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The area around the base and the leadoff corridor are two spots we spend extra time on. After a game, we will sweep them out just like we do the batter's boxes and then water to establish moisture in the base. The next morning we fill in, grade with a level-board and roll. This process keeps the material fresh and the area firm and level. Both of the leadoff areas at 1st and 2nd base are spots we keep an eye on and will level out and roll when the team is out of town. Another area to watch your grade is where the 1st baseman plays with no runners on. They are the least mobile of all of the infielders, so a low spot may soon appear there after a number of games. Finally, consider the dirt a few feet along the foul line past 1st base. This area can get hard and doesn't get worked too much by your nail drag. It requires a bit more water so that the last hop does not dart up at the fielder.

8. INSIDE EDGES

Batting practice is a great time to evaluate the state of your inside edges. There is more to it than keeping the lip down. You

want the ball to bounce true as it makes the transition from turf to dirt. This means keeping that first few feet of dirt from the edge level with the turf. You must also be conscious of that first few feet of dirt getting too hard, particularly as you turn and pivot your walk-behind mower there. Remember, any spot on the infield skin that gets overly compacted will require a bit more water to get it to ideal playability.

In terms of edging, consider that more frequent edging and hand rolling is a more efficient method of maintenance and will produce better results. During a homestand, walk your edges and be aware of not only lips, but ledges as well. A ledge is when the elevation of your turf soil is higher than that of your skin. When an edge has a ledge, a ball hitting the edge will gain a great deal of topspin. Instead of bouncing true, the ball will quickly roll and scoot, against the expectation of the infielder. This could cost your team a potential double play.

9. MIDDLE INFIELERS

Watching the game in person rather than on TV allows you to learn how your infielders move around in different situations. At the professional level, 2nd basemen have the arm strength to play back on the outfield turf much of the time. The shortstop has a longer throw, so unless he has a very strong arm, he will straddle the edge of the grass or be 2 or 3 feet in front of it. What is double play depth? The simplest explanation is: two full steps up and two steps in toward the bag. This allows the infielder to get to the bag faster to receive a throw to begin a double play.

I find that during the day, as I am nail dragging and working the dirt, it helps me to be able to visualize where the infielders play and what types of plays they will be making in different areas. This also helps with knowing how much water to put on the dirt. One other consideration for middle infielders is the 2nd base cutout. In front of 2nd base, where no one runs through, that cutout can be given a little extra water. Your goal is to give the infielder a true hop off the dirt on throws from the catcher. On a stolen base attempt, the infielder reacts reflexively as he picks the throw from the dirt and applies a tag.

10. BACK EDGES

Professional infielders have range that allows them to field balls in unusual places. They need to have confidence in your back edge. The elevation of the dirt needs to be perfectly even to just slightly higher than the level of the outfield turf soil. Again, I have found life to be easier by edging lightly and often. Because of the many types of shifts teams seem to employ on hitters these days, we make sure to walk and check the entire back edge each game day. Having a walk-behind roller around is vital, and allows us to keep the edge in top condition.

11. THE 3RD BASEMAN

Sitting at field level at a major league game, I still continue to be amazed at how difficult it can be to play 3rd base in the big leagues. The game is so fast and the 3rd baseman must constantly adjust his positioning to suit the situation. We spend quite a

bit of time daily on the 3rd base cutout and the edges in front of the player. We want to be sure the edges are clean, the dirt has enough moisture and the topdressing quantity is consistent. In addition to the calcined clay we use throughout the infield, we will also add some vitrified topdressing before the game in this area. Keep in mind the area along the foul line past 3rd base as well. This area, approximately 3 x 40 feet, needs to be managed so that ground balls stay down. The 3rd baseman has virtually no room for error on backhand plays in this area due to the length of the throw to first base.



12. IT IS YOUR DIRT

To cultivate a quality professional infield, I like to think the infield dirt is alive, just like the turfgrass. I find it helpful to maintain an acceptable moisture level in the dirt all the time, even when the team is out of town. I don't like having to totally reestablish moisture just before a homestand. If weather forces you to tarp around the start of the homestand, and your dirt lacks adequate moisture down through the soil profile, the ball will start taking some odd bounces. As you evaluate weather for your turf, do the same for your dirt and water accordingly.

