

PLANT & PEST ADVISORY

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Transplanting Trees and Shrubs to the Landscape

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Below are some guidelines on the transplanting of trees and shrubs into the landscape. While considered a simple task by many, there are some details that can ensure successful plant establishment and performance in the landscape.

❖ **Handling plants before planting:** Carefully inspect plants before or upon delivery to see that they meet shoot and root quality and specifications. Keep plants (and roots) moist and initially protected from temperature extremes. Consider “acclimatizing or hardening-off” the plants for a few days to the environmental conditions of the planting site. Plant bare-root and B&B materials as soon as possible after delivery or digging. Keep them cool, shaded and moist if they need to be held up for some time. Protect roots of container-grown plants from high temperatures by placing the containers close together, preferably in the shade. If they must be in the open, protect the outside cans from the sun and keep the plants from wilting.

❖ **Preparing the planting hole:** Dig a hole that is deep enough to hold the root ball, and about twice its diameter. With regards to depth it is recommended to plant “high” (top of root ball 1-2” above soil line) in all but sandy soils. If a deep hole is dug and loose soil returned, the plant usually settles after a few irrigations or rains. If the root ball top is below the level of the surrounding soil, water will collect around the trunk in all but very well-drained soils, leading to potential crown rot problems. For sandy soils, however, planting at the original depth or 1-2” deeper will keep soil around the roots from drying out so quickly. Minimize “glazing” of the planting hole sides by digging when soil is not dry. In poorly drained soils, *do not* put any gravel in the bottom of the holes. While the gravel layer is supposed to provide drainage for the soil above, it will in fact have just the opposite effect, causing the soil above to become saturated when it otherwise would not. If drainage is a problem, you will need to improve the overall physical properties of your soil by other means (see last issue of this newsletter).

❖ **Transplanting:** Remove dead, diseased, broken, and twisted roots of bare root plants by pruning to healthy tissue. Cut and remove or straighten roots matted at the bottom or circling around the root ball of container-grown. *Butterflying* the bottom half of the root ball of container-grown plants minimizes root girdling and helps plant establishment. To do this, remove root ball from its container, and split with a

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sharp spade or cutting tool 1/2 to 2/3 of the way from the bottom to the top. The two cut halves are spread and placed on a slight mound in a shallower hole (with top of root ball above surrounding soil as indicated above). Freeing roots at the periphery of the root ball provides better contact between the roughened root ball and the backfill soil. The removal of some roots from the outer 1" of a root ball typically stimulates the growth of new roots in most plants. Create a slight mound in the center of the planting hole and set the plant. Orient any budded or grafted plants, particularly trees, with the scion toward the afternoon sun to reduce the possibility of sunburn in the crook just above the bud (graft) union. For deciduous plants face the side with the most branches to the direction of the strong winds during the growing season. If wind, sunburn, and appearance are not factors in plant orientation, place the side with the best or largest branches away from the afternoon sun, favoring the less developed side with more light. If stakes are to be used place them close to the root ball or through the bare roots, and drive them into undisturbed soil at the bottom of the planting hole.

❖ **Backfilling:** In most cases, the soil dug from the planting hole is satisfactory for backfilling, particularly for bare root plants. Just make sure that the soil has been previously loosened and mixed. Although adding organic matter to backfill soil is often recommended, studies have shown the practice to be of no consistent benefit, and that there is little reason for amending backfill soil when planting trees and shrubs in the landscape. When backfilling, firm the soil around the roots or root ball taking care not to tear, bruise, or debark the roots. For B&B plants remove the rope or twine that holds the burlap and fold back the burlap from around the trunk and the top of the root mass as long as the root ball stays firmly together. Cut off the loose burlap or fold it down to be buried when the rest of the fill is added making sure that it is not exposed above the soil (it can act like a wick, drying itself and the soil below). For sturdy and/or treated burlap carefully cut large gashes through it in the lower root ball area.

