Therefore, it's crucial to test drive the vehicle you're considering, not only empty, but fully loaded.

Reliability is equally critical. An engine that performs like no other, between frequent breakdowns, is worthless. Ask both your dealer and the references he provides about the service records of engines offered in utility vehicles. Also, ask about service intervals, and don't be put off if they're regular. The best engines in the world will fail if improperly serviced. That means paying attention to the "little" things, like clean oil and oil filters, as well as major tuneups.

Test drives or "demos" are a must before you buy. Photo courtesy: John Deere Company.

Engine noise can be another consideration. If you work in a residential area and you begin work at dawn, a noisy engine will be not be well received by your neighbors. Here again, a test-drive can be invaluable.

•Drive-train durability — The drive-train transfers the power of the engine to the wheels — that sounds, and is, fairly basic. Yet problems in the drive-train are often serious and involve significant downtime, so asking your utility vehicle dealer about drive-train construction is worthwhile. Protection is one element. Reliability is another.

•Suspension system — Payload capacity, and how that load is carried, is in large part determined by a utility vehicle's suspension system. Shocks, struts and springs can determine the smoothness of ride, ability of the vehicle to handle difficult terrain, and can enhance stability. The suspension system itself should also have adequate ground clearance, so that it is not damaged by obstacles as the vehicle travels. Suspension systems vary in sophistication from vehicle to vehicle. Your dealer should be able to explain, in plain English, the advantages of various suspension systems on the vehicles he carries.

•Maneuverability and stability — Utility vehicles often operate in tight quarters, which makes maneuverability yet another element to consider. Maneuverability, in general, is determined by the steering and suspension systems of a given vehicle, combined with that vehicle's length and wheelbase. Wider wheelbase vehicles tend to be more stable, particularly on angled terrain, than those with narrower wheelbases. They are less prone to roll-overs. They also tend to be more maneuverable.

Tires are the third portion of the stability equation. Wide flotation tires not only reduce compaction of surfaces over which they travel, but enhance stability simply by the increased surface area they apply to the ground.

Here again, a test drive is immeasurably valuable. Approach the test drive with a mental picture of the area in which you operate. As you put the vehicle through its paces, picture it working in the confines of your facility. Can it make the difficult corners? Does it "feel" stable in both straight lines and corners? How will it feel when fully loaded? (You may want to ask the dealer to load the bed before you test drive it.)

•Operability — Have you ever set out to buy an automobile when a certain model looked spectacular and its engine hummed, but once you got behind the wheel it just wasn't comfortable to drive? That's operability, and while it's important in your personal vehicle, it's doubly so in a utility vehicle an operator may use for hours on end. The good news is that today's top manufacturers have designed their utility vehicles with ergonomics in mind.

Start by examining the operator area of the vehicle, and trust your eyes. If a particular lever, knob, or peddle looks difficult to reach, it probably will be.

However, just because a vehicle looks like it will be comfortable and convenient to operate, doesn't necessarily mean it will after several hours. And while a short test-drive may be useful, it's an inadequate gauge of how operator will feel after a long day of using a given vehicle. If your dealer has a "demo" program, which enables you to try a vehicle for a couple of days, take advantage of it. Short of that, you'll want to ask owners of the kind of vehicle you're considering about operability characteristics of those vehicles.

•Versatility — In general, utility vehicle versatility goes up with the rating (light, medium, heavy) of the vehicle. Utility vehicles move you and your personnel around your facility. That, and perhaps carrying 500 pounds or less of cargo, may be the limits of a light-duty utility vehicle, and if that's all you need from the vehicle, you've made the right choice. If perhaps, you still need to move workers but require a bit more payload capacity, a medium-duty vehicle might provide all the versatility you need. However, when it comes to heavy

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Utility Vehicle Manufacturers

American Suzuki Motor Corp.
Brea, CA
(800) 447-4700

Club Car
Augusta, GA
(800) 643-1010

Columbia Par Car
Deefield, WI
(800) 222-4653

Cushman
Lincoln, NE
(402) 475-9581

Daihatsu America, Inc.
Los Alamitos, CA
(800) 777-7070

Deere & Co.
(800) 544-2122

E-Z-GO-Textron
Augusta, GA
(800) 241-5855

Haulmaster
Mendota, IL
(800) 848-4285

Jacobsen
Racine, WI
(414) 637-6711

Kawasaki Motors Corp.
Irvine, CA
(714) 770-0400

Kent Manufacturing
(813) 485-8871

Mitsubishi Motor Sales of America
Cypress, CA
(800) 366-6487

Smithco
Wayne, PA
(215) 688-4009

The Toro Company
Bloomington, MN
(612) 888-8801

Yamaha Golf Cars
Cypress, CA
(800) 447-4700

UTILITY VEHICLES

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hauling, towing implements, or converting a utility vehicles into spray vehicles, heavy-duty utility vehicles are the norm.

