

recognized varieties in our own Province. We must increase their yielding capacity and make them more suitable to the conditions under which they are to be grown. In the northern parts, we must aim to develop better flints for husking purposes, while in the more southern portions of the Province we must encourage the production of pure-bred, hardy, early-maturing dents, suitable for silage purposes further north. In this work the interest of both grower and buyer are inseparably linked.

Last, but not least, the whole system of storing must be exploited and put on a safe basis, so that all high-class seed may be carried over from harvest to seeding time without danger of its vitality being impaired.

#### CORN BREEDING.

The system of corn improvement, as adopted by the Canadian Seed-growers' Association, is one which should commend itself to all careful growers. The success which the members of this Association operating with corn have already achieved, bears ample testimony alike to the merits of the system and the intelligence of the operators. This system is, no doubt, known to the majority of the readers of "The Farmer's Advocate," but for the sake of those unfamiliar with it, we give the following outline, step by step:

First, decide upon the variety it is desired to improve. This may be one that has been grown in the locality for years, or may be a more recent importation which has already proven its superiority.

Secondly, locate a piece of land on a part of the farm isolated, at least one-quarter of a mile from fields producing corn of other varieties. This distance has been found necessary, on account of the tendency of corn to cross one variety with another, and, remember, our aim is to produce a pure-bred strain. This plot should consist of at least one-quarter of an acre of land, so arranged as to accommodate at least 20 rows, with 50 hills in a row. It should also be in a good state of cultivation, and composed of soil suitable for corn-growing.

Thirdly, mark out this finely-cultivated seed-bed into squares, at least 3½ feet apart each way.

Fourthly, choose 20 ears, each of which excel in the various points looked for in a good ear of corn, and test each individual ear for vitality.

Fifthly, plant each individual row with corn from a separate ear. The reason for this is because of the great variation existing between the different ears as regards yield, and this system allows one to single out and select from the heavily-yielding rows.

Sixthly, as the tassels (male organs) appear, remove all of them from every alternate row, as well as those from all inferior scrub and barren stalks on the intervening rows. This is done to prevent inbreeding (fertilization of the silks of an ear by the pollen from the tassels of the same stalk) and to avoid the danger of the barren and scrub plants fertilizing the good ears, and thus predisposing them to perpetuate this evil.

And lastly, select for next year's breeding plot the superior ears from the best plants of the most productive detasseled rows. By this method both parents are controlled, the danger of getting in bad blood, so to speak, is avoided, and the tendency to produce strong, healthy, productive plants and ears is encouraged. When this plan is pursued, and the same type of ear selected year after year, a marked improvement in type and quality gradually adds to the value of the variety.

The inceptive stage of the work of corn improvement, as conducted by members of the Association, dates back to little more than one year, yet, even with so short a time, information of great value has been secured, which should prove interesting. The points most noticeable and of greatest significance, to date, are as follows:

First, the great difference in vitality between the different ears planted on the breeding plots. This was found to vary from 2.1 per cent. to practically a perfect germination.

Secondly.—The great variation in the vigor of growth of the plants produced from different ears.

Thirdly.—The variation in the per cent. of barren stalks between the different varieties and strains. This was found to vary from a perfect freedom from barrenness to 34.19 per cent. The dent and the sweet varieties had a much higher per cent. of barren stalks than did the flints.

Fourthly.—The difference between the different rows in the same plot, as regards their tendency to produce nubbins (small, inferior ears).

Fifthly.—The difference in the productive capacity of the different rows in the same plot.

Sixthly.—The variation existing between strains of the same variety. This was found to be almost if not quite equal to the difference existing between different varieties, and is no doubt due to the various conditions under which these strains have been grown, together with the amount of care that has been exercised in choosing the seed ears. This being the case, any system requiring that greater care be given the selection and preserving of the seed will surely

make for the general improvement of the resulting crops.

The objective evidences of the utility of this system as a means of developing and maintaining a high standard in crop production are sufficiently apparent to require no further comment. It is to be hoped, however, that the germ of improvement may infect and spread, so that ere long the growers generally will realize that they themselves must grapple with this all-important question.

L. H. NEWMAN.

Sec. C. S.-G. Association.

[Note.—Those who desire to take up the work of corn-breeding for themselves, under the guidance of the Association, can get instructions without cost by writing the Secretary Canadian Seed-growers' Association, Department of Agriculture, Ottawa.]

#### White-pine Forestry as an Investment.

In a bulletin by the Vermont Agricultural Experiment Station are the following calculations of the profits of white-pine reforestry on waste pasture lands:

The original value of the land is placed at \$4.00 an acre; taxes are computed at 2% of the original value, and computed interest at 4% on the investment.

The allowance for taxes is really not necessary, as the Legislature of the State has passed an Act exempting such planted lands from taxation for a period of ten years. In the calculations it is estimated that the seedlings will be grown in a homemade nursery bed, at \$2.00 per thousand, and set 6x6 feet. The estimate supposes that the crop is cut clean at the end of forty years. The trees should then average eight to twelve inches in diameter, and yield 140 cords per acre. At present such would sell at \$3 to \$5 per cord on the stump for box boards. One may safely assume that this price will, as a matter of fact, advance during the next forty years. It is also probable that the profit from the crop would be greater, providing only one-half the trees are cut at forty years, the balance being left for later harvesting. Bearing these conditions in mind, the following would seem to be a safe guide:

Initial outlay per acre.	Amounting at end of 40 years, compound interest at 4%.
Value of land .....	\$ 4 00
Cost of seedlings, grown in homemade nursery.....	2 42
Cost of planting same (at \$2 per thousand) .....	2 42
Taxes (no exemption deducted).....	3 20
Totals .....	\$12 04
	\$50 99

Returns.—For this investment of \$50.99 per acre, the owner should have at the end of forty years, as already explained, forty cords of timber, worth at present prices on the stump \$3 to \$5 per cord; and, probably, prices will be considerably higher forty years hence.

