Tackling the challenges of overseeding and transitioning

By Dr. Shawn D. Askew

Who is the most unruly taskmaster in the athletic complex? Is it the athletic director, the coach, the fans, or the players? The correct answer is time. Time never yields and is always demanding. It never gives you enough and takes from you constantly. It demands pinpoint accuracy from you and does not care that you dodge things like weather, sporting events, and sickness.

Much is asked of the sports field manager and, unfortunately, much of what you do has little to do with taking care of grass. So when you are doing things to keep the field green, it is of utmost importance that your actions count; that you make a difference. Of all the things done to keep a playing surface in great shape, few are more important than overseeding; especially for fields including warm-season grasses like bermudagrass. On warm-season fields, your success as a field manager is measured in large part by your success in establishing and managing overseeded grass.

We often talk about "the transition" as if there were only one transition associated with overseeded game fields: the spring transition. In fact, there are two transitions, one in the spring and one in the fall. When you are trying to establish an overseeded grass in the fall, you are transitioning from a bermudagrass monoculture to an overseeded stand. In the spring, you want to eliminate the overseeded grass to preserve the health of the bermudagrass underneath. Unfortunately most game fields experience use during at least one of these transitions.

Into dense bermuda

In years past, establishing ryegrass or other appropriate grasses in the fall was not very difficult. It seems now that our quest to select bermudagrasses with extreme wear tolerance and increased density is

[Figure 2] Patriot bermudagrass canopy showing mass of stolons and thin layer of leaves on top.

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causing difficulties with establishing overseeded grasses in the fall.

Patriot bermudagrass has been widely successful in the northern states due to its density, wear tolerance, and cold tolerance. One of the largest problems facing those who adopt Patriot for their game fields is difficulty in establishing perennial ryegrass in the fall. The canopy architecture of Patriot has not been scientifically compared to previously existing cultivars but close observation reveals several differences. Patriot's density seems to come predominately from stolon mass and not leaf mass (see Fig. 1). Patriot had more than twice the biomass of Midiron due to a higher percentage of stolons. Starch content per unit stolon weight was actually higher for Midiron because Patriot's stolons were smaller (data not shown). Patriot tends to have a densely packed canopy of small stolons with a layer of leaves on the surface (Fig. 2). In contrast, most other bermudagrasses have leaves throughout the canopy and much lower stolon mass.

The increased stolon mass and canopy architecture of Patriot likely give the grass its superior wear tolerance but is also responsible for increased scalping problems when mowing is delayed and for decreased perennial ryegrass establishment in fall. Research is currently underway to characterize methods that will aid in the establishment of overseeded grasses into Patriot and other dense bermudagrasses. Although the data are not in, the following are techniques that we plan to test at Virginia Tech to help solve the establishment problem:

Verticut and open the canopy. Field managers in the Deep South are accustomed to cutting or slicing the field in several directions to aid in perennial ryegrass establishment. In the North, winterkill is more of a concern and the practice is less common. At Virginia Tech, we have verticut Patriot up to four directions before overseeding and have not had problems. More research is needed to thoroughly test the procedure.

Use a plant growth regulator or suppression chemical. Products like Primo Maxx (trinexapac ethyl) can be applied to bermudagrass until emergence of the overseeded grass. Other growth regulators like Cutless (flurprimidol), Trimmet (paclobutrazol), and Embark (mefluidide) may be injurious to perennial ryegrass seedling emergence. Turflon Ester (triclopyr) can also be used for more aggressive bermudagrass suppression but may be too aggressive against bermudagrass and injurious to seedling establishment. Consult the label to determine restrictions on seeding after treating with any suppression chemical.

Use a spiker to force seed through the canopy. Any piece of equipment that can safely move the perennial ryegrass seed down to the soil is beneficial to overseeded establishment. We have even used blowers for this purpose. Several Patriot fields have had problems where overseeded perennial ryegrass germinates in the middle of the Patriot canopy. Although perennial ryegrass roots can find the soil even if the seed are lodged between bermudagrass stolons, any wear on the field quickly severs these roots, killing the perennial ryegrass. Topdressing the field with sand or other materials could also help in survival of these "midcanopy" seedlings.

