Timing is Everything

What's wrong this picture II

BY DR. JEFF KRANS

This is a follow-up article to "What's Wrong with this Picture?" in the May issue, page 30. There I addressed two management strategies. One strategy was based on the concept of bringing your turf to game-ready status as soon as possible, then holding quality until game day. The other strategy stood on the concept of delaying game-ready status of the turf and peaking just before game day. Using turf biology as a guide, I concluded that you should delay your quest for game-ready quality and peak just before game day. How does a field manager achieve this objective?

There is no universal management schedule that will achieve the above stated objective for all fields in a uniform manner. Each and every field is unique in that they have a definable location and composition (zone of climatic adaptation, soil composition and grass community); type and sequence of sports played, and most importantly, game schedule.

These criteria make-up the field's profile. A field manager must schedule field activities based on the principles and concepts of plant and soil science in concert with the field's profile. In addition, a field manager should have a clear picture of their anticipated end product.

Now some managers may say that their end product is obvious: high quality sports turf. But what exactly is meant by high quality sports turf? Sports turf experts have addressed this question and generally agree on a list of criteria. A high quality sports turf will have solid traction, low surface hardness, high traffic tolerance, and true ball response properties. Translated into turf characteristics, the field should have high verdure (high leaf and stem biomass below the height of cut), prodigious lateral stem development, and a deep and extensive root system.

Achieving these turf characteristics is a challenge within itself, but achieving these characteristics on time is an even greater challenge. Because all field profiles are different, attaining these surface features must be based on turfgrass growth and development principles that will provide a guide rather than a schedule of activity.

Building verdure

Building verdure is one of the key turfgrass features in sustaining a safe and playable field. Past research studies have reported that the level of verdure is highly correlated to wear tolerance. In common sense terms, this can be interpreted as "the more you start with, the more you end up with."

Of course species selection plays a role in biomass accumulation, but what cultural practice can be used to promote verdure in all species? One of the most powerful tools to create verdure is height and frequency of cut. Mowing provides the manager with the opportunity to stimulate and layer biomass. This is achieved by adjusting mowing height during the course of the growing season. Within the mowing height tolerance range of any species, mowing should start at the low end of the range, then move upward. The early low mowing height stimulates dormant axillary buds to break dormancy as well as reduce leaf sheath and blade lengths (Figures 1 and 2).

As time progress towards game-day, height should be adjusted upward until the designated game height is reached. The practice of low-to-high cutting height adjust-

Figure 1. Bermudagrass turf cut at 3/4 inches causing prostrate growth and shortened leaf sheaths and blades. A gradual increase in height will layer biomass and build verdure.

Figure 2. Bermudagrass turf cut at 1 1/2 inches causing upright growth and elongated leaf sheaths and blades.

ments will promote verdure development by layering or concentrating shoot biomass below the height of cut. However, as previously stated, not all fields can be treated the same and a low cutting height on a cool season turf during peak heat stress would not be recommended. In this case, a higher summer time cutting height should be adopted to sustain a more vigorous turfgrass plant. Once the stress subsides, the appropriate mowing height strategy can be used. In this and other cases, the field manager must always weight each decision and draw compromises as required.

TABLE 1: Turfgrass seeding guidelines for sports fields

Turfgrass common name	Lbs. per 1000 sq. ft	seeds per sq. inch
perennial ryegrass	7 to 9	13 to 19
Kentucky bluegrass	1 to 1.5	10 to 14
tall fescue	7 to 10	10 to 13
bermudagrass (hulled)	.5 to 1.0	10 to 12

Another cultural practice that affects shoot biomass is nitrogen applications. As stated in the May 2002 article, an aggressive nitrogen application should be avoided early if there is not an early game scheduled. Early application should only meet the need of achieving a closed canopy. As the game-day schedule approaches, nitrogen applications can be increased to achieve the anticipated growth that will be needed to recuperate from post-game defoliation and divoting. In the context of overall fertility management, proper nutrient balance, levels, and pH levels should never be compromised.

Creating a wide-ranging network of lateral stems (tillers, stolons, and/or rhizomes) is also a key component of a safe and playable field. One of the most direct relationships of lateral stem density and a cultural practice application is seeding rate (Table 1, and Figures 3 and 4). Research studies have repeatedly shown that a seeding rate beyond the recommended level retards lateral stem development in all turfgrass species. Applying only the recommended seed number per unit area may be difficult for some managers, as quick cover (due to high seeding rates) is usually interpreted as a successful planting.