There are two equally important reasons for this: power and construction. If a vehicle is rated for a payload capacity of 2,000 pounds, the engine is sized accordingly. You might be able to overload the bed of a mid-duty utility vehicle, which would be a serious and dangerous error to begin with, but when it comes time for the engine to actually move the vehicle the power wouldn't be available. Aerators and other implements require power to tow — the kind of power generally found in the heavy-duty utility vehicle range.

If a utility vehicle is rated for a payload capacity of 2,000 pounds, the construction of the vehicle must support that without the compromise of structural integrity. An overpowered medium-duty utility vehicle might be able to handle overloading, again a mistake, from a power standpoint, but at what long- and short-term price to body and chassis of the machine itself? Construction strength is required of the utility vehicles that tow aerators and other implements, and that kind of strength is generally found in the heavy-duty utility vehicle range.

•Dealer and manufacturer support — As previously mentioned, machines break down. Even with the best design, engineering, the most conscientious operation and care, it is inevitable that at some point your utility vehicle will go off-line for service. When that happens, all the promises made to you on the showroom floor must be kept.

From the manufacturing standpoint — how well your machine is designed and built — there is a certain amount of safety and comfort in going with a "name" manufacturer. The utility vehicle world is fairly small, and manufacturers that put out junk don't last long. After you've done your utility vehicle homework, including talking to other end users and taking test drives, and the choice comes down to a well-known brand or something less well-known, you're probably better off going with the "name" model, even if it means spending a few more dollars. In general, the manufacturers you've heard of didn't get well-known by ducking problems or putting out inferior products.

Size or volume is something to look for in an equipment dealer in terms of selection, but it guarantees nothing when it comes to maintenance and support. The best manufacturers are selective in who they let sell their equipment.

Come to the lot armed with plenty of questions, and expect direct answers. How responsive is the dealer's service department to your immediate needs? What about the parts department's inventory? Is it adequate? Does the dealer provide loaners, and at what cost if any, should your utility vehicle be in the shop for a couple of days? These and other questions, beyond things like finance options, are critical to ask before you buy or lease. If you don't feel comfortable with the answers, move on. There's probably another dealer who can meet your needs.

Whatever choice you make, be sure it's an *informed* one. Nothing makes less sense than "impulse buying." The investment required for a utility vehicle, light, medium or heavy is substantial and should be considered carefully. That means talking to other sports turf managers, comparing all manufacturer literature, and taking as many test drives or "demos" as possible. Investing time and effort now is cheap insurance for choosing the most versatile tool to meet your needs today and tomorrow. ❑

Getting Ahead With Basepath Renovation

By Michael P. Matherne

Basepath cleared of existing brick dust and calcined clay, with boards in place. Photos courtesy: Michael Matherne.

Every aspect of maintenance, including basepath renovation, is "big" at Baseball City Sports Complex in Davenport, FL. The complex covers 43 acres, including the main ball field and 8,000-seat Baseball City Stadium, support facilities with a lighted, 2,500-seat practice field, four additional practice fields, a practice infield, two indoor batting/pitching facilities, 40 outdoor practice mounds, batting tunnels, support building, and surrounding parking areas.

Until 1990, Baseball City served not only as spring training headquarters for the Kansas City Royals, but also hosted more than 1,000 additional games per year. Field users varied from the Baseball City Royals-Class A and the Florida State League, to Florida High School Athletic Association State High School Tournament to the American Legion State Tournament.

New clay added and leveled after the existing clay has been roto-tilled.

The stadium's artificial turf infield was replaced with natural turf in the fall of 1991. The Tifway Bermuda 419, which now covers the entire grassed area of the infield, is overseeded in cool weather with perennial ryegrass.

Timing Critical

The renovation procedures that follow in this article keep Baseball City in top shape. It's best to renovate basepaths each year, when the work can be completed with relative ease. If the task hasn't been tackled for several years, especially on heavily used fields, it can be an extensive undertaking. Whenever possible, plan the process for that time in the fall immediately following field use. If weather or schedules don't permit this, begin renovation during winter months or as early in the spring as the ground is workable so fields are ready for spring play.

When basepaths are not kept up to the level of the grass, rain or heavy irrigation can cause puddles that are difficult to clean up, interfere with play, and threaten player safety. Over time, the exposed surface is worn down, which leaves the grass by the infield and outfield higher than the center of the basepath and forms a "bowl" effect. Professional baseball players want the skinned areas of the field to be as perfectly level as possible so that the ball has a true bounce, whether it touches down on the grass or the clay.

The Baseball City fields, like all of Florida, are sand-based. This provides for excellent drainage — sometimes even too much drainage. Basepaths must be monitored closely and water applied as necessary to keep them from drying out.

