

their interests, or that of those who are making a living from the timber.

Having thus far dealt with our pine timber trade, which is of such vast importance to this Province, and the Dominion generally, owing to the large number of hands its production employs, the machinery and shipping utilized, and the enormous revenue derived from it, a little attention must be given to the hardwood trees, and those most suitable for forest planting. Perhaps it is as well to state that the area of the natural habitat of some of our most valuable native trees is very circumscribed. Experiments show that this may be greatly enlarged.

It may be said in a general way that no tree is unsuited for cultivation, but probably the largest returns may be derived in the fewest years by setting the Black Walnut (*Juglans nigra*). This graceful and beautiful tree is an exceedingly rapid grower. Ten years from the sowing of the seed, on suitable soil, will give nuts in return, and at thirty years of age its wood may be sold for furniture purposes. Chief Johnston, of Brantford, states that he has trees of this variety in his grove for which he has been offered thirty dollars apiece. It will be found, by referring to the July number of the *Canada Horticulturist*, a very practical lesson is taught by the experience of Mr. Horace Everett, who, it is stated, twenty-three years ago planted twenty-three acres of land in the Western States with black walnuts. The trees are now from sixteen to eighteen inches through, and were sold for \$27,000, this gives an income of \$70 per acre for the use of the land, with a minimum of labor, by planting this timber.

In all tree planting on level ground it will be found advantageous to set every second row with soft wood trees, such as poplar, willow, basswood, black ash, etc., as these assist in keeping the ground clear of grass and weeds, and can be utilized in from five to ten years in a variety of ways. Their rate of growth being from three to four times greater than the hardwood trees, they present a special advantage for cultivation. The most profitable trees to grow will probably be determined by the locality where the planting is to take place; that is to say, when plantations are made of trees outside of the ordinary commercial timber, such as pine, oak, black and grey walnut, &c. Near large paper mills it would be most profitable to plant basswood, and such of the poplars as are used in that business. If near extensive carriage and tool handle works, hickory and white ash would be most suitable. Near gunpowder factories, the willow, used for charcoal. Furniture makers use maple, birch, black and grey walnut, and sweet chestnut; fish barrels, butter tins and hay-rakes are chiefly made from black ash, and in this way scarcely a tree of any kind can be grown that is worthless, and as the land becomes denuded of its forests, every tree will have its special value.

It is believed that if farmers worked less land better, soil feeding their stock, and raised more trees, they would find more money in their land. Some idea of the capacity of soil for tree growing, and the management of experienced foresters in Europe, may be formed from the statement that an acre of ash, elm or sycamore, 40 years old, will contain from 2,000 to 3,000 cubic feet of timber, and when 60 years old, double that amount, after successive thinnings, which, near a commercial market, become an important source of revenue, and often realize more than the cost of management and interest on the money invested. Larch, spruce, and other conifers, require less space than broad-leaved deciduous trees. Larch will do well in soil with only nine feet between the trees.

The quantity of timber grown on a given area in some of the European government forests, managed in accordance with the rules of forestal science, is very much greater than the same soil would grow if the wood is left entirely to itself. So much is this the case that Dr. Berenger, head of the Italian school of Vallombrosa, states in the *Journal of Forestal Economy*, 1871-72, "That while an uncultivated woodland, taken for a long period, and counting interest and taxes, would yield almost nothing for the capital invested, it is well established that the same land, managed according to modern science, would in the long run yield a revenue both conspicuous and constant."

Whatever planting is done,—and it is recommended that the nut bearing trees should be the first experimented with, such as sweet chestnut, walnuts, black and grey, hickory and white oak,—the planting of nuts and very small trees should be made, so as to cover the ground promptly, say three feet apart, these may be thinned and pruned as circumstances dictate. It is calculated that, with very little labor for culture, rough, rocky lands, or ravines, by planting and securely fencing,—where there are no stock laws against cattle running at large,—may be made to pay a revenue in four years' time. The first cuttings could be utilized for hop-poles, hurdles, grape sticks, walking sticks, or sold for replanting on other waste lands, or along road sides, or permanent fences.

Another estimate gives the price for the preparation and planting of ten acres of land with black walnut and white ash as follows:—Planting, harrowing, ploughing, etc., would cost \$5 per acre, \$50; seed, 50c. per acre, \$5; planting, \$25; cultivating during first five years, if rows are eleven feet apart, and three feet eight inches between the trees, to be thinned to eleven feet apart when required, will be paid for by crops grown between them; for cultivation from fifth to ninth year, with horses only, \$30 per annum, \$120; after this time no cultivation will be required, making a total of \$200 for ten acres. These trees, at 25 years of age, will average sixteen inches in diameter at the butt, and about ten inches at the height of sixteen feet. This would give, deducting waste in sawing, 120 feet of lumber per tree, allowing one-sixth for damage by the elements, and loss from other causes, there would be in round numbers 360,000 feet of lumber, which, at \$30 per thousand, would give \$108,000, whilst the tops for fuel would be equal to the cost of preparing the logs for the mill, and the expense of sawing would be \$5 per thousand, so that, after deducting all outlay, the gross earnings would be \$103,000 for the use of ten acres for 25 years, and the interest on the amount expended for planting and cultivation.

The European larch is probably one of the safest trees to plant as an investment, and would thrive well on the sandy lands of Dorchester, or the gravelly plains of Burford. This tree grows rapidly and closely, and in fifteen years becomes fifty feet high. It is equally at home on arid sands, rocky soils, ravines, or hill sides. It is valuable as an enduring tree, and for such purposes as railway ties, fence posts, etc., it has no equal.

In closing this paper, a reference to the planting of the larch by the Duke of Athol may not be out of place. These plantations were begun in 1728, and continued up to 1826, when more than 14,000,000 trees were planted, covering 10,000 acres. It was found that the larch gained its fullest value in 72 years, and before it reached this age the trees were thinned to 400 to the acre. Estimating the trees at 50 cubic feet, worth a shilling per foot, the product would be £1,000 per acre, from the poorest land for agricultural purposes that could possibly be found. Larch trees planted on this estate in 1743 were in 1795 nine feet three inches round at four feet from the ground, and one hundred feet high. In 1870 these trees measured more than sixteen feet round, and were 120 feet high.

From the foregoing observations the following conclusions may be arrived at:—Firstly, it is absolutely necessary that forest fires should be suppressed, and that it is the duty of the Government, who derive so large a revenue from timber lands, to expend any sum in reason that may be necessary in the direction indicated. Secondly, it is undesirable to open for settlement much of the land at present covered by pine forests, as it is of such a rocky, barren nature as to be quite unsuited for agriculture. Thirdly, that rocky lands, ravines and lowlying grounds may be profitably planted with little expense, if stock laws are enacted and enforced to keep cattle from destroying the young trees; fencing where wood is scarce and deer being almost a prohibition against the utilizing of waste lands. Fourthly, the area in which many of our valuable timber trees now grow may, by judicious planting, be much enlarged; and finally, if the present destruction of trees is not arrested, or new plantations made, there is much danger that our climate, rainfall, and the general health and prosperity of the country may be most seriously affected.

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