

What's Wrong with this picture?

BY DR. JEFF KRANS

The turf on the football field in the photo on this page has excellent density, outstanding color, great uniformity, and no sign of any disease or insect problems. So, what's wrong?

The answer can be found in the picture, but not easily recognized without another piece of information—the game schedule. This turf has peaked 2 months before the first sporting event. Now you may not see this as a problem. After all, we all know that a manager is better off to have the turf ready early than late. Early turf beats late in most situations, but does early beat “on time” or “peak” turf performance?

Peak performance refers to turf growth and quality that maximizes (peaks) immediately before or at the start of play. The management strategy of peaking turf is not new to golf course superintendents, who will adjust cultural practices, nutrition, and water to peak turf just before a tournament, then readjust for everyday golf. The superintendent's adjustments in management are designed to match turf quality with player expectations over a season.

In sports turf, the common management strategy appears to be one of peaking the turf early, then holding quality. Both approaches have been successful and there is no doubt that golf and sport turfs are very different and may not even be comparable. The pressure on the sports turf manager to maintain quality turf at all times is intense and trying. The early peak, then hold strategy is a compelling choice given the high expectations of players, fans, coaches, and administrators for high quality turf no matter what the circumstance or season.

So, what is the best management strategy for growing turf on sports fields? The response may not lie in a comparison of golf and sports turf management, but in understanding the limits and biology of the turfgrass plant.

Knowledge of turfgrass growth and development is a fundamental requirement of good management. The first step in gaining this knowledge lies in the sequence of turfgrass growth and development. All grasses, including turf-types, have a continual pattern or expression of growth. In other words, when temperature, moisture, and light levels are adequate for plant activity, all structures grow continually. The continual growth of turf is especially true for turfgrass leaves and stems. In contrast to grasses, other plant types such as deciduous trees express flushes of growth. In trees, all of the leaf growth occurs in the spring, commonly referred to as a “spring flush.” This flush is followed by the summer-long presence of the same leaves, then leaf senescence (growing old) and detachment in the fall. The tree example represents a single season of growth lasting 6-8 months depending on climate.

The continual and repeated growth sequence of the turfgrass leaf is a key factor in addressing how to peak turf. The turfgrass plant will follow a continual and repeated (old leaves are replaced by new leaves) as well as short (individual leaf longevity is only 2-4 weeks) growth sequence of (a) emergence, (b) function (c) senescence (growing old), and (d) detachment.

Emergence is the growth of the leaf blade and sheath from their respective growing points until both segments have fully expanded. The function sequence refers to a fully expanded leaf engaged in high photosynthesis (manufacture of plant food) and export of photosynthate (distribution of plant food). Senescence is a leaf growing old with low photosynthesis and no export of photosynthate. Detachment is the death stage with no contribution to plant health. The sequence of leaf emergence to detachment in grass is difficult to visualize because all events occur continually and concurrently among during a short time period (2-4 weeks).



A bermudagrass football field with excellent quality turf, but 2 months away from the first game.

For example, new turfgrass leaves are continually emerging from their growing points while existing leaves (originated from the same growing point) are passing through the other sequences of growth. Leaves that emerge from a single growing point arise in concert with other leaves and the number of leaves exposed at any one time per growing point is limited to 4 to 8 depending on conditions. In addition, the lifetime of an individual leaf is short, ranging from only 2-4 weeks depending on species, cultural practices, and environmental conditions. The pattern of leaf emergence to detachment from a single growing point can go on indefinitely provided the growing point remains alive or viable. To gain a sense of the sequence and pattern of leaf growth, leaves of tall fescue and bermudagrass are labeled to illustrate the different stages of growth (See next page).

These pictures represent only a snap shot in time that identifies the growth sequence of each leaf and do not demonstrate the dynamic and continual process of leaf growth. In practical terms, the individual leaves mowed today will not be the same leaves mowed 3-4 weeks in the future. The future leaves will be new leaves and today's leaves will be dead.

