

# Overseeding bermudagrass fields on the north edge of the transition zone

**B**ERMUDAGRASS is widely used in southern and transitional zones of the United States for athletic fields. Its popularity is due to its recuperative potential via aggressive stolons and rhizomes and tolerance to heat, drought, and low ( $\leq 1$  inch) mowing. With improved cold hardiness in seeded and vegetative cultivars, bermudagrass has been pushed to the northern edge of the transition zone. The major drawbacks of use in more northern climates are the possibility of winterkill and an extended dormancy period that results in a straw-brown appearance that can last from

first frost in the fall until soil temperatures at a depth of 4 inches rise above 50°F; this is usually late May to early June in the northern transition zone.

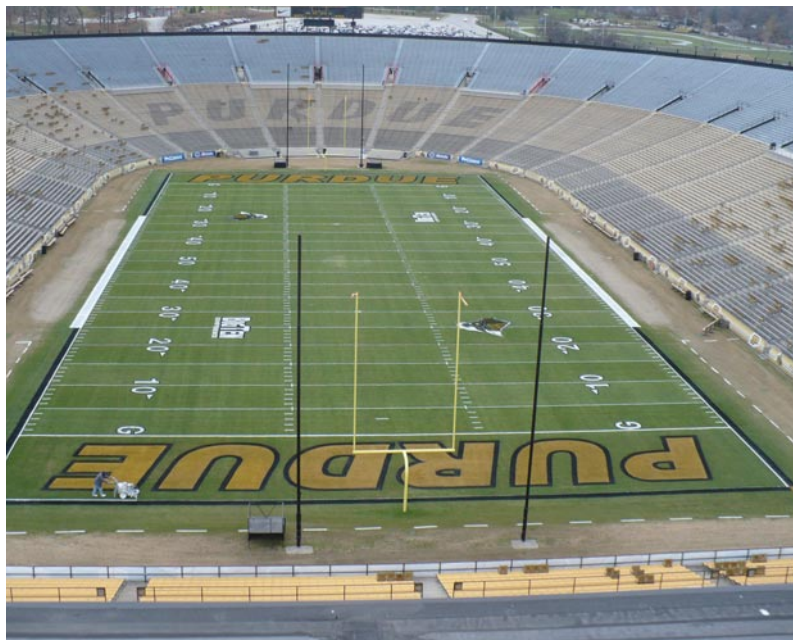
To overcome this, turf managers routinely overseed bermudagrass athletic fields with a cool-season ryegrass mixture in late summer/early fall to achieve year-round color and improved aesthetic quality. Although dormant bermudagrass can withstand considerable traffic, overseeding can improve resiliency and performance under intense use.

Overseeding bermudagrass also has its disadvantages. From an agro-

nomic standpoint, overseeding is basically growing two types of plants with different management requirements in the same location. Ryegrass out-competes the dormant bermudagrass for light, nutrients and water throughout the fall, winter and transition period in the spring. Another potential disadvantage is scheduling the overseeding within the optimum planting window without interfering with play on the field. Overseeding too early in the fall reduces establishment of the ryegrass seedlings due to the competition with bermudagrass and the possibility of disease, whereas overseeding too late hampers establishment because of reduced germination and seedling development in suboptimal temperatures.

Although the majority of literature is geared toward the golf course industry, recommendations for overseeding rates of perennial ryegrass (PRG) range anywhere from 12 to 15 pounds pure live seed/1000 ft<sup>2</sup>/year for southern athletic fields. These recommendations were found to be very inefficient in the colder climate when they were followed the first year (2006) we had bermudagrass at Purdue University's Ross-Ade Stadium. In addition, while several of the studies evaluated the effect of seeding rates when planted on a single date, little research had been conducted evaluating the impact of multiple overseeding events into bermudagrass turf. The objectives of this study were to determine optimum perennial ryegrass seeding rates for overseeding bermudagrass athletic fields in the northern transition zone and to determine if multiple seeding events improved overall (PGR) establishment compared to a single seeding event.

**>> THIS PHOTO OF ROSS-ADE STADIUM** at Purdue was taken right before the last home game, November 20, 2010. The field has bermudagrass from wall to wall but is overseeded only inside the media lines; see the contrast of overseeded vs. non-overseeded.



## STUDY DETAILS

The study was conducted at the Purdue University varsity football practice complex in West Lafayette, IN, which is in the USDA Hardiness Zone 5a, approximately 220 miles north of zone 6a and 6b, which could be considered the transition zone between cool- and warm-season turfgrass adaptability. This site was selected because it provided a moderate amount of wear from the football team while practicing four times per week from August to November. The test plots were located just outside the hash marks in an area where the defensive backs ran their daily drills ensuring that each one received similar traffic. This gave us a more practical understanding of how the overseeding would respond to wear, rather than using the standard cleat simulator.

The field was originally sodded with Patriot bermudagrass in June 2006 and subsequently overseeded with Riviera bermudagrass in May 2007 after approximately 70% turf loss resulted from winterkill. This was a 2-year study that consisted of three application strategies and five seeding rates. Seeding rates of the perennial ryegrass blend were 12.5, 25, 50, 75, and 100 pounds/1000 ft<sup>2</sup>/year pure live

seed. Application strategies included applying 100% of the total seed in one application (100), 70% of the total seed in the initial application plus 10% of the total in each of three successive applications 10 days apart (70/10/10/10), or 25% of the total seed applied in four events applied on ten day intervals (25/25/25/25). Before seeding, a flexible steel drag mat commonly used for baseball infields was used to open the bermudagrass canopy, as opposed to verticutting. We found that verticutting a football field in the northern climate before the start of the season weakens the stability of the bermudagrass, essentially setting up the possibility of field failure. This is due to the shorter window for bermudagrass growth, where our fields typically do not reach 100% coverage until mid- to late July.

It is possible verticutting would be an acceptable practice on a baseball or softball field where there is less demand on the turf. Initial seeding dates for both locations were 24 August 2007 and 25 August 2008. Plots

were lightly topdressed with rootzone sand after each seeding and brushed into the turf canopy with a stiff bristled broom.

## RESULTS

Perennial ryegrass coverage rarely increased at seeding rates higher than 50 pounds/1000 ft<sup>2</sup>/year regardless of location, seeding strategy, or rating date. The 12.5 pounds/1000 ft<sup>2</sup>/year seeding rate consistently produced the lowest coverage in this study and would not be recommended, but 25 pounds/1000 ft<sup>2</sup>/year was occasionally amongst the top grouping for PRG coverage in this study. The seeding strategy of 25/25/25/25 consistently produced the most PRG coverage, nearly 20% greater than that from the 70/10/10/10 and nearly 50% greater than that from the 100 strategy. This could be due to the fact that both the 25/25/25/25 and 70/10/10/10 strategies introduced PRG seed on more than one occasion to counteract the seedling mortality from disease and cleat traffic.

Another interesting discovery from this study was when disease conditions were favorable, any one time seeding amount that exceeded 25 pounds/1000 ft<sup>2</sup>, resulted in high disease activity. Therefore, based on this study, it is recommended to seed a total of 50 pounds/1000 ft<sup>2</sup>/year in four equal applications 10 days apart to maximize PRG overseeding coverage on bermudagrass athletic fields in the far northern transition zone. Ultimately, it will be your budget and level of maintenance that determines the total amount of seed you apply at your facility.

For a more comprehensive look at this study, see “Strategy and Rate Affects Success of Perennial Ryegrass Overseeding into Bermudagrass Athletic Fields Located on the North Edge of the Transition Zone” in the *Applied Turfgrass Science Journal*. ■

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