

PLANT & PEST ADVISORY

LANDSCAPE, NURSERY & TURF EDITION \$1.50

JULY 2, 1998

Field Nursery Weed Control

Albert O. Ayeni, Ph.D., Weed Science



Established Plantings

The weather has been favorable for a vigorous weed flora in established nurseries throughout the state. The chemical weed control program used last fall has worn out by now necessitating another treatment. Where weed control is by cultivation, several passes must have been made since the start of spring; otherwise, by now the plantation would be completely overgrown.

Winter annuals including **common chickweed, henbit, speedwells**, etc., have completed their life cycle and their seed are in a state of dormancy until next fall. On the other hand, the summer annuals and perennials are actively growing, offering stiff competition to the established nursery crops for light, nutrients or water. At this time of the year, the challenge is to control these actively growing weeds to give the nursery crop a good environment for optimum growth and development.

Problem Weeds of Established Nursery

Weeds of major concern in established nursery are as listed for new plantings (see Plant and Pest Advisory: Landscape, Nursery & Turf Edition, May 21, 1998). In addition, **Canada golden rod, hemp dogbane, milkweed, mugwort, plantain (buckhorn and broadleaf) and white heath aster** are frequently encountered perennials in established nurseries throughout the state. Identify and control these weeds at early growth stages when they are susceptible to herbicides at low rates. To kill older plants, higher herbicide rates are required. In some situations the plant may develop resistance to herbicide treatment and necessitate other more tedious control measures.

Weed Control in Established Nursery

a) Cultivation: In the summer months, frequent cultivation (repeated every 2 to 3 weeks) is essential to control both annual and perennial weeds. Due to the large population of weed seeds in the soil, annual weeds often re-establish within a few days after cultivation. Most annual weeds become very demanding of nutrients and water from the second week after emergence. Frequent cultivation ensures minimum weed interference with the crop and efficient nutrient recycling for the benefit of the crop. Where perennial weeds are a problem, reduce their population by deep cultivation which fragments the propagative organs and exposes them to sun drying.

SEE NURSERY WEEDS ON PAGE 2

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Cultivation has a limitation of leaving the intra-row weeds untouched. Unfortunately, these weeds interfere more with the crop than the inter-row weeds. Throughout the state, many nurseries that adopt cultivation as a weed control method often disregard the intra-row weeds. This is not a good practice. Remember that these weeds not only compete with the crop for nutrients and water, they are also potential shelters and/or hosts for pests and pathogens which may cause severe damage to the nursery crop and increase the cost of crop protection.

b) Chemical weed control: If properly applied, chemical weed control eliminates the need for supplementary hand-removal of intra-row weeds. Several selective PRE or POST herbicides can be applied to established nursery plantings. It is important to know which herbicide is safe in what nursery crop. The table below gives a list of PRE herbicides which can be used in some popular nursery crops in New Jersey (*Note: the use of herbicide trade names is for easy identification only; no endorsement or discrimination is intended*).

Postemergence herbicides commonly used in

established nursery are limited to grass killers such as Envoy (or Prism), Fusilade II (or Ornamec, Take Away), or Vantage. These products control different types of grasses at different growth stages. They work best on young actively growing plants. Casoron effectively controls many difficult broadleaf weeds including **Canada thistle, white heath aster, white clover** etc. However, *it must be applied in the winter months* when temperatures are low enough (< 45°F) to prevent volatilization which may cause injury to nearby plants. Stinger is another POST herbicide with good activity on several broadleaf weeds. However, it is currently registered for use *only in Christmas trees* in New Jersey.

Non-selective herbicides including Reward, Finale, Roundup Pro (or Roundup Ultra), and Scythe are effective for directed application in established nursery. These herbicides kill all types of vegetation they come in contact with. Extra care is therefore needed to direct them away from the crop. Where the nursery crop is well established and the stem bark is already hardened, herbicide contact with the hardened surface does no harm to the crop. Reward, Finale, and Scythe work much better on annual (and biennial) weeds than

perennial weeds. Roundup Pro (or Roundup Ultra) is recommended for fields infested by all types of weeds including perennials.

