

Farmers' Gazette,

AND CHERAW ADVERTISER.

VOLUME VIII.

CHERAW, SOUTH-CAROLINA, TUESDAY, JANUARY 24, 1843.

NUMBER 11.

By M. MACLEAN.

TERMS:—Published weekly at three dollars a year; with an addition, when not paid within three months, of twenty per cent per annum. Two new subscribers may take the paper at five dollars in advance; and ten at twenty. Four subscribers, not receiving their papers in town, may pay a year's subscription with ten dollars, in advance. A year's subscription always due in advance. Papers not discontinued to solvent subscribers in arrears.

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AGRICULTURE.

RECENT AND EXTENSIVE MARLING IN SOUTH CAROLINA.

Communicated for the Farmers' Register.

Columbia, S. C., Nov. 30, 1842.

DEAR SIR:—It affords me great pleasure to comply with your request, to furnish you with a statement of my marling operations during the first year, and the result of them so far as it has been ascertained.

I commenced in November last to marl my plantation at Silver Bluff, on Savannah river. There is no marl on the place. I procured it from Saell Bluff on the same river, and had to boat it 12 miles up the stream. It requires eleven prime hands to man the boat (use, and when the river is not too high they make two trips a week, loading and unloading themselves. They haul about 1100 bushels at a load. The marl is landed at a spot below high water mark, and during the whole crop season two other hands and two carts are constantly engaged in hauling it to a place of security on the top of the bluff. At other times it is hauled directly from the landing to the fields. There are however 13 hands and 2 mules lost to the crop. My boat, which is a common pole boat, was built chiefly by my own people, and cost me about \$500, including their labor. There have been incidental expenses to the amount of about \$200 this year. During the year ending on the 8th of November, there were 85 trips made and about 93,000 bushels brought up. I think I can safely calculate on bringing up 100,000 bushels per annum hereafter, with the same force. I mention these facts that every one may form his own estimate of the cost of procuring marl under similar circumstances. My calculation is that it costs me about two cents a bushel delivered on my bluff.

To one having marl on his own premises nearly the whole of this expense would be saved. I am enabled, by omitting to open new land, to haul out and spread this marl, without interfering with other plantation work, or lessening the number of acres planted per hand. In hauling out I have not been able to do as much as they do in Virginia. Mr. Ruffin, the author of the marling system, hauled 24 loads of 5 1/2 bushels with each cart per day a distance of 647 yards; I have done but little over half as well. I use mules however, and land being level carried 6 1/2 bushels at a load. I found the mules could not stand trotting back with the empty cart. The marl weighs about 105 lbs. per bushel. My land was laid off in squares, so many to an acre, and a load dropped in each square. It was spread by hand; each negro taking his square, and carrying his marl on a board or in a small tray. A prime fellow can spread an acre in a day. But it is a hard task, and counting the gang round I have not averaged over half an acre for each worker. The marl spreads best when damp. It will then yield to the hand, and lumps are in general easily crushed.

Saell Bluff is a bold cliff on Savannah river, over 200 feet high and in some places more than 100 feet perpendicular. Professor Vanuxem, who examined it some years ago (see Farmers' Register, vol. vii. p. 70, and also vol. x. p. 457,) discovered 14 varieties of marl, varying in quality from 37.2 to 93.4 per cent. of carbonate of lime. In using the marl I have excluded the inferior as much as possible, and have not found the very best in any great quantity. I tested the quantity of carbonate of lime in one specimen taken at random from each boat load brought up this summer, and found the average of 34 loads to be 62.8 per cent. varying from 51 to 77. In every specimen there was a small proportion of oxide of iron, and clay and sand, usually in about equal quantities. There were, no doubt, other component parts which I did not ascertain; but I satisfied myself that there was neither gypsum nor magnesia. The marl presents various appearances, being in color white, brown, olive, yellow, and violet, and in consistence from sand to soft stone. Some of it appears to be a concretion of shells from a size scarcely visible to the naked eye to an inch in diameter. There is no

