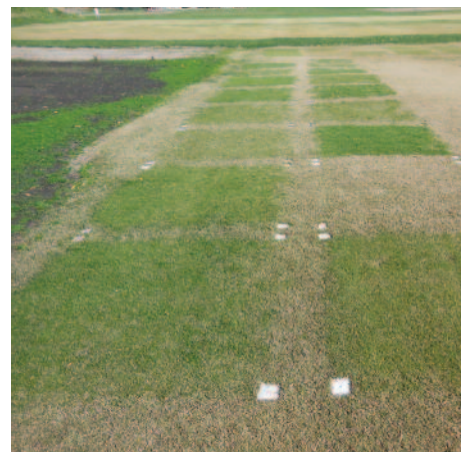




► PURDUE UNIVERSITY'S Boilermaker soccer complex.



Winter overseeding athletic fields update: 2013

▲ **Top: OVERSEEDING** is largely for cosmetic purposes but the cool-season grass also provides some wear tolerance and recovery.

▲ **Bottom: ANNUAL RYEGRASS**, left, compared to perennial ryegrass, right.

BERMUDAGRASS provides one of the best playing field surfaces throughout many parts of the United States. When properly maintained it forms a uniform, dense, attractive and durable turf. Its strengths are that it readily tolerates close (< 1") cutting heights resulting in a "fast" surface players and coaches like. During the warmer months of summer it is a fast grower. This provides wear tolerance and rapid self-repair of divots from creeping rhizomes and stolons. This dense matrix of stems and roots also provides surface stability, good traction characteristics and an overall stable base for footing.

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Like all grasses, it is not perfect, and there are negatives. Being a warm-season grass, active growth slows as the days shorten in late-summer or mid-September. As the first hard frosts of autumn approach, bermudagrass begins to lose its vibrant green color and it slowly turns to a golden straw-brown color. In addition to this color loss, rapid growth stops resulting in decreased wear tolerance and less rapid recovery.

Probably one of the biggest weaknesses and one that limited wide-spread adoption in prior decades was the risk for severe winter-kill. Turf

managers were reluctant to use a grass that "might" need replanting each year. With the development of very winter hardy cultivars and the ability to rapidly establish bermudagrass from seed, it is now used in many areas where it once was never considered.

To offset some of the aforementioned negatives and to satisfy the public's desire for green grass "all the time," bermudagrass field managers often overseed with a cool-season grass. Overseeding is largely for cosmetic purposes but the cool-season grass also provides some wear tolerance and recovery in trafficked and heavily divoted areas. In recent years many different overseeding strategies and philosophies have emerged. The purpose of this article is to highlight and share some of these thoughts and considerations.

WHAT TO PLANT?

Historically, the grass of choice for winter overseeding has been the ryegrasses. This group includes annual, perennial and "inter-



▲ **OVERSEED** species competing with bermuda during spring transition.



▲ **UP-CLOSE VIEW** of a ryegrass seed germinating.

mediate” ryegrasses. The ryegrasses have a large seed size, with significant endosperm (food reserves), which helps them germinate fast and mature quickly when planted under ideal conditions. Generally, most managers select and plant good quality perennial ryegrasses for winter overseeding, especially where they plan to chemically remove the overseeding. There are, however, alternatives that can be considered.

Annual ryegrass is one of the options among the ryegrasses and appears to be attractive from a price point, 25-40% less than a high quality perennial ryegrass. Most annual ryegrasses tend to form a lower quality turf than the perennial ryegrasses, even when well established. Many people do not like the light-green/yellow-green color and the turf may be prone to becoming “stemmy” with poor mowing quality/leaf shredding. Lastly, annual ryegrass is sensitive to harsh winter conditions and will die quickly with the onset of summer heat, making it somewhat unreliable. Although breeders continue to improve and advance this grass, it may best be left for use in places where appearance is not paramount like utility lawns.

Some researchers have been evaluating the tetraploid ryegrasses for overseeding with some success. These ryegrasses are sometimes referred to as “intermediate” ryegrasses and have turf quality characteristics similar to the perennial ryegrasses but their heat tolerance is not very good, somewhat similar to an annual ryegrass. This lack of heat tolerance helps as the turf stand transitions back to bermudagrass during late-spring without the need for chemical transitioning.

