

Beet Sugar-making in England.

If from 20 to 30 tons of sugar-beet can be grown per acre, and disposed of on the spot at £1 per ton, there is no question but that sugar farming will prove profitable.

The mode of culture must steer clear of two extremes—gross feeding and starvation. The former is apt to produce water rather than sugar, and yet the root must have weight enough to pay. Apart from the question of sugar growing it is worthy of inquiry, how far farmers are wise in growing those mangels that are almost wholly above ground, and whether, even for feeding purposes alone, the Sugar Beet would not prove the more profitable? The chief feeding value of Mangel is derived from its sugar. The question may be asked with great pertinence—whether more food might not be grown by choosing a low-growing Sugar Beet than a high-growing Mangel? For it seems that the part above ground yields scouring salts rather than nourishing and fattening sugar. Heat in any great quantity is not needed to develop sugar.

But how will the new industry affect the feeding of stock and the agricultural interest generally? The stock will suffer much less than is generally supposed. It is difficult to convince many farmers that as much as 90 per cent. of their large Mangels is sheer water. This item can at least be readily supplemented from the nearest pump or pond. We lose nothing by allowing the hydraulic presses to disperse the water of our beet. A brief outline of the *modus operandi* of production will render this apparent to every intelligent reader. The sugar-maker is intent upon extracting the sugar, not wasting or destroying the roots; hence every part of the root not convertible into sugar is used for cattle food or manure.

The first process consists of the trimming of the beets. Along the centre of an open shed a row of women sit, armed with knives, between two long rows of Sugar Beet; those on the outside are untrimmed, those on the inside being dressed. The dressing consists of scraping the rough soil off, removing the fibres and the part of the top that has been above ground. These chippings are then sold for stock food, at 1d. per bushel. The cleaned roots are then caught up by boys, and emptied into a long cylindrical iron cradle or washer; they are delivered at the further end of the washer clean, seized by active hands lying in wait for them, and delivered to the raspers. These convert the roots into a soft homogeneous mass, resembling potato soup or rotten turnips, and deposit it in a small well. Into this well a scoop or basket constantly dips, hung with such nicety that the least touch tips it over and empties its contents. On each side of this spot women are stationed with flannel bags that just hold the contents of this measure, and their business is to empty the measure of beet soup into these bags, and place each bag flat

between two plates of iron; these are piled one above the other until they reach a sufficient height, when they are placed under powerful hydraulic presses. The pressure is not completed at once, but they go through a series of six or eight presses in succession, arranged in a semicircular line, around an open gutter that conveys the juice into a large tank. After every separate squeeze the plates and bags are re-arranged, made up to the requisite height, and re-pressed. And thus a great many are employed, and a number of presses are at work together.

From the last press the bags are carried back to one end of the cleaning-shed, whence the pulp is emptied into the pulp store, and the bags are passed into the washing-house. Here a number of women are engaged constantly cleaning the bags, and passing them on again to the fillers. Thus far, then, nothing has been added to the beet; it has simply been separated, by enormous pressure, into liquid and solid. The liquid has been passed forward one step nearer to sugar, the solid has been sent back ready for conversion into beef. The pulp, as it is called, might, with great propriety, be called beet bread. It is the flesh-forming matter of the beet, not baked, but pressed almost dry. It is greedily eaten by all kinds of stock, and is, doubtless, a most wholesome and nutritious food.

From the well near the hydraulic presses the beet-juice is speedily lifted up to the top of the factory. Following it as quickly as possible, we find three large copper vessels full of beet-juice. Here, also, we are confronted with the Excise officers, and are reminded for the first time of a duty of 8s. per cwt. on British-grown sugar. Singularly enough, the duty is levied on the beet-juice, and before one step further can be taken towards converting the raw juice into sugar, its temperature and specific gravity must be duly and carefully noted. As soon as this is done, the process of conversion into sugar is resumed. The samples analyzed range from 3 to 13 per cent. in their sugar. The former samples of roots are not worth more than 10s. per ton, while the latter would be worth 30s. per ton. Now it would be easy to keep the roots of each grower by themselves, and test the specific gravity of the respective juices separately. This would afford a powerful stimulus to the discovery of the best means of increasing the per centage of sugar, and it is just possible that the amount will be still further increased.

But beet juice is readily decomposed. No sooner does it leave the presses than it begins to change colour. From a bright pinkish, it at once assumes a dark hue. This chiefly affects the quality of the sugar, and must be prevented as much as possible by hurrying forward the process of manufacture. The instant, therefore, that the Excise is satisfied, a quantity of lime is cast into the juice, which destroys certain impurities, and casts them up to the surface as a dirty froth or scum. After boiling by steam, the clear

liquor is drained off in one direction, and the scum in another. The juice is then saturated with carbonic acid gas (which throws down the lime), filtered through animal charcoal, and otherwise purified, and another residuum is thrown off. The scum is sent through a filter-press, all that is useful for sugar making preserved, and the refuse converted into cakes for manure, and offered at the works for £1 per ton. As nothing more of the beet comes back to the farmer, it is unnecessary to follow the process of sugar-making further here. Suffice it to say, that from this stage most of the processes aim at getting rid of the water, and changing the sweet liquid into solid sugar; hence it is evaporated while in vacuum, and after being reduced as much as considered desirable, it is run into barrels and dispatched to London, to be finally converted into sugar. It is hardly needful to observe that the whole of the machinery is driven by steam-power.

It is one of the necessities of the manufacture that the work should be continuous. Fresh relays of workmen and women, therefore, succeed each other night and day. Over 100 hands are employed, and the result upon an agricultural community of so much money earned, wages spent, and such an active industry excited just at the dead season of the year, can hardly be over-estimated. All around the factory there is an air of bustle and of business. Visitors are flocking to see the sugar-making from far and near, and the Lavenham experiment will, doubtless, become the birth-place of many others throughout England and other countries. From different countries of Europe, from Canada, and from all parts of Great Britain and Ireland, gentlemen have been to see and judge for themselves; and there seems no reason, in the nature of our climate, circumstances, or laws, why sugar-growing should not speedily become almost as important a branch of British agriculture as the production of beef, beer, and corn.—*Gardeners' Chronicle, England.*

IMPORTED SEED.—A correspondent from Burford sends us a small sample of wheat, which he says he obtained at Woodstock, out of a quantity recently imported from Scotland. The sample was particularly full of weed seeds, and he wishes to know what kind they are. They appear to be principally oats, barley, cockle, and wild convolvulus. The wheat itself is fine, but parties having such for seed should follow our correspondent's example, and carefully hand-pick the lot, or separate the impurities by floating in strong brine. We have seen several samples of seed wheat and barley, imported both from Europe and the States, every one of which contained altogether too many foul seeds; and a specimen of "Norway oats" had a peck of Canada thistle heads taken out of every bushel. Farmers would do well to closely examine any seed sample, and get rid of all weeds before sowing.