hard limestone, and it is doubtful whether any of the marl here will make lime, though it is an excellent cement. Much of that which I have used has been cut from the face of the cliff with pick-axes. It falls down sometimes in fine grains, sometimes in masses. At every handling it breaks up finer, and exposure to the air assists disintegration. I do not burn or pound it, or use any preparation whatever, but spread it as I get it.—Where it was spread last winter, an observer would readily discover it, and lumps as large as an egg, and occasionally much larger are to be seen. A mere passer-by, however, would not notice that the land had been marled. At every working it is more and more mixed with the soil. But I imagine it will be several years before it is completely combined with it, and until then the full effect of this marl cannot be known. A difference was apparent in this crop between the effects of that spread early in February and that spread in the latter part of April.

By the 22d of April last, I had marled 175 acres at the rate of 200 bushels to the acre. Of these I planted 50 acres in corn on the 17th March, 50 acres in cotton on the 10th April, and 75 acres in cotton on the 22d April. These three cuts are in the same field, and adjoining, being separated only by turn-rows, yet the soils vary considerably. In the corn, I laid off four separate acres along the turn-row, as nearly equal in quality as possible. The one supposed to be the best was left without marl. The others were marled with one, two, and three hundred bushels respectively. It was all of the same best land, and contained 54 per cent. of carbonate of lime. This land has been in cultivation more than one hundred years. I have planted it myself 11 of the last 12 years, and sowed it in oats the other year. I have given it three light coats of manure, the last in 1839. It is a light, gray, sandy soil, of which the following was the analysis before marling, viz:

Water lost at 300 degrees	2 per cent.
Vegetable matter	3
Silica	80
Alumina	11
Oxide of iron	2
Loss	2
	—100

This cut was in cotton last year, and my expectation was that with common seasons it would produce 12 bushels of corn per acre. And had I not kept the unmarled acre as a test, I should have set down all over that quantity to the credit of the marl. The corn came up badly, and suffered by the birds. The four experimental acres were cultivated precisely as the rest of the cut, and were distinguished only by the posts which marked the corners of each acre. From the first however the marled corn exhibited a different appearance. It was stouter and of a much deeper color. As the season advanced, the difference became greater. The marled corn was as dark a green as swamp corn usually is. The fodder was pulled on the 31 August, and after hanging two days and a half on the stalk in dry and rather windy weather, weighed as follows:

	Unmarled acre	250 lbs.	Increase.	Per cent.
Marled, at 100 bushels	285	35	14	
" " 200 "	314	64	25.6	
" " 300 "	261	11	4.4	

The corn was gathered on the 24th of October, being thoroughly dry and having shrunk as much as it would in the field. There appeared to be little or no difference in point of soundness. It was shucked clean and measured in a barrel. The unmarled corn shelled out 2 quarts less to the barrel than the marled. The following was the result:

	Unmarled acre	17 bush.	Increase.	Per cent.
Marled, at 100 bushels	21	4	23.5	
" " 200 "	21	4	23.5	
" " 300 "	18 1/2	1 1/2	8.8	

From this it would appear that 100 bushels of marl was as efficacious as 200, and perhaps in such land as this such may be the fact. It appears also probable that 300 bushels to the acre is too much. I ought however to state that this last acre had a slight sink in the centre, and that the slopes around it are much thinner than the average land. These constitute about one-fifth of the acre, and were evidently injured by the marl. It was a bad selection for the heaviest marling; but at the time it was made I did not suppose, judging by the rates at which they marled in Virginia, that 300 bushels would injure any land. My fear now is that 200 bushels may prove too much for soil like this; and I have accordingly determined to put only 50 bushels on the acre hereafter, until I see its further effects. This has been a remarkable productive season for corn. I think the unmarled acre in this cut made at least 5 bushels more than it would have done of an average year. I presume the marled acres have done so likewise. But whether it would be fair to attribute any

of the four bushels increased to the peculiarity of the season operating on the marl I am wholly unable to decide. Supposing the increase from the season to be the same on the marled and unmarled land, and deducting 5 bushels from the produce of each acre there will be 33 1/2 per cent. in favor of the ten best marled acres. This however is all conjecture. The average per acre of this whole cut was 18 bushels. The measurement of all but the experimental acres was made however by wagon loads according to the usual plantation estimate, in which there is a liberal allowance for shrinking, &c. Had the whole been measured in the same manner as the experimental acres were, the produce would have appeared greater. I have had this cut planted in corn once before, but having been absent the whole year, no account of it was preserved, and I do not know what it produced.

