For as little as $10 a day you can ride a winner.

Wouldn't it be great to be able to deep-tine anytime you want? State-of-the-art turf practice calls for tining throughout the year, not just spring and fall. Now that's a winning idea. By using the Redexim Charterhouse Finance Program*, you'll have several options for leasing or purchasing turf equipment that may surprise you. Rates are competitive and the programs are flexible to fit your needs.

Based on industry averages, it can cost you less than $10 a day to have your very own Verti- Drain®. If you qualify, you can extend payments on your Verti-Drain for as long as seven years – unheard of in the industry. That makes it cost friendly for everyone.

Counting on contractors or doing without because of weather, scheduling conflicts or budget crunches can be a thing of the past. This season your turf can be a winner.

Log on to our website or call today for complete details.

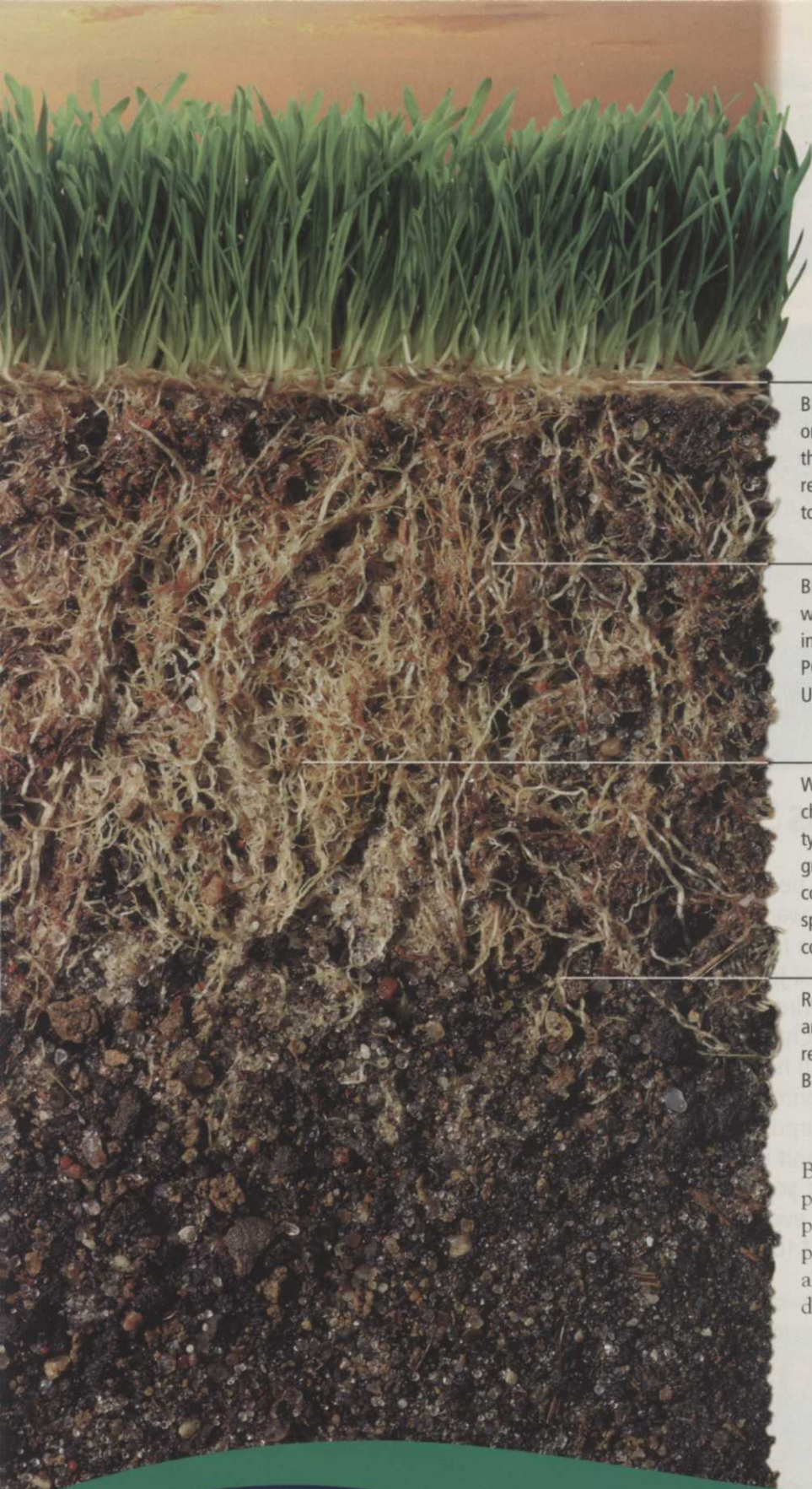
* Redexim Charterhouse Finance Program provided by bankgroup financial services.

