

# Citation II · Birdie II · Omega II CBS II · Manhattan II

*Introducing a new generation of stem rust resistant, lower maintenance, darker green, better mowing, drought and wear tolerant perennial ryegrasses.*



*These flag leaves show the genetic improvement of Turf-Seed's IIs.*

## Citation II

- High in endophyte (insect resistant)
- Attractive dark blue-green color
- Improved crown and stem rust, leaf spot and brown patch resistance
- Better heat tolerance and mowability than older ryegrasses

## Birdie II

- Improved disease resistance
- Rich blue-green color
- Better insect, leaf spot and brown patch resistance
- Highest rating for red thread resistance
- Topped turf trials in Hubbard, 1983

## Omega II

- Increased tiller density
- Darker green color
- Improved mowability over older ryegrasses
- Improved leaf spot, brown patch, stem and crown rust resistance

## CBS II

brand turf-type perennial ryegrass mixture, with advantages of all three II's. The only ryegrass blend offered that is stem rust resistant. Whichever you choose, you just can't lose!

## Manhattan II

- Finer leaved than Manhattan
- Improved mowability
- Darker green
- Highest tiller density of perennial ryegrasses
- Improved leaf spot, brown patch, stem and crown rust resistance



These Turf-Seed varieties qualify for our blue tag redemption program. Ask your distributor for details.



Produced and marketed by

P.O. Box 250, Hubbard, OR 97032  
503/981-9571, TWX 510-590-0957

Circle No. 149 on Reader Inquiry Card



The problem of LDS has been primarily on golf courses but it is becoming more clear that they are a problem on most turfgrass sites.

The problem of LDS is caused by a fungal growth that produces a wax-like material that coats the particles of soil or thatch. When wetting agents are applied to LDS, the soil moisture conditions are improved, resulting in better quality turf (see Table 2).

The depth of soil affected by the fungi can be considerable so that some form of cultivation may be ineffective in alleviating the dry spot, as seen in Table 3.

A soil probe is a useful tool in determining whether you have LDS. Probe both the healthy and affected areas and compare moisture levels. LDS soil will appear bone dry compared to the moisture-healthy area. Another method used in diagnosing LDS is to place several drops of water on the dry soil or thatch that you suspect has LDS.

If the droplets do not disappear in

10 minutes there is a good chance that the area has LDS. Remember that uneven irrigation delivery, heavily sloped sites and shallow soil underlined by debris or rocks can appear to have LDS.

### Growth, quality

On areas that contain LDS, treatments with wetting agents can result in a dramatic improvement in plant growth and visual quality, as seen in Figure 1.

However, on easy to wet soils, wetting agent effects on plant growth have been inconsistent.

Early reports (Whitcomb and Roberts) suggested that wetting agents had no effects on turfgrass when applied to easy-to-wet soils.

Since that time several others have shown different effects.

Dr. Richard E. Schmidt at the Virginia Polytechnic Institute, found that sod treated with the wetting agent Aqua Gro prior to installation rooted much faster under dry soil conditions.

**On areas that have localized dry spots, wetting agents can result in a dramatic improvement."**

This author's work at Cornell University showed that Aqua Gro substantially reduced the seedhead production of annual bluegrass fairways without reducing clipping yields. These effects could be explained in several ways.

In the first example, the wetting agent could have improved the soil moisture condition at the sod/soil interface. Wetting agents have been shown (Law, 1964) to reduce the evaporation of water from a bare soil surface, which could support the claim of improved moisture conditions.

However, the reduction in evaporation could also be explained by having less water to evaporate since the wetting agent could reduce the amount of water reaching the soil surface by capillary action.

Another explanation of these results might be that wetting agents could be acting as plant growth regulators.

Seedhead suppression and increased rooting are two effects of plant growth regulators.

### Classes of regulators

Two classes of plant growth regulators are phenolics, like 2,4-D, and ethylene compounds.

Aqua Gro contains both phenolic and ethylene compounds and it is very likely it is acting like a plant growth regulator.

Improvement of water movement into soil by wetting agents has been shown primarily on LDS areas; however, on easy to wet soils there is little evidence to suggest any improvement.

Drainage can be improved by wetting agents, especially in layer soil profiles. Wetting agent manufacturers claim that compaction is reduced by wetting agents.

Research has not been done to substantiate this claim. However, if water is drained more rapidly following rainfall or irrigation, the soil will be less likely to be compacted, which can be important on sites that receive heavy, uncontrolled traffic.

