

There are special circumstances, however, where a heavy-soil sod could be appropriate for a sand-based field. In an "emergency" mid-season resodding situation, Indyk notes, a heavy-textured soil-grown sod could be used on a sand-based field to lend stability for immediate play. However, he emphasizes, this would be a stop-gap measure to keep the field in play, and resodding with a compatible sand-based product would eventually be necessary.

"Another important aspect is to have the sod cut as thinly as possible," he adds. "That will minimize the amount of amount of soil differential. One of the problems we see is people having sod thick-cut to gain topsoil, but if you need topsoil, it's much better to simply buy it and spread it before you put down sod."

Regional strengths of turfgrasses are being studied at more than 30 locations throughout the country as part of the National Turfgrass Evaluation Program (NTEP). The program is sponsored by the United States Department of Agriculture's Beltsville Agricultural Research Center and the Maryland Turfgrass Council.

NTEP data is helpful for sod growers and sports turf manager who buy sod regularly. Knowing the regional strengths of turfgrasses can be vital in selecting a turfgrass for your area.

Installation: Right From The Start

Sod is a living thing—one under the stress of having its root severed. Therefore, timing, from harvest to installation, is critical, especially in the hot summer months.

"Programming, timing harvest and placement of sod to minimize the time between them, is important," says Indyk. "Sod should be scheduled to be cut quickly, delivered quickly, and placed quickly to prevent damage from heating up on the palette or in the roll."

There are four steps for successful sod installation. Following these steps will ensure a turf that thrives. Neglecting any of them know can set the stage for future disaster.

Measuring and Estimating. Measure the area where you plan to install the sod. Mark the figures on a site sketch. In addition to width and length, note any unusual features or grades. Determine in advance the direction the sod will be laid in relation to sidelines, cart paths, and other features.

Soil Preparation. Determine what amendments the soil will require. As previously mentioned, it's important to know the type of soil in which the sod was grown on the farm. At best, the soil types of the sod and the existing field will match. If not, amendment is a must, whether that comes in the form of nutrients, modification of the soil structure, sod washing, or something else.

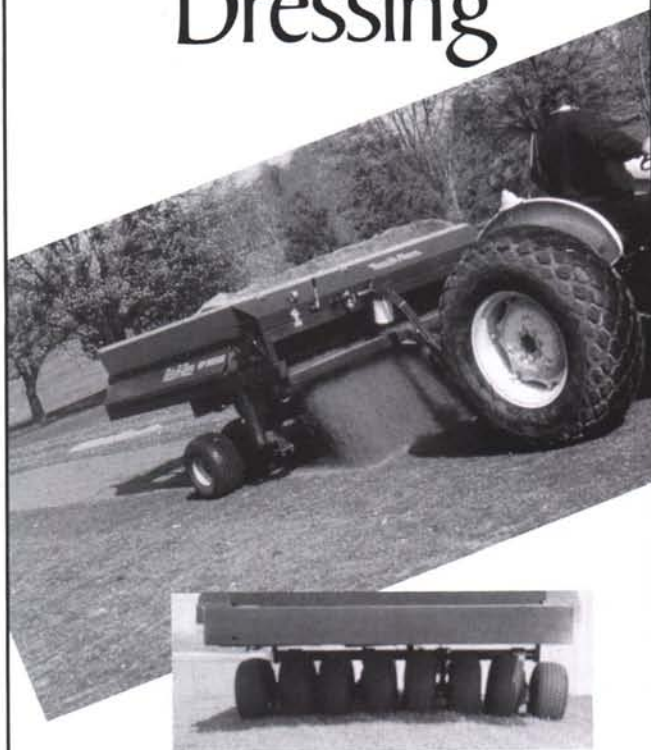
"Proper soil preparation is key," says Indyk. "That includes drainage, which means more than putting a drain line in a trench and covering it. Drainage systems have to be properly engineered and programmed in terms of depth, spacing, and physical properties of the soil above the drainage line. I've seen drainage systems fail where the same soil that was taken out of the trenches was used to fill them in after lines were installed.

"You also want to make sure the soil has the proper nutrients and is graded correctly, because it is very difficult to make great corrections in these areas after the sod is laid.

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Success With Sod

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And of course, no sod should ever be laid without provisions for watering."