Skinned areas and basepaths in southern regions should have clay base a minimum of six inches deep. If this layer is too thin, it cracks under hot, dry conditions. In some northern regions, where the underlying soil has a high moisture content, it may be possible to "get by" with a four-inch clay base. Baseball City uses a mix of 80 percent red (Interlachen) clay and 20 percent sand as the base.

Renovation Techniques

To begin the renovation process, remove any existing calcined clay and brick dust. Scrape off the material and store it on-site. It can be run through a screen to remove rocks, grass, and other debris, then added back into the mix when reworking the basepaths.

Next, remove any lips that have built up at the grass line. The best way to eliminate lips is not to let them happen. Sweeping clay from grass surface every game, and washing away accumulation during a break in the schedule will hold lip formation to a minimum.

With minor lip building, cut a trench at the edge of the grass line, then roll and tamp down. For more defined lips, cut along the edge of the turf with a sod cutter. Flip back the grass, remove the excess material, level the soil surface, and replace the grass.

Basepaths should be level. (Skinned areas should slope towards the outfields at the rate of one inch per 10 feet, to

allow for drainage.) To accomplish this, build a wooden frame similar to those used when pouring concrete. Stretch string lines from grass area to grass area, one-quarter-inch higher than the desired basepath level. This additional quarter inch provides the cushion that will be needed since, as the process of adding clay nears completion, it becomes almost impossible to get the surface level to the top of the board frame.

Run two-by-four boards down each side of the baseline at the correct elevation, level with the stretched string lines. To the hold the boards in place, drive spikes through them and into the underlying field mix.

Within the framework of the boards, rototill the existing clay to a depth of 2 to 3 inches. Be careful not to hit the boards.

Do any mixing necessary to ensure that the clay or clay/sand mix that will be added to the basepath is uniform.

Monitor the moisture consistency of the new material. It should be wet, but not sticky. It must be moist enough to resist drying out, but not so wet that it sticks to equipment. The moisture content will vary with the properties of the clay and proportions of sand and clay in the mix used. Without the proper degree of moisture, the new material won't bond properly with the existing clay. It may take some trial-and-error work to get the ideal moisture content. When temperatures are high and drying winds prevail, keep a hose on-hand so additional water can be added throughout the renovation process to maintain the correct moisture content.

Add new clay to the basepaths within the board frame and rototill to a depth of 2 to 3 inches to bring the surface level with the two-by-four "forms." Make sure the new material bonds well with the existing clay. Run a board along the top of the boardforms to check the surface level.

After the basepaths have been leveled initially, they're ready to be rolled. Allow the top to dry out a bit so it won't stick to the roller. Baseball City uses a three-ton flat, self-propelled roller. If a roller isn't available, "tire roll" the surface. Drive a tractor back and forth, moving side to side, until the surface is rolled adequately.

The rolling process will compress the clay, forming a solid base. The mix used at Baseball City is compacted approximately one-half by rolling (meaning one inch of new clay packs down to one-half inch of added material). Compression rates generally vary with the mix used.

Spike the clay with a nail board. Then continue adding new clay, leveling it within the forms, rolling and spiking, until the clay is level with the form at one-quarter inch above the grass surface.

Remove the boards. Fill the long, narrow trench they leave with clay. Compact it to the same point as the clay added to the rest of the basepath.

Then spike and float the entire skinned area and basepaths. Spike and float boards have a nail drag on one side and are flat on the other. The flat side is used as a "float" to skim over the surface to level it off.

Add new calcined clay and/or brick dust.

If brick dust will be used, work it into the top three-eighths to one-half inch of clay by adding thin layers, then spiking and floating until the desired amount has been added.

Complete the renovation process by applying a top-dressing of approximately one-quarter inch of calcined clay. This creates a cushion that absorbs excess moisture and gradually releases the moisture as needed to the clay below. It also holds down dust when conditions are dry.

These final steps will have compressed that one-quarter inch "cushion" of clay mix so that the resulting basepath is level with the infield and outfield grass lines.

Monitor basepath conditions, making sure they don't dry out during the interim period before the daily maintenance schedule of the playing season begins. Providing daily attention to basepath maintenance, and renovating them when necessary will not only keep these crucial areas of your diamond in top shape, but it will help enhance player enjoyment, performance, and perhaps most importantly, safety. ❑

Editor's note: Michael P. Matherne is head groundskeeper for Baseball City Sports Complex. He is a member of the national Sports Turf Managers Association.

(left) Once the clay has been leveled, as shown here, the next step is rolling.

(below) Finish one section at a time until the entire skinned area has been renovated.

1993 Man of the Year Educator and Organizer Kent Kurtz

By Bruce F. Shank

Kurtz served as consultant for the Rose Bowl from 1984 to 1989.