Adding a wetting agent to an exist-  
continued on page 84

**TABLE 2.**  
Effects of wetting agents on the visual quality and soil moisture content, Boyne Highland, MI.

Wetting Agent	Rate† Oz/1000 sq. ft.	Quality rating (1=ideal) % Moisture content	
		August 4, 1977	
Check	-	6.1	12
Aqua Gro	8 + 8	3.8	16
	16	2.2	20
	16 + 16	3.8	16
	32	2.4	19
	8 monthly	2.5	18
Hydro Wet	16	2.5	17
	16 + 16	2.3	17
	8 monthly	1.6	23

\* Data courtesy of Dr. Paul E. Rieke and Mr. R. Bay, Michigan State University.

† Treatments started June 9, 1977.

**TABLE 3.**  
The effects of wetting agents and cultivation on the visual quality, 18th Fairway, Boyne Highland, MI\*

Cultivation	Visual Quality Rating (1 = ideal), Oct. 26, 1973	
	Check	Aqua Gro (16 oz/1000 ft <sup>2</sup> )
None	6.7	4.0
Spiker	5.3	3.2
Core cultivator, 1/2" tine	4.0	2.2
Core cultivator, 5/8" tine	5.0	2.3

\* Data courtesy of Drs. Paul Rieke and James Beard, Michigan State University





For  
Disease Control

# DOUBLE DUTY DUO



For  
Insect Control

## on turf, trees and shrubs

**Duosan is** Mallinckrodt's double-action broad spectrum fungicide. It goes to work instantly as a contact fungicide, then remains active as a systemic fungicide.

Duosan effectively controls 8 turf diseases — including Leaf Spot, Red Thread, Dollar Spot and Brown Patch — and it's now also approved for control of 9 tree and shrub problems including Apple Scab, Anthracnose, Rust, Powdery and Downy Mildews, and others.

With just one fungicide — DUOSAN — you can control 17 disease problems on turf, trees, and shrubs!

**Dymet is** Mallinckrodt's double-action insecticide. It delivers a quick kill upon contact, then provides long-lasting residual control.

Dymet is effective against surface insects such as Cutworms, Chinchbugs, and Sod Webworms, and can also be mixed for use on sub-surface pests. In addition, it controls a wide variety of insects on trees, shrubs, and ornamentals.

With just one insecticide — DYMET — you can control 25 insects on turf, trees, and shrubs!

**Mallinckrodt**®

P.O. Box 5439  
St. Louis, MO 63147  
(800) 325-7155

For more information on Duosan, or Dymet, or both, call Mallinckrodt toll-free. Or, contact your Mallinckrodt distributor. You might eliminate a long list of problems all at one time!

# Getting Back to Basics

Knowing how much water to apply and when are key questions in developing an efficient irrigation program.

by Dr. Robert N. Carrow

**W**ater is necessary for a turfgrass plant to grow and be physiologically healthy.

In fact, most of the cells of a turfgrass plant contain 80 to 90 percent water on a weight basis. Unfortunately, weather patterns often do not result in sufficient water for good growth and the grower must irrigate.

The grower who desires to conserve water and irrigate efficiently is confronted with two questions:

- When should I irrigate? (i.e. frequency of irrigation)
- When I irrigate, how much water should I apply? (i.e. rate of water application)

The answers to these questions cannot be given in one or two easy "rules of thumb".

Instead, the grower must have at least a basic knowledge of the important factors that influence plant water relations—then a good irrigation plan

## The wise turfgrass grower should think about how to maximize inputs, minimize outputs and maintain as large a reserve pool as possible.

can be developed based on sound principles.

Thus, before we deal with the two questions of frequency and rate, we shall look at the soil-plant-atmospheric system from a budget approach.

Water management can be visualized as a bank checking account

(Figure 1) with additions (inputs), losses (outputs), and a reserve balance at any point.

The wise turfgrass grower should think about how to maximize inputs, minimize outputs, and maintain as large a reserve pool as possible.

The maximum reserve pool of plant-available moisture depends primarily on soil texture and extent of the plant's root system. Thus, unlike a checking account which can hold unlimited funds, the "reserve water account" has a maximum limit determined by soil and plant factors.

Table 1 illustrates how soil texture influences plant-available moisture, which is the fraction of total water held in the soil that the plant can potentially extract. Some water is unavailable for plant uptake because it is held so tightly by adhesion and cohesion forces in the soil.

Sometimes a turf manager may increase the plant-available moisture fraction by adding organic water which holds much water to a sandy soil. The turf manager can greatly expand the maximum reserve pool of water by using cultural practices favoring maximum root development.