What about other species and options? Turf breeders continue to advance all species with the help of feedback from turf managers and desirable characteristics. In some parts of the country I have heard of managers exploring the incorporation of Kentucky bluegrass into their bermudagrass. The goal I am told, is to create a polystand of warm and cool-season spreading, self-repairing grasses that would ebb and flow throughout the growing season. This mixture of bermudagrass and bluegrass might allow for greater intense use across all seasons, spring, summer, autumn, while providing moderate green color all season without a need to overseed/interseed. This technique has not been well evaluated in research trials and it is possible that over a period of years the turf could become very patchy due to segregation. This approach may have some merit where appearance is not paramount and is not a suggested option for stadium fields.

The turf-type tall fescues are another

species that has not been well explored, particularly the very narrow leaved ones. The seed size of tall fescue is similar to perennial ryegrass and germination, emergence and establishment is about the same, but ever so slightly slower. Further, with some of the new turf-type tall fescues the visual (color/density) and mowing characteristics are similar to perennial ryegrass or a Kentucky bluegrass. One advantage to using tall fescue is it is not quite as susceptible to gray leaf spot compared to perennial ryegrass. Tall fescue does, however, have very good heat and drought tolerance and would need to be chemically removed the following spring.

The final point I should make is to remember, like anything, you get what you pay for! Purchasing a higher quality ryegrass that germinates quickly and has good turf characteristics (color, leaf texture, density) would in most circumstances be preferred over a less expensive species that has poor seed quality. These less expensive, lower quality seed lots tend to have a greater potential for annual bluegrass (*Poa annua* L.) contamination and that introduces a whole group of other future problems.

HOW MUCH SEED?

If you look up published seeding rates for any grass species the values are normally based on the assumption that you will be seeding on bare soil with the intended purpose of an ornamental lawn, etc. As we all know athletic

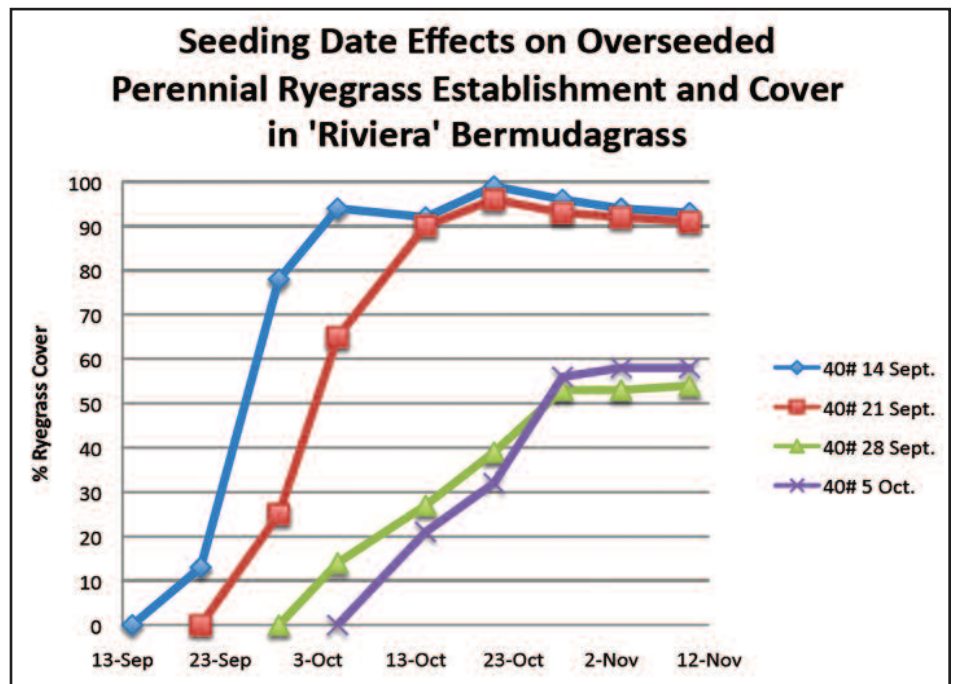


Figure 1

fields serve a very different purpose than an ornamental lawn. The sometimes intense traffic, particularly in concentrated areas like between the hashes, sidelines, goal mouths, and field entry/exit points along with the mechanical forces involved in close mowing and foot traffic, can be a harsh environment for a turfgrass seedling to develop and survive. As one of my colleagues has said, the adage “more is better” bears some truth when it comes to winter overseeding, and I agree.

For athletic field overseeding, it is recommended that the seeding rates be double or many times more than normal, simply because a great deal of seedling mortality is expected. For example, a common seeding rate for perennial ryegrass on bare ground is about 5 pounds of seed per 1000 ft² or 220 pounds per acre. For general overseeding purposes a rate of 2 to 4 times as much or 400 to 800 pounds per acre is not uncommon. Without these higher seeding rates you risk producing an overseeded turf that may have a patchy appearance. This can be worse than not overseeding at all.

