

MODERN WEED CONTROL STRATEGIES

Many managers of golf and sports turf today are asking themselves if they are acting responsibly in the way they use chemicals. They are weighing risks versus benefits each time they go to their distributor to buy products which allow them to meet increasingly higher turf standards. They are sensitive to concerns regarding exposure, the fate of chemicals once applied, and the amount they apply. Overall, they are seeking ways to do their part in protecting their employees and the environment.

For years, universities have been teaching turf students that weed control is a science. Professors have urged their classes to carefully plan control rather than react to weed invasion. By identifying specific weeds first, they can determine the most effective control strategy.

Effectiveness is a major issue today because it enables turf managers to use the least amount of herbicide in the fewest number of applications. The selection of herbicide(s), timing of applications, and close attention to rates can have a great influence on how much chemical needs to be used in one season or in future seasons.

A survey conducted by Rhone-Poulenc revealed that a "typical weed" will produce more than 24,000 seeds, ranging from a few hundred seeds for leafy spurge to 40,000 for crabgrass. By allowing weeds to become established and produce seed, the amount of control necessary grows by leaps and bounds. Fighting weeds after they produce seed is too little too late.

Weed seed can also remain dormant in the soil for years. Maintenance practices such as aeration and verticutting bring dormant seed to the surface, where it receives the moisture and warmth needed to germinate. These escapes must be controlled at the appropriate time to reduce the bank of viable weed seed in the germination zone. Negligence during one year may take up to ten years to correct. What may be an acceptable level of control one year may turn into an unacceptable level the next.

It's often stated that the best defense against weeds is a healthy, dense stand of turf. Resprigging warm-season turf and overseeding cool-season turf are needed in many sports facilities to maintain density. Resodding is an option for both types of grasses. Timing herbicide applications or selecting herbicides and rates which don't affect establishment of new turf is a much larger issue for golf courses and athletic fields than it is for commercial or residential turf.

Vegetative spread of weeds can be more persistent and difficult to deal with than growth from seed, states Dr. William Daniel, professor emeritus of Purdue University. He notes the aggressiveness of stolons

and rhizomes of plants such as quackgrass, bermudagrass, kikuyugrass and bentgrass. The tubers of nutsedge are notorious, he says, for their proliferation and long dormancy.

Golf course superintendents and sports turf managers for the most part have a grasp on the types of weeds causing problems. As a result, they can be more selective about control measures. They also discover fairly quickly what herbicides work better than others and what rates are most effective. By relaying this information to chemical suppliers and extension turf specialists they are a major influence on product development.

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Goosegrass can affect ball bounce and roll as well as disrupt the appearance of turf.

Weed Control Strategies

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One message being sent to manufacturers is that granular formulations of herbicides are favored over liquid forms. "Granular products are perceived as being safer and more controllable," states Dave Maurer with DowElanco. "Less equipment is needed to apply dry products. No mixing is involved. If your spreader is calibrated properly and you follow label directions, there is little room for error."

If a product is effective in dry form, then it is easy to go to combinations with fertilizers, Maurer adds. "The fertilizer has to match the timing for the herbicide," points out Roger Story from DowElanco. "The formulation of the fertilizer must fit the time of year."

"Fertilizers are some of the best carriers for herbicides," remarks Paul Grosh with Lebanon Chemical. "There is a definite trend toward combinations of fertilizers and herbicides. We have developed fertilizers with analyses that fit the timing of spring or fall applications of preemergent herbicide. These combination products have to be registered with the EPA like any herbicide."

One thing to check with granular herbicides or fertilizer/herbicide combinations is whether they should be applied to wet or dry foliage. "You may have to target the application for a certain time of day to meet these requirements," says Vince Kageyama with O.M. Scott & Sons.

Some herbicides must be applied as liquids because of their mode of action. Some emulsifiable concentrate and wettable powder formulations can be mixed with liquid fertilizers for spraying. This requires more knowledge of products and mixing than dry applications. It also necessitates investment in spraying equipment. However, many golf courses and some large sports complexes have this type of equipment and trained personnel under supervision from certified staff.