I selected also and laid off separately 4 acres of cotton along the turn-row of the 75 acre cut of cotton. At the time I thought them nearly equal in quality, and the one supposed to be the best of these was left unmarled, and 1, 2, and 300 bushels of marl spread upon the other three. It turned out however that the acre with 100 bushels was inferior to the average of the cut, while the other two were far superior. I was deceived by the stalks grown the year before. The two first named acres being somewhat rolling, and the year a wet one, they produced as good cotton as the other two which were flat. The unmarled acre was not much inferior to the one marled with 300 bushels, save that there was a spot where fodder stalks had stood in 1838-9, which produced nearly double the cotton of any other spot of the same size in either acre, and added probably 30 lbs. to the amount gathered from that acre.—The marl on these acres contained, like that on the corn cut, an average of 54 per cent. of carbonate of lime. This land is of the kind commonly known as mulatto soil, and was clearly at least as early as the corn cut. It was certainly planted by the Indians in 1740. The following was the analysis of it before marling, for which, as well as for the analysis of the corn cut, I am indebted to the kindness of Prof. Ellet;

Water at 300 degrees	3
Vegetable matter	4.5
Silica	74
Alumina	14.5
Oxide of iron	4

This cut was not planted until the 22d April, because it could not be marled before. A dry spell occurred immediately after, at the end of two weeks very little cotton had come up except in the marled acre in which there was about half a stand. My overseer becoming alarmed in my absence replanted the whole, and threw out the whole seed wherever it had not come up. This was done on the 6th May, so that the crop of this cut dates from that period, which is at least a month later than I should have preferred. For my experience is that early cotton, like early corn, is almost always the best. I consider the two weeks start which one-half the unmarled acre obtained in this instance as of considerable consequence to it. These early stalks could be distinguished until the bolls began to open. The difference between the marled and unmarled cotton was as obvious as it was in the corn. The leaf too appeared broader and the stalk stouter from the first. The following was the production of these four acres. I state the production of all, though that of the 1 and 200 bushels acres ought not to be compared with that of the other two, on account of the relative inferiority of the soil.

The unmarled acre	1111 lbs. in the seed.
Marled cut at 100 bu.	846 "
" " at 200 "	1003 "
" " at 300 "	1318 "

The difference between the unmarled acre and that with 300 bushels of marl, was 17.7 per cent. in favor of the latter. It would have been greater perhaps any other year than this, which has been almost as favorable for cotton as corn. The average production of the whole 75 acres was 966 lbs. per acre. I have had this cut in cotton on 10 of the last 12 years; in corn 1, and in oats 1, and the following is a statement of its production of cotton for 6 of the 10 years; that of the other years not having been preserved.

1833 av'ge p. acre in seed	731 lbs. manured lightly.
1834 "	" " 784 "
1835 "	" " 951 " manured lightl[y].
1736 "	" " 451 "
1843 "	" " 497 "
1841 "	" " 509 " manured.
1842 "	" " 966 " marled.

The other 50 acre cut of marled land was planted in cotton on the 10th April. It came up in good time and was a fine stand. This is also a light gray soil, with less clay than the mulatto land, and less sand than the corn cut. It is probably as old as either, and has been cultivated in much the same way. Although planted 10 days later than some other fields, and

after all of them except the 75 acre cut, it soon appeared to be the oldest cotton, and certainly matured the earl est of any. Immediately after the cold weather, about the 1st August, the rust commenced in it, and by the 20th of that month it had the appearance of a field after frost. Forms, small bolls, and even the leaves dropped. Most persons who saw it thought it had been cut off one half. I think myself it suffered to the extent of one-fourth at least. But I have made on this cut this year 840 lbs. of seed cotton, which is nearly 50 per cent. more than I ever had made on it before. The following is the average of its production for 4 other years.