Circle No. 116 on Reader Inquiry Card

Redexim Charterhouse

Breaking barriers to better turf.

Redexim Charterhouse Inc.
950 Sathers Drive
Pittston Township, PA 18640
1-800-597-5664
Tel: 570-602-3058
Fax: 570-602-3060
www.redexim.com



Often It's What You Don't See That Makes Our Fertilizers BEST®

BEST® fertilizers are part of the J.R. Simplot Company, one of the largest privately held agri-businesses in the world. Since 1953 BEST has built upon the resources of this leader in research and development, to exceed the expectations of its customers.

BEST professional turf fertilizers lead the industry with a broad mix of technologies, some of which include: homogenous pellets, controlled-release POLYON® PRO™ and TriKote®, stabilized nitrogen UMAXX® and UFLEXX®.

World-class fertilizer has made BEST the preferred choice on every part of a golf course and with every type of landscape. BEST offers a variety of greens grades, pre-plant, controlled-release, herbicide combinations, and specialty formulations to meet specific turf and landscape requirements across the country, and around the globe.

Reliable N-P-K delivery, balanced secondary elements and micronutrients, predictable response, consistent results are what you **will** see every time you apply BEST fertilizers.

BEST backs its distributors with thorough product training and state-of-the-art order processing to ensure you get the precise product you need, when you need it. For all the reasons why we're BEST, visit your distributor or call **800-992-6066.**

Circle No. 117 on Reader Inquiry Card

BEST®

Simplot

Phone: 1-800-992-6066 • Fax: 209-858-2519 • www.bestfertilizer.com

Make lawn maintenance low maintenance

Common sense ideas for selecting and siting trees and plants for affordable long-term beauty

BY RALPH NICOLOSI, PH.D.

Too often, landscape architects and designers create landscapes with little, if any, regard as to how much it will cost to maintain them. Their designs can become so boggled in aesthetics, harmony, composition and the interrelationship of spaces that they fail to recognize the costs associated with property upkeep.

With the exception of payroll and taxes, grounds maintenance is one of the most costly operating expenses property and facility managers face. Consequently, landscape architects and designers have an obligation to deliver a finished product to their clients that reflects serious consideration of long-term maintenance and associated costs.

Select street trees that can survive limited space, reflected heat and — in the North — de-icing products.

Understanding consequences

A commercial landscape design should do the following:

- Maximize a property's overall appearance, drive-by and curb appeal.
- Control current and future landscape and grounds care costs and expenses.
- Protect and enhance the client's landscape investment through careful plant selection and placement.

As a result, a successful landscape architect or designer knows how to do more than just draw pretty shapes. He or she understands every consequence of every component of a proposed landscape before it's installed, when it's installed and 10 years after it's been installed.

Pick the right plants

Proper plant selection and placement is a cornerstone of good design. Select and arrange species and cultivars suited for their purpose, such as providing screens, accents or shade. Choose and site them with minimum maintenance as one of the primary considerations.

Pest resistance: Regardless of their aesthetic value or intended use, avoid plants that are even marginally susceptible to pests. Why increase the potential for regular chemical control? It's environmentally unsound and expensive. For example, while crabapple trees are attractive ornamentals, many of the cultivars still in the trade are susceptible to apple scab, which requires regular fungicide applications.