"There is a great economic and performance benefit in being able to spray a mixture of chemicals at the same time," advises Dr. Paul Sartoretto, technical director of W.A. Cleary Chemical Corp. "Once the art has been mastered, the chemical operator will never go back to the old-fashioned notion that chemicals must be sprayed one at a time." The key to mixing is compatibility among the products in the tank.

Lesco, Inc., has developed a closed system for adding chemicals to spray tanks.

The system reduces the exposure of the applicator to the chemical. All herbicide suppliers stress that applicators of any form of herbicide should read and understand the label as well as the Material Safety Data Sheet for each product they use. It is the responsibility of facility managers to inform employees of the dangers of handling or applying pesticides. Severe penalties can result from noncompliance.

To make compliance simpler, a number of sports facilities are trying to limit the number of pesticide applications they make during the growing season. Combination granular products or spraying herbicides with other chemicals can cut applications in half. In the case of preemergence herbicides, longer residual means fewer applications. However, some turf managers are finding split applications at half rate allow them more flexibility in case renovation is needed.

Combining different herbicides is another way to cut down on applications as well as broadening the spectrum of weeds controlled. Older products are being assisted with newer chemistry brought over from agriculture. In some cases, adding a second or third herbicide enables the applicator to achieve control while at the same time lowering the rate of one or more of the components.

These developments are an invitation for turf managers to take a fresh look at their weed control strategy. Below are some of the new twists available to control weeds safely and effectively in today's chemical-sensitive world.

Broadleaf Weed Control - Control of broadleaf weeds in turf has long centered around postemergent applications of selective herbicides. The phenoxy (2,4-D, 2,4-DP, MCP, and MCPA) have dominated this market since the '50s. Each phenoxy has certain strengths and weaknesses, which has led many formulators to combine a number of them to broaden their spectrum of control.

"There are all kinds of different combinations and formulations of phenoxy," explains Sean Casey, marketing manager of Riverdale Chemical Co. "The combination products are effective on a wider range of weeds than any of the phenoxy by themselves. Manufacturers are providing combinations that are more targeted than before."

The spectrum of these herbicides can be enlarged further by the addition of dicamba. Combinations of dicamba plus two phenoxy are quite common and effec-

tive. Recently, 2,4-D has become the target of certain critics. Researchers have also found that enzymes in some weeds can detoxify certain phenoxy, says Maurer from DowElanco.

Dr. Joseph Neal at Cornell has been investigating alternatives to 2,4-D. Included among them are clopyralid, chlorflurenol, dicamba, and triclopyr. The advantage of dicamba is its safety on both cool- and warm-season turfgrasses. Neal found that a combination of triclopyr and clopyralid is a promising alternative to phenoxy when applied to Kentucky bluegrass, tall fescue, and perennial ryegrass. Clopyralid is also highly effective on clover and other legumes.

One of the biggest steps forward in broadleaf weed control is the development of better preemergence herbicides. "Pre-emergence herbicides in the past have been most effective on grassy weeds with some control of broadleaves," explains DowElanco's Story. "Isoxabin is the first preemergence product that is strong against broadleaf weeds. When applied in the fall, it can prevent germination of many problem spring broadleaves. That helps reduce the number of applications of postemergence herbicides the following season."

Isoxabin treatment can follow seeding or overseeding once the new turf reaches the three-leaf stage, Story says. The current formulation of the product is a dry flowable for spraying. The amount of active ingredient applied compared to alternative postemergence herbicides is considerably less, he adds.

Grassy Weeds and Sedges - While selective postemergence herbicides have dominated broadleaf weed control, pre-emergence herbicides have been the main weapon against grassy weeds. Finding significant differences between desirable grasses and undesirable ones is a delicate process. Postemergent products are able to select between one plant and another based on such differences. Only recently have chemists had luck finding and utilizing these differences.

Preemergence herbicides are nonselective for the most part. They create a chemical barrier at the soil surface which prevents the emergence of the seedling. This barrier lasts for weeks or months depending upon rates and the product used. The established grasses continue to grow without competition from new plants. However, the materials will prevent the emergence of turf seed applied until they

break down.