For optimum results, rotary till the soil to depth of four to six inches. Add the necessary soil amendments and blend to a depth of three or four inches. Grade and level for a smooth surface. Remove any large clods.

After rolling to firm the soil surface, water the prepared area to settle the soil and provide a moist base for the turf. On most soils, irrigate to a depth of six inches.

Turf Installation. Sod needs water to survive and should be installed upon delivery. Begin irrigating sod within 30 minutes of installation. In hot weather, protect unlaied sod by placing stacks in shade, covering the sod with moist burlap or sprinkling with water.



Forklift-attached sod installer from Cygnet Turf & Equipment.

Begin installing sod along the longest straight line, such as a fence or cart path. Butt and push the edges against each other tightly without stretching. Avoid gaps or overlaps. Stagger the joints in each row in brick-like fashion,

using a large, sharp knife to trim corners and edges. Avoid leaving small strips at the outer edge, because they will not retain moisture. On slopes, place sod across slope and install staples until the sod has rooted.

To avoid creating indentations or air pockets, refrain from repeatedly walking or kneeling on the sod while you are installing it. After installing the sod, roll the entire area to improve sod-soil contact and remove any air pockets.

Irrigation. Immediately after installation, apply one inch of water. The turf should be kept moist until the sod is firmly rooted. This means irrigating daily, even several times a day, depending on the weather. Hot, dry, windy conditions will create a greater need for supplemental irrigation than cool rainy periods. Also, keep in mind that turf near buildings or pavement will dry out faster than other areas. Once the turf is rooted, reduce frequency of irrigation, while increasing duration for deep watering.

Post-Installation Pointers

During the first three weeks after installation, avoid heavy traffic on the new sod. This will give the roots an opportunity to knit firmly with the soil, helping to keep the turf smooth.

Mow turf at an acceptable growing height for the species you select. The general rule of thumb is to mow frequently enough so that you're not removing more than one-third of the grass blade. And, of course, always make sure your mower blades are sharp to limit turf damage.

Aerating the sodded area in the fall prior to fertilization can improve rooting and resolve any compaction problems resulting from traffic. Topdressing may be necessary to correct uneven settling and help protect turf in traffic areas. Use sterilized topdressing to avoid bringing weed seed onto the site.

By paying attention to selection and installation fundamentals, you can ensure the success of your sod investment. And that makes good sports field management, not to mention financial, sense in the long run. □

Editor's Note: The American Sod Producers Association in Rolling Meadows, IL, assisted with this article. For information about the National Turfgrass Evaluation Program contact: Kevin Morris, Director, Agricultural Research Center West, Building 001, Room 333, Beltsville, MD 20705.

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SPORTS TURF MOWING TRENDS: MANUFACTURERS' ROUNDTABLE



Walker mid-size rotary mower at work on a soccer field in Israel.

Mower technology has come along way since the horse-drawn reel gangs of years gone by. Now there are host of alternatives—lightweight fairway mowers, multi-deck rotaries, hydraulic reel gangs, fine-cut flails, mulchers—but the objective remains the same: To cut grass efficiently and cleanly.

Nowhere is this more important than on athletic fields, golf courses, and other recreational turf areas, where time and turf quality are of the essence.

Advances in mower technology are created by designers and engineers, but born of the needs and desires of end users. Successful mower manufacturers listen carefully and attempt to build and improve the products requested. End users, in turn, let the manufacturers know how they've done. Without this relationship, the technology might stand still.

Here's a look, from the perspectives of several major mower manufacturers, at a few of today's trends in user preference and mower technology for cutting large turf areas, and some possibilities for the future. They don't agree on all points but one thing is certain—they're listening.

Jacobsen's Light Thrust

"Right now, it seems like sports turf managers want their fields to be as finely manicured as a golf course, and to look and play as well as a golf course," says Dave Buchanan, marketing specialist for Jacobsen/Textron. "You can really see that in the precision striping of professional baseball diamonds. Sports turf managers are going to things like the Turf Groomer, a reel in front of the mowing reel which 'stands up' the grass before it is cut.

"Professionals want less compaction, so they're going with lightweight mow-

ers, better quality of cut, so they're going with higher quality reel mowers," he continues. "They want it done as fast as possible, so riders are becoming more popular, and they want a machine that's comfortable. Creature comfort in mowing is not as important on a baseball field as it is on a golf course, where you have acres of turf to cut, but it's still nice to have comfort if you have to mow something every other day. That means more comfortable seats and ergonomic design, so people can reach and see everything they need to."

