RUTGERS COOPERATIVE EXTENSION AT THE NEW JERSEY AGRICULTURAL EXPERIMENT STATION

PLANT & PEST ADVISORY

LANDSCAPE, NURSERY & TURF EDITION $1.50 JUNE 15, 2000

INSIDE

How Long to Establish Athletic Field Sod?

James A. Murphy, Ph.D., Turf Management

I recently was asked a question about sod: A municipality is planning on sodding a football field in late spring. The football coach was told that the team won't be able to use the field this fall because of the new sod. How long does it take for athletic field sod to be established?

The answer to your question is "it depends", the traditional agronomist's reply. Primary factors that control when the field can be used include turfgrass species, weather, soil type and the management used to establish the sod. Tall fescue is more heat tolerant and, thus, may root better during the hot weather of summer compared to some varieties of Kentucky bluegrass. Therefore, tall fescue could require less time to establish during hot weather. The high temperature sensitivity of Kentucky bluegrass sod will depend on the varieties used, some varieties are less sensitive to high temperature and may not present a significant lag in establishment time. Download publication FS738 at: http://www.rce.rutgers.edu/pubs/ag/plantscience/lawnsturfgroundcovers.html (or call your county extension office) for more information on recommended varieties/cultivars of tall fescue and Kentucky bluegrass.

Weather is important, particularly if the management during stress is negligent or inappropriate. A healthy vigorous sod will withstand the stresses of summer better than a sod that is under stress from improper cultural management. Critical management practices include adequate fertilization, appropriate irrigation and good mowing practices. Intensively trafficked fields and sandy soils will also benefit from well-timed cultivation (aeration).

Without adequate soil nutrition, the sod will not fully root and the sod pieces will not knit together. As an initial guide for fertilization, consider applying to the soil 1-½ to 2 pounds of nitrogen (N) per 1000 square feet before the sod is laid. See publication FS104 at: http://www.rce.rutgers.edu/pubs/ag/plantscience/lawnsturfgroundcovers.html for guidelines on soil preparation. Over the next 2 to 3 months be prepared to apply another 2 pounds of N per 1000 square feet, particularly on fields of low soil fertility. Two to four fertilizer applications can be made every 2 to 4 weeks at ½ to 1

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South Jersey Christmas Tree Growers' Meeting

Tuesday, June 20, 2000, 6:30 p.m.
at Belly Acres Tree Farm
Royal Avenue, Franklinville, NJ
Sponsored by Rutgers Cooperative Extension

Owners Charles and Eileen Rauchfuss will lead a walking tour of the Belly Acres Farm. Stops will be made at certain locations and conducted by the following:

6:30 p.m. Welcome and Introductions by Jerome L. Frecon, Agricultural Agent, Rutgers Cooperative Extension of Gloucester County – *"How We Do It and What We Do"* by Eileen Rauchfuss
6:50 p.m. *"Disease Problems and Management Techniques"* by Richard Buckley, Plant Diagnostic Laboratory, Rutgers Cooperative Extension
7:20 p.m. *"Major Insect Problems and Management Strategies"* by Dr. Jim Lashomb, Research Professor, Department of Entomology, New Jersey Agricultural Experiment Station, Rutgers Cooperative Extension
7:45 p.m. *"Weed Identification and Management Strategies"* by Dr. John Meade, Professor Emeritus, Weed Science, Rutgers Cooperative Extension
8:10 p.m. *"Shearing and Pruning Christmas Trees"* by Dr. Mark Vodak, Specialist in Forestry, Rutgers Cooperative Extension
8:30 p.m. *"Pesticide Safety and Proposed Regulations Affecting Christmas Tree Growers"* by Dr. George Hamilton, Specialist in Pesticides/Pest Management, Rutgers Cooperative Extension
9:00 p.m. Adjourn

