

Managing fields using crumb rubber & varietal selection

BY JOHN C. SOROCHAN AND J. TIM VANINI

Turfgrass is a biological system and if abused, it will die. Be prepared because the loss of a turfgrass stand can be just around the corner. Maintaining quality turf stands that withstand athletic field conditions has always been a challenge, particularly when many events are scheduled when growing conditions are not favorable for turfgrass recovery. Properly implementing the five primary cultural practices (mowing, irrigation, fertilization, cultivation, and pest control) and using non-traditional methods are important management practices in maximizing turfgrass vigor. Non-traditional methods can be cost beneficial and extend the field performance in the long run. Using crumb rubber as a topdressing and turfgrass selection are two methods that have demonstrated improved turfgrass functionality.

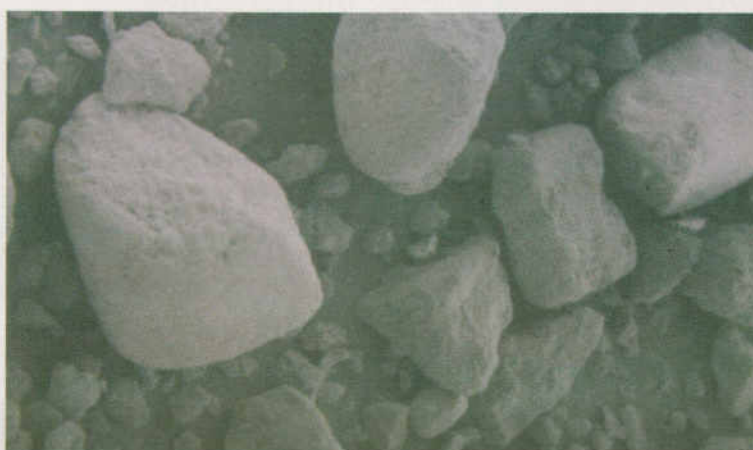
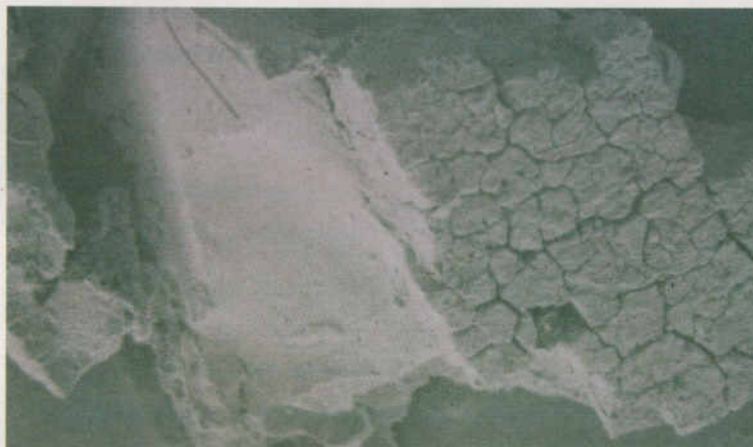
Crumb rubber is simply used car tires that have had the steel belts removed and been ground into small rubber particles or "crumbs." The size of the ground rubber varies, and is similar to the particle size distribution of sands and fine gravel. Research that was completed in the early 1990's at Michigan State assessed the dynamics and versatility of crumb rubber in a turfgrass situation for athletic field use.

Original research looked at crumb rubber tilled into the soil profile of an existing athletic field. Results showed crumb rubber was an effective soil amendment, but having to take a field out of play to add it was too time-consuming and costly. So more research was initiated to evaluate cultural practices that would be more effective at introducing crumb rubber to the turfgrass/soil interface.

Core cultivation and topdressing were evaluated. Crumb rubber particle sizes of 1/4-in. and 10/20 mesh were researched. Though core cultivation was effective, topdressing crumb rubber was more so. Plus, using the 10/20 mesh was the best particle size, over time, to introduce crumb rubber

to the turfgrass/soil interface.