The number of preemergence herbicides is relative large. They were developed mainly for their effectiveness against crabgrass and goosegrass. One group called the dinitroanilins includes benefin, oryzalin, pendimethalin, and trifluralin. These disrupt cell division within the emerging seedling. Bensulide, DCPA, oxadiazon, and siduron have different types of chemistry and modes of action. Preemergence herbicides are frequently combined to provide broader spectrum control or increased safety on certain types of turfgrasses.

Furthermore, all but one preemergence herbicide, oxadiazon, can stunt the growth of roots of sod or sprigs. Tests at North Carolina State University have shown that some preemergence herbicides may injure the short root systems of drought-stressed or very young turf, especially in compacted soils. The root pruning impact of some preemergence herbicides can be reduced by lowering rates or using combinations of herbicides which are effective at lower rates. Half rates of herbicide can also be applied in split applications to give the turf manager the option of reseeding sooner than he could if used at the full rate.

The other option is cultural, to address the problems of compaction and soil moisture before these herbicides are applied. Nutrient deficiencies should also be corrected. Quite often, preemergence herbicides are combined with fertilizers.

If maintenance practices or surface damage disrupt the chemical barrier, some weed plants may escape. Then the turf manager must rely on selective postemergence products. Some of the phenoxy's combined with dicamba, or a few of the arsenicals, control crabgrass and goosegrass, but two or more applications may be required.

Fenoxaprop is a relatively new product effective on young grassy weeds in cool-season turf and zoysiagrass. It controls weeds that are missed by preemergence herbicides for a month or longer depending upon the rate. It is most effective when applied to emerged crabgrass, goosegrass, foxtail, or fall panicum before the two-leaf stage, says Frank Dierdorf of Hoechst. "It is not translocated by tillers and has no soil activity," he states. "The area can be reseeded within a month without negative effects. New sod can also be treated."

The emulsifiable concentrate can be tank mixed with preemergence herbicides to catch escapes if weed germination started before the area could be sprayed. It may improve the control of crabgrass and

later-germinating goosegrass in one application instead of two. "Athletic field managers and golf course superintendents choose fenoxaprop if they have a grassy weed problem and need the ability to overseed in the spring," adds Dierdorf.

A few new products selectively remove grasses from others. Scott's metsulfuron methyl is registered for controlling bahiagrass, foxtail, and some broadleaf weeds in bermudagrass. Chlorsulfuron from Lesco can eradicate tall fescue in bermudagrass. Nor-Am's ethofumesate can remove annual bluegrass from bermudagrass or bentgrass fairways. Pronamide from Rohm & Haas can selectively eliminate annual bluegrass from bermudagrass fairways or fields. Metribuzin by Mobay can be used as a selective preemergence herbicide for goosegrass in bermudagrass fairways, roughs, or fields.

Grassy weed control is not the toughest challenge of superintendents and sports turf managers, the sedges are. Yellow and purple nutsedge spread from bulbs buried below the surface. Multiple treatments with MSMA can knock back nutsedge after it has emerged. Imazaquin from American Cyanamid provides better postemergence control of nutsedge in bermudagrass, zo-

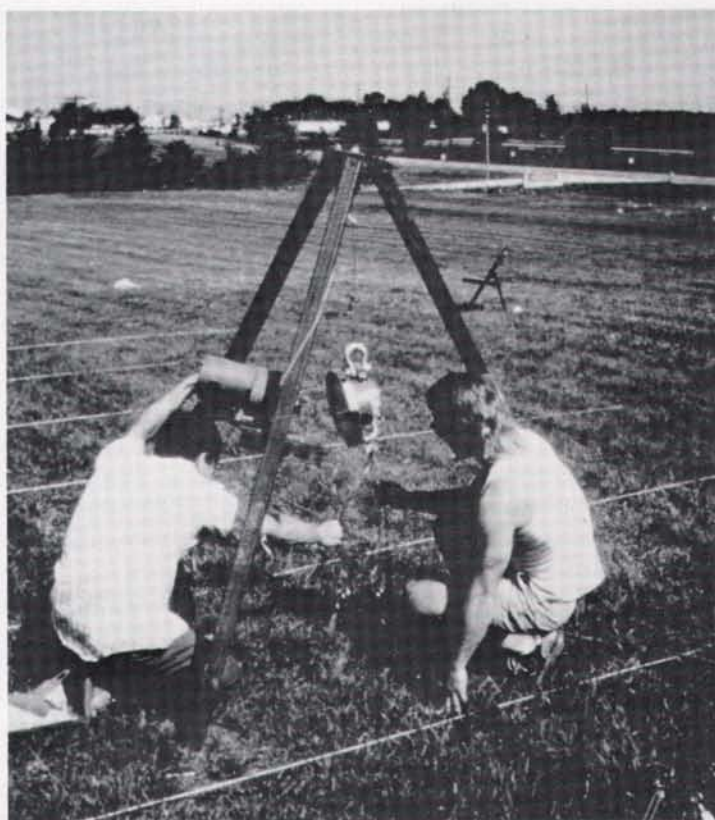
sia, St. Augustine, and bahia. Basagran by BASF offers similar control in cool- and warm-season grasses.

