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# MADRAS RECORD OFFICE

GOVERNMENT OF MADRAS

Revenue. DEPARTMENT

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

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Press  
Mis.

Dated

11 - 5 - 1874 196 . .

Not to be folded or roughly handled

Read the following papers:—

- No. 15. From Captain F. D. M. BROCK, Assistant Secretary to the Government of the North-Western Provinces, Public Works Department, to the Secretary to the Government of Madras, dated 9th December 1873, No. 2,824 B. R.-C.

WITH reference to the Administration Report of Public Works in the Madras Presidency for the year 1872-73, paragraph 154, I am directed to request that you will, with the permission of His Excellency the Governor of Madras, furnish this Government with a copy of papers, or report, on the subject of planting of nanel grass for regulating the widths of the beds of the main rivers, for the perusal of His Honour the Lieutenant-Governor.

- No. 15A. No. 261.

*Memorandum on the use of the Nanel grass for purposes of river regulation, &c.*

THE grass is of a kind closely resembling that called Pappas grass, and it grows from seed self-sown, but when used in the operations of this department it is always propagated by cuttings. Tanjore is the district in which it has been most extensively used, and there five or six cuttings of about 2½ feet in length are taken and planted in a hole scooped out of the sand, the stalks being spread like a fan, and the holes being at intervals of about 2½ feet each way. Where the sand is soft, or where the grass is planted in water, single sticks at intervals of six or nine inches are forced into the sand. It is advisable to place two of the joints of the grass within the sand, and one must project above the surface of the sand or water, as the case may be. The cost varies according to circumstances, and principally depends upon the distance from which the grass has to be brought. In Tanjore it is generally to be found close at hand, and it is frequently obtained from old plantations somewhat higher up the river, and is then floated down in bundles to where it is wanted. Three annas for 100 square yards of plantation is about the cheapest rate at which this kind of work is done.

2. The proper time for planting is when the river begins to fall at the termination of the annual or periodical freshes. As the water recedes from the banks the grass is planted yard by yard, and it then takes root before the ground gets dry, and there is every chance of its becoming well grown before the freshes of the following season, for it will not bear long submergence, and in order to flourish its head should never be long under water, and should generally be 2 or 3 feet above water. Under favourable circumstances it grows to a height of 12 to 15 feet, 9 or 10 feet is a more common height. It is also planted on sand banks and shoals either when these appear above water, or as soon as the depth of water on them falls to a few inches, and it then thrives well. Circumstances often required plantations to be established in 2 feet of water or perhaps a little more, but then much of the grass fails to take root and grow well.

3. Nanel grass plantations impede the current, act as filters, and cause the precipitation of all or nearly all the earthy material or silt held in suspension by the rivers when in fresh; they also stop the movement of sand along the bed. Very muddy water entering such a plantation emerges at the lower end almost

clear. The result is that shoals which may be beyond its proper ground proceeds rapidly at first, passing over it decreases, and ultimately the deposit which can be obtained during the short time that the rivers are in high fresh.

4. Land thus formed is well covered on its surface by the grass, but it is very liable to erosion on the edges of the plantation, unless these have been carried down to a relatively low level in the river bed, and much care is required to protect these margins by planting up the scarps directly they appear. Danger is experienced also where a plantation descends the river bank into a comparatively low channel, and then is carried across on to a shoal. A set will then sometimes scour a deep channel having an island, and various contrivances are then resorted to. In the Tanjore rivers, where the rise and fall of the freshes seldom exceeds 9 feet, the current in such channels is sometimes checked by hurdles formed of bamboo thorn, which are fastened to a frame work of bamboo supported by trestles, locally called horses, made of cocoanut trees. At other places an earthen bank, having its top above flood level, is thrown across the channel, and this, if maintained, soon causes a sufficient silting up to allow of grass being replanted.

5. As a protection to the banks of rivers against erosion the grass is valuable. It is also serviceable as a substitute for revetment on the interior slopes of tank bunds, where a belt of 15 to 24 feet in width is sufficient to stop the wash of the waves. It is likewise used to protect the banks of channels in rear of head sluices, and then the mode of using it is sometimes rather different. Young and supple grass is laid on the ground, some more grass is laid transversely upon it, the surface is sprinkled with earth, and the whole is rolled up in the direction of the grass of the under layer, so as to form a roll about 6 inches in diameter, with 3 or 4 feet of the grass projecting. These rolls are then used as a revetment, the free ends being laid in the earthwork, the revetment is kept well watered, and the grass grows strongly, and will withstand a strong current and wash.