Twenty years ago, professional sports turf managers often hid behind a cloak of secrecy. They dazzled coaches and players with superior field conditions produced by a series of tricks and secrets. Their disguised version of plant and soil physics was more craft than science.

Unfortunately, these conditions weren't being matched at most hometown fields. Games were regularly cancelled because of poor field conditions, athletes suffered unnecessary injuries, and fans were deprived of watching their favorite sports.

Some of the most fervent sports fans are those of the Chicago Cubs and White Sox. One big reason is that Wrigley Field and Comiskey Park are two of the best maintained diamonds in baseball.

One of their loyal fans in the late '50s was a kid from Arlington High School (Arlington Heights, IL) who was not above skipping school to see an afternoon doubleheader. Kent Kurtz has sports in his blood, something he inherited from his dad, formerly a sales manager for Atlas Cement Company in Chicago. Kent, his dad, and brother Kerry memorized the stats on the sports page of the Tribune and watched Cubs and White Sox games on black and white television. There was no doubt where the Kurtz boys were on summer Sunday afternoons.

Little did Kent, who didn't hesitate to sit in the bleacher seats if he had to, realize that one day he would be asked to organize an association to make spectacular, safe, and true sports fields available to everyone in the U.S. He could not possibly imagine that the groundskeepers of the finest sports fields in the country would ask him to help them remove the cloak of secrecy from sports turf management. Nor could he imagine that the most skilled groundsmen in England would invite him to Great Britain to share their knowledge of soccer, lawn bowling, and cricket pitches. Therefore, he could not possibly predict that he would become *sportsTURF* magazine's Man Of the Year for 1993.

Many people enjoy sports without thinking for a moment about who or what is to credit for the condition of the playing surface. But a few do notice and they, for various reasons, get hooked forever on the behind-the-scenes efforts that make sports, as we know it today, possible. We are indeed spoiled by their dedication, curiosity and creativity.

Just as I document this story in words for readers, Kent Kurtz dissected the sports turf industry for science. In fact, this editor owes much to this persistent professor and taskmaster. I know there are hundreds more like me who have been pushed to the limit to make a contribution, especially if it is for the good of kids playing on millions of acres of grass across these 50 states.

A Different Kind of Agriculture

Arlington Heights, IL was part of the escape from the inner cities after the Korean War. Veterans wanted the best for their families. Part of their dream was green space where their children could, in a small way, experience the agricultural heritage of their forefathers. That meant a game of baseball on grass instead of dirt. It meant picnics in parks that were bigger than a city block. And it meant yards that were spacious and neighbors that wanted something better than city life for their children. They wanted gardens in which to grow their own tomatoes, roses and tulips. They wanted yards of Kentucky bluegrass growing like carpet around dogwoods, crabapples and rhododendrons. In a big way, it was a return to the agricultural roots of the previous century, yet in a suburban form.

Kent Kurtz grew up in the middle of this transition. He mowed the sickly bluegrass lawn, planted the new "Zoysia" plugs his father purchased from the sunday newspaper, dug out the crabgrass and dandelions and raked leaves in the fall. While some kids dreaded these tasks, he enjoyed them. A big reason was the Kurtz ancestors were farmers who settled in Pennsylvania Dutch country around New Holland, PA. One can still find the inscription on an old stone barn on a farm now owned by the Amish near New Holland which reads "Abraham & Barbara Kurtz 1740". His grandfather, Martin Kurtz, was a rural mail carrier who delivered mail first with a horse and buggy and later in a 1941 Ford in Davis, IL.

There was something special about Davis near the Wisconsin state line with the rolling hills and miles of corn, oats and soybeans that captivated the teenager. The country gave him a new purpose, especially since his high school days were running out. He played sports—basketball, managed the football team for 3 years and lettered in track 2 years in the 880 and 2-mile relay team. He saw no future in athletics beyond high school as a participant. Therefore, he turned to agriculture on his own terms, which meant urban horticulture. The question was how to adapt agriculture to fit his personal situation.

Kurtz tried to enroll in the vocational agriculture program at his high school but was rejected because he didn't live on a

Professor Kurtz has always believed in field demonstrations and on-the-job training for students.

farm. Never tell a teenager that he can't do something for some weak reason. He fought back by getting a job at Charles Klehm & Sons nursery during summers hoeing weeds and planting peony roots. This was production agriculture in an urban setting. He realized that he wanted *applied* horticulture.

He found what fit his vision of urban agriculture nearby at Rolling Green Country Club, where he caddied and later worked on grounds maintenance.He also worked summers for the Arlington Heights park district under Tom Thornton, the director of parks, and further for the Village of Arlington Heights mowing grass at the well sites. He also mowed the 3 acre Elk Grove cemetery for a total of $10.00 per mowing plus had to furnish his own mower and gas. It was not uncommon for Kurtz to work two or three jobs during the summer to earn money for school. However, a job taking concrete samples during the construction of the Illinois Tollway between his senior year in high school and freshmen year in college almost destroyed his goal before he got started. Kurtz severely injured his back, beginning what has been a lingering disability for the active and inquisitive outdoorsman.