Preemergence of yellow nutsedge control is now possible with metolachlor by Ciba Geigy. Ethofumesate by Nor-Am has been used to suppress the spread of nutsedge.

Effectiveness is a big issue in weed control. In many cases it allows the turf manager to achieve control while applying less material. Rather than accept lower turf standards, he can keep his facility competitive and reduce his use and exposure to chemicals. Price is the trade-off. Specialized materials are more expensive.

Another benefit is that since you are using less product, you have less to store. "Superintendents and sports turf managers are buying just what they need today," reveals Grosh from Lebanon Chemical. "We are basically storing it for them until they need it."

The trends in weed control indicate that superintendents and sports turf managers are acting responsibly. They are sensitive to environmental concerns and the exposure of themselves and their staff to chemicals. Manufacturers, distributors, and extension specialists are helping them maintain safe, high-quality turf by balancing the benefits and risks. ☺



Device measures the sod rooting strength of turf treated with preemergence herbicides.

CHALKBOARD

TIPS FROM THE PROS

BALANCE MICRONUTRIENTS FOR SOIL FERTILITY

By Mark Altman

The quality of turf directly reflects the fertility of the soil in which it grows. Even a perfectly maintained golf course or athletic field will have mediocre turf if proper soil fertility is ignored. Correct amounts of micronutrients are integral to superior soil fertility, yet so often they are forgotten. Let's take a look at three of the basic keys to understanding micronutrients, and use them to open the door to high-quality turf.

Proper Sampling: An accurate soil analysis is the first, vital step toward understanding what the soil does and does not need. An accurate soil analysis should include major and minor nutrients, because you need both groups to make intelligent fertility decisions. Base saturation and NPK alone are not enough.

The amount of soil samples and their depths depend largely on the particular area you're sampling. On golf fairways and greens, for example, I like to take at least 15 samples to a depth of six inches. However, 15 samples would be a bit much for a tee, because you're not working on a very big area. On football fields, I like to take at least 25 to 30 samples. On baseball fields, I sample the infield and outfield separately, because of their respective high- and normal-use characteristics.

Create A Balanced Fertility Program: Once you have the results of your soil analysis in hand (and tissue analysis from a random sample of grass plants is not a bad idea for fine-tuning), you can begin to create a balanced fertility program.

First, take a look at NPK and base saturation of calcium and magnesium. Optimum ratios between these two nutrients will differ with factors such as clay and sandy soils and grass type, but until they are correct there is no need to worry about micronutrient fertility. You need to address the major nutrients first before you move into micronutrients such as boron, iron, manganese, copper, and zinc. These are measured in parts per million (ppm).

When attempting to balance micronutrients in the soil, it's helpful to have a basic

knowledge of what they do, as well as the causes of their deficiencies. Let's start with two that I rarely see problems with: copper and boron.

Copper is an enzyme activator. It functions in the respiration of the grass plant and inhibits frost. High pH, excessive zinc and phosphate levels, and compacted wet soil create copper deficiencies. The main function of boron is seed set, but it also has other functions in plants such as protein synthesis. It affects nitrogen and carbohydrate metabolism, as well as the water relationship within the plant. High pH, extremely leachable soils, and low organic soils create boron deficiencies.