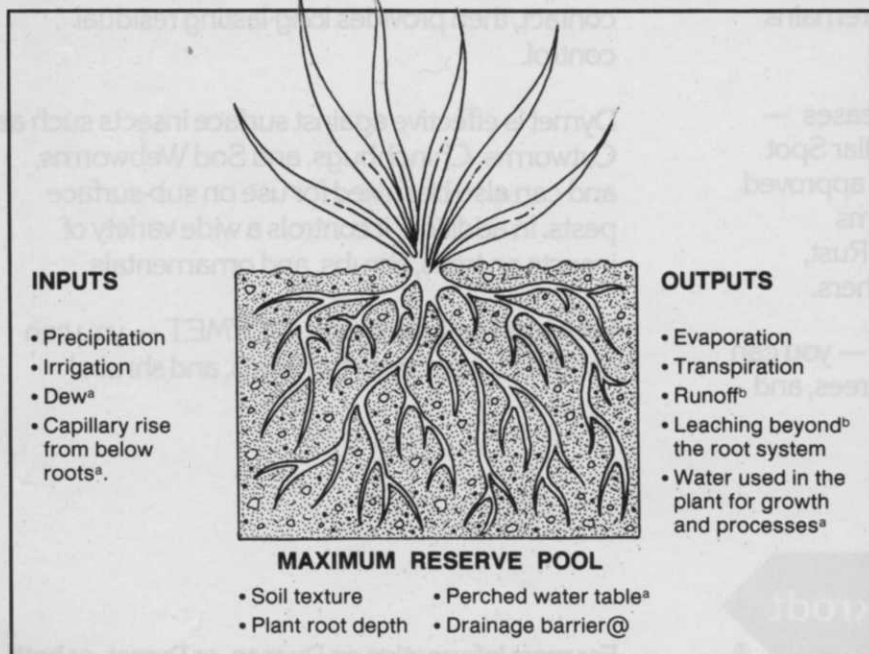
A plant with a 12-inch root system has twice as much water available to it compared to one with a 6-inch root system. This illustrates why our research-teaching-extension personnel stress management for a good root system.

Major factors that limit rooting are: close mowing; excessive nitrogen, irrigating lightly and frequently, compacted soils, and root feeding insects.

Inputs of moisture are precipitation, overhead irrigation, dew, and in some situations, capillary rise of moisture from below the root system.

Since precipitation and irrigation are the major inputs, we will only discuss these in this article. The grower cannot control the rate or frequency of precipitation but he or she has complete control of irrigation inputs.