When adding crumb rubber to a field, it is important to start off with as close to a 100 percent turfgrass stand as possible. Crumb rubber will not resurrect your turfgrass stand after wear damage has already occurred. Therefore, for an existing athletic field, the best time to add crumb rubber is before the start of a new season when your turf cover is greatest. Use crumb rubber that has a 10/20 mesh particle size and topdress it in at 1/4 inch (1/4"=600 lbs. crumb rubber per 1000 ft.) intervals until you have added 1/2 to 3/4 inch of the material.



You can see the sharp edges and angles of the sand particle (below) compared to the smooth edges of the rubber particle.

How does crumb rubber benefit?

Crumb rubber serves two functions when topdressed: reducing soil compaction and improving wear tolerance. Crumb rubber for an athletic field acts as a "padding" for protecting the turfgrass. If an athlete's cleats damage the crown tissue area of a turfgrass plant, the turf will quickly die because the point of rejuvenation has been damaged beyond repair. Crumb rubber protects the crown tissue of the turfgrass. This limits the direct impact of a cleat or shoe, thus resulting in the prolonged wear tolerance.

After a fall season of testing using simulated football traffic, 50 percent more turf cover can be maintained by topdressing 3/4-inch crumb rubber onto a sand-based athletic field, according to research. Another benefit of crumb rubber is that it will not break down with repeated wear in high traffic areas. Thus, it will provide a cushioning benefit for maintaining increased turfgrass cover. As a result, your field will be able to tolerate more traffic, which in turn translates into more events, which in turn, translates into increased revenue potential.

Another benefit is extending your

turf's growing season. Having a 1/2 to 3/4-inch layer of crumb rubber at the soil surface increases surface temperatures enabling growth to occur earlier in the spring and later into the fall. Similarly, due to the black color, crumb rubber can act as a catalyst for seed germination when seeding either earlier or later in the year (overseeding) or starting "spring green-up" in bermudagrass. In other words, the warm season window for bermudagrass can be extended.

Potential problems

No question there have been concerns about topdressing crumb rubber if too much water takes over an area, i.e. rainfall or excessive irrigation. Crumb rubber is half the density of a soil particle, so it floats. Strategies to deal with this problem are first, be in tune with the weather and second, do not put too much crumb rubber down at one time.

Our recommendation is that no more than 1/4 inch should be topdressed in a single application. Remember, you can always add more. A final strategy is to fertilize more frequently, budget permitting. Obviously, the grass will grow more vigorously and crumb rubber will gravitate quicker down to the surface.

Turfgrass variety selection

Whether it is bermudagrass for a warm-season field or Kentucky bluegrass for a cool-season field, varietal differences for each turfgrass species are great in terms of vigor and aesthetics. Therefore, overall performance will in part be dependent upon the variety(s) chosen.

When it comes to selecting the best turfgrass varieties, you want to choose an aggressive growing variety and an aesthetically pleasing variety. It is best to have an aggressively growing turfgrass because they provide the greatest recuperative potential from damage caused by wear. Typically, turfgrass varieties that grow aggressively will be more prone to producing a thatch layer if they grow by rhizomes and/or stolons. While a more thatch-producing variety may not be desirable for a home lawn situation, for an athletic-field, this characteristic offers increased benefits, such as reducing surface hardness, and increasing shear strength. The National Turfgrass Evaluation Program (ntep.org) is an excellent resource to compare

differences between turfgrass varieties.

Even when cool-season turfgrasses are used for overseeding warm-season fields, species and varietal selection is important. Although cheaper and faster to establish, annual ryegrass, as an overseeding species, is inferior to perennial ryegrass. This was demonstrated in an overseeding study done at the University of Tennessee football practice fields last fall. The study compared perennial ryegrass



