Buffel grass

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BUFFEL GRASS (Cenchrus ciliaris L.). A—Plant showing habit of growth; B—Burr.

BIRDWOOD GRASS (Cenchrus setigerus Vahl.). C—Plant showing habit; D—Burrs.
BUFFEL GRASS (Cenchrus ciliaris L.)

By K. FITZGERALD, B.Sc. (Agric.), Agricultural Adviser

BUFFEL grass occurs in various forms in tropical and sub-tropical parts of Africa and Southern Asia and extends from Arabia to India. It has been found in Madagascar, Socotra and, in more recent years, in the northern parts of Australia. The exact date of introduction into north-western Australia is not known for certain, but it was probably brought in accidentally in camel fodder from India about 1910. The spread of the plant along the coastal areas since that time has been both spectacular and rapid.

In more recent years further strains have been isolated in Africa and these are now being tested under Australian conditions.

A number of native species of the same genus as buffel grass are found in Australia, but mostly they are inferior types and in many cases are regarded as pests; *Cenchrus echinatus* commonly called Gallant’s Curse or Cheeky Grass is a well known pest of cultivated areas at Broome (W.A.) and Katherine (N.T.).

**DESCRIPTION**

Variation in growth habit occurs, but generally it is an erect perennial grass of the tussock-forming type which produces short underground runners; this latter habit is more pronounced in some strains than in others.

Under favourable conditions it forms a dense tussock up to two feet in diameter and 30 inches tall with numerous flowering heads.

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Fig. 2.—Buffel grass growing on Mundabullangana Station between Port Hedland and Roebourne. This stand has been grazed fairly heavily before the photograph was taken.
Fig. 3.—The top picture shows portion of a Buffel grass paddock at Mundabullangana after heavy grazing during a dry summer. The lower picture, of the same area, shows the response to early winter rains.
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The degree of leafiness varies with the strain and stage of maturity, but grazing has a marked effect. After heavy and repeated grazing the plants shoot at the nodes and produce clusters of short shoots; these are relished by stock, but the tough wiry stems are usually left untouched.

The fox-tail-shaped seedheads, borne on a short stem, are purplish in colour when young, but change to a dull purplish-brown or yellow-brown colour when mature. There are usually seedheads at all stages of maturity on any one plant. The seeds or burrs bear a number of hairs or bristles near their base, however, these are fairly soft to the touch (as distinct from the seeds of Birdwood grass).

**CLIMATIC REQUIREMENTS**

Buffel grass is essentially a summer rainfall loving type making its best growth in the hotter months of the year; however, it has the ability to make growth in the cooler months in response to winter rains; this has often been demonstrated in the Broome-Port Hedland areas.

While buffel grass is usually regarded as a drought-tolerant type capable of existing and spreading on a 12-inch rainfall, it thrives at Darwin on a 50-inch rainfall and equally as well at Katherine on a 35-inch rainfall. It appears to make a more luxuriant growth under higher rainfall conditions. Here too, the seed head appears larger and more open while the percentage of leaf to stem appears higher than under less favourable conditions.

In the past it was generally agreed that buffel grass only thrived on the coastal areas where it benefited from an occasional heavy dew. This belief is losing favour in view of the excellent establishment of buffel grass on areas remote from the coast where dews are very rare. Buffel grass does respond to heavy dews, but they are not essential to successful growth.

Leaf damage results from severe frosts, but recovery is usually fairly rapid, especially in the warmer spells during the winter months. Repeated frosts would prove detrimental and this is one of the main reasons why buffel grass has not been grown with any degree of success in southern areas.

**SOIL REQUIREMENTS**

Buffel grass favours the lighter-textured, freely-drained soils and appears as equally at home on sands as on sandy loams. It grows particularly well on the limestone country adjacent to the coast at Port Hedland.

It has not persisted on the heavy Cununurra clay soils in the Kimberleys, but it has been established on the desert loam soils at Murray Downs in the Northern Territory.

The fact that it has failed on the red sandy Pindan soils between Broome and Derby while it thrives on the sandy soils at Broome suggests that the level of soil fertility rather than soil texture may be the determining factor.

**SEED**

Commercial supplies of buffel grass seed are now available in both Queensland and Western Australia, but it is still in fairly short supply.

In the past, most seed-collecting has been done by hand, but this is slow and costly; there is also a tendency for a certain amount of immature seed to be collected by this method. In Western Australia most of the seed is collected by native labour. Their technique is to scrape it up from the ground after it has fallen and then to separate the seed from the rubbish; this method ensures that most of the seed is mature.

Seed collecting has been mechanised in some areas, but a really efficient method has not yet been perfected. One reasonably effective method is to attach a U-shaped sheet of galvanised iron, fitted with supports, to the bumper bar of a truck or utility. Driven through the crop at 8 to 10 miles per hour the device works quite effectively and only mature seed falls into the trough.

Pioneers in the establishment of buffel grass areas have been aware for many years of the necessity of planting mature seed. Freshly collected buffel grass seed has a very low germination percentage, but this improves with storage. Tests carried out at Port Hedland have shown that freshly-collected seed with a germination percentage of 3% could be improved to 71% by keeping the seed for two years.
before using. The price and scarcity of seed make this an important consideration.

SEEDING RATE

Experience has shown that 2½ to 3 lb. of seed per acre is sufficient to give a satisfactory stand provided the seed is fully mature; this should give two or three plants to the square link. Seeding rates of 4 or 5 lb. to the acre have been used with success in heavier rainfall areas adjacent to the coast and on more fertile soil types. However, with the scarcity of seed and its high cost the lighter seeding rates are recommended.

