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MADRAS RECORD OFFICE.

Government of Madras.

Revenue **DEPARTMENT.**

G.O. No. 345	Press ~~Mis.~~
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Dated 3 — 3 — 1860.	

Not to be folded or roughly handled

Proceedings of the Madras Government, Revenue Department, for the month of March 1860.

No. 40. Read the following Memorandum from J. D. INVERARITY, Esq., Commissioner in Sind; to T. PYCROFT, Esq., Chief Secretary to the Government of Madras, dated 27th January 1860, No. 272.

The Commissioner in Sind presents compliments, and has the honor to forward for the use of the Government of Madras, twenty five copies of a Report by Mr. N A. Dalzell, Forest Ranger in Sind, upon the experimental cultivation of Imphee or South African Jowaree in this Province during the past season.

No. 41. ORDER THEREON, 3rd March 1860, No. 345.

Ordered that 20 copies of the report which accompanied this letter be forwarded to the Board of Revenue for distribution to the several collectorates, and that the remaining five copies be sent to the Public Department.

(Signed) T. PYCROFT,
Chief Secretary.

REPORT UPON THE EXPERIMENTAL CULTIVATION OF IMPHEE OR SOUTH AFRICAN JOWAREE IN SIND DURING THE PAST SEASON,

BY N. A. DALZELL, ESQUIRE, FOREST RANGER IN SIND.

Every considerable division of the Earth's surface, Australia excepted, seems to have been originally and specially gifted by Providence with some staple article of vegetable food.

Thus Europe had its barley and oats, Asia Minor its wheat, North America its Maize, South America, its Mandioc, yams, Bananas and Potatoes, New Zealand its Taro, the South Sea Islands their bread fruit, India and China their rice, and Africa its Dhourra.

This last, called Jowaree in India is the produce of a tall stout grass, the largest of the cerealia. This is the Sorghum vulgare of Botanists, the guinea corn of colonists, and is now cultivated extensively over the tropical and sub-tropical parts of the world, and next to rice forms the main article of food, over a greater extent of the Earth's surface than any other, extending throughout the whole of Africa.

This plant is amazingly productive, its grain when ground, yields a fine white flour, very nourishing, and contains more gluten than wheat. Its stalks also which contain a sweet juicy pith, form a most excellent forage plant. Many varieties of this plant have been long cultivated in India, among which may be mentioned Sorghum bicolor and saccharatum (Roxb.) as well as the ordinary S. vulgare. The word varieties is here used advisedly, instead of species, because it would be a hopeless task to attempt to define species in plants of this kind which have been cultivated from a remote antiquity, while in systematic botanical works the greatest vagueness and indecision seems to mark the opinions of botanists with reference to the species of the genus Sorghum.

These remarks are introductory to the special notice now to be given of a variety of Sorghum now attracting attention as a sugar producing plant.

While Dr. Balfour of the Central Museum Madras, was preparing his Cyclopædia of India, Lord Harris sent him some "Reports of the American Commissioner of Patents," from which it appeared that a great degree of expectation had been occasioned in America as to the value of a variety or species of Sorghum, called S. saccharatum a native of Caffraria.

Professor Arduino has published in the "Journal de Botanique" vol. iii. p. 168 an account of his experiments on the extraction of sugar from this plant which were extremely satisfactory. The juice when obtained with care by depriving the stalk of its outer coating of woody fibre, is nearly colorless, and consists merely of sugar and water. Its density varied from 1·050 to 1·075 and the proportion of sugar contained in it from 10 to 16 per cent. (The juice of the best or Otaheite sugar cane contains 17 per cent). Dr. Balfour has supposed that this variety or species was the one described by Dr. Roxburgh in his Flora Indica or Holcus saccharatus, and that its sugar producing qualities may be less in India, than in colder countries, or that its value may not have been discovered in India, but an examination of specimens has proved that Dr. Roxburgh's species, which Colonel Sykes tells us is cultivated in the Deccan under the name of "Shaloo," is quite distinct from the South African one, and leads to the suspicion that the Indian plant, is not as Roxburgh supposed, the H. saccharatus of Linnæus.

The plant which has been introduced into America, France and England is generally recognized as the true Holcus Saccharatus of Linnæus, and is found to be hardy and well suited to the climate of the northern parts of the United States, it has been introduced also into New Brunswick, and has passed through 2 sharp frosts, which killed the maize.

This plant has also been introduced a few years since from China to England under the name of Chinese sugar grass, and has been successfully cultivated in France and the Southern States of Russia, and is looked upon as an introduction of great importance by many celebrated agriculturists.

In England it promises to be in a short time in the foremost rank of Forage plants, all kinds of cattle eat it with avidity and it is said to be extremely nutritious especially for milk cows.

The climate of England however is too uncertain for it to come to perfection, and to ripen its seeds.

Through the exertions of Dr. Balfour, a quantity of seed of a variety of the Sorghum Saccharatum called Imphee in Cafferland, was obtained from the Cape of Good Hope, to be tried in various parts of India.

It appears that the Caffres do not cultivate this variety for the sake of its grain or for forage, but for the sweet juice obtained by chewing the stalk.

A small quantity of the Imphee seed was sent to Sind by Dr. Balfour in March last, and the result of the experiments, has been in the highest degree satisfactory, it is believed that it will prove a most valuable acquisition to the province as a sugar producing plant.

The seed was distributed by the Commissioner, small quantities having been sent to the 3 Collectors, the Political Superintendent on the Frontier, Captain Cowpar, Deputy Collector Nowshera and to the Forest Ranger.