Next time I'll cover fertilization of established and newly transplanted landscape trees and shrubs. □

Transplant Shock in Ornamental Plantings

Submitted by Ann B. Gould, Ph.D., Ornamentals Plant Pathology

Adapted from Kentucky Pest News, by John Hartman and William Fountain (University of Kentucky Extension Plant Pathologist and Horticulturist, respectively)

Symptoms of decline and dieback of recently planted trees and shrubs are of major concern to commercial landscapers and residential clientele. Despite adequate moisture this spring, recent hot weather has placed additional stress on already inadequate root systems of newly transplanted trees and shrubs statewide, resulting in symptoms often described as transplant shock.

Trees and shrubs transplanted as balled and burlapped (B&B) specimens generally lose 90 percent of their absorptive roots at the time of digging. The goal for the first one to two years should be re-establishment of a good root system rather than production of a lot of new growth.

❖ **Symptoms:** In extreme cases, trees fail to leaf out. Buds, twigs, and branches are dead and dried out. Young, dead twigs may have changed from green to brown and may have bark that is cracked and irregular rather than smooth. Sometimes the tree may try to sprout from the base. In most cases, trees leaf out, but the growth is not vigorous. Leaves may be undersized and chlorotic, sometimes with dead margins. Shoots will be shortened, and some twigs and branches will die back. Because of the loss of roots, some stunting is always expected and the effects of transplanting may be seen on some trees for several years.

❖ **Causes of transplant shock:** The root ball may have been too small for the size of the tree. After digging it may have dried out. Once a soil ball dries out, it can be very difficult to re-wet. Roots are killed when the soil balls become cracked from careless handling, or are allowed to freeze (roots are generally two plant hardiness zones less hardy than tops). Roots may have been crushed rather than cut cleanly at digging, thus reducing branching.

Most woody plants can be moved at any time of the year with mid-summer being the least favorable time and fall/early winter being the best. A plant may fail to leaf out if it was dug at the wrong time. Trees such as birch, black gum, dogwood, fir, hickory, magnolia, pecan, red oak, and walnut are best dug and planted in early spring. Trees should be dug and planted while there are no leaves on them. Trees with transplant shock may have been planted too deeply, too shallow, or without removal of burlap and ties, or were not watered after transplanting. Mechanical injuries to trunk and branches can also affect survival of the transplant.

❖ **Remedies?:** Trees cannot be brought back from the dead. For live trees showing transplant shock symptoms, provide good growing conditions, including judicious application of mulch to reduce competition from turf and weeds. Protect trees from mowers and string trimmers, and provide water to get through dry periods. Prune out dead twigs and branches. Avoid fertilizing newly planted trees and shrubs and especially those showing stress from transplant shock. Review digging and transplanting procedures to determine where the problem might have occurred, so that transplant shock can be avoided in the future. □

Diseases of Ornamentals

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

◆ Landscape Ornamentals

A number of diseases that get their start in the springtime are evident now. High incidence of foliar diseases such as **crabapple scab**, **cedar-apple rust**, **leaf spots**, and **shade tree anthracnose** have been reported from locations throughout the state. In addition, **juniper tip blight** and **Sphaeropsis (Diplodia) shoot blight and canker** on scotch pine are particularly prevalent. Once the symptoms of these diseases develop, it's too late for chemical control. For disease management *next year*, however, improve plant vigor, prune dead branches during dry weather, and remove leaf litter in the fall to reduce disease spread. For further information, refer to the March 27th and April 10th editions of this newsletter.

To prevent fungal **leaf spots** on chrysanthemum, spray plants *now* with chlorothalonil or mancozeb and continue at 10-day intervals through mid-August.

Be on the lookout this month for one of the most common diseases of woody shrubs and shade trees - **powdery mildew**. Hosts particularly affected by this disease include ash, azalea and rhododendron, catalpa, flowering cherry, crabapple, crape myrtle, elm, euonymus, hydrangea, lilac, and rose. The fungi that cause **powdery mildew** grow superficially in light-colored "powdery" mats on upper leaf surfaces. In most cases, this disease does not result in serious harm to the plant.