Now let's talk about iron, manganese, and zinc, which superintendents must deal with on a daily basis. Deficiencies of these three micronutrients are common.

Iron, a chlorophyll activator, is essential for chlorophyll production. It has a pronounced effect on shoot and root growth. High pH soils, excessive levels of phosphate, manganese, and zinc, and compacted soils can all cause iron deficiencies.

Manganese aids in the plant's breakdown of carbohydrates, is active in metabolic chlorophyll products, and increases the availability of calcium, magnesium, and potassium. High pH soil and iron levels, as well as compaction in wet or dry soils, contributes to deficiencies of manganese.

Zinc plays a very small role in chlorophyll production. It also helps regulate sugar consumption, is essential for the transformation of carbohydrates, and affects plant respiration. High pH and phosphate in soils and low organic matter can create zinc deficiencies.

By now, you've probably recognized a common denominator in micronutrient deficiencies: High soil pH. As pH levels increase in the soil, the availability of micronutrients decreases. Also, micronutrients are interrelated. Excessive levels of one can lead to deficiencies of another. Again, this points to the need to balance pH and major nutrients before you focus on micronutrients.

The Law of Minimums: Another less obvious, yet equally important, rule of thumb to keep in mind when addressing micronutrient deficiencies is known as the "Law of Minimums." Simply stated, it means that plant quality is limited by the nutrients in least supply, even when other essential nutrient levels are sufficient.

Let's say you've had a soil analysis performed, have addressed the major nutrient deficiencies, balanced the soil to the best of your ability, know the micronutrients you need, and have a basic idea of how they function. You still have to select products to address those micronutrient deficiencies, and there are plenty of them out there. Micronutrients are available through both inorganic and organic sources.

Inorganic sources include sulfates, oxides, and fritted products. Sulfates and oxides are two of the most commonly used forms of trace elements. They are fully water-soluble, available in all minor metals in granular or solution form, can be used in either soil or foliar application, and are effective in acidic to neutral soils. The downside, however, is that they are relatively immobile in soil. Where you put them is where they stay.

Fritted inorganic micronutrient sources are rarely seen these days. They use what is called a "glass carrier," an extremely fine matrix of glass, and are very insoluble. Fritted potassiums were once very popular, and there are still instances in which I would love to have them, but some sulphur-coated potassiums also work really well.

Organic sources of micronutrients are synthetic chelates. They are mobile in the soil and readily move into the root zone. They mix easily with all fluid fertilizers, as opposed to inorganic products. The downside is that they are not efficient in acidic soils and leach readily in sandy soils.

There are also all-natural organic complexes. They have a lower cost than synthetic sources, are effective on neutral soils, and can be safely applied to plants through foliar applications. Their disadvantages are that they cost more than inorganic sources,

are readily decomposed by microorganisms, and are not at all compatible with NPK fertilizers. They also suffer from reduced efficiency in alkaline soils.

The three basic keys to balancing micronutrients for high quality turfgrass—proper sampling, a balanced fertility program, and the Law of Minimums—are the winning combination for creating and preserving superior golf course and athletic field conditions. You should always assess why you are having a deficiency. Is it an epidemic, or is it simply seasonal? You need to look at that deficiency, figure out how you are going to treat it, and select the proper products.

Editor's Note: Mark Altman is a soil fertility specialist who consults golf courses, parks, and professional and amateur sports complexes. His office is located in Marshall, MN.

RANSOMES/CUSHMAN ANNOUNCE APPOINTMENTS

Ransomes America Corporation and Cushman, headquartered in Lincoln, NE, have announced three recent appointments.

Gregg W. KinKade has been named director of Creative Support Services for Ransomes America Corp. He will be responsible for overall direction of corporate communications programs, including marketing communications, for all Ransomes-owned companies in North America. Besides Cushman/Ryan in Lincoln, those companies include Ransomes, Inc., Johnson Creek, WI; Brouwer Turf Equipment, Keswick, Ontario; and Steiner Turf Equipment, Orrville, OH.