Culture: Match plants with their site conditions. Urban settings present a harsh environment for trees and shrubs. Usually,

continued next page

How large will this tree become as it matures? What is its purpose? These are vital considerations for a commercial site like this one.

the soils are compacted, heat reflects from parking lots and sidewalks, and the plantings are exposed to urban pollution such as de-icing agents. Flowering dogwoods thrive on country hillsides but could never tolerate these tough urban conditions and should be avoided.

Select plants with few cultural or physical maintenance requirements both generally and within the specific context of the design. It's not wise to select plants that require regular pruning or ornamentals that are weak-wooded or produce a lot of fruit. Also reconsider using plants that require specific soil conditions.

Fast-growing shrubs such as pyracantha or forsythia require regular pruning. Sweetgum trees annually produce thousands of 1-in. diameter spiny fruits that are messy, unsightly and difficult to clean up. Plants that require acidic soils such as rhododendrons and river birches need costly remedial soil amendments to ensure their survival when they're planted in the wrong site. Herbaceous perennials were erroneously marketed years ago as low-maintenance plantings, but they should be used with discretion as well.

Plant placement: Be aware of trees and shrubs' mature sizes in relation to their proximity to other landscape elements to avoid creating additional regular maintenance.

Select plants with few cultural or physical maintenance requirements both generally and within the specific context of the design.

Don't plant trees such as pin oaks that have pendulous lower branches next to walkways, streets or parking lots where those branches could interfere with traffic. Likewise, fast-growing, spreading shrubs such as burning bush and dense yews shouldn't be sited within confined areas.

Variety: In addition to providing seasonal color and textural interest, a variety of plant species will reduce the likelihood of pest problems and subsequent maintenance costs. Monoculture plantings (e.g. the use of one species of shade tree) are more susceptible to insect and disease infestations than mixed species plantings. Webworm infestations on Honeylocust trees, for example, can defoliate individual trees and spread rapidly to others throughout a landscape. Furthermore, because monoculture plantings are uniform in texture, size and general appearance, even minor insect or disease damage is more noticeable than if it occurred in a diverse planting.

Location, location, location

The location of elements in a landscape influences its long-term maintenance needs nearly as much as the elements themselves. Locate sidewalks, for example, according to "desire lines," the preferred convenient routes people choose when walking from one place to another. If sidewalks aren't placed properly, people will damage lawns and shrubs by establishing shortcut paths.

Don't plant beds, trees and other landscape elements too close to one another or to a lawn border's edge. These areas become too difficult to mow efficiently. Configure bed lines and other defining elements in a landscape to provide easy access and maximum maneuverability for mowers and other maintenance equipment.

Maintenance will be easy here.

Small plants can grow into large plants. Site them properly.

Tackling trees

Street trees: Tree lawns (the areas between sidewalks and streets) are difficult environments for most trees because:

- limited space restricts root growth,

continued on page 36

Honda trimmers. More power. Less smoke. Virtually smoke-free Honda 4-stroke trimmers don't whine like 2-strokes, run on straight gas, and are 360° inclinable. They cut operating costs up to 60% compared to similar sized 2-stroke trimmers. Plus, it won't bog down, regardless of which of its eight optional attachments you use. Also, be sure to check out our new 4-stroke Stick Edger. You'll find it in the no smoking section, too. For more information, call 1-800-426-7701 or visit www.honda.com.

HONDA
Power
Equipment

Circle No. 118 on Reader Inquiry Card

Taking care of tomorrow's environment today.

continued from page 34

■ adjacent surfaces of sidewalk and street reflect intense heat, and

■ regular use of salt or other de-icing agents in the north creates toxic soil salinity levels.

That's why it's critical to specify the most urban-tolerant species for street tree plantings.

Carefully consider size (height and breadth) and branching habits when specifying trees for tree lawns. Trees that will grow tall shouldn't be placed where there are existing or planned overhead utility lines. Be careful of the types of trees you site at properties' entrances and exits. They shouldn't interfere with pedestrian or vehicular traffic, or obscure the vision of motorists and pedestrians entering or exiting a property. In these areas, use trees with fastigiate or upright growth habits as opposed to those with broad and full branching patterns.