Mowing on low end

On established fields, mowing at the low end of the cutting height range, light vertical mowing or spiking, and core cultivation can increase lateral stem density. All of these practices stimulate the growth of dormant axillary buds at or near the soil surface. The breaking of dormant buds in response to these practices is due in part to enhanced light penetration and the cutting or wounding of stem tissue. These signals are the triggers that tell the plant to make a developmental change. The stimuli that enact the biological changes occur at the hormonal level.

A turf community that increases its lateral stem density will have greater verdure and more growing points for leaf production. Similar to the cutting height strategy, these cultural practices should be used during the off-season to position the turfgrass community for recuperation. When recuperation is needed, nitrogen applications can stimulate the needed growth.

An extensive and deep root system is another turfgrass feature of a safe and playable field. Several cultural practice strategies have been proven to increase root mass and depth. One of the most critical practices is water management. Researchers have shown that deep and infrequent irrigation promotes a deep root mass. When water is applied deep into the soil profile, the turfgrass plant will adjust it root development and grow a deep and more massive root system.

Determining deep and infrequent water management is not always an easy task. The best approach is to watch the turfgrass plants for signs of temporary wilt (daytime wilting that will disappear by the next morning) before the next irrigation. Your goal is

Figure 3. Bermudagrass seeded at 1/2 lbs. per 1000 sq. ft. causing seeding to elongate internodes and begin lateral stem production.

Figure 4. Bermudagrass seeded at 2.0 lbs. per 1000 sq. ft. causing upright growth and a lack of internode elongation. Lateral stem production will be inhibited.

to irrigate to meet the needs of the plant based on signs from the plant.

Another effective practice for increasing root depth and mass is core cultivation. Core cultivation creates voids or space for roots to occupy as well as improves the water drainage and gas exchange. No matter what the turf condition, age or soil composition, core cultivation is an essential maintenance practice for a healthy turf and deep root system.

There are multiple pathways to achieve a safe and playable turf. All cultural practices should be applied with anticipation of how the turfgrass plant will respond. Peaking your turf just before game-day should be your ultimate goal. Your geographic location, type of species, soil condition, anticipated end product and game-ready date will determine your schedule. No single management schedule fits all situation, so be prepared to make changes to meet the needs of the plant. Time your cultural practices to position the turfgrass plant for growth, then adjust to promote growth. In all situations, no matter what cultural practices are used, timing is everything. **ST**

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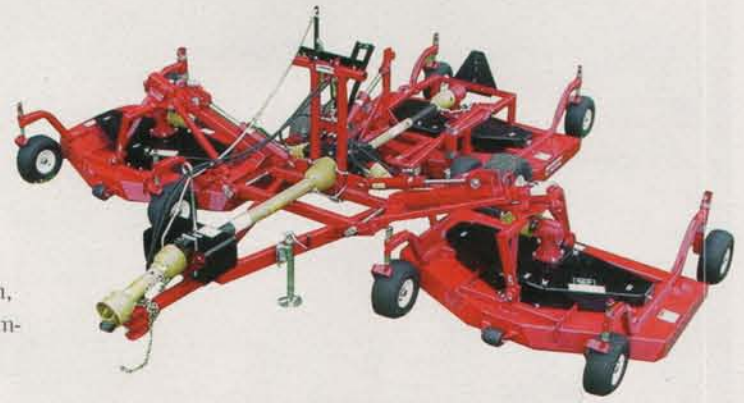
ONE-STEP GROOMER

Field Master's infield groomer is a three-point hitch or drag machine that comes in 4- and 6-ft. widths and feature: combination scarifier/dethatcher bar; dual drag leveling bars; roller with built-in scrapper bar; built-in weight tray; and final sweep for textured finish.

The Fieldmaster unit is used by the Girls College World Series in Oklahoma City, the National Baseball Congress in Wichita, the College World Series in Omaha, and was used in the 1996 Olympics in Atlanta. Gary Hines, superintendent of the Lawrence (KS) Parks Dept has a groomer that has taken care of 21 fields for more than 7 years. "What I like best about it is, it works," says Hines.