PLANTING TECHNIQUES

Buffel grass is readily established from seed, but to ensure a satisfactory strike it must be sown on broken ground and covered lightly. Excellent stands result from planting into a well prepared seed-bed.

Tandem disc harrows or an ordinary tyne cultivator have been used with success. After broadcasting seed it is advisable to cover it with up-turned harrows or with a bush dragged behind a vehicle.

Disappointing results have come from broadcasting on to hard, bare, unprepared ground.

On stations where suitable machinery is not available, a useful technique is to drive cattle over the area both before and after broadcasting the seed to break the soil and tread the seed into it. Most station managers appreciate the effectiveness of scattering buffel grass seed around stock yards and watering points. The broken ground assists in the establishment and later the stock assist in the dispersal of seed; it is possible too, that the extra manure around these areas promotes a more vigorous growth.

The bristly nature of the seeds makes an even distribution through a seed drill a difficult undertaking as the seed tends to block the drills. The use of a hammer-mill to remove these bristles is an advantage while mixing with sand or sawdust ensures an even distribution.

Pelleting of the seed with superphosphate and some musilaginous substance does assist, but it is doubtful whether the extra labour involved is worthwhile.

On large pastoral holdings, probably the quickest and cheapest method of establishing buffel grass over extensive areas in a short time is by resorting to “strip-planting”; here single runs with a seed drill are made a couple of chains apart and the grass is left to spread between the runs by natural means. Again, small fenced plots, say one chain square, are planted, as seed increase plots; these, placed strategically around the run to make the best use of the prevailing winds for seed dispersal, should greatly facilitate the spread of grass over the run.

Every station interested in the establishment of buffel grass should at least have their own seed increase plot from which to draw their seed. A five acre paddock is a useful size for such a project and it will be found most useful for the odd night horse held occasionally at the homestead.

Fig. 4.—Broken ground is essential for Buffel grass establishment. Here where contour working was carried out on claypans, seed was broadcast over the whole area shown in the photographs, but germination only took place on the cultivated strips.
MANAGEMENT

The secret of success with buffel grass pastures lies in correct management; faulty treatment within the first 12 months of establishment can ruin an otherwise satisfactory stand.

As a general rule, newly-established areas should not be grazed for the first 12 months.

Under adverse conditions, seed is often set within six week of planting at which stage the plants are only three or four inches tall; it would be foolish to put stock on such an area.

An established stand can withstand heavy grazing; in fact, it is essential that it be kept short. Stock relish the young tender shoots and regrowth, but often refuse the mature plant.

Palatability and feeding value decline with age and both protein and phosphorus values fall to fairly low levels as the plant matures; the following table indicates this trend:

<table>
<thead>
<tr>
<th>Grass</th>
<th>Protein</th>
<th>Fat</th>
<th>Carbohydrate</th>
<th>Fibre</th>
<th>Ash</th>
<th>CaO</th>
<th>P₂O₅</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>Buffel...</td>
<td>18.0</td>
<td>1.6</td>
<td>40.7</td>
<td>27.0</td>
<td>12.7</td>
<td>.95</td>
<td>.67</td>
<td>Young growth.</td>
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<tr>
<td>Buffel...</td>
<td>8.3</td>
<td>0.8</td>
<td>43.7</td>
<td>38.5</td>
<td>8.7</td>
<td>.72</td>
<td>.157</td>
<td>Stemmy leaf; with ripe seed.</td>
</tr>
<tr>
<td>Buffel...</td>
<td>5.6</td>
<td>1.2</td>
<td>52.8</td>
<td>30.4</td>
<td>10.0</td>
<td>.25</td>
<td>.154</td>
<td>Dry stemmy plants.</td>
</tr>
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CHEMICAL COMPOSITION OF BUFFEL GRASS (on Water-Free Basis)

With heavy dense stands it is advisable to use a mowing machine and then graze the regrowth, adjusting the stocking rate so as to keep the grass fairly short. Continued overgrazing is detrimental especially on new areas.

Where cattle and sheep are run on the same property it is advisable to graze mature stands first with cattle to remove heavy growth and then turn the sheep in to graze the shorter material.

Periodically the crop should be allowed to set seed before it is grazed in order to re-thicken the stand.

Buffel grass can be cut and baled as hay; the product being quite good in both feeding value and keeping quality. Even if baling is not possible, a mature stand can be cut and left in the paddock; the stock will eat quite a lot of the dry material and even though some is lost the quality of the regrowth will be greatly improved.

An occasional fire in a buffel grass area will cause no serious permanent damage, but frequent burnings are to be avoided.

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FERTILISER REQUIREMENTS

Marked responses have been obtained from topdressings with superphosphate, especially on the lighter soil types, but the response on heavier soils is not so marked.

Again, old buffel grass stands show signs of nitrogen starvation and the response to a topdressing of 1 cwt. of ammonium sulphate to the acre is quite spectacular.

From an economic standpoint it seems more desirable that efforts be made to establish some type of legume with buffel grass to improve the nitrogen status of the soil rather than relying on expensive artificial fertilisers. Further experimentation
into the economic aspects of applying artificial fertilisers to buffel grass pastures seems warranted.

CONCLUSIONS
Buffel grass has already displayed its ability to establish and spread over extensive areas of our North-West. This, coupled with its high degree of drought tolerance, its palatability and high nutritive value makes it a particularly valuable introduction whose role in the North-West could almost be comparable in importance with that of subterranean clover in the southern portions of the State.

Probably the most important points to remember when establishing buffel grass are:

1. Use only mature seed—18-24 months old—seed at the rate of 3 lb. to the acre.
2. Plant into broken ground—preferably light soils—and cover the seed.
3. Protect from grazing for the first 12 months.
4. Once established, graze heavily to prevent coarse, rank growth.

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