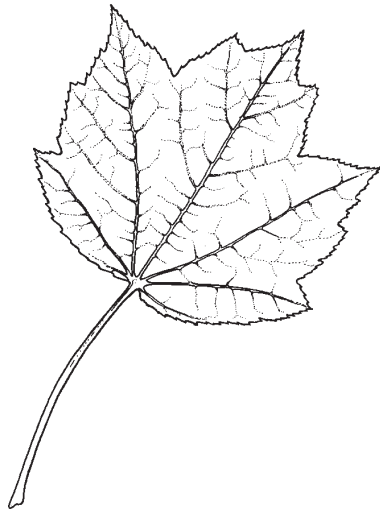


PLANT & PEST ADVISORY

LANDSCAPE, NURSERY & TURF EDITION \$1.50

SEPTEMBER 25, 1997



Fertilization Of Landscape Plants

Raul I. Cabrera, Ph.D., Nursery Crops Management

Plants have the remarkable ability to adapt to landscape soils with low fertility. The foliage of most trees and shrubs is usually an acceptable green even though nutrient deficiencies may significantly limit growth. Experiments with several woody species have shown that seedlings can adjust root and shoot growth to low levels of nitrogen, phosphorus, and other nutrients so that their foliage maintains a healthy appearance. These findings have important implications for the care of young as well as old trees. For young trees to grow rapidly, they must have increasing amounts of nutrients available at least until they reach full size or maturity. On the other hand, mature trees with little or sometimes no fertilization will be able to remain growing (low to moderate rates), attractive (i.e. good leaf color) and healthy, in balance with their surroundings. Fertilization practices for landscape plants have, unfortunately, been plagued by tradition and rules of thumb for decades. Following is some research-based information on the nutrition and fertilization of landscape plants, including some general recommendations.

Nitrogen (N) is the most important mineral element influencing plant growth and to which plants most commonly respond. Ironically, N is a nutrient that is almost universally deficient. The most visible response when N is added is increased shoot growth. On the other hand, phosphorus (P), also an essential nutrient, is not deficient for trees in most regions and top growth is seldom affected when P is applied to trees. When there is a deficiency, however, the addition of either N or P stimulates both root and shoot growth. Similar to P, potassium (K) is seldom deficient for trees and large shrubs in most regions. Numerous field trials have shown that most soils contain sufficient levels of P and K for trees and large shrubs. Applying nutrients 'to be safe', without knowing if they are deficient wastes time and money and can lead to salt build-up in the soil and water pollution. Hence, the use of "complete" or "balanced" fertilizers that contain these two nutrients plus N, and possibly others, are seldom required.

Recommendations for fertilizing newly planted trees and shrubs, as well as established plants, vary considerably. With regards to the former, some suggest that a complete fertilizer be mixed in backfill soil; others advise no fertilizer during the first growing season. Experimental results vary with some trees responding to N fertilizer the first season, but many others not responding until the second or third season.

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Considering that the bulk of shoot growth during spring depends primarily on tree nutrient reserves, little or no growth response might be expected to fertilization the first season. However, if it is applied at or soon after planting, N should be absorbed and stored for growth the following spring. Based on this information, it appears that fertilizing soon after planting is good insurance, but should be used with moderation. Slow-release fertilizers can supply low concentrations of nutrients for 2-18 months. These fertilizers are particularly useful for plantings that are inconvenient or expensive to fertilize regularly, or for those in sandy soils. Slow-release fertilizers can be mixed with the backfill at planting according to the manufacturer's directions, preferably the lower recommended rates. The quantity recommendations for N application vary considerably, typically ranging from 10 to 50 g (0.02-0.10 lb.) of N in the planting hole or backfill soil. Alternatively, a surface application of 10 to 75 g of N per square meter (0.02 - 0.15 lb. per 10 sq. ft.) of the basin surface around each tree after planting will ensure an adequate supply. Do not apply close to the trunk. A second application in early summer may enhance growth the following spring.

Information on N fertilization recommendations for established mature trees and shrubs is relatively vague and varies considerably. As a first approximation, modest amounts of N, between 0.25 to 1 lb. of N per 1000 sq. ft. (annually), may be more than sufficient to supplement the needs of these plants. The correction of N deficiencies in mature trees and shrubs will require higher N applications, namely 2-4 lb. of N per 1000 sq. ft. (annually), with applications likely needed for a couple of seasons.

As for the best timing of N fertilizer application, mid- to late-summer, or when shoot growth slows down, is usually the most effective application time. It is at this time that conditions are more favorable for nutrient absorption and storage. In regions of warm autumns or sandy soils, applications could be later than regions where early winters or clay soils prevail. In sandy soils, particularly in high rainfall areas or where heavy irrigation is practiced, plants may respond best to split applications in late spring and autumn. Split applications or slow-release fertilizers can also be used to encourage rapid growth of young trees. □

Shot Hole Borers

Deborah Smith-Fiola, Ocean County Agricultural Agent

Shot hole borers are common bark beetles that attack many stressed plants, including fruit trees (apple, pear) and shade trees (especially mountain ash, hawthorn, elm). Adult beetles are small (1/10") black and 'humped.' The adult female chews through the bark of tree branches and main stems/trunks, then turns 90% to excavate a gallery 1" - 2" long in the cambium in which she lays her eggs. If the bark is removed, this gallery is shaped like a centipede.

