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1992

EC92-1245 Buffalograss: A Warm-Season Native Grass for Turf

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Buffalograss

A Warm-Season Native Grass for Turf

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Buffalograss is a native grass species which has prospered on the Great Plains for centuries. Both cyclic and prolonged droughts have challenged it to evolve water use efficiency and sod forming ability. People are considering this short, fine-leaved prairie grass for an ecologically sound and energy efficient turf.

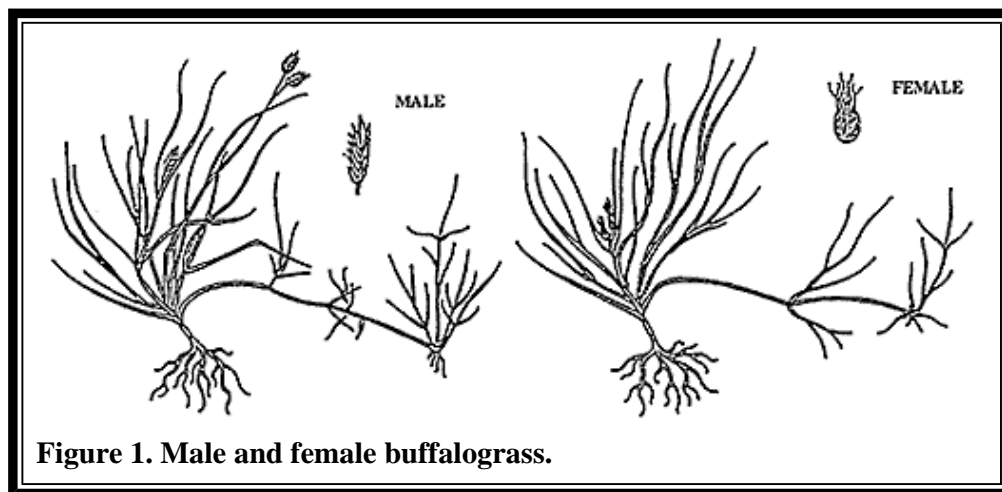


Figure 1. Male and female buffalograss.

Buffalograss is a warm-season, sod-forming grass. It spreads by seed and by stolons (runners) which take root and produce new plants at the nodes (*Figure 1*). Buffalograss is dioecious with male and female inflorescences (flowers) occurring on separate plants. Male flowers produce pollen in one-sided spikes on stems. These stems stand 3-8 inches above the leaves. Female plants produce one or more burr-like inflorescences that are partially hidden among the leaves near ground level. Each burr may contain one or more caryopsis (seeds).

Buffalograss begins growth in mid to late May and begins to go dormant with the first freeze. Leaves are basal and generally light green during the growing season. Great variation exists in color, leaf width and internode length. Buffalograss does not tolerate excessive shade and is not well adapted to sandy soil. It can survive under flooded conditions for short periods of time. Buffalograss, unlike the cool season grasses (Kentucky bluegrass, perennial ryegrass and tall fescue), has a higher resistance to drought stress because it has both an extensive, deep root system and less leaf surface area. One or more summer irrigations, depending

on rainfall, will prevent summer dormancy in buffalograss whereas Kentucky bluegrass and tall fescue may require weekly watering. Once established, a buffalograss lawn requires substantially less water than the widely cultivated cool-season turfgrasses.

Establishment of Buffalograss

Buffalograss may be established by seeding, vegetative plugs, or sodding. All methods require proper establishment methods (bed preparation, fertility, irrigation and management) to insure a good turf stand. Establishment is expensive relative to traditional turfgrasses, but thereafter maintenance costs are low.

Bed Preparation

If soils have been compacted by vehicles or extensive foot traffic, deep till or preferably chisel the site to a depth of 18-24 inches to promote deep rooting. Further bed preparation will differ depending on your choice between burrs (seed) and vegetative material. When establishing turf with seed, work the soil to a garden-like, but firm condition before planting. The seedbed should be firm enough to walk on without sinking more than 0.5 inch into the soil. This can be accomplished mechanically or by irrigation. If you choose to establish the turf with vegetative material, the garden-like condition is preferred but is not as important provided the plug or sod has good soil contact.