Pesticide applicator units are: 4 units of 1A, 3A and PP2; 1 unit of CORE

This facility is not accessible to the physically impaired. Contact Jerome Frecon at Rutgers Cooperative Extension of Gloucester County at 856-307-6450 and every effort will be made to make special accommodations. ❑

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pound of N per 1000 square feet, if post-sodding fertilization is needed to maintain root growth and sod knitting. Adjustments in this program should be based on soil type, rainfall and irrigation. Athletic fields with excellent soil fertility will be fertilized at a lower N rate than soils having poorer fertility. During the first year of establishment, the sodded field may need as much as 6 to 8 pounds of N per 1000 square feet to completely establish. A maintenance (post-establishment) program for N fertilization on athletic turf is typically in the range of 4 to 6 pounds of N per 1000 square feet per year.

Nitrogen is generally the nutrient needed in the greatest quantity to establish and maintain turf. Other plant-essential nutrients, however, can be limiting and the analysis of the fertilizer needed to correct these deficiencies can be determined with a soil test. Without a soil test, a 1-1-1 nutrient ratio (starter fertilizer) for the fertilizer grade is suggested at pre-sodding; and 3-1-2 nutrient ratio for the fertilizer grade is suggested for post-sodding fertilization. Liming should only be done based on a soil test; an over-limed soil can be as problematic as an under-limed soil. See publication FS635 at: http://www.rce.rutgers.edu/pubs/ag/plantscience/lawnsturfgroundcovers.html for more information on managing soil pH.

Irrigation will be needed throughout the summer when rainfall is inadequate. Without irrigation, a sod installation during late-spring or summer is likely to fail because of drought. Daily irrigation (or rainfall) is important immediately after the sod is laid and should be continued until the sod begins to root into the soil. Two or three light waterings per day may be needed to keep the sod healthy and growing, if the weather is very hot, dry and windy. After the sod has begun to root (early stages of sod establishment), 4 applications of 1/4-inch of water during the week would be better than one 1-inch watering per week. Once the sod has thoroughly rooted, irrigation frequency can be adjusted to twice a week. The general rule of thumb is to apply 1-inch of water per week through either rainfall or irrigation. Inexpensive rain gauges can be purchased at local lawn and garden centers to help keep track of rainfall and irrigation amounts. Six to twelve inexpensive rain gauges can be placed throughout an athletic field to determine whether the application of water is uniform over the field. Over-watering and under-watering are equally problematic, although for different reasons, and should be avoided.

Cultivation (aeration) is another management practice that can enhance the establishment of a sodded field, particularly on sandy soils. Root and knitting of the sod on sandy soil is often hastened if the above guidelines for fertilization and irrigation are combined with several hollow tine corings and topdressings. These practices help to incorporate the sod layer into the underlying soil, improving moisture conditions, rooting and knitting of the sod. (More on this subject in a latter edition of the newsletter.)

If managed properly under good to excellent growing conditions, a new sod can be ready for play within a 60 day time period. But it is important to keep in mind that any deficiencies in weather or management during establishment of the sod will extend the time of establishment period. ❑

Diseases of Landscape 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.

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, hydrogen dioxide[1], potassium bicarbonate[1], neem oil[1], paraffinic oil[1] (JMS Stylet-Oil, or SunSpray Ultra-Fine Oil), myclobutanil, propiconazole, thiophanate-methyl, triadimefon, trifloxystrobin, triforine, Ziram, or combination products that contain thiophanate-methyl (Benefit or Zyban), 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), piperalin, or triflumizole. Most of these compounds are applied at the first sign of disease; however, consult the label for timing, rates, and appropriate hosts.

China Aster

Be on the lookout this summer for **Fusarium wilt** and **Phomopsis stem canker** in China aster. In plants affected by Fusarium wilt, the leaves turn yellow, the lower leaves wilt, and the roots decay. In some cases, the underground portion of the stem is coated with a pinkish mass of spores and mycelium. Phomopsis stem canker causes the lower stem portion of diseased plants to exhibit a purple to brown discoloration. Unlike Fusarium wilt, however, the roots usually remain healthy.