Most recently, KinKade was senior account executive with Miller Friendt Ludemann advertising in Lincoln, where he handled the Cushman/Ryan account. Prior to that he was director of marketing communications for Flexible Steel Lacing Company in Downers Grove, IL, and before that he was national sales promotion manager for Schwinn Bicycle Company in Chicago, IL.

KinKade holds bachelor's degrees from Western Illinois University, Macomb, and attended graduate school at Northwestern University in Evanston, IL.

Clarke Staples has been promoted to director of sales and distribution for turf and lawn care products at Cushman, Inc.



Gregg KinKade

He will be responsible for sales of Cushman and Ryan products throughout North America and Japan, plus supplying support to Ransomes Sims & Jefferies of Great Britain in pursuit of international markets. He will direct the North American network of more than 105 dealers of Cushman Turf, Cushman Front Line, and Ryan lawn care equipment.

Staples has been in the turf and lawn care equipment industry for 29 years, 17 of those with Cushman. He was named market manager for Cushman and Ryan turf care products in 1988. A graduate of Boston University, he served as a medical technician with the U.S. Army's 101st Airborne Division from 1953-1955.

Staples is a member of the Sports Turf Managers Association and the American Sod Producers Association. He is also on the Industrial Advisory Board for the Golf Course Superintendents Association of America.

Daniel L. Hedglin has been appointed vice president of marketing at Cushman, Inc. He will be responsible for all marketing operations for Cushman and Ryan products in North America. He will also be responsible for the company's international promotions through Ransomes plc of the United Kingdom.

Hedglin attended both the University of Nebraska and the University of Maryland. He also served two years with the U.S. Army in Washington, DC, with the Office of Research and Development.

He is a member of the American Management Association, the National Golf Foundation, Golf Course Superintendents Association of America, Professional Lawn Care Association of America, and the American Sod Producers Association.

BEAM CLAY OPENS NEW DISTRIBUTION CENTER

Beam Clay, a producer of dirt mixes for infields, pitcher's mounds, home plate areas, and red warning tracks, has opened a distribution center in Orlando, FL. The facility is designed to service the southeastern portion of the United States.

"The new distribution center enables us to reduce shipping costs," says Jim Kelsey, company president. "We pass these savings on to our customers. We hope to announce another distribution center on the West Coast in the near future."

LESCO OPENS NORTH CAROLINA FACILITY

Lesco, Inc., has opened a regional distribution center and warehouse in Charlotte, NC. It will serve golf course and lawn care customers throughout the mid-Atlantic states.

The 38,400-square-foot facility has six loading docks and is served by a rail spur. Dave Alexovich, previously manager of purchasing at the company's headquarters in Rocky River, OH, is manager of the facility.

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ROOKIES

PRODUCT UPDATE

COMPACTION TESTER



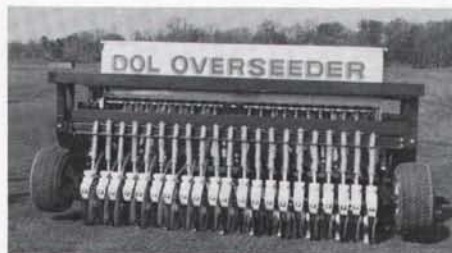
Soil compaction problems can be detected and identified easily with the Soil Compaction Tester from DICKEY-John Corporation.

The tester features a handle-mounted pressure gauge and a stainless-steel probe with depth markings at three, six, nine, 12, 15, and 18 inches. Compaction in pounds per square inch is displayed on an easy-to-read, color-coded dial as the probe is pushed into the soil by hand.

DICKEY-JOHN CORPORATION

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LARGE OVERSEEDER



Up to 20 acres can be overseeded in one day with the OV 200 Commercial Overseeder by Dol Brothers. The ground-driven, two-meter-wide seeder can be pulled by a 35hp or larger tractor at speeds up to six mph.

Two staggered rows of discs cut through thatch and soil for precise placement of seed or granular material in bands 1-1/2 inches apart. All 43 double-disc planters are individually sprung to provide a constant

seeding depth regardless of ground contours. The seeder adjusts to ground speed to maintain a constant rate of application.

