Sorghum Culture.

There appears to be an increased interest taken in the growth of amber cane for the purpose of manufacturing into syrup. As there are plenty of lands admirably adapted to its growth in Ontario, we are fully persuaded that handsome profits can be realized from its culture.

The progress of this industry is slow, and the growing of sorghum for sugar and syrup is yet in its infancy in this country. Since the first experiments were made in the U. S., it has taken about thirty years to produce good crystalized sugar from it. The original kinds of sorghum experimented with proved a failure, from the fact that in a northern latitude, such as Ontario and the Northern States, they were too late in ripening, and the consequence was the syrup was dark and of an unpleasant taste. Attempts to grow it were generally abandoned, and only about ten years ago was a kind produced—the Early Amber—which would succeed in a northern latitude. This will ripen in any latitude where Indian corn matures, and there can be no trouble in raising it in any part of Ontario. The best soil for growing Amber cane is a good corn soil. Like corn, it requires thorough culture and similar treatment, but should be planted a little later when the soil is well warmed up.

One of our esteemed correspondents, Mr. James Allen, who is now manufacturing sorghum at Tilsonburg, Oxford Co., Ont., is probably one of the pioneers in this part of the country. In 1878 this gentleman experimented with one eighth of an acre, with seed obtained from Wisconsin, and the product of this land was 37 gallons of syrup. This did not keep well, from the fact that it was not boiled enough and was too thin. The next year he planted an acre or an acre and a half, and produced over 200 gallons of syrup, although it was a bad season, as the stalks were blown down by a heavy storm. Between the first and second year's trials Mr. Allen found there was a great waste, resulting from the way in which the cane was crushed. The second year's crop was raised from his own seed; it cost him 20 cents a gallon for making, and he sold the syrup for 50 cents a gallon. The third year the factory was started, and he planted one and a half acres and had an enormous crop, the stalks of the cane being 10 feet high. From this he had 300 gallons of syrup per acre; his neighbors had similar results, of thick syrup. But taking even 150 gallons per acre, at 50 cents a gallon, a crop of sorghum would pay.

Of course the success of the crop will depend to a great extent upon culture and the nature of the land. Mr. Allen's experience is that low land is not suitable, and that the best results are produced on high lands that have been previously under corn culture; he considers that fresh barn-yard manure is fatal to the crop, owing to the predominance of certain salts, which affect the flavor of the syrup. He does not consider as much can be made from a clay soil as from land of a lighter texture.

It appears from Mr. Allen's account that the apparatus for making syrup is not so costly as might be imagined, as he considers that an evaporating pan and press may be had for about $90, for say a pan 4x8 feet, by 7 inches deep, set in brick. He considers after the cutting that five men and two spans of horses can make 75 gallons of syrup a day. Good thick syrup will yield 14 pounds of sugar to the gallon, and it takes from one to two months to granulate by itself, but by an improved process it can be granulated in 15 minutes. Mr. Allen's experience is that perpendicular rollers are preferable to horizontal ones.

Strawberries should be mulched before they begin to grow. Coarse straw is a good material, if free from weed seeds, and it is all the better if from the barnyard and saturated with manure water.

Road Making.

Good roads are the exception and not the rule in this country, and with the exception of a few main gravel roads, the majority of them are almost impassable, excepting during good sleighing or when they are dried up during the summer. If the loss to the farmers was counted in the shape of extra wear and tear on wagon, harness and horse-flesh, it would be found to be enormous. Good roads pay a large interest on the investment to the general public, and money used this way is well spent.

We unhesitatingly assert that the main cause of so many bad roads is the misdirected labor of the statute labor system. When the country was new and the population sparse, no doubt it served a good purpose for the time, but in the majority of the closer settled townships it should have been abolished years ago, and some more effective system adopted. On roads that have statute labor performed on them for the last 20 or 30 years, there is but little improvement, from the fact that the work was never done right. Labor enough has been performed, but has been misdirected and futile. On roads that have been worked at for half a century, they are just about as far from what a road should be as when the work was commenced; in fact the greater part of the work would have to be undone in order to make a road that two teams could pass without upsetting or getting into the ditch. The first great mistake in building roads that has been made is to pile the dirt in the centre of the road, and have it sloping at an acute angle to the edge, instead of having an oval road bed, so that the travel, if required in turning out, can go clear to the bottom of the grade. Of course the starting point of having to have a narrow cone road, was to have the centre high, so that at least some part of the road would be dry, instead of all of it. The cheapest and most efficient way to make a dry road is to make ditches that will take the water off. Any road will become dry that has proper ditches, and nothing short of this would make a dry road.