To manage either disease, discard infected plants, prevent wounding, maintain adequate fertility, use resistant varieties, avoid extremes in soil moisture, and, if possible, replant next year in a new location. Thiophanate-methyl, applied as a soil drench, may provide some control on a preventive basis, but will not cure plants once diseased. Add a spreader-sticker to improve spray coverage.

At the first sign of **powdery mildew** on China aster, the following products may be used: *Ampelomyces quisqualis* or thiophanate methyl every 7 to 14 days; hydrogen dioxide[1] every 5 to 7 days; potassium bicarbonate[1] every 7 to 10 days; *or* triflumizole every 7 days.

Elm

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, Mauget Fungisol, or Phyton 27 as per manufacturer's recommendations. When trees exhibit more than 5% crown symptoms, fungicide injection may be ineffective.

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.

Snapdragon

Look for **leaf rust** on snapdragon this time of year. If left untreated, severely infected plants will eventually die. For best results, apply mancozeb, Ziram at 7- to 10-day intervals; maneb weekly; myclobutanil at 10- to 14-day intervals; propiconazole (see label); *or* use triadimefon at 14- to 21-day intervals.

To **manage powdery mildew** on snapdragon, spray *Ampelomyces quisqualis*, thiophanate-methyl, trifloxystrobin at 7- to 14-day intervals; Benefit, myclobutanil at 10- to 14-day intervals; hydrogen dioxide[1] at 5- to 7-day intervals; kresoxim-methyl (Potamic Rose, Potamic White), potassium bicarbonate[1], piperalin (plus a spreader-sticker) at 7- to 10-day intervals; *or* triadimefon at 14-day intervals.

See Ornamentals Diseases on page 4

Diseases of Turfgrass

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

General

Brown patch developed on greens and tees during the past few days. This disease should continue to be troublesome throughout the summer months. **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.

Brown Patch

This disease, caused by the fungus *Rhizoctonia solani*, developed recently on greens, tees, and fairways 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 minimize the leaf wetness period, and spray turf with Banner (preventive only), Chipco 26019, Chlorostar, Cleary 3336, Compass, ConSyst, Curalan, Daconil, Eagle, Fungo, Heritage, Manicure, Pentathlon, Prostar, Sentinel, Spectro, Thalonil, or Touche per manufacturer's recommendations.

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 and Heritage have 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.

Pythium Blight

We will start to see **pythium blight** soon on golf and landscape turf with a return to hot, humid, weather. **Pythium** thrives in low or poorly drained areas, especially when the night temperatures are above 70°F. For best results, improve drainage, water in the early morning hours, avoid over-fertilization, and apply Aliette, Banol, Heritage, Koban, mancozeb, Prodigy, Quell, Subdue, or Terrazole, according to the manufacturer's recommendations.

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, Bayleton, Cleary 3336, Compass, Eagle, Fungo, Heritage, Rubigan or Sentinel in 4 to 5 gal of water/1000 ft^2. Repeat every three to four weeks. If fungicides cannot be applied with this 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

Mark your calendars now for this year's Rutgers Turfgrass Research Field Days. The Landscape Turf Research Field Day has been set for August 2, 2000 at the Turf Research Farm (Ryders Lane) in North Brunswick, N.J. 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 registration cost is $20 ($30 with lunch). The Golf Turf Research Field Day will also be held at the Turf Research Farm (Ryders Lane) in North Brunswick, NJ. This event will occur on August 3, 2000 at 12:30 PM (registration) and field tours will run from 1:00 to 5:00 PM. Registration is $25. Recertification credits will be available at the conclusion of each program. Call Marlene at (732) 932-9400. ext. 339 for additional information. ❑

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Zinnia

During hot, dry weather, zinnia varieties susceptible to **stem and root rot**, caused by the non-water mold fungi *Fusarium* and *Rhizoctonia*, can rapidly wilt. To control stem and root rot, discard wilted plants, avoid soil moisture extremes, and drench remaining stock with fungicides at the intervals specified: Banrot (4 to 8 weeks); Benefit, thiophanate-methyl (2 to 4 weeks); iprodione (2 weeks); fludioxonil, flutolanil, triflumizole (3 to 4 weeks); *Gliocladium virens, Trichoderma harzianum* (see label); *or* PCNB at transplant (repeat once in 4 to 6 weeks); *or Streptomyces griseoviridis* (2 to 6 weeks).

