

EDWARD Y. HOSAKA
NORMAN K. CARLSON

BUFFELGRASS

for Hawaiian Ranges

EXTENSION CIRCULAR 380
UNIVERSITY OF HAWAII
AGRICULTURAL EXTENSION SERVICE
HONOLULU 14, HAWAII
JUNE, 1957

Introduction

Buffelgrass (*Pennisetum ciliare* (L.,) Link) is a native of Africa and the southern Mediterranean region. It was first introduced into the Territory in 1935 by the University of Hawaii Agricultural Experiment Station. Sometimes referred to as *Cenchrus ciliaris* L., it is more widely known as *Pennisetum ciliare*, the name which will be used in this booklet. In Hawaii the common name *African foxtail* was first given the new grass, but the use of the name has been discontinued over the more preferred designation, *buffelgrass*.

In the dryland pastures, where long-lived forage grasses are rare, buffelgrass is important because of its ability to survive and grow under drought conditions. In the inland regions of Australia, with less than 20 inches of annual rainfall, buffelgrass grows better than any of the more palatable native forage species (see figure 1). Ranchers in these low-rainfall regions regard buffelgrass as the most important introduced grass, and believe it is likely to do more than any other grass to promote the grazing industry of Australia.



Fig. 1. Closely grazed buffelgrass in the Cloncurry region of Australia.—Photo by Hosaka.

Buffelgrass is important because of its high palatability and nutritional value. It was found, for instance, at Texas A. & M. College, that the protein content of buffelgrass ranges from 10.69 to 13.50 percent (dry basis).

Buffelgrass has an important place in the forage composition of the dry lowland ranges of Hawaii (see figure 2). It is especially useful in the humic latosols of the dry lowlands and in deep sandy soil areas such as those found in

the Mokuleia region of Oahu. Buffelgrass is sensitive to frost and does poorly in the high altitude pastures of Hawaii, however.

In 1936 buffelgrass was planted in the low humic latosols of the 20-inch or less annual rainfall region at Waianae, Oahu. It spread by its buoyant seeds into the surrounding kiawe (*Prosopis chilensis* (Mol.) Stuntz) thicket and replaced some of the sourgrass (*Trichachne insularis* (L.) Nees), an undesirable, medium-height bunch grass. This succession took place because buffelgrass is more tolerant to shade than sourgrass. Under similar climatic and soil conditions on Molokai, it has advanced into adjacent regions from a small original planting.



Fig. 2. An excellent stand of buffelgrass in the dry west-end of Molokai.—Photo by Carlson.

Description

A bunch spreading perennial grass $\frac{1}{2}$ to 4 feet tall, with a tough, knotty crown. Roots are dense and long. Leaves are green to bluish-green in color, 3 to 12 inches long and $\frac{1}{8}$ - to $\frac{1}{4}$ -inch wide. Old plants become stemmy with harsh leaves. Flowering stems extend beyond the leaves, are cylindrical, upright to slightly drooping, purplish, and 2 to 4 inches long. Individual flowers appear singly or clustered (2 to 3) and are surrounded by numerous bristles. The $\frac{3}{8}$ - to $\frac{3}{4}$ -inch long bristles are fused at the base.

Buffelgrass is a highly variable species with many strains. Some have narrow leaves, others much wider foliage. Some are distinctly upright while others appear to be partly lying down. Some varieties produce abundant seed while others are poor seeders. One extreme strain, adapted to heavy soil, is the dis-

tinctly rhizomatous type called *blue buffelgrass*, (see figure 3). It has light-colored seed heads and bluish-green leaves.

The most commonly used strain in Hawaii is T-4464, an introduction into America from South Africa in 1946 by the U. S. Soil Conservation Service, which has a trial planting of several strains in the reddish brown soils of South Point, Kahuku, Hawaii. Three strains of the group, T-3782, T-4701, and T-20250, have been rated superior over T-4464 in the 18 months of performance under actual grazing conditions, according to Carl Sundquist, Soil Conservationist, S. C. S. Ten strains of buffelgrass, collected from the different regions of Africa and India, were planted in a Parker Ranch test plot in June, 1956. Observations of the young plants indicate that some of the strains are definitely promising. Trial planting also has been established at the University of Hawaii Haleakala Branch Station on Maui. It is hoped that a better strain of buffelgrass will be found for the various conditions of the Hawaiian ranges as a result of these trials.