Making all allowances, the conclusion seems justified that few more profitable long-time investments are open to the Vermont public to-day than the planting of white pine on the low-priced lands which abound in the State. And the man who does it may have the further expectation that such an investment will not only enrich his heirs far more than any form of life insurance, but will, in addition, contribute to the prosperity and attractiveness of the entire community.

#### Advance in the Price of Lumber.

Editor "The Farmer's Advocate":

We have noted the stand "The Farmer's Advocate" has taken in regard to the preservation of Canada's forests, and agree with you that such action has been taken none too soon. There is no better way to get next the consumer (who, originally, as a rule, is the farmer) than by talking to him through his weekly paper. Lumber does not enter very extensively into the construction of modern farm machinery. As time goes on we find there is less and less used, and we are not, therefore, in a very good position to speak with authority regarding the general supply and demand of different kinds and grades of lumber. To begin with, we might say that we never had very much difficulty in procuring sufficient maple, basswood and different grades of elm in Eastern Ontario (say from Sharbot Lake, east) to supply our requirements each season. The pine we use is all imported from the States, the freight and duty making it very expensive when laid down at Smith's Falls. All our poles, etc., are manufactured out of this wood.

Prices, as compared with those of 20 or 30 years ago, have, we should say, advanced on an average of from 25 to 40 per cent. Some lines, such as good maple, have not increased nearly so much as has basswood, for instance.

But on the whole, we would state that we find, for our business, we do not have a great deal of difficulty in obtaining in Canada a sufficient quantity of lumber of all kinds, with the single exception of pine.

THE FROST & WOOD Co., Ltd.

#### A Theory of Spontaneous Origin of Plants.

Editor "The Farmer's Advocate":

Will soil, when in certain condition, sometimes produce plants by itself, without there first being a seed or root from which to grow? This is a question for our scientific agriculturists to answer. If the answer is "no," then there are certain things which need explanation, for several facts have suggested the probability of the theory being correct. Here are a few of them:

It is well known that, in certain sections, where fields are allowed to lie uncultivated for a short time they rapidly turn to a heavy blue-grass sod. It may be argued that the seeds or roots of the blue grass were in the soil, ready to grow at the first opportunity. Let this be granted. However, another fact comes up: During the past few years we have had wet summers. In this time the old blue-grass pastures have become thick with small white clover. Have the seeds or roots of this plant been lying dormant all these years?

It is related that, after the burning of Moscow in 1812, a certain variety of tree sprang up in great profusion, so that if the Russians had not returned the city would soon have been a wilderness. Were the seeds in the ground all those years, or were they carried there by the French?

It is well known that clay land, trampled upon when wet, as it is on roadsides, soon becomes overrun with sweet clover. Whence did it come?

Here is another case. There is a small patch of red, wet-looking ground, and on it there is a kind of grass growing which grows nowhere else nearby. Over a mile away there is another patch of the same kind of ground, and the same kind of grass grows on it. Although blue grass grows all around it, it does not smother out these small spots.

I once read an article stating that in certain districts where hardwood timber was cut a new growth of soft woods would spring up, and vice versa. If this is a fact, what is the reason?

Several other instances might be given; and, although people generally regard this idea as nonsensical, they generally end by relating some instance which came under their notice which helps to prove the theory. It seems probable that this is the solution of the long-debated question as to whether or not wheat will turn to chess. Is this theory correct, or is it false?

A. W. MARSHALL.

[Note.—That plants will originate spontaneously, is beyond the belief of a scientifically-trained mind. The puzzling instances cited, and myriads of others, are all explainable when one takes cognizance of all the facts that might account for the phenomena. Nature's provisions for clothing the earth with vegetation are inconceivable in their variety and astonishing in their effectiveness. Usually every foot of soil is teeming with seeds, while such agencies as birds, wind, water and animals are continually disseminating others. Some, such as wild mustard, will lie in the ground a long time awaiting opportunity to grow. When conditions become favorable, they flourish and usurp the ground. As for the particular cases our correspondent cites, if he has noticed carefully, he will probably remember that, with the blue-grass pasture, a certain amount of white clover has grown each year, enough to seed the field pretty generally, or the stock may have carried the seed to the field in manure. There is no doubt, also, that clover seed will lie dormant for a considerable time in the ground, and we have seen a good crop of hay cut from a field of alsike seeded on oats, the oat stubble being plowed down and the seeds turned up a year after by another plowing. Such cases do not necessarily explain our correspondent's data, but they are suggestive. Regarding the sweet clover, it is of comparatively recent years that this has become spread over Ontario. It seemed to start along the trunk lines of the railroads, and spread thence along the roadsides, the seed carried by mud-laden wheels, horses' and cattle's hoofs, men's boots, running water, and who knows how many other means. As for the spot of soil that grows a peculiar kind of grass, the case is parallel to that of fields where lucerne is sown in a pasture mixture, and is eventually crowded out on all but the hard-clay hillsides, for which it is peculiarly suited. As regards the growth of soft woods after hard, this cannot be said to be a rule. The second growth depends on such factors as parent seed trees and condition of soil. Old pine stands have grown up with young pine, owing to the few old seed trees of pine which escaped the fire.

There can be no effect without a cause, though the cause may be difficult to discern, and no plant starts without a seed, root, cutting, or some other means of propagation, though its origin and means of transference may baffle the most subtle investigation.