

# INITIAL INVESTIGATIONS OF EFFECTIVENESS OF CULTURAL PRACTICES TO MINIMIZE THE NEGATIVE EFFECTS OF EXCESSIVE THATCH ON SR1020 CREEPING BENTGRASS

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## ABSTRACT

*Increased demand for golf course greens with fast ball speeds and aesthetically pleasing turf present the greatest public pressures that golf course superintendents face today. In the desert southwest, the annual summer monsoon rainfall pattern brings increased atmospheric humidity which results in an increase in the tendency of SR1020 creeping bentgrass to build-up thatch. The effects of four different cultural practices on color, quality, thatch, and ball roll were evaluated on a SR1020 creeping bentgrass green built to USGA specifications grown in an arid environment during a period of increased atmospheric humidity and rainfall.*

*Plots that were verticut/topdress once every two weeks showed unacceptable color, quality, and ball roll. Rolling twice a week had no significant impact on color, quality, and thatch, however, rolling did have a slightly positive impact on ball roll. Grooming three times per week had no significant impact on thatch reduction, and resulted in decreased color, quality and ball speed. Topdressing one time per week did decrease the natural tendency of thatch build-up in SR1020 during periods of increased atmospheric humidity. Topdressing one time per week slightly increased color, quality, and ball roll.*

## INTRODUCTION

Public pressures have increased the demand for aesthetically pleasing and highly playable turf on golf greens. The warm climate of the desert southwest challenges golf course superintendents to maintain cool-season high quality bentgrass golf greens year-round in an arid environment where summer temperatures greater than 38°C are common. In response to this demand researchers released a new >heat-hardy= cultivar of creeping bentgrass. The SR1020 creeping bentgrass is far more heat tolerant than other popular varieties including Pencross and Crenshaw. Advantages of SR1020 include (1) a more dense turf stand, (2) deeper root system, and (3) greater recuperative ability during the summer months. A disadvantage of the SR1020 creeping bentgrass is that it must be culturally managed to deter thatch build-up. The annual summer monsoon weather pattern typically brings increased atmospheric humidity and cloudiness, resulting in a tendency of SR1020 creeping bentgrass to accumulate small pockets of thatch. These small pockets of thatch accrue as a result of stolon elongation and increased leaf tissue at stolon ends, thus creating @pockets@ of turf. These turf pockets decrease turf aesthetic appeal, and more importantly decrease ball speed and trueness of ball roll.

In response to these demands on SR1020 creeping bentgrass, this study was initiated to investigate and analyze four different cultural practices including :verticut/topdress, topdress, grooming, and rolling over the course of five weeks.

## MATERIALS AND METHODS

This study was conducted on a 50 x 50 SR1020 creeping bentgrass green at the University of Arizona Karsten Desert Turfgrass Research Facility in Tucson, Arizona. The green was built to conform with USGA specifications for golf course greens. Irrigation was applied nightly by applying 100% of reference evapotranspiration calculated from an on-site weather station. Areas where the turf exhibited hydrophobic characteristics were watered daily as needed. The

green was mowed daily at a height of 5/32". The five week study began on 7/25/97 and continued through 8/25/97.

The study consisted of five different treatments of four replications each. Treatments included (1) verticut/topdress every two weeks. Verticut depth was set at 1/8" below turf canopy. Topdressing was applied with fine sand at 1/16" depth. Topdressing was brushed into the turf canopy immediately following application. Treatment two (2) consisted of a topdress application at 1/16" depth once a week. Again, topdressing was brushed into turf canopy immediately following application. The third treatment (3) included grooming three times per week. The greens mower was set at a height of 5/32", and the groomer was set at a height of 1/64". The fourth treatment (4) involved rolling with a 600 lb. walk behind roller two times a week at two passes per event. Treatment five (5) was the control. Turf was rated weekly for characteristics including color (Clr), quality (Q) and a rating for the occurrence of turf pockets (puffiness (PF)). Data presented in the following paragraphs and in Figures 1-4 represent the mean of four ratings (four replications per treatment) for color, quality, puffiness and ball speed at the corresponding dates where ratings were recorded. Ball roll using a stimpmeter was recorded three times throughout the study to quantify an initial reading, a mid-study reading, and a final reading on ball speed.

## RESULTS

### July 25, 1997

Prior to initiation of treatments, the average atmospheric humidity was recorded for seven days prior to the onset of the study. The average relative atmospheric humidity during this period was 52%, with the maximum humidity reaching 79%. During August, the month of study, the average relative atmospheric humidity was 55%.

Initial turf ratings were performed prior to the first application of the five treatments. Prior to treatments, the green had acceptable color (Clr=6 on a 1-9 scale), acceptable quality, ball speed of 7-7.75 (1-12 scale: 12 fastest), and a puffiness rating of approximately 5 (PF=1-9 scale: 1 = most puffy).