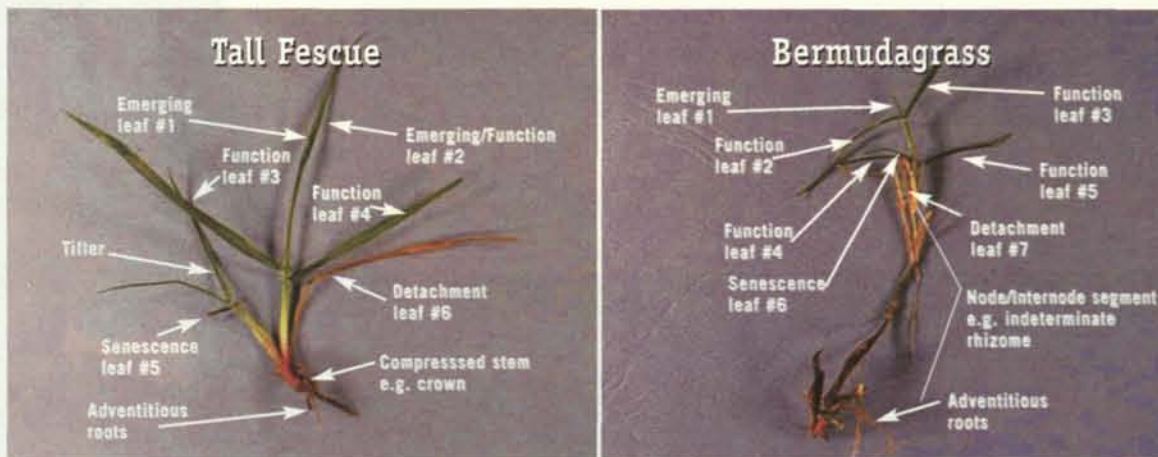
Management can affect the continual sequence of turfgrass leaf growth. In fact, the manipulation of the number of leaves can be a useful and powerful tool in managing quality turf. One direct means to manipulate the number and sequence of leaves is nitrogen fertilizer. Nitrogen will stimulate the frequency, alter the sequence, and change the size of leaves. Multiple applications of nitrogen stimulate leaf emergence resulting in a greater than normal number of leaves exposed from a single growing point (an increase in shoot density). This response can be used to peak turf. Peaking turf with high nitrogen will have consequences however, which fall into two categories

of plant affects - a sudden loss of turf quality and the predisposition of the plant to pest and environmental stresses.

The sudden loss of turf quality will come 2-4 weeks after the repeated nitrogen applications have accelerated leaf emergence and thereby causing a higher than normal number of leaves to emerge. This higher than normal "unit" of leaves will eventually pass along the growth sequence. In other words, the leaf unit will emerge,

function, senesce, and finally detach or die. Therefore, 2-4 weeks down the road, the unit flush of new leaves will result in a unit "flush" of detachment (death). In practical terms, pushing turf with nitrogen to get a "bounce" in turf quality is great, but how great will the "bounce" in leaf detachment be 2-4 weeks down the road?

The other consequence of a larger than normal number of leaves emerging at one time is the predisposition of the plant to suffer from pest and environmental stresses. In this case, pest and environmental stresses are disease, insect, and nematode invasion as well as injury from heat, cold, and drought extremes. The scenario of high shoot density predisposing turf to injury has been well documented in research stud-



Tall fescue and bermudagrass plants illustrating stages of leaf quality and growth sequences. Leaves are labeled according to stage of growth for a single point in time. This illustration does not exemplify the dynamic and concurrent nature of leaf growth and development in grass.

ies, but predisposition is not a guarantee of injury. After all, chemical controls are available for nearly all invasions of turfgrass pests, and most environmental stresses can be countered with cultural management. Yet, is the predisposition of turf to injury a sound management strategy?

The consequences of the nitrogen bounce both up and down and the predisposition of turf to pest and environmental stresses are determined

by the biology of the plant. There is also no doubt that the strategy to peak turf on time coincides better with the plant and sound management than to peak early, then hold until game day. So, what are the practices that one should use to peak turf on time and avoid the consequences of holding turf quality? In my next article, I will discuss management practices to grow quality sports turf within the limits of the biology of plant and sound management.

ST

Jeff Krans, Ph.D. is a professor of agronomy at Mississippi State University and SPORTSTURF's technical editor.

