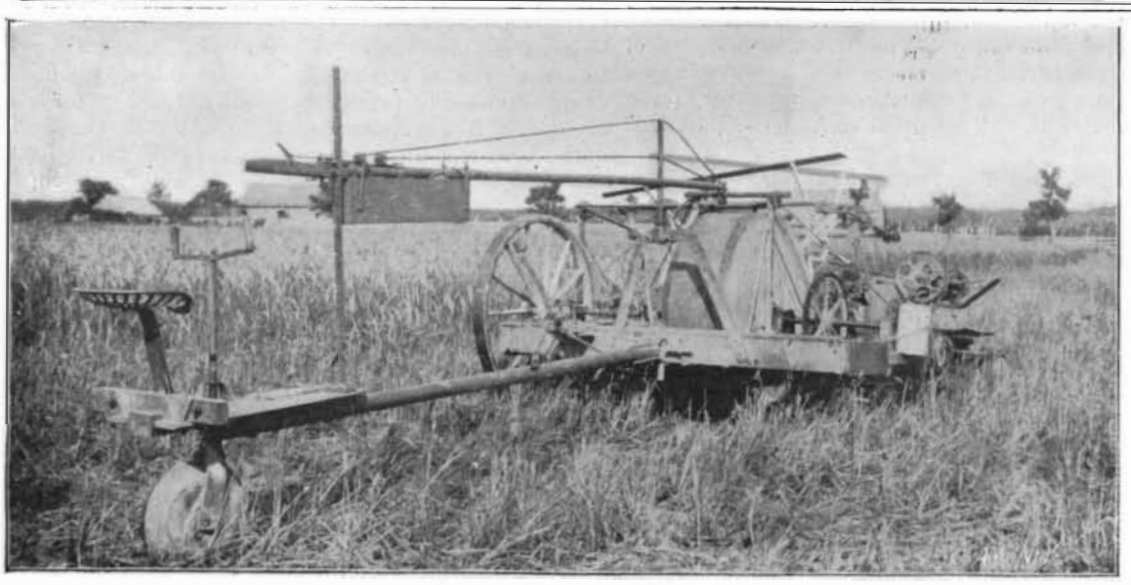
SCIENTIFIC AMERICAN

[Entered at the Post Office of New York, N. Y., as Second Class matter. Copyright, 1896, by Munn & Co.]

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES.

Vol. LXXIV.—No. 19. ESTABLISHED 1845. | NEW YORK, MAY 9, 1896 | $3.00 A YEAR. WEEKLY.



A RICE CUTTING MACHINE.

PUMPING ENGINE AND FLUME FOR A 1,000 ACRE RICE PLANTATION.

RICE CULTURE IN SOUTHWESTERN LOUISIANA.

BY H. H. CHILDERS.

At present rice is a leading industry in only two States of the Union, though at one time it was grown in many States. Louisiana and South Carolina are now the rice-producing States, and in these States its production continues to be profitable. Within the last few years some impetus has been given this industry in Southeastern Texas, but so far it amounts to little more than an experiment. At one time rice was planted in the States of North and South Carolina, Alabama, Georgia, Florida, Mississippi, Louisiana, Texas, Virginia, Tennessee, Missouri, Kentucky, Arkansas, Michigan, Minnesota and California, and for some reason, perhaps by the law of the survival of the fittest, the acreage decreased until the quantity produced in all except the two States mentioned was no longer appreciable. This falling off may have been caused by destructive competition with foreign countries and by the discovery that the soil chosen for rice production in those States above mentioned was found to be inadequate and unsuited for lucrative results

Rice is grown in Louisiana in the lower Mississippi, La Fourche and Terre Bonne River valleys and in the southwestern portion of the State, in the parishes of Calcasieu and Acadia. Rice growing for commerce began in Southwestern Louisiana in the year 1884. Before that time the largest field that could be found was five acres in size. But that year a colony of Iowa farmers settled in Calcasieu Parish, and each year since that time the acreage has continued to increase in that belt of prairie country, taking in Acadia and St. Landry Parishes.

