Herb Graffis

Joe Graffis

GRAFFIS BROTHERS RECEIVE USGA AWARD

Brothers Herb and Joe Graffis have been awarded the 1972 Green Section Award of the United States Golf Assn. for their "distinguished service to golf through work with turfgrass." They are the first dual recipients of the award since its inception in 1961, and the first recipients in the publishing field. Co-founders of GOLFDOM, Joe Graffis presently is associate publisher; Herb Graffis is senior editor.

The award was presented by Philip H. Strubing, USGA president, and Henry Russell, chairman of the USGA Green Section Committee, January 28 at the USGA's Conference on Golf Course Management at the Biltmore Hotel, New York.

"In 1927, Herb and Joe founded GOLFDOM, which they edited and published," the USGA said in an announcement. "Through their editorial policies they encouraged the trial of turf products in experimental plots throughout the country. They also campaigned for improved status and recognition of golf course superintendents, the use of proven turf chemicals, improved drainage, installation of fairway watering systems and automatic irrigation. They helped set guidelines for the use of pull carts, and later for automotive carts to avoid damage to turf."

In addition to their work in publishing, the Graffises founded the National Golf Foundation and helped establish the Golf Course Superintendents Assn. Turfgrass Conference and Show. For many years Herb Graffis has been president of the National Golf Fund, the sponsor of National Golf Day. □

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Low cost transportation vehicle for supervisors and workmen. Competitive in price with vehicles that have far fewer quality features. Easy riding, easy driving and easy on the turf with big 6.50 x 8 turf tires. Now available with a powerful 8hp gasoline engine. Power enough for fast personnel transportation plus power to spare for towing the new Cushman low-bed utility trailer, or even a 3-gang ball picker. And you can carry hand tools and another person with the optional covered cargo box and rear personnel seat.

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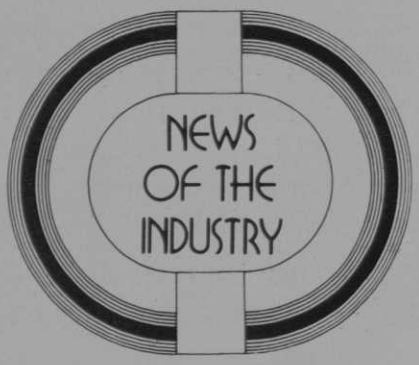

Shakespeare introduces a graphite shaft

Shakespeare Company of Columbia, S.C., has announced the introduction of a graphite fiber golf club shaft in a driver for 1972.

According to Frank Thomas of Shakespeare's central engineering group, a shaft of Thornel graphite yarn has been developed using computer and space-age materials. Shakespeare, well-known for its fiberglass fishing and archery equipment, has also bolstered the strength of its fiberglass shaft, long considered by some manufacturers to be too whippy or weak. According to Thomas, a new method of constructing the glass fibers has enabled Shakespeare to challenge the dominance of aluminum, steel and lightweight steel shafts.

Shakespeare said that its Tor Fil Sigma driver with its graphite shaft will be available by early spring, but the retail price will probably not cause a mass buying movement by the public. A spokesman for Shakespeare estimated that the graphite-shafted driver with an extremely stiff, but strong shaft, would retail for around $100. The marketing is currently being directed toward the big hitter and the professional golfer.

Bernie Lavins, Shakespeare's vice president for manufacturing, says, "The weight of the head can be slightly increased with the decrease in shaft weight. By lightening the shaft of the club," Lavins explains, "we have made it possible to increase clubhead speed without decreasing head mass." In addition to its lightweight and regular steel shafts, all-fiberglass and all-graphite shafts, Shakespeare is also preparing a combination graphite-fiberglass shaft. This shaft will be more in the buying range of golfers than the all-graphite shaft, says a company spokesman. Although Shakespeare has not found another golf equipment manufacturer to buy its Union Carbide-developed graphite shaft concept, the company is pursuing this avenue as well as attempting to find tour professionals willing to test the shaft. Professional Don January, under contract to Shakespeare, has worked with the company in testing and designing the graphite shaft.

According to Thomas, the over-all weight of the graphite shaft is 2.6 ounces as opposed 4.0 to 4.5 ounces for steel.

Chlevin resigns top GCSAA post

Ben Chlevin, for seven years executive director of the Golf Course Superintendents Assn. of America, resigned effective January 31. The announcement came prior to the GCSAA Conference and Turfgrass Show in Cincinnati, February 13 to 18, and was accepted "with regret" by the GCSAA Executive Committee, according to association President Richard Blake.