Some other thoughts: try to avoid moving too much loose material around when you screen drag, and consider using a smaller stiff mesh drag. If you choose to nail drag regularly, remember that a light nail drag is the most effective tool for day to day maintenance. Deep spiking is a renovation technique. You want to create a firm, moist base of dirt with some moderate topdressing as an upper layer. I have had good experiences with having calcined clay incorporated into the entire infield dirt profile. Heavy watering early or late in the day will be more efficient for soaking the entire dirt profile.

Finally, it is now widely accepted that new or renovated infield skin mixes have silt to clay ratios (SCR) between 0.5 and 1.0. Our SCR here at Target Field is 0.69. So, watch the game and look for balanced hops. If the ball bounces consistently throughout the infield, you are allowing the fielders to truly determine the outcome of the play. If your infield skin can take some speed off the ball, provide a true bounce and offer clean and firm footing, you've done a great job. ■

Larry DiVito is head groundskeeper for the Minnesota Twins.

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Thick-cut sod experiences at Busch Stadium

Billy Findlay, head groundskeeper for the St. Louis Cardinals, has twice turned to thick-cut sod from his supplier, Graff Turf Farms in Colorado, since the new Busch Stadium opened in 2006. The first time was after a U2 concert in July 2011. "It was a hot summer and Graff's was working hard to keep the turf healthy. We went with a 1-inch thick sod and played on it 3 days after the concert," Findlay said.

"It did well that first year but interfacing can be a problem with the thick cut; ours didn't root down enough and that's tough since we're playing on bluegrass in the St. Louis climate," he said. "But we played on it through the 2012 season, which was the hottest summer on record in St. Louis, and with bluegrass in that heat, the roots just weren't optimal. By mid-August last year we had some divoting and black layer forming. I poked some holes but you can't aerate too much that time of year here.

"After last season we stripped it all out, put in a 1/2-inch sod, and I have an amazing root mass now. We took another inch of rootzone during the changeover to get rid of the black layer and put down fresh sand before the laying the new sod," Findlay said. "In my experience thin-cut sod has always yielded amazing results."

Findlay said when the new Busch Stadium opened he had only a 2-week window to finish the field and 1 1/4-inch sod was put down. "The second season on it we had major issues with tearing and the players were losing footing; I'm a fan of the thinner the better.

"But there are situations, especially after major events like a concert, where you might have to use thick-cut. And after our experiences with it, management is much more likely to let me take out any thick-cut we have to put it, to see it only as a temporary fix," Findlay said. "You can aerate that bluegrass until you are blue in the face in this climate and you won't get the rooting you need."

Turf farmers' advice on choosing and successfully managing thick-cut sod

Editor's note: From any good sod supplier, thick cut sod is always more money, and is NOT always the best solution, according to several sources. Some reasons it's more expensive: More soil with the sod means less topsoil for the farmer, which of course he depends on for future crop; more soil means more weight, which means less sq. ft. per big roll of sod, and even less on the truck. If a standard load is 10-12k sq ft, and thick cut sod could be less than half that, it's double the trucking price; more equipment, time and labor on both ends (sod farm and installation at the field).

In this article we get feedback from turf farmers on two questions: What factors should be considered when a sports turf customer is deciding between thick-cut v. regular-cut sod? What are the most important things turf managers need to do, for both thick-cut and regular-cut, after a sod installation to assure a successful outcome?

GREG JOHNSON, Bigfoot Turf, LaSalle, CO

Obviously harvesting thick cut sod presents some problems for sod producers. The fast removal of existing topsoil is kind of a scary thing when looking at the long term use of agricultural land. The use of expensive, environmentally damaging and economic deficit growing fossil fuel to haul dirt around is also questionable.

