

would in this case give us a stumpage value of \$16.00 per cord. Second quality Scotch pine trees at the same age would average about 50 feet clear bole with a diameter of not more than 16 inches at breast height, inclusive of bark, and are worth \$18 to \$20 per thousand feet, board measure, stumpage. Such trees would have but small value in the eyes of Canadian lumbermen.

Now, if we can expect such prices as the above to prevail in this country in, say seventy-five years, we see that the prospective value of our forests is something enormous and that it is high time to establish a regular protective management, not only over the existing forests but also over already lumbered areas, which, if only protected from fire, are bound to produce a second growth by far more valuable than the original crop.

The main point of difference between the forests of Canada and those of Germany, and one which makes it impossible to introduce European methods, lies in the fact that here we have to deal principally with virgin forest, while abroad this condition has long since disappeared.

The fundamental principle underlying all German forestry is to secure an equal sustained annual yield, and in each range practically the same amount of wood is harvested every year. With virgin forest a sustained annual yield is not possible owing to the large amount of mature and hyper-mature trees growing in it which must first be cut out in order to bring the forest into the best state of productiveness. In other words, the capital invested in the forest must be reduced to that figure which will pay the highest interest. As soon as we get rid of the excess of mature timber now standing in the virgin forest, we may then introduce systems of management having for their object the harvesting of an equal annual yield, but this will not be for some years to come.

In European forests the various age classes are grouped more or less together, that is, we find a few acres of forest containing only trees one hundred years old, adjoining which may be a compartment forty years old, and alongside of this one of eighty years old, the whole forest being spanned by a net work of roads making every point quickly accessible. In such woods there is practically no risk from forest fires, the enemy most to be dreaded by Canadian foresters. If a fire should happen to start in one compartment, it can easily be stopped before reaching the next, as there is no great amount of debris on the ground and the road system allows of at once reaching any point where a fire may be burning. As a matter of fact, forest fires are almost unheard of in Europe. In this matter of fires Canada is again greatly handicapped, as the virgin forest suffers considerable risk owing to the immense amount of debris present on the ground, the comparative inaccessibility, and the scarcity of help in the neighborhood which can be quickly summoned to battle against the flames. Anyone who has had any experience knows the hopelessness of trying to extinguish a fire which has once gained a foothold in virgin forest, unless aided in some way by rivers, creeks or other natural barriers.

The risk of danger from fire is the main impediment to forestry in Canada and is the problem which must receive for some time the greater share of the forest officers' attention. Once remove the evil effects of fire, and forestry is bound to become one of the safest businesses in which capital can be invested.

The German forester enjoys yet another advantage. He is in possession of elaborate yield tables compiled by the government for the various species under varying conditions of growth. These tables are based on the results of long years of experience and experiment and furnish absolutely reliable data (for German conditions). Thus when a piece of land is planted up the

owner knows at once what yield he may expect to obtain at any future date, and about what interest his investment will bring him, doing away with all the uncertainty which a similar work undertaken in this country would suffer from. Such yield tables are a necessity for successful forestry, but owing to the time and expense necessary in their preparation, their compilation can only be undertaken by government.

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A PROBLEM IN FORESTRY; TREE PLANTING IN THE NORTH WEST.

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Nearly every rancher you meet in the North West can tell you something about tree planting. Everybody seems to have had trees or seeds from Indian Head at one time or other, and everybody seems to have had a try at transplanting evergreen trees from the hills to the ranch. But nearly everybody has a more or less constant tale to tell—trees will not grow. You come across a few cases here and there where men have been successful with some of their planting. You see sometimes a Manitoba maple or two, usually pretty straggled-looking specimens, and there are a few ranches which are beautified by one or two spruce or Douglas firs. But such a thing as a hedge or shelter belt is unknown. There are some precious specimens of *Douglasii* growing in town, that is, they were planted two or three years ago and are not dead yet. There are the envy and admiration of everybody, though usual, they are only existing and making little or no growth. A lot of nice, healthy young trees are brought down from the hills every spring, and sold to the townspeople. They are bought up eagerly, for strong is the desire of the householder to improve the appearance of his dwelling. But the purchase is now usually accompanied by the despairing thought, "We may perhaps be able to keep it green this summer anyway."

On some of the ranches a few Siberian poplars are growing and doing very well; and a man will point to a small insignificant-looking cotton-wood and tell you with pride that it is a triumph of transplanting. Success in planting there has been, but compared with the attempt it is very small indeed. Yet it is enough to encourage us to hope that with improved methods we may be able to obtain much better results. As things are at present, however, it may safely be said that tree-growing on the plains is a problem which has been attacked with some vigour for many years, but which is still awaiting a satisfactory solution.

Even the very act of planting seems to be a hazy point, and you will usually find a newly planted tree just about as loose in the soil as if it had only heeled in the nursery for an hour or two. The trouble seems to be in the fact that no one as yet who has attempted planting has ever made any study of tree life or the requirements of tree growth. A man will "plant" a score or so of carefully grown trees in a notch (it can be called nothing else) about twelve or fifteen inches wide and perhaps as many deep, and confidently expect them to grow. He waters and, as he considers, tends them carefully, but notwithstanding all his anxious efforts those trees die. Any one with a little knowledge of the subject would have expected nothing else. The failure could not be attributed to the soil's being unable to support vegetation, for the same kind of soil a little distance away would perhaps be bearing abundant crops of vegetables or grain, and, given the proper conditions, would just as readily support a tree.

Ten chances to one every tree was loose, and not a single root was in surroundings which would enable it to live and