Use paint to keep things green. In addition to winterkill, a second problem with aggressive disruption of the bermudagrass canopy is decreased turf aesthetics. Even folks who don't like using paint might consider the use during this transitional period. After the perennial ryegrass is established, the need for paint will diminish. By the way, paint is an excellent alternative to overseeding on dense bermudagrass fields and should be considered depending on how aggressive the field is used and the expected turf quality during the dormant season.

Use covers to keep things green. Dr. Mike Goatley at Virginia Tech has conducted several experiments demonstrating the ability to keep bermudagrass green during winter using turf covers. Depending on your playing season, turf covers could be an excellent method to keep fields looking good during the winter. By keeping turf paint on hand as a "backup," you may be able to go at it alone with just bermudagrass.

Killing the overseeded grass

About the time your overseeded perennial ryegrass reaches a perfect stand and the field is striping nicely, it is time to kill it to release bermudagrass that is breaking dormancy. Bermudagrass needs 85 to 100 days of competition-free growth to sustain maximum density and health. It is important that the overseeded grass be eliminated as soon as possible in the spring. In the Deep South, simple cultural practices such as lower mowing, increased fertility, and decreased watering will do nicely to aid bermudagrass in overcoming and killing the existing cool-season grass. These practices help in the North, but herbicides must be used due to lack of harsh climate and shorter bermudagrass growing season. There are several new herbicides in the sulfonylurea class of chemistry that

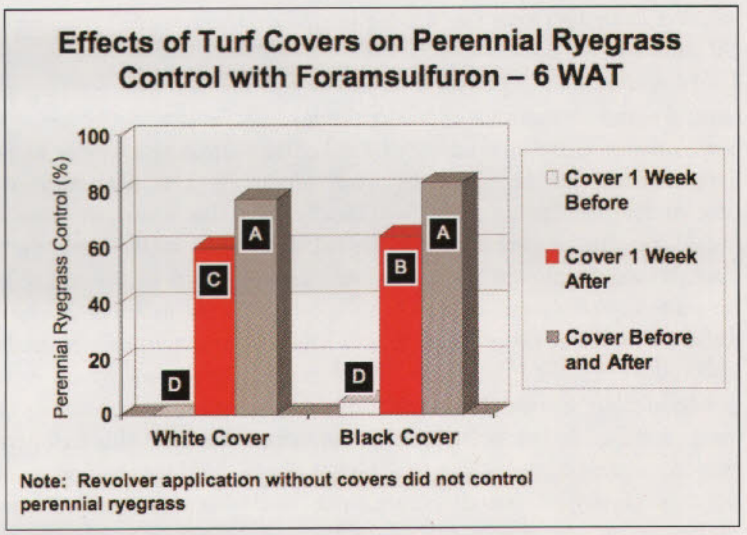
[Figure 1] Dry biomass of aboveground foliage from Patriot and Midiron bermudagrass as affected by the number of competition-free days the bermudagrass was allowed to grow in Blacksburg, VA.

are available to chemically transition overseeded game fields (see Fig. 3).

Plots were treated weekly at Virginia Tech with Revolver (foramsulfuron), Monument (trifloxysulfuron), and Flazasulfuron 25DF, an experimental herbicide from ISK biosciences, to determine effects of environment on herbicide efficacy for perennial ryegrass control. Of these, Revolver has the market share due to excellent bermudagrass safety, reduced restrictions on seeded bermudagrass, and excellent perennial ryegrass control. Monument is an excellent choice and provides superior perennial ryegrass and annual bluegrass control. Manor can be hit and miss for perennial ryegrass control and is less effective for annual bluegrass but still performs excellently for a large sector of the market, especially in the South.