Still recovering from his back injury and not able to accept a scholarship for the track team, Kurtz entered Southern Illinois University intending to major in horticulture. The university did not have a turf or landscape program so he selected plant industries. The one professor who taught field crop production and later weed control was Dr. Herbert Portz. Kurtz worked for Portz in the Agronomy lab and also in the greenhouse. They formed a close bond and still remain close friends today even though Portz is retired.

The lack of college turf program and a discouraging experience on a golf course during the summer of his freshman year directed his studies toward an interest in fruit and vegetable crops. A professor at SIU (Dr. John Kelly) directed Kurtz into interesting research for the Campbell Soup Company on breeding tomatoes for mechanical harvesting, a major advancement in the early '60s. He went on to refine fertility programs for tomatoes using the first plastic-coated fertilizers now know in the turf field as Osmocote.

After graduating in 1963 with a degree in Plant Industries, he began the active duty portion of his commitment to the National Guard at Fort Leonard Wood in Missouri. From the fort, he sent out letters and resumes seeking employment. The National Grape Cooperative Association, parent company of Welch Grape Juice Company, hired Kurtz as a field representative to work with grape growers in southwestern Michigan. He became involved in converting the first vineyards in Michigan to a new trellis system known as the Geneva Double Curtain System.

While in his final quarter at SIU he met Patricia "Trish" O'Hara. They were married in 1964 in Kalamazoo, MI where they lived in a house rented from one of the grape growers. After Trish finished her degree from Western Michigan University she taught English and history for the Decatur, MI school system.

John Souter giving tour of Celtics Pitch in Glasgow, Scotland.

One of the grower's daughters kept her horse at the farm where Kurtz was living and one evening encouraged him to take a ride on the horse. During the ride the horse was spooked and threw him at full speed against the barn. The accident resulted in the compression fracture of six vertabrates which disabled him for a year and changed the whole course of his life. Since he was unable to work and not being one to just sit around he applied for admission to the masters program at Western Michigan University in Biological Science. Welch's offered to pay his disability for one year while he retrained for a less grueling career. It was his chance to get back into turf.

Since Western Michigan did not have a turf program he took advantage of several resources to develop his own program of study. He took all of the soils and agriculture classes from Dr. Lee Baker, plant physiology classes from biological science, an intensive turfgrass class from Dr. William Daniel at Purdue (driving back and forth to West Lafayette, IN for 4 weeks), and then contacted Michigan State University where Drs. James Beard and Paul Rieke, two of the leading young experts on turf at that time, assisted him with setting up and conducting his thesis study. While at Western he encouraged the owner of the Hampshire Country Club in Dowagiac, MI, Rolfe "junior" Wells, to also take classes in soils, etc. and they rode together to Kalamazoo.

As Kent began to feel better he managed the greenhouse for the Biological Science Dept. and also worked as the farm manager for Paul Todd, a multi-millionaire who owned 5,000 acres of farmland near Kalamazoo where he raised peppermint, spearmint, potatoes and corn. Todd also owned a 300 acre piece of propery in the center of Kalamazoo where he had a lawn bowling green and several greenhouses which inspired Kent and recharged his dedication and enthusiasm in turf.

In order to conduct his masters thesis field work Kent worked out a special arrangement with Roy Peck, superintendent of the Kalamazoo Country Club. For the privilege of using a site on the Country club grounds Kent had to work 20 hours per week mowing greens and doing general maintenance. Kurtz set up trials using Merion Kentucky bluegrass

with various rates of nitrogen fertilization to test the strength and durability of sod. This was a project suggested by Paul Rieke to aid the sod growers in Michigan with their fertility programs. The help of these professionals, Beard, Daniel and Rieke, at a time when there were few turf programs in the country gave impetus to Kent's career.

Kurtz finished his masters in December of 1967 and in March of 1968 was hired by O.M. Scott and Sons as a Golf Course Consultant with the Proturf Division. Driving 1,500 miles per week, Kurtz called on golf courses, schools, parks and municipalities selling the Proturf line of fertilizers, seed, pesticides and equipment. He was as much a problem solver for his customers as a salesman and became a trusted friend rather than an annoying order taker. Kurtz took every opportunity to speak or demonstrate his products at community colleges with turf or ornamental horticulture programs. Teaching seemed to come naturally to him.

The miles and long work weeks took their toll on his sensitive back. As the pain once again incapacitated him, doctors diagnosed a rare disease, Rheumatoid spondylitis, in which spinal discs fuse together. Taking medication became part of his daily routine. Strong ties with his customers carried him through. From his home in Hasting, MI, Kurtz sold over the phone when he could not stand to drive. His only long term solution was to redirect his energies within the turf industry.

