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BEING THE FOURTH CHAPTER OF THE REPORT OF THE ONTARIO AGRICULTURAL COMMISSION.

Tree Planting—Ages and Dimensions of Trees.

Hitherto, the observations made have applied more particularly to the case of persons owning timbered lands of lesser or greater extent, and to whom the economical handling and management of their bush is of very great importance. The subject of tree planting will next receive some attention. It is probable that not a few farmers neglect the work of planting forest trees from the notion that their growth will be so tardy as to make the outlay of time and a little money worthless to them in their day and generation. The idea of handing down a fine estate to their sons is not so constantly present to the minds of Canadian farmers as to those of men in older countries, and a craving to achieve—even at some loss—immediate returns, is one of the weaknesses of the times. But it is possible to show not only that very speedy benefits of a practical nature may be conferred by tree planting on the soil itself, but also that, in actual money receipts, the investment will in a few years be a paying one. Horace Greeley has some very excellent advice to give under this head, and it may not be out of place to quote his utterances here. Greeley was, it will be seen, an advocate for the gradual substitution of new woodland plantations for the old forests—a very wise policy in most cases when carefully carried out. His first remarks are in that direction. He says:—

"I have said that I believe in cutting trees as well as in planting them. I have not said, and do not mean to say, that I believe in cutting everything clean as you go. That was once proper. It is still advisable in forest-covered regions where the sun must be let in before crops can be grown; but in nine cases out of ten, timber should be thinned or culled out rather than cut off; and for every tree taken away at least two should be planted or set out.

"Why do not farmers infer readily, and generally, that growing indifferent timber where the best and most valued would grow as rapidly, is a stupid and costly blunder? It seems to me that whoever has attained the convictions that apple trees should be grafted, ought to know that it is wasteful to grow red oak, beech, white maple, and alder, where oak, hickory, locust, and white pine might be grown with equal facility, in equal luxuriance, provided the right seeds were planted, and a little pains taken to keep down for a year or two the shoots spontaneously sent up by the wrong ones.

"North of the Potomac and east of the Ohio, and, I presume in limited districts elsewhere, rocky, sterile woodlands, costing \$2 to \$50 per acre according to location, etc., are to day the cheapest property to be bought in the United

States, even though nothing were done with them, but keep out fire and cattle, and let the young trees grow, as they will. Money can be more profitably and safely invested in lands covered by young timber, than in anything else. The parent who would invest a few thousands for the benefit of his children, or grandchildren, still young, may buy woodlands which will be worth twenty times their present cost within the next twenty years. But better even than this would it be to buy up rocky, craggy, naked hillsides and eminences, which have been pastured to death, and shutting out cattle in flexibly, scratch these over with plough, mattock, hoe, or pick, as circumstances shall dictate; plant them thickly with chestnut, wal nut, hickory, white oak, and the seeds of locust and white pine."

He then meets the difficulty above suggested. He says:—

"Many farmers are averse to planting timber, because they think nothing can be realized therefrom, for the next twenty or thirty years, which is as long as they expect to live. But this is a grave miscalculation. Let us suppose a rocky, hilly, pasture lot of ten or twenty acres, rudely scratched over as I have suggested, and thickly seeded with hickory nuts and white oak acorns only; within five years it will yield abundantly of hop-poles, though the better, more promising half be left to nature, as they should be; two years later, another and larger crop of hop-poles may be cut, still sparing the best; and, henceforth, a valuable crop of timber may be taken from that land, for, if cut at a proper season, at least two thrifty sprouts will start from every stump, and, so that wood will yield a clear income each year, while its best trees are steadily growing and maturing. I do not advise restriction to those two species of timber; but I insist that a young plantation of forest trees may and should yield a clear income in every year after its fourth."

In the Report of Dr. Hough, already referred to, and from which the quotation from Mr. Greeley is made, is a statement bearing upon the same subject, made by Mr. O. B. Galusha, in the course of a lecture delivered at the Industrial University of Illinois, in 1869. Mr. Galusha says:—

"Let us estimate the expense of raising a growth of ten acres planted with white ash and black walnut, five acres of each. These varieties grow at about the same rate, and are about equally valuable for lumber.

"A good way is to plant in rows eleven feet apart, running north and south, and three feet eight inches (in the marks for corn). This will secure straight trees, being closer, and they may be thinned out to eleven feet each way when large enough to use for grape-stakes, bean or hop-poles. This will give 300 trees per acre, or 3,000 trees in all, allowing for some vacancies, though in all cases of tree planting, whether in

groves or screens, a supply of good plants grown elsewhere should always be in readiness to use in filling vacancies, which should be done at the end of the first year.

