



Improving ball lie in TifSport bermudagrass

Plant growth regulators produced a denser turf in TifSport, improving ball lie.



Although TifSport, a fine-textured bermudagrass hybrid (*Cynodon dactylon* × *C. transvaalensis*) (2), has performed well on golf courses, high-handicap golfers have wanted to see a higher ball lie. Therefore, we initiated this study to see whether a combination of nitrogen and plant growth regulators would increase the lie at four different mowing heights/schedules. To measure ball lie, we used a modified version of an instrument called the Lie-N-Eye (developed by Luke Cella at the University of Illinois).

Treatments

The cultivars in the study were TifSport, established in 2004, and two experimental vegetatively propagated bermudagrasses that had shown potential for golf course use, Tifton 11 and Tift #4, which were established in 2005. The design was a strip-plot test with four replications. Treatments included three nitrogen levels — 0.5, 1.0 or 1.5 pounds/1,000 square feet (2.4, 4.9 or 7.3 grams/square meter) per month alone or 1.0 or 1.5 pounds/1,000 square feet (2.4 or 4.9 grams/square meter) of nitrogen in combination with Primo (trinexepac-ethyl; Syngenta) or Primo + Cutlass (flurprimidol; SePro) — and four mowing heights (0.5 inch [12.5 millimeters] or 1.0 inch [25 millimeters] twice per week, 1.5 inches [37.5 millimeters] once or twice per week). A treatment with 1.0 pound nitrogen/1,000 square feet (4.9 grams/square meter)/month + Primo was considered a general practice used by superintendents.

Primo was applied at 9 ounces/acre (0.66 liter/hectare) in Primo-only treatments and at 4.0 ounces/acre (0.32 liter/hectare) in Primo + Cutlass treatments. Cutlass was applied at 4.0 ounces/acre (0.32 liter/hectare). Treatments were applied once per month during the growing season (May to October).

Mowing heights were selected to approximate practices used in various areas of the golf course. Quality and color ratings usually were taken at the end of the month before the new treatments were applied.

Data collection

Turf quality

Turf quality data were collected in 2005 and 2006 and rated on a scale of 1 to 9, where 7 is acceptable quality and 9 is the best.

Ball lie

Ball lie measurements were taken by dropping two golf balls into each plot from a height of 6 feet (1.8 meters) and then measuring the distance the ball sank into the turf. Ball lie data were collected on three dates in 2005 and 2006 for TifSport, but only on one date in 2006 for Tifton 11 and Tift #4.

A golf ball is 1.7 inches (42 millimeters) in diameter. The ball height values in Table 1 indicate the number of millimeters that the ball sank into the surface of the grass. Therefore, the smaller the number, the higher the ball lie. All ratings and ball lie measurements were rounded to the whole number.

Results

Turf quality

Differences in overall turf quality were small except for the 0.5 pound nitrogen/1,000 square feet treatment (2.49 grams/square meter), which reduced turf quality for TifSport in 2006 and for Tifton 11 in 2005. We also observed a lighter green color (data not shown) for the 0.5-pound/1,000 square feet (2.4-gram/square meter) nitrogen treatment for TifSport and Tifton 11.

Neither Primo nor Cutlass improved overall turf quality, but Cutlass caused some discolor-



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ation in all the grasses for a few days after treatment, and caused browning and swirling in TifSport and Tift #4 at 1- and 1.5-inch (25- and 37-millimeter) mowing heights for about a week after treatment, particularly in October.

One pound of nitrogen/1,000 square feet (4.9 grams/square meter)/month appeared adequate for maintaining desirable turf quality in all three grasses.

TifSport turf quality tended to improve from 2005 to 2006 as the turf matured.

Mowing heights caused only small differences in turf quality (data not shown).

Ball height

Nitrogen level had little effect on keeping the golf ball from sinking into the grass, and nitrogen + plant growth regulator treatments had almost no effect on ball lie in Tifton 11 and Tift #4 (Table 1). All combinations of nitrogen, Primo and Cutlass effectively improved TifSport ball lie, which improved from 2005 to 2006 as the grass matured.

The highest ball lie for TifSport was achieved with 1.5 pounds nitrogen/1,000 square feet (7.3 grams/square meter) + Primo + Cutlass. It appears from these results that 1.0 pound nitrogen/1,000 square feet (4.9 grams/square meter) + Primo can produce a good ball lie. Superintendents would need to decide whether the slight improvements in ball lie are worth the extra costs of additional nitrogen and/or Cutlass. A lower level of Cutlass may prevent some of the discoloration we observed.

Mowing at 0.5 inch (12.5 millimeters) twice per week produced the best ball lie in all three grasses (Table 1). As mowing height increased and mowing frequency decreased, the ball sank farther into the grass for TifSport and Tifton 11.

Another important measurement is the distance from the ground to the bottom of the ball at the different mowing heights (numbers in parentheses in Table 1). The ball sinks into the grass less at the 0.5-inch (12.5-millimeter) mowing height, but the ball is farther from the ground at the 1.0- and 1.5-inch (25-37-millimeter) mowing heights.

Treatments with Primo or Primo + Cutlass were most effective at preventing the ball from sinking into TifSport. Under all treatments, Tifton 11 was exceptional for keeping the ball from sinking into the turf.

Conclusions

- Treatments with 1 or 1.5 pounds nitrogen/1,000 square feet (4.9 or 7.3 grams/square

Ball height measurements

Treatment (pounds N/1,000 square feet)*	Ball height (millimeters) [†]			
	TifSport		Tifton 11	Tift #4
	2005	2006	2006	2006
0.5 N	24 a	14 a	5 a	5 a
1.0 N	21 b	14 a	5 a	5 a
1.5 N	20 b	13 a	5 a	5 a
1.0 N + P	14 c	10 b	5 a	4 b
1.5 N + P	16 c	9 bc	5 a	5 a
1.0 N + P + C	15 c	10 b	5 a	5 a
1.5 N + P + C	11 d	8 c	5 a	5 a

* N, nitrogen; P, Primo; C, Cutlass. Primo was applied at 9 ounces/acre in Primo-only treatments and at 4 ounces/acre in Primo + Cutlass treatments. Cutlass was applied at 4 ounces/acre.

[†] The smaller the number, the higher the ball lie. Within a column, means followed by the same letter are not significantly different from one another.

Table 1. Mean ball height measurements (in millimeters) for TifSport, Tifton 11 and Tift #4 in 2005 and 2006.

meter) produced similar turf quality and color in TifSport, Tifton 11 and Tift #4.

- Treatments with nitrogen + Primo or nitrogen + Primo + Cutlass did not have major effects on improving turf quality or color.
- Applications of Primo or Primo + Cutlass produced a denser turf, which gave a higher ball lie in TifSport. Ball lie in Tifton 11 and Tift #4 was similar for all treatments and significantly better than ball lie in TifSport.

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