These low-growing evergreens don't block the view in this parking lot, and mulch allows the area to be maintained without mowing. However, plants so close to the road can suffer damage from de-icing spray.

Trees that tend to heave sidewalks (river birch, Norway maple, honeylocust) should never be used.

Parking lot plantings: Just as with street tree plantings, trees and shrubs specified for parking lot islands and borders must be urban tolerant. They, too, are subjected to the dangers of snow piling, reflected heat and limited planting areas.

Plant trees with upright-growing branches to avoid interfering with traffic and obscuring pedestrian and motorist visibility. Similarly, shrubs used in parking lot islands or separation islands should be dwarf-growing with a maximum size of three feet at maturity.

Building and foundation plantings: No landscape elements should be positioned where they will block lighting or create recessed spaces that could potentially compromise security and safety. Walkways, patios and other communal areas should be designed and planted so they remain unobstructed and open. Don't select trees or plants that will block windows at any stage of growth and maturity.

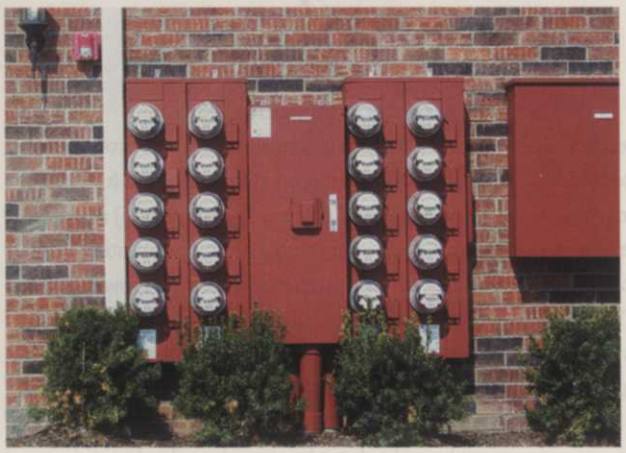
This small island creates a maintenance problem because of the small area of turfgrass that needs regular tending and mowing.

To minimize future maintenance, building plantings should be spaced as follows:

■ Medium-sized shrubs (to six feet at maturity) should be sited no closer than four feet to buildings.

■ Small shrubs (to three feet at maturity) no closer than two feet.

■ Shade trees (those ex-



Above: (Top) Trees' mature height should be considered when overhead features like power lines are involved. **(Bottom)** Access to meters is important, but adequate screening should be offered to the passerby.

ceeding 45 feet in height at maturity) no closer than 20 feet.

- Ornamental trees no closer than 12 feet to buildings.

While much of this has to do with common sense, we sometimes don't see it exhibited in some of the ill-conceived designs in newly constructed commercial developments. We need to restore low maintenance to landscape design and make it one of the most important criteria by which it's judged. We need to restore common sense in landscape design. LM

— Ralph Nicolosi is with Landscape Management & Consulting, Columbus, OH. He can be reached at 614/487-1967.

PART TWO OF A TWO-PART SERIES

Managing diseases

PHOTOS COURTESY:
DAVEY TREE EXPERT COMPANY

Don't be a "fungicide addict." Know how contact and systemic products differ, and use them effectively

BY HENRY T. WILKINSON

Editors' note: Last month, Part 1 of this two-part series looked at ecological factors that cause turf disease development, as well as basic strategies for management. Unfortunately, the first page of that article was omitted from the magazine. You can read the entire article at **www.landscapemanagement.net**, *or, if you call 440/891-2623, we'll fax you the missing page. This month's article explains the difference between contact and systemic products and explains how to choose which kind of product best suits your turf.*

Fungicides are only "needed" because of our high expectations for turf quality, but more people are relying on them because of their availability and the increasing demand for "perfect" turf. I describe this as "fungicide addiction," and believe it leads to poor grass and anxiety.