*continued on page 48*

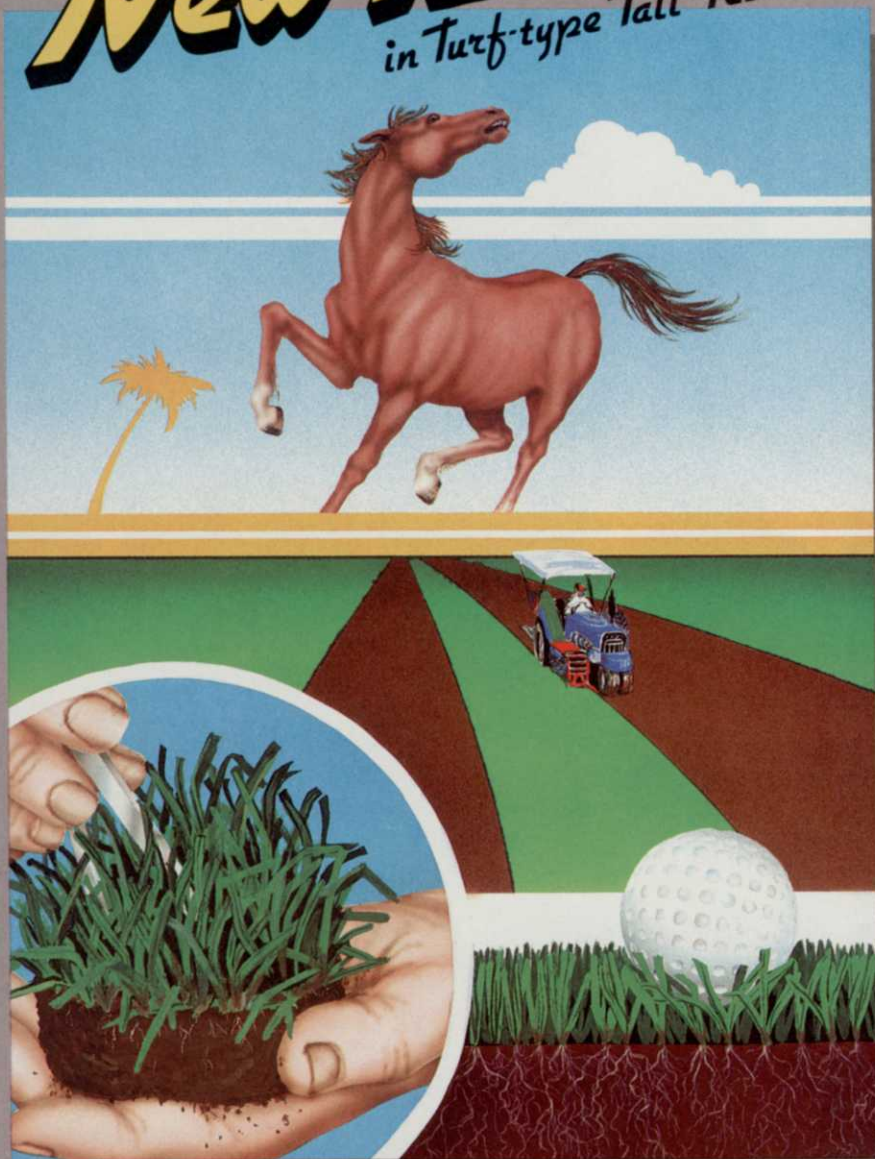


**Figure 1.** Budget concept of turfgrass water management (<sup>a</sup>denotes minor factor in most situations; <sup>b</sup>These should be minor if corrected by the turf manager). After: Carrow, R. N. 1985. Turfgrass soil-water relationships. In V. A. Gibeault (Ed.). Turfgrass Water Conservation. ANR Pub., Univ. of Cal., Oakland, CA.



# MEET THE New Breed

*in Turf-type Tall Fescue*



Meet Mustang—the new turf-type tall fescue whose extraordinary turf quality, heat/drought tolerance and dark green color make it a breed apart from the others.

Turf data from major universities rank Mustang

superior in seedling vigor, turf performance, and disease resistance. You demand excellence in your turf management, so why settle for anything less in your

choice of a tall fescue...demand Mustang!

**MUSTANG**  
TURF-TYPE TALL FESCUE



Pickseed also produces

**Fiesta** PERENNIAL RYEGRASS & **Touchdown** KENTUCKY BLUEGRASS

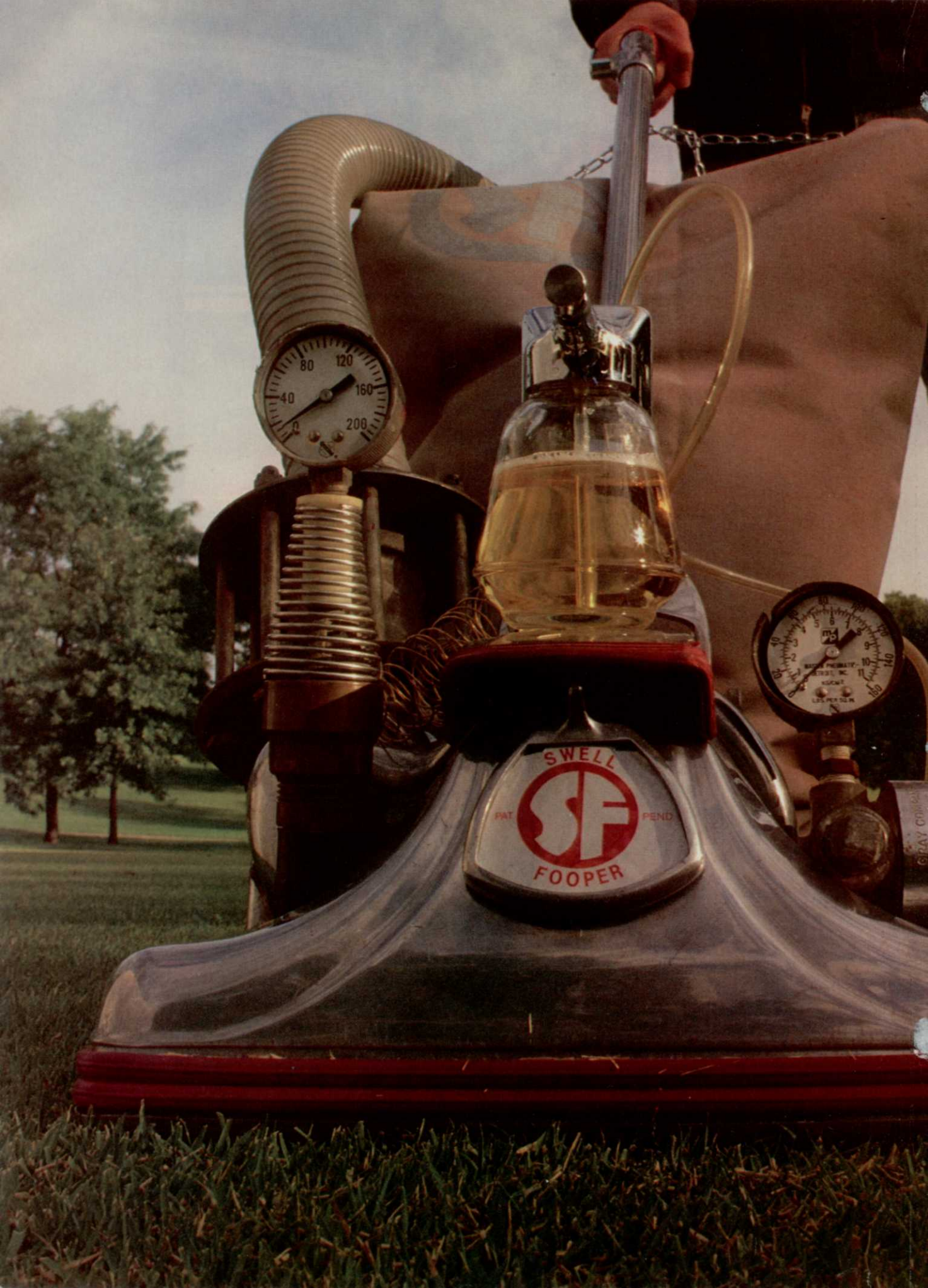
and other fine turf grasses available nationwide from quality seed suppliers.

