

The Beet Sugar Industry

(The Fourth of a Series of Articles on the Sugar Question.)

(Specially Contributed)

The cultivation and manufacture of beet sugar is a comparatively recent industry, dating back to the beginning of the last century, although the original discovery was made in 1747, when Marggraff tested the wild beets of southern Germany and Italy, and found them to contain from 2 to 4 per cent of saccharine matter. From this beginning Marggraff increased the sugar content by means of proper selection and cultivation, and at the beginning of the nineteenth century the yield of beet sugar was as high as 10 per cent.

In 1803, after a temporary lull in hostilities, England again declared war on France. One of the minor effects of the war was that France was unable to import sugar from her colonies. Napoleon saw the necessity of home production, and therefore induced the French Government to pay large premiums to the farmers and manufacturers in order to develop the beet sugar industry.

In Canada the cultivation of sugar beets and the production of beet sugar is of recent origin, no real progress having been made until the present decade. Several attempts were made to establish refineries between 1881 and 1891, but in spite of every effort they resulted in failure. Promoters and experts were brought over from France and Germany, elaborate prospectuses were sent forth, Government subsidies were voted and paid, capital was subscribed, contracts were made with farmers in the Eastern Townships of Quebec, for growing beets, and factories were built at Coaticook, Berthier and Farnham. For various reasons each of these in turn was closed down before any real test had been obtained, as to the possibility of raising beets at a profit either to the farmer or the refiner.

Under the circumstances it is necessary to regard the establishment of four factories in Ontario, as the actual beginning of the industry in Canada. Of the four factories that of the Dominion Sugar Company is the sole survivor, being an amalgamation of the Wallaceburg Company, the only successful one, and the Berlin Company. The latter having failed was bought from the court by the Wallaceburg Company. A third factory at Warton was closed after two seasons of work, while another attempt at Dresden was similarly given up. The latter was the darling project of an American millionaire who quarrelled over his charter after he had built his factory instead of beforehand. Deciding the Uncle Sam was good enough for him, he picked up his factory bodily and carted it over the imaginary line we call the 49th parallel. Then he pieced it together again in Michigan. They say that, like the prophets of old who shook the dust from off their feet, he even swept up the sugar from the ground.

In Raymond, Alberta, the Knight Sugar Refining Company was organized by the Mormons in 1902, the promoters being Jesse Knight of Provo, Utah, and John D. Taylor, of Salt Lake City. This had been carried on as part of a large farming enterprise with a million dollar capitalization, but has discontinued business during 1915. In Vancouver the British Columbia Sugar Refining Company has been operating successfully for a number of years.

Government Assistance.

In 1901 the Legislature of Ontario set apart \$225,000 as a special fund to be paid out of the consolidated revenue of the province to encourage the growing of sugar beets and the establishment of refineries. For the first three years the subsidy paid was at about the rate of 50 cents per 100 lbs., and the yearly sum expended by the Government ran from \$70,000 to \$75,000. In 1906 and 1907 the rate was reduced to about 37½ cents per 100 lbs., but although the factories became fewer in number, the amount paid annually in subsidies remained about the same for the output of the two surviving companies, in Berlin and Wallaceburg. As, however, the sum expended far exceeded the original estimates an additional \$150,000 was voted for the purpose. As the business gradually developed, the subsidy was finally abandoned.

The Farmers' Point of View.

The chief difficulty in connection with sugar beet raising is largely a question of farm labor, but on the whole, the farmers appear now to be making a fair profit upon their work. Much depends on the soil, a pliable clay loam, or sandy loam, such as is found in many parts of Ontario, and in the irrigated prairies of Southern Alberta, being specially

adapted to beet cultivation. A farmer with three or four boys and girls from eight to sixteen years of age, may cultivate a crop of four or five acres without hired help. But when he puts a large acreage into beets and then searches for cheap labor he finds that to be one of the things lacking in Canada, just as it is conversely abundant in such countries as Germany or France.

The refiners usually contract with the farmer for the output of a given number of acres at a price per ton of beet. Ten tons of roots per acre on farm, and 15% of sugar in factory are regarded as good results, and these are not far from the averages in Ontario. On the well tilled farms of Utah, however, the production under intensive and irrigation cultivation runs from 20 to 30 tons. The money value of a crop yielding fifteen tons per acre ranges from \$50.00 to \$75.00 according to the recent estimates of an Alberta farmer, the whole cost of ploughing, seeding, thinning, cultivating, lifting and carting to the factory is \$25.00 per acre. The Dominion Sugar Co. are at present erecting a third plant at Chatham. As their Wallaceburg and Berlin plants have reached at their maximum output, it was necessary to build another factory.

The local beet crop is brought to the factory at the end of September and beginning of October, and is refined during the three following months. As a result, the beet refineries are left without occupation for three-quarters of the year. During that time raw cane sugar is imported in order to keep the machinery in operation.

Before the war, in addition to the cane sugar from the West Indies, raw sugar was imported from the United Kingdom, Austria-Hungary and Belgium. In 1908, 22,056,516 lbs. of raw sugar were imported from these countries, valued at \$491,463. Prior to 1903 considerable raw and refined beet sugar was imported into Canada from Germany, but with the surtax on Germany imports that came into effect early in that year, the importations decreased from \$3,411,811 to zero. At the outbreak of war, all importation of raw beet sugar ceased, cultivation in France and Belgium having been abandoned, and Austrian products being debarred by Government enactment.