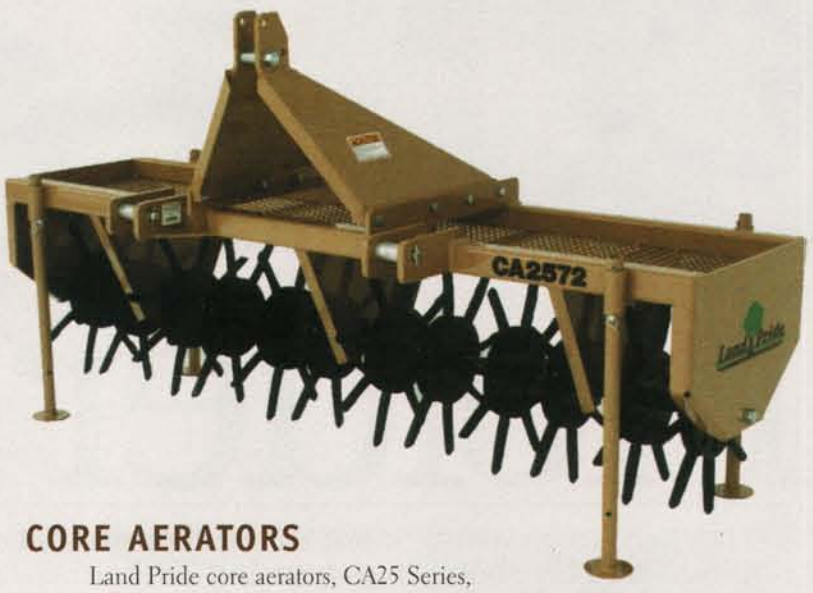
Field Master/800-728-3581
For information, circle 143

ROTARY FINISHING MOWERS



Progressive Turf Equipment Inc. produces a complete line of pull behind rotary finishing mowers for turf maintenance. The TD65 (shown) or the 12-ft. TD65-2 has long been the mower of choice for many sportsturf managers. Our Pro-flex 120 contour mower is ideal for other areas that have mounds or undulations. Whatever the application, Progressive has a mower that will provide a superlative cut at a very competitive price, says the company.

Progressive Turf Equipment/800-668-8873
For information, circle 141



CORE AERATORS

Land Pride core aerators, CA25 Series, help reduce compaction in heavy soil conditions. Available in 4-, 5- and 6-ft. units, these aerators feature case hardened 3/4-in. spoons to penetrate the ground to a depth of 4 1/2 in., depending on soil conditions and additional weight needed. A core is pulled every 7 in. of forward travel from each of the spoon gangs. Each gang is mounted independently, which minimizes torque on the spoons during slight turns.

Storage stands are located on all four corners for added stability and ease of hook up to the tractor. Water tanks are optional on 5- and 6-ft. models to safely and easily add weight to aid in spoon penetration.

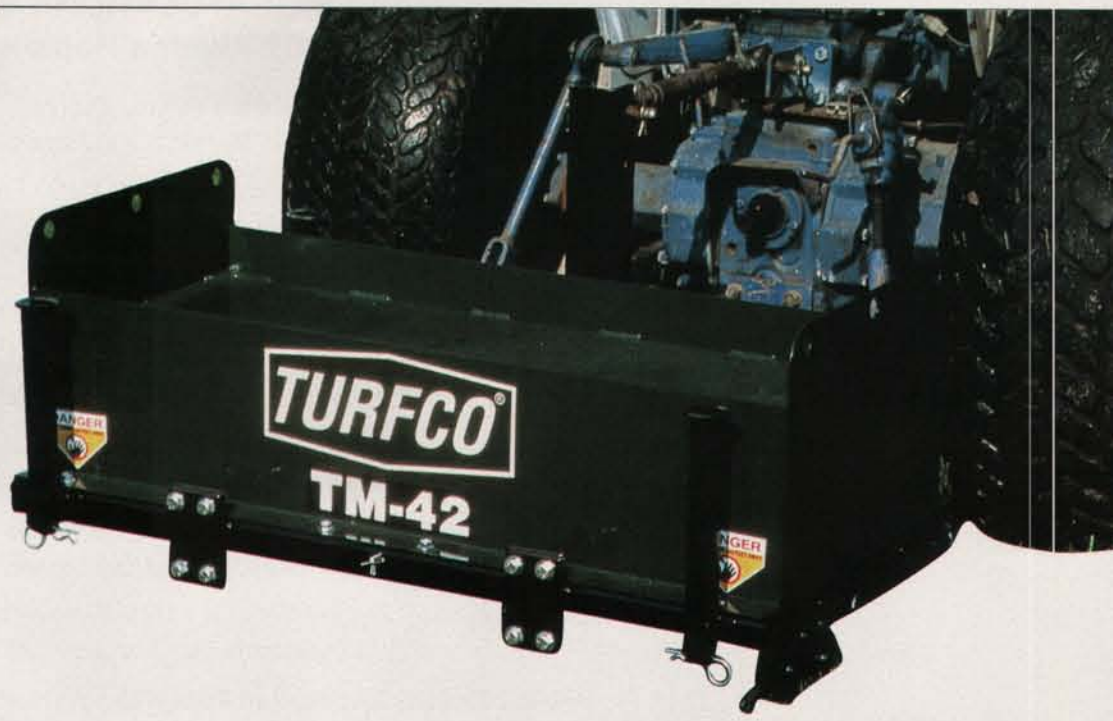
Land Pride/785-823-3276
For information, circle 140