We've found that thick cut sod roots down much slower than regular thickness sod. We've even seen instances where thick cut never roots down at all. Hopefully, we as sod growers have prime soil that we grow sod on and the thick cut seems to be content growing roots in the soil delivered with the sod.

We have found that if our customer needs to use the

newly laid sod immediately, a topdressing with sand right after the sod is laid helps keep the sod in place. This allows for the use of regular cut sod, with its faster rooting characteristics, while maintaining the ability to use the area immediately. Also using a core aerator on the prepared ground right before laying sod and removing the cores allows the sod to root faster.

JAMES GRAFF, Graff's Turf Farms, Ft. Morgan, CO

Thick-cut sod is a great tool when a sports turf manager is against the clock. However, there are additional costs associated with thick cut turfgrass. The added expense is directly related to time and weight. It takes the producer more time to harvest, the install process is slower, and less turfgrass can be loaded on the trucks, so consequently, additional freight expense is accrued.

It is our opinion that a standard harvest turfgrass, established in a reasonable amount of time, produces a better rooted field and more easily managed. Often times, the need for thick-cut sod isn't a choice. What put the customer in this predicament? Something controllable or uncontrollable? A schedule issue or weather?

Playing surfaces are programmed more heavily than ever before and the expectations are high for the sports turf manager to deliver a safe and aesthetically pleasing field regardless of what is humanly possible or what Mother Nature is up to.

To answer the question, "Is it normally a simple 'How soon can we play on it?' issue?"—absolutely, this is the million dollar question. Sports have become a "time is money" type game. The more time the field is available, the more revenue the venue can be realized in concerts, events, band competitions, you name it. Can it be done? We have some amazing men and women in the business of sports turf management, so with their talents, abilities and knowledge, I say yes, it can be accomplished. And

field safety will still be the top priority of the sports turf manager.

A close second to this question is, "How long will it last?" The answer to that depends more on the schedule for the remainder of the season, the sports turf manager, and the budget. Oh yes, and the weather.

Typically, thick-cut grass does not root as well as a standard harvest as it doesn't need to. Think of it like a potted plant: it has no reason to jump in the ground when the roots are shipped in adequate sand or soil. It will last the season, but the uncertainty is, does the thick-cut turf best serve the field in the next season? While thick-cut sod may be used as a tool to survive the season, it is not the standard for a new install with adequate grow-in time. So after the season is over, often the thick cut turfgrass comes out and a field replacement at standard thickness is installed for the next season.

For turf managers to have success after a sod installation, they must start by communicating clear and realistic expectations to the decision makers and facility schedulers. Then hope and pray they listen. No doubt we want to see natural playing fields have success in the future. A field needs adequate time to root in and those timelines look much different depending on turf thickness. The expectations must be set, a plan must be made, and a schedule must be followed. Above all, the attitude of "what is best for the field" must be adopted. We know this is not an easy road. Some managers are just trying to get enough in their budget for fertilizer and staff, let alone request to have input on the programming of a field.

Communicating and coordinating with your turfgrass supplier ahead of time can give you the best product when you need it. This may allow for custom applications, and if the scenario is such that the new turfgrass must match up with the existing, this ensures a high success rate. Also, whenever possible, have someone from your organization at the farm, confirming and verifying the thickness of harvest. We know how we define the thickness of the turf at harvest. Make certain that your expectations are being met also. If this is not possible, ask for a sample test cut to be sent ahead of the delivery date so removal, ground prep and grading will be precise when the turf arrives.

**JOHN MARMAN,
West Coast Turf, Capistrano Beach, CA**

“We often try to talk customers out of buying thick-cut sod,” says Marman. “If you can stay off a field for 3-4 weeks you can get away without thick-cut. But if you have an application where there’s a real need to get on the field right away, for example the area in front of a pitcher’s mound or a soccer goalmouth in mid-season, that’s a different situation and you need a Band-Aid.