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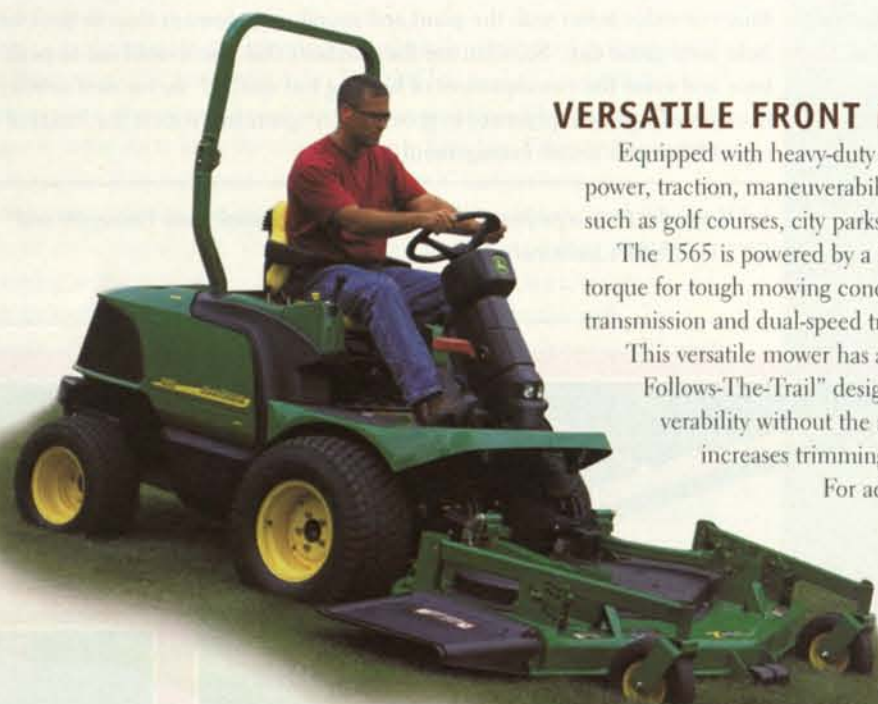
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TRIM WIRE, ADDITIVES

Prime Line has available new pre-wound trimmer line spools that are OE replacements with a 7-year shelf life. Many applications including: McCulloch, Ryobi, Sears-Craftsman, Homelit, John Deere and Toro. Also available is gasoline performance additive and stabilizer (part number 7-09013) that promotes quick starting, keeps carburetor and fuel systems clean, reduces gum and varnish build up, improves engine performance, and stabilizes gasoline up to 24 months.

Prime Line/217-324-9430
For information, circle 194



VERSATILE FRONT MOWER

Equipped with heavy-duty components, the John Deere 1565 front mower offers power, traction, maneuverability, and mowing productivity for various applications, such as golf courses, city parks, and universities.

The 1565 is powered by a 36-hp Yanmar diesel engine that features maximum torque for tough mowing conditions. This mower also features a Kanzaki hydrostatic transmission and dual-speed transaxle with forward mowing speeds of up to 8.5 mph.

This versatile mower has a front-mounted offset mower deck with a "Tail-Follows-The-Trail" design. An industry exclusive, this design allows for maneuverability without the rear of the machine encountering obstacles and increases trimming capabilities.

For added productivity, the 1565 is outfitted with a 14.5-gal. fuel tank and is available with 60- and 72-in. side-discharge, 7-IRON mowing decks for cutting performance.