AERATION ON A BUDGET

Turfco's aerator TM-42 comes in tow type and three-point hitch attachments and is good for large area aeration. Both models come with storage legs, making hook up quick and easy, says Turfco, and the two-tongue can be easily removed to save storage space.

These units can cover up to 92,400 sq. ft. in an hour, use 3/4-in. tines for aeration depths up to 4 in., have a pattern of 5.5 x 8 in., and have tines mounted six to each wheel in sets of two wheels.

Turfco Manufacturing/763-785-1000
For information, circle 197



TACKLE TOUGH TERRAIN

Broyhill's AccuAire core aerator is one of the most powerful aerators on the market, able to penetrate the toughest terrain, says the company. The FlexWing design allows the AccuAire to follow the contour of the ground, providing even penetration. The solid frame and extra-wide racks add weight to maximize core depth in all types of soils.

Equipped to use slicer blades or core spoons, the machine is available in two lengths, 69 or 93 in. The AccuAire is equipped with a hydraulic lift, and hooks up easily to the Broyhill TerraForce and Highlander PRO, or other utility vehicles equipped with hydraulics or three-point hitch.

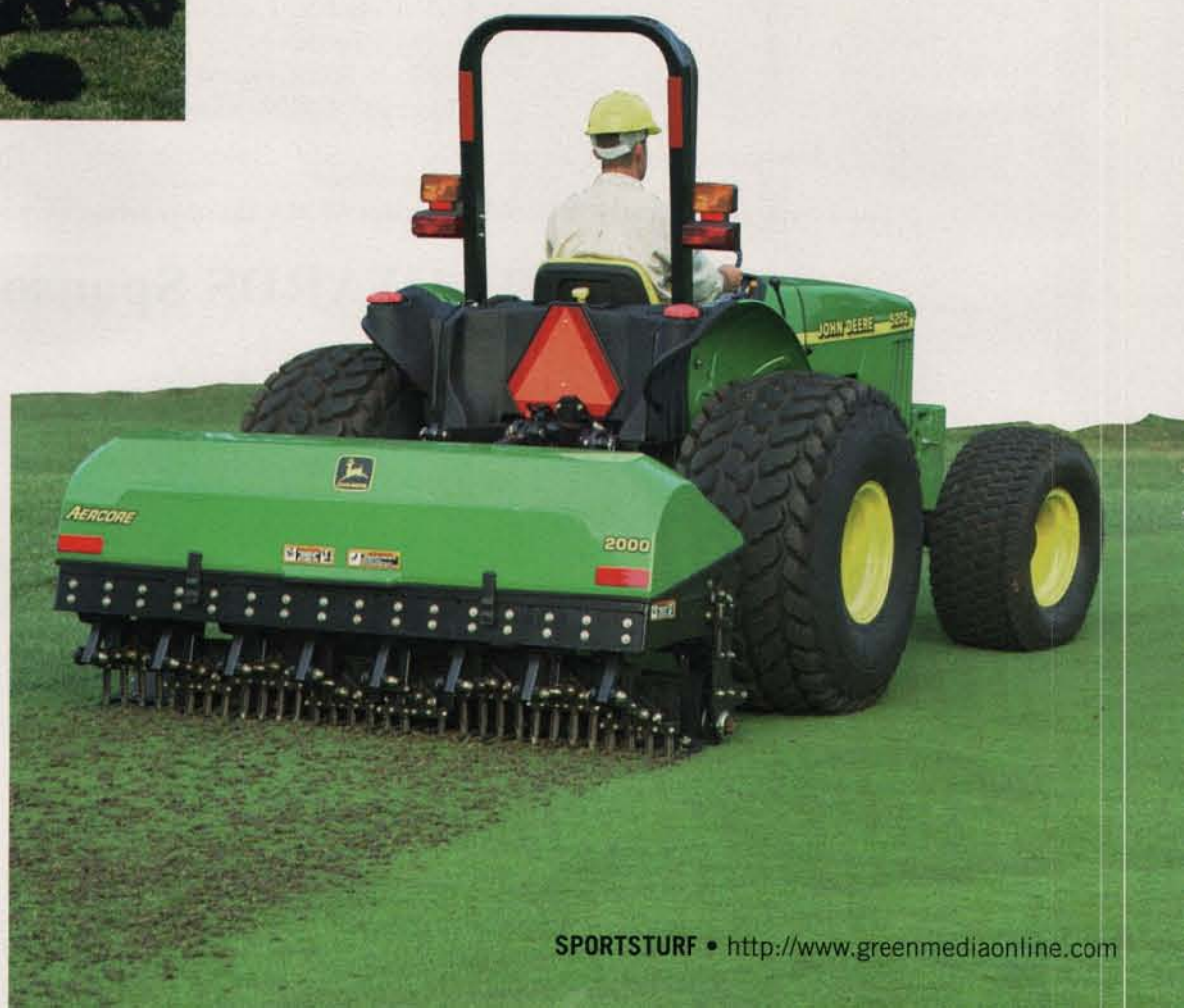
Broyhill/800-228-1003
For information, circle 142

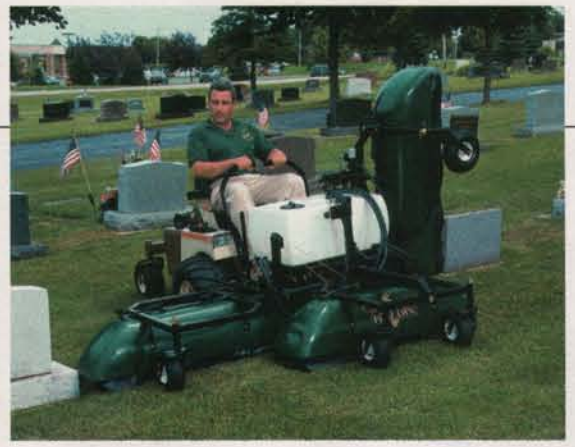
BIG-PRODUCING AERATOR

With an 80-in. coring swath, the John Deere Aercore Aerator 2000 delivers high productivity without sacrificing hole quality, durability, or ease of service, says the company. The unit, designed to produce coring holes up to 4 in. deep, can cover 100,066 sq. ft. per hour.

Its heavy-duty frame, tine rams, and adjustable hole spacing provide operators with added durability and versatility. You have a choice of two coring patterns, a 2.4-in. or 3.2-in. The Aercore 2000 features the patented "Flexi-Link" design that ensures tines stay perpendicular to the ground for a consistently round hole. The high-speed tines leave no scuffing at the top of the hole.