"The preparation of the ten acres at \$5 per acre would be \$50. Average cost of seed, 50 cents per acre, \$5. Planting, \$25. The cultivation during the first five years will be paid for in the crops grown between rows. For cultivation from fifth to ninth years (four years), with horses only, \$30 per year, \$120. After this time no cultivation or care will be needed. This makes the entire cost, in seed and labor, of the ten acres of trees, \$200. These trees will at twenty-five years of age, average sixteen inches in diameter at the ground, and about ten inches at the height of sixteen feet. This will give, deducting waste in sawing, 120 feet of lumber per tree. Allowing one-sixth for damage by the elements and loss from other causes, we have in round numbers, 360,000 feet of lumber, which, at \$50 per thousand would amount to \$18,000. The value of the tree tops for fuel would be equal to the cost of preparing the logs for the mill, and the expense in sawing would not exceed \$5 per thousand. This, added to the cost of producing the trees, and the amount deducted from the value of the lumber, leaves \$16,000 for the use of ten acres of land for twenty-five years and the interest upon the amount expended in planting and cultivating the trees. This statement may be deemed incredible perhaps, by those who have not previously turned their attention to the subject; but after much study and many years observation and measurements of growths of different varieties of trees, I am convinced that in all well conducted experiments in growing artificial groves upon our large prairies, the profits will not fall far, if at all, short of the rates above stated."

As the owner of a large farm and other landed property, Senator Allan has taken a deep interest in this particular question. He has been able to fix with considerable certainty the exact age of several varieties of forest trees, and gives the results in the letter already referred to. What the size and quality of the tree may have been, and how far it would have been marketable at earlier stages of its growth may be inferred from its measurements at maturity. The Senator says:—

"In enumerating the trees which I consider desirable for planting, I have named only those which could generally be obtained without any great difficulty or expense, in almost any part of Ontario, and I shall now give some data, which will show what growth these trees will attain within a specified time, taken from memoranda kept by myself, or which have come into my possession, and for the accuracy of which I am prepared to vouch.

"Elm trees taken from the woods as young trees of about 6 inches round the stem, and between 8 and 9 feet high, have attained, in

forty-five years, a height and girth round the stem at 3 feet from the bottom, in several instances as follows: One 60 feet high, 8 feet in circumference at 3 feet from the ground; one 65 feet high, 8 feet 2 inches in circumference at 3 feet from the ground; one 60 feet high, 7 feet 9 inches in circumference at 3 feet from the ground. Another elm planted about fifty years ago, a small tree from the nursery gardens, has now grown to height of 70 feet, with a girth at 3 feet from the ground of 8 feet 6 inches.

"A red oak, planted as a sapling about forty-eight years ago, is now nearly 50 feet high, and measures 5 feet 8 inches round the stem at 4 feet from the ground.

"A maple of the same age, is 6 feet 5 inches round the stem, and nearly 60 feet high, and two others planted within the same period, are 6 feet in girth at four feet from the ground, and between 50 and 55 feet high.

"All three of these were, when planted in their present position, young trees about 6 or 7 feet high—just the size at which they can be most safely transplanted when taken from the woods.

"Of beech I have no record that I can entirely depend upon, but I believe one that I measured, which gave nearly 4 feet as the girth at about the same height from the ground, and was about 38 feet high, has been planted over forty years.

"A butternut between forty seven and forty-eight years old, measured 6 feet round the stem (4 feet from the ground), and has attained a height of 75 feet.

"Of two ash trees planted fifty years ago, one is 60 feet high, with a girth of 6 feet 5 inches; the other about 55 feet high, girth a little over 6 feet (3 feet from ground).

"It will be seen from this memorandum that the elm has made the most rapid growth of all these, and the maples come next; although the ash is close upon them.

"Of evergreens (native), I can only give with certainty the white pine. Two of these—both planted fifty years ago—have reached, one a height of nearly 70 feet; the other a little over 60 feet. One measures 6 feet 6 inches; the other a little over 5 feet, at four feet from the ground.

"It will be seen, therefore, that, within an average of fifty years, trees transplanted at just such a size as they can be safely and conveniently taken up when growing in the woods (say from 5 to 6, 8, or 10 feet high) have attained dimensions, which render them very valuable as firewood, as well as being perfectly sufficient for many useful purposes about a farm for which timber of a moderate size is suitable and requisite.

"I do not think that, with such facts as these, it can be said that there is anything visionary or impracticable in the means I have suggested for meeting the coming scarcity of timber in Ontario, and supplying the wants which will soon make themselves felt, even by