To manage **powdery mildew**, reduce humidity through proper spacing and weed control. There are a number of fungicides labeled for control of this disease on one or more hosts. These compounds, including chlorothalonil, copper (Champ, Kocide), dinocap, fenarimol, myclobutanil, horticultural oil (neem, JMS Stylet-Oil, or SunSpray Ultra-Fine Oil), 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.

June, July, and August are the best months to look for symptoms of **Dutch elm disease** on American elms in New Jersey. 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

Plant Diagnostic Laboratory Highlights

Richard J. Buckley, *Coordinator, Plant Diagnostic Laboratory*

◆ Turf

Aside from the impact that hot, dry weather has on turf, **Anthracnose**, caused by the fungus *Colletotrichum graminicola*, continues to be the most common problem on annual bluegrass and bentgrass golf greens this summer. Heat and drought stress are often precursors to **anthracnose** infection. The **basal crown rot** stage of the disease was identified on turf from Hunterdon, Passaic, and Bergen counties. **Anthracnose foliar blight** was found on samples from Bergen, Salem, and Burlington counties in New Jersey, and on golf turf from New York and Pennsylvania.

Summer patch is active in some locations with higher soil moisture. The disease was diagnosed on golf turf from Burlington, Monmouth and Passaic Counties, on a greens sample from Oregon, in sod from Warren County, and on landscape turf in Ocean County. Although we had some disease activity after last week's heavy rains, **Pythium blight** and **brown patch** have not been very serious this summer. **Brown patch** was confirmed on samples of landscape turf from Bergen and Monmouth Counties, and **Pythium blight** was identified on turf samples from Atlantic and Salem Counties, from New York State and Ohio.

Fairy rings have been especially active on many golf courses throughout the state this summer. As many as 60 species of mushrooms, puffballs, and toadstools will form rings in turf. At least 13 of them are found in New Jersey, some of which may cause the turf to die in rings. They are so active in some locations that a golf course superintendent commented "every morning as the mushrooms emerge it looks like hundreds of golf balls had been left on the fairways." There are fungicides labeled for **fairy ring** control; however, the materials do not work on all of the species of fungi that cause rings in turf! Remember, it is especially important to get a proper fungal identification before making any management decisions. This is true for **fairy ring** or for any other disease or insect pest problem.

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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. □

Diseases of Turfgrass

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

◆ General

Brown patch and **pythium blight** are apparent on golf and landscape turf throughout the State. Both diseases developed during the recent hot, humid weather (July 26-28, 1997). **Basal stem rot anthracnose**, **dollar spot**, **red thread**, **slime mold**, **summer patch**, and **yellow ring** (on Kentucky bluegrass) are also quite common at this time. Please refer to recent issues of this newsletter for additional disease control information.

Basal Stem Rot Anthracnose

This disease, caused by the fungus *Colletotrichum graminicola*, has been quite prevalent on annual bluegrass, fine fescue, perennial ryegrass, and Kentucky bluegrass recently. 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 **basal stem rot anthracnose** in the field, look for small black fruiting bodies with protruding black spines on discolored stems or leaf sheaths. Affected plants are easily pulled apart due to the extensive crown rot associated with this disease. For best results, increase turf vigor with light applications of nitrogen, maintain adequate irrigation, reduce thatch, and raise the cutting height (whenever possible). On a preventive basis, Banner, Bayleton, Cleary 3336, Daconil, Manicure, Rubigan, Sentinel, or Thalonil work well when used according to the manufacturer's recommendations. Once the disease develops, however, apply a tank mix of Bayleton 25DF (2 oz/1000 ft²) + Daconil 2787 4F (10 to 12 fl oz/1000 ft²) or a tank mix of Cleary 3336 50W (4 to 6 oz/1000 ft²) + Daconil 2787 4F (10 to 12 fl oz./1000 ft²) for best results.