Excel Industries: Tough, Durable, Safe

"It seems like people are having to maintain turf in rougher and rougher areas, so tougher, more maneuverable equipment is becoming increasingly important," says Don Consolver, com-

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Mowers

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munications writer for Excel Industries. "We're fortunate in that our equipment is built to handle tough mowing conditions."

"Mulching machines, like the Turbo Shredder, provide a real convenience for superintendents and turf managers in that they don't have to collect the grass and dispose of it," he continues. "Quite a few universities are doing studies on what happens to those short grass clippings left on the grass, and it seems that they help retain moisture and deliver nutrients back to the grass. There's a real thatch myth—certainly, it could become a problem if you mow infrequently and leave long clippings, but if you cut regularly and leave short clippings there won't be a problem."

The Toro Company: Wide Rotaries Are Cutting Edge

"For the last 10 years at least, we've been doing a lot research in wide area mowing preferences," says Rick Rodier, marketing manager of rotary products for The Toro Company. "That led us into the wide area rotary mower market, which began with the release of the 16-foot Groundsmaster 580D in 1987 or 1988. But there was more than productivity of the machine to consider. At the time, research showed us that if an operator felt comfortable after an eight-hour day mowing, then he'd be more productive."

"This lead us to consider features other than cutting width. How well does a wide area rotary maneuver? How easy is it to transport? With these and other questions, we put together a computer program called "Value Analysis" which helps customers compare wide cut mowers and figures out how much it will cost per acre to mow a site with a given machine."

Kubota: Reel Performance

"One of things I've seen at the university level is people becoming more knowledgeable on field quality and mowing products," says Doug Fencl, Kubota products manager. "Some sports fields have actually hired golf course superintendents, and that's pulled the golf course mentality into the sports turf mentality."

"The sports turf area, I think, is moving toward better quality, in both practice and playing fields, where they have

the budget. That may create a tendency to go with more reel equipment."

National Mower: Standing By Simplicity

"In sports fields and parks, I see people going with incredibly expensive and sophisticated equipment, and I question whether it's needed," says Stan Kinkead, secretary/treasurer for National Mower. "Who would have thought that people would be mowing grass with machines that cost \$50,000? Wishfully thinking, I would love to see people getting back into reel mowers and gang reels, but I don't see that happening."

"Cost-conscious people who appreciate simplicity and don't think they need all the technological sophistication tend to be the users of our products. All of our reels gangs are PTO-driven, which is what everybody wants in this day and age. We don't even make friction drive reel gangs anymore, but as far as I'm concerned, they were easiest, simplest, cheapest, and best way to cut large areas. And they would last so long—that may have been their strongest feature. They provided a good return on investment."

Walker Manufacturing: Mid-Size Versatility

like ours, are primarily used as companions to large field mowers, which can be limited in the areas they can enter," says Bob Walker, president of Walker Manufacturing. "In areas involving intricate landscaping, the usefulness of a mid-size mower ties right in. For example; I've been told that now our machines are being used to mow the entrance way at Pinehurst golf course in North Carolina."

"Recently, a magazine publisher predicted to me that five years from now there wouldn't be any vacuum decks—they'd all be replaced by recyclers. But we've seen no decline in the sales of our vacuuming machines."

Gravely International: Going Big

"If there's anything that comes to mind from talking with parks and recreation departments, people that take care of really serious areas of quality turf, it's that bigger is better," says Craig Neuhardt, Gravely customer service manager. "Years ago, 60-inch mowers were considered huge. Now, with the wing-deck units, you can cut 10 feet and beyond."

"In the actual mowing end of large areas, grass collection has never been a

big issue, but safety is. Side-discharge decks, even with chutes, have the possibility of throwing objects. What we're finding, almost universally, is that people are asking for rear-discharge or mulching type decks. They reduce the incidence of thrown objects. In many markets, like New Orleans, we couldn't even consider presenting our product if we didn't offer rear-discharge decks. Safety is a big issue. We just flat cannot let anything out the door if there's even the beginning of a question mark on safety."