Teaching and helping others had struck a chord with Kurtz. The classroom was not as physically challenging as the field.

Triton College in Chicago had already offered him a job when he read an ad in a trade magazine for an assistant professor position in turfgrass management at Cal Poly, Pomona. The president of the University was a former professor at MSU. The technical college wanted to begin a turf educational and research program in addition to strengthening its park program within the Department of Horticulture. Kurtz fit the bill and arrangements were made for him to teach his first class in the fall quarter of 1969. Trish was expecting to deliver the couple's first child by summer.

Cal Poly professor Jim Griffin became ill. Kurtz was asked to join the faculty in two weeks instead of six months. He left his pregnant wife in Michigan with instructions to pack up their belongings and sell the house. She did both in her characteristic style of reliability and responsibility.

The Cal Poly Connection

Having built a reputation in northern Illinois and Michigan, Kurtz now had to do the same in Southern California. Fortunately, men such as John Madison, William Davis, Vic Youngner and Hamilton Williams had already laid a foundation. The academic turf support system in the state would grow stronger with the addition of Vic Gibeault, Ted Stamen and John VanDam.

Kurtz with Ken Irons (center), who is the Los Angeles Raiders turf manager, and exhibitor during early Cal Poly Sports Turf Institute.

From Cal Poly, Kurtz created an effective network to get many things accomplished. He molded a golf and turf program which previously had not been offered. To do this, he enlisted the support of suppliers and employers who wanted to hire such types of college graduates. He set up research plots on campus to demonstrate the latest technology to students, area superintendents and coaches, and any interested taxpayer. He consulted golf courses, parks and schools throughout the area to build a reputation for the University of service and support. He strongly encouraged work study programs for his students. And he worked with local and national associations to lend them the resources of Cal Poly to their cause.

When an associate professor slot opened up in 1972, Kurtz was selected over 11 others, providing he earned a Ph.D. Since Cal Poly offered no Ph.D. of its own, he enrolled at the University of California in Riverside under the wing of Dr. Vic Youngner. His quest for applied research over scientific exploration led him to the University of Arizona under the counsel of Dr. Bob Kneebone. Using summers and sabbatical leaves from Cal Poly, it took him eight years to complete his Ph.D.

These were, however, some of the most productive years of Kurtz' academic career. At UA, he worked with Kneebone on creeping bentgrasses for desert climates. He vividly remembers rating plots of 1020, a bentgrass now in production by Seed Research of Oregon, Inc.

He built the first Purr-wick golf green in the West at Cal Poly, Pomona. His friendship with Purr-wick creator, Dr. Bill Daniel at Purdue, came into play. Kurtz took a trick used by movie studios to make the lawns of their outdoor sets green during the winter by painting the dormant bermuda with special turf colorants, but not just any colorants. In 1971, and again in 1981, he researched and sampled every turf colorant available on the U.S. market, rating and ranking the products according to effectiveness.

When a lumber company asked Kurtz to create a use for waste sawdust, he designed a method of growing sod on polyethylene, using the waste sawdust as a growing medium. The famous sod producer Ben Warren told Kurtz he was years ahead of his time. He was right. The lightweight, fast growing sod eventually gained popular use 15 years later.

In 1981 he finished his dissertation on the effects of iron fertilization on zoysiagrass and was presented with his doctorate from the University of Arizona.

By the late '70s, Kurtz faced a tremendous challenge that he continues to address, the unnecessarily poor condition of most athletic fields. He now had a son and daughter in sports leagues. He knew there was a solution to the problem of unsafe fields, but the support just didn't exist. He started on a local level, working with local leagues and expanding his curriculum to his students to include sports turf management.

Not one to be shy, Kurtz contacted the groundskeepers of many college and professional sports stadiums to get more information on the care of sports fields. He found them very willing to share their techniques with others if the result was increased safety for athletes.

Top groundskeepers, George Toma at Kansas City, Dick Ericson at Minneapolis, Harry Gill at Milwaukee, Roger Bossard

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THICK CUT SOD: *Weight For Stability*

Close up side view of thick-cut sod. The quarter at the center provides a perspective on the actual thickness of the sod.

By Matthew Trulio

It isn't a cure-all and it certainly isn't cheap, but when it comes to the "last resort" resodding of sports turf for immediate play, it's hard to beat thick-cut sod in terms of stability and performance. From Candlestick Park, to the Rose Bowl, to less high-profile venues around the country, thick-cut sod has been used to get troubled fields ready for play, *in a hurry*.

