

problems and will require applications of herbicides from the beginning. Late summer and early fall seedings have considerably fewer problems with weeds.

Proper applications of mulch can help reduce weeds in a new seeding and can hasten turf establishment. However, a mulch can often contain weed problems such as timothy, orchardgrass and thistle. Always specify weed-free mulch.

Maintenance

More weed problems on athletic fields develop due to improper maintenance than any other reason. Most important are mowing practices, fertilization, irrigation, aerification and scheduling field use.

Mowing too low or infrequently leads to weed encroachment. Sports turf managers often mow fields too low in order to satisfy a coach's or player's demands. In Maryland, reducing mowing heights from two to one inch on both Kentucky bluegrass and tall fescue can result in a change from virtually no weeds to 50 percent or more weeds. Infrequent mowing also stresses turf which eventually enhances the opportunity for weed encroachment. On many athletic fields, extremely dull mowers are used causing additional stress to the turf.

Turf density is largely dependent upon proper applications of nitrogen. Unfortunately, low budgets often don't allow for sufficient amounts of nitrogen and weed problems multiply as both turf density drops and the turf recovers from injury more slowly.

Timing of nitrogen applications is nearly as important as the rate. Poorly-timed applications often enhance the weeds more than the desired turf. Optimum timing varies with location, so it is important to contact local turf specialists for timing recommendations.

Potash is also critical for athletic turf. Potassium improves wear tolerance and turf performance during periods of environmental stress. Maintaining levels of potassium according to soil test recommendations can reduce weed populations. The same is true for applications of lime and phosphorus. Early spring greenup and growth are made possible with adequate levels of phosphorus. It's important to give turf a head start in the spring over the weeds.

While many athletic fields cannot be irrigated, proper irrigation can greatly improve turfgrass vigor and density. Improper irrigation, however, can have the opposite effect. Light, frequent irrigation may actually improve weed seed germination and growth. Excessive irrigation, particularly just before a field is to be used, can cause increased compaction as well as greater damage to the turf.

Although the athletic field manager usually has little control over field use, educating those who do can be of great benefit. Restricting use of fields when they are excessively wet or under stress from heat, cold or drought can greatly reduce field damage and resulting weed problems. Communication in this regard is vital to field condition.

Herbicide Selection and Use

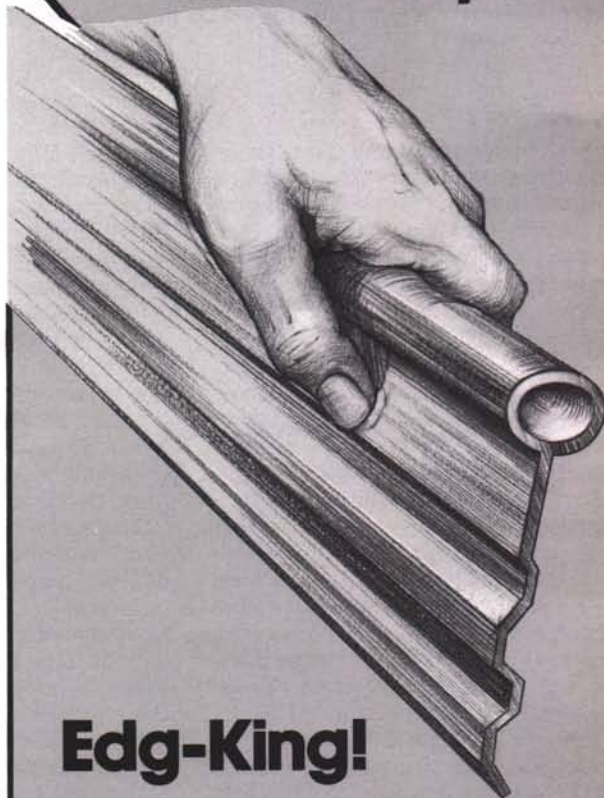
Despite the best management, the heavy use of athletic fields often leads to conditions that favor weed encroachment. Herbicides then become necessary to regain control over weeds. Five factors influence selection of herbicides. They include weed species, turf species, weather or irrigation capability, seeding or sodding plans, and aerification.