John Deere/800-537-8233
For information, circle 190

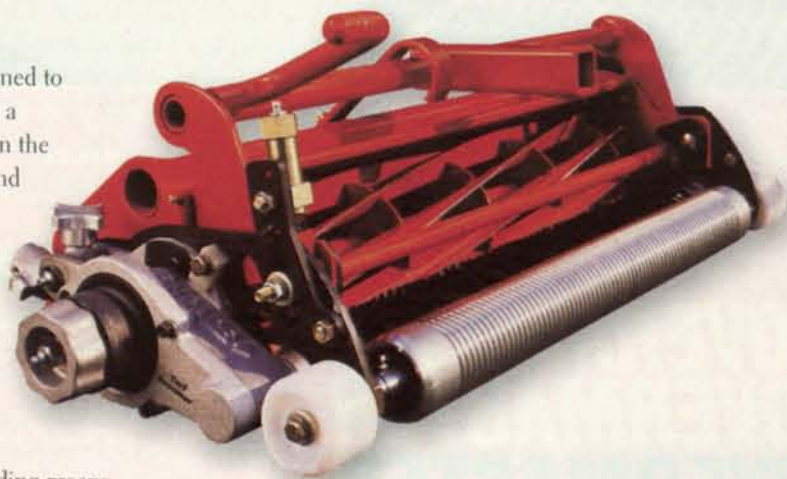
SPORTS FIELD CONDITIONER

The patented Turf Groomer attachment from Jacobsen is designed to promote healthier turf by working with the cutting reel to produce a smooth finish. Powered vertical knives rotate through the grooves in the front roller of the unit to cut runners in the grass close to the ground before they can lie down.

The cutting action exposes more of the leaf surface for better photosynthesis while encouraging a healthier, deeper root system and improved stress tolerance. Because the roller base of the Turf Groomer is sharp, the cutting head closely follows ground contours. Combined with the cutting action of the blades, the unit helps smooth out irregularities in sports fields caused by normal play.

The Turf Groomer is available on Jacobsen walk-behind and riding greens mowers, and selected models of Jacobsen LF and Super LF Fairway Mowers.

Textron Golf & Turf/888-922-8873
For information, circle 195





MULTI-PURPOSE IMPLEMENT

The Quadivator attaches easily to your ATV or lawn tractor, and can be used with numerous attachments (each sold separately). The 4-ft. deluxe unit comes standard with a cultivator attachment and is equipped with electric depth control that is operated from a switch that is mounted on the towing vehicle.

The Quadivator tool bar can be used with several accessories including: hilling model boards, potato digger, box scraper, lawn irrigation plow, dump box, tandem disc, barb wire dispenser, lawn roller and lawn aerator.

Swisher Inc./660-747-8183
For information, circle 193



EQUIPMENT IN ONE WAY AND OUT THE OTHER

All-new trailer design eliminates the need to back equipment on or off ramps, saving inconvenience, damage, and injury.

Tongue Twister, manufacturer of trailers for recreational, automotive, construction and utility equipment, announces a new technology in trailer systems that totally eliminates the hazardous backing of, landscaping and utility equipment up or down trailer ramps. Employing a patent-pending, swivel design, Tongue Twister enables users to easily pivot the trailer without unhitching it, allowing vehicles to be safely driven directly onto and off the trailer via straight-through front and rear ramp access.

Available in a variety of trailer styles including flat or cargo, bumper pull or gooseneck, Tongue Twister offers the first technology to virtually eliminate the peril insurance studies say causes the most accidents involving trailers: vehicle damage and personal injuries incurred when backing equipment onto or off the trailer platform.

Tongue Twister/877-925-8265
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Maintaining the Grounds



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The Ty-Crop TD-460 is made to topdress large areas in a short time; build or maintain cart paths, walkways, running tracks, and infields; and apply materials as growing mediums for a variety of seed beds. The fully adjustable locking tailgate and high-speed finishing brush work together to spread almost any kind of material from a fine misting of 1/64 in. up to several inches in depth, in a 72-in. wide spectrum.

The unit is controlled directly from the tractor's remote hydraulics and can be towed with tractors starting at 30 hp. You can operate easily by opening the tailgate to the desired level, turning on the control for the finishing brush, and setting the speed of the floor belt.

Ty-Crop/800-845-7249

For information, circle 196

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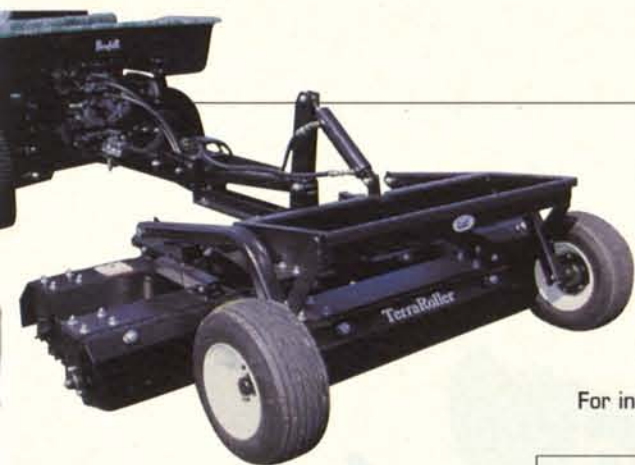


BASEBALL MOWING SYSTEM

ProMow has introduced The FLEX, a gang reel mowing system designed in part for baseball fields and infields. The 5-ft. cutting path will deliver a scissors-type cut and a healthier field by not chopping the grass.