Produced by:

**PICKSEED**  
PICKSEED WEST Inc.

P.O. Box 888 • Tangent, Oregon 97389  
(503) 926-8886







# HOW TO TAKE OUT SURFACE FEEDERS AND GRUBS IN ONE SWELL FOOP.

To take out surface feeders like sod webworm larvae, chinch bugs, billbugs, and flea beetles, just follow these simple steps.

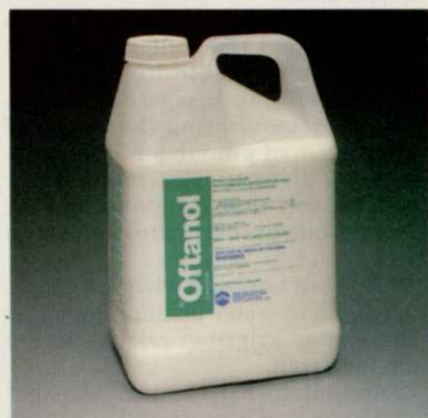
Step one, get some <sup>®</sup>OFTANOL 2 Insecticide. It's the liquid formulation of OFTANOL. If you think OFTANOL is too expensive to use on surface feeders, check out step two.

Step two, mix it at the *economical rate* and spray where the bugs are. It'll work.

The same product, OFTANOL 2, does a bang up job on grubs. Mix it at the recommended rate and spray it on. Use OFTANOL anytime, as a preventive in the spring or as a curative, whenever grubs are a problem.

Surface feeders and grubs, two serious problems with one serious solution. OFTANOL 2.

OFTANOL is also available in a granular formulation. Always read the label before use.



**OFTANOL 2.  
WHEN YOU'RE SERIOUS  
ABOUT SURFACE  
FEEDERS AND GRUBS.**



Möbäy Chemical Corporation  
Specialty Products Group  
Box 4913, Kansas City, Mo. 64120

OFTANOL is a Reg. TM of the Parent Company of  
Farbenfabriken Bayer GbmH, Leverkusen.

Circle No. 129 on Reader Inquiry Card



**TABLE 1.** Total water, plant available water, and plant unavailable water typically held by different soil texture classes.

Soil Texture	Water-holding capacity (inches per foot of soil)		
	Total	Available <sup>a</sup>	Unavailable <sup>b</sup>
Sand	0.6-1.8	0.4-1.0	0.2-0.8
Sandy loam	1.8-2.7	0.9-1.3	0.9-1.4
Loam	2.7-4.0	1.3-2.0	1.4-2.0
Silt loam	4.0-4.7	2.0-2.3	2.0-2.4
Clay loam	4.2-4.9	1.8-2.1	2.4-2.7
Clay	4.5-4.9	1.8-1.9	2.7-3.0

<sup>a</sup>Available for plant uptake  
<sup>b</sup>Not available for plant uptake  
 From: see reference, Figure 1.

**Keeping tabs**

Accurate rainfall and snowfall records should be kept so that the irrigation program can be adjusted for precipitation.

Also, the irrigator must know how much water his system applies per unit of time (i.e. inches of water per hour). Losses of water or outputs include runoff, leaching beyond the rootzone, evaporation from moist soil and plant surfaces, and transpiration which is water vapor lost from the plant leaves through the stomates.

Runoff can be reduced or eliminated by cultivating (coring, slicing) sloped areas, dethatching if needed, and applying water at slower rates on sloped areas.

Over-watering causes water to move beyond the root system and become unavailable for plant uptake. Leaching losses can be reduced by monitoring the depth of turfgrass root growth and then irrigating with sufficient moisture to wet the soil to just below the root system; one or two inches below the roots.

This can be observed by looking at the depth of water penetration a few hours after irrigation relative to the rooting depth.