Apply POST herbicides when there is assurance of a rain-free period of a minimum of six hours after herbicide application. The rain-free period gives the weed sufficient time to absorb enough herbicide to effect a kill. Also, read the herbicide label to confirm whether or not a surfactant should be added to the formulation to obtain the best results. For more information on herbicide use in established nursery, call your RCE County Agent. ☐

Crop	Casoron	Devrinol	Eptam	Factor	Gallery	Goal	Kerb	Pendulum	Pennant	Princep	Ronstar	Surflan	Treflan	OH2	RegalstarII	Regal O-O	Rout	Snapshot TG	XL
Evergreen Narrowleaf Ornamentals¹																			
Arbovitae	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
Fir		G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G
Juniper	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G
Pine		G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G
Spruce		G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G
Yew	G	G	G	G	G	G	G	G	G	G	G	G	G		G	G	G	G	G
Evergreen Broadleaf Ornamentals																			
Boxwood	G	G	G	G	G		G	G	G		G	G	G	G	G	G	G	G	G
Euonymus	G	G	G	G	G		G	G	G		G	G	G	G	G	G	G	G	G
Firethorn	G	G	G	G	G		G	G	G		G	G	G	G	G	G	G	G	G
Holly	G	G	G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G
Rhododendron	G	G	G	G	G		G	G	G		G	G	G	G	G	G	G	G	G
Deciduous trees																			
Dogwood	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G	G
Maple		G	G	G	G		G	G	G		G	G	G		G	G		G	G
Oak		G	G	G	G		G	G	G	G	G	G	G		G	G		G	G
Sweetgum						G	G	G	G		G	G	G		G	G		G	G
Willow	G				G		G	G	G		G	G	G		G	G		G	G
Shrubs																			
Azalea	G	G	G	G	G		G	G	G		G	G	G	G	G	G	G	G	G
Barberry			G	G	G		G	G	G	G	G	G	G	G	G	G	G	G	G
Cotoneaster	G	G		G	G		G	G	G	G	G	G	G	G	G	G	G	G	G
Forsythia	G	G		G	G		G	G	G	G	G	G	G	G	G	G	G	G	G
Gardenia	G	G		G	G		G	G	G		G	G	G	G	G	G	G	G	G
Pachysandra	G	G	G	G	G		G	G	G		G	G	G	G	G	G	G	G	G
Rose	G	G	G	G	G		G	G	G		G	G	G	G	G	G	G	G	G
Viburnum		G	G	G	G		G	G	G		G	G	G	G	G	G	G	G	G

¹G signifies herbicide is labeled for use in the crop; an empty (or shaded) box indicates herbicide is not labeled for use in the crop.

Fertilizing Herbaceous Perennials

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

In a previous issue of this newsletter (April 23, 1998) I described some of last year's results from our research program on the fertility management of herbaceous perennial crops. To summarize, we found that the best growth and quality of perennials like *Hemerocallis*, *Coreopsis*, *Astilbe*, *Phlox* and *Rudbeckia* was obtained with 3 to 6 lb./cu.yd. of Osmocote 18-6-12. We attributed the success of such low rates of controlled release fertilizer (CRF) to the fact that we grew the plants in a peat moss-based growing medium. This year we are repeating the experiment, and about a month ago we began evaluating the effects of growing media (peat moss vs. pine bark) and application rates of CRF on the growth and quality of these same species. So far we have noticed that, as expected, plants growing in a pine bark:sand medium at low CRF rates are not doing as well as those being grown in peat moss:sand.

While the provision of recommendations for sound CRF application rates according to growing media will have to wait for more time, there is information available that may prove useful in the elaboration of fertility programs for perennials. After browsing the current literature on the subject (meager I should say) I was able to compile data on the average tissue nutrient content in some of the most popular perennials (Table 1), and they reveal at least two major points. First, *Hostas* and *Rudbeckias* have relatively low leaf nitrogen concentrations (2-2.5%), when herbaceous plants in general (including vegetables, grasses, and household plants), have values in the order of 4-6%. Secondly, it is readily apparent that the potassium (K) requirement of herbaceous perennials is high, denoted by the N:K ratio of 1:1. In woody ornamentals this ratio is typically more like a 2:1, and most CRF's in the market reflect this ratio (for example Osmocote 18-6-12, with a N:K ratio of 1.8:1). Unless CRF manufacturers have formulations more adequate for herbaceous perennials, growers may want to supplement their fertility programs with more K. Compared to N and K, the phosphorous (P) requirements of these species is low. Incidentally, the popular notion that P is directly linked to the flowering response of plants has not been supported by research. In fact, today most fertility recommendations for container-grown plants avoid the addition of P fertilizers in preplant (i.e. no superphosphate applications). Phosphorous levels in irrigation waters and most complete fertilizers are sufficient to meet the demands of most plants.