John Deere/800-537-8233
For information, circle 149

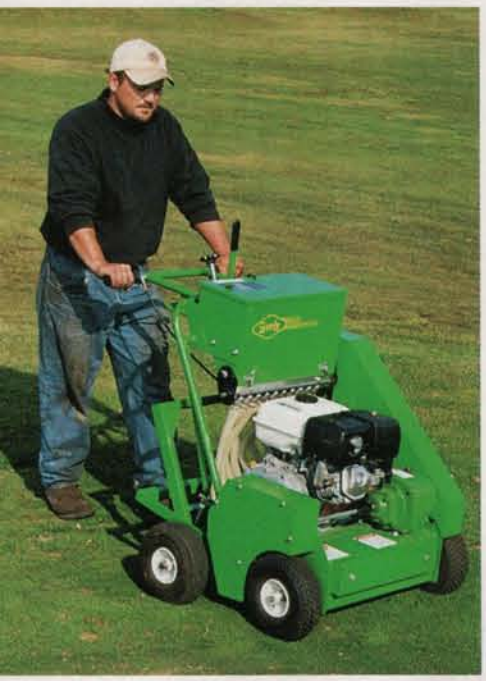




SHIELDED SPRAYER

The 52- and 132-in. aerodynamically designed shielded sprayers deliver an even spray every time. The sprayer applies a constant accurate balance of small droplets that "stick" to vegetation achieving greater coverage with less chemicals. The most efficient and cost effective way to apply liquid fertilizer, pesticide, herbicide and adjuvant, says the company, ProLawn. Independent floating chambers follow the ground contours for precise application. Grasshopper maneuverability is maintained, even in tight spaces.

Grasshopper/620-345-8621
For information, circle 144



WALK AND SEED

Gandy Company's new 20-in. self-propelled Slice n' Seed walk-behind overseeder is used for repairing or re-establishing grass in worn areas for establishing new grass varieties. This walk-behind model complements the Gandy 48-in. 3-point-hitch overseeder.

The Slice n' Seed has an 8-hp Honda engine with centrifugal clutch and is capable of covering 22,000 sq. ft. per hour. Nine-inch heat-treated slicing blades are fixed on 2-in. centers. The seed box features Gandy's precision-mated stainless-steel bottom and slide with internal rotor driven by front-wheel drive. A cam gauge sets opening size to meter all types of grass seed while a hand lever is used to shut off flow.

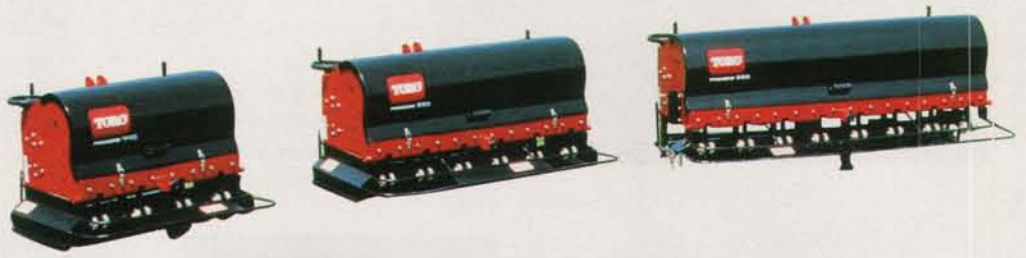
Gandy Company/800-443-2476
For information, circle 145

FOR EARLY SPRING GREEN-UP

Kesmac's five-gang vertical mower helps seed germination in large turf-covered areas. But its main job is breaking up thick layers of thatch. According to Kesmac, the vertical mower also allows increased aeration, permits turf to use fertilizer more efficiently, helps prevent diseases, allows better water penetration, and is economical.

With thatch removed, Kesmac says that turf greens up in the spring up to two weeks earlier.