The key, of course, is weight. Where conventional sod might be cut with 1/2- to 3/4-inch of soil, thick-cut sod often comes with as much as 2-1/2 inches of soil attached. That added weight, as much as four times that of conventional sod, makes thick-cut sod inherently stable, which translates to near-instant playability with minimal slippage. Combined with "long roll" technology, in which thick-cut sod is laid in lengths sometimes exceeding 30 feet, thick-cut sod presents the ultimate in "overnight" stability.

The Thick Of It

A number of factors must combine to make thick-cut sod a viable alternative for any given situation. First, you've got to have the basic need for it. If you're not in a hurry to resod a field for an imminent event, it makes little or no sense to use thick-cut sod, given both its significantly higher price than conventional sod and inherent soil interface difficulties. Second, you've got to have the budget.

Jeff Cole, marketing manager for West Coast Turf in Palm Desert, CA, which grows bermudagrass and bentgrass, attributes the higher cost to two factors. "One is freight," Cole explains. "Freight is a big consideration. We are restricted to what we can put in a truck by weight, not by volume. Ordinarily, we may be able to put 10,000 square feet of conventional sod in a truck. With thick-cut sod, because of the added weight, we may only be able to ship 2,500 square feet per truck. That means we'd need four trucks to ship the volume of sod — four times the cost.

"The other thing that contributes to the higher price is that with thick-cut sod, we're removing valuable soil from the field," he continues. "We're restricting the ability of that field or area to regrow. With bermudagrass, when you cut sod, roots are left underneath — there's no need to 'reseed.' But when you take the amount of soil you do with thick-cut sod, the bermuda is very slow to come back. We sometimes have to go back and add stolons to the area. Also, picture a sod field of 10 acres. You've harvested some sod at conventional thickness, and then you get an order for an acre of thick-cut sod. Now you've got one acre in your 10-acre field that's lower than the rest, and that can create problems later on."

The advantage of thick-cut sod, again, is the extra weight provided by the extra soil. However, Cole points out, this extra soil has its drawbacks, particularly in the area of soil "matching."

"You can have a pretty big problem with it if your soils don't match up fairly well, particularly if the existing soil is sandier than soil that comes with the sod," he explains. "If you had a sports field or golf tee that was made to USGA specifications, you wouldn't want to use thick-cut sod on it long-term, because the roots will never leave the soil layer. Also, with thick-cut sod, the grass can survive for an indefinite period of time, but if you put a lot of weight or compaction on it, the long-term effects wouldn't be positive. We've always felt that it's better to take sod with as little soil as possible, because you don't want to create a different layer or medium."

Dr. Tim Bowyer is general manager of golf and sports turf for Southern Turf Nurseries, a Warren's company based in Norcross, GA. For 18 years, Southern Turf Nurseries resodded the infield of

Atlanta Fulton County Stadium with thick-cut sod after the Braves had finished their baseball, so the Falcons could play football on it. (The Falcons now play inside the Georgia Dome.) Although Southern Turf Nurseries still provides and installs thick-cut sod in facilities when appropriate, Bowyer is also quick to point out the detriments of long-term applications of the product over sand profile fields.

"There are major agronomic drawbacks in taking sod with two inches of soil and placing it on a sand-profile field for long-term repair purposes," he asserts. "The long-term impacts can be very negative. Now you have a thick layer of soil that will not percolate as quickly as the soil beneath. You end up with standing water on the field, or worse, conditions where clay and silt wash out of the soil and into the sand profile, and affect the ability of water to move through that profile."

Installation Tips

Assuming you're not going to use the large-roll concept for laying thick-cut sod, you'll probably want a few extra crew members for the job. Keep in mind that the sod can weigh four times that of conventional sod, and the extra muscle will come in handy. Weight aside, the sheer thickness of the sod adds another dimension to pre-installation.

"You've got to remember to excavate the surface to the same depth of the sod," Bowyer notes.

As for the laying of the sod itself, the technique doesn't differ substantially from that of conventional sod. However, Cole suggests making sure the sod bed is especially firm, pre-rolled and watered, prior to installation. Whether the thick-cut sod is brought in on pallets by a forklift or rolled directly onto the field by a long-roll installation machine, the sheer weight of product, combined with the weight of machine, can lead to rutting.

Because thick-cut sod contains extra soil, it may not require the immediate watering of conventional sod installations. Naturally, you want to approach irrigation after installation on a case-by-case basis. If the grass appears or feels dry, if the weather is particularly hot and arid, or if the installation takes hours under the hot sun, an immediate application of water may be necessary, even on thick-cut sod. But you may not want to water the sod simply as "a matter of course," particularly if there's a game to be played on it immediately.

"Thick-cut sod is a very, very specialized product that costs money — its primary benefit being you can play on it almost immediately," says Cole. "On a tee box, for example, you can realistically lay sod and hit golf balls off of it when you're finished. Thick-cut sod is for special events and circumstance where conventional sod just isn't going to work."