“If you are considering thick-cut sod be aware that putting it over a coarse sand base is inviting the creation of a perched water table. At West Coast Turf, in the Coachella Valley, we grow our turf on anywhere from 78-94% sand, so this isn’t as big a deal for our customers, since it’s a finer material underneath the sod,” Marman



said. “Of course most sod has more peat or clay, which holds more water, and if you don’t work the repaired area by aerifying, you might end up with root rot or black layer in that section of your field.

“So while putting down thick-cut will get you through the season, as soon as you have the chance you need to core aerify with ½ inch hollow tines. You want to remove as much material as possible then backfill with sand, to get the sand down into the soil layer and create sand channels,” says Marman. “This area must be managed well if you want this ‘Band-Aid’ to work long term. Many times these areas wear out anyway despite turf managers’ best efforts and you will have to totally renovate. You have to get in after the season and harvest out a layer then backfill with native material, and then go to a thin sod to get the roots going, assuming your soil isn’t too heavy with clay or silt.

“Another application for thick-cut sod is in specific applications such as one-time events on a synthetic turf field, when for example a World Cup or MLS soccer match is scheduled. You put in a barrier and place the sod on top of it. Of course the event must generate enough revenue to cover this cost but the money is well spent in protecting the highly paid athletes,” says Marman.

For these one-time or several games only situations, you can get away with 1 inch of soil profile; bigger is better, especially for football I recommend 1 ¼ or 1 ½ inch but we’ve done Fiesta Bowls and Rose Bowls with only 1 inch [soil profile only, not including the thatch layer or the grass itself].

“Ideally customers will let us know where their fields will be at a certain time in the future so we can have what they want ready but most of the time it’s more of a ‘911 fire drill’ where the field was failing on a Sunday and they are calling on Monday asking how fast we can get sod on their field. We are highly reactive to disaster situations,” says Marman.

“Grant Trenbeath of the Arizona Diamondbacks has the opposite situation. We maintain an entire second field’s worth of sod for Chase Field on Grant’s spec sand and custom grow it to match perfectly to what’s on his field. Mature plants guarantee we will have the product he wants,” he says.

“After rollout there are air pockets or other incomplete uniformity in most cases. Lots of customers like us to use a solid 42-inch blade on a Bucyrus machine to cut the turf and this length combined with the vibrations from cutting creates a flex in the middle of the blade, and the roll becomes convex or concave,” Marman

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JOHN MASCARO'S PHOTO QUIZ

John Mascaro is President of Turf-Tec International

Can you identify this sports turf problem?

Problem: Green sports field with two brown lines across field

Turfgrass area: Private boarding high School

Location: Dedham, Massachusetts

Grass Variety: 50% Bluegrass/50% Ryegrass

Answer to John Mascaro's Photo Quiz on Page 33



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wrote **Chip Baker**, Asst. Baseball Coach,
Florida State University, Tallahassee, FL

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The biggest issue from a growers' side between thick- and regular-cut is the cost of shipping because of the extra weight and of having to regrade a field if you have to cut an extra inch of soil in some places. The benefit of thick-cut to the customer is being able to play on it sooner. We have shipped sod with 2 inches of dirt on it on a Thursday and they played soccer on it 3 days later. If there is no rush to play on it then there isn't an advantage to getting thick-cut.

—Mark Woodard, Cane Creek Sod, Poplar Bluff, MO

says. “So after rolling out thick-cut sod, you need to use a 2-ton vibratory roller to mash down and even out the high and low spots for a nice surface. One minor issue with sand-based sod is losing sand during transport. Every road bump can cause a bit of sand to fall and you lose more with a sandier base.

“While silt/clay profiles can make for better maintained edges during a short-term fix, if you get rain right after the installation you can have a very soggy field with little to no short-term percolation,” Marman says.

JAMES BETTS,
Tuckahoe Turf Farms, Hammonton, NJ

Our standard cut big roll is ¼ inch soil below thatch layer. From past experiences, we strongly feel the thinner you cut turf without scalping (1/4 inch soil +/-) the sooner it will root.

Thick-cut sod does have its place, however. We would recommend these guidelines for any sodding project:

- Any athletic field—¼ inch soil for any sod done in the fall and will be able to winter over for play the next spring.