The older authorities on rice growing have claimed that this cereal must be grown in alluvial soil, but this statement is successfully contradicted by the facts, and other wet soils have been found that have in them the elements that enter into the body of the rice grain. The soil in Southwestern Louisiana is clay loam, with clay subsoil. It is thoroughly saturated with moisture, and the underlying subsoil acts as an impervious basin, preventing anything like a perfect absorption, or the disappearance of the water from the surface. Unlike the prairies of Western Texas, all during the winter, and not unfrequently during the summer seasons, the water stands ankle deep even in places covered by the "feather top" or "broom sage" grass; and the pedestrian who would

(Continued on p. 295.)

HARVESTING RICE ON A LOUISIANA PLANTATION.

A RICE PLANTATION WAREHOUSE, 480 FEET LONG.

CYCLONE THRASHER AT WORK ON RICE PLANTATION.

RICE CULTURE IN SOUTHWESTERN LOUISIANA.

(Continued from first page.)

reach some desired spot by a "near cut" across a field would soon find himself wading in water above his shoe tops. This prairie country covers a large scope of country, and, going westward, from New Orleans to the Texas line, begins at La Fayette and runs continuously beyond the Sabine River, repeatedly interrupted by forests that generally shade deep running streams.

Considering the limitless character of this prairie country, the surface of the country is scarcely marked by farm inclosures, and thus is evidenced the unlimited possibilities held out to the farmer, who must pay a large price for a few acres in other States. The sizes of the farms in this section range from fifty to two thousand acres.

The consumption of domestic and foreign rice in the United States for ten years past has been as follows:

	Domestic. Sacks.	Foreign. Sacks.
1884	490,000	333,000
1885	600,000	246,000
1886	615,000	208,000
1887	448,000	410,000
1888	465,000	491,000
1890	500,000	450,000
1891	600,000	500,000
1892	1,000,000	500,000
1893	1,000,000	500,000
1894	1,000.000	500,000

(A sack of clean rice weighs 224 pounds)

In preparing the land for use, the first thing done is to dig the necessary main and lateral ditches and levees for irrigating purposes, and then look out for an abundant supply of water at the proper time. There are three sources from which the water supply is drawn, viz, rainfall, which is always hazardous, reservoirs and flume pumping.

The rice planter with extremely limited means constructs his system of ditches, and then relies on the elements to furnish him his moisture, and in due time, if his basins fill with water, he turns it on when needed. The reservoir is an artificial basin that catches the water in the rainy season or is supplied by a pump at or near some abundant water supply, and the water is turned on at the proper time. The most expensive means of irrigating, though the most certain, is by pumping and carrying the water through "flumes" to the larger and, at a convenient time, the smaller ditches inclosing the rice lands. This latter supply of water is taken either from a bayou, river or swamp.

The planting season is in the months of March (after about the 10th), April, May, and as late as June, while harvesting begins late in August and sometimes continues to October, though not generally so late.

I am indebted to Messrs. C. C. and W. W. Duson, of Crowley, Louisiana, for the subjoined information and for some of the pictures. They say: "The commercial names of the most popular varieties now in use in the United States are the Honduras, Carolina and Japan. The Honduras rice has much the longer and broader kernel and derives its name from the fact that the seed originally came from Honduras. The Carolina rice has a smaller kernel than the Honduras and requires less water for its cultivation. The Japan variety has a shorter berry than either of the others and is also much larger in circumference, and while the straw is much finer and shorter, the yield is more prolific and brings a higher price."

In growing rice the land is prepared the same as for wheat or other small grain and the seed then sown broadcast or in drills, about one and one-fourth bushels being used to the acre. When the crop comes up it resembles nothing so much as a Dakota wheat field. After the young plant gets from six to twelve inches above the ground it is flooded with water four to twelve inches deep, and then the water remains until that part of the rice stem above the water begins to turn yellow, ready for the reaper. The water is then drawn off into the ditches, and in a few days the hot sun dries the ground and the reapers are put to work.

The following formula gives the ingredients of the Indian rice, the same that is planted in South Carolina, brought originally from Madagascar, and about the same chemically as that planted in Louisiana:

	Per cent.
Moisture	13·00
Nitrogenous matter	7·44
Starch	77·63
Fatty or oily matter	0·70
Ash	1·23
	100·00

An average yield of a good farmer is fifteen barrels or sixty bushels to the acre. The market price reaches three dollars per barrel, though sometimes the price goes below that figure, but when the cost of cultivating is so low as one dollar per barrel or fifteen dollars per acre, the profit is fair.