Herbicides have been designed to have specific effects on specific plants. The common herbicides for control of broadleaf weeds are 2,4-D, dicamba, MCPP, triclopyr and 2,4-DP. Often a mixture of two or three of these are used for broad spectrum control.

By knowing the specific weed problem, money can be saved. For example, if dandelions are the only problem, 2,4-D alone will provide excellent control. Knotweed can also be controlled with 2,4-D alone if it is treated when in the two- to three-leaf stage. Many broadleaf weeds, however, are not controlled by 2,4-D.

continued on page 22

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Broadleaf weed herbicides may be applied up to the time of seeding when seed is drilled in by a slicer/seeder.

Weed Control

continued from page 21

For postemergence control of crabgrass, a new material called fenoxaprop (Acclaim) offers a new approach to annual grass control. If applied according to label directions, fenoxaprop usually gives excellent post-emergence annual grass control with one application and with little or no phytotoxicity to the desired turf. This represents a major advantage over the previous alternative, the methanearsonates. This new chemical should prove to be very valuable in sports turf management, allowing for greater customization of crabgrass control.

Nutsedge, often misidentified as a broadleaf or annual grass weed, can only be successfully controlled with bentazon (Basagran). Even with this material, control will be poor and phytotoxicity can occur if label directions are not followed exactly.

Each turf species has different sensitivities to the various turf herbicides. For example, perennial ryegrass and tall fescue have a greater tolerance to fenoxaprop than Kentucky bluegrass. Rate and particularly timing of application are more critical on Kentucky bluegrass and label directions must be followed carefully. Also, fenoxaprop can be used on seedling perennial ryegrass and tall fescue, but Kentucky bluegrass should be at least one year old. To prevent possible problems, tailor your herbicide selection to the species being used on each field. A weed control program for tall fescue fields may not be the right choice for a Kentucky bluegrass stadium field.

Irrigation capabilities are a big factor in

selection of specific preemergence crabgrass herbicides. If you cannot irrigate, sprayable formulations of materials such as bensulide or DCPA should be avoided since they must be watered-in within 48 hours to be effective.

In general, granular formulations of the preemergence herbicides should be used on fields without irrigation systems. Also, try to time your application as close as possible to an expected rain. These materials need to be applied about two weeks before the anticipated germination of crabgrass. It becomes increasingly important to apply these materials well in advance of annual grass germination if a field lacks irrigation.

The success of broadleaf herbicides is very weather dependent. Weeds must be actively growing for good control. Soil moisture must be adequate and temperatures should be below 85 degrees F to prevent damage to the turf. Also, rain falling within 24 hours of application can reduce the effectiveness of the materials.

If you cannot irrigate, wait until sufficient soil moisture has been achieved through rainfall before applying broadleaf herbicides. Usually spray formulations will give better and more cost-effective control than granular broadleaf formulations.

Early fall and mid-spring are generally the best time for broadleaf weed control. However, these are also the times when athletic fields are most heavily used. Due to the current negative attention on pesticides, it might be wise to make broadleaf herbicide applications at a time when fields will not be used for a couple of days.

One of the most important considerations an athletic field manager must make in herbicide selection and use is planning for seeding and sodding. Due to the heavy use and wear of athletic fields, some seeding or sodding may be needed several times each year. Unfortunately, many herbicides have negative side effects on new seedings and on newly laid sod. Know the potential effects of each herbicide so that seedling development or rooting is not retarded or damaged.

The only preemergence herbicide that can be applied to a new seeding or an overseeded area is siduron. However, each preemergence herbicide differs in its residual activity in the soil. For example, pendimethalin has an activity of about 16 weeks. If your plans call for overseeding within four months of your preemergence application, this material should not be used. As mentioned previously, postemergence control of annual grasses can be achieved in seedling tall fescue and perennial ryegrass with fenoxaprop, which should make this chemical an important tool in the athletic field manager's overall program for these grasses.