1833 av'ge p. acre in seed	596 lbs. manured.
1834 "	" " 435 "
1840 "	" " 338 "
1841 "	" " 356 " manured lightl[y].
1842 "	" " 840 " marled.

I think the injury from the rust nearly or quite equal to the benefit derived from the favorable season. And that the increase from the marl was greater on this cut than on any other, because the earliest marled and most seasonably planted. The rust here was more injurious than in any other field, and I might have attributed it to the marl, but that the 75 acre cut also marled suff'ered least of all. I am inclined to think that the most advanced cotton was most affected, and the youngest least; and that marl had no influence one way or the other. It is worthy of remark, that while all my other cotton suffered from lice and the worm both, neither made their appearance on the marled land.

I have troubled you with this lengthened detail of my operations, because this being the first serious experiment with marl in South Carolina (that I know of), it may be interesting to those who have this earth within their reach, to know the particulars. From the facts I have stated, each one can form his opinion on nearly as good data as I can my own.—I can only add that my expectations for the first year have been fully answered. I did not calculate on any of those magical results which agricultural experimenters so often look for, and so seldom realize to the full extent. I regard an increase of 20 per cent. as a very handsome return, and if it only does as well another year, I shall at all events be repaid for my labor even if the beneficial effect of the marl ceases then. But the experience of all who have used it is, that it continues to improve the soil every year, until thoroughly disintegrated and combined with it; and that with proper culture it never declines from its maximum. Under these circumstances, and with these hopes, I shall continue myself to prosecute the business vigorously during the summer. I have hauled marl over 100 acres, and have now at my landing enough to cover 300 acres more. My great regret is that I did not engage in the business sooner. I have long known Saell Bluff, and for some years had heard of Mr. Ruffin's successful introduction of marl into the culture of Virginia. But I had not read his Essay on Calcareous Manures, nor examined Saell Bluff, until the summer of 1841. The idea of obtaining marl from that spot was first suggested to me by my friend Mr. Dickenson, of Georgia; and after a careful perusal of Mr. Ruffin's Essay, and an analysis of marls there, I determined to try the experiment. I have, during the course of it, received much encouragement and valuable practical information from Mr. Ruffin himself, to whom, in common with all other beneficiaries of this inestimable treasure, I owe a debt of gratitude which cannot be easily cancelled.

I am, my dear sir,
With great regard and esteem,
Your obedient servant,
J. H. HAMMOND
Hon. WHEATMARK B. SEABROOK,
Pres't of the State Agr. Soc.

"NATIVE" AND OTHER CATTLE.
Messrs. Gaylord & Tucker.—I have read, with great interest, the first volume of the Transactions of the New York Agricultural Society; and with none of the papers therein contained have I been more pleased, than with the one on "Neat Cattle," by Henry S. Randall, in which are many useful suggestions in regard to the improvement of our cattle, and the production of a breed or breeds suited to our climate and purposes.

Mr. R. fears that too many are "too prone to underrate our native stock," which he thinks "has produced animals that would suffer little by comparison with those of any other breed." In some remarks on Mr. Randall's ideas, by Mr. Wm. H. Sotham, in the Sept. No. of the Cultivator, is the following rather ultra-expression:—He [Mr. R.] may select the best [of the native stock] if he chooses, and breed them until he is of the age of man, and my word for it, he will never breed a beast that a good judge would condescend to put his hand upon."

There may be a difficulty, I confess, in deciding such a proposition. In the first place, the premises should be understood and admitted by the parties. What, then,

is "native stock?" Here is the grand point; and they may as well dispute about the merits of British sheep, or any other species of animal which embraces varieties very widely different in their characters, as to attempt to decide that matter until this point is settled.