Table 1. Average leaf macronutrient concentrations for container-grown herbaceous perennials

SPECIES	Macronutrients (% of dry weight)					
	N	P	K	Ca	Mg	S
<i>Hosta</i>	2.0	0.3	2.2	1.4	0.3	0.2
<i>Rudbeckia</i>	2.6	0.2	2.5	2.2	0.6	0.7
<i>Coreopsis</i>	3.0	0.3	2.5	1.6	0.5	0.3
<i>Hemerocallis</i>	3.0	0.3	2.6	1.0	0.2	0.2
<i>Phlox</i>	3.5	0.5	2.3	2.0	0.4	0.3
<i>Salvia</i>	3.8	0.4	3.7	1.5	0.4	0.3
<i>Sedum</i>	3.8	0.6	3.8	2.6	0.5	0.4

Diseases of Ornamentals

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

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.

Be on the lookout this month for one of the most common diseases of woody shrubs and shade trees - powdery mildew.

To manage **powdery mildew**, 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 chlorothalonil, copper (Champ, Kocide), 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. □

Management for Safe and Healthy Street Trees

Jim Willmott, Camden County Agricultural Agent

Street trees provide functional and aesthetic benefits. They cool and purify the air, consume carbon dioxide, provide oxygen and offer wildlife habitat. Unfortunately, many communities commit little thought or resources to street trees which, when neglected, present serious risks. *Recent storms revealed the urgent need for proactive management of street trees. Aging and unhealthy trees were damaged resulting in power outages, property damage and injury to people.* Public officials and citizen groups need to work towards safer and healthier street tree plantings. This begins with comprehensive inventories that document tree locations, health and species population numbers. Inventories are essential tools for understanding the current condition of trees and for developing proactive maintenance strategies.

The following are guidelines for successful plantings.

Plan for greater diversity. There are too many of the same tree species on our streets. For example, in many communities, Norway maples comprise 80 percent or more of the total tree population. No species should be overplanted. Diversity reduces the chances of catastrophic losses from either biotic (insect pests and pathogens) or abiotic stress (deicing salt, heat, cold,

drought, storms, etc.). While there is disagreement over specific percentages, urban forestry experts agree there should be species population limits. Comprehensive plans should include provisions for replacing trees lost to storms, pests or other problems. To increase diversity, select less common species. Keep in mind that no tree is perfect! Eventually homogenous populations face devastation from biological and physical forces. This is the lesson we should learn from the lost American elm plantings. Table 1. lists less common street trees worth considering.

Pick plants adapted to site conditions. Remember street trees must endure site extremes not present in parks or open lawn areas. Provisions for planting should begin with a thorough interpretation of site conditions - both above and below ground. Above ground consider light intensity, air temperatures, salt spray and space, but don't forget about space - especially when planting under utility lines. Larger trees under utility lines require costly trimming which often damages health. Below ground assess soil chemistry (pH, nutrients) and physical properties (drainage, aeration). While these can be amended, it is always best to pick a tree species that tolerates soil problems such as pH and moisture extremes or compaction. Also, *below ground don't forget about utility lines* including gas, electric and cable. Call 1-800-272-1000 at least three days before you dig for free markouts by utility professionals. Again, don't forget about space. If big trees are confined, they will decline and die. Small soil volumes cannot support their growth.

Another concern is that larger trees lift and damage paved areas. Choose smaller trees for smaller sites.

Choose plants with few serious pest problems (insects, mites, pathogens). Pest troubles jeopardize tree health. This is a greater concern for street trees since they are usually challenged by multiple stress factors that lead to decline and death. *Pest Resistant Ornamental Plants* from Rutgers Cooperative Extension of Ocean County, is an excellent reference. Cost is \$8.00 (\$9.70 including postage) per copy. Contact Penny Jacobs at 732-349-1246.

