conserve

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Ornamentals Pest Notes

Deborah Smith-Fiola, Ocean County Agricultural Agent, and Steven Rettke, Program Associate in IPM

BRONZE BIRCH BORER (440-880 GDD = egg laying) Adults emerge in late spring from overwintering larvae and leave behind their characteristic 1/8 inch, D-shaped exit holes. Adults are 3/8 inch, narrow-bodied beetles, dark gray in color with a faint bronze-metallic sheen. White and European birch species are the most vulnerable to attack by this borer. There is only one generation per year. A dead crown leader is an early symptom, indicating that internal larvae have destroyed sections of the vascular tissue. Infestation and dieback usually start at the top and work down infested trees. Dead and dying branches should be pruned off in late winter or during the late summer period. Avoid pruning during the late spring months since the emerging egg-laying adult beetles will be attracted to pruning wounds. Maintaining or improving vigor is essential for preventing this pest. Help maintain adequate sap pressure by reducing drought stress possibilities. Controlling the Birch leafminer is also critical for improving the longevity of this sensitive tree. Consider replacing borer infested trees with the resistant "Heritage" birch (*B. nigra* "Heritage").

Since there are no pheromones available to trap the adults, accurate spray timing of the pesticide becomes less certain. Some IPM managers wrap a sticky barrier around major birch scaffolds to monitor for adult bronze birch borers, for better spray timing. Chlorpyrifos (Dursban) or Astro (a pyrethroid) can act as a preventive or protective treatment when sprayed on the bark. The pesticide must be applied to nearly the entire tree, since eggs may be laid on the trunk as well as on branches 1 1/2 inches in diameter or greater. The chemical barrier must be in place on the bark before the eggs are laid, which usually starts in late May or early June and can continue into early July. Two applications may be necessary.

PINE ERIOPHYID MITES (298-533 GDD): These four-legged mites cause pine needles to appear chlorotic as well as dwarfed and distorted. The last 2-3 years have shown increased infestation levels on eastern white pines in many areas throughout the state. It has been reasoned that the warmer than average winters have increased survival rates of the pine eriophyid mites. Severe infestations can result in at least partial defoliation. Use at least a 15X to 30X hand lens to identify these tiny mites. They do not resemble the standard spider mites (i.e., spruce and two-spotted); they are lighter in color, a lot smaller and more elongated (cigar shaped) in appearance.

The use of a dark colored beating tray may provide a better contrast and aid in the detection of these mites. When damage is severe, apply horticultural oil, dimethoate (Cygon), carbaryl (Sevin), or fluvalinate (Mavrik) during the mid-May to early June period.

PINE BARK ADELGIDS: These common aphid-like insects are easily detected on white and Scots pines this month. Eggs laid in May hatch this month and the crawlers settle on the bark, branches and new pine candles, covering themselves with white cottony wax. Damage is usually cosmetic, although sometimes high populations can kill small branches. When customers react negatively to their presence, reduce this first generation with a strong blast of water, horticultural oil, or insecticidal soap. These treatments also help conserve beneficial insects that are commonly associated with this pest.

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 small (1/16" in diameter) circular and white, in contrast to the male covers that are white, elongated and even smaller in size. During light infestations, there are 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. Scales usually build-up first on the south side of shrubs or on the side against buildings. Adult females overwinter on the foliage and there is only one generation each year. The yellow-colored crawlers start hatching this month and can continue well into July. Controls may not be required if many beneficials are present (monitor for parasitoid emergence holes in covers). Dormant oil sprays can be used and summer oils or insecticidal soaps can be targeted against the crawlers. When using these short residual materials, more than a single treatment will be required against the crawler stage, because of their extended emergence period (at least 3-4 weeks). When time constraints make multiple applications less feasible at certain sites, longer residual insecticides such as acephate (Orthene), chlorpyrifos (Dursban), and dimethoate (Cygon) can be more effective. If the crawler stage is missed, then a late summer foliar systemic insecticide should be applied.

WHITE PRUNICOLA SCALE (707-1151 GDD = crawlers): This armored scale is found predominately on members of the *Prunus* genus (flowering cherry, lilac, purple leaf plum), particularly on Japanese flowering cherry. Males are white, narrow elongated in shape, and surround themselves with a white, waxy, filamentous wax. The females are circular and white. There may be 2 to 3 generations per year with huge populations building up over a relatively short period. These scales do not feed on leaves, but only suck phloem sap from twigs and branches. Leaf yellowing

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and premature leaf drop are the initial symptoms, followed by dieback of small branches.

Monitor for the first generation crawlers during June and into July. Crawlers are salmon colored. Control crawlers with horticultural oil. Oil sprays (2-3%) during the dormant season can also reduce populations. Management of this pest is often difficult. Predators and parasitoids such as ladybird beetles and parasitic wasps are often abundant enough to achieve suppression, but are not always reliable. The most effective controls on small trees may be to manually scrub patches of white scale covers off branches of small trees with a stiff brush. Prune off unhealthy branches that are heavily infested.

