

## EVERGREEN WINDBREAKS.

The following is from the Ontario forestry report by Mr. R. W. Phipps:—

We know from long experience that the summer storms, the early frosts, and the fierce unrelenting winter blizzards do pass by fields surrounded by growing trees, uninjured and unscathed.—*Judge C. E. Whiting.*

Throughout a large extent of Ontario, considering how much is already cleared of the original forest, with the exception here and there, of some small portions, and the decaying condition of many of these, where cattle have been allowed to destroy all chance of forest perpetuation, it is plain, that unless trees be planted, the surface of the country must soon largely resemble a wind-swept plain. The resultant evils, agricultural and other, of this state of affairs cannot be too frequently impressed on our minds.

In our latitude, one of the principal of these, is necessarily, the additional cold experienced in winter. Every Canadian has observed, that in the absence of wind a low thermometer is comparatively little noticed. In the deep forest where wind was not, and four feet of snow overlaid the ground, I have passed days, time and again, working without gloves, at twenty degrees below zero. "In the Arctic regions," says Dr. Kane, "I can stand a journey at forty degrees below zero, but remember, no wind."

An evil to agriculture, perhaps even greater in a treeless country, is found in the injurious dryness occasioned in the soil by an uninterrupted wind-course. When the reviving showers of summer fall on the thirsty ground, the beneficial result to vegetation is easily seen—it is well-known and undeniable, and the farmer is apt to calculate how great would be the benefit if, for a week or two, his wheat and clover would thrive as they appear to have done within the past twenty-four hours. The fact is they would continue so to thrive, had we not interfered with those operations of nature, which, in this our climate of extreme heat and cold, are needed for the growing plant. When the protection afforded by forests is altogether destroyed, in a country like Ontario, the course of the wind over the surface of the land withdraws the moisture too rapidly from the soil. The moisture given by a summer shower in conditions favorable to agriculture should remain near the surface for a length of time, until dissipated by slow descent to the water courses below, or gradual uprising to the air above. During this process of slow movement of moisture through the warm summer soil, growth proceeds with its utmost vigor, and one of the chief objects of partial shelter is to keep the ground in this favorable condition during the growing period.

When the earth is deprived of the natural shelter given by portions of forest, and the natural moisture too quickly absorbed in the following way: The soil parts with a portion of its moisture to the stratum of air passing immediately above, which passing on, is immediately succeeded by another body of air equally dry, which absorbs another portion, and this in its turn is succeeded by another. As long in fact, as the wind blows briskly across the soil, so long the process of evaporation continues, occasioning necessarily great loss of fertility, compared with that obtainable in better sheltered grounds. This cause has much to do with the often observed fact, that growth is by no means so strong, vigorous, or lucrative to-day, even on new land, in the same locality, as it used to be on similar soil, when the country had been recently settled, and sheltering forests existed in all directions.

We cannot at once expect to see a general commencement to replace those portions of woods, which, long since cut down, experience teaches us had better been allowed to stand. The work of replanting many thousands of acres would be vast. But there is a method whereby, without expense beyond a sum quite within the means of most agriculturists, much of the benefits formerly obtained by the forest shelter might be again secured, and yet the husbandman retain his acres for plough or pasture almost in undiminished extent. This method is simply the use of evergreen windbreaks.

Whoever chooses to take a little time now

for this purpose can, in a few years have his farm protected on the north, west, or whichever are its most exposed sides, by beautiful walls of verdure, giving the property an additional value twenty times in amount that which the necessary time and labor will cost him, and giving a shelter from wind, a warmth in winter, and an increase in the return of many of his crops, far beyond what is generally imagined.

It is now that this pains should be taken, for our trees are not increasing. Many small forests, now giving shelter, are yearly being cut down, some because want of care has rendered them impossible now to preserve, some through a mistaken idea of getting more land for farming operations. Be it as it may, we have been finding year by year, the country become more and more destitute of shelter, and he who begins to protect his farm now, will certainly, in a few years, find such work the best investment he ever made, whether in view of the better crops to be obtained, the greater comfort in a farm so sheltered, or the additional price to be had if he choose to sell.

It is not as if this was a new, untried, or a but lately tried method. Letters have been received from nearly three hundred well informed residents in different parts of Ontario, stating that such protection is always, in their experience, beneficial, and often in the case of winter crops, increasing the yield one-half over those obtained close by, but in unsheltered parts of the same or other farms.