Chemicals used as fungicides

Tables 1 and 2 list chemicals that are registered for turfgrass use. Check your local regulations to determine what you can use. Also, some of these materials are no longer available. Table 1 lists fungicides considered systemic, while Table 2 lists those considered to have contact activity.

The common name refers to a fungicide's active ingredient; the trade name refers to the marketed name; and the chemical class refers to the active ingredient's chemical structure. The mode of action refers to how the active ingredient inhibits a fungus, and the resistance risk indicates how likely it is that a fungicide will perpetuate a genetic change (i.e. chemical resistance) in a fungus.

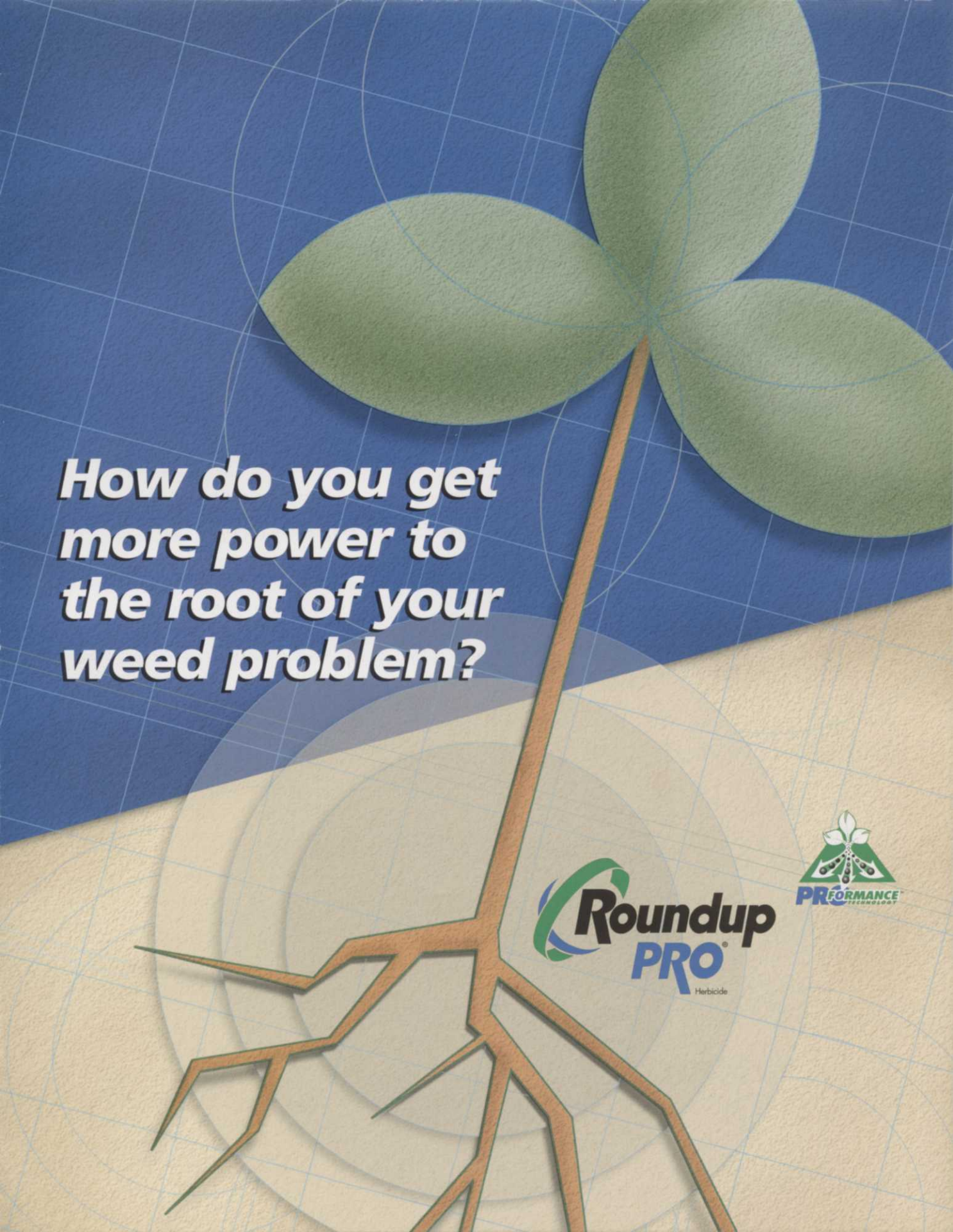
How contact fungicides work

Contact fungicides are also known as protectants because they're intended to intercept a fungus and prevent it from infecting (getting inside) a grass plant. They inhibit fungi not by penetrating plant tissues, but by interfering with their growth and development in a number of ways, i.e. multiple site inhibitors (MSI). MSIs reduce the risk of fungal resistance. To develop resistance, a fungus needs to change its DNA. In nature, changes in fungal DNA are brought about by several mechanisms.

I won't explain these complicated processes, but you should know that most genetic changes kill fungi, and these changes hardly ever occur. When a fungus has to change its DNA more than once, the chances of it succeeding are so rare that it won't happen. Therefore, contact fungicides remain effective even if you use them repeatedly.