Plant properly. While proper selection is vital, even the best trees suffer and decline from improper planting. Much research demonstrates the importance of site preparation for long term survival. Too often trees are abused as inanimate things, wrestled around and dropped in a hole. Trees, especially those recently dug from nurseries, are much more delicate than commonly perceived. Site preparation should optimize soil chemical, physical and biological properties. Beyond this, *planting depth is critical.* Countless trees

Table 1. Less Common Trees Suitable for Street Plantings¹

Common name	Genus species	Height
Hedge maple	<i>Acer campestre</i>	25-35 ft.
European hornbeam	<i>Carpinus betulus</i>	40-60 ft.
Katsuratree	<i>Cercidiphyllum japonicum</i>	40-60 ft.
Washington hawthorn	<i>Crataegus phaenopyrum</i>	20-30 ft.
Ginkgo	<i>Ginkgo biloba</i>	50-80 ft.
Kentucky coffeetree	<i>Gymnocladus dioica</i>	60-75 ft.
Goldenrain Tree	<i>Koelreuteria paniculata</i>	25-45 ft.
Crabapples (<i>disease-resistant cultivars only</i>)	<i>Malus spp</i>	15-30 ft.
Amur corktree	<i>Phellodendron amurense</i>	35-45 ft.
Swamp white oak	<i>Quercus bicolor</i>	60-80 ft.
Japanese tree lilac	<i>Syringa reticulata</i>	20-30 ft.
Bald cypress	<i>Taxodium distichum</i>	60-80 ft.
Silver Linden	<i>Tilia tomentosa</i>	50-70 ft.
Hybrid elms	<i>Ulmus hybrids</i>	50-80 ft.
Chinese elm	<i>Ulmus parvifolia</i>	50-75 ft.
Japanese zelkova	<i>Zelkova serrata</i>	50-80 ft.

¹Trees listed by species only. Most have improved cultivars with improved performance. Consult knowledgeable nursery professionals. Be sure trees are adapted to sites.

SEE STREET TREES ON PAGE 5

Plant Diagnostic Laboratory Highlights

Richard Buckley, Coordinator, Plant Diagnostic Lab

Turfgrass

The advent of hazy, hot, and humid weather conditions since mid-June unleashed a flurry of summertime disease problems. **Brown patch** was very active on golf and landscape turf during this time. The disease was found on bentgrass and annual bluegrass golf greens from Atlantic, Burlington, Camden, and Monmouth Counties. Two golf courses in Virginia with perennial ryegrass fairways also had problems with the disease. On residential turf, **brown patch** was diagnosed on samples from Union and Bergen Counties. The **pythium disease complex** was also active during the end of June. **Root-infecting pythium** was identified on greens and collars from golf courses in Pennsylvania and Ohio, and from courses in Monmouth and Somerset Counties. It is interesting to note that all of the greens with what we call **root pythium** were newly constructed or rebuilt, sand-based construction. In each case there also was evidence of nutrition and/or pH problems. **Pythium blight** also did its share of damage with samples from Maryland, Virginia, and Camden County being diagnosed with the disease. I would also like to mention that the **brown patch** and **pythium blight** on the turf farm in New Brunswick was particularly awesome last week. Another **root-infecting disease, summer patch**, is increasing at this time. The disease was confirmed in samples from golf courses in Bergen and Hunterdon Counties, two courses in New York, and from a baseball field in Baltimore.

Other diseases of note include: **leaf spot and melting out** from residential lawns in Somerset and Hudson Counties; **anthracnose basal crown rot** from a golf course in New York; **dollar spot** from golf courses in Gloucester County and Virginia; and **fairy rings** on golf turf from New York, and Bergen County.

Landscape

Leaf spot diseases and **twig cankers** continue to be primary submissions to the laboratory from landscape. **Anthracnose** of ash, oak, sycamore, and maple continue to flow in from around the state. Samples of **cytospora canker** were recently diagnosed on willow from Somerset County, serviceberry from Morris County, and maple from Burlington County. **Juniper twig blight** was identified on juniper from Middlesex County. On herbaceous ornamentals **pythium crown and root rot** was diagnosed on pachysandra from Passaic County, and **rust** was found on mallow from Bergen County.