The planting of evergreens has not been so general as that of other trees in Ontario, as they have been considered more difficult of growth. This has arisen mainly from one fact connected with their planting, that is, the roots must not be allowed any chance of drying. These trees have a resinous sap, which, once dried, kills the life of the tree. It requires but little exposure to do this. If you bring an evergreen, in apparently good condition, to the place where you want to plant it, and leave it exposed to sun and wind while you dig the hole, even that amount of drying will sometimes destroy its chance of strong life, or of any life. These roots are often hair-like in their size, and wind or sun chokes the tubes at once with solid resin, which no watering will soften or vitalize. Yet they can be, and are, often carried with perfect safety long distances, even round the world, well packed in damp moss. If you so receive them, plant them the instant you take them out of the moss. If you dig them, cover instantly with some cloth or rug, choosing, if possible, a cloudy still day, and keep them closely covered till the time of planting. It is well to dip them in thin mud, as elsewhere advised. With this care there is absolutely no difficulty in planting evergreens. It is being done every day—is done in the States. I am glad to say, by the hundred thousand plants, and failure is rare.

As for the time to plant them, the first week in June is an excellent time—so is the first week in August. Yet they have been and are planted at all seasons, when the ground is workable, and with success. But reason must be observed in planting. For instance, if you go to a deep poor sand for your plants. There they send in their long hair-like roots far down—perhaps three feet—for nourishment. It is hard to transplant this lengthy mass so as not too greatly shock its habit of growth. The moral is, if you go there, take the plants thence very young, before they can have sent out deep roots, transplant them into your garden, and in a couple of years you will have fine stocky plants fit for any purpose. But do not let this discourage you from taking them from any forest. In many localities you will find them—take those near the outskirts always—with excellent roots. I know many beautiful groves of pine in Ontario—many long stretches of wind break now fifty feet in height—the pride of the farms they beautify—which were taken when two or three feet high from the forest without one per cent. of failure. I know one instance where nearly eight hundred young pines were moved in early spring, one morning after a sharp frost, which had re-frozen the ground, previously thawed, an inch or so deep. These then cut round, brought up circular masses of earth three or four inches thick and eighteen inches wide, containing within plenty

of root fibres. This was on loam, not sand, so there was much surface root. Of the 800 scarce half a dozen failed.

A very important matter is the preparation of the ground, and when our plantation is of such narrow proportions as a windbreak this is easily done. A few furrows of the plough in fall and spring, or it being alone, harrow it properly, and the work is done. This statement is applicable to most farm soils in ordinarily good condition, but where the soil is rather intractable other means may be necessary. We must consider, that it is only one long narrow row of plants we are preparing for. If the soil be a hard, apparently poor red or white clay, it is undoubtedly difficult even with two ploughings to bring about exactly the condition of mellowness which we should desire for the reception of tender roots of young evergreens. They can be planted there, and they will grow and succeed there, but it will take time. There is a quicker method, and when we can, it is well to employ one, for life is short. This hard clay soil is not poor, it is too close and dense. If you have within reasonable distance some sand, whether it be sharp and white, apparently only fit for mortar, or whether it be red and mixed with humus, so that it be but sand. A few waggon loads of this drawn along the proposed line of windbreak, and scattered two inches thick before you plough, would change your hard clay to soil soft enough for tree roots. Two waggon loads will do a hundred yards, or if the land be poor sand, and clay be near white, red, or blue, though it be the hardest and poorest, applied in the same quantities, (break the lumps) it will do as much for the sandy soil, as the sand does for the clay one. But most soils will grow trees without.

There are different methods of rapidly planting these windbreaks. In the case of young plants, one is to run a furrow, two men then pass along, one with a bundle of plants under his arm, the other with a spade. He first places the plant in position, presses and spreads its roots against the upright side of the furrow and holds it there, while the second throws earth against it and presses it firmly and evenly with his foot. Another, still in the case of small plants, is to run no furrow, but set a line, along which, at proper intervals, one throws out a spadeful, the other sets the tree therein and holds it, while the first throws earth against it and presses it firmly. The third is in the case of larger plants. Here, three men are better employed, one in advance digs larger holes along the line, the second places a tree, spreads its roots more horizontally than in the former methods, while the third fills it up and treads it down.

It must be remarked that the time occupied depends on the side of the roots and the state of preparation of the soil. Farmers must judge whether the roots need more or less time to place them at the level they stood in their nursery or forest, and with their roots properly in contact with the soil. Some soils would need much more careful handling than others. But do the work well; it will pay.