Tranxit GTA (rimsulfuron) is also an excellent herbicide for perennial ryegrass control at rates of 2 oz/A or better. Kerb (pronamide) is an older herbicide that gives a smooth transition in the South but often fails to completely control perennial ryegrass and annual bluegrass in the North.

Several complaints of poor perennial ryegrass control have been received from patrons who used sulfonylurea herbicides in winter. Since it seemed these control failures were related to temperatures, we conducted studies last year to evaluate temperature influence on three sulfonylurea herbicides (Revolver, Monument, and Flazasulfuron 25DF. These herbicides were applied at labeled rates each week for 17 weeks. Environmental conditions including soil and air temperature, solar radiation, photosynthetically active radiation, leaf wetness period, and soil moisture were recorded at hourly intervals with weather stations at each site (Fig. 4).

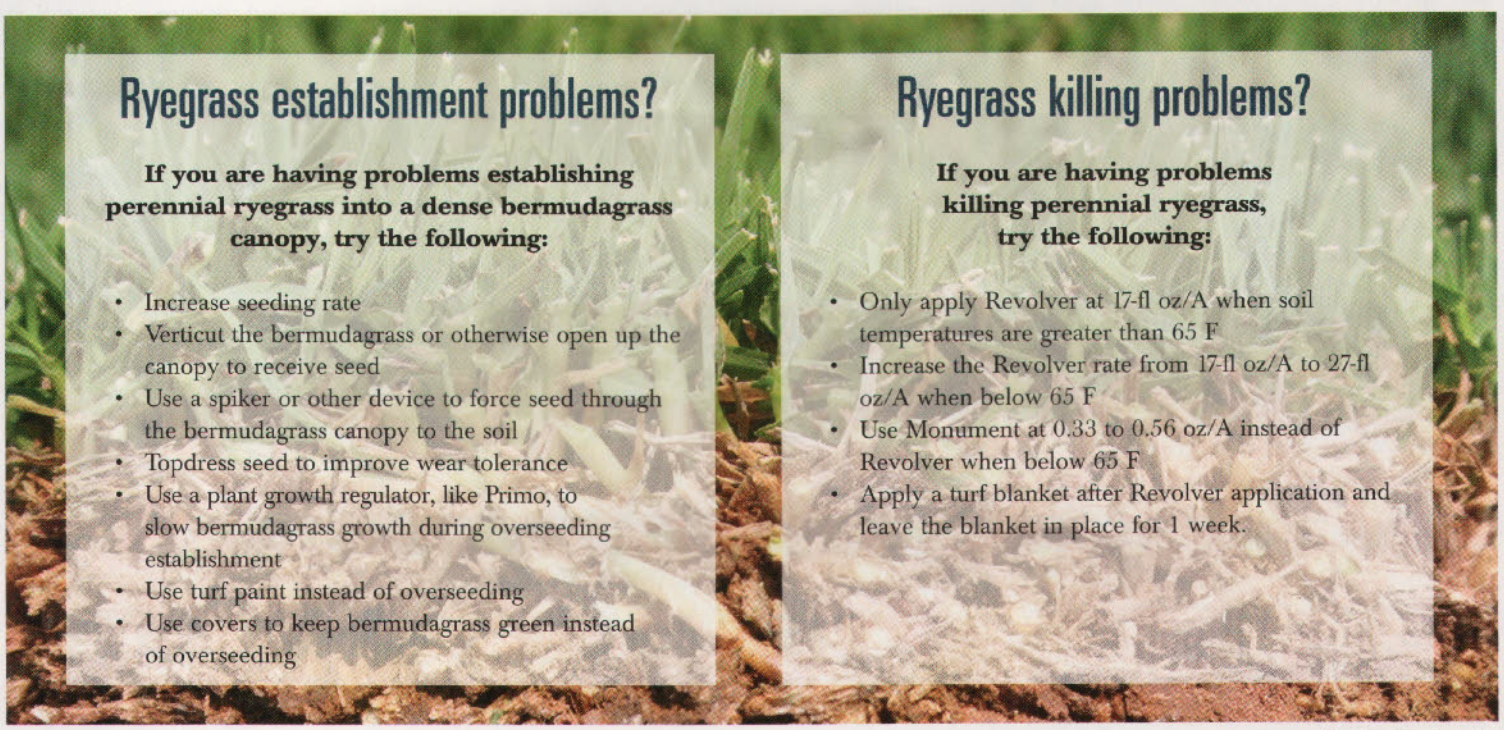


[Figure 3] Plots were treated weekly to determine effects of environment on herbicide efficacy for perennial ryegrass control.