Assuming that the turf manager has corrected runoff and leaching losses, the remaining losses of water are evaporation and transpiration. These are often combined into the term evapotranspiration (ET).

It is the ET losses of water from the soil and plant that must be replenished by precipitation or irrigation if turf growth is to be sustained. Most of the water taken in by a plant's roots is used in the transpiration (90 percent or more) process. The re-

mainder of the water taken up by a plant is used for cell growth and physiological processes.

Transpiration, the vaporization of water from inside the plant leaves through the open stomata, removes heat from the plant and is important for prevention of high temperature stresses.

The evaporation component of ET should be minimized but cannot be totally eliminated. Water lost by evaporation from moist soil and plant surfaces cannot be used for the beneficial processes of transpiration or growth.

Immediately after irrigation the evaporation component will be high but will decrease rapidly as the soil and plant surfaces dry. Thus, avoiding light, frequent irrigation will reduce evaporative losses.

Also, maintaining a dense, higher cut (within the recommended cutting height ranges) will shade the soil surface and reduce evaporation.

Since evaporation and transpiration are both vaporization processes, the grower can visualize how climatic conditions influence ET. Weather conditions that increase ET are:

- low humidity
- high temperatures
- clear and bright days
- high winds

However, if ET exceeds the ability of a plant to absorb enough soil moisture, the plant's stomata will close which greatly reduces transpiration as well as transpirational cooling.

**Greatest efficiency**

From this brief discussion of the soil-plant-atmospheric system as a water budget, the grower is encouraged to start thinking of how to control dif-

ferent parts of the system to efficiently irrigate.

No one factor alone will result in maximum water use, but by adjusting several factors the grower can irrigate better and have a good quality turfgrass.

Frequency of irrigation depends on many factors:

- A** rate of ET
- B** turfgrass species, and
- C** management-mowing, fertilization
- D** irrigation, traffic level, etc.

This is why it is impossible to give absolute frequencies of irrigation to a grower. Frequency of irrigation changes dramatically with time of year even if you are dealing with only one species and one management regime.

ET rates for turfgrasses are commonly in the 0.10 to 0.25 inches of water per day but may be as much as 0.45 inches of water per day for a well-watered turf exposed to high ET conditions.

If a grower has a turf with a 12-inch root system, a loam soil, and an average ET rate of 0.25 inches per day, then from Table 1, we can see that

**TABLE 2.** Relative need for frequency of irrigation under home lawn conditions.

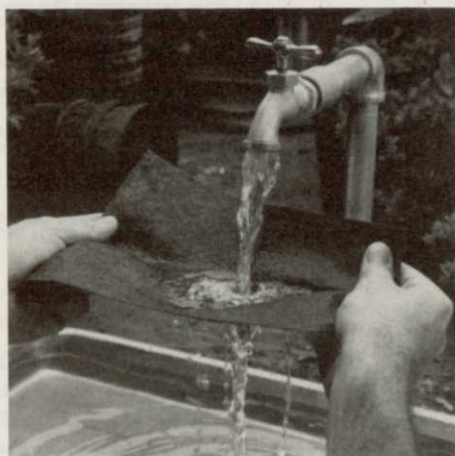
Species <sup>a</sup>	Frequency of Irrigation
<b>COOL SEASON</b>	
Tall fescue	Least frequent
Red/chewings fescues <sup>b</sup>	
Perennial ryegrass, improved	
Kentucky bluegrass, common	Most
Kentucky bluegrass, improved	
Creeping bentgrass Rough bluegrass	
<b>WARM SEASON</b>	
Buffalograss	Least frequent
Bermudagrass	
Bahiagrass	Most
Zoysiagrass	
St. Augustine	
Centipede	
Carpetgrass	

<sup>a</sup> Cultivars within a species vary; thus some cultivars may rank better than the species as a whole.

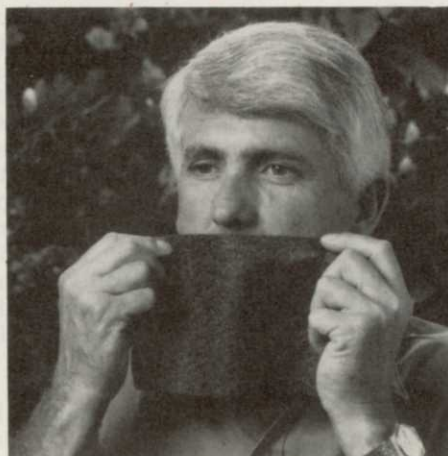
<sup>b</sup> Red/chewings fescues may go easily dormant if irrigated too infrequently.



