Crumb rubber improves field wear tolerance

By Matthew Goddard and Dr. John Sorochan

Athletic fields are exposed to some of the most intense traffic conditions of any turfgrass environment. In many cases, frequently used fields encounter injury beyond their ability to recover. In this situation, loss of an actively growing turfgrass surface can result in bare areas that affect the playability of the field.

Athletic fields require a turfgrass species that can withstand traffic and recuperate from wear. In cool-season environments, Kentucky bluegrass (KBG) and perennial ryegrass are the species of choice. Conversely, bermudagrass is used extensively in warm-season environments. This presents a problem for turfgrass managers in the transition zone region of the country where no turfgrass species is ideally suited for growth. Regular use can take its toll on athletic fields. As traffic continues, wear patterns can develop, especially if the turfgrass cover has entered winter dormancy and no longer actively growing.

Crumb rubber is a product made from recycled automotive tires. Past studies have shown that topdressing crumb rubber over actively growing turfgrass can improve wear tolerance and prolong the playability of these fields. Our objectives were to determine the wear tolerance of four turf grasses in the transition zone with and without crumb rubber topdressing under simulated athletic field conditions, and to determine if improved cool and warm-season turfgrass species can be used for transition zone athletic fields.

To test this, four different turfgrasses, Tifway hybrid bermudagrass, Riviera and Quickstand bermudagrasses, and Thermal Blue hybrid Kentucky bluegrass were evaluated with and without crumb rubber topdressing to determine the wear tolerance of each species under simulated athletic field traffic in the transition zone. In this area, bermudagrass is often used on athletic fields because of its wear tolerance and recuperative potential. These attributes make Tifway hybrid bermudagrass a good choice for athletic fields, but cost and cold tolerance limit its use in the transition zone. Riviera bermudagrass is an improved common bermudagrass cultivar that is similar to Tifway bermudagrass in density and overall quality. In addition, it has greater cold tolerance and can be established from seed, but wear tolerance and recuperative potential of Riviera had not been determined.

One of the issues concerning the use of bermudagrass in the northern parts of the transition zone is the loss of color and active growth as it enters winter dormancy in the fall. To account for this, sports turf managers often overseed to provide an actively growing turfgrass cover throughout the fall athletic season. Unfortunately, overseeding is not an option for all athletic fields due to budget limitations. As a result, these athletic fields are subjected to significant wear during periods when active growth does not occur.
Recent advances in turfgrass breeding efforts have introduced new turfgrass cultivars that have potential for use in transition zone athletic fields. Most KBG varieties do not perform well in the transition zone due to a lack of tolerance to heat, drought, and disease. Texas bluegrass (TBG), mainly a forage grass, demonstrates higher levels of heat and drought resistance relative to KBG, but has poor turfgrass quality. Thermal Blue is a hybrid of these two species and possesses genetic traits from each species allowing it to survive the hot, humid summers of the transition zone and provide an actively growing turfgrass surface during the fall athletic seasons.

To test these turfgrasses under simulated athletic field wear, the Cady Traffic Simulator (CTS) was used. The CTS is a walk-behind Jacobsen core cultivation unit with artificial feet to simulate athletic wear. Two passes with the CTS is designed to generate wear equivalent to that sustained during a football game between the hash marks and the 40-yard lines.

The four turfgrass species were subjected to 1 (low traffic) or 3 (high traffic) simulated games per week. Timing of traffic applications was established to mimic fall high school football schedules. Plots receiving crumb rubber topdressing had improved turfgrass cover at the end of the season than those not receiving crumb rubber topdressing.

Crumb rubber proved to significantly reduce the amount of wear sustained during traffic events. All plots receiving crumb rubber treatments had improved turfgrass cover at the end of the season than those not receiving crumb rubber topdressing.

Results

Hybrid bluegrass (HBG) retained its color and provided an actively growing turfgrass surface after bermudagrass plots had entered winter dormancy. Riviera and Tifway bermudagrasses were more tolerant to wear than Quickstand. Quickstand consistently ranked lowest in percent cover, which shows that Riviera, Tifway, and HBG are better suited for athletic fields. Crumb rubber proved to significantly reduce the amount of wear sustained during traffic

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Dear Editor,

Re the article by Chris Harrison on “Alternative fuels power next wave of equipment” (Jan. ’08, p. 40): Mr. Harrison states that “Emissions from bio-fuels and biodiesel blends are lower than petroleum-based diesel fuels making them more environmentally friendly.” This statement is totally false.

In fact, bio-fuels (ethanol) and biodiesel often burn less efficiently and pollute more than most petroleum-based fuels. This type of “Al Gore” reporting that selectively ignores data that shows these fuels, while being an alternative to petroleum-based fuels and lessening our dependence on foreign oil, are not always cheaper or cleaner. The additives that have to be put into the biodiesel fuel tanks, to keep it from growing bacteria, are even worse at polluting the air when it is burned.

Mr. Harrison should have checked the facts (all the facts) instead of writing a “sexy green” article that gives many in our industry incomplete information. I am all for lessening our dependence on foreign oil and being good stewards of the environment, but let’s be wise in how we do it. It is not a quick fix, and this type of article fuels the fire that the “feel good” fix is just around the corner, and does not address the economics. [For example] the installation of an underground, 500-gallon biodiesel storage tank, if a permit can be obtained (currently Los Angeles County will not issue any permits for biodiesel storage tanks) costs a minimum of $50,000. These costs, plus the current information coming from several fleet managers who are now seeing more frequent servicing on equipment using biodiesel, should make us all “look before we leap.”

Richard Farmer, Manager, Landscape Services
California State Polytechnic University
Pomona, CA
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