Temperature effects on efficacy

Soil temperature was the most influential environmental influence on perennial ryegrass control with the three herbicides tested. Cold temperatures negatively impacted Revolver more than Monument or Flazasulfuron 25DF. Perennial ryegrass control 9 weeks after treatment by Monument was not correlated to temperature and tended to be inconsistent at both high and low temperatures. Revolver tended to control perennial ryegrass consistently when average soil temperature for 5 days before and after treatment were 65 F or higher. Despite some inconsistencies, Monument controlled at least 70% of perennial ryegrass 65% of the time when temperatures were below 65 F and 67% of the time when temperatures were above 65 F.

In contrast, Revolver controlled perennial ryegrass equivalently only 10% of the time at temperatures below 65 F and 88% of the time when temperatures were above 65 F. In short, Monument is more effective than Revolver when average temperature is below 65 F.



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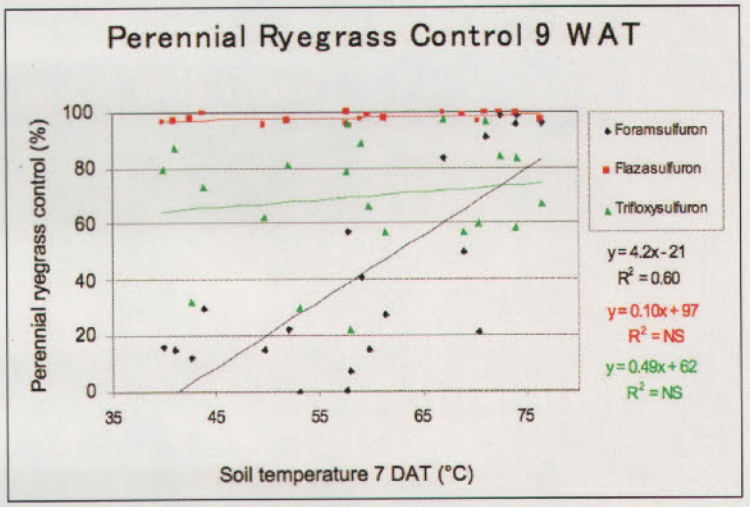
Flazasulfuron 25DF is not currently registered for use on game fields but may be soon. This herbicide controlled all of the perennial ryegrass 100% of the time, regardless of temperature.

Several things may cause poor herbicide performance. Let's examine a few other reasons sulfonylurea herbicides like Monument and Revolver may perform poorly:

- Did not use an adjuvant
- Rainfall soon after treatment
- Turf was mown soon after treatment
- Target weed is stressed due to heat, drought, disease, etc
- Mixing and calibration errors
- Poor water quality (hard water, or pH 2 units above or below 7)
- Large weeds and/or bermudagrass is not competitive

John B. Willis, Research Associate and Graduate Student, Virginia Tech, established and maintained most of the research trials discussed in this article. His efforts have made and continue to make substantial impact in the turfgrass community. Dr. Mike Goatley, Associate Professor of Turfgrass Science, Virginia Tech, provided valuable insight for the writing of this article. David McKissack, Kevin Hensler, Brent Compton, Matt Goddard, Matt Page, Andrew Monk, and Julie Keating provided technical assistance for research trials. The contributions of these individuals are much appreciated. ■



[Figure 4] Perennial ryegrass control with three sulfonylurea herbicides as influenced by soil temperature in Blacksburg.

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