ProMow/877-477-6669

For information, circle 192



GREENS ROLLER

TerraRoller's integrated roller/spiker design employs a two-section star bladed spiker followed by a three-gang roller to fold foliage back over perforations in the green without closing opening. The result is an immediately playable green with a smooth, fast surface, says the company. Standard weight trays have been brought forward to provide additional down force on the front spiking heads for 2002. Three gang rollers can be used separately to increase greens ball roll rate.

Broyhill/402-987-3412

For information, circle 198



COMPACT BUT HEAVY DUTY

Ingersoll Equipment's 7000 Series loader/backhoe is a compact, 4-wheel-drive tractor.

Its loader is an integral part of the tractor and frame, with heavy-duty lift arms and a reinforced bucket. Lift capacity of the loader bucket is 750 lb. at full height.

The backhoe is coupled to the tractor via mounting arms connected to a counterweight. It offers a 92-in. digging depth with joystick controls and a selection of buckets from 8 to 24 in.

The tractor is powered by a 20-hp Kohler engine. It has a hydraulic drive through a 2-speed transaxle controlled by a foot pedal.

Power steering is standard.

Ingersoll Equipment/
920-582-5000

For information, circle 088

Z D S E R I E S

TURN ON THE KUBOTA VALUE: SHAFT DRIVE, QUIET DIESEL POWER, HYDRAULIC DECK LIFT



The new Kubota ZD28 zero-turn mower is strong enough to handle the tough turf, yet responsive enough to make work seem like fun. With 18,500 fpm blade tip speed (72" mower) for better mowing performance, a tilt-up mower deck for easy maintenance, a shaft drive mower and transmission to reduce wear and the lowest noise output of any zero-turn mower in its class, the ZD28 is everything you value in a commercial turf mower. Talk to your Kubota dealer about the complete line of ZDs today.

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Circle 106 on card or www.OneRS.net/205sp-106



DIESEL ZERO TURN

Kubota now is offering its ZD28F zero turn mower, powered by a liquid-cooled 3-cylinder E-TVCS diesel engine that has higher torque curves than competitive diesel and gas-powered ZTRs, says the company. The engine operates at lower rpms, lower noise levels, and offers better fuel efficiency, says Kubota.

Cutting height can be adjusted in 1/2-in. increments between 1 and 5 in.; all deck controls are accessible from driver's position. Kubota's exclusive multi-belt drive with heavy-duty cast-iron pulleys distributes and reduces belt tension while transmitting power to the mower blades, and helps prevent damage and slipping caused by belt twisting.

The unit's front suspension uses an oscillating front axle that follows ground contours, and its Tilt-up feature allows you to easily raise the mower.

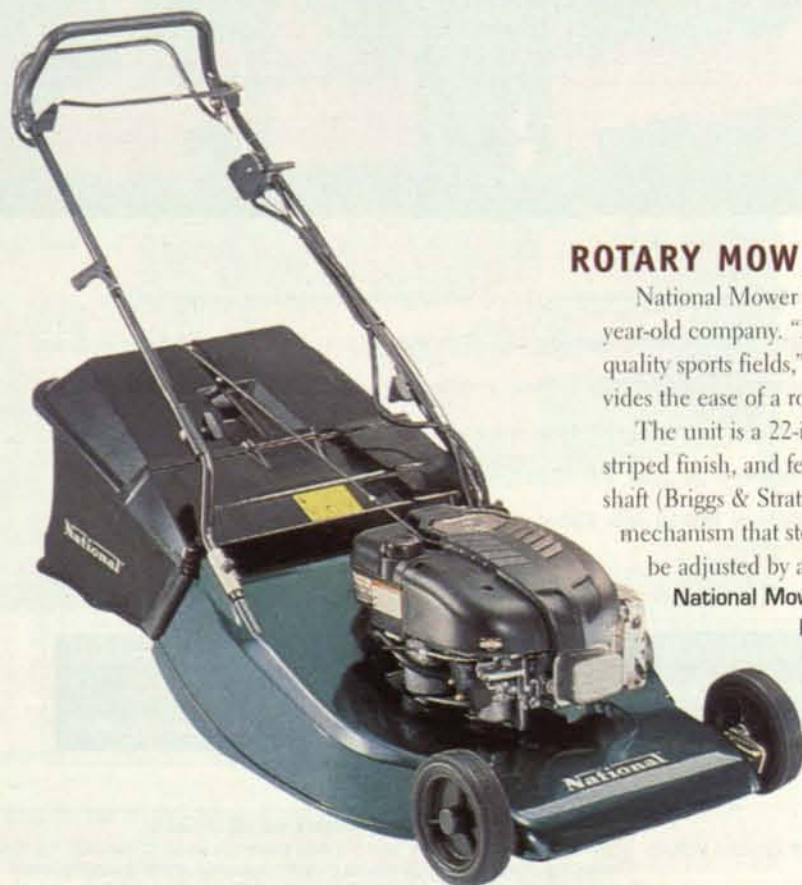
Kubota Tractor/888-458-2682
For information, circle 200