World's Beet Sugar Statistics.

The steady growth of the world's beet industry during the year 1869 to 1908 is shown in the following figures:

Year.	Tons.
1869-70	878,000
1879-80	1,720,000
1889-90	3,657,000
1899-1900	5,450,000
1907-08	8,100,000

No struggle for supremacy is more interesting than that which took place between the cane and beet sugar industries. In 1807 the production of beet sugar was less than half that of cane sugar, but in the decade 1870-1880 the production of both sugars was about the same. For the 26 years following, the beet sugar industry forged ahead of cane sugar in production, which was due to the activity of European scientists. In 1907 cane sugar gained the ascendancy in production but lost it again in 1908. Since that time the production of cane sugar has been far ahead of beet sugar and in 1914 there was a difference of about 1,000,000 tons.

The following table shows the increase from 1891 to 1906 in various countries:

Countries.	Production of Sugar Beet in Tons.			
	1891.	1902.	1906.	1915.
Austria	1,050,686	1,034,815	9,862,900	.....
France	719,071	198,894	2,010,308	.....
Belgium	.....	198,894	2,037,298	.....
Germany	1,341,752	2,283,368	15,617,544	.....
Holland	.....	118,619	1,321,298	.....
Russia	.....	1,143,467	11,390,272	.....
United States	5,998	159,809	299,384	779,756
Canada	.....	.....	(1907. 13,029	18,419

Recent figures show the sugar beet crops in Canada and their value during the past two years:

	1914.	1915.	Diff. bet. Average of	
			1914 and 15	5 years 1915-14.
Acreage under beets	12,100 ac.	18,000 ac.	149	17,000 ac.
Average yields per acre	8.98 tons.	7.83 tons.	87	9.65 tons.
Total yield	108,699 bu.	141,000 bu.	121	164,000 bu.
Average price per bu.	\$5.99	\$5.50	.....	\$5.86 bu.
Trade value	\$3,095,600	\$3,402,600	.....	\$2,632,000

Up to the time of the Brussels Convention in 1902, beet sugar cultivation and refining were encouraged in European countries by Government bounties, ranging from \$5.00 to \$10.00 or even higher per ton. The object of the Brussels Convention was to equalize the conditions of competition between beet and cane sugars from different sources, and to promote the development and consumption of sugar. With these objects in view, it was decided to suppress all bounties and to limit the surtaxes in importing countries. Between the years 1902-1906, 1903 being the year of the convention, and for four years later, the increases in the European countries were as follows:

	Increases.
Area under cultivation	183,514 acres
Sugar beets raised	7,316,914 tons
Sugar produced	429,947 tons

Possible Scope of Beet Sugar Production in Canada.

In 1907-08 the total quantity of imported and home produced sugar was 493,565,115 lbs. of which 5.28 per cent was beet sugar actually grown in Canada. Since then these totals have increased considerably both in imports and home products, the ratio of the beet to the cane remaining about the same. There is no good reason why the beet sugar industry should not be developed extensively and greatly to the advantage of the Dominion as a whole. Not only does the money expended in the cultivation and refining stay in the country from beginning to end, but the by-product so helpful to mixed farming, also remains in the country. We import practically no lumber, or flour, or cheese, our forests, wheatfields, and herds of milk cows being sufficient for these products. The refiners tell us that we possess the soil and climate for maturing the best quality of sugar beets, while farmers are agreed that no other crop pays so well as sugar beets. Notwithstanding these facts, we import 90 per cent of all the raw sugar refined in Canada.

As to the quality of beet sugar vs. cane sugar, there is only one answer, that will show that there is no difference between a good quality beet sugar and a good quality cane sugar. There is no difference of taste or odor, or from any other physical, chemical or technical standpoint, between the two kinds of sugar. The discussion of this standpoint in 1907 led the Agricultural Experimental Station of the University of California to a very interesting experiment. About 2,000 cans containing different kinds of fruit were preserved, half of them with refined cane sugar and half with beet sugar. After being stored in a rather unfavorable location for two years the cans were opened. Seven of the cans from the cane sugar lot and six of the cans from the beet sugar lot were spoiled, in all probability due to imperfect sealing. The quality of the fruit in the remaining cans was perfect; not the slightest difference could be noticed in the fruit as well as in the preserving syrup.

The difficulty of obtaining beet seed since the war has made this a very important factor. Not only has the market value of the present price it is almost impossible to secure it. Prior to the war practically all seed was brought from Germany, and since then only one ship load has been procured by the United States from Holland, of which Canada has had her share. These unusual conditions have resulted in increased activity in beet seed cultivation, both by the Mormons in Utah and the Dominion Sugar Co. in Ontario, with quite a fair measure of success in both cases.

Many people consider that sugar is as much a natural product of this country as are timber, flour, butter and cheese. Statistics of the industry show that in other countries great strides have been made in the economic production of beet sugar. It is claimed that similar expansions should certainly take place in Canada.

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