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MADRAS RECORD OFFICE

GOVERNMENT OF MADRAS

Reg DEPARTMENT

G.O. No.
B.P. No. 7

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Dated 22 7, 1875 196—.

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Proceedings of the Madras Government, Revenue Department,
22nd July 1875.

No. 232. Read the following Proceedings of the Board of Revenue, dated 9th July 1875, No. 1,902:—

Read the following letter from W. R. ROBERTSON, Esq., M.R.A.C., Superintendent of Government Farms, to H. E. STOKES, Esq., Acting Secretary to the Board of Revenue, dated Sydapet, 19th June 1875, No. 317.

I HAVE the honor to submit the following observations on Hurriali grass and its cultivation, in compliance with the request made in paragraph 1 of the Board's Proceedings, No. 1,390, dated the 21st of May 1875.

HURRIALI GRASS.

Hurriali grass is known to Botanists as *Cynodon dactylon*, as *Panicum dactylon*, and as *Agrostis Linearis*. Its tamil name is Arugampilloo, and its Bengalee name is Doorba. Hurriali is a very common grass in most parts of India. It will be found described under one or other of the names above given in many of the Botanical works that relate to India.

Hurriali grass is found in most parts of this Presidency growing in a wild state where the soil is of average quality; when growing under such circumstances, it yields a moderately nutritious herbage which is greedily eaten by all kinds of farm stock. In the vicinity of Madras, near Bangalore, and in the neighbourhood of one or two other large towns in Southern India, this grass has been cultivated to some extent as a hay producer. Under high cultivation, especially when irrigated, it yields heavily.

When I took charge of the Sydapet Experimental Farm in 1868, I found a plot of land, measuring 3 acres, under Hurriali grass, which had been laid down sometime previously on the system described by General Otley in his letter to the Chief Commissioner of Mysore, dated the 22nd of January 1870. The following extract from my report for the year ending 31st of March 1870 refers to this plot:—

"50. The showers in August and September started the grass, and a small crop was obtained about the middle of the latter month; part of this crop was cut green for house-feeding sheep, and the remainder of the crop was consumed on the ground by sheep. Since then, two or three small crops have been obtained. The first of these was cut during the rains, and the hay was so discolored that greater part had to be given to the working cattle. The quality of the hay obtained from the other two crops was superior, and Rupees 237-7-0 were realized by its sale. Excepting about a month, during which time a water-lift was experimentally worked by a pair of mules, the field was never artificially irrigated, and depended entirely on the rains. The total expense of cutting and winning the hay, &c., did not exceed Rupees 100....."

In my report for the following year, this plot of Hurriali grass is again referred to as follows:—

"93. The old Hurriali meadow.....gave five cuttings during the past year, yielding 8 tons 13 cwts. of hay. Excepting about 50 square yards, which was watered for experimental purposes, the meadow was solely watered by the rain-fall....."

"94. The hay was sold for Rupees 360-13-3, and the cost of cutting, winning, &c., was Rupees 105....."

The grass was not again mown after 1871, but was kept for pasture only. A portion of the plot was broken up for arable cultivation, but about an acre yet remains under the grass; this, in showery weather, affords moderately good grazing for sheep. Not more than 50 per cent. of the grass now growing on this plot is Hurriali grass, the remainder consists of Bull grass (*Cyperus hexastachyus*) and Finger grass (*Panicum Sanguinale*), which are rapidly extending and crushing out the Hurriali plants.

I regret that I have not been able to ascertain the cost that was incurred in putting down these 3 acres of land under Hurriali grass. The Farm "Labor Book" shows that during a

Proceedings of the Madras Government, Revenue Department,
22nd July 1875.

period extending over more than a year, a very large proportion of the cattle labor and manual labor of the Farm was expended on this plot of land in planting it with Hurriali grass. These entries are not, however, sufficient to enable me to determine the actual value of this labor; but if, as I have every reason to believe, the practice recommended by General Ottley was followed, the cost must have been enormous. General Ottley, in his published instructions on the cultivation of Hurriali grass, says that the land intended to be put under this grass should be dug over, at least half a yard in depth, and should be manured with a dressing of cattle manure nine inches in depth. Now for digging an acre of land half a yard in depth, for planting the grass, and other early work, the cost could not be less than Rupees 80; and to manure an acre of ground with a dressing of cattle manure of nine inches in depth, 1,210 cubic yards, or about 2,000 country cart-loads of manure would be required, the cost of which on the land could not, under any circumstances, be less than 600 Rupees, making the total expenditure Rupees 680 per acre, an expenditure which nothing could justify, even were it possible to obtain the enormous quantity of manure that is required under this system.