With both methods it is important to eradicate all vegetation in the area to be planted. Either tillage or a herbicide will accomplish this. Control early season weeds with tillage before seeding. Application of non-selective herbicides to untilled areas is recommended before establishing vegetative plugs. Follow manufacturer's recommendations regarding use of all chemicals.

Fertility

Buffalograss is adapted to a wide range of soil types but is best suited for naturally fertile, clay and loam upland soils. Maintenance requirements for buffalograss turf will be lowest on these sites. It will establish and grow in areas with eroded soils and often adapts to low fertility and poor drainage conditions. A starter fertilizer high in phosphorus, applied at time of establishment, enhances seedling root development and stolon growth. Nitrogen is also important for early plant growth. Apply 1 lb of phosphorus and 1 lb nitrogen per 1000 sq. ft in plantings to aid seedling establishment and growth.

| <i>Number of PLS/ft²</i> | <i>Pounds PLS/1000 ft²</i> | <i>Pounds PLS/Acre</i> |
|-------------------------------------|---------------------------------------|------------------------|
| 20 | 0.4 | 16.8 |
| 50 | 1.0 | 41.9 |
| 75 | 1.4 | 62.8 |
| 100 | 1.9 | 83.8 |

Seeding

Proper seed placement is needed for a successful turf stand. For large areas you can achieve excellent stand establishment with a depth limiting drill, which plants burrs at a depth of 0.5 inch or less. Use a 1-2 inch row spacing. For smaller areas, broadcasting seed is sufficient. Assure proper soil-seed contact by using a harrow or by hand raking first in one direction and then in a perpendicular direction.

Time of Seeding. Late spring is the optimum time for establishing buffalograss. Seeds will not germinate until

soil temperatures reach 60° F. This is usually after May 15 in eastern Nebraska and May 31 in western Nebraska. For Nebraska, June 1 is a good target date if the goal is to have a full stand by September. Control early season weeds before spring seeding.

Irrigation during germination and stand establishment greatly influences success. Areas without irrigation can be seeded in the fall or winter after soil temperatures fall below 50° F, however, frost the following spring may delay establishment. For best results, don't seed buffalograss after Sept. 1 in eastern Nebraska and Aug. 15 in western Nebraska. Unirrigated fall seedings of buffalograss often fail because young seedlings are susceptible to frost and winter desiccation (drying).

Seeding Rate. The amount of seed required depends on many factors. Trials conducted in southern Nebraska found rates of .25 to 2 lb of seed per 1,000 sq ft, seeded in early June, produced fully covered stands by mid-September. Problems with weed competition, seedbed preparation, seed placement, nutrient availability, and/or dry soils can inhibit stand success. Unless the season is unusually wet, you must irrigate to assure uniform germination and growth during establishment.

Recommended seeding rate is 0.5 to 1.0 lb Pure Live Seed (PLS). Pure Live Seed is the actual amount of live caryopses (seed) in the bag which will germinate, e.g., Pure Seed (82.13) x Germination percent (75) = .62 PLS (*Figure 2*). The quantity of treated bulk seed required for a given area is determined by dividing the PLS seeding rate listed in Table I by the pure seed percentage of the seed lot found on the tag. For example, to achieve 100 PLS/sq ft. over 1,000 sq. ft of area:

Figure 2. Test label for buffalograss seed.

| Common Name | Buffalograss <i>Buchloe dactyloides</i> | | Lot No. 1990-C Treated |
|---------------|---|--------|---------------------------|
| Pure Seed | 82.13% | 75.0% | Germination |
| Crop Seed | 0.02% | 14.0% | Hard Seed |
| Inert | 17.85% | | |
| Weeds | 0.00% | 1/6/90 | Date Tested |
| Noxious Weeds | none | | |
| Origin | Oklahoma | | |

$$\frac{1.0 \text{ lb PLS}/1000 \text{ sq ft}}{.82 \text{ PLS}} = 1.22 \quad \text{Bulk lbs seed of 82\% pure seed with 75\% germination}$$