◆ Brown Patch

This disease, caused by the fungus *Rhizoctonia solani*, continues to be reported on golf, turf and home lawns due to the recent hot, humid weather. For best results, avoid heavy applications of nitrogen fertilizers during hot weather, water in the early morning hours, and spray turf with Chipco 26019, Cleary 3336, Curalan, Daconil, Fungo, Heritage, mancozeb, Manicure, Prostar, Thalonil, or Touche per manufacturer's recommendations.

◆ Pythium Blight

Pythium blight has been very active on golf and landscape turf in several locations during the past few weeks. Since **pythium** thrives in low or poorly drained areas, especially when the night temperatures are above 70°F, we should see a lot more of this disease as the "hot muggy" weather continues this summer. For best results, improve drainage, water in the early morning hours, avoid over fertilization, and apply Aliette, Banol, Heritage, Koban, Prodigy, Subdue, or Terrazole, according to the manufacturer's recommendations.

Slime mold

Although not actually a disease, inquiries have been received recently regarding the appearance of tan to

black colored clumps on turf, flower beds, and home gardens. In many cases, this material has been reported to occur virtually overnight on plant stems, grass blades, soil mounds, or other vertical objects. Upon close examination, these mysterious structures have been identified as clumps of the common **slime mold** fungus *Fuligo*. *Fuligo* is not injurious to plants and will soon disappear on its own. It can be easily dispersed with a rake or steady stream of water. No fungicides are recommended.

◆ Summer Patch

This disease, caused by the root-infecting fungus *Magnaporthe poae*, is prevalent on annual bluegrass, Kentucky bluegrass, and fine fescue turf throughout the state. For those turf managers who are on a preventive spray program, now is the time to apply the third and final fungicide application for the control of **summer patch**. For optimum results, apply Banner 1.24 MC (4 fl oz product/1000 ft²), Rubigan 1AS (4 fl oz product/1000 ft²), Bayleton 25DF (4.0 oz product/1000 ft²), or Heritage 50WG (0.4 oz product/1000 ft²) in 4 to 5 gal of water/1000 ft². If fungicides can not 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.

◆ Yellow Ring

This disease, caused by the fungus *Trechispora alnicola*, is evident on Kentucky bluegrass lawns and sod fields at this time. Patches are 1 to 2 feet in diameter. Affected areas consist of green grass surrounded by 2 to 4 inch diameter yellow rings. Upon close inspection of the thatch, a dense mat of white mycelium is often apparent. Infected turf rarely dies and rings do not always reappear the following year. Symptoms are most apparent during cloudy weather between May and October. The fungus is primarily a saprophyte which colonizes organic matter in the thatch. Since the damage caused by this disease is purely cosmetic and the turf recovers during cool weather in the fall and spring, control is rarely warranted. In areas where symptom expression cannot be tolerated (i.e. sod fields), turf managers should dethatch affected areas. PCNB has proven effective in university tests but is not currently labeled for use against this disease. Due to phytotoxicity, this fungicide should not be used on cool-season grasses during hot weather.

◆ Turf Field Day

The date for this year's **Rutgers Turfgrass Research Field Day for "Golf and Fine Turf"** has been set for **August 13, 1997** at Hort Farm II, Ryders Lane, in North Brunswick, NJ. Registration will begin at 12:30 p.m., "rain or shine." Guided field tours will commence at 1:30 p.m. Field Day will conclude with a barbecue dinner at 5 p.m. The cost of registration is \$20.00 without dinner and \$30.00 with dinner. Recertification credits will be awarded at the conclusion of the program so mark your calendars now for this worthwhile event. Call (732) 932-9400 for further information or directions. □

Poinsettia Production Notes

Jim Willmott, Camden County Agricultural Agent

A conscientious effort early in production is essential for finishing quality poinsettias: Now's the time! The following are important considerations to get off to a good start.

Buy or produce quality cuttings: Nothing is more important! Remember well conditioned cuttings result from well managed stock plants. For most growers it is best to purchase from specialists who have the time, experience and resources to produce uniform cuttings that are pest free and not too "hard" or "soft". Highly diversified growers have so much going on in spring that stock is often neglected and crowded due to space shortages.