Newly hatched larvae excavate secondary galleries as they feed, which further weakens the tree. Newly emerging adults chew holes through the bark to emerge and repeat the life cycle. The numerous small emergence holes appear as though a shotgun created holes in the tree bark. 2 to 3+ generations occur each year, with immatures overwintering beneath the bark.

Trees in poor condition are most likely attacked, particularly those declining from not enough water, inadequate fertilization, or sunscald. Shot hole borers can detect these weakened trees, and emit a kairomone (an interspecies attractant hormone), which signals to other shot hole borers that a tree host is "ripe for the picking." Shot hole borers are often the first borer to attack a weakened tree; other, more destructive borers then come in to polish off the dying tree. Sometimes they attack healthy trees, but only if a large infestation is nearby (from, for example, an abandoned orchard, firewood pile, an infested roadside chokecherry tree).

Spraying pesticides to control shot hole borers is ineffective for two reasons: 1) it is difficult to time adult emergence for proper spray timing; and 2) once the larvae are protected beneath the bark, no pesticide will be effective. An IPM alternative is to *prevent* the problem ahead of time or, if the problem already exists, to use sanitation.

Remember, these borers attack weakened trees. When shot hole borers attack, it usually means that there are other serious problems within the tree. Keep trees healthy to prevent attack by proper watering and fertilization. Watering is especially important during the droughty summer months. Take care not to injure roots or the tree trunk. Keep in mind that although trees may show decline symptoms and borer holes during a wet year, the tree may be reacting to the stress conditions of a previous year's drought. Prune out affected branches if only a few are attacked and the tree is in the first stages of decline. If the tree has extensive damage, removal may be the best option, particularly if adjacent trees could also be attacked. Remove or burn infested wood, and do not leave branches or stumps (even logs left for firewood could become a source of infestation). □

This article was reprinted from the September, 1997 issue of Landscape IPM Notes, Rutgers Cooperative Extension of Ocean County, (732) 349-1246.

Horticultural Engineering Publications Available

The following greenhouse publications are available from Rutgers Bioresource Engineering Department:

Qty.	PUBLICATION NAME	I.D.	Unit cost	Total cost
	Soil Heating Systems for Greenhouse Production	Rutgers E208	\$4.00	
	Environmental Control of Greenhouses	Rutgers E213	\$5.00	
	Energy Conservation for Commercial Greenhouses	NRAES 3	\$5.00	
	Movable Thermal Insulation for Greenhouses	Rutgers	\$1.00	
	Starting in the Greenhouse Business	Rutgers E169	\$4.00	
	Greenhouse Engineering	NRAES 33	\$25.00	
	Greenhouse Systems Automation-Culture Environment	NRAES 72	\$32.00	
	Greenhouse Systems Post Conference Proceedings	NRAES 72S	\$10.00	
	Water and Nutrient Management for Greenhouses	NRAES 56	\$20.00	
	Trickle Irrigation for the Eastern United States	NRAES 4	\$6.00	
	Home Storage of Fruits and Vegetables	NRAES 7	\$6.00	
	Commercial Storage of Fruits/Vegetables/Nursery Stock	USDA 66	\$15.00	
	Refrigeration and CA Storage - Horticultural Crops	NRAES 22	\$8.00	
	Facilities for Roadside Markets	NRAES 52	\$7.00	
	Produce Handling and Direct Marketing	NRAES 51	\$7.00	
	On-Farm Agrichemical Handling Facilities	NRAES 78	\$6.00	
	Private Water Systems Handbook	MWPS 14	\$7.00	
	Farm Buildings Wiring Handbook Second Edition. 92	MWPS 28	\$10.00	
	Farm and Home Concrete Handbook	MWPS 35	\$6.00	
	Greenhouse Climate Control Handbook ACME Eng'g		\$5.00	

Make Check payable to— Rutgers, The State University

Mail to: William J. Roberts Director CCEA
Bioresource Engineering Department
George H. Cook College, Rutgers University
P.O. Box 231, New Brunswick, NJ 08903

Shipping Address:

Calendar of Events

October 15, 1997 (Wednesday evening) - Forestry Workshop, Gloucester County Office Building, 1200 N. Delsea Drive, Clayton, NJ. Contact: Jerome L. Frecon 609-863-0110 Rutgers Cooperative Extension of Gloucester County, 1200 N. Delsea Drive, Clayton, NJ 08312 for program and registration information.

October 21, 1997 (Tuesday) and **October 28, 1997** (Tuesday), Basics of Landscape IPM Course, Watchung Stable, Watchung Reservation, Mountainside, NJ. Contact: Rutgers Cooperative Extension of Union County at (908) 654-9854 for a registration form and program agenda.

December 3, 1997 (Wednesday) - South Jersey Landscape Conference, Masso's Crystal Manor, Delsea Drive, Glassboro, NJ. Contact: Jerome L. Frecon 609-863-0110 Rutgers Cooperative Extension of Gloucester County, 1200 N. Delsea Drive, Clayton, NJ 08312 for program and registration information.