Seed Sources. Several seeded buffalograss cultivars are available in bulk form. Be sure to specify that you want pre-treated seed. Pre-treated seed has been soaked or treated with special chemicals to help soften the seed coat, enhancing germination. If treated seed is unavailable, soaking seed in water before planting will speed germination. The amount of water for soaking a sack of seeds is considerably less than would be required to keep the soil moist for an equal period of time. To pre-germinate seed, place it in a water-resistant but porous material. The bag and seeds are then placed in a larger container and covered with water. A critical factor in pre-germinating seed is changing the water daily. Dump the water, allow the sack of seeds to drain and then refill with fresh water. Three days of soaking is sufficient. As soon as the seeds are dry on the surface, plant and water them into the soil without delay.

Prices of buffalograss seed vary widely based on availability and whether the seed is treated. Usually the smaller the package the higher the per unit seed cost. To evaluate the actual cost of seed divide the cost per

bulk pound of seed by the PLS. For example:

$$\frac{\$8.70/\text{lb}}{.50 \text{ PLS}} = \$17.40/\text{lb of PLS} \qquad \frac{\$9.10/\text{lb}}{.65 \text{ PLS}} = \$14.00/\text{lb of PLS}$$

Vegetative Plugs and Sodding

Stand establishment with vegetative plugs or sod may decrease time required to cover the planted area. Plugs are helpful when early landscape aesthetics or soil stabilization are important.

Vegetative Plug Establishment. Plugs should be 2 inches or more in diameter with a minimum depth of 2.5 inches. Spacing between plugs can vary, depending upon how quickly full coverage is desired. Vegetative plugs should not be placed more than 24 inches on center. If site conditions and preparation are expected to be less than optimal, the placement interval must be reduced to provide a full stand in one growing season. During establishment, it is important to keep weeds to a minimum to avoid their competing for moisture, nutrients, light and space. Periodically mowing the turf stand at a 2 to 3 inch height will help minimize weed competition.

Plug condition is important to establishing a successful stand. Plugs which have been harvested from an established field, placed in trays, fertilized and watered in a greenhouse or under clear plastic for four to eight weeks are called pre-rooted plugs. For early spring and summer plantings, pre-rooted plugs have been shown to establish more quickly than plugs not pre-rooted. With this method plugs harvested in March and planted in May will establish an acceptable stand, under proper growing conditions, by fall. Plugs not pre-rooted need three to four weeks to initiate growth and may not completely cover an area by fall. Newly harvested plugs may go brown after planting due to shock. Proper establishment methods can help minimize this off-color period and insure good rooting of the plant material. Applying a starter fertilizer at 1 lb of phosphorus and 1 lb of nitrogen per 1000 sq ft will aid in establishment and growth. Irrigation to maintain active growth will decrease the length of time required for establishment.



Sod Establishment. Harvest common buffalograss sod (Texoka, Sharps) to a depth of at least 2-3 inches. Improved cultivars such as '609' and Prairie can be harvested at a shallower depth. Because buffalograss does not have a fibrous root structure, the deeper harvesting depth insures sod integrity and sufficient numbers of roots for establishment. The sod bed should be prepared to a garden-like condition and be weed free. Irrigation and fertilization of the sod area is the same as that of a vegetative plug planting. Sod, like newly harvested plugs, will exhibit an off-color appearance during the initial weeks after planting.

Plug and Sod Selection. The selection of a buffalograss cultivar and choice of male or female plants will depend on the intended use. Establishing a single cultivar stand will provide greater stand uniformity. However, as with selecting a single cultivar of cool season grasses, it's important to select a cultivar that is not susceptible to diseases or pests. You should also carefully consider whether to select one or two sexes. The male and female flowers have a different appearance if a stand is unmowed. The male flowers will generally extend above the leaf blades whereas the female flowers remain close to the ground and are not as visible (Figure 3). When mowed at the same height, the sexes are not easily distinguished at a distance. Both the male and female plants will continually initiate flowering throughout the growing season with visibility of the

flowers highly dependent on the variety. Therefore, selection of one sex over another depends on the user's preference.