John Deere: Diamond Focus

"In the baseball market, we definitely see some changing trends, particularly if it's a professional field. In a professional sports complex, one that will appear on television, a very clean, striped appearance is becoming a requirement," says Bill Chestnut, marketing coordinator for the golf and turf division of the John Deere Company. "Even from the infield to the outfield, you see different mowing patterns and different widths, depending on what the park wants the attending and television audience to see."

"Another thing you see in professional baseball fields or complexes are team managers and grounds care managers strategizing for upcoming games. They look down the road at the team that's coming in—look at its hitting and field characteristics—and decide how high they want to cut the grass to control the speed of the roll of the ball."

Ransomes America Corporation: Middle Weight Possibilities

"For larger areas such as golf course fairways, I believe people are going away from 'ultra-light' mowers, depending on what part of the country you're in," says Peter Whurr, director of sales and distribution for turf products for Ransomes America. "Some are still going with ultra-light mowers and others are using hydraulic reel gangs. But there seems to be an area of need between the two—sort of a mid-weight mower that is light in terms of ground compaction, but more durable than an ultra-lightweight machine."

"We will continue to build our machines to what our customer base requires. Of course, legislation also governs a lot of what we can do. But we're a market-driven company. What comes out of the focus groups we conduct will determine much of what we do. We depend on end users." □

EXPLORING EQUIPMENT

THE KEY TO ENGINE TROUBLE-SHOOTING

By Paul Scholten

For turf maintenance professionals, limiting equipment downtime is crucial. The less time a piece of equipment spends being repaired, the more time it can be at work in the field. A systematic approach to engine troubleshooting will help sports turf managers accurately diagnose and solve engine problems efficiently.

If you can't get your mower's engine to start, don't start tearing into the carburetor or ignition system until you've made a few basic checks.

Check for fuel in the tank or see if the fuel shut-off valve is open. Then, see if the engine spins over normally. If it does, you know the engine is not locked up and you can discount lubrication and compression as a problem. By quick-

ly eliminating these factors, you've already narrowed your troubleshooting efforts to the areas of carburetion and ignition. Keep in mind that a four-cycle, air-cooled engine has five requirements in order to start and run properly. It needs:

*Carburetion—clean, fresh fuel delivered in the correct proportion to combustion air.

*Ignition—good ignition spark, precisely timed for best performance.

*Lubrication—proper amount and quality of lubricating oil.

*Cooling—sufficient quantity of cooling air, no more than 20 degrees F hotter than outside ambient air.

*Compression—30 to 45 psi minimum for starting and 90 psi minimum

for efficient operation and proper power.

If the engine runs for 30 minutes and then stalls, consider the performance of the engine first. Ask yourself how the engine started before the problem arose. Relate it to the five engine requirements. Does the engine restart immediately after it stalls? If "yes," the problem is probably an ignition component breaking down from the heat. If the engine needs to cool down before it will restart, the problem may be vapor lock or a sticking valve. If you're hearing a metallic *snap* in the engine during the cool-down period, you know the valves are the problem. □

Editor's Note: Paul Scholten is the manager of the service and technical publication for Kohler Engines.