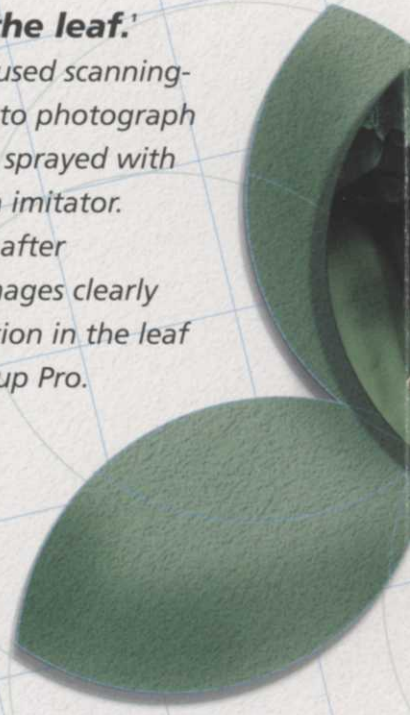
Since they're toxic to many non-target fungi that are beneficial to your turf, repeated use of contact fungicides isn't a wise choice. To work, they must cover plant surfaces before fungi attack. If the fungal pathogen attacks the leaves, it's easy to apply the contact fungicide to them. Remember to apply the fungicide frequently since the leaves are growing and the new leaf tissue will be unprotected. In

continued on page 39


How do you get more power to the root of your weed problem?
Roundup PRO®
Herbicide
PROFORMANCE TECHNOLOGY™

The proof is in the leaf.[1]

Monsanto scientists used scanning-electron microscopy to photograph the effects of weeds sprayed with Roundup Pro and an imitator. Taken just one hour after application, these images clearly show more formulation in the leaf sprayed with Roundup Pro.



Get Roundup Pro® herbicide with patented PROformance™ technology.

In the first two hours, it delivers three times more power to the roots than Glypro Plus™ herbicide.

The proof is in the roots.[2]

Scientists also used autoradiography to photograph and measure the amount of herbicide in the roots two hours after application. Time after time, at least three times more herbicide showed up in the weeds sprayed with Roundup Pro. With the imitator, barely any herbicide has moved to the roots.