# THIS TEST WON'T HOLD WATER —OR AIR.



*Water passes easily through highly permeable Duon Weed Control Mat.*



*Just blow through Duon to see how easily air passes through it.*

## The proof is stronger, longer lasting plants with **DUON**<sup>®</sup> Weed Control Mat.

Both water and air pass easily through Duon Weed Control Mat, made of Phillips Fibers non-woven polypropylene. As a landscaper, you know how important that is to a plant's root system and to the future well-being of your big landscape jobs—especially those you use as references.

When water and air can't get through, plants die. Black plastic won't work for the long-term. And woven polypropylenes are nowhere near as permeable as nonwovens. For example, the air permeability for nonwoven Duon is about 14 times greater than for woven polypropylenes and the water

permeability for Duon is about 10 times greater.

Put our words to the test. Hold Duon under running water, then take another piece and breathe through it. Then try the same test with a competitive weed control mat.

When covered from sunlight, Duon is virtually permanent. It allows plants to thrive and impedes about 95% of weed growth (in most areas). It also keeps mulch from going down into the soil.

For your quality landscape jobs, order Duon. For further information, call Phillips Fibers (803) 242-6600.

MARKETED THROUGH:

**Blunk's** 8923 South Octavia  
Bridgeview, IL 60455

On the West Coast:

**BRUCE KING & CO.**

1055 Bertelsen Rd. • Eugene, OR 97402



**PHILLIPS FIBERS CORPORATION**  
A SUBSIDIARY OF PHILLIPS PETROLEUM COMPANY

TEXTILE NONWOVEN FABRICS MARKETING  
P. O. BOX 66, GREENVILLE, SC 29602  
(803) 242-6600

\*Trademark Phillips Petroleum Company

Circle No. 136 on Reader Inquiry Card

JULY 1985/WEEDS TREES & TURF 49



irrigation would be needed every four days (1.3/0.25) to eight days (2.0/0.25).

If the soil was a sand, irrigation frequency would be every 1.5 to four days. Turfgrass species and cultivars of a species vary greatly in water use because they differ in leaf area, shoot density, rooting depth, growth rate, and other aspects that influence water use.

Table 2 gives a general ranking of turfgrasses as to their frequency of irrigation, assuming each has a fully developed root system.

In a home lawn situation with a good cultural regime for the particular species management practices have a profound influence on how often irrigation is needed because they affect the growth and development of the plant.

A few examples will illustrate this principle:

**A Mowing Height** — mowing too close for the species will result in a much reduced root system and an open turf. The reduced rooting decreases the "maximum reserve pool of water" while the open turf results in higher evaporation versus transpiration losses.

**B Excessive Nitrogen** — applying nitrogen beyond the plant's needs will cause a decline in rooting and promote excessive leaf growth - more leaves for transpirational losses. This results in transpirational water use beyond the real needs of the plant.

**C Irrigation** — if a grower irrigates more frequently and at a lower rate i.e. more lightly than necessary, the turfgrass plant does not develop its full potential for rooting depth.

**D Traffic** — recreational turf is subjected to wear on the above-ground plant parts and to soil compaction. Wear of the turfgrass shoots causes the grower to force a faster growth rate with more nitrogen and water. Also, recreational turfs are often mowed closer because of their use.

As previously discussed, these all increase water use. Soil compaction reduces rooting and thins out the turf so that more frequent irrigation is often applied. Also, reduced infiltration under compaction encourages the irrigator to go to a more frequent, light application schedule. The grower should experiment with different irrigation frequencies with the goal of irrigating as infrequently and as deeply (i.e. with a higher water quantity) as possible.

This necessitates knowledge of the plant's rooting depth which changes on a seasonal basis and depth of water penetration after irrigation. On most sites, there are indicator spots that

first exhibit wilting - as evidenced by a bluish-green color; footprinting; or rolling, folding, drooping of leaves.

By observing these, a grower can obtain some guidance as to when to irrigate his site.

## Rate of application

It should be obvious by this point that the turf manager must know his soil texture, depth of plant root development, and how much water his system applies per unit of time.

For example, if the soil is a loam (Table 1), which the grower believes has an available water-holding capacity of 2.0 inches per foot of soil, and a turf with a 12-inch root system, he should apply 2.0 inches of irrigation when his plant starts to show wilt symptoms.

If by observing the soil a few hours after irrigation, he finds that water penetrated to 16 inches, then the rate of water should be adjusted to a lower one; perhaps 1.50 inches the next time.

By a little experience based on observation, the irrigator can determine the actual quantity needed for his specific soil. After a turf manager determines the quantity of water needed to replenish that lost by ET, he must know how long to run his irrigation system to apply this quantity. In the above example, let us assume that 1.5 inches of water is enough and that the irrigation system applies 0.5 inches of water per hour. Thus, the system must run three hours (1.5/0.5) to obtain the total amount needed.