Insect problems are also being submitted to the laboratory at a rapid pace. Fortunately, in January, we added a part-time entomologist to the laboratory staff who has rapidly become quite competent in insect pest diagnosis. Insect samples of note this period include: **azalea lacebug** on azalea from Atlantic County, **bark beetle** on Japanese snowbell from Passaic County, **oystershell scale** on lilac from Passaic County, and **juniper scale** on juniper from Middlesex and Passaic Counties. **Spruce mites** were found on most evergreen samples from around the state.

Lastly, two non-pathogen/pest problems have reared their ugly heads this summer. **Artillery fungus** samples were submitted from Middlesex County and **slime mold** was found on a lawn in Morris County. While these common problems generally do not compromise plant health they certainly cause some anxiety with our clientele. □

STREET TREES FROM PAGE 4

die after deep planting. The root ball should always be at the soil surface or slightly above. To avoid sinking, be sure the soil immediately below the root ball is compacted - *just the area below, not the whole area!* In most cases organic and chemical amendments are not necessary and may retard establishment. In some cases pH adjustment and phosphorous fertilization will be beneficial. During establishment, most critical needs are water and good soil aeration. Mulching helps moderate soil moisture and reduces surface compaction. Minor pruning may be necessary to remove dead limbs and correct growth habit. However, it is best to start with quality trees that are pruned and grown correctly. Identify growers or suppliers that provide quality trees. Finally, keep in mind trees take several years to become established - don't neglect maintenance during this period. Following establishment, trees should be monitored for various pest or other troubles. Early detection of troubles is key. Problems should be addressed with comprehensive strategies that stabilize and restore tree health.

Judicious management of street trees is an important community issue. Aging and unhealthy trees demand attention. Good selection and proper planting limits long term maintenance and costs. And more importantly, it will reduce future damage to people and property. □

The advent of hazy, hot, and humid weather conditions since mid-June unleashed a flurry of summertime disease problems.

Diseases of Turfgrass

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

General

Pythium blight and **brown patch** had been quite severe on greens and tees during the past two weeks. These diseases should continue to be troublesome as long as the weather remains hot and humid. **Anthraxnose, dollar spot** and **red thread** are all quite 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*, continues to be reported on tees, greens, and home lawns due to the warm, humid weather. To reduce the incidence and severity of **brown patch**, avoid nitrogen applications during hot weather, irrigate between midnight and 9 a.m. to reduce the period of leaf wetness, and spray turf with Banner, Chipco 26019, Cleary 3336, Curalan, Daconil, Eagle, Fungo, Heritage, mancozeb, Manicure, Prostar, Sentinel, Thalonil, or Touche per manufacturer's recommendations.

Pythium Blight

Pythium blight has also been active on golf and landscape turf 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.

Turf Field Day

The date for this year's "**Golf and Fine**" **Turf Research Field Day** has been set for August 6, 1998 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. The day will conclude with a barbecue dinner at 5 p.m. The "**Lawn and Landscape**" **Turf Research Field Day** will be held on August 5, 1998 at Hort Farm II, Ryders Lane, North Brunswick, NJ. Registration will commence at 8:00 a.m. (rain or shine). Research tours will start at 9:00 a.m. and will conclude at 3:30 p.m. The cost of registration each day is \$20.00 without a meal and \$30.00 with a meal. Recertification credits will be awarded for both days, so mark your calendars now for these worthwhile events. Call Marlene at (732) 932-9400 for further information or directions. □



Deer Fencing Installation Seminars

August 4, 1998

4 PM - 8 PM

Rutgers University, Snyder Research
Farm

140 Locust Grove Road
Pittstown, NJ 08867

August 5, 1998

4 PM - 8 PM

Rutgers University, Agricultural
Research and Development Center
121 Northville Road
Bridgeton, NJ 08302

The New Jersey Department of Agriculture and the New Jersey Division of Fish, Game and Wildlife in a cooperative program will be awarding over 700,000 feet of deer fencing to New Jersey farmers.

The Snyder Research Farm will be hosting the above noted seminars to educate farmers and other interested parties in the proper installation procedures. Representatives from the fence manufacturer and distributor, as well as commercial installers will be on hand to demonstrate fence installation.

Call the Snyder Research Farm at 908-730-9419, ext. 11, to register for either seminar.

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