Bowyer adds that, in most cases where thick-cut sod is installed over sand-profile fields, it is removed after the event and replaced with a conventional-cut or even a washed sod. To leave the thick-cut sod in place, he asserts, would be ill-advised, because it defeats the purpose of the sand profile.

"The reason thick-cut sod gets used on sand-profile fields is because the maintenance of the field has failed," Bowyer concludes frankly. "The growing months prior to the playing season haven't been taken advantage of, and when play begins, the turf gets destroyed. It's truly a question of management prior to the problem." ❑

Mechanical/Chemical Strategy Cuts Costs

In a move to meet tight budgets while tackling an increased athletic turf maintenance workload, Pasco County Horticulturist Mitch Boyle has developed a strategy that's helping trim tens of thousands of dollars from his maintenance costs.

In addition to his duties managing athletic fields at 14 park sites throughout Pasco County, FL, Boyle also serves as the county's aquatic weed manager. Money saved as a result of Boyle's turf strategy is vital to meeting the costs of his other responsibilities, he says.

In providing an overview of his approach to turf care, Boyle explains that agronomic schedules for each park are slightly different. Those differences rest on specific growing conditions, which vary from one end of the county to the other. The facilities he oversees include 35 full-size soccer fields, 37 Little League fields, and 11 softball fields. In total, Boyle's crew cares for 180 acres of hybrid Bermuda 419, with 20 more acres under development.

One of Boyle's primary goals for 1994 is to save money on turf management by using a new pest control strategy he developed during the past year. In 1993, Boyle managed the Bermuda turf at a total cost of $740 per acre. His goal for 1994 is to trim that to less than $700, and put the money saved to work in a habitat restoration project on the gulf coast. The savings from the turf program are being used to purchase Rodeo® herbicide and other products for use in a Brazilian pepper eradication program along several miles of coastline park sites.

In caring for the athletic turf, Boyle plans to cut costs by controlling fungus mechanically, while emphasizing use of cost-effective herbicides to keep weeds in check and reduce maintenance costs. "We spent up to $100 per acre to apply fungicides," he explains. "By following a regular schedule of power raking, verticutting, and aerating twice a year, we'll be able to cut fungus control costs significantly."

During the last three years, Boyle conducted a study on county fungicide applications. By late summer of 1993, his crew had applied fungicides only three times.

"In previous years, we've had to apply many times that amount of fungicide by September," he says. "The mechanical program allowed us to divert approximately $20,000 in 1992, and $30,000 in 1993, to other needs."

Boyle believes the mechanical work controls fungus by increasing microbial activity in the turf. To help microbes along, the crew applies Milorganite at a rate of 250 pounds per acre to lightly topdress fields in January, March, and April.

"These light applications of Milorganite help increase microbial activity so grass stays healthy and balanced," says Boyle. "Then we come through with our aeration and power raking, and we don't have an environment that harbors fungus and disease down in the thatch. I've talked this theory over with some of the turf specialists at the university, and they're experimenting on this very same thing."

Another factor in Boyle's success is frequent applications of high-quality fertilizer. The variety selected for Pasco County turf is Par-Ex®.

The first application is in February, using 15-2-5 with a crabgrass control at 350 pounds per acre. In April, 21-2-6 is applied, with an insecticide for mole cricket control, at a rate of 200 pounds per acre. In June, 19-0-10 is applied at 200 pounds per acre, again with a crabgrass control. In August, 15-0-15 goes on at 300 pounds per acre, followed by 10-15-15 in October at 500 pounds per acre.

Rather than relying on fungicides in 1994, aeration and power raking will continue throughout the year on a monthly basis.

Another change for 1994 will be a switch to Mainstay® for mole cricket control. Previously, Boyle used another insecticide, which he says lost is residual effects under heavy rains last summer. "With Mainstay, we'll have a greater length of control for mole crickets," he says.

During winter, Boyle avoids overseeding with ryegrass, a common practice on many warm-season grass athletic fields. "We've been real lucky so far — I've been able to keep the fields safe and playable all winter long," he says. "It also saves a lot of money as far as mowing."

Boyle also reduces mowing costs through the use of Roundup® herbicide along several thousand feet of athletic field fence line. The product is also applied around trees and along buildings in a narrow strip that leaves room for mowing equipment to pass.

"The savings from Roundup® are significant," says Boyle, who estimates each of the 25 parks sites uses a 2 1/2-gallon jug of the product. "We also do trail maintenance with the herbicide, instead of mowing."

The herbicide also saves a significant amount of trimming time, Boyle notes. Without it, his crew would have to use weed trimmers along miles of fence, twice a week.

"Putting your budget together the year before and trying to live by that budget throughout the year is tough," he concludes. "By concentrating on cost control strategies within our various programs, we're meeting budget requirements and freeing up dollars to improve and expand our programs." ❑

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