Broadleaf weed control can also present a problem in new seedings or overseedings. When seed is broadcast, the only broadleaf herbicide that can generally be used is bromoxynil. It is recommended that 2,4-D, dicamba, and MCPP not be applied sooner than three weeks before seeding or after seedlings have been mowed twice. However, an important study in Rhode Island showed that if seed is sown with a slicer/seeder, these broadleaf materials can be applied up to the time of seeding and possibly a few days after. This information should be of great value to athletic field managers who often work under severe time restraints.

Research at Rhode Island has also shown broadleaf herbicides should generally not be applied approximately four weeks before sod is harvested or four weeks after it is laid. These same studies indicated pre-emergence herbicides contained in sod can reduce rooting for a period of five to 13 weeks.

Many benefits can be achieved in the overall health of sports fields with proper aeration. However, improper timing of aeration can actually increase weed problems. Aeration performed during periods of peak annual grass germination will greatly enhance their encroachment. It will also break the herbicide barrier of pre-emergence herbicides. Aeration should not be performed when the turf is not actively growing because the open holes are an ideal site for weed establishment.

Weed control in sports turf management is far greater than just applying herbicides. It encompasses sound construction, establishment and maintenance, in addition to proper herbicide selection and use. Weed control is a major part of athletic field safety and contributes greatly to the effectiveness of an overall field management program.

TABLE 1

Weeks Before Overseeding Is Possible When Preemergence Annual Grass Herbicides Are Applied.

Herbicide	Weeks Before Reseeding Is Possible	Herbicide	Weeks Before Reseeding Is Possible
Benfen	6-8	Oxadiazon	16-20
Benfen + trifluralin (Team)	6-8	Pendimethalin	16
DCPA (Dacthal)	8-10	Siduron (Tupersan)	0
Bensulide	16		

NEW PGMS PRESIDENT URGES JOINT SERVICES

Jeffrey Bourne, the new president of the Professional Grounds Management Society (PGMS), believes industry associations can expand their educational and lobbying services for their members by cooperating with each other. PGMS recently held a successful conference in Milwaukee, WI, in conjunction with the Landscape Maintenance Division of the Associated Landscape Contractors of America (ALCA). "By holding a joint conference," Bourne states, "we were able to provide a broader range of speakers, to attract more members from both groups and to make the show more valuable for the exhibitors."

Bourne, Bureau of Parks chief, for Howard County, MD, believes such joint services do not threaten the integrity of the participating associations, but allow them to concentrate more on day-to-day membership services. "The PGMS board of directors wants the staff to devote more time to activities for the regional branches," he explains. "By sharing the work involved to put on a big conference with another group, we give the staff more time to get closer to the members."

PGMS has 17 branches in six regions. Bourne says offices will be set up in each region sometime this year. "The directors will work more closely with the chapters

and the staff will concentrate on serving each region."

Other new officers include First Vice President Russell Studebaker, horticulturist of Tulsa, OK, Parks Department; Second Vice President Theodore H. Shull, grounds superintendent at Kettering Medical Center in Kettering, OH; Treasurer Thomas Smith, vice president of the Cemetery of Spring Grove in Cincinnati, OH; Director-at-Large John Michalko, superintendent of grounds at Case Western Reserve University in Cleveland, OH; Southeast Regional Director Doyle Watson, landscape superintendent Belle Meade Country Club in Nashville, TN; and Mid-Atlantic Regional Director Robb Orndorff, horticulturist with Lakeforest Associates in Gaithersburg, MD.

TEXAS TURF CLINIC TO ADDRESS SPORTS- RELATED INJURIES

Speakers at the second Southwest Turf Clinic & Trade Show will concentrate heavily on sports injuries and school liability. The two-day event, February 18-19 at the Will Rogers Memorial Complex, is aimed toward managers of football, baseball, softball and soccer fields at public schools and parks.

"Providing the Playing Surface for America's Athletes" is the theme of the confer-

ence says Dr. Bill Knoop, turfgrass specialist for the Texas Agricultural Extension Service.

Orthopedic surgeon and sports medicine specialist Dr. Carl Highgenboten will cover the types of injuries caused by poorly-maintained fields. Two attorneys will then report on liability insurance claims and lawsuits resulting from sports injuries attributed to fields.

