

Breeding Colonial Bentgrass and Buffalograss

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Genetic improvement through conventional breeding is an effective strategy for improving agronomic performance of turfgrasses while minimizing environmental impact. Newly developed turfgrass cultivars with dramatically improved leaf texture, persistence, uniformity, genetic color, and insect and disease resistance contributed greatly to the turfgrass industry.

Breeding colonial bentgrass

Colonial bentgrass (*Agrostis capillaris* L.) is a cool-season perennial grass also known as browntop (also written as brown top). Colonial bentgrass has fine textured leaves with a prostrate growth habit that forms sod and spreads by short rhizomes and stolons. Based on morphological classification, colonial bentgrass resembles other *Agrostis* species, including dryland bentgrass, *A. castellana* Boiss & Reut. and creeping bentgrass, but it differs from creeping bentgrass in two respects: creeping bentgrass does not produce rhizomes but readily forms roots from the nodes, whereas colonial bentgrass produces short rhizomes but does not produce roots from its nodes in stolons.

Colonial bentgrass is mainly used for erosion control, but is increasingly being used on fairways and tees in golf courses. Unlike creeping bentgrass, colonial bentgrass is poorly adapted to very low mowing heights, but performs well at a moderately low mowing height, thus is better suited to golf course fairways than to greens. Colonial bentgrass is ranked as one of the most cold-tolerant cool-season turfgrasses and has good tolerance to acidic soil and moderate tolerance to shade when compared to other *Agrostis* species. It has better resistance to dollar spot (*Sclerotinia homeocarpa*) than does creeping bentgrass. Compared to creeping bentgrass, colonial bentgrass also has better wear resistance under fairway and tee maintenance standards.

In a recent North Central regional field trial involving 13 alternative species, colonial bentgrass was identified as one of the top performers under low input conditions. Colonial bentgrass is susceptible to heat and drought stress and is prone to thatch accumulation. Breeding colonial bentgrass has not been extensively explored. The goal of this breeding project is to develop colonial bentgrass cultivars with enhanced resistance to biotic and abiotic stresses and persistence under low input conditions.

We have obtained colonial bentgrass accessions from the Western Plant Introduction Station in Pullman, WA and have also collected natural ecotypes from surrounding areas. Based on morphological observations and molecular data obtained from our diversity study, a total of 199 colonial bentgrass progeny from three subfamilies were selected and evaluated in the greenhouse. These accessions are now being evaluated in a field trial established on May 19, 2006. We evaluated plant vigor, genetic color, leaf texture, stolon and rhizome production, and disease resistance under spaced-plant environment with each entry occupying a 5' x 5' plot and the trial was replicated twice in the Horticulture Research Station near Gilbert, Iowa. This is the second year of the field trial. Superior plants will be selected and moved to a crossing block for random interpollination. Seeds will be harvested for the next cycle of selection for desirable traits.

Breeding buffalograss

Buffalograss (*Buchloe dactyloides*) is native to the Great Plains of North America. It has excellent drought tolerance and heat resistance. It has a low growth habit with a slow growth rate that requires mowing as few as only twice a year to maintain acceptable turfgrass quality. Buffalograss also has low requirement for fertilization and has few known insects and no diseases. These traits make buffalograss an excellent choice as a low maintenance turfgrass. Breeding buffalograss is still in an early stage, particularly for development of seeded cultivars. The objective of this breeding project is to develop vegetative and seed cultivars of buffalograss that have longer green period and wider adaptation areas.

We have collected a total of 174 buffalograss genotypes in the last few years. Clones of each genotype have been evaluated in the greenhouse for more than a year and are now being evaluated in a field trial that was established in May, 2006. Each vegetative clone was planted in the center of a 5' x 5' plot and the field trial was replicated twice for visual evaluation for vigor, percentage cover, leaf texture, genetic color and internode length under spaced-plant environment. This is the second year of the field trial. At the end of this growing season, vigorous, dark colored buffalograss genotypes with shorter internodes and finer leaf texture will be further evaluated for possible vegetative cultivar release, and/or for seeded cultivar development.