Basics of Landscape IPM Course

Dates: Tuesday, October 21, 1997 and Tuesday, October 28, 1997

Time: 8:30 a.m. - 3:30 p.m.

Location: Watchung Stable, Watchung Reservation, Mountainside, NJ

Fee: \$50, includes luncheon both days

Registration: To register, call Rutgers Cooperative Extension of Union County at (908) 654-9854 for a registration form and program agenda.

Pesticide Recertification Credits will be offered.

This two day course is designed to teach public employees, landscape and turf professionals and other interested people, the basics of implementing an Integrated Pest Management (IPM) program. Program participants will learn how to identify common turf and ornamental insect and disease problems, use cultural methods to prevent and control pests, and select the least toxic pesticides if their use is deemed necessary. Information on how professionals have adopted IPM practices in their businesses and marketing will also be presented.

Diseases of Turfgrass

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

◆ General

Dollar spot, red thread, rust, summer patch, and anthracnose are prevalent on turf at this time. Please refer to recent issues of this newsletter for complete disease control information.

Fairy Rings

This disease, caused by a group of fungi known as **Basidiomycetes**, is quite apparent 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 this disease, usually develop only in the mid-spring and mid-fall months. Although chemicals have been relatively ineffective against these fungi in the past, Prostar has shown promise in university tests. For now, maintain adequate fertility and soil moisture to mask symptom expression. Spiking affected turf prior to irrigation should enhance water movement into the soil profile.

◆ Stripe Smut

This disease, caused by the fungus *Ustilago striiformis*, will soon be apparent on sensitive Kentucky bluegrass varieties. Symptoms typically appear as long black streaks (striations) between the veins of infected blades. These areas eventually rupture, releasing abundant black smut spores. Research at Rutgers has shown that one well-timed application of a systemic fungicide in early to mid-October offers excellent control and is, therefore, far superior to multiple applications in the spring (mid-May). For best results, apply Banner, Bayleton, Cleary 3336, Fungo, Rubigan or Sentinel, now per manufacturer's recommendations. □

Plant Diagnostic Laboratory Highlights

Richard J. Buckley, Coordinator, Plant Diagnostic Laboratory

◆ Turf

Summer patch, anthracnose, brown patch, and dollar spot were still active in some turf areas during the past month. **Anthracnose** was found on turf from golf courses in Atlantic, and Ocean counties, and also from New York, West Virginia, and Oregon. **Dollar spot** was identified on turf submitted from Bergen, Burlington, and Salem Counties, as well as from West Virginia. **Summer patch** was diagnosed on turf from a Bergen County golf course, and on golf turf from New York and Virginia. It was also the cause of problems on landscape turf from Hunterdon County. **Brown patch** flared up again and was diagnosed in landscape turf from Warren and Somerset counties, and on golf turf from Morris County. An Ocean County landscaper submitted an excellent sample of **Fairy Ring** to the laboratory in early-September. The sample had a distinct mycelial mat that was completely hydrophobic - very exciting for the pathologist!

Gray leaf spot, caused by the fungus *Pyricularia grisea*, is active at this time. Golf course superintendents from Philadelphia to southeastern New York have called the laboratory inquiring about the problem, however, to date, there has been only one confirmed case of the disease.

◆ Nursery and Greenhouse

A nursery and greenhouse grower in Burlington County sent samples of amaranthus that were diagnosed with **Alternaria leaf spot**. Samples of stunted chrysanthemums from a Warren County grower had **Pythium root rot**. **Pythium root rot** was also a problem on newly planted leopard-bane for a Camden County grower. White pines from tree farms in Middlesex and Mercer counties were sent to the laboratory in September. Several trees in each field had declined and died rapidly during late-summer. In each case, **black turpentine beetles** were identified in the trunk. These beetles are attracted to stressed trees. **Flatheaded appletree borers** decimated several blocks of oaks in a Monmouth County nursery. The insect is primarily a problem on newly planted trees without adequate roots. These trees were planted this spring.

◆ Landscape

In the landscape, two oak samples received from Morris and Union County arborists were diagnosed with **Actinopelte leaf spot**. **Phyllosticta leaf spot** was identified on a rhododendron sample from a Bergen County landscape. Samples of maple with **shade tree anthracnose** were sent from arborists in Somerset and Warren counties. **Phytophthora root and crown rot** killed several hundred rhododendrons that were planted on a Union County commercial landscape site.

Other diseases of note include: **powdery mildew** on a Middlesex County lilac sample, **Volutella blight** on pachysandra from Bergen County, **Diplodia tip blight** on pine in Somerset County, **Botryosphaeria canker** on redbud branches from Atlantic County, and **Rhizoctonia root and crown rot** on impatiens in Middlesex and Cape May County landscapes.

Insect problems of note in the landscape include: **oak spangles and gall midges** on white oak leaves from Somerset County; **hemlock woolly adelgid**, and **azalea bark scale** from Middlesex County; **pitch midge** on pine from Union County; and **arborvitae leaf minor** on samples from Atlantic County. □

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