Buffalograss Breeding and Genetics

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1. Buffalograss can tolerate moderate shade and traffic stress
2. Buffalograss can grow in a broad range of soil types
3. Forty elite buffalograss accessions were evaluated and top performers advanced

Demand for management input reductions is drawing golf course superintendents to consider native and naturally adapted turf species such as buffalograss. Buffalograss is native to the short grass prairies of the Great Plains and has exceptional heat, drought, and low temperature tolerance. It is a stoloniferous, warm season species that forms a dense sod. Cultivar development of native and reduced management input species such as buffalograss is the focus of the University of Nebraska-Lincoln (UNL) turfgrass breeding program. The buffalograss collection at UNL consists of nearly 2,000 buffalograss clones derived from vegetative selections and progeny from pairwise crosses. The breeding program consistently establishes crossing blocks to test combining ability between select male and female accessions and to fix desirable turf traits in buffalograss populations. Crossing block accessions are grouped in an attempt to fix stand persistence, high seed yields, leaf spot and false smut resistance, shade tolerance, chinch bug resistance, and turfgrass quality (Figure 1). Female plots are harvested separately and progeny evaluated for two to three years. An advanced lines evaluation trial was established in May of 2016 to 40 buffalograss accessions and maintained at 0.5” mowing height (Figure 2). Establishment rate and quality data was collected, and significant variability was observed among the clones. Top performing individuals will be selected and evaluated for potential use as vegetative plugs or sod and or used in the next crossing blocks. Buffalograss populations from crossing blocks are separately evaluated for turf quality and seed production potential (yield, seed weight, seed quality), and recurrent phenotypic selection is imposed to further improve the populations. Four populations are currently being evaluated from the 2013 crossing blocks and populations from the 2015 crossing blocks will be established during the 2017 growing season.

Another focus of our program is to address common misperceptions about buffalograss. There are observational-based reports suggesting that buffalograss is intolerant of shade, lacks traffic tolerance, and is only adapted to lighter soils. Many of these reports are based on observations from natural buffalograss stands or from research conducted on common buffalograss or early cultivars. These reports are misleading since newer cultivars of buffalograss don’t share the same characteristics as early types and since most of these concerns can be addressed through common turfgrass management practices (Amundsen et al. Int. Turf. Soc. Res. J. 2017). As an example, in the sandhills region of the Great Plains, buffalograss is often found in the low areas between sand hills and is not commonly found on the hills. Heavier soils tend to accumulate in the low areas, leading to the observation that buffalograss prefers heavier soils. Buffalograss performance when grown in different soil types has not been tested. To address this misperception, mean turfgrass quality data and soil types for each site was obtained from the National Turfgrass Evaluation Program (NTEP) 1991, 1996, and 2002 buffalograss

tests. Turfgrass quality was grouped based on soil types and plotted. No significant differences were observed for buffalograss quality among the different soil textural classes (Figure 3). Multi-year experiments were also completed that were designed to test buffalograss response to traffic (Figure 4) or shade (Figure 5). In each study (soil type, traffic, and shade), variability was found among buffalograss entries for turfgrass quality, suggesting that prior observational-based reports on buffalograss performance should be re-visited.

Figure 1. Isolated buffalograss crossing block at the UNL turfgrass research center near Mead, NE.

Figure 2. Performance of 40 buffalograss accessions from an advanced evaluation trial at the UNL turfgrass research center near Mead, NE.

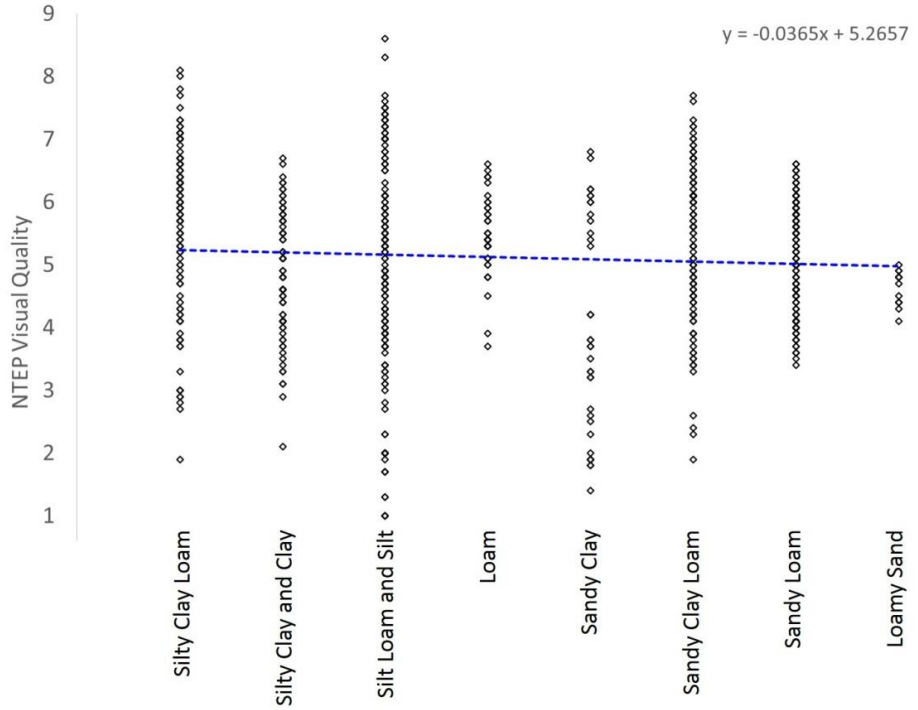

Figure 3. Mean turfgrass quality of buffalograss entries from the NTEP 1991, 1996, and 2002 buffalograss trials grouped by soil type. A best fit line, having near zero slope, is shown by the dashed line.

Figure 4. Traffic tolerance variability of 104 buffalograss accessions tested at the UNL turfgrass research center near Mead, NE.

Figure 5. Prestige buffalograss performance following two years of light treatments. Prestige was grown in full sun or under black shade cloths that block 30% or 60% natural light.