At the first sign of **powdery mildew** on zinnia, the following products may be used: *Ampelomyces quisqualis*, chlorothalonil, lime-sulfur, thiophanate-methyl (7 to 14 days); Benefit, fenarimol, myclobutanil (10 to 14 days); hydrogen dioxide[1] (5 to 7 days); kresoxim-methyl, potassium bicarbonate[1], triforine (7 to 10 days); paraffinic oil[1] (2 to 4 weeks) (outdoor plants only); Phyton 27, piperalin, propiconazole (see label); Spectro (7 to 21 days); triadimefon (14 days); *or* triflumizole, Zyban (7 days). NOTE: avoid use of chlorothalonil on zinnia during bloom where flower injury is unacceptable.

[1]Check for phytotoxicity on a few plants before spraying an entire crop. ❑

Plant Diagnostic Laboratory Highlights

Richard Buckley, Plant Diagnostic Laboratory Coordinator

Turfgrass

What a wacky two weeks! One day it's summer, the next it's early spring. Enough of March in June! The crazy weather has turf diseases all over the map. Samples with active **pink snow mold** (*Microdochium nivale*) and **yellow patch** (*Rhizoctonia cerealis*) continue to be submitted to the laboratory. Samples of **snow mold** were submitted from Salem and Atlantic Counties and **yellow patch** came from golf courses in Ocean and Cape May Counties in New Jersey, and Long Island in New York.

Anthracnose basal crown rot also continues to be a problem for golf turf managers. Samples with confirmed **anthracnose** were sent to the laboratory from Delaware, and Pennsylvania, as well as, from Atlantic, Camden, Union, and Morris Counties. Many other golf course superintendents sent samples of yellowing annual bluegrass, suspecting **anthracnose**, but the disease was not found. Several abiotic factors were associated with these samples that may have contributed to the poor performance of the turf on the sites. The cultural and environmental stresses common among these submissions include low fertility inputs, cold soil temperatures, heat stress, anaerobiosis, and the use of Primo and/or Embark. Another problem for annual bluegrass, the **annual bluegrass weevil**, is also active at this time. Adult beetles were found migrating to greens on a golf course on eastern Long Island and larvae and pupae of the weevil were found in a sample from an Ocean County course.

Take-all, caused by the fungus *Gaeumannomyces graminis*, has finally come on. This puts the disease about two weeks behind schedule for New Jersey. **Take-all** was confirmed in samples of bentgrass greens and fairways from New York, Pennsylvania, Morris and Hunterdon Counties. Each sample was newer (3-7 years old) bentgrass.

In landscape turf, samples of **leaf spot diseases** dominate the submissions. *Drechslera poae* is the fungus attacking Kentucky bluegrass and *Drechslera siccans* is found on perennial ryegrass.

Landscape

Shade tree anthracnose is the most common problem coming from the landscape in early June. The disease was diagnosed on oak samples submitted from Monmouth and Middlesex Counties and was evident on sycamore and maple samples from Monmouth County. **Cedar apple rust** was identified on crabapple from a Middlesex County landscape, and **Dutch elm disease** was confirmed in elm branches from Mercer County. **Juniper tip blight**, caused by the fungus *Phomopsis*, has also been very common. Samples of **juniper tip blight** were sent from plantings in Morris, Middlesex, and Bergen Counties. **Spruce mites** were active in juniper from Bergen County and on Norway spruce samples from Passaic County.