Rice is thrashed and winnowed as soon after harvesting as is convenient to the planter, and is then placed in sacks in the rough state, when it is called "paddy." The most improved machinery is used to separate the rice grain from the hull.

The different terms used for the processes of converting the rice in the field into a marketable article of commerce are "cutting" or "harvesting," "stacking," "thrashing and winnowing," "raying" and "hulling." At present most of the rice goes to New Orleans for the final preparation, there being several large mills in that city. There is one mill at La Fayette, and it is now working to its full capacity. Rice will keep in the rough or "paddy" state an indefinite length of time, and loses none of its nutritious or fecundating strength.

The Southern Pacific Railroad, which passes through this rice section of Louisiana, has furnished the following figures, showing that it shipped rice in the rough state in 1886 to the amount of 2,000,000 lb.; in 1887, 4,000,000 lb.; in 1888, 8,000,000 lb.; in 1889, 16,000,000 lb.; in 1890, 60,000,000 lb.; in 1891, 180 000,000 lb.; in 1892-1893, 300,000,000 lb.

The following tabulated statement of our total rice production (cleaned rice) is furnished by one of the largest dealers:

Season.	Carolina Coast. Pounds.	Louisiana. Pounds.	Total. Pounds.
1894-1895	33,020,800	76,800,000	109,820,800
1895-1896*	56,600,000	160,000,000	215,600,000

* Estimated. Crop not all in yet.

Lawns and Tennis Grounds.

In making lawns in a locality where the surface is mainly sandy and poor one often finds, either accidentally or by observing the nature of the natural tree growth, that there are patches of clay beneath the gravel or sand: and, if near at hand, this clay is just what is wanted for making the lawn, and it is quite worth the trouble and expense of carting to the lawn site and placing a layer of six or nine inches just below the surface, so that it will serve to retain moisture and the grasses to root into. If nothing is done to stiffen the surface in a sandy or heath soil, a satisfactory lawn is almost hopeless. The reverse of this light soil is the heavy clay, with just a thin layer of lighter soil on the surface. On this surface the grasses will grow rank, coarse weeds will in time oust the grasses to a great extent; the lawn will not be fit to walk on in even only showery weather, and for games—tennis, croquet, and the like—it can seldom be used. Such a surface must first of all be underdrained by ordinary field drain pipes, laid from ten to twenty feet apart, according to the excess of moisture to be drawn off. Oftentimes in such sites it is difficult to obtain a sufficient fall as an outlet to the drains, and in such cases it is folly to attempt to underdrain a large area, but for smaller plots, such as tennis courts or croquet lawns, the outfall drain can be made to empty in a dry pit, which would be sufficient. In clay districts it is often difficult to get sand or chalk to mix with the clay for the surface, and one has to fall back upon such material as burnt ballast, made by burning the clay with coal dust, or even coal ashes or wood ashes half burnt, and this last is about the best, as the charcoal so quickly absorbs superfluous moisture.

Trenching the ground deeply is the most important condition in lawn making. A foot and a half is the depth generally specified. Trenching for a lawn is a different process from trenching for tree planting or shrubberies. By proper trenching a uniform surface is obtained, which is important in a lawn; for, if there are inequalities of surface, the lawn can never be mown properly, either by machine or scythe. Therefore, if there are on the site any pits or places where trees have been growing, their places must be rammed hard before the trenching is done. Before the trenching any alteration in the grade must be made, and if the natural surface layer is disturbed thereby, this must be replaced at the time of trenching; otherwise a uniform surface of equal texture and richness will not be obtained, and the result will be a patchy surface, that is, in the poor and dry parts the grass will be thin and pale, and have an unsatisfactory appearance. The trenching for new lawns should be done in autumn and winter, and the surface allowed to lie rough till early spring, when it should be lightly forked over to make it even, and afterward evenly trodden or rolled, raking off the large stones, and then the surface is ready for either turfing or sowing, which is best done in April.

Sodding.—The old fashioned way of making a lawn was to lay sod cut from the nearest pasture, and this is done now to a great extent in country places, and that is why one seldom sees good lawns in even what are termed the best gardens. Very seldom, indeed, can perfect sod be cut from a pasture, that is, turf composed exclusively of grasses; and even when cut from sheep pasture, and apparently free from weeds, when the turf is laid on a richer soil weeds will invariably crop up in it and in time become a nuisance, only to be got rid of by persistent hand weeding, a tedious and costly process on lawns of large area. The true way of making a perfect lawn is unquestionably that of sowing pure grass seeds guaranteed to be free from seeds of weeds, and nowadays the most reputable seed houses do this, and supply mixtures to suit any soil. The mixing of the various kinds of grasses in true proportion suitable for the different kinds of soil is quite a fine art.