Plug and Sod Sources. As improved selections are released, more vegetative cultivars will become commercially available and vegetative propagation will be more common. Horticulture supply houses sell plugging tools which can be used to harvest plugs from existing stands.

Irrigation

Watering is necessary to establish buffalograss whether with seed, vegetative plugs, or sod. Seeding requires a light application of water at .25 to .5 inch, depending on present soil moisture and natural precipitation. Alter the following irrigation schedule according to precipitation. After seeding, water every day the first week, every other day the second week, every third day the third week, and once a week during weeks four and five. It is important not to let water puddle or run off the seed bed. Let the soil surface become dry before watering again, but maintain adequate subsoil moisture. This practice also helps reduce weed competition. Seedlings should start emerging in 10-14 days with treated seed. For vegetative plantings, water every other day for the first week and every third day the second week. Water once a week the third through the fifth weeks, if rainfall is less than .25 inch since the last irrigation. Again, do not let water puddle or run off.

On hot days, light watering (syringing) in the late morning or early afternoon will improve stolon elongation and rooting in plants established from all methods. Syringing is the light application of water (.125 inch or less) to prevent wilting and to cool the turf. For established stands, one deep irrigation or rainfall during July, August and September is necessary if green growth is desired. In low maintenance situations, no water is necessary, but some browning of leaf tips may become evident. Without water, establishment of a covered turfgrass stand could take several years.

Weed Control

The degree of success in establishing a stand in one year is strongly influenced by weed competition. Warm season annual weeds are frequently the main competitive problem for buffalograss.

Make every effort to remove growing weeds from the bed before planting. Weeds that develop after buffalograss has been seeded should be eliminated as quickly as possible to enhance turf establishment. Weeds that are taller than buffalograss seedlings should be mowed at a 2-3 inch height. Hand weeding is effective in establishing buffalograss plants. Registrations of several new materials are being developed for buffalograss. Please contact your local Extension agent for current recommendations. As with any herbicide, read all directions and follow the manufacturer's recommended application rates. Refer to Neb-Guide G91-1045 *Lawn Weed Prevention and Management*, for specific weed control methods.

Insects

Little is known about the insects and mites associated with buffalograss, but, in general buffalograss is relatively free of pests. Only a few isolated cases of insect and mite damage have been reported. In addition, buffalograss usually harbors many of the enemies natural to the pest insects which do invade. These beneficial insects include big-eyed bugs, syrphid flies, lady beetles, predatory mites and several species of parasitic wasps.

The most potentially serious pests of buffalograss identified so far in Nebraska are a tiny, grass-infesting mealybug, the buffalograss webworm and a short-winged species of chinch bug. Injury by the mealybug appears as a general yellowing or browning of the foliage similar to the symptoms experienced during periods of drought stress. In severe cases, plants turn straw brown and may go dormant or die. Because buffalograss mealybugs prefer to feed in the younger, terminal growth, closely mowing (1/2 to 3/4 inch) mealybug-infested areas and removing the clippings should help reduce insect numbers.

Buffalograss webworm injury appears as irregular brown spots in the turf and is often associated with areas stressed by drought or higher traffic. Good cultural practices, especially irrigation, are usually enough to overcome light to moderate webworm infestations because the buffalograss can simply outgrow the injury. During very hot, dry periods, however, webworm damage is likely to increase.

The short-winged chinch bug damages buffalograss by withdrawing plant sap. While feeding, they also inject a plant toxin into stems and leaves which interferes with the translocation of water and nutrients. Chinch bug damage appears as patchy areas which turn from yellow to brown as feeding progresses. Since chinch bugs prefer turf areas where thatch and organic debris are abundant, cultural practices which minimize thatch accumulation should help reduce insect problems.

There are no insecticides registered to control mealybugs, chinch bugs or webworms on buffalograss. Control of these insects is through proper maintenance and cultural practices.