"I have no definite plans at this time," said Chlevin, "although I would like to go into public relations activity connected with the golf industry."

Chlevin served as public relations director of the National Golf Foundation from 1953 to 1960; assistant to the publisher, GOLFDOM Magazine from 1960 to 1964, and was named executive director of the GCSAA December 1, 1964.

During his tenure the GCSAA headquarters were relocated from Jacksonville, Fla., to Chicago. The association's membership increased from 2,000 to 3,000, and the annual budget doubled from $275,000 to over $550,000.

GOLFDOM Senior Editor Herb Graffis, in commenting on Chlevin's resignation, said, "Solid progress and smooth operations in the superintendents' association have been achieved since Chlevin has been on the job."

Dr. Paul Alexander, director of education for the GCSAA, is acting as temporary executive director until a successor is found.

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IF YOU DON'T BELIEVE IT, CALL ME COLLECT!"

"I'm Marv Scobee, superintendent at Highland Golf and Country Club, Indianapolis.

Last fall I PO-SAN-treated 18 fairways. Some had 85% Poa annua. A week after the PO-SAN application, I drill-seeded all fairways to Highland bentgrass. Result? *Astounding!* The initial turf yellowing from the PO-SAN (which I had expected) left in about 10 days — and the bent, well fertilized, "came on like gang-busters" — filling in quickly as the Poa retreated. My fairways, shown here 5 weeks after the PO-SAN treatment (and 4 weeks after seeding) are the most beautiful we've ever had. The Poa is down to about 25% — and I'm rapidly approaching 100% bent fairways! A real PO-SAN bonus — it killed practically all the clover, knotweed, and other broadleaf weeds! Now I have beautiful fairways, far less Poa than ever before, and *350 mighty pleased club members and officials.*

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To share my enthusiasm for PO-SAN, give me a buzz. PO-SAN has to be "the way to go" in fairway Poa control."

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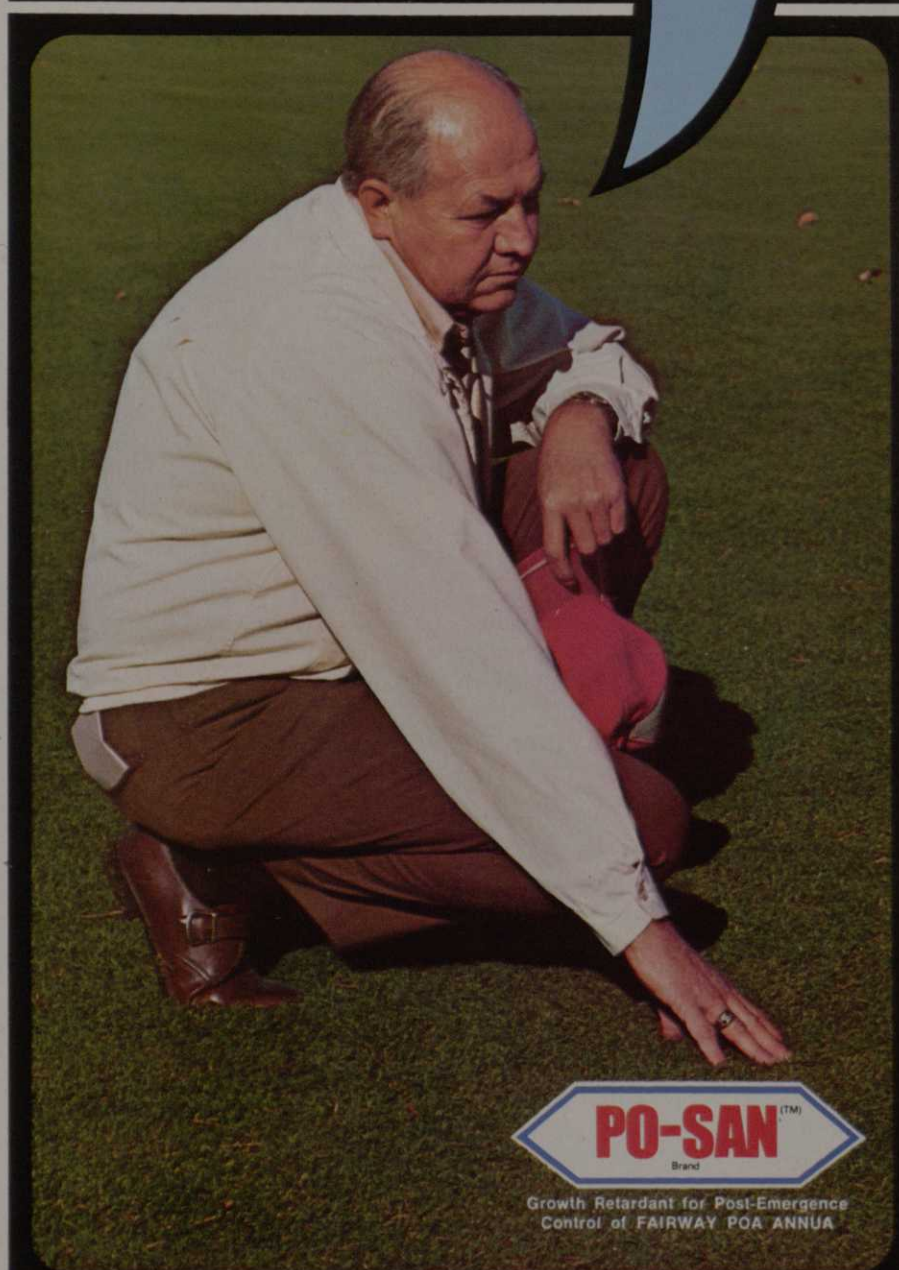