Roundup PRO® Herbicide

PROFORMANCE™ TECHNOLOGY

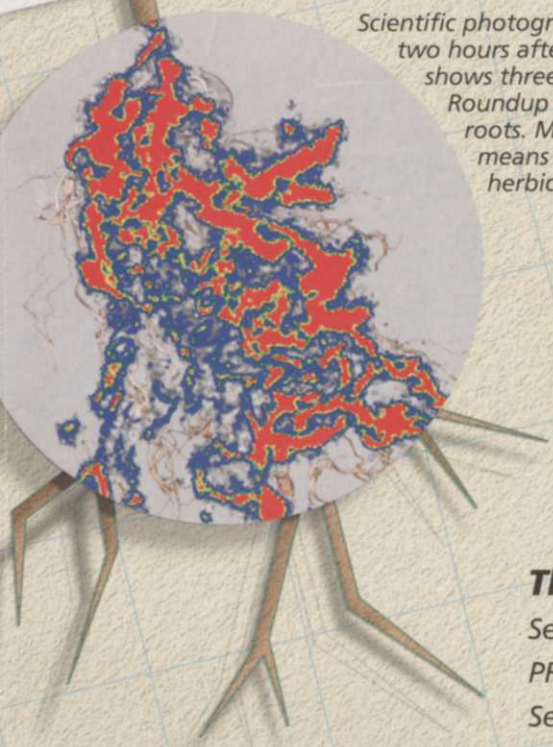
This is a cross-section of a weed leaf magnified 1000x. The yellow droplets mean Roundup Pro is already at work inside.

This weed, sprayed with the imitator, has almost no droplets in the leaf.

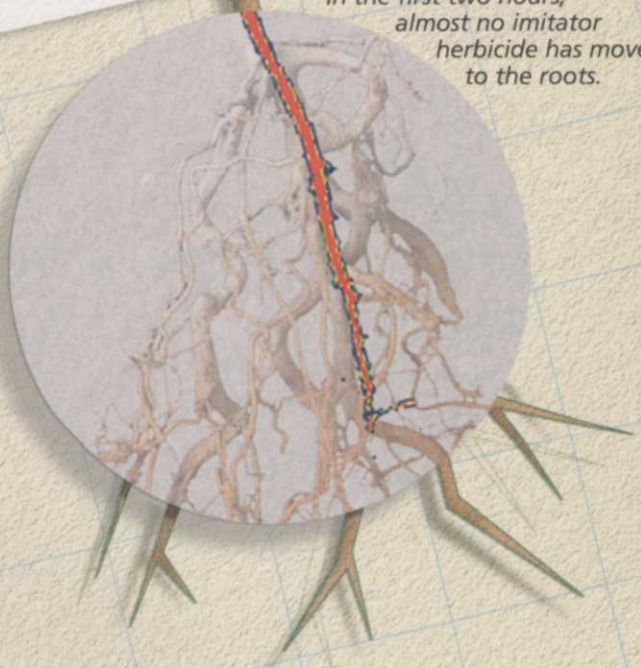
Roundup PRO® Herbicide

Glypro Plus

In the first two hours, almost no imitator herbicide has moved to the roots.



Scientific photography taken two hours after application shows three times more Roundup Pro in the roots. More color means more herbicide.



The proof is in your control.

See for yourself the difference Roundup Pro with patented PROformance technology can make in your weed management. See your dealer or call ***1-800-ROUNDUP*** *for more information.*

Free video shows science in action.

See PROformance technology at work in a free, five-minute video. Scientists Dr. Tracey Reynolds, Ph.D., and Dr. Jimmy Liu, Ph.D. demonstrate the autoradiography and cryo-SEM techniques used to compare Roundup Pro with Glypro Plus on two identical weeds.

*Call **1-800-ROUNDUP** and ask for your free Roundup Pro video today!*

Always read and follow label directions. Test conducted with MON 77360, EPA Reg #524-475 with comparison to Dow product carrying EPA Reg. # 62719-322. 1.Test methodology: In scanning-electron microscopy Monsanto scientists identified penetrated formulations of both Roundup Pro and Glypro Plus in the mesophyll cell layer. These micrographs support the evidence that formulations containing Monsanto's patented PROformance technology rapidly penetrate the leaf surface. 2.Test methodology: Radiolabeled formulations were applied at equal acid-equivalent rates. Radioactivity was visualized by autoradiography following a simulated rain event two hours after application. Monsanto laboratory tests, 2000. Glypro Plus is a trademark of Dow AgroSciences LLC. Roundup®, Roundup Pro® and PROformance™ are trademarks of Monsanto Company. [10613 jct 1/01]

continued from page 38

the spring, this could be every week or more.