- Any athletic field—¼ inch soil for any sod done in the spring and play in the fall.

Baseball, Softball, Soccer, & Field Hockey—1 inch soil for play 3-4 weeks after sodding.

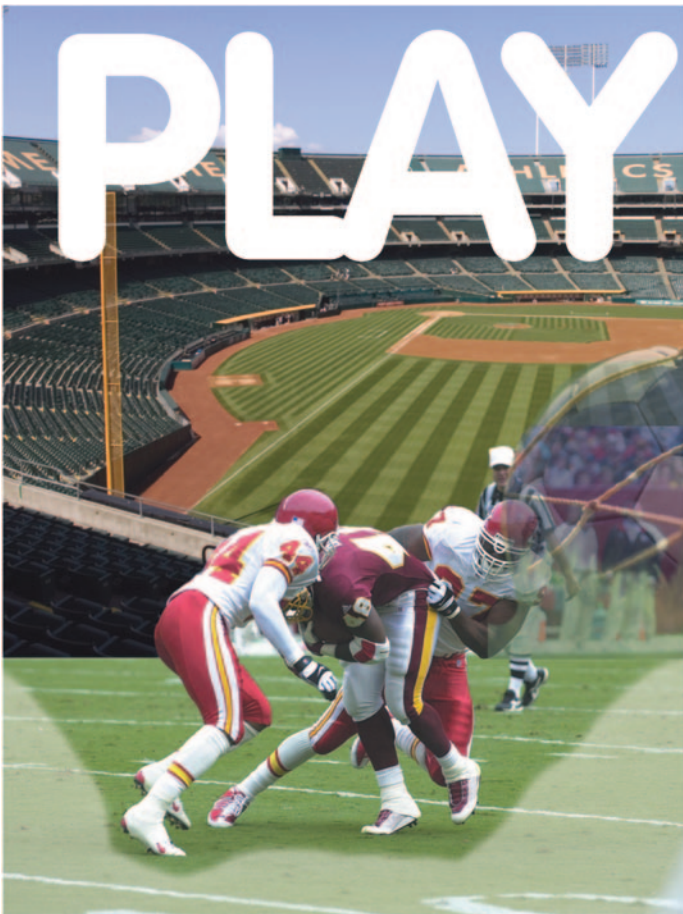
- Football 1¼ inch soil for play 3-4 weeks after sodding.

- Baseball, Softball, Soccer, & Field Hockey—1½ inch soil for play 1-2 days after sodding.

- Football—1¾ inch soil for play 1-2 days after sodding.

After thick cut sod is used we suggest topdressing lightly and deep-core aerating to promote root growth when 3-4 weeks of recovery time is allowed. Please note that when sodding in the summer all new turf shuts down and the rooting process slows down. If summer sodding, you might want to look into a thick-cut sod.

Cost justifications for thick cut sod: If you purchased 1-inch thick cut sod your cost would be more than our standard cut be-



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cause of the increased trucking costs, more rolls, and our soil loss. The cost can be outweighed by the benefits.

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TOM KEEVEN,
Heartland Turf Farms, Columbia, IL

From our perspective, you are spot-on with your first question. It is really just a matter of "how soon." I believe that if one has the time to wait, they should opt for regular-cut sod. On a proper sod installation, done during the right growing season for that particular grass, the field should be usable in 3 to 4 weeks. I have seen it done in as little as 2 weeks—regular-cut, bermuda sod on a sand-based professional field.

You are correct in identifying the major issues with thick-cut sod. It is difficult to perfectly match the rootzones of your sod vs. your field. With thick-cut sod, you are increasing the chances of "sod interfacing," where the roots tend to stay in the sod layer. Especially on sand-based fields, which are often quite nutrient-deprived, you probably have better nutrition in the sod layer. While the thick-cut sod allows you to get by in the short term, you may be replacing it again soon due to improper rooting.