PEAR LEAF BLISTER MITE: The familiar Callery 'Bradford' pear, a relatively pest free ornamental tree is attacked by the pear leaf blister mite. Its feeding causes the formation of galls or blisters on the leaves. These blisters are yellow to green at first, becoming red, and finally black on the leaves of pear. Many blisters may coalesce, discoloring large continuous patches on the leaves. The white, elongated, four-legged eriophyid mites responsible for the damage are exceptionally small, at less than 0.25 mm in length (less than 1/100th of an inch). At least 20X magnification is required to observe these mites clearly. They winter beneath the bud scales, and become active and lay eggs when the buds begin to swell in warm spring weather. They produce their characteristic injury by feeding and burrowing into the undersides of the leaf tissue. A succession of overlapping generations develops throughout the summer that migrate to other leaves. They overwinter in bark crevices and under bud scales. Plants with a history of eriophyid mites should receive a dormant oil application to suppress the overwintering stage. They can also be treated whenever they are detected reaching damaging levels by using summer oils and soaps, carbaryl (Sevin), dimethoate (Cygon), or oxythioquinox (Morestan).

HONEYDEW and SOOTY MOLD: Most landscapers are very familiar with the honeydew created by the feeding from aphids and soft scales, and the associated black sooty mold that follows soon afterward. Incompletely digested plant fluids (honeydew) is shiny, sticky, and loaded with sugary carbohydrates. This food source becomes an irresistible attractant to an assortment of ants, bees and other stinging and biting insects. Mealy bugs and whiteflies also produce honeydew. When the infestations are light and sprays are required, apply horticultural oils or insecticidal soaps. In heavy infestations, spray a residual insecticide, adding soap to the tank to dislodge the honeydew and sooty mold.

PINE THRIPS: These minute insects feed on pine needles by rasping the tissue with their sickle-like mouthparts and lapping up leaf sap. Symptoms appear as discolored, crooked or curled needles on new growth with brownish wound spots. The orange brown thrips (1/16 inch long) are rarely seen and are very fast. The adults lay their eggs in May and there are several generations throughout the season. Control is often not necessary, but dry conditions favor the buildup of their populations. Sprays of Cygon or Orthene plus 1% oil will control pine thrips. (Note: both treatments will also control Pine Oystershell Scale [=Maskell scale]).

PRE-EMERGENT EFFECTS ON ANNUALS: A study a few years ago at Auburn University tested five common pre-emergent herbicides for weed control on selected annual bedding plants. The herbicides, Dimension 0.5 G, Snapshot 2.5 TG, South Weedgrass Control (pendamethalin, 2.68 G), Rout 3 G, and Ronstar 2 G, were tested for control of large crabgrass, prostrate spurge, and phytotoxicity to newly planted annuals in a planting bed with over irrigation. The results indicated that none of the herbicides evaluated were considered to be safe on any annual. Both Dimension and Snapshot showed limited injury to ageratum, celosia, impatiens, and marigold. They also suppressed growth on basil, begonia, nicotiana, and salvia. Ronstar (one of the least injurious landscape herbicides), injured celosia and salvia. Most of the products also reduced root growth of impatiens and basil, although foliar injury was not always apparent. □

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beneficials by: avoiding unnecessary applications of insecticides and miticides; spot treating only where high pest populations exist or by choosing products that are less toxic to beneficials.

Finally, a few cultural considerations can reduce mite problems. Avoid over-fertilization with nitrogen. Resulting soft tissue is attractive and nourishing, not only to mites, but many sucking insect pests and some pathogens. Plant resistant species and cultivars and avoid those that are frequently troubled. Research by Dr. David Smitley of Michigan State University, showed that different cultivars of New Guinea Impatiens exhibit varying levels of resistance. While there is limited information on resistant plants, document chronically infested species and cultivars and grow those with resistance in the future. Lastly, while not advised under conditions favorable for disease, overhead watering will suppress spider mites.

While the hazy, lazy days of summer may slow you down, remember - mites love the heat! Now's the time to monitor, detect and manage spider mites. □

Rutgers Cooperative Extension - NJAES
U.S. DEPARTMENT OF AGRICULTURE
Rutgers - The State University of New Jersey
Plant & Pest Advisory
18 College Farm Road
Cook College
New Brunswick, N.J. 08901-8551

PLANT & PEST ADVISORY LANDSCAPE NURSERY & TURF EDITION CONTRIBUTORS

RCE Specialists and Staff

Raul I. Cabrera, Ph.D., Nursery Management
Bruce B. Clarke, Ph.D., Turf Pathology
Ann B. Gould, Ph.D., Ornamentals Plant Pathology
Steven Hart, Ph.D., Weed Science
Joseph R. Heckman, Ph.D., Soil Fertility
James A. Murphy, Ph.D., Turf Management
George J. Wulster, Ph.D., Floriculture
Richard J. Buckley, Coordinator, Plant Diagnostic Laboratory
RCE County Agricultural Agents and Program Associates
Atlantic, Charlene H. Costaris (609-625-0056)
Bergen, Joel Flagler (201-599-6162)
Burlington, Raymond J. Samulis (609-265-5050)
Camden, James Willmott (609-566-2900)
Cumberland, James R. Johnson (609-451-2800)
Essex, Jonathan H. Forsell (973-678-7988)
Gloucester, Jerome L. Frecon (609-863-0110)
Hunterdon, Winfred P. Cowgill, Jr. (908-788-1338)
Middlesex, William T. Hlubik (732-745-3443)
Monmouth, Richard G. Obal (732-431-7261)
Ocean, Deborah Smith-Fiola (732-349-1246)
Steven Rettke, Program Associate IPM
Passaic, Stanley Kamara (973-305-5742)
Somerset, Nick Polanin (908-526-6293)
Union, Madeline A. Flahive, Prog. Assoc. (908-654-9854)
Warren, William H. Tietjen (908-475-6505)

Newsletter Production

Jack Rabin, Assistant Director, NJAES
Cindy Rovins, Editor and Designer
Mary Ann Hughes, Assistant Editor

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