SOD CUTTER

The KisCutter is the newest sod cutter in Turfco Direct's line. Its simple design, few moving parts and easy-to-use controls make it easy to operate. The handles fold down for easy transport or storage, lowering the height to less than 32 in. Only 140 lbs., the KisCutter is easy to haul and useful for many applications. Unit features a centrifugal clutch, friction drive to the wheels, and variable speeds make starting and stopping, corners and curves easy to maneuver.

Turfco Direct/800-679-8201
For information, circle 197



ROTARY MOWER FOR INFIELD STRIPING

National Mower has introduced its I-Stripe 22 rotary mower, the first rotary for the 83-year-old company. "In the past decade, field striping has become synonymous with top-quality sports fields," says National Mower president Stan Kinkead. "The I-Stripe 22 provides the ease of a rotary mower and stripes like a reel mower."

The unit is a 22-in. walk-behind with a powered rear roller for creating the classic striped finish, and features a blade friction disc to limit the impact to the engine's drive shaft (Briggs & Stratton Intek OHV 5.5 engine). Incorporated into the handlebar is a safety mechanism that stops the mower blade whenever the bar is released. Cutting height can be adjusted by a single lever to seven settings, from 1/2 to 2 1/2 in.

National Mower/888-907-3463
For information, circle 199

CHAINSAW

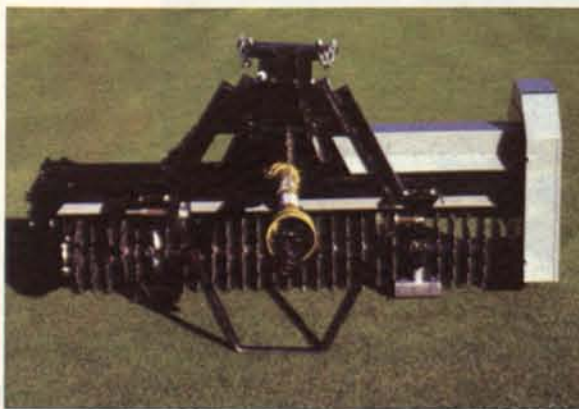
John Deere has available its Pro-Series chainsaws, the CS46 and CS52, each which have 16- and 18-in. bar options. While a two-ring piston and closed port cylinder provides higher compression and more power, the saws' compensating carburetors can last triple the average time between cleanings, says Deere.

Maintenance is more efficient since the air filter and spark plug both can be accessed without tools, and the side cover on both models offers easy access for chain tensioning. Deere guarantees delivery of any replacement parts needed within 24 hours, 7 days a week.

John Deere/800-537-8233
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PRE-SOD OR SEED ATTACHMENT

The Landscaper is a commercial attachment that is used on skid steer loaders or tractors to level and pulverize the ground before laying sod or planting grass seed. The Landscaper has an optional Ripper Bar for packed surfaces and optional Grass Seed Box for one pass operation. Available sizes, 48 to 96 in.

Reist Welding (Elmira)/888-565-5587

For information, circle 191

HYDRO DRIVE WALK-BEHIND MOWER

LESCO has available its 36-, 48-, and 52-in. fabricated deck hydro drive rotary walk-behind mowers, all powered by Kawasaki engines, which are optional in 15 hp single cylinder to 17-, 19-, and 21-hp twin-cylinder with or without electric start models.