If Mr. Randall is to be allowed, (and this is obviously his intention,) to take such animals as Mr. Rust's fat ox as specimens of the scrub or "native" breed, it appears to me he would be under no necessity of breeding till he is three score years and ten, before he could "produce an animal that a good judge would condescend to put his hand upon." While on my late trip to the East, I saw this ox of Mr. Rust's. He is truly a most superb animal. He has, both in shape and color, all the leading characteristics of a Hereford; his shoulders are well set, his chime full, back short, loin and hips very wide, rump long, legs clean and sinewy, and he is considerably heavier than any other animal I ever saw of so little bone and offal. At the time I saw him, Mr. Rust thought his weight could not be less than 3,700 pounds; and it had been ascertained by repeated weighing, that his gain was at least three pounds per day. Notwithstanding his immense weight, he was, from the justness of his proportions, very active. When lying down, he would get up as quick as a sucking calf.

I saw the man who said he raised this ox; and the history which he gave of him, was that the bull which sired him was "part Hereford." In this, both he and Mr. Rust agreed. I cannot see why this statement need be doubted; for according to an account which Mr. Bement has published, some Herefords were introduced into this part of the country several years ago. But history and tradition out of the question, it appears to me there would be as much propriety in taking an animal which should show all the principal points in shape and color of an improved Short Horn, as a specimen of the "native stock," as there is in taking this ox as such. An example of this kind would probably be regarded by the advocates of the Short Horns as not altogether fair.

Your reviewer, Commentator, in the Oct. No. of the Cultivator, in his remarks on Mr. Sotham's expression, given above, says Mr. Bakewell made a similar experiment in England to that proposed by Mr. Randall, "and it is presumable with no better cattle to begin with than Mr. Randall might probably find among what is called the 'native breed' in New York." Now it may be pretty near true that Bakewell began to breed with cattle which were not better than those which some have called native in this country; but from the best evidence to be had, it seems to me certain, that the animals with which Bakewell began to breed, were not only very good in themselves, but belonged to a race whose superior excellence had been long acknowledged. That under his master mind they attained still higher improvement, is neither denied nor doubted; but that the originals were altogether superior to our common cattle, is plain, if we admit testimony on this subject.

The first great advantage which Mr. Bakewell possessed over any one who might attempt a similar experiment, confining himself to the common cattle of this country, was the fixed character of his stock. Their leading points had been the same, without admixture, as far as we learn, for ages. Hence he might calculate on a certain transmission of the qualities possessed by those he first selected, hereditarily, to their offspring. The originals of our common cattle have been brought from almost every country and district from which this country has ever received emigrants. These animals, so heterogeneous in their character, have generally been bred in an indiscriminate, haphazard manner, until they have, in most cases, lost all marked resemblance to any distinct breed.

Youatt, in the work on British Cattle, gives a very interesting account of the stock from which Mr. Bakewell made his original selections. Under the head of the "Long Horns," he says: "In the district of Craven, a fertile corner of the West Riding of Yorkshire, bordering on Lancashire, and separated from Westmoreland chiefly by the western moorlands, there has been from the earliest records of British agriculture a peculiar and valuable breed of cattle." At page 189 is given a portrait of a Craven bull, "supposed to bear about him many of the characters of the old breed." The portrait conveys an idea of a most excellent animal; one of the best in the book; the body and limbs indicating surprising strength, with a rich, mellow coat of hair.