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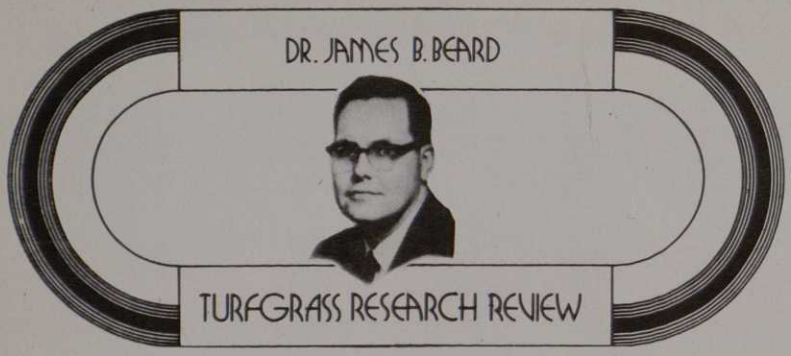

Influences on water use rate of Penncross creeping bentgrass

Cultural and environmental factors influencing the stomatal density and water use rate of Penncross creeping bentgrass. R.C. Shearman. 1971. M.S. Thesis. Michigan State University. pp. 1-57. (from the Department of Crop and Soil Sciences, Michigan State University, East Lansing, Mich. 48823).

The objective of this study was to determine the relative importance of selected cultural and environmental factors on the water use rate of a Penncross creeping bentgrass turf. Correlations were also made with the stomatal density of the leaves when grown under various environmental and cultural conditions. The stomatal density counts were made from clear-nitrocellulose replications of the leaf blade surface.

The water use rates were determined in a specially devised wind tunnel. The environmental conditions maintained in the chamber included a temperature of 91 degrees F, 40 per cent relative humidity, a four mph constant wind velocity and a moderately low light intensity which kept the stomata open during the test period. This environmental stress condition was maintained for a 12-hour period after which the amount of moisture loss was determined by weighing. Six to 10 replications were made in each of the individual experiments depending on the variability anticipated.

The Penncross creeping bentgrass was established from seed in small half liter containers under greenhouse conditions. The standard cultural practices, except where varied by the specific treatments, were as follows: mowing weekly at two inches; the application of a complete nutrient solution twice a week to avoid nutritional deficiencies, and watering daily at midday.

The specific treatments utilized in the five experiments were as follows: experiment one included light intensity treatments of (a) 3,762 lux, (b) 25,800 lux and (c) full sunlight. The influence of the previous growing temperature was determined in experiment two. The treatments included (a) 50, (b) 68 and (c) 91 degree F soil temperatures for 2.5 months prior to determinations of the water use rate. In experiment three, there were three cutting heights: (a) 0.25, (b) 1 and (c) 5 inches applied on a weekly clipping schedule during the three-month growing period. In experiment four the water application rate effect was determined. The three treatments included: (a) 0.5, (b) 1 and (c) 4 inches of water applied weekly for three months prior to determination of the water use rate. In experiment five, three irrigation frequencies were evaluated. Included were (a) water applied only when visual wilt occurred, (b) watering three times a week to a saturated soil condition and (c) watering daily to a saturated soil condition. As in most of the previous studies, this experiment was conducted for a three-month period prior to placement in the wind tunnel for the evaluation of the water use rate as well as for the determination of the stomatal density.