This quantity of water can be applied in different ways. If the soil has a good infiltration rate, above 0.50 inches per hour in this case, the water could be applied in a single three-hour setting. If the soil has a lower infiltration rate, the grower may wish to improve infiltration by cultivation or removal of excessive thatch.

On low infiltration soils, an automatic system can be programmed to apply water onto a site in two or three sequences separated by a few hours or even one day if necessary.

The first application in the sequence can be longer since soil takes water faster when it is dry; especially, if it cracks upon drying.

Of all the management practices that a turfgrass grower must do to develop a good turfgrass, irrigation is the most important. Yet, it is the most complex since a knowledge of each component of the soil-plant-atmospheric system is required.

The turf manager must truly think in terms of managing the whole "system" in order to achieve efficient water use.

Dr. Carrow is associate professor in the Department of Agronomy, University of Georgia.

## For Information Contact Your Nearest Ransomes Distributor

### EAST

**Brodner Equipment, Inc.** (Upstate NY)  
Rochester, NY 14606, 716/247-5218

**The Clapper Co.** (ME, VT, RI & Eastern MA)  
West Newton, MA 02165, 617/244-7900

**Conaway, Inc.** (MD, Northern VA & Washington D.C.)  
Laurel, MD 20707, 301/953-9220

**Conaway, Inc.** (Western & Central PA)  
Lawrence, PA 15055, 412/341-6447

**EDM Distributors, Inc.** (CT, VT & Western MA)  
Agawam, MA 01001, 413/786-6977

**Steven Willand, Inc.** (NJ, NY, LI & Eastern PA)  
Fairfield, NJ 07006, 201/227-5656

### SOUTH

**B & W Golf Cars, Inc.** (Southern FL — West Coast)  
Fl. Myers, FL 33908, 813/481-8060

**Chemical & Turf Specialty Co., Inc.** (TX & OK)  
Garland, TX 75041, 214/271-4549

**Pifer, Incorporated** (Southern FL — East Coast)  
Jupiter, FL 33458, 305/746-5321

**E. J. Smith & Sons Co.** (NC, SC & VA)  
Charlotte, NC 28266, 704/394-3361

**South Central Turf Equipment (MS & LA)**  
Jackson, MS 39209, 601/922-7437

**Stovall & Company, Inc.** (GA & AL)  
Atlanta, GA 30318, 404/352-1555

**Tennessee Outdoor Power, Inc.** (TN)  
La Vergne, TN 37086, 615/793-6052

**Turf & Industrial Eqt. Co.** (Northern FL)  
Winter Springs, FL 32708 305/327-2220

### MIDWEST

**Baker Vehicle Systems, Inc.** (Northern OH)  
Macedonia, OH 44056, 216/467-2250

**Brentom Lawn & Turf Corp.** (KY & Southern IN)  
Louisville, KY 40207, 502/895-8687

**Conniff's Power Equipment, Inc.** (IN & Southern OH)  
Richmond, IN 47347, 317/935-2344

**General Turf & Grounds Equipment Co.** (KS & MO)  
Columbia, MO 65205, 314/445-6609

**Grass Roots Turf Equipment Co.** (IA & NE)  
Des Moines, IA 50321, 515/223-5980

**Hanley Equipment, Inc.** (WI)  
Sun Prairie, WI 53590, 608/837-5111

**Ideal Mower Sales** (MI & Western OH)  
Ferndale, MI 48220, 313/541-4200

**Kaye Corporation** (MN, ND & SD)  
Mankato, MN 56001, 507/345-5083

**Olsen Distributing Company (IL)**  
Barrington, IL 60010, 312/381-9333

### WEST

**Colorado Outdoor Power Equip., Inc.** (CO, WY & NM)  
Denver, CO 80223, 303/733-4651

**Highland Equipment Co.** (UT)  
Salt Lake City, UT 84103, 801/364-9445

**Huber Incorporated** (AZ)  
Phoenix, AZ 85016, 602/955-1731

**Jenkins Machinery Company** (CA, NV & HI)  
Concord, CA 94520, 415/685-6685

**Turfgo Northwest** (WA, OR & AK)  
Seattle, WA 98036, 206/771-4885

### CANADA

**Consolidated Western Ind. Co., Ltd.** (Alta & Sask)  
Edmonton, Alta T5S 1H4, 403/484-7181

**G. C. Duke Equipment Ltd.** (Ont, Que & Maritime Provinces)  
Burlington, Ont L7S 1W6, 416/637-5216

**Par Equipment Ltd.** (Man)  
Winnipeg, Man R3E 3J8, 204/775-8988

**Rollins Machinery Ltd.** (B.C.)  
Vancouver, B.C. V5T 1H8, 604/874-6404

**RANSOMES**