Greenhouse and Nursery

Samples of myrtle from a Somerset County flower farm had **phytophthora root and crown rot**. The fungus *Botrytis* was identified as the cause of red **leaf spots** on a fuchsia submitted from a Morris County grower. ❑

EPA Announces Changes to Chlorpyrifos Labeling

George Hamilton, Ph.D., Pest Management

On June 8, 2000, the United States Environmental Protection Agency (EPA) announced that it would be reclassifying chlorpyrifos (Dursban and Lorsban) as a restricted use product, phasing out certain uses, and limiting the use of chlorpyrifos in areas where children may come in contact with product residues. While these changes impact more than just turf and ornamentals, you should be aware of the following items:

- Beginning in December of 2000, you will be required to have a state applicators license in order to purchase and use chlorpyrifos products except in the case of insect baits sold in child resistant packaging.
- Between 12/1/00 and 12/31/01, the use of chlorpyrifos on home lawns will be phased out. In addition, most other outdoor residential uses will also be phased out during that time period.
- Outdoor chlorpyrifos uses in areas such as parks, etc., where children could be exposed to residues will be phased out by 12/31/01.
- Chlorpyrifos uses on golf courses, road medians, and industrial plant sites where children will not be exposed to residues will continue to be registered. However, the application rates for these sites will be reduced beginning 12/1/00.
- Non-structural wood treatments using chlorpyrifos, such as fence posts, utility poles, etc., will continue to be registered at their current application rates.

If you have any questions about these changes further information can be obtained from the USEPA website at http://www.epa.gov/pesticides/announcement6800.htm. ❑

Ornamentals Pest Notes

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

✔ **GYPSY MOTHS** (448+ GDD = 3rd+ instars): The casual observation during routine field inspections the past month has shown a definite increase of gypsy moth caterpillars compared to the past several years (however, the population levels are not close to the extreme outbreak years in New Jersey during the 1980's). Most of the larvae have now reached at least the 4th instar stage and they can begin to cause very noticeable defoliation. Also at this stage of development, the 6 pairs of red spots and 5 pairs of blue spots are easy to identify on the back of the caterpillar. When they develop into the 5th or 6th instar stage, then a single caterpillar can consume up to one square foot of foliage during a 24 hour period. The mature gypsy moth larvae are now capable of consuming leaves to the midrib. Over 50% defoliation may reduce tree vigor and make them more susceptible to boring insects and disease.

Hopefully the *entomophaga* fungus will cause a high percent mortality to their late instar populations and therefore reduce egg laying activity and next year's population. If sprays are required, the use of B.t. (*Bacillus thuringiensis*) is no longer an option. The use of B.t. sprays is most effective against the 1st and 2nd instar stages. When the 3rd instar stage is reached, then the B.t. begins to lose some of its potency. By the time the gypsy moth caterpillar exceeds one inch in size, then the 4th instar molt has usually occurred and a B.t. spray will have little impact. Effective controls at this late stage require a residual insecticide (e.g., pyrethroids).

✔ **TWO-SPOTTED MITES** (437-997 GDD = adults build-up activity): This warm season mite species is possibly the most notorious ornamental pest for its ability to "strike like lightning." Even with a twice monthly monitoring schedule, many scouts are surprised by the seemingly overnight population explosion that the two-spotted mites are capable of producing. It would be wise to begin monitoring for this pest with the beginning of hot, summer weather (i.e., early to mid June). On deciduous shrubs (e.g., burning bush), inspect deep within the inner foliage for the initial population build-up. Examine the underside of stippled leaves or tap them over white paper and look for spider mites with two spots on the body. In hot, dry, sunny locations, this spider mite will produce several generations during the summer and is capable of producing a new generation each week.