The clinic was planned by an advisory board utilizing results of a survey of 375 persons who attended the first clinic. The cost of the two-day conference and show is \$15 per person. Those interested should contact the Athletic Turf Association, P.O. Box 1114, Hurst, TX 76053. (817) 282-4965.

DU PONT FIBERS DIVISION SOLD TO INTERTECH GROUP

The Fibers Division of Du Pont, which manufactures Remay and Typar turf blankets, has been sold to InterTech Group of Nashville, TN, reports Gary Anderson, director of marketing. InterTech is a group of independent producers of non-woven materials for a variety of applications.

Anderson said Du Pont's fiber production and marketing staff will move from Wilmington, DE, to Nashville by the middle of this year.

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SUCCESS WITH SOD

One of the hardest yet smartest things a sports turf manager can do when he is unable to keep turf on a playing field is to raise a white flag and quit spending money on maintaining mud. It's hard because it's admitting that with all his special knowledge he can only push natural turf so far. He is no longer a miracle worker.

It's smart because it forces management to put a price on field maintenance and a limit on field use. Items that were once considered luxuries suddenly make more sense. One of those so-called luxuries is sod.

When a field keeps going bare in certain areas because of overuse, and that level of use is expected to continue, periodic renovation and resodding are necessary. It's an investment to keep the field in use and safe for players.

Dr. Henry Indyk, turf specialist at Rutgers University and sports field consultant, believes every sports turf manager should be very familiar with proper sod installation. "It's one of the skills every sports turf manager should have," says Indyk, "even if the areas being resodded are small."

Adequate drainage, irrigation, soil texture, fertilization and soil preparation are as important for sodding as they are for seeding. The whole idea is to get the sod's roots to grow into the soil as fast and as deeply as possible. The field can then be put back into play and the turf will recover rapidly from heavy use.

"Correcting drainage and irrigation problems may cost more than the sod," says Indyk, "but it is the only way to gain control over maintenance costs later." Once the turf manager has control of maintenance, field use levels and weather are the only remaining variables.

Once drainage and irrigation are corrected, attention needs to be focused on the soil. Soil samples should be sent to a lab for testing to determine if they contain all major and minor nutrients, have a texture which permits water to percolate through them fairly rapidly, and are compatible with the soil the sod was grown in.

Compatibility—"Sod grown on heavy-textured soil will not perform well on a field that is mostly sand," he points out. "A few sod growers have begun to grow sod on sandy soils just for installation on sand-based fields. The only other way to improve compatibility of heavy-textured sod on sand fields is to wash the sod prior to installation."



Santa Ana bermudagrass is sprigged in a sandy, 50-acre field at Pacific Sod's farm in Camarillo, CA.

Selecting a sod grower should be based upon the quality of sod and the compatibility of the sod compared to the field soil. Sod producers in some parts of the country will custom-grow sod to meet a sports turf manager's needs. In such instances, the specifications for the sod must be clear during bidding since the price of the custom sod will be higher than standard sod.

Indyk encourages sports turf managers to incorporate sand into the soil of important playing fields. The sand portion should be at least 80 percent of the volume of the soil. Furthermore, sands vary greatly in size and shape. Dr. James Beard at Texas A&M University recommends sand with particles ranging from 0.25 to 1.2 mm in size for soil modification. The cost of such sand can be significant for an entire field.

Preparation—The same preparation for seeding is necessary for sodding. Even if the turf on a field is extremely thin, do not install sod over it. The soil needs to be cultivated to a depth of three inches and smooth-graded to the slope specified in the field design. If topsoil is going to be added to the field, the subgrade should first be loosened by disking or scarifying to a depth of at least two inches to permit bonding of

the topsoil to the subsoil.

The soil test will show the pH (acidity/alkalinity). The proper range for soil pH is 6.0 to 7.0. In case of a problem, corrective materials should be mixed into the top four inches of soil.

Lime should be worked into the soil to correct highly acid soils (those with pH below 5.5). The American Sod Producers Association (ASPA) suggests that at least 50 percent of the lime be either magnesium oxide or calcium oxide. No more than 25 pounds of oxide forms of lime should be applied to 1,000 square feet per application.