Units' dual hydro pumps and drive motors mean true zero-turning radius, and twin ground speed control levers allow on-the-go speed adjustment. Newly designed ergonomic handles reduce operator fatigue, and a digital gauge that monitors total hours, engine rpm, and hours between oil changes is standard.

LESCO/800-321-5325

For information, circle 202



MULTI-FUNCTION TOPDRESSERS

Redexim Charterhouse has introduced their new line of hydraulically driven topdressers, including two models that function in either drop spread or broadcast spread modes.

Models 1010 and 1520 have both rotary brushes as well as optional twin spinning disks. The smaller 1010 is a trailed unit with four pivoting wheels and a 35.3 cu. ft. capacity. In drop spreader mode its width spread is 5 ft.; fitted with the twin disks it has a broadcast range of up to 19.6 ft.

The larger 1520, designed for fairways and sports fields, offers a 70.6 cu. ft. capacity and a drop spreader width of 5 ft.; the disks create a broadcast spread of up to 36 ft., says the company.

Redexim Charterhouse/800-597-5664

For information, circle 204



BUNTON MIDSIZE SERIES

Launched last year, the Bunton midsize series of walk-behind mowers offer more choices in engines, cutting widths, and cutting decks, says the manufacturer.

Every Bunton midsize has an electric clutch for blade control and a top-mounted cutter spindle for better impact resistance. Bunton's comprehensive warranty (3-yr. no-crack deck; 2-yr. spindle, electric clutch and hydro-drive components; and 1-yr. power unit) is available on both hydrostatic-drive and gear-drive models.

Textron Golf, Turf & Specialty Products/888-922-TURF
For information, circle 205

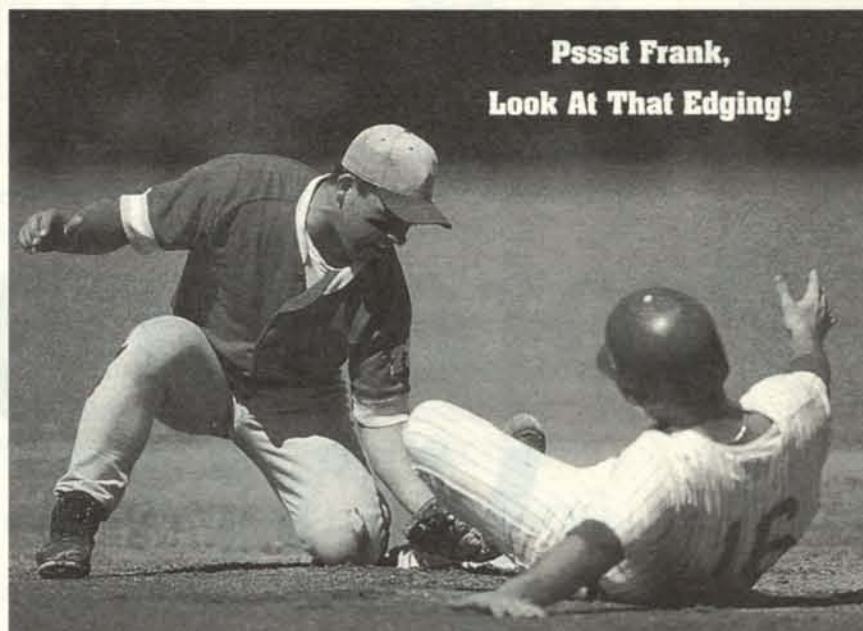


HOVER MOWER

Instead of using wheels, the Eastman HoverMower floats on a cushion of air, allowing you to mow difficult terrain such as slopes, wet turf, steep banks, sand traps, and retaining walls. The air cushion also increases maneuverability and productivity, as well as reduces wear and tear on mower parts.

The model HM 19S-2 weighs just 37 lbs. and features a Suzuki 3.8 hp, 2-cycle engine with a 19-in. cutting width and adjustable cutting height from 1 to 3 in. Cutting disk is aluminum with three stainless steel blades, and the unit features a 15-in. impeller for optimum air volume.

Eastman Industries/800-760-1680
For information, circle 203



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