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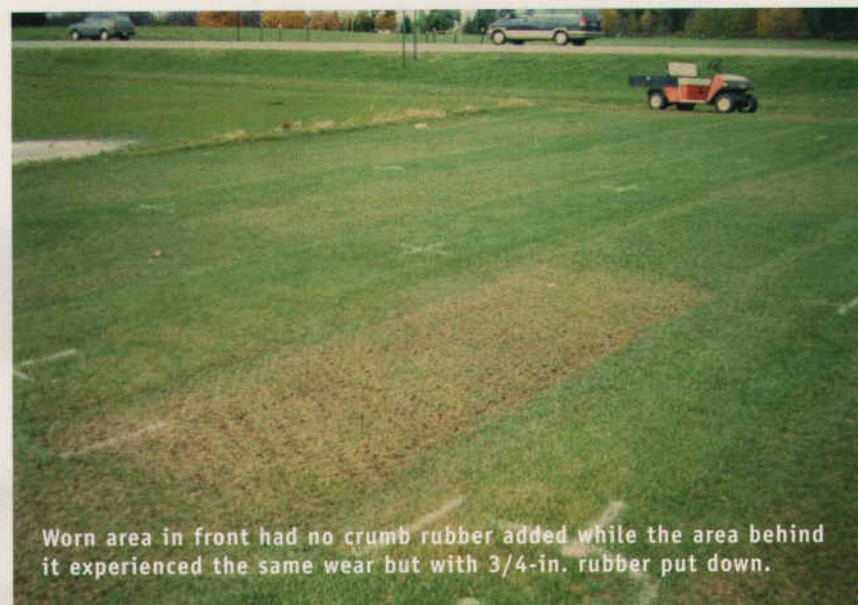
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varieties and annual ryegrass for density, color, and wear tolerance. Results determined that all perennial ryegrass varieties had greater turfgrass density, color, wear tolerance than the annual ryegrass species investigated. Thus, perennial ryegrass is used as an annual turfgrass for overseeding warm-season fields. Differences in turfgrass density, color, and wear tolerance also occurred between the perennial ryegrass varieties compared. "Hawkeye" perennial ryegrass was the best variety in terms of density and color when overseeded into dormant bermudagrass and subjected to actual collegiate football practice wear conditions.

By topdressing crumb rubber and choosing the appropriate species and variety, you will prolong the wear tolerance of the turfgrass stand and improve the playability of the field for a longer period of time. Pending on your turfgrass selection and other management practices, re-establishment will be minimal in terms of cost over the long period.

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Worn area in front had no crumb rubber added while the area behind it experienced the same wear but with 3/4-in. rubber put down.



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Painting the perfect picture

Although many field managers use paint strictly for delineating the required boundaries and markers of the playing surface, field paints truly shine when colors are used for elaborate field art, such as football field end zones, midfield designs and other detailed logos. The following photo essay provides a glimpse of the possibilities that field paints offer.



The crew working on the Tampa Bay Buccaneers end zone at Super Bowl XXXVII in San Diego applies the finishing touches using a low-pressure airless sprayer with World Class custom paint colors. Custom stencils can be designed to make any facility look like the pros. Photos courtesy of World Class Athletic Surfaces.

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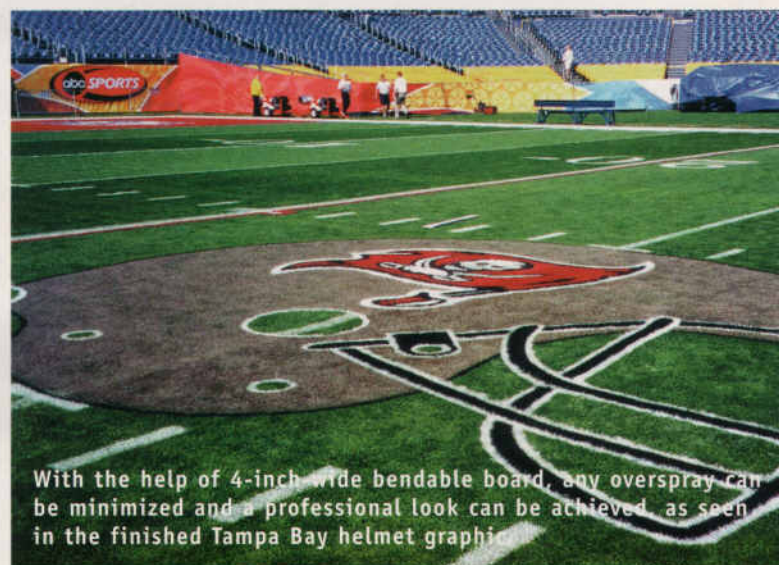
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The crew creates the Tampa Bay helmet graphic for the Super Bowl XXXVII field in San Diego.