Moderately alkaline soils (pH between 7.5 and 8.4) can be corrected with elemental sulfur applied at a rate of no more than five pounds per 1,000 square feet. Use of ammonium sulfate and iron sulfate fertilizers during maintenance can also modify alkaline soils. Use of these fertilizers should be avoided on acid soils.

Apply a starter fertilizer in addition to any nutrients that were deficient as indicated by the soil test. Pay special attention to potassium, phosphorus, iron, magnesium and calcium levels. Incorporate the fertilizer into the topsoil. The sod will contain sufficient nutrients to grow up to six weeks

without additional fertilizer.

Faster Rooting—Recent tests by Dr. R. E. Schmidt at Virginia Tech have shown that applications of chelated iron, iron sulphate, certain wetting agents and cytokinin-like fungicides can speed up root growth of Kentucky bluegrass by as much as 100 percent in the spring and 50 percent in the fall. Smaller increases were reported for tall fescue. In Schmidt's test, these materials were applied to sod one week prior to harvesting. After allowing four weeks for the sod to knit, he used a device to measure the amount of strength it took to pull up a section of the sod. He also measured root length.

Over four years, Schmidt has tested these materials individually and in mixes with positive results. Certain turf fungicides and seaweed extracts contain hormones called cytokinins, or chemicals closely resembling cytokinins. These materials stimulate cell division of plants. Bayleton by Mobay and Banner by Ciba Geigy are fungicides which increase root growth when applied to turf at a rate of one ounce per 1,000 square feet. These materials are not labelled for use as rooting stimulators, but are registered for application on turf for disease control. As long as the purpose of the application includes controlling disease, it is legal.

Root stimulation was also found after applications of the wetting agent Aqua-Gro by Aquatrols Corp., chelated iron, iron sulphate and seaweed extract. The greatest results were produced by combining one of the fungicides with one pound of iron per acre and 1/10 pound of urea per 1,000 square feet.

The original intent of Schmidt's research was to find methods to speed up sod growth so it can be harvested earlier. Post-installation rooting is a side benefit he discovered. Like anything else, the cost of the applications, estimated at \$90-100 per acre, will be passed down to the buyer. The research is new and many sod producers may not be aware of it.

Sod root growth and knitting are dependent on soil temperatures. A few field managers and golf course superintendents have accelerated the rooting of sod by raising soil temperatures with covers. By creating a greenhouse effect, soil temperature and moisture content are improved to help the sod knit faster.

Indyk reminds turf managers that thicker sod actually takes longer to root than thinner sod. Heavier, thick sod may provide better footing initially but the additional time it takes to root may be a problem for fields requiring well-established turf in four to six weeks. A heavy topdressing with sand is used by some field managers to help weight down fresh sod in emergency situations.

Installation—Protecting sod from shock during transportation, planting and after installation is very important. The period of time between harvesting and planting should be as short as possible. Some sod growers are treating sod with wetting agents to prevent shock from moisture loss during transportation.

The soil surface should be lightly moistened before sod is installed. Sod should be laid in sections with each section taking no longer than 30 minutes to install. Each section should be watered as soon as it is completed. Daily or more frequent irrigation may be required for the first two weeks to keep the soil beneath the sod moist.

Assuming a field is important enough to sod, it is also correct to assume it is important enough for a permanent underground irrigation system. The ultimate goal is to provide a uniform application of water to be stored by the soil beneath the sod. As the sod roots, irrigation frequency should be reduced to encourage the roots to search

below the surface for their moisture needs. Too frequent irrigation discourages deep root growth and can cause conditions on the surface favorable to diseases. Wet surface soil also compacts much more quickly than drier soil.

Some people might think spending money on sod is foolish when a field is expected to be demolished by use during the season. On the other hand, sod is reliable and provides an excellent athletic surface. Resodding should not be an embarrassment to the sports turf manager if it is necessary under existing use conditions. It simply is what has to be done under those conditions for a field which is too valuable to keep out of play.