Diseases

Buffalograss is relatively free of plant pathogens. Isolated cases of diseases have been reported; however, little research has been done in this area. Proper turf stand maintenance which incorporates integrated pest management should reduce the likelihood of disease infestation.

Management of Established Turf

After the establishment year, buffalograss lawns in Nebraska can be maintained with no irrigation, beyond that received as rain or snow. However, the quality of a buffalograss lawn will be enhanced with timely irrigation. In especially dry springs, irrigation when buffalograss begins to green up will insure a good, dense lawn that is competitive with weeds. The greatest benefit from added water is gained during the period of active stolon development in late July through August. Added moisture at this time helps the stolons develop roots at the nodes, thus establishing new plants, however, excessive irrigation at this time will promote weed growth. The period when the turf exhibits a green color may be moderately extended in the fall with additional water if freezing temperatures do not occur.

Apply fertilizer between June 15 and June 30 for optimum results. This nitrogen stimulates new tissue and is available during the period of active stolon development in July and August. If fertilizer is applied to an established buffalograss lawn, actual nitrogen levels should not exceed 2 lb. per 1,000 square feet per year.

Buffalograss is a short grass that grows to 4 to 5 inches, therefore mowing requirements are reduced. Buffalograss lawns can be mowed to 3 to 4 inches to remove the slender male flower stalks that develop above the height of the leaves. This may require regular mowing since the male flowers are continually produced. Buffalograss turf can be given a uniform appearance by mowing at a 2.5 inch height at three to four week intervals in late spring and two to three week intervals later in the season.

The amount of supplemental water needed to maintain a green turf and good stand quality is influenced by mowing management. Minimal frequencies of mowing and higher cutting heights will allow buffalograss to maintain a vigorous root system. Removing more than one-third of the live leaf material will reduce root activity and growth. This will make plants more susceptible to moisture stress near the soil surface. Do not cut the grass by more than one-third its total height at any mowing. Because of the aggressive stolon development, buffalograss may require edging along walks, driveways, shrubs and flower beds.

Acknowledgements

Gratitude and appreciation are extended to Drs. Edward Kinbacher and Chet Hawley for their input into the writing and editing of this publication. Both have been instrumental in the collection, development and use of

buffalograss as a turfgrass species in the United States.

Care and Management Summary

| | |
|-----------------------|---|
| Requirements | <ul style="list-style-type: none">• Grows best in full sun• Should have at least six to eight hours per day of direct sunlight• Good soil drainage is essential• Adapted to wide range of soil types• Not suited to sandy soils |
| Establishment | <ul style="list-style-type: none">• May 31-August 15: Western Nebraska• May 15-September 1: Eastern Nebraska• Water 0.25-0.5 inch per week depending upon natural precipitation• Seeding: 0.5-1.0 lbs seed/1,000 sq ft• Plant seed 0.25-0.5 inch deep• Vegetative: Plugs planted on 0.5-2.0 ft centers |
| Mowing | <ul style="list-style-type: none">• 2-4 inches for home lawns• Low maintenance areas may be mowed taller or not at all• Frequency is affected by amount of watering and fertilizer• Catching clippings optional |
| Watering | <ul style="list-style-type: none">• Deep soak once a month from July to September for higher maintenance areas• Soak soil before winter if soil is dry• Occasional or no watering for low maintenance areas |
| Fertilizing | <ul style="list-style-type: none">• June 15-June 30 is best; second application, if used, July-August• 1-2 lbs actual nitrogen/1000 sq ft• Less on low maintenance and natural areas |
| Weed control | <ul style="list-style-type: none">• Avoid frequent watering, short mowing and over fertilization• Minimize early season watering• Avoid 2,4-D and related products in the spring, when temperature is above 90° F, and on first year turf• Control broadleaf weeds in the fall |
| Insect/disease | <ul style="list-style-type: none">• Follow good maintenance and cultural practices control |

File EC1245 under HORTICULTURE
Issued 1992

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Elbert C. Dickey, Director of Cooperative Extension, University of Nebraska, Institute of Agriculture and Natural Resources.

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