With the help of 4-inch wide bendable board, any overspray can be minimized and a professional look can be achieved, as seen in the finished Tampa Bay helmet graphic.

In & On the Ground



Don Skeens, grounds director of Glynn County, Georgia Board of Education, has been using Game Day athletic field marking paints since 1995 on all of their athletic playing and practice fields. "For a field to look its best, the lines have to be bright and crisp, and the colors vibrant and true," says Skeens. "Game Day delivers custom colors quickly, on time, and matched perfectly to the team logos. The concentrated formula of 8010 Bright White allows us to dilute with water to achieve even better economies and to stay within our budget. The durability of the paint allows us to paint several days before our games, and the grass always grows back vibrant and healthy." Photos courtesy of Glynn County Board of Education.



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In & On the Ground

"We try to paint the field at Ohio Stadium twice before each game," said Brian Gimble, supervisor of grounds at Ohio State University. "We paint it the first time around Tuesday and a second time as close to game time as possible. We do this so that we know we will have something on the field no matter how bad the weather is close to game time. This schedule has to be flexible based on weather, team practices and everything else."

According to Gimble, lines get painted first. Markers around the field indicate where the lines go, so the crew can skip the ordeal of measuring the field out each time. The crew uses a string line that is held or nailed at each end and then paints the line with a walk-behind, battery-powered paint machine called the EZ-100. This part takes a trained and steady hand and is usually done by Gimble's full time assistants instead of the students. The lines are allowed to dry before starting any thing else.

"Dependent upon the weather our paint dry time is about 20-30 minutes," said Gimble. "We then lay down string lines to mark out where the numbers and hash marks go. Then our team of student employees move the stencils around. The stencils are placed into position and painted in with a 12-foot hose and wand attachment from the paint machine using Pro-Stripe paint. On back-to-back games we usually paint them with 4-inch and 9-inch rollers, assuming they are visible enough."

According to Gimble, the end zones and the Block O are painted last. These are initially laid out with stencils, but are painted with 4-inch and 9-inch rollers the rest of the season. When the team is away for two weeks or more, the crew paints the corners of the letters with spray paint and then re-measures them for accuracy before painting them out again.

"We have a lot of student help, so the rollers help the job to go really fast," Gimble added.



The crew at Ohio Stadium paints the second coat of the white border around Block O with a 4-inch roller using Pro-Stripe Super White.



The crew paints the end zones mid-season, being careful to keep straight lines. Photos courtesy of Whitlam Paint.



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Seahawks Stadium

a natural for soccer match

BY NATHAN ODGAARD

The United States' men's soccer "friendly" with Venezuela last March gave more than 17,000 spectators at Seahawks Stadium and a nationwide audience on ESPN2 a chance to see world-class soccer. But to Jay Warnick, the Seahawks' director of fields, the game's storyline was the performance of the natural grass playing surface and its improbable existence at the new stadium.

Less than 2 weeks before the exhibition soccer game, Seahawks Stadium was temporarily converted from an artificial to a natural grass field. West Coast Turf (WCT) installed 87,000 square feet of hybrid Bermuda sod over the stadium's FieldTurf. It was one of the few times that either Warnick or Greg Dunn of WCT knew of a natural grass field overlaying synthetic turf for an athletic event.

"I was very pleased," Warnick said following the game, a 2-0 USA victory. "Considering the weather, I think we did about all we could to effectively prepare and manage the field."

Frequent rain showers hampered the crew's ability to care for the newly laid turf as was planned, Warnick said. Tarps covered the field nine of the 12 days leading up to the game. As a result, Warnick noted, the field played a bit slick.

Overall, Warnick deemed the unique installation project a success in terms of safety, playability, and appearance of the field.

With the lack of "how to" information available on overlaying artificial turf with sod, Warnick turned to colleagues for input. At this year's annual meeting of the Sports Turf Managers Association, Warnick approached "anyone who would listen to me, and I asked them how they would do it and what issues

would come to their mind," he said.