Remember, this mite species overwinters as adults under the plant and not as eggs. Therefore the use of dormant oil treatments during late winter or early spring will not provide any suppression. Use horticultural oil or soap sprays against low mite populations in order to conserve any beneficials present. If the populations have gotten out of hand and objectionable damage is evident, then apply a residual miticide and reevaluate within a week. The reevaluation is especially important if the miticide used has no ovicidal properties.

✔ **PEAR LEAF BLISTER MITES:** Last year many Callery pears in several New Jersey locations were heavily infested by these tiny eriophyid mites. Some of the trees were even substantially defoliated from the infestations. Therefore, the Callery pears have been observed more closely this spring and the mite again appears to be widespread (although the infestation levels are often mild). The initial leaf symptoms indicating the presence of blister mites are subtle. Although the mites actually begin feeding within the leafbud before budbreak, the size of the leaves is not usually affected. However, upon closer examination, an infested leaf during early to mid May will often indicate two parallel lines of lighter colored leaf tissue. These parallel lines typically run along both sides of the main leaf vein. By late May or early June the lighter colored lines of leaf tissue darken dramatically and the symptoms are obvious. The mites 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 can migrate to other leaves. They overwinter in bark crevices and under bud scales. Trees with a history of the pear leaf blister mite can 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 if in storage, oxythioquinox (Morestan).

✔ **ARBORVITAE LEAFMINER** (533-700 GDD = adults begin egg laying): At this time of the season, the larvae of the arborvitae leafminer have pupated and are now emerging as adults and laying eggs. They will continue to emerge and lay eggs into July. As the moths emerge, they leave holes within brown terminal tips. Look for brown tips dispersed among the green foliage. The dead yellow-brown tips sharply contrast with green, uninfested tips. Unless observed closely, the damage produced by the leafminers can be misdiagnosed as a summer or winter desiccation injury since the damage is usually most severe on the south side of plants.

To confirm the presence of this insect, look for the emergence hole or break open discolored tips and look for tunnels, frass, and caterpillars (or pupae). Also, shake the foliage in June and July to detect small, light tan moths. The adult moths are about 1/3 inch long and silvery gray. Larvae are in tips most of the year, feeding heavily in fall and early spring. Larvae overwinter in terminals.

Simply prune out infested tips when infestations are light. When heavy infestations are present then use a systemic insecticide against the larvae (e.g., acephate (Orthene) and a residual insecticide for the adults in June or July.

✔ **LEAF NOTCHING WEEVILS** (400-2800 GDD = adults): There are at least four common types of weevils that chew leaf notches in foliage of ornamental plants

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and the larvae feed on roots. The most common of these are the blackvine weevil and two banded Japanese weevil. Leaf notching weevils feed on many kinds of ornamental plants Yews, rhododendrons, azaleas, laurels, leucothoe, forsythia, euonymus, hollies, Photinia, viburnum, most deciduous and evergreen shrubs, ground covers, and many kinds of perennials and annuals are attacked.

Adults chew "C" notches in the margins of foliage. These notches tend to be fairly small (1/4") and distinct. Do not confuse feeding by gypsy moth caterpillars, grasshoppers, crickets, or katydids with leaf notching weevils. These other insects generally consume large irregularly shaped areas of foliage. Larvae of leaf notching weevils feed on the roots and crowns of plants. Feeding damage by larvae may cause reduction in plant health, branch dieback and death of the plant.

Black vine weevil adults are black weevils (beetles with a long curved snout) (1/4" length) with a hard body. These are active at night. Two banded Japanese weevils are light brown/gray weevils with wavy contrasting bands across the back. These are active during the day. The larvae of both are white legless "C" shaped grubs with red/brown heads. Do not confuse larvae of leaf notching weevils with larvae of Japanese beetles and turf grubs. These grubs have three pair of true legs at the front of the body.

