

## A NEW GENERATION HYBRID VERTICAL DWARF BERMUDAGRASS BREAKTHROUGH

by

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**Historical Perspective.** The turfgrass species utilized on putting greens prior to 1956 in the warm climatic regions, especially under humid environments, was common seeded dactylon bermudagrass (*Cynodon dactylon*). A major breakthrough occurred in 1956 with the release of **Tifgreen** hybrid bermudagrass (*Cynodon dactylon* x *C. transvaalensis*). Tifgreen was greatly improved in terms of sustaining a reasonable shoot density at the 1/4 inch (6.4 mm) mowing height used on putting greens at that time. Its superior characteristics led to the rapid conversion of putting greens to Tifgreen in the southern United States.

Nine years later the hybrid bermudagrass cultivar **Tifdwarf** was released. Tifdwarf sustained a better density than Tifgreen as mowing heights were lowered to 3/16 inch (4.8 mm) on putting greens, plus it had a slower growth rate and darker-green color. The slower growth rate did present some limitations in initial establishment when compared to Tifgreen. Also, a different cultural system evolved to bring out its desirable characteristics. Thus, there was a learning curve in understanding the cultural requirement of Tifdwarf. For the past 40 years Tifgreen and Tifdwarf have been the standard cultivars used on putting greens in warm to hot climates throughout the world.

**Dwarf Terminology.** The dictionary defines **dwarf** as a plant much below the normal size of its species or kind, which is formed as a result of genetic expression or by cultural techniques that suppress growth. The dwarfness of bermudagrasses discussed in this paper is primarily an expression of genetically controlled characteristics. These genetic controls of dwarf characteristics involve multiple components. Included are the (a) **vertical shoot components** such as potential vertical leaf growth extension rate per unit of time and the inherent relative leaf length and (b) **horizontal shoot components** such as the internode length genetic potential, internode density genetic potential, and outward growth rate potential per unit of time of the lateral stems, especially the stolons. Of course, the dwarf cultivar should also have a high shoot-leaf density and tolerance to extremely close mowing

heights of 1/8 to 3/16 inch (3.2 to 4.8 mm) in order to perform adequately on putting greens.

Tifdwarf is a genotype that has morphological dwarfing and reduced growth rate potential in both the vertical and horizontal planes. This results in a very slow establishment rate, slow recuperative potential from divot openings, ball marks, and pest turf injury; plus less competitiveness against invading weeds and off-type bermudagrass species. From a putting green standpoint, it would be desirable to have a genotype that is not a full dwarf, but rather has vertical dwarf characteristics, but normal horizontal or lateral outward extension capabilities. The newer dwarf hybrid bermudagrasses have been described as "super" dwarfs or "ultra" dwarfs. Actually, most of these newer generation dwarf bermudagrasses appear to possess vertical dwarf characteristics but retain the desired more vigorous horizontal growth, particularly when compared to Tifdwarf. Thus, they could more correctly be termed **vertical, intermediate, partial or semi dwarfs**.

**New Generation Vertical Dwarfs.** Now a promising new generation of hybrid bermudagrass cultivars is emerging for putting greens. These cultivars tend to be dominated more by the *transvaalensis* characteristics of the hybrid, such as a higher shoot-leaf density, slower vertical leaf extension rate, and an increased dominance of stoloniferous growth relative to rhizomes. Historically the *C. transvaalensis* have tended to become puffy and prone to scalping at a cutting height of 1/4 inch (6.4 mm), especially when not frequently groomed and/or vertically cut. Now with the much closer mowing heights approaching 1/8 inch (3.2 mm) and development of the grooming attachment for greensmowers, the bumpiness and scalping problems on greens are greatly reduced if proper cultural practices are followed.

As with any new genotype possessing different morphological and growth characteristics, there will be a learning curve in development of the proper cultural system for each new cultivar. An individual not recognizing the importance of accepting and learning new approaches to the culture of a new generation cultivar for greens, but rather clings to practices that have been successful for them in the past with Tifdwarf or Tifgreen may experience problems. He or she may blame the failure on the cultivar, when in fact it may be their own inflexibility in adapting to the cultural needs of a new generation dwarf cultivar.