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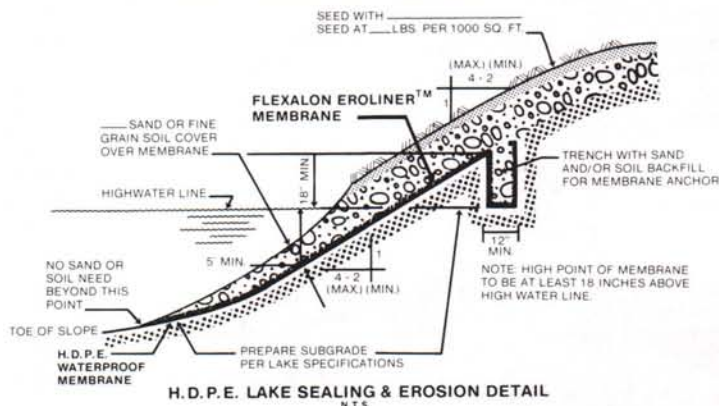
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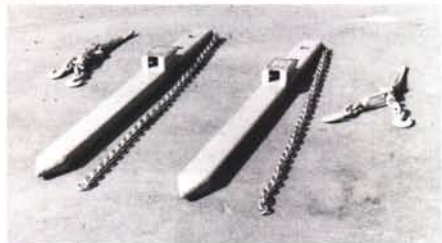
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FORD INCREASES SUPPORT OF PELE SOCCER PROGRAM



Pele' (right of sign) dedicates the Ford soccer center carrying his name in Los Angeles County.

Ford Motor Company and international soccer star Pele' are expanding a young adult soccer program first developed for Los Angeles County, CA, to Atlanta, GA, and perhaps other cities next year.

In 1984 the automobile manufacturer arranged with the Los Angeles County Parks Department for Pele' to dedicate a two-field soccer center and tournament in Whittier Narrows Regional Park in South El Monte, CA. Pele' cut the ribbon opening the soccer center and blew the whistle to start the first game of a tournament which included 16 teams from eight different area soccer leagues. He also presented ten \$1,000 college scholarships to players that year.

The use of the Pele' Soccer Center has snowballed ever since. More than 30 different leagues were represented at the last tournament and more are expected for the tournament this April. Players in these leagues range from 18-year-olds to adults over 30. "Now we have teams competing from outside the county," says Bob Larsen, program coordinator for Ford's agency, Marketing and Financial Management Enterprises of Encino, CA.

With Ford's support LA County Parks have been able to build a pavilion to serve as a location for announcements and award presentations. Dressing rooms, showers, concessions and bleachers are on the drawing board for the park.

"All Ford's money goes toward scholarships and improvements to the park," says Bill Delegarza, assistant director of LA County Parks Department's Eastern Region. The actual cost of maintenance to the park has increased, but the publicity and the increased use of the fields is worth it, says Delegarza.

The Pele' Soccer Center is closed down twice a year for renovation of the fields. "With the current level of use there is just no way to keep turf in the goal mouth areas without shutting down," says Delegarza. He hopes to improve six other general purpose fields in the park for soccer.

A similar facility is being constructed by the Fulton County, GA, Parks System this year. "We are currently exploring soccer parks in New York City, Chicago, San Antonio, Miami and Dallas," says Larsen.

SUPERINTENDENTS TEAM UP WITH PROS AND MANAGERS FOR DEERE TOURNAMENT

A unique national golf championship teaming up superintendents with golf professionals and club managers across the country has been announced by Gary Gottschalk, manager of golf and turf at John Deere. The turf equipment manufacturer is sponsoring 41 qualifying tournaments this summer leading to a two-day, 36-hole national championship in November.

To pull the event off, Deere is cooperating with the Professional Golf Association (PGA) and the Golf Course Superintendents Association of America (GCSAA). "This pro-

gram provides an opportunity for the club professional and club superintendent to play together on a team with other club officials," says Gottschalk. Each team will consist of a club's PGA professional, superintendent, club president and club manager. These teams, says GCSAA President Riley Stottern, are the same ones responsible for keeping the nation's golf courses enjoyable.

The regional tournaments begin in June and conclude in August. Deere has not yet announced the location of the championship in November.