Defective drainage is what is the trouble with all our roads, and instead of pathmasters trying to make a road by filling up mud holes, they should have started to make good drains on each side, and then dry roads would have followed as a natural consequence.

This statute labor system is inefficient and fails to meet the increased demand for better roads. No one can fail to see that this road-work and pathmaster business is a complete farce, as men do not go on the roads to work, but to loaf in their time as best they can. We venture to say that at the tariff rate of 75 cents a day for each man, that 25 cents a day is not realized to the benefit of the roads. The truth is, keeping up roads by statute labor is a thing of the past, and we are certain if the same amount of money was expended yearly at 75 cents a day for each man, and the work let by contract, double the benefit would be derived.

Let every municipality have road commissioners to look after the work in each ward, look after the culverts and ditches by contracts, &c., and see that the work is satisfactorily performed, and in a little time there will be but few complaints of bad roads. Besides the advantages which would accrue from the judicious expenditure of money in building roads, the Ontario Government has offered a liberal inducement to every land owner to add to the appearance of the country by allowing for every tree that is planted on a public highway. How much would property be enhanced by having first-class roads, good fences, and ornamental rows of shade trees along our public highways?

Farmers, there is nothing will add more to the value of the land in your township than good roads, and see that you have them.

PRIZE ESSAY.

THE ADVANTAGES AND RESULTS DERIVED FROM THE APPLICATION OF ARTIFICIAL MANURES TO GRAIN, GRASSES AND ROOTS.

BY W. L. BROWN, HYDE PARK, ONT.

A knowledge of the preparation and application of manures to the soil is the key to a farmer's success, especially in the older soils of Ontario, which have been partially exhausted of their virgin fertility. And to treat this subject intelligently will require a certain latitude to be allowed in the use of scientific terms. No person can avail himself of the researches of modern science in the advancement of agriculture unless he is more or less familiar with the technical language of chemistry and kindred sciences. You cannot start at the elementary part of artificial manures without using more or less terms that are not common in every-day talk with our farmers; and to commence to simplifiy and explain this language would only lead to obscurity and confusion, and likely to inaccuracies. I therefore shall avoid all unnecessary technicalities, but I shall be compelled to use them where accuracy of expression and scientific exactness require them.

I shall now consider what the composition of manure is—that is, manure in its general sense—and then proceed to show that manure has a special application as it is used for different cereals and roots. The essential plant-food elements in any manure are the ash constituents and the compounds of nitrogen; but laying aside all analysis and mention of several constituents of the ash of a plant, I shall only consider three,

NITROGEN, POTASH AND PHOSPHORIC ACID,

as the most important and essential elements in relation to artificial manures and which require investigation in the practical relations of the farm. Experience and science have taught us that land employed for agricultural purposes should be supplied with these to produce a luxuriant vegetation, and that we must restore these to the soil in sufficient quantities to restore the waste going on by the removal of crops. This waste must be supplied from the elements I have mentioned either in combination or singly, or whether they be supplied by farm-yard manure—which contains these elements of plant-food in a greater or less proportion,—or whether they be supplied in the shape of artificial manures. After first ascertaining the relative quantities of each required for various kinds of crops, the next important consideration is how can they be produced at the least cost. We will now take a glance at these elements of plant growth separately.

NITROGEN.

Nitrogen as an element is a gas, and combined with hydrogen and oxygen to form respectively ammonia and nitric acid, it acquires agricultural qualities; and I may say experience has pretty conclusively shown that nitrogen does not become active as a manure until it has been oxydized; or, it is clearly shown in whatever form nitrogen is applied to the soil, nitric acid is the resultant. As applied to land in the form of a nitrate, such as soda or potassium, the nitric acid washes away in the drainage and is but feebly retained by the soil. Reference will be made to the loss of this element of manure by washing from the soil, further on. When nitrogen is applied in the form of a salt of ammonia (such as a sulphate), which form it is in in barn-yard manure, it only escapes as fast as it changes into nitric acid through chemical action operating in the soil. It has been suggested by Pasteur that natural supplies of nitrogen are obtained by plants through a process of nitrification due to *bacterium* or a low form of vegetable ferment which takes place only under certain conditions of temperature, moisture, and supply of oxygen. Hence the great importance of manure to cultivated soil. Nitrogen is one of the most essential of all the elements that compose our artificial manures, and one of the most costly, as it is so liable to waste through the process of nature, and is continually in danger of changing its condition after being applied to the soil. As atmospheric nitrogen is not under our control, it does not concern us in this essay, and hence I shall not touch upon this point.

PHOSPHORIC ACID

forms part of all fertile soils, and exists in three forms in combination with lime; such as three parts or atoms of lime, and one of phosphoric acid (tri-calcic); two parts of lime, one of water, and