Seed Harvesting

Buffelgrass seeds can be harvested by hand stripping the long seed-stalks, or with a seed harvester (see figure 4). Some seeds are lost, however, because the very dry or overly mature seed-heads shatter. From an acre of good buffelgrass, 600 to 1,000 pounds of unhulled seed can be hand-picked. This amount will seed 200 to 400 acres. Buffelgrass seed may be also collected by machine with some success, although the amount of seed harvested is only about 75 to 150 pounds per acre (see figure 5).

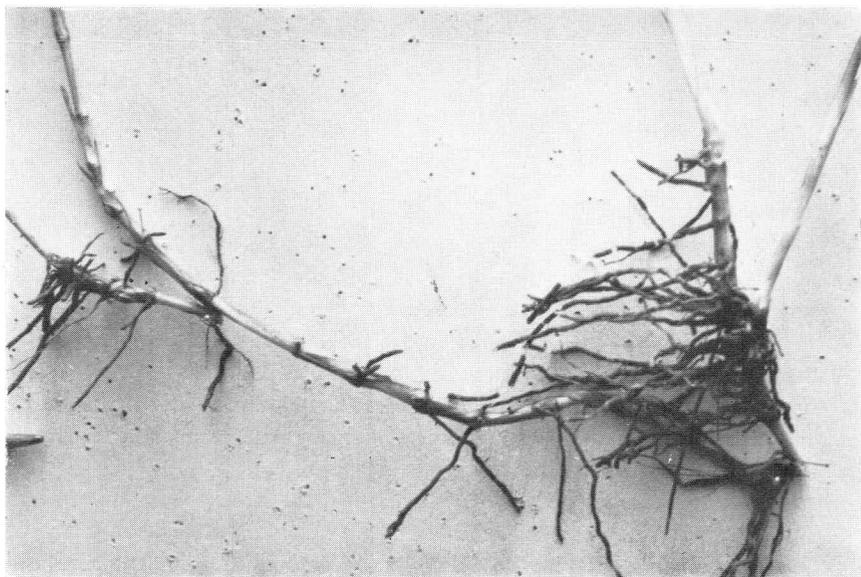


Fig. 3. Underground runners of blue buffelgrass.—Photo by Teho.



Fig. 4. Seed-head of buffelgrass—S.C.S. photo by Carlson.



Fig. 5. Seed harvester—S.C.S. photo by Carlson.

Establishment

Two to three pounds of good quality unhulled seed gave a good stand of seedlings on Parker Ranch in the reddish brown soils. Other ranchers have



Fig. 6. Young buffelgrass.—Photo by Carlson.

experienced similar results. Good mulch of leaves and stems lowers soil moisture loss and keeps the soil cool, features most important in seed germination of forage species in the dryland areas. If practicable, the land should be disked to a depth of 3 to 4 inches before seeding with a seeder, or hand broadcasting. Follow this with a light-chain drag. It has been found that buffelgrass seeds go through a one-year dormant period, so year-old seeds give a more uniform stand than fresh seeds (see figure 6).

Fertilizer is desirable to get a good stand. Soil tests are necessary to determine the kind and amount of fertilizer to apply.

In order to get a good stand of buffelgrass with a minimum amount of care, graze the seeded pasture lightly with a relatively large number of animals for one to two days when the plants are five to six inches tall. Deferred grazing of young plants will encourage the development of strong and healthy clumps.

Two-year research at the Texas A. & M. College indicates the need for an intensive grazing management program with buffelgrass. Without controlled grazing, the growth will get ahead of the animal and the results will be poor quality grazing and a great waste of forage by trampling.

The late Edward K. Baldwin of Ulupalakua Ranch planted a mixture of two pounds unhulled buffelgrass and eight pounds guineagrass with good results. The buffelgrass filled in the spaces between the individual guinea clumps, and retarded soil erosion.