The machine is easily calibrated for different types of turf seed. It has also been used for subsoil placement of pesticides for mole cricket control. The discs do not disturb the playing surface so the turf area is ready for use immediately following application.

DOL BROTHERS LTD.

Circle 231 on Postage Free Card

DUMP TRAILER



Cushman's hydraulically operated fifth wheel dump trailer can haul up to 20 cubic feet of cargo and is designed to be towed behind the company's Turf-Truckster vehicle.

The unit's fifth wheel configuration provides excellent maneuverability. Turf-Trucksters must be equipped with a special quick-attach fifth-wheel hitch and live hydraulics package to utilize the trailer. It attaches to the Turf Truckster with a two-inch ball hitch.

Even with a trailer box capacity of 2,500 lbs., ground pressure is kept at 12 psi for the trailer and slightly less for the Truckster. The trailer is equipped with 24-x-13-inch turf tires on 12-inch rims.

The trailer box is 48 inches wide, 60 inches long, and 12 inches deep. Hydraulic dumping of the trailer is controlled from the Turf-Truckster seat. Dumping height is 16 inches.

CUSHMAN, INC.

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KENTUCKY BLUEGRASS

Marketed by Peterson Seed Company, Monopoly is a fast-emerging Kentucky bluegrass. According to the company, 65 per-

cent of the variety emerges in five days.

The bluegrass has also been recognized for its low-maintenance performance in the USDA's five-year National Turfgrass Evaluation Program for "no irrigation" practices.

PETERSON SEED COMPANY

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WALK-BEHIND POWER ROLLER



The Brutus A-3 1/3-ton walk-behind power roller is designed for use on freshly seeded areas, athletic tracks, golf course greens, and tennis courts. It can also be fitted with a sprinkler reservoir and cocoa mat for blacktop patching.

The unit is powered by a three-hp Briggs & Stratton engine with a 6:1 gear reduction. It features a forward and neutral drive transmission, a 24-x-24-inch drum fabricated from 3/16-inch steel plate, and a front safety bar to prevent accidental flip-over.

NORTHEAST POWER PRODUCTS

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DURABLE BENTGRASS

Developed by the University of Arizona, SR 1020 is an improved creeping bentgrass designed for use in warm areas of the desert Southwest. It features excellent upright growth habit, fine leaf texture, a dark-green uniform color, excellent heat and drought tolerance, tolerance of low fertility levels, and improved resistance to pythium and brown patch disease.

SEED RESEARCH OF OREGON

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ROOKIES

PRODUCT UPDATE

COMPACT AERIFIER



Mounted to a 13- to 45-hp tractor, the Model TC 11 Yeager-Twose Compact Greens Aerifier can be fitted with six optional attachments.

The unit employs hydraulic blade vibration to aerify. Its deep running blades create no plugs and penetrate areas with tough clay. Bullets create air and water circulation caverns.

A bottom dresser places granule polymers, fertilizer, sand, and insecticide at or below the root level. This helps prevent surface water runoff and promotes deeper roots.

Fitted with a sod cutter with clean-cutting adjustable coulters and a vibrating lift blade, the unit can cut 18-inch-wide rolls of sod. Pipe puller, cable layer, and root cutter attachments are also available.

YEAGER-TWOSE EQUIPMENT DIVISION

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TURF ENHANCER

Scotts' Turf Enhancer 50WP (TGR 50WP) can increase the playability of golf course fairways and greens up to six to eight weeks. It produces a dense, tightly knit turf stand that improves turf quality and consistency.

The spray-applied, wettable-powder product is available in water-soluble packets. Used in conjunction with nitrogen fertilizer, it can extend turf greening for as long as 12 weeks. The product helps manage hard-to-mow areas and suppresses *Poa annua* by reducing its growth and ability to compete with more desirable grasses.

TGR 50WP is designed for use on hybrid bermudagrass, bentgrass, and perennial ryegrass fairways, tees, and roughs; St. Augustine and Kentucky bluegrass/perennial ryegrass turf areas; and bentgrass and overseeded bermudagrass greens.

O.M. SCOTT & SONS COMPANY

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