Reports on the cultivation and the extraction of Sugar, have been received from Dr Gilbert, Civil Surgeon Shikarpoor, and from Captain Cowpar, Dr. Gilbert sowed the seed on the 16th of May, in the ordinary soil of the place, without manure. The plants had formed their seed in the beginning of September, but were not so tall as the common jowaree.

From 2½ lbs. of the stalks, he obtained from 3 to 4 ozs. of good strong sugar.

Captain Cowpar reports, that he sowed on the 28th of June, half a pound of the seed, on the 6th part of a Beegha of soil of middling quality in the Government Garden of Tarooshah.

It sprung up, he states, like the ordinary jowaree, but on its attaining a height of 1½ feet the difference became obvious, it was of a delicate light green, the stalk was stouter, and the leaves broader, and they were covered with a fine white dust.

The crop was very fine and attracted the attention of the natives, who often collected in crowds to examine and admire it. It attained the height of 7-8 feet, and the ear made its appearance in the beginning of September.

The ear differed materially from that of the common jowaree, being rigidly erect, much longer, more open and resembling that of the tall forest grasses. (Saccharum) When the grain was fully formed, though soft, the stalk was found full of Saccharine juice, 2 maunds of the bare stalks were pressed and yielded 14 lbs. of *ghoor*.

Ten days later when the grain was fully hardened, the remainder of the stalks were pressed, and produced the same proportion of ghoor, as those cut when the plants were supposed to be at their best, i. e. 7 lbs. to the maund.

This, adds Captain Cowpar, is an important fact, for in the former case, the grain was sacrificed, which proved to be unnecessary.

From this half pound of seed, sown on the 6th part of a Beegah 77lbs. of ghoor were obtained worth at the current bazaar price Rs. 3-10.

The quantity of seed obtained is calculated at from 40 to 50lbs.

The natives were delighted with it, and would gladly sow any quantity of it, were it procurable which with care, it may be in the course of 2 or 3 years.

The seed obtained by the Forest Ranger was sown in the very inferior soil of Kurrachee and watered with brackish water, nevertheless it grew vigorously and reached a height of 4 feet, flowering well, producing however only a few seeds.

It was not expected that this experiment would be a successful one, the main object being to determine the botanical characters of the plant, from which it has resulted that it does not correspond with the descriptions of any recorded species, although it may possibly be the Sorghum Caffrorum of Kunth, the description of which is extremely meagre, being comprised in five words copied from Thunberg's Cape Flora.

From the above account it is evident that the climate and soil of Sind are admirably suited for the successful introduction of this valuable plant, and that doubtless it will in the course of a few years, be one of its finest products.

On comparing the results with those of sugar cane cultivation, it will be observed that the time between the sowing and reaping was not quite three months whereas the time required for the sugar cane, is on an average fourteen months.

From Captain Cowpar's report it would appear that the produce of a Sind Beegah would be 462 lbs. of ghoor, equal to 900 lbs. per English acre.

The average produce of sugar from the sugar cane in the West Indies and with the finest variety of cane, the Otaheite, is 1550 lbs. of sugar per acre, but probably the yield in Sind does not exceed 1000 lbs., if this supposition is any where near the truth, it is obvious that the Imphee, will prove a much more profitable crop, seeing that the amount of labour is less than a quarter of that required for sugar cane.

But in addition to these advantages, there is the further one, of the grain which would appear to be about 250 to 300 lbs. per Sind Beegah.

With respect to the amount of crystallizable sugar in ghoor, it is now well ascertained that, molasses and other refuse, is a product of imperfect manufacture but as far as Sind is concerned, the comparison between the sugar cane and the Imphee holds good, as in neither the one case, nor the other is it likely, that the process of manufacture will be carried, for a long time to come, to ultimate crystallization.

It may be mentioned in conclusion that the reason of Dr. Gilberts experiment not being quite so successful as that of Captain Cowpar, is that the sowing took place at an improper time, and before the air was in such a state of moisture as to aid in the vigorous growth of the plants.

The Forest Ranger in Sind will have a supply of Imphee seed in May 1860, which will be distributed to any parties in Sind who may wish to cultivate the plant, as well as to any other persons in other parts of India.

No. 272 of 1860.

Revenue Department

Memorandum:

The Commissioner in Sind presents compliments, and has the honor to forward for the use of the Government of Madras twenty five copies of a Report by Mr. Nat. Dalzell, Forest Ranger in Sind upon the experimental cultivation of Imphee or South African Jowaree in this Province during the past season.

Commr's Office
Hyderabad
January 1860

H. Bromley
Commissioner in Sind

To,

The Chief Secretary
to Government of Madras.

Revenue 1860 Dep.t

Pro: of Gov.t 10th March.

No. 406

Memo. from the Com-
-missioner in Sind;-

Dated 27th January &

Rec.d 24th February 1860.

1 Encl.

Forwarding 25 Copies
of a Report upon the
experimental Cultivation
of Imphee or South
African Jowaree in
Sind during the past
season.

With an order

No. 345. 3d. Encl.

No. 345

Ordered that 20 copies of
the Report which accompanied this
letter be forwarded to the Board
of Revenue for distribution to the
several Collectorates, and that the
remaining five copies be sent
to the Public Department.

Fort St. Geo.
3d March 1860

Copies to Mar.B. do. of Rev: with 20 Copies of Report.
" " Public Dep.t with 5 " "