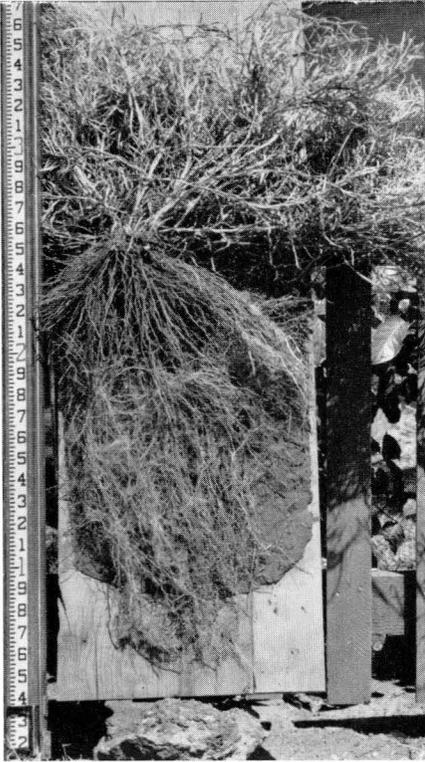


Fig. 7. Excellent root system of buffelgrass.

In a mixed buffelgrass stand, graze so as to favor the most palatable grass.

Root System

Buffelgrass has a tremendous root system (see figure 7). The fibrous roots have been found to penetrate down to four feet or deeper, thus preventing soil movement. Strong roots develop soon after germination, and within a few weeks cover large areas in search of soil moisture and plant food.

Management

Buffelgrass can withstand heavy grazing and mowing and should not be allowed to become rank and tall because the stemmy material has little value as feed. High feed value is found in the young growth, however.

In a well-established pasture, start grazing at the early seedling stage and move the cattle when the plants are grazed down to about four inches from the ground. To keep a healthy stand of buffelgrass, the practice of deferred grazing once in three years, until the seed heads are mature to insure a vigorous root system and new seedling, is suggested.

LITERATURE

Trew, E. M. *Buffelgrass*. Texas A. & M. College System, Texas Agr. Ext. Serv. Leaflet 213.

Buffelgrass. Agronomy Handbook, Western Gulf Region, Soil Conservation Service, pp. 61-61a. February, 1951.

The Grasses and Pastures of South Africa. The Grasses and Pastures of South Africa Book Fund, p. 451. 1955.

Whitney, L. D., E. Y. Hosaka, and J. C. Ripperton. *Grasses of the Hawaiian Ranges*. Hawaii Agr. Expt. Sta. Bul. 82, p. 133. 1939.

Buffelgrass. Queensland Agr. Jour., XLVIII(4), pp. 422-423. October, 1937.

Cooperative extension work in Agriculture and Home Economics
College of Agriculture, University of Hawaii
United States Department of Agriculture cooperating
Y. Baron Goto, Director, Hawaii Agricultural Extension Service
Distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914

UNIVERSITY OF HAWAII
COLLEGE OF AGRICULTURE
AGRICULTURAL EXTENSION SERVICE

Willard Wilson

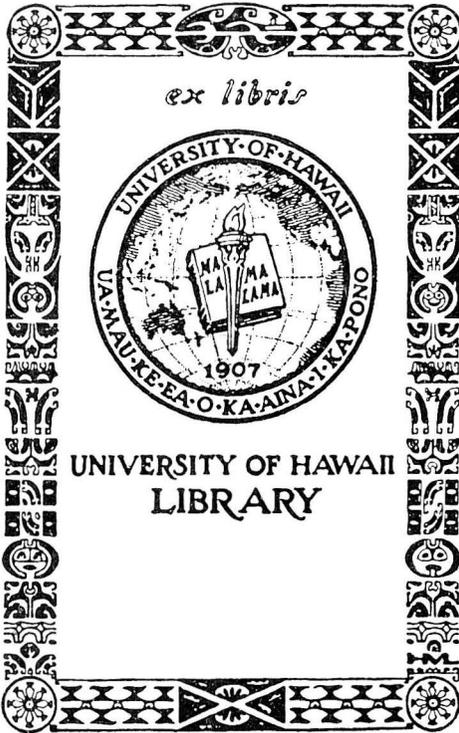
Acting President of the University

H. A. Wadsworth

Dean of the College of Agriculture

Y. Baron Goto

Director of the Agricultural Extension Service



ex libris



UNIVERSITY OF HAWAII
LIBRARY