An assessment of the stomatal density data indicated that there was a three-fold greater number of stomata on the upper surface of the Penncross creeping bentgrass leaf compared to the lower surface of the leaf blade. The actual stomatal density in this study ranged from 72 to 125 stomata per square millimeter.

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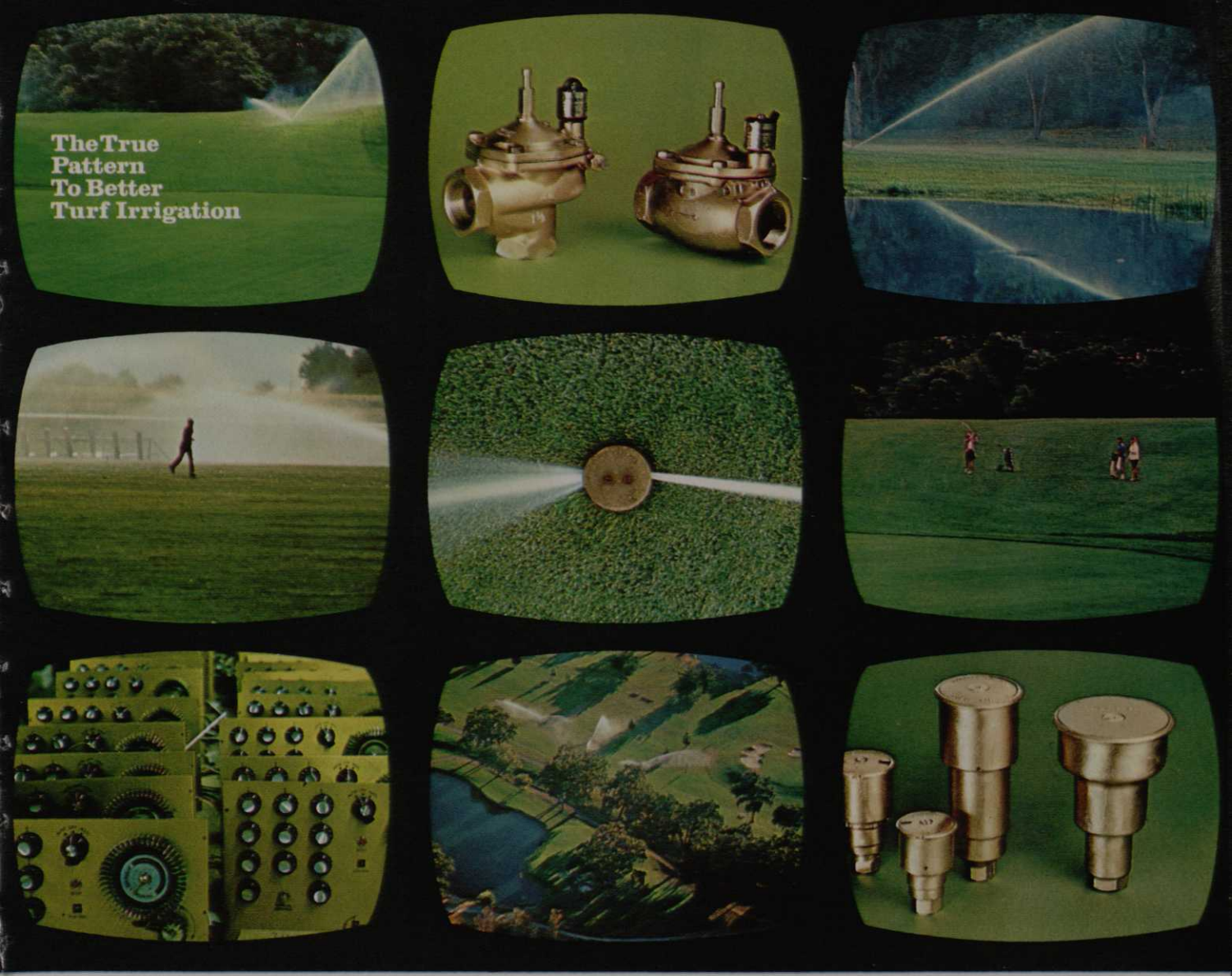