Adult leaf notching weevils can be easily monitored with a beating tray or by observing signs of current feeding damage. More laborious monitoring techniques include pit fall traps and various types of bands wrapped around plant stems. Foliar sprays may be necessary to reduce the aesthetic injury caused by adults and to prevent large populations of larvae from developing. Many pesticides work when applied to the foliage. These include Orthene, synthetic pyrethroids, and Ficam/Turcam. Synthetic pyrethroids provide quick kill of leaf-feeding adults. Pesticides should be applied when fresh feeding damage is seen. Ideally, these pesticides should be applied before GDD (growing degree day) accumulations exceed 1000. After the 1000 GDD levels are reached, then adults begin laying eggs for the next generation. Depending upon the location in New Jersey, the 1000 GDD accumulation will typically be reached sometime between late June to mid-July.

Larvae may be killed with drenches of beneficial nematodes or drenches of Turcam or Talstar during the summer and early autumn. Formulations of Talstar may provide season-long control when incorporated into potting mixes for container plants. The effectiveness of soil drenches in landscape situations is questionable. Beneficial nematodes work well in relatively cool, well-irrigated soil such as nursery containers. They don't seem to be effective in hot planter boxes with sporadic irrigation or in heavy clay soils. Beneficial nematodes are very effective against larvae of blackvine weevil and may also work against larvae of two-banded Japanese weevil. *(Source: BUG BULLETIN; June 22, 1998)*

✔ **PLANT GALLS:** Plant galls often attract considerable attention because of their unusual shapes and colors. Galls are considered to be abnormal growths developing in plant tissue due to the introduction of a foreign substance. A gall is made up of plant cells that have been stimulated to undergo rapid division and growth by the presence of the foreign substance. Many gall producers are caused by tiny wasps, midges and mites. Other gall inducers can be from aphids, psyllids, flies, and adelgids. Some galls are produced by fungi, nematodes, bacteria, viruses and by mechanical injury. Many galls will form on susceptible plants when an insect deposits eggs in rapidly growing plant parts. Chemical fluids may be deposited simultaneously, which stimulates tissue to grow over the eggs. Upon hatching, the protected larvae feed internally on the gall tissue until they complete their life cycles. Leaf galls only cause cosmetic damage to ornamental plants and therefore control measures are rarely recommended.

✔ **HONEYLOCUST PLANT BUGS**: The stippling damage from the feeding of the nymphs and their black fecal spots (similar to lacebug damage) have been apparent for several weeks. Often the plant bugs and leafhoppers will form a complex and can both be found present on the foliage at the same time (the plant bug does most of the damage to the leaves). The nymphs are pale green and about 1/8 inch long with wing buds on the top of the abdomen. They started to feed in early spring and began to damage the young foliage. In heavy populations (such as in 1998) the developing leaves are stunted and ultimately defoliation occurs. Nymphs and adults are still active, but this single generation pest will soon be completing its life cycle for the season. Unless there is a large population, the plant will outgrow the damage and no action is necessary. If control is called for, a 1% solution of oil at bud break or a 2% solution when the adults are present gives good control.

✔ **MIMOSA WEBWORM** (880 GDD = 1st generation larval hatch): Looking for this pest in mimosa and honeylocust (especially the thornless varieties) trees within a week or two (late June or early July). The young caterpillars initially web leaflets together, and then expand the web to include several branches as they grow. Older larvae actually consume the foliage. The webbed foliage is unsightly, which gives trees an ugly gray/brown appearance. The adults have the habit of laying their eggs on the old webs, so the second generation (due in late July or early August) magnifies the damage, and large populations may defoliate the tree.

Since there may be many webs in one tree, hand pulling/pruning may not be effective. Monitor for the first signs of webbing of the second generation (1800-2100 GDD) (when *Hydrangea paniculata* is blooming) and apply B.t. on small larvae. Conserve (spinosad) may also be used with reduced impact on beneficials and non-target organisms. Residual pesticides such as Orthene, Scimitar/Battle, Tempo 2, Diazinon, Mavrik, or Talstar can achieve control against older larvae (be certain to drench foliage thoroughly). ❑

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