For overseeding on American football fields used at the collegiate and professional level it is not uncommon to use extremely high rates, doubling those aforementioned rates to 1500-1600 pounds per acre. Some of our research at Purdue on winter overseeding indicated that these very high rates, 40-50 pounds per 1000 ft² or 1600 pounds per acre, appear necessary if the goal is to produce a dense, closely mowed turf that will persist. Remember, these fields are subject to very intense traffic compared to soccer, etc. The athletes at this level are larger, more aggressive in the way they move on the field, and basically there is much more potential for large divots. Compounding the overseeding challenge for us in north central Indiana is that we have a very short window to achieve good establishment. Thus, the strategy is seed heavier early, then top off the stand throughout the season. Remember, if these very high seeding rates are used you will most certainly be considering chemical removal if you want the bermudagrass turf to fill back in quickly the following spring.

The other consideration is that if you are using these extremely high seeding rates it is important to regularly scout for disease. If an “Indian summer” persists resulting in prolonged late-summer heat and humidity these seedling diseases will be more of a concern. Loss during late-season establishment can re-

ally set back any overseeding program. You should have appropriate plant protectants available for either preventative or curative control. It is also important to at least be aware and scouting for potential seedling mortality from gray leaf spot. This disease is a very real concern wherever ryegrass is planted and can be particularly devastating to seedling ryegrass. The symptoms are very similar to drought stressed turf, so keep a watchful eye.

WHEN TO PLANT?

The ideal time to plant cool-season grasses for optimum germination and the fastest establishment is late-summer through early to mid-fall. The most important factors affecting overseeding success are sustained soil temperatures and seed-soil contact. Rather than put a hard and fast planting date on overseeding, some published guidelines suggest monitoring air and soil temperatures. For example, some books suggest initiating overseeding when night-time temperatures are consistently around 50F or soil temperatures at 4 inches are in the mid 70'sF. These are good guidelines and in many cases it is probably better to be slightly

early than too late when initiating overseeding.

A suggested planting date or monitoring soil temperatures can be a bit of a moving target and sometimes as a field manager you are stuck with a seeding window dictated by field use schedules. If you have a choice, starting earlier is highly suggested and then topping off throughout the rest of the season. This is particularly true if you are pushing the northern edge of growing bermudagrass in the transition zone. One thing I have learned is that the farther north you are, it is amazing how quickly the soil temperatures can drop and limit establishment success. We have been evaluating perennial ryegrass overseeding dates and it continues to surprise me how much of a difference even a few weeks makes once you get into late-September in West Lafayette. It is essentially the difference between achieving roughly 90% ryegrass versus 60% when planted the last week of September or the first week of October, even at a very high seeding rate, 40 pounds of seed per 1000 ft² (Figure 1).

Continued on page 44

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Also, remember it is one thing to germinate the overseeded grass; it is a whole other process to get it to establish enough to actually tolerate traffic and persist. You can always add a bit more seed to touch up worn/thin areas but you can never go back and regain the warmer days and longer period of sunlight that might be lost due to a late start. Some managers have used germination blankets and field covers to help later in the season but those are not ideal solutions compared to the natural growing conditions Mother Nature provides in September and early October.

Lastly, if you plan for only one seeding date, then it is advisable to make sure you seed in two directions, seeding the borders with a drop spreader (if you want a nice crisp edge) and the interior can be planted with a drop or broadcast spreader.

TO CULTIVATE OR NOT?

This is a highly debatable question when it comes to overseeding preparations. The research in this area is inconclusive but almost never negative in terms of overseeding success or bermudagrass survival. Remem-

ber, seed soil contact is a critical factor for success. Where excess thatch is not an issue, many turf managers have had good success with broadcasting seed and then following with moderate sand topdressing and dragging the seed/sand into the canopy with a drag implement (flexible drag, brush, etc.). Otherwise, a cultivation/coring about 2-3 weeks before the intended initial overseeding event is advisable.

GOING BACK TO BERMUDA?

Managers of bermudagrass fields work hard to get back to nearly 100% bermudagrass, at least for part of the summer. This will help ensure a good bermudagrass base and better overall long-term field performance. Thus, a grass species that transitions easily or the use of chemical transitioning herbicides is recommended. This topic, however, is a whole article in itself. ■

Cale Bigelow, PhD, is an associate professor of agronomy for the Purdue University Turf Science program.



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