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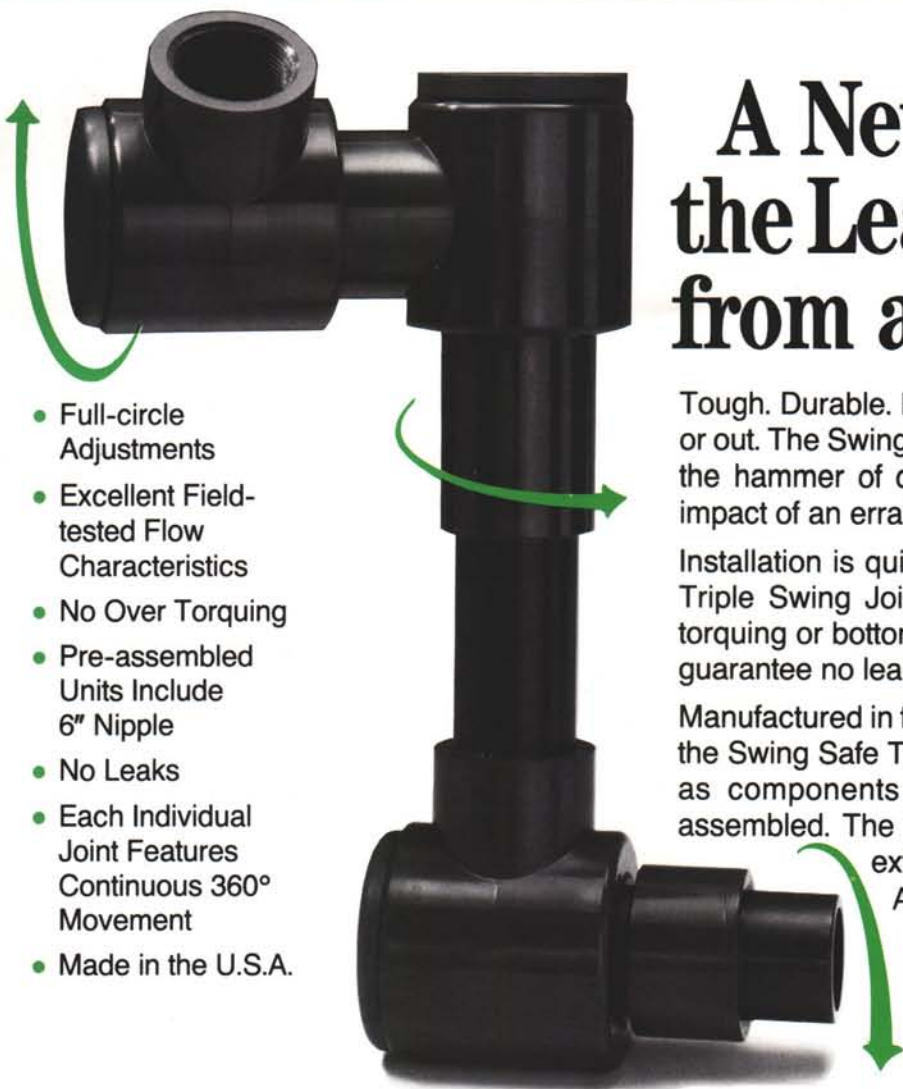
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"First, there's its general quality and toughness—I know I can depend on the Estate Master when I need it. Second, there's its versatility. I use it to pick up grass clippings, to dress the field between mowings, to shade the field right before a game, and to pick up debris at halftime."

"And third," says George, "there's



Estate Master's 8' plus swath makes quick work of Super Bowl XIX cleanup for George Toma's "Sod Squad."

what I call the 'speed factor.' The Estate Master is the only sweeper that lets you clean a swath over 8 feet with every pass."

Which is how George Toma and his "Sod Squad" raced through halftime cleanup at Super Bowl XIX. Using only a pair of Estate Masters, they made a clean sweep in 3 minutes.

You can put the same speed, versatility, and reliability to work on your own field. Just see your Parker dealer and ask him about the Parker Estate Master. In fact, ask him about Parker's full line of sweepers and vacuums. Tell him George Toma sent you.



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