6. Rollers are made of this grass for use as aprons to prevent scour round the ends of temporary groynes, and for preventing the deepening of channels or bye washes, as well as for many other purposes. Two rows of small pegs, 15 to 18 inches apart, are driven into the ground or sand at an interval of 24 to 30 feet, the length of each row varying from 12 to as much as 40 feet. Small ropes are laid from the pegs of one row, and are tied to small bamboos laid behind the opposite row; a layer of grass is then placed all over the ropes and in their direction, then a transverse layer of grass, then a thin layer of straw followed by a layer of clay, and, lastly, some small brushwood. The bamboos are then lifted over the small pegs and used as a core on which the whole is rolled up, somewhat as a large plan would be, and a roller 3 feet, or sometime a little more, in diameter is formed, all the ropes being tied securely; the bushes, like the transverse layer of grass, act as ties; the clay is used for weight. These rollers are made close to the place where they are to be used, an adjacent sand bank being commonly selected, and they are then rolled over and over into position and fastened down with pegs or stakes of

bamboo, 8 or 9 feet long. In water they can be moved about without much difficulty, their specific gravity being less than water. In closing breaches they are very effective. In a depth of 5 or 6 feet of water, four or five rollers would be laid all across the breach, the first line being placed against trestles, such as those before mentioned, and staked down, the second row in front of these, and so on; then other rows would be imposed upon these, a third layer upon the second, and so on. Leakage would then be reduced by clay and straw stuffing, and thereafter the earthwork of the breach would be filled in.

7. Nanel grass is apt to grow where it is not wanted, and its seed is floated down rivers and lodged on shoals where it germinates and leads to the formation of islands. It is an excellent servant, but a very bad master, and it is necessary to take care that it is promptly rooted up when found growing where it is not wanted. A stalk of nanel laid on moist sand will throw out roots at each joint, and soon after shoots; the refuse material should therefore not be left outside a plantation, but should be collected and thrown within its limits, where some of it will probably take root and the rest will die.

8. Nanel requires much moisture for its first rooting and start; afterwards it gets on very well with a moderate amount of moisture. For the protection of river banks the wild cane, a species of sugar-cane, called in the Tamil country Pey Karamboo, is better than nanel, and will grow in drier soil. Like the cultivated cane it grows from cuttings, and a bank fully clothed with wild cane will withstand a very strong set.

9. In Tanjore the use of nanel is from time immemorial, and of late years the regulation of the widths and alignments of rivers, principally by means of plantations of this grass, has been taken up in earnest, and with good results. There are thousands of acres now covered with it, and in time much of the reclaimed ground will become available for cultivation. The grass is liked by cattle, perhaps rather too much so, and for that also it is much used.

(Signed) J. MULLINS, Lieut.-Colonel, R.E.,  
CAMP AT GRAND ANICUT,  
TANJORE,  
31st March 1874.

No. 16. ORDER THEREON, 1st May 1874, No. 1,144.

IRRIGATION, No. 2.

ORDERED that a copy of this Memorandum be forwarded to the Government of India, and that it be circulated to all District Engineers.

(True Extract.)

*J. Mullins*  
Lieut.-Colonel, R.E.,  
Joint Secretary to Government.

To District Engineers.  
To the Revenue Department.  
Chief Engineer for Irrigation.  
Erd. S. T. Austin.  
Spare Copies

*will follow from Madras.*  
*abd d. G. ...*

N<sup>o</sup> 1183.

Revenue 1874 Department

Govt. of Madras.

PUBLIC WORKS.

DISTRICT ENGINEERS,

&c. &c. &c.

Dated 1st May.

Recd. *g*

Encl.

G. O., 1st May 1874, No. 1,144.

Dis. No.

*Memorandum* Grass.—Ordered that the Memorandum by the Chief Engineer for Irrigation on the use of canal grass for purposes of river regulation, etc. be forwarded to the Chief Engineer and all District Engineers.

*Comd to the*  
*Boas of Revenue*  
*11 May 74* *CLL*