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go a considerable distance from home, so that he could see a change in conditions. He should learn to do everything well. He should be a very close observer, make a note of all experiments, and keep a diary whether working for himself or others; he should train his mind to retain the different facts ascertained—there is so much in the training of the mind! The education is not completed when he leaves school; in a sense it is only beginning. At school his powers of thought and observation have just been developed, so that he is prepared to go out into the world and learn.

It has been said very truthfully that "agriculture is the noblest profession of man." Why? Because the agriculturist is a co-worker with the Mighty Maker of all. The God of nature sends the frost and snow; the farmer prepares the soil and sows the seed, and God sends the rain and the sunshine, and the harvest rewards are just in proportion to the perseverance and zeal displayed in complying with the stern and inflexible laws of nature. As a man sows so shall he also reap.

Ebenezar Villa.

How to Install a Rural Telephone.

To the Editor "Farmer's Advocate":

Sir,—The first step to be taken in establishing a rural telephone is to call a public meeting of all persons interested, to form a joint stock company, with a board of not less than five directors, get out stock sheets, and get the necessary stock subscribed; then if it is a long line, the next step will be to get out a charter from the Government.

Our poles cost us 50 cents each, 35 to the mile; digging holes and erecting poles, 20 cents each pole; best 'phones cost each \$16. Wire varies in price according to size; it can be got from the Dominion Wire Co., Montreal. We use No. 9 galvanized telephone wire. B. and B. insulators cost \$1.75 per hundred, and freight; side blocks about the same, and freight; insulated wire for putting in 'phones, 46 cents a pound; ground rods, 20 cents each. This is all for a bridging telephone line with one wire. It works extra well in all weather, and we have over fifty miles of such line through this part of the country. Switch boards cost from \$1.50 upwards, according to number of lines to switch. You can put up a line and equip it for about \$60 or \$65 per mile. Poles should be 22 feet above ground at all cross-roads, and not less than six inches in diameter at top end; 30 or 32 to the mile will do, but 35 is better for heavy wire, which will stand more 'phones on it than light wire. We have a 'phone every three miles along our line, but after about 10 or 12 'phones come on a line it is better to cut it, and put in a switch to connect the whole line. We call the offices with rings 1, 2, 3, 4, 5, 6, or 7; that is, if we want say 6, we ring six times; if we want office No. 4, we ring four times, and so on. I have installed some of the 'phones and extension bells. These bells are put in bedrooms to call operators at night. We charge 15 cents per message over the line, short or long, and pay each operator 20 per cent. on the money he takes in; messenger fees extra.

I would advise any one or more parties starting a line to get someone who understands these lines for one or two days to show them everything.

THOS. BEGLEY,

Secretary, Egerton Telephone Co.

Wellington Co., Ont.

Don't Question the Gospel.

A Constant Reader says: "I have plowed up this fall considerable sod, and have been reading about seeding with clover and plowing under, etc., to enrich the soil. Will clover seed catch on fall-plowed sod? I rather doubt it, but would like to find out. How can I get rid of ox-eye daisy without using hoed crops?"

So much depends upon the nature of the seed-bed that is worked up in the spring, and the climatic conditions existing after seeding, that one cannot say with certainty whether or not clover seed will catch. If the sod broken up is not more than two or three years old, and sufficient soil has been turned up to make a good deep seed-bed, and that seed-bed is made mellow and warm, there is no reason why clover seed should not catch there. But it is frequently the case that sod is left until it is deep and tough, so that after the spring crop is sown the grass plants are so vigorous that they send up a new growth that smothers the weaker plants of clover and newly-sown grasses. On such a soil there would be no particular need to sow clover to enrich the land in humus. As for the daisy, it is a weed that grows to best advantage in old sod, and is rarely seen in grain fields where a short rotation is followed. Where the land is left in sod for many years, and the daisy flourishes, sheep should be allowed to pasture upon it, and they will keep it in check. It is, however, impossible to get the most out of land that does not produce a hoed crop quite frequently. Eastern Canadian soil is best adapted to the growing of stock, dairying, fruit-raising, etc. It cannot compete with the cheaper lands of the west in grain growing. We should, therefore, grow corn, roots, clover, mixed grains, fodder crops, etc., and by this means we will obtain the maximum production of the soil, and keep it clean of weeds.

The Farmer's Wood-lot.

By Judson F. Clark, Ph. D.

V.—TREF-PLANTING ON THE FARM.

In the last paper of this series, the problem of what to plant, with notes on the obtaining of desirable planting stock, was discussed. It remains to consider methods of planting and propagation from seed in the case of those trees which cannot be transplanted satisfactorily. The preparation of the soil, the manner of mixing the different species chosen, the setting out of the trees, and the after care of the plantation are all of the greatest importance.

PREPARATION OF THE SOIL.—Wherever it is practicable to prepare the soil thoroughly, it is very desirable that it be as well prepared for the setting out trees as for any other crop. If the land be very rough it may not be possible to do anything in the way of preparation. In such cases all that can be done is to use extra good planting stock and plant with greater care. If the land be soddy, cut out about 20 inches square of the sod, plant the tree, and replace the sod in an inverted position. It will then serve as a mulch.

THE MIXING OF SPECIES IN PLANTATIONS.—As a rule plantations should be of several species. Such plantations give a diversity of product, and are less liable to serious ravages by insects and diseases. The mixing of the species should, however, be groupwise, rather than by alternating rows or alternating species in the rows. The groupwise mixture secures all the advantages of other methods of mixing, and has in addition the advantage of admitting of planting the different kinds of trees used on the particular soils in the wood-lot which they are best adapted to utilize to the best advantage. Thus, we would naturally place



W. J. Black, B. S. A.

One of the Editors of the "Farmer's Advocate and Home Magazine," recently appointed Deputy Minister of Agriculture for Manitoba.

a group of white pine on a gravelly ridge or knoll; a group of black ash on a low, poorly-drained area, and so forth. In other words, each species in the place where it can do the most good.