In my Report for 1870-71, I described a system of operations that appear to me well suited for putting in practice when considerable areas of land are being planted with Hurriali grass. The following extract is from that report:—

"96. The land, having been well cleaned, received a dressing of five tons per acre of fold-yard manure; when ploughing the manure in each plough was followed by a woman who dropped the grass roots in the open furrow, these the next plough covered up, when the furrow made by it was similarly planted, and the process repeated again and again until the ground was all planted; a heavy harrowing and rolling completed the work." The plot of ground thus planted did not yield such good results as I had anticipated; but this was not because the system pursued in planting was in any way defective, but was the result of the bad physical state of the soil, and its low condition. Had the soil been good, the result, I am satisfied, would have been all that could have been desired, considering the smallness of the expense incurred in planting the ground, which, including manure and every other charge, was not more than Rupees 30 per acre. Ground planted in this way, if terraced, ridged, or laid out in long narrow beds, can be as readily irrigated as when laid out in the small beds that General Ottley appears to recommend.

The following extract from the same report may be interesting as showing the cost of cutting Hurriali grass when planted in small beds, in comparison with the cost of cutting grass when planted on larger surfaces of ground where the scythe can be used:—

"97. Being anxious to see what amount of work our coolies really could do with our improved grass knives in cutting Hurriali grass, I offered three small prizes for "quick and good work." The ground selected was laid out in the usual sized beds, and the crop was very similar. Fifteen coolies entered for competition; each plot contained 120 square yards; the following are the results:—

Time occupied.		Time occupied.	
Minutes.		Minutes.	
1st Man...	115	9th Man...	134
2nd	117	10th	135
3rd	118	11th	139
4th	119	12th	141
5th	122	13th	153
6th	123	14th	155
7th	123½	15th	158
8th	130		

"98. The work was fairly done; however the laborers worked at a much greater speed than they could continue at during a whole day. The result shows what they can do under extraordinary circumstances. The average time required to complete the work was 132 minutes; at this rate eleven men should cut an acre per day. My experience is that it usually takes nearly twice this number. Formerly, when the common country knives were used, it was considered that

Proceedings of the Madras Government, Revenue Department,
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forty men did a fair day's work if they cut one acre per day. The competition took place in the early morning while the men were fresh, and before the heat of the sun became unpleasant; so the results obtained cannot be taken as average results. Probably 50 per cent. added would more nearly represent a fair day's work. Though it is certainly a great step in advance to cut an acre of grass on land divided under these troublesome beds by sixteen men in one day at a cost of 3 Rupees, I cannot look upon the result as anything like what we ought to attain. In England three-and-six-pence or four shillings per acre is a fair price to pay for cutting meadow hay; this is equivalent to the pay of two average field laborers, and here we are content if we get the same work done by sixteen field laborers. The fault is not so much with the men as with the system; as long as Hurriali grass is grown in these wretched little beds, we cannot hope to reduce greatly the cost of cutting. If we can succeed in growing as good crops on a surface where the scythe can be used, I have no doubt but that the cost of cutting could be reduced to 12 Annas or at the most 1 Rupee per acre."

The following observations on the curing and stacking of Hurriali hay, taken from the report from which the previous extracts were made, may be of use:—

"99. Hurriali, like most other meadow grasses, should be cut immediately the flower begins to appear; at this state the juices of the grass are more nutritious, and the hay is far superior than when made from the fully-matured plant. Besides, when cut before the seed appears, the plant is more vigorous and produces another crop much sooner. Hurriali hay is generally spoiled in this country by being too much exposed to the sun's rays. It is quite unnecessary to bleach the grass in order to make it into hay. The great object should be to retain the green color of the grass by drying it as quickly as possible. Under ordinary circumstances, two days, or at the most three days, should suffice for making the hay."

"100. Cutting should not commence until the dew is off the grass. The grass should remain on the ground for an hour or so after being cut. It should then be turned and tossed until sun-set. It cannot be tossed too much during a hot sun. To preserve the green color and aroma of the hay, it is absolutely necessary to keep it moving. At night, if the dews are heavy, it should be put up in small cocks, each containing from two to three cwts. These cocks should not be tramped, though it is advisable to beat smooth the outside with the back of a rake, in order that should a shower of rain fall, the water may run off without penetrating the mass. A single hay rope should be passed over the cock to prevent it from being blown to pieces by a gust of wind. Next morning, after the dew is off the ground, the cocks may be opened again, and the hay spread out. It must be tossed and turned again, as on the previous day; care being taken that it is constantly kept moving. At the end of the second day, under usual circumstances, it will be fit to cart; though if the weather be at all damp or foggy, it will be advisable to give it another day's sunning, of course putting it again into cock at night."

"101. Hay thus rapidly made is rich in saccharine matters, and is, therefore, very liable to heat and ferment: this, to a moderate extent, does no harm; in fact it gives the hay a good flavor; however, care must be exercised that it does not go too far and char the hay. If the hay is loose in a room, exposure for an hour or two in the hot sun will put it all right, or a layer or two of dry paddy or cholam straw may be put through the mass. In the stack it is equally easy to prevent too great fermentation. I have found a single line of six-inch drain pipes placed at about the middle of the stack from the centre to the outside a capital arrangement for keeping down the temperature. A thick bamboo, or a couple of hollow pieces of the stems of palmyrah or cocoanut trees, the one resting on the other so as to form a pipe, will equally effect the purpose, or in building two or three layers of dry paddy or cholam straw placed in the stack will prevent it heating to an injurious extent."