The growth of the crown, rhizomes, stolons or roots can also leave their new leaf tissues exposed to fungal pathogens, but the problem is further complicated by the fact that they're surrounded by soil. Soil and organic matter will filter and bind many chemicals to their surfaces, which forces you to use more compound to achieve disease control. It's a vicious cycle you won't win because these compounds also unbalance the turf ecosystem and create weak turf.

How systemic fungicides work

Systemic fungicides have been around for only 20 years. They're called "systemic" because, once applied to turf, they move.

Beware: Systemic implies that the compound will move into all of a plant's cells. You might think that if you apply it to the leaves, it will end up in the roots, and if you apply it to the soil, it will end up in all the roots and leaves. This, however, is not the case!

Some fungicides are described as locally systemic, which means they only move a few cells away from the point of entry. This is most likely the case for the majority of systemic fungicides.

Table 1 lists 19 systemic fungicides. For the most part, they have different active ingredients (chemistries). They also have different carriers, or materials upon which the active ingredient is loaded for the purpose of application. The carrier itself can have fungicidal activity and can affect how the active ingredient reacts and enters a plant. Companies that develop a fungicide test

continued on page 40

TABLE 1: SYSTEMIC FUNGICIDES GROUPED BY CHEMISTRY AND MODE OF ACTION [a]

Common name	Trade name	Mode of action	Resistance risk
(benzimidazoles):			
benomyl	Tersan 1991*	mitotic poison (SSI)	high
thiophanates	Fungo, Cleary 3336	mitotic poison (SSI)	high
(phenylamide):			
metalaxyl	Subdue, Apron	RNA synthesis inhibitor	high
mefanoxam	Subdue MAXX	RNA synthesis inhibitor	high
(1,2,4-triazoles):			
cyproconazole	Sentinel*	demethylase inhibitor	moderate
myclobutanil	Eagle	DMI	moderate
propiconazole	Banner	DMI	moderate
tebuconazole	Lynx	DMI	(expmtl)
triadimefon	Bayleton	DMI	moderate
triticonazole	Triton	DMI	(expmtl)
(pyrimidinemethanol):			
fenarimol	Rubigan	DMI	moderate
(strobilurins):			
azoxystrobin	Heritage	respiration inhibitor	moderate
kresoxim-methyl	Experimental	cytochrome bc complex	moderate
trifloxystrobin	Compass	in mitochondria	moderate
(dicarboximides):			
iprodione	Chipco 26019, GT	not well known	moderate
vinclozolin	Vorlan, Curalan	not well known	moderate
(benzamide):			
flutolanil	Prostar	multi-site	low
(carbamate):			
propamocarb	Banol	membrane disruption MSI	low
(phosphonate):			
fosetyl-aluminum	Aliette	indirect plant activity	low

(a) Some are single-site inhibitors (SSI), and a few are multi-site inhibitors (MSI). SSIs have a moderate to high risk of developing fungicide resistance.

(*) Systemic fungicides marked with an asterisk are no longer available.

continued from page 39

many carriers to determine which works best. However, each grass type has different surface chemistries, and each will react differently to a carrier. Sometimes, one fungicide can be more effective than another because of the carrier.

Don't overestimate how well fungicides with translocative or systemic properties work. In most cases I've seen, the compound's movement, once applied, is limited to short distances within the plant. Proof of this is how quickly fungicidal protection is lost when the grass plant actively grows or when the pathogen is aggressive.

Another limitation with systemics is that they take three to five days to move into a plant, redistribute and build up enough active ingredient.

I've observed systemics fail to control a disease they purportedly are effective against. This results from applying systemic fungicide when disease pressure is high; the pathogen simply overruns the plant before the fungicide reaches full effectiveness. Combine this with rapid or poor turf growth and it appears as though the fungicide failed.

Contact fungicides that control dollar spot (shown here) well are chlorothalonil, mancozeb and thiram.

To be effective, systemic fungicides must be applied when disease severity is low. This means you have to scout your turf and look for the start of disease. This is why it's important to use as many turf management techniques as possible to slow down the rate of disease development.

Which systemic is best?

Use a fungicide that's effective against the fungus causing the disease in your turf.