Low Maintenance Troubles

Research that is helping turf managers maintain buffalograss as a low-maintenance alternative.

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NAMED AFTER the animal that grazed it, buffalograss (*Buchloe dactyloides*) is a warm-season turfgrass species native to the subhumid and semi-arid regions of the North American Great Plains. It is a long-lived perennial that spreads vegetatively by stolons and, historically, was one of the most widely used species for erosion control and dryland pastures. Buffalograss's low growth habit and exceptional heat and drought tolerance have given it the ability to survive in environments considered too hostile for other species. In the early 1930s, buffalograss was commonly used on non-irrigated home lawns, golf courses, parks, and other turf areas in the central United States.

In the early 1980s, interest in buffalograss began to escalate as the public became more conscious of natural resource conservation and the need for a turfgrass species that would require fewer pesticide and fertilizer inputs while providing an acceptable level of quality. The acceptance of buffalograss as a high-quality, low-maintenance turf has been hindered by the limited number of available varieties and a superficial understanding of its management requirements. In 1984, the USGA Turfgrass Research Committee began funding a breeding project at the University of Nebraska to develop new buffalograss varieties and determine their management requirements.

The first buffalograss plots were established in the spring of 1985. These plots were composed of plants collected by a team of scientists from the University of Nebraska that included Dr. Larry Newell, a forage grass breeder, and Drs. Edward Kinbacher and Terry Riordan. The plants were established in an irrigated field and evaluated for rate of spread, density, and color. To the surprise of those involved with the project, several of the selections had completely grown in by August of the same year and had acceptable turf quality. During the following winter, the selections that had performed well in the field were increased in a greenhouse and, in the spring of 1986, the first replicated plots were established.

In 1989, two vegetatively propagated buffalograss cultivars were ready for release to the public: "Prairie," developed by Dr. Milt Engelke at Texas A&M University, and "609," developed by Dr. Terry Riordan. This event furthered the widespread use of buffalograss in the United States. Ben Crenshaw, a professional golfer, and David Doguet, a Texas sod grower, obtained the rights to produce these two varieties and began marketing them as turfgrasses that were better for the environment.

The marketing efforts of Crenshaw and Doguet resulted in significant sales of buffalograss sod and plugs, and made the public aware of the potential environmental benefits of using buffalograss in areas where traditional turfgrass species were used. For example, based on buffalograss's low water use rate, the cities of Austin and San Antonio began offering rebates to homeowners if they planted or converted their turf areas to buffalograss.

Since the release of Prairie and 609, other vegetative cultivars have found their way onto the market, including northern-adapted cultivars from the University of Nebraska breeding program. In addition, private industry and other university breeding programs have produced several seeded cultivars.

In the late 1980s and early 1990s, fundamental information on optimal mowing height, fertilization rates and timing of application, optimal planting times, etc., was lacking for the improved buffalograss cultivars. As a consequence, many turf managers maintained buffalograss using traditional cultural practices and reported disappointing results. For instance, rather than taking advantage of the low water and nutritional requirements of buffalograss, many established areas were over-irrigated and over-fertilized. This management regime promoted heavy weed invasions and unacceptable turfgrass quality.

In recognition of the absence of fundamental information, the USGA Turfgrass and Environmental Research Committee approved additional funding to develop more comprehensive management recommendations in 1993. This research could not have come at a more critical time for those attempting to maintain buffalograss stands.

Early management research concentrated on establishment techniques.

Fertilization rates play an important role in the results of buffalograss performance. Over-fertilization results in a significant amount of weed competition.

Over-irrigation promotes unacceptable turfgrass quality. In research investigating various irrigation rates, buffalograss (right) was still able to produce a quality turfgrass stand as the irrigation amount was decreased when compared to tall fescue.

Although buffalograss is categorized as a low-maintenance species, it was soon discovered that during establishment it does require irrigation and nitrogen fertilizer at levels comparable to other warm-season turfgrasses. It was also discovered that the primary factor restricting successful establishment was weed competition. Part of this latter problem was that the herbicides routinely used on buffalograss in a pasture system were either not registered for turfgrass usage or were no longer available. This meant that a turf manager trying to establish buffalograss had to either apply products illegally, hand weed, or mow in hopes that cutting the stand would give buffalograss a competitive edge. None of these options were acceptable.

The herbicide dilemma has been somewhat remedied by the registration of the herbicide Plateau, which has shown good promise for alleviating weed competition during establishment of buffalograss. The plant protectant industry has further responded to the dilemma by rewriting existing herbicide labels to include application on buffalograss.

Research on buffalograss management also has focused on determining optimal and sub-optimal planting dates. Kevin Frank, a graduate student at the University of Nebraska, has evaluated seven different planting dates in Utah and Nebraska. This work has shown that buffalograss can be successfully planted anytime from April to July in these locations, and that planting after early August will produce unsatisfactory results.

An evaluation of mowing and fertility requirements of four cultivars (seeded Texoka, seeded Cody, 118, and 378) also was made at the conclusion of the establishment research project. This work shows that some cultivars respond well to fertilizer rates of 2.0 pounds per 1,000 square feet, which is twice as high as what was previously recommended. While this rate is still a lower nitrogen recommendation than what is applied to traditional turfgrass species, it does indicate that the early belief that buffalograss would not respond to nitrogen fertilization is not true of all cultivars. The mowing results indicate that, depending on the end-user's preference, buffalograss can be maintained at 5/8" for a high-quality stand or simply mowed once a year for a truly low-maintenance landscape.

Buffalograss research conducted to date has only scratched the surface of what can and needs to be discovered. The potential of this species as an alternative to traditionally used turf species is indeed tremendous. With this in mind, it is unfortunate that some turf managers, without giving buffalograss adequate time to prove its environmental benefits, have already gotten off the bandwagon.

Currently, buffalograss is being effectively used in home lawns, as golf course rough, in areas that are difficult to mow, and in roadside/industrial areas. As research continues to identify optimal management programs for improved turf-type buffalograss, their use on golf course fairways and other intensively managed areas, especially in locations where water supplies are limited or restricted, should be realized.

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