An extract from an Australian Seed Catalogue accompanies this; the information there given may be useful, should supplies of seed of this grass be needed from Australia.

(Signed) W. R. ROBERTSON,
Supt., Govt. Farms.

*Proceedings of the Madras Government, Revenue Department,
22nd July 1875.*

ENCLOSURE No. 1.

EXTRACT from a Seed Catalogue published by Messrs. ANDERSON, HALL and Co., of Sydney,
in 1874.

Cynodon Dactylon—Couch Grass, or Dool Grass.

THIS is, without doubt, our most valuable pasture grass, as many pastures where it abounds would be comparatively worthless without it. As a summer grass it has no equal, as, during the hottest weather, it has always a green appearance; however, its fattening properties are not equal to many others. Where it does not grow naturally, it would be a valuable plant to introduce for binding sand-hills or dams, or for sowing around sheep and cattle yards, as its long creeping shoots root at every joint, and thus form a complete carpet or network of roots. During winter it is very brown, but its wiry stem will always give a nutritious bite. The collection of seed is a matter of great difficulty; however, we have secured a good supply for present season. This seed being very light, it must be carefully sown, and should always be mixed with sand, as getting the seed to germinate is a matter of great difficulty.

(True Extract.)

(Signed) W. R. ROBERTSON,
Supt. Govt. Farms.

SUBMITTED to Government with reference to G. O., dated 30th April 1875,
No. 878, Revenue Department.

(True Copies and Extract.)

(Signed) C. A. GALTON,
Acting Sub-Secretary.

No. 233.

ORDER THEREON, 22nd July 1875, No. 1,100.

Miscellaneous.

COMMUNICATED to the Military Department with reference to G. O. in that Department, dated 26th April 1875, No. 1,982.

(True Extract.)

(Signed) A. MACGREGOR,
Acting Secretary to Government.

To the Military Department.
„ the Board of Revenue.

Ld. W. H. French.

No. 1,902.

PROCEEDINGS OF THE BOARD OF REVENUE, dated 9th July 1875.
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I HAVE the honor to submit the following observations on Hurriali grass and its cultivation, in compliance with the request made in paragraph 1 of the Board's Proceedings, No. 1,390, dated the 21st of May 1875.

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Hurriali grass is found in most parts of this Presidency growing in a wild state where the soil is of average quality; when growing under such circumstances, it yields a moderately nutritious herbage which is greedily eaten by all kinds of farm stock. In the vicinity of Madras, near Bangalore, and in the neighbourhood of one or two other large towns in Southern India, this grass has been cultivated to some extent as a hay producer. Under high cultivation, especially when irrigated, it yields heavily.

When I took charge of the Sydapet Experimental Farm in 1868, I found a plot of land, measuring 3 acres, under Hurriali grass, which had been laid down sometime previously on the system described by General Otley in his letter to the Chief Commissioner of Mysore, dated the 22nd of January 1870. The following extract from my report for the year ending 31st of March 1870 refers to this plot:—

"50. The showers in August and September started the grass, and a small crop was obtained about the middle of the latter month; part of this crop was cut green for house-feeding sheep, and the remainder of the crop was consumed on the ground by sheep. Since then, two or three small crops have been obtained. The first of these was cut during the rains, and the hay was so discolored that greater part had to be given to the working cattle. The quality of the hay obtained from the other two crops was superior, and Rupees 237-7-0 were realized by its sale. Excepting about a month, during which time a water-lift was experimentally worked by a pair of mules, the field was never artificially irrigated, and depended entirely on the rains. The total expense of cutting and winning the hay, &c., did not exceed Rupees 100....."

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REVENUE.

THE MILITARY DEPARTMENT,

to, Ac, Ac.

Dated July, 22nd.

Recd.

Encl.

G. O., 22nd July 1875, No. 1,100.

JULY.

Nos. 232-233.

Hurriali Grass.—Communicating to the Military Department Board's Proceedings forwarding letter from Superintendent of Government Farms furnishing information regarding the cultivation of—

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(True Extract.)

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Supt. Govt. Farms.

SUBMITTED to Government with reference to G. O., dated 30th April 1875,
No. 878, Revenue Department.

(True Copies and Extract.)

W. H. French
Acting Sub-Secretary.

To the Acting Secretary to Government, Revenue Department.
Copy to the Superintendent of Government Farms.

*No. 1100
Communicated to the Military
Department with reference to G. O. in
that Department dated 26 April
1875. 2/1982.*

Ed. W. H. French.

*7 To the Secretary of the Board
14. The Secretary of the Board*

22 July 75.

BOARD OF REVENUE,
MADRAS.

1875.

PROCEEDINGS, 5TH JULY 1875, No. 1,902.

Def 15 July 75
Encl.

Received 19 July -

JULY.
No. 1,902.

Hariali Grass—Letter from Superinten-
tent of Government Farms, submitting observa-
tions on — and its cultivation, submitted to
Government.

No 1100. 22 July 1875

W. H. French