Kesmac, Inc./905-476-6222
For information, circle 146

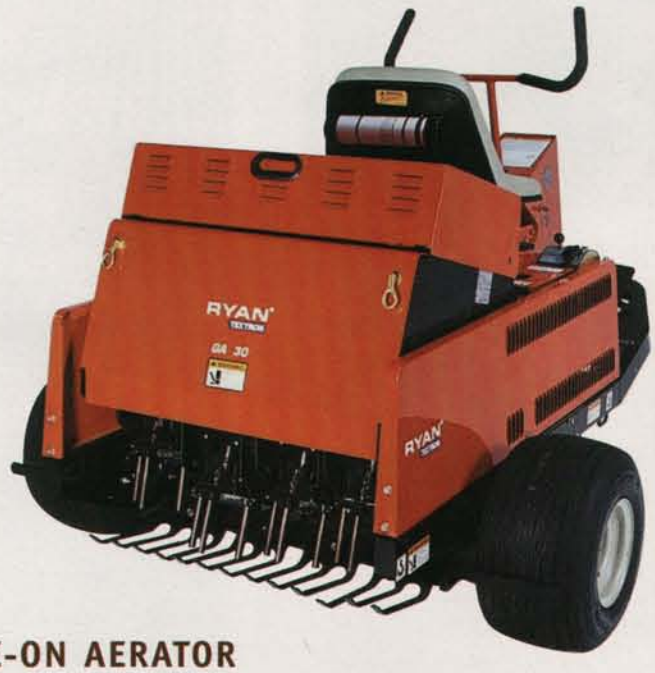


VERSATILE AERATION TOOL

The Toro ProCore 660 aerator relieves compaction, controls thatch, and enables positive gas exchange for healthier turf. The 660 covers a 60-in. swath and produces excellent hole quality due to its RotaLink centering mechanism, says Toro. RotaLink requires no maintenance and ensures tines remain vertical as they enter and exit the ground, producing a consistently circular hole while the tractor moves forward.

No timing to tractor is required for operation or to vary hole spacing patterns. You just speed up or slow down to change hole pattern from 1 to 5 in. spacings. Individually floating turf holders keep the turf secure as the tine is withdrawn, preventing turf lift and maintaining a true and level surface. Aeration depth is adjusted without tools to a depth of up to 4.25 in. The unit is easily installed on any compact tractor and comes in three sizes.

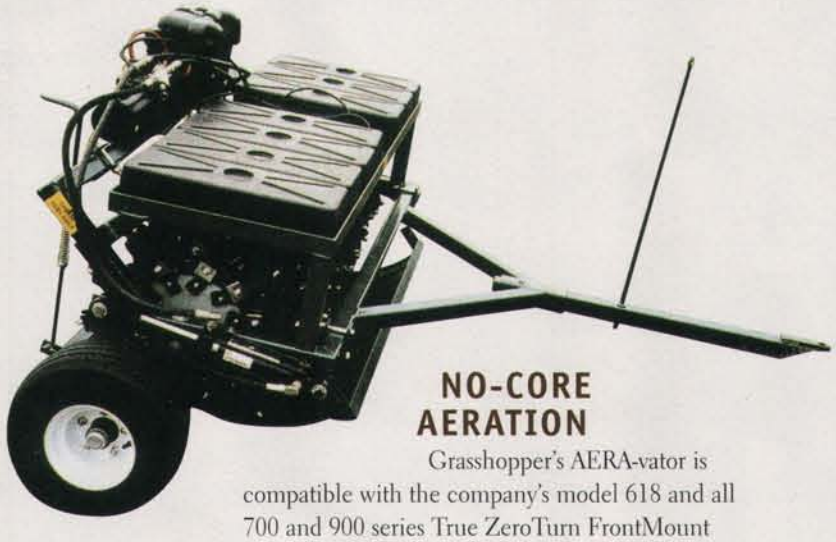
The Toro Company/800-803-8676
For information, circle 150



RIDE-ON AERATOR

This precision, self-propelled, ride-on aerator from Ryan delivers both quality and productivity. Featuring a 30-in. aerating width, the GreensAire 30 can aerate sports fields up to a depth of 3 3/4 in. The unique Ryan reversing gearbox ground drive system ensures every coring hole is perfectly vertical for precision introduction of soil amendments. Core hole spacing adjustments can be done from the driver's seat.

Textron Golf, Turf and Specialty Products/888-922-8873.
For information, circle 196



NO-CORE AERATION

Grasshopper's AERA-vator is compatible with the company's model 618 and all 700 and 900 series True ZeroTurn FrontMount power units, and leaves no cores to clean up. Turf is available for use immediately. Units feature oscillating, forged steel tines that penetrate and fracture soil and don't require irrigation before operating. PTO-driven 40- and 60-in. models available.

The Grasshopper Co./620-345-8621
For information, circle 152

NEW CORE AERATOR

Redexim Charterhouse has introduced a new line of core aerators called Verti-Core, which they say penetrate more cleanly than other machines to a full 5 in. The units are available in three sizes: 4.2, 5.6, and 6.9 ft. All share a gearbox and crank design for the drive system, meaning there are no belts.

A control mechanism allows tine depth to be adjusted from 1 to 5 in., and a rapid-change feature permits quick tine changeovers, allowing the units to be fitted with a variety of tine types, including the popular 3/16-in. needles.

The company also markets Verti-Drain, Verti-Seed, Rapidcore, and Turf Tidy products.

Redexim Charterhouse/800-597-5664
For information, circle 148