Give prompt attention to arriving cuttings: Unrooted cuttings are vulnerable to heat and desiccation. Delays often cause irreversible damage. Mist as soon as possible.

Thoroughly clean and disinfest propagation areas, tools and media: Infectious diseases caused by *Pythium* and *Rhizoctonia* often injure young plants. Fungicides can control these, but may injure unrooted cuttings. Reducing the presence of pathogens is the best disease management strategy. Once rooted, fungicidal drenches can be applied.

Maintain favorable rootzone temperatures: Rootzone temperatures should be held at about 70°F. Often growers are caught off guard by cool nights. Low rootzone temperature delays root development and predisposes plants to infectious disease troubles. Bottom heat technology is essential for propagation, but some growers complete the crop cycle with floor heat and other designs.

Maintain favorable air temperatures: High temperatures, especially when combined with high summer light, can be deadly to cuttings. Generally temperature and light can be increased as roots develop. Be sure ventilation systems are functioning well. If day temperatures can be kept cool, height control (stretching) is less of a problem.

Manage height early: Early height control is important for finishing compact plants. Watch for excessive internode elongation and manage either through temperature control or growth retardants.

Provide needed nutrients: Nutrients leach from cuttings during misting. Some growers apply low concentrations of calcium and/ or potassium nitrate during propagation. Once rooted, supply 100-150 ppm of nitrogen at each watering. Increase this, *according to cultivar preferences*, up to 200-300 ppm continuous liquid feed. *Don't over fertilize!* It pushes growth and creates problems with stem breakage. Be especially sensitive to some of the newer slower growing cultivars. Many of the dark leaf types, for example, like a "leaner

feed". *Sound nutrient management strategies always require an understanding of media and irrigation water chemistry.* Be sure to test both! Growers in some parts of Southern Jersey may see high sodium and chloride due to salt water intrusion into wells.

Control the gnats: Fungus gnats are most damaging during cutting production. Management should begin before production. Treat fungus gnat larvae under benches with labeled insecticides several weeks prior to cutting arrival. Monitor soil for larvae with quarter inch slices of potatoes. Place slices on soil surface and examine for larval infestation. Use potatoes to determine the extent of an infestation before treating and also to evaluate control after treating. If larvae survive, adult flies can be detected with yellow sticky cards. They can easily be controlled with aerosol formulations of insecticides.

Monitor for pests: The practice of IPM requires formalized monitoring and record keeping. Scout for whiteflies, fungus gnats, thrips and aphids. *Keep alert for mites!* Lewis mites have become increasingly common in recent years presumably since Marathon does not control mites. Besides root diseases, *Erwinia* stem rot, a bacterial disease, often causes damage during propagation. □

HIGHLIGHTS FROM PAGE 3

◆ Landscape

Phytophthora crown and root rot remains active in landscape plantings during this period. Samples of junipers were diagnosed with the disease from two sites in Union County. **Botrytis blight** was identified on rose canes submitted from a Morris County landscape.

Insect problems are also proving to be very common this year. **Hedgehog gall** and the **wool sower gall** were identified on the oak leaves from an Essex County landscape. High populations of **cottony camellia scale** were found on the branches of a yew sample from a Middlesex County resident, and on holly from a Bergen County arborist. Samples of birch with **bronze birch borer** injury were submitted from a Passaic County landscape. **Pine needle scale** was found on pine from a Bergen County landscape, and a large **mite** population was identified on spruce from the same landscape.

◆ Nursery and Greenhouse

Phytophthora root rot was diagnosed on chamaecyparis, juniper, and rhododendron from a Burlington County Nursery. The same nursery also submitted samples of rhododendron with **Botryosphaeria canker**. Another water mold disease, **Pythium root rot**, was a problem for a Middlesex County nurseryman who was growing fall mums. **Wireworms** girdled the stems on a large planting of zinnia grown for cut flowers at a Bergen county farm stand. The insects chewed the crown of virtually every plant. **Wireworm** injury is normally a problem for vegetable growers, but the field had been in vegetable production for several seasons before the zinnia's. □

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