He also talked with Stephen Cockerham, a superintendent of agricultural operations at the University of California, Riverside, who consulted on a similar project at The Meadowlands, where sod was installed over the artificial surface for a 1994 World Cup soccer match. Warnick took the input, which he said closely matched his preconceived notions, and ran with it.

"We did everything based on hypothesis," Warnick said. "There's no textbook to tell someone how to put natural grass over an artificial field, and doing it in Seattle in March . . . we definitely learned as we went along."

The team foresaw numerous challenges so they conducted a litmus test in early March, installing a 3,000 square foot test plot of sod and studying the intricacies of the project. Many of Warnick's questions about the installation project were answered that day.

Among the challenges was selecting the right sod. The test plot helped determine the appropriate thickness of sod, which was laid in 42-inch wide strips. WCT installed strips of sod with three different thicknesses, 1 1/8 inch, 1 1/4 inch and 1 1/2 inch. Warnick and Dunn agreed that the 1 1/8-inch thick sod with a split 42-inch seam would be the most consistent, uniform, and stable for the game.

Based on WCT's recommendation, Tifway II Bermuda grass was chosen for its durability and rhizomes. The sod was overseeded with Chaparral ryegrass, which provides a deep green color and is highly tolerant of all weather conditions. Though a warm-season grass, the Bermuda performed well in the cool,



rainy climate.

"Bermuda grass is ideal for soccer matches," Dunn said. "Because of the tightly packed leaves near the soil surface and the incredibly dense root system, the sod provides excellent footing and a cushion-like feel." An initial post-game analysis showed that "the field played extremely tough," Warnick said.

Another challenge was protecting the FieldTurf. The test plot helped Warnick determine the best material for protecting the FieldTurf and holding the sod in place. Two layers of material were placed between the two to protect from soil and water contamination: a tarp and a geo-textile fabric. After a few crewmembers laced up cleats and simulated the stop-and-go action of a soccer player on the sod, they determined that the woven fabric better prevented shifting.

WCT installed the sod, which covered more than 78 x 123 yards, and finished March 20, giving the field's crew time to take care of any maintenance issues. The crew had to strike a balance by keeping tarps over the field to keep it dry, but also by pulling the tarps off to allow the field to breathe.

Drainage was another issue. The field could handle a slight amount of rain but without a soil base, there was nowhere for it to drain. The water would soak through the sod and sit on the fabric covering.

With the sod's saturation point only 1/2 inch, the frequent rain showers posed problems. While the field was covered most of the time, at every opportunity the maintenance crew uncovered the turf.

The maintenance crew for Safeco Field, the Mariners' home field that sits next to Seahawks Stadium, got into the act. Just 3 days before the game, Warnick decided to keep the tarps off overnight. Realizing that heavy rain was closing in, the Mariners crew helped Warnick's crew cover the field in the middle of the night.

While extensive rain posed a threat to the health of the sod, it also made it difficult for the stadium crew to maintain a mowing schedule and prepare the field for game day. The crew worked in between rain showers to mow and paint the parameters of the field.

So why go to the trouble of installing a natural grass field over a quality synthetic surface? Only 2 years old, Seahawks Stadium was built not only for the Seahawks, but also to serve as a world-class soccer facility. And such facilities must have natural turf to accommodate international soccer. The stadium is hosting a Manchester United-Celtic FC exhibition game July 22, though it hasn't been determined at press time whether sod or the FieldTurf will be used.

"We learned a lot from our experiences," he said. "There's not much you can do about the weather. Next time, I think we can make two or three small adjustments and take it to an even greater level."

Editor's note: After the game, First & Goal, owners of the Seahawks, donated the sod to the Mukilteo School District in the Seattle area, Warnick said. It will be used to renovate a multi-purpose athletic field and to replace worn hash marks and other areas on fields throughout the district.

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Nathan Odgaard is a public relations associate with Swanson Russell Associates, Lincoln, NE, 402-437-6400. Photos courtesy of West Coast Turf.

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