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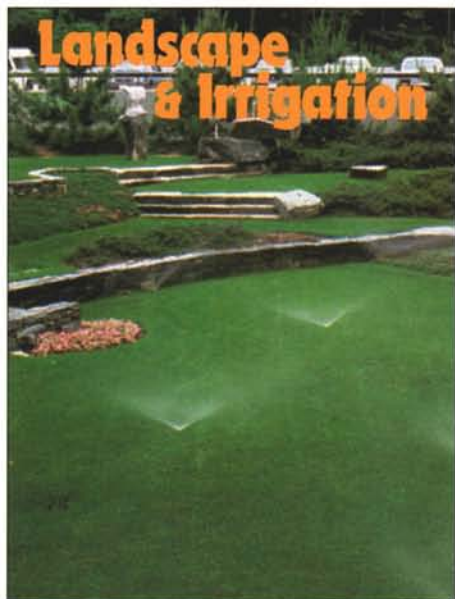
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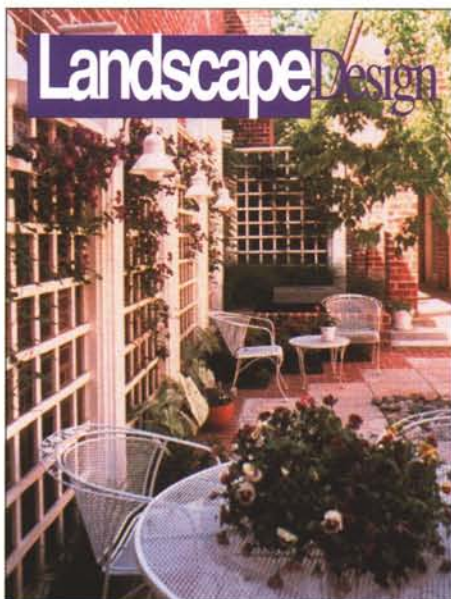
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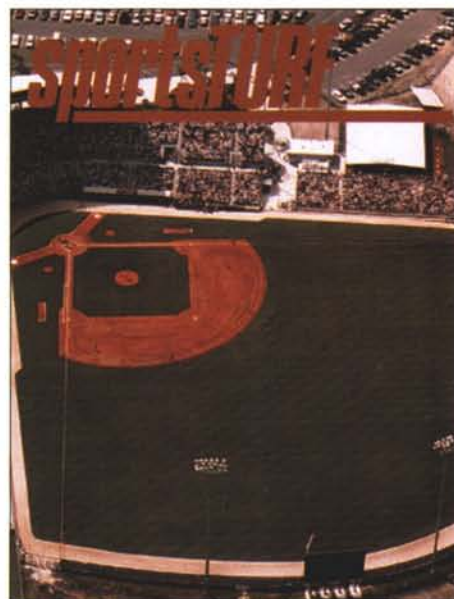
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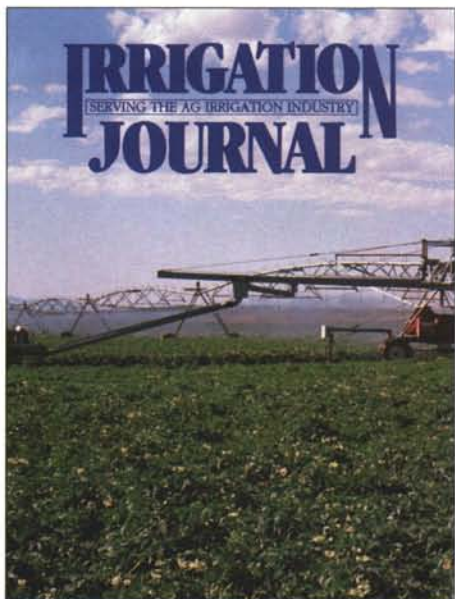
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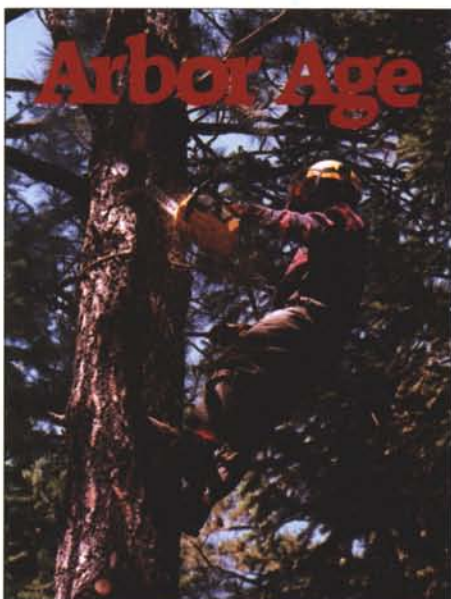
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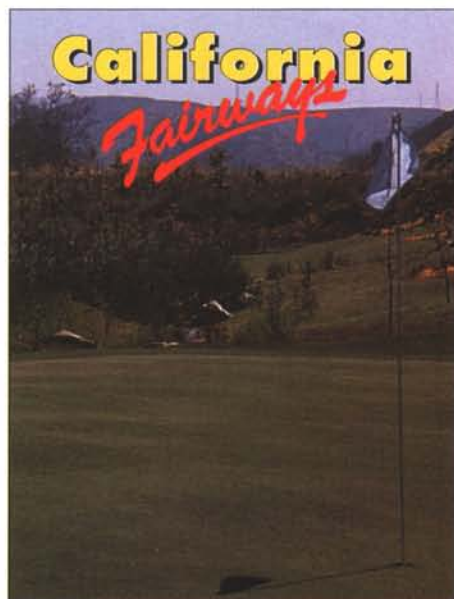
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