Here's our perspective as a sod farmer: We'd like to be farmers, not miners. Thick-cut sod depletes the soil on the farm, and farmers need to charge for that. Thick-cut sod should be priced significantly higher. Plus, you are going to require extra trucking, up to three times as much, to carry the extra weight.

That being said, we realize that there are many instances where there is not time to wait. In these instances, thick-cut sod is a great tool to keep a field playable at a high level. Many high school fields see a high amount of events from multiple sports. Often these campuses also lack the land area to spread out the traffic. In recent years, many schools have turned to artificial turf as the answer. Instead, they could keep a top-level natural grass field by budgeting a partial replacement of thick-cut sod during the season. If you plan ahead with a local sod grower, the replacement could take place in as little as a day, keeping your downtime at a minimum. Even with the added cost of thick-cut sod, you should still spend less than you would on artificial turf, and have a natural surface that the players would appreciate. ■



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How to get the equipment you need

THE BUDGET CHALLENGES facing grounds and turf managers today require skills and knowledge beyond those found in most of our job descriptions. In order to meet fiscal challenges and justify funding needed for new equipment and resources, we must use personal attributes, professional knowledge and business relationships.

For many of us, gone are the days when a manager could simply go to his or her boss, banker, or CFO and state the need for equipment and expect the request to be fully funded. Today we are

It's important to remember that you are competing for a slice of your organization's budget pie and the others are hungry for it, too.

held accountable for every dollar and even the most necessary or justifiable expenditures are often denied. We are presented with a professional and personal challenge: How do we continue to meet our customer expectations and our own desire to succeed and perform at a high level when faced with likely rejection of capital purchase requests?

Purchasing equipment requires a well-thought-out plan and process. It's important to remember that you are competing for a slice of your organization's budget pie and the others are hungry for it, too. Developing a plan, solid talking points based on demonstrable needs, and an effective sales pitch are critical to success. Here are the steps to help achieve your goals.

DEFINE THE PROBLEM

Make a list of your equipment needs and what these tools are needed for. For example, if you have sand-based fields and no topdresser, a host of problems will result that can affect turf health, quality, playability and player safety. If you have old equipment, or difficult-to-

10 TIPS ON HOW TO JUSTIFY NEW EQUIPMENT

- 1. DEMONSTRATE A RETURN ON INVESTMENT.** Show that the new equipment will somehow pay for the investment within 1 year. This is a key item.
- 2. LOBBY FOR NEW EQUIPMENT** on the basis that it will eliminate the need to hire additional help. Be careful though, a shrewd boss may use this against you later when you are trying to fill a vacancy.
- 3. USE CONCRETE FACTS AS EVIDENCE** in support of any expensive expenditure request. Show how the equipment will (1) cut costs, (2) raise revenues, (3) increase efficiency, (4) improve customer service, or (5) meet some other basic goal.
- 4. MAKE YOUR APPEAL** on the basis that the purchase will help employees to do their jobs better by eliminating errors, thus creating a savings.
- 5. SHOW HOW THE PURCHASE WILL IMPROVE PRODUCT QUALITY.** In this instance, as well as others, it will help if you get other department heads to support your request. In this case, the head of quality would be a key figure.
- 6. PROVE THAT THE NEW EQUIPMENT WILL REDUCE REPAIR AND MAINTENANCE COSTS.** Include all costs associated with down time.
- 7. SHOW THAT THE NEW EQUIPMENT WILL BE EASIER TO OPERATE,** can be used by less skilled workers and/or will result in fewer mistakes.
- 8. SHOW HOW THE NEW EQUIPMENT WILL MAKE THE COMPANY MORE COMPETITIVE IN THE MARKET PLACE—**price, cycle time, quality, etc. Identify a competitor who is using new equipment to be more competitive.
- 9. DEMONSTRATE HOW THE EQUIPMENT WILL OVERCOME A PERSISTENT PROBLEM.**
- 10. NO MATTER HOW THE JUSTIFICATION IS MADE,** the merits of your request will be greatly enhanced when your boss supports the request. Get your boss to adopt the idea as his/her own idea and request.