Another and almost equally important advantage will be that the trees in each group will have a similar height growth habit. This will result in the production of a better quality of timber. The mixing of trees by alternating the species in the row is admissible and desirable in the case of a few trees which, because of the open character of their crowns, do not make a good soil cover. The black walnut is a good example of such a tree. In planting it should be alternated with hard maple or other shade-enduring tree. The maple thus intermixed will not amount to much, so far as the timber is concerned, for the walnut will quickly outgrow it and shade it, preventing any considerable growth. The maple, however, is capable of living and growing slowly under the shade of the walnut, and provides an excellent soil cover, and thereby greatly increases the vigor of the growth of the main walnut crop.

THE PLANTING.—There are just two secrets of success in planting trees, and both need to be used together. They are:

1. Keep the roots from being dried out by sun or wind; and
2. Plant the little tree so firmly that it would seem that it would break rather than pull up on being grasped by the top.

All the planting tools necessary are a good hoe, and a bucket with a few inches of water or thin mud in the bottom, in which the roots of the little trees to be planted are kept. In placing the tree, spread out the roots as evenly as may be quickly done, fill in the soil and pack it firmly around the stem, using both feet to firm it. Finally, cover the surface with some loose soil, old leaves, inverted sod, or anything that is at hand for a mulch.

It is important that a sufficient number of trees be planted per acre to quickly cover the soil and to induce the trees to grow straight clean trunks. This should not be less than 1,500 per acre, and double that number would be considered still more satisfactory. The larger the number, however, the greater the cost both for planting stock and labor of planting. As a compromise between efficiency and economy, trees are commonly set five feet apart each way, which may be regarded as at once fairly efficient and economical. This requires 1,730 trees per acre. Where it is practicable to cultivate the trees for two or three years after planting, it is better to vary this to 6 x 4 feet. This gives 1,800 trees per acre, and cultivation may be continued a year longer between the six-foot rows than would be practicable where they are but five feet apart.

CULTIVATION OF PLANTATIONS.—Wherever practicable the cultivation of plantations should be carried on for at least two or three years after the trees are set out. This cultivation should be similar to that given a field of corn, and should be discontinued at the end of August, so as to enable the young trees to thoroughly mature their wood before the fall frosts.

The quality of the product of plantations of chestnut, catalpa and locust may be greatly improved by cutting back the young trees to the ground when they have become thoroughly established in the permanent plantation. This will be at the end of the first year, after setting out under favorable circumstances for growth, and at the end of the second year in other cases. This cutting back should be done late in autumn or early in spring before growth begins. The resulting sprout from the stump will give much straighter, cleaner stock, which is of especial advantage in growing fencing stock.

PLANTING OF NUTS.—The larger nuts, such as the chestnut, walnut and hickory, and the acorns of the oaks, are usually planted where the tree is wanted, for their taproot habit prevents their being transplanted satisfactorily. They may be planted with an iron or wooden dibble to a depth of about twice their own diameters in heavy soils, and three times their diameters in lighter soils, spacing them about three feet apart each way. This may be done either in the spring or fall, but if done in the fall the nuts should be slightly moistened and completely colored with red lead, otherwise the squirrels will very likely destroy the most of them.

Where fairly large trees are wanted for planting in the barnyard or along lanes where they must be above the reach of the live stock, oaks and nut trees should be grown the first year in boxes; the taproot on striking the bottom of the box will be forced to grow in a horizontal direction. Such trees can be as readily transplanted at the end of the first year as other trees. For general forest planting, however, it is better that the taproot strike directly downward, hence the desirability of planting the nut where the tree is wanted. The cultivation of such plantations is, of course, equally desirable, as in the case of plantations of young trees.

Cropping Drifting Sand.

A constant reader says: "Would you please inform me through your paper what would be best to sow on a piece of drifting sand? It has never been worked, and what is the best way to prepare the soil?"

It is always difficult to know just what to grow on such soils. Certain it is, they will not support the ordinary farm crops, so one must cast about for some other means of utilizing land that is too light for general farming. On small areas soil of this nature would suit admirably for a chicken farm, where, if it were convenient to a cheese factory, hogs could also be fed, and in time, with the aid of manure and green crops, alfalfa could be started and the redemption of the land would then be assured, and by raising poultry, hogs, small fruits, etc., a good living could be made off such land. If one is not in a position to go into this kind of farming, and has a field of light sandy soil as described, we would suggest that he either prepare to use it for growing pine, or get it full of humus, by putting on a coat of manure, followed by a crop of buckwheat, in early spring plowed down lightly; this in turn followed in the fall with a crop of rye, and, if necessary, a light coat of manure in winter. In the following spring a good seeding to alfalfa might be made, and the rye crop harrowed with a light harrow. If the alfalfa caught, which it should, careful treatment should be given it for a year, and then with occasional applications of manure good crops of hay might be secured for some years. One must remember that such a soil is poor in plant food, lacks in humus—the chief water retaining constituent of soils—and that it easily dries out. Treatment, therefore, should consist in supplying plant food by manuring, but by little at a time, as fertility soon leaches away in sandy soil. In providing humus through the decomposition of manure and green crops, and in conserving moisture by giving only shallow cultivation, which keeps the humus at the top, firms the lower layers of the soil, and when judiciously practiced helps to conserve moisture.

"If the Editor of this paper were a farmer he would have the 'Farmer's Advocate,' if it cost twice its subscription price. As it is, he reads it every week with much pleasure and profit. It is amazing that a paper of such size and excellence can be prepared, every week, for \$1.50 per year."—[Canadian Epworth Era.