Sodding is a simple operation. The chief points to observe are cutting the sods of uniform thickness, and laying them immediately on the surface that has been prepared by leveling and making firm. After being sown, the turf should be well and evenly beaten, and after this it should be rolled, and then a layer of fine rich soil thrown on and brushed in so as to fill up the interstices. Seed sowing is best done in April, during fine or showery weather. It should be evenly scattered by hand on the firm and even surface, and lightly raked in, and as the sower proceeds another should scatter over the seed a layer of fine soil; but it is most important that this soil has been sterilized, and that there are no seeds of weeds in it, and therefore must not be taken from the surface anywhere, particularly from a kitchen garden.

Seeds sown in April quickly germinate, and when the sward is about two inches high it should be well rolled, and after a day or so, should be mown, first with a scythe and after that it can be mown by a lawn mower, which should not be set too low at first. Later in the season it may be cut lower, though it is a mistake to set it too low, as the grass roots are torn, and the lawn does not recover for some days, and, besides, a lawn cut too close dries up so much more rapidly. It is the practice of some to scatter artificial manure on the young grass crop, but this is not necessary if the soil has been properly prepared. Better reserve the manure until the lawn really requires it, which it will in a season or two after sowing, in order to keep it perfect. The edges of lawns by walks are generally made by turves, even if the main part is sown; but this is a mistake, as the difference between the laid turf and the sown grass will always be perceptible. The best way is to overlap the edges a few inches and sow with seed, and when the turf is thick, cut off the edge. Though April is the best time for sowing, it can be done from March till May, if not too dry, and in autumn during August and September. The quantity of seed required is about fifty pounds per acre; smaller areas will, of course, require quantities in proportion.

Tennis courts, croquet lawns, cricket pitches, or golf links require special care in making, as it is highly important that these should be in a fit condition to play upon in all weathers. They must, therefore, be made to provide against being soft and spongy during a wet season, and not dry up in a dry one, and the principles for making these are the same as for the perfect lawn. Special care should be taken in making the parts that undergo most wear in playing, which in tennis are the base lines, in cricket the wickets, and in teeing greens the centers. On all lawns where games are played it is essential the surface should be as level as practicable, and in order to effect this it is, in tennis and croquet, often necessary to cut out from a slope and fill up parts. This cutting out requires to be very carefully done, otherwise the part cut out from the solid will often be poor and dry, and the filled up part will cause the grass to grow rank; therefore even and deep trenching is necessary all over, so as to make the surface of uniform texture and quality.—Abstract from the Gardeners' Magazine.

National Electrical Exposition.

The exhibits are being rapidly installed in the Grand Central Palace, on Lexington Avenue between Forty-third and Forty-fourth Streets, New York City, where the National Electrical Exposition will open on May 4. The building is remarkably well adapted for exhibition purposes, as it measures 200 by 275 feet. The center is occupied by a main exhibition floor, and around it is built a building six stories high, and there is also a basement. Large elevators and numerous stairways give access to the different floors. The building is lighted by 4 000 incandescent lamps. The lighting plant will supply current to exhibitors either for light or power. The model of the Niagara power plant will be run with current transmitted from Niagara over Western Union wires. About forty receivers will be grouped around it, so that visitors will hear the roar of Niagara. Mr. Edison, Mr. Tesla and other celebrities of the electrical world will be present on the opening night, which promises to be a memorable occasion. One of the most interesting exhibits will be the loan collections of apparatus. The valuable Morse relics will be shown.

The department of physics and electrical engineering of Cornell University has also provided an important exhibit. The Lighthouse Board have loaned an exhibit showing how Gedney's Channel is now lighted. Mr. W. J. Hammer will show a notable collection of two hundred portraits of celebrated electricians. The great companies are nearly all represented by an adequate display.

The Patent Office exhibits 360 models of electrical apparatus. A practical working laboratory has been provided and special lectures have been arranged for.

THE Swiss National Exhibition at Geneva was opened on May 1, and the Millennial Anniversary Exhibition at Budapest on May 2.