### August 1, 1997

At one week following initiation of treatments, color (Figure 1) did not change significantly for treatments 2-4 (treatments 3 and 4 increased slightly), but treatment (1) (verticut/topdress), however, exhibited a much lower color rating (Clr=3) than the pre-treatment rating. Quality (Figure 2) was slightly higher for all treatments except for treatment one, which decreased from an acceptable rating of six to an unacceptable rating of three. Puffiness (Figure 3) ratings decreased slightly (an increase in the occurrence of turf pockets) on treatments 2-5. Treatment one was visibly less puffy a week following treatments, however, at the expense of turf quality and color.

### August 6, 1997

Mid-study ball speeds were recorded using the stimpmeter. Ball speeds (Figure 4) decreased for every treatment except treatment four (rolling), which exhibited a slight increase in ball speed.

### August 8, 1997

Color ratings increased for treatments two and five, both receiving a mean rating of approximately 6.8. Treatments three and four decreased in color slightly, while treatment one recuperated from a rating of three the previous week to a rating of five. Quality ratings indicated that treatment two (topdress only) had the best quality, receiving a mean rating of approximately 7. Treatments 3-5 had similar quality ratings to each other (Q=6), and were consistent with ratings recorded the previous week. Treatment one increased only slightly receiving an unacceptable quality rating of 3.5. Puffiness ratings indicated treatments one and two had a positive effect on reducing puffiness since the onset of the study, while treatments 3-5 had no significant effect on reducing puffiness.

### August 15, 1997

Mean color ratings for treatments 2,4 and 5 were above average (Clr=6.5). Color for treatment three was lower than that recorded the previous week at 5.5, and treatment one remained constant with a mean color rating of 3.7. Similar to color ratings, analysis of the quality ratings showed treatment 2 to have the highest quality, followed by treatments 4 and 5. The quality rating for treatment three decreased to a rating of 5, and treatment one stayed constant with a rating of 3.5. During the previous week, atmospheric humidity significantly increased (atmospheric humidity reached during this period averaged 69%, and the maximum reading was 100%), resulting in increased turf pockets (puffiness). Thus, puffiness ratings decreases for treatments 2,3 and 5. Treatment four was consistent with the previous week, and treatment one had a higher puffiness rating of 6.3.

### August 22, 1997

Analysis of the final color ratings indicated again that treatments 2, 4 and 5 had the best ratings (approximately 5.8), followed by treatment three (Clr=4.5), and then treatment one (Clr=3.5). Mean quality ratings for treatments 2, 4 and 5 were highest (Q=6) followed by treatment three (Q=5), and treatment one (Q=3.2). Treatment one was least puffy, followed by treatments 2 and 4 with ratings slightly above 5. The treatments receiving the lowest ratings for puffiness were treatments three (PF=4.5) and five (PF=3.5).

August 25, 1997

Final recording of ball speeds were done. Ball speeds were highest for treatments one and two (BS=7.2), followed by treatment four (BS=6.8). Ball speeds for treatments three and five were the lowest of the five treatments at the conclusion of the study (BS=6.5).

## CONCLUSION

### Treatments

Treatment #1. Over the course of the study, treatment one (verticut/topdress every two weeks) did decrease the occurrence of turf pockets (puffiness), however, this occurred at the expense of the turf color and quality. Visual quality and color were unacceptable. In addition, trueness of ball-roll was significantly hindered. Thus, verticut/topdress at 1/8@ into turf canopy and topdressing with 1/16@ depth of fine sand is not recommended at any frequency during the summer months on SR1020 creeping bentgrass greens.

Treatment #2. Topdressing once a week at 1/16@ depth decreased the tendency for SR1020 creeping bentgrass to form turf pockets, produced the best visual quality and color of any of the five treatments, and slightly increased ball speed. Topdressing at 1/16@ depth followed by brushing the sand into the turf canopy allows for immediate unaltered play after application. Topdressing at 1/16@ depth proved to have a positive impact on turf color, quality, puffiness, and ball roll.

Treatment #3. Grooming at three times per week with the mower set at 5/32@ and the groomer set at 1/64@ did not decrease puffiness, and resulted in decreased turf quality, color and ball speed. Therefore, grooming three times a week at 1/64@ is not recommended during summer months on SR1020 creeping bentgrass.

Treatment #4. Rolling two times per week with a 600 lb. walk behind roller had no significant impact on puffiness, color or quality. Rolling did increase ball roll initially, however, ball speeds did not continue to increase once the atmospheric humidity increased, resulting increased puffiness. Future study might evaluate the effectiveness of a combination of cultural practices including rolling and topdressing.

Treatment #5. The control (no treatment) had no significant impact on color or quality. Puffiness increased substantially throughout the study, which decreased ball speed, and trueness of ball roll.

## RECOMMENDATIONS

The most effective method is to prevent the tendency of SR1020 creeping bentgrass to form pockets of turf prior to the annual monsoon weather pattern. Preventive methods would include topdressing, verticutting, core aeration and grooming. However, these cultural practices should be implemented in the spring, when the turf is vigorously growing and recuperative ability is high. This study suggests that once the SR1020 creeping bentgrass green becomes puffy, curative methods are futile. However, results from this study indicate that puffiness can be controlled with cultural practices. Analysis of the four cultural practices utilized in this study suggest that the best method to control puffiness involves topdressing at 1/16@ depth followed by brushing into turf canopy at one dressing per week.