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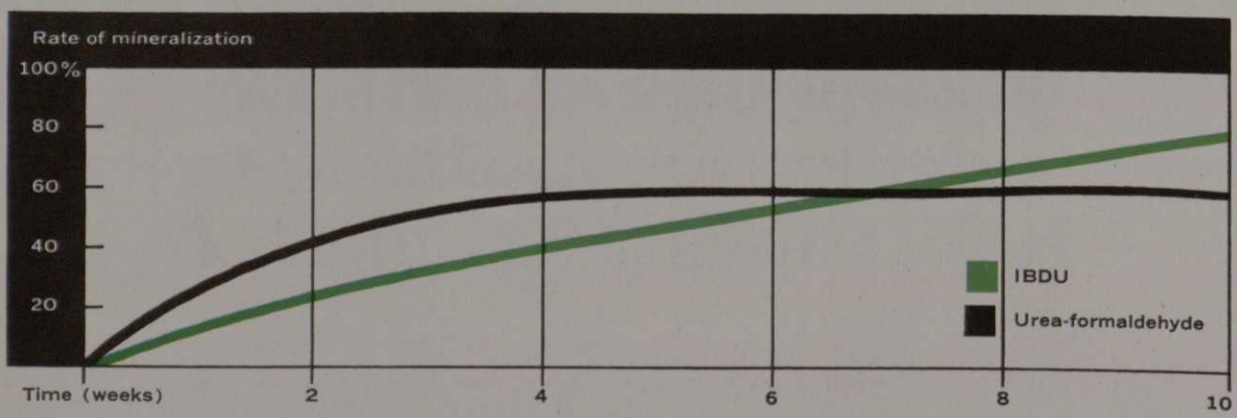

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In experiment one the water use rate of Penncross creeping bentgrass increased as the light intensity was increased. There was also a corresponding increase in stomatal density with increased light intensities. Thus, the light conditions under which turfgrasses grow have a strong influence on the density of stomata formed on the leaf surface. This in turn affects the water use rate. Turfs growing in shade would have a lower water use rate compared to adjacent turfs of the same species growing in full sunlight.

In experiment two, it was found that suboptimal growing temperatures resulted in a reduction of both the water use rate and the stomatal density. A 30 per cent reduction in stomatal density occurred between 68 and 50 degrees F, while the water use rate declined by 20 per cent. There were no differences observed in the water use rate or stomatal density between the 68 and 91 degree F growing temperatures. In this regard, the soil temperature is more important than the air temperature. Turfs growing under cool conditions form a reduced number of stomata per unit area and therefore have a lower water use rate.

In experiment three the water use rate increased as the height of cut was raised. In raising the height of cut from 0.25 to one inch the water use rate increased 53 per cent. This results primarily from the greater leaf area exposed to the evaporative conditions of the atmosphere.

In experiment four the water use rate decreased as the water application rate was increased. In experiment five frequently irrigated turfs had an increased water use rate. The author concluded that, of the factors studied, the light intensity, cutting height and frequency of irrigation had the greatest influence on the water use rate.

Comments: The water use rate is defined as the total amount of water required for turfgrass growth plus the quantity lost by transpiration and evaporation from the soil and plant surfaces. The rate of water use of most turfgrasses under normal conditions usually ranges from 0.1 to 0.3 inch per day. Water use rates as high

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as 0.45 inch may occur under conditions of high evapotranspiration. This situation usually exists only in early to midsummer when peak water use rates are more common.

A knowledge of the water use rate of turfgrasses is important in designing and utilizing irrigation systems. It is also important to obtain information on the relative importance of various environmental and cultural factors on the water use rate. In this way it may be possible to modify certain environmental conditions or to alter certain turfgrass cultural practices so that the water use rate of a specific turf can be reduced. This probably will become more important as water availability becomes limited in the future.

The stomata are extremely important structures because they are the primary avenues or openings through which gas and water exchange with the external atmosphere. Although the stomata compose only 2 to 3 per cent of the turfgrass leaf area, they are responsible for as much as 90 per cent or more of the total water loss from the turfgrass plant to the atmosphere. Stomata may occur on the stem tissue but in a substantially reduced density compared to the leaf blades. The rate of water loss by stomatal transpiration is a function of the water vapor gradient between the leaf tissue and the external atmosphere. It increases with (a) a decrease in the atmospheric water vapor content adjacent to the leaf, (b) an increase in the wind velocity adjacent to the leaf, (c) a high leaf moisture content and (d) an increase in the leaf and atmospheric temperature.

As demonstrated in this paper, the density of stomata varies with the environmental and cultural conditions under which the stomata develop. The stomata density will also vary with the turfgrass species. The stomata on turfgrass leaves are usually arranged in longitudinal rows interspersed with other epidermal cells. The opening of stomata for water loss is stimulated by exposure to light. Generally, the stomata are closed during dark periods. Thus, the water loss by evapotranspiration is less at night.

Of the environmental factors in-