The distance at which such evergreen trees should be planted is a matter for consideration. If you take the pines, planting even twenty feet apart would undoubtedly give, after a number of years, an efficient windbreak, for, say in twenty years, their branches would interlace. But by planting closer we may have a windbreak in a much shorter period. If we plant, say three feet apart, we can well, in a few years, take out and plant elsewhere every second tree, and this is preferable to planting them six feet apart at first, for each closely neighboring young tree helps the growth of the other. Where plants are small, it would be better to plant them yet closer, and depend on the future for proper thinning. Then you can indefinitely extend your lines of trees, as you will have a number of well grown plants five or six years old with fine large masses of fibrous roots, which, properly dug and planted, will then give you, in a very short time, as many beautiful rows of sheltering evergreens as your farm shall need, or, if you have more than you will then consider requisite, you can sell them for good prices to such of your neighbors as have been less provident. And there is too good reason to believe that by that time, con-

sidering the present process of tree denudation, the value of shelter will have so impressed pressed itself upon the minds of the surrounding farmers that you will have a remunerative market for all you can spare.

With regard to the after treatment of these windbreaks, an evergreen never should be trimmed up, that is to say, it should always be allowed to throw out its branches close to the ground at will. Its lowest branches are naturally the longest when grown in the open, and its tendency there is over to shade by its lower branches and to much the earth below them by the covering of its fallen needles.

As has been said, the planting of even a very long row of evergreen windbreak is a matter of but slight expense. The young trees can, in many instances, be procured from our forests, or the seed can be sown, the young plants the second year planted out in nursery beds and the fourth in the windbreak, or the seedling can be procured for a few dollars per thousand from nursery-men.

In planting windbreaks of cedar, the best specimens I have seen were planted much more closely than the pines or spruces, being left at two feet or even a less distance apart.

Following this will be found a list of pines, cedars and spruces best calculated for this purpose, their distinctive methods of growth, their favorite soil, and their means of propagation and culture. Where these are not fully stated in any instance, all particulars will be found in the list of trees at the end of the book:—

*Pinus Resinosa* (Red pine).—This tree delights in a dry, sandy, or gravelly soil, or in one formed from the debris of rock. It will, however, and does frequently in our forests, grow in others. I have seen large trees on clay loam.—B.

*Pinus Austriaca* (Black Austrian pine).—We have not found this tree at all particular in regard to soil, if it is not stiff and wet. The best specimens we have seen of it grow upon a sloping bank, where the soil was a light loam, and deep and porous. We have, however, seen thriving plantations of it on most kinds of land, but there were always made dry by drainage, if not so naturally. It is a tree well adapted to produce a great degree of shelter, as its massy foliage forms a great protection from winds, and its rapid growth insures this within a very short time after planting. This tree is readily known from all other pines introduced into this country by its very strong and robust habit of growth, by the stiffness and strength of the leaves, by their prickly points, and by the very decided dark appearance of the foliage over the whole tree.—B.

*Pinus Sylvestris* (Scotia pine).—Leaves in pairs, rigid. Cones conico-ovate, acute, as long as the leaves, generally in pairs. We have seen the Scots pine growing on almost every variety of land; but we are of opinion that a light, sandy, or gravelly loam, is, above all others, when perfectly dry, the most appropriate for the tree. As to situation, suffice it to say, that if the land on which the Scots pine is planted be dry, it will prosper in any site not too elevated and exposed for trees to succeed in this country.—B.

*Pinus Strobus* (White pine).—The white pine will grow rapidly on light, poor, sandy soils, and there are millions of acres of such lands that could not be put to a better purpose than planting it with white pines.—F. The branches are in regular whorls; and in young trees, and where openly exposed, they form a beautiful pyramid; the foliage is plant, leaves slender, from three to four inches long, of a light bluish green.—W.

*Pinus Ponderosa* (Heavy wooded pin).—This tree has leaves from nine inches to a foot long. Branches are regularly whorled, horizontal, and inclined to droop. This tree has a noble appearance, even when young. It is from the northwest coast of America. Hard, and grows rapidly.—W. The soil of this species, as for most others of the pine tribe, should not be of a rich nature, as under such circumstances the pines generally grow too luxuriantly, and consequently do not ripen the points of their shoots sufficiently to resist the frosts of our winter.—B.

*Pinus Pinaster*, (Cluster pine).—Leaves twin, roughly at edge. Cones oblong, conical,