In 1720, it is stated that a blacksmith by the name of Wilby, commenced the work of improving the Craven cattle, with some cows which he procured from Sir Thomas Gresley. "Soon after this," says Mr. Youatt, "Mr. Webster, of Canley, near Coventry, distinguished himself as a breeder. He, too, worked upon Sir Thomas Gresley's stock. He was at considerable trouble in procuring bulls from Lancashire and Westmoreland; and he is said to have had the best stock of cattle then known." At pages 191, 192, it is said, "improvement had hitherto been attempted to be produced by selecting females from the native stock of the coun-

try, and crossing them with males of an alien breed. Mr. Bakewell's good sense led him to imagine that the object might be better accomplished by uniting the superior branches of the same breed, than by any mixture of foreign ones. On this new and judicious principle he started.—He purchased two Long Horned heifers from Mr. Webster, and he procured a promising Long Horned bull from Westmoreland. To these and their progeny he confined himself." * * * "Many years did not pass before his stock was unrivalled for the roundness of its form, the smallness of its bone, and its aptitude to acquire external fat, while they were small consumers of food in proportion to their size."

The object in making these quotations is to show that the ancestors of Mr. Bakewell's stock had been considered excellent long before he began his career as a breeder.

In what I have said, I disclaim any intention to "underrate the native stock," but have been influenced only by a wish that the public may be set right in matters of fact.

SANFORD HOWARD.
Albany Cultivator.

From the Southern Planter.

GUINEA GRASS.
Along with some grass roots, for which we are indebted to the public spirit and politeness of Mr. Garnett, we received the following note:

Messrs. Botts & Burfoot:
Gentlemen.—I now send you the Guinea grass roots which your North Carolina friend requested you to procure for him; and, with your permission, I will avail myself of this occasion to publish once more what I think of this grass. As I find that some of my good friends have attributed to me opinions which I never entertained. Not that I consider those opinions at all important to any of my brother farmers; but having once published them, and perceiving that some persons have thereby been induced to make a trial of the Guinea grass, I owe it both to them and to myself to guard them, if I can, from forming an erroneous opinion on the subject.

The good friends to whom I allude, have called it "my favorite grass," preferring this, I presume, to the somewhat ruder term—"hobby," although it means pretty much the same thing. But the truth is, that if I must have a hobby—like most of my brethren—it shall neither be of grass nor straw; and as to the grasses I have been content to rank them as those have done who have most experience in their culture. What I formerly said of the Guinea grass I still think; and it is, that it will produce a greater weight of green food—counting the four cuttings which it will certainly bear, at an average weight of between two and three feet, in high, dry land, of ordinary quality, than any grass of which I have any knowledge. I infer from this, it will yield a greater quantity of such food, on high, dry land, of any quality. I have also said, that it will stand drought better than our other grasses, that horses and cattle eat it very freely, for I have seen them do so. How it would compare with other grasses in nutritive properties I do not know, as none of them, I believe, have yet been analyzed in this country. It is certainly a coarse grass, if suffered to reach a greater height before cutting than I have mentioned, and therefore less suitable for hay than the grasses commonly used for that purpose. It is also hard to extirpate, but not more so than the red top, which is generally preferred to all others, for very wet land. From all these facts, then, which I have noticed for four years, I deem myself authorized to say of the Guinea grass, that in all high, dry, and even sandy soils of ordinary quality, such as are unfit for either clover, orchard grass, timothy, red top, or meadow oat, it will produce a much greater weight of green food than any of them; that it will stand drought much better, and that horses and cattle eat it freely. But in all situations where the climate and soil are well adapted to clover, orchard grass, and timothy, it might content any farmer to cultivate no other kinds. Still, the knowledge of their excellence should not prevent small experiments with other grasses; for our maxim should be, that there is no stopping place for those who wish to acquire a thorough knowledge of husbandry in all its branches. Let your friend then, proceed to make a small experiment with the Guinea grass roots, which I now send you for him.—They should be buried in the earth until the ground ceases to freeze in the spring. Then cut the roots into pieces two or three inches long, and plant them in well prepared land, between two and three inches deep. Let the rows be twelve inches apart, and place the cuttings in each row, at the distance of eight or nine inches. The plants will require working the first year; but after that they will occupy the ground to the exclusion of any other growth, and will bear cutting at least four times a year. In one season I cut it five times. With sincere wishes for the success of your paper,

I remain, gentlemen,
Your obedient servant,
JAMES M. GARNETT.