A COMPLETE AND IMPERVIOUS SHELTER,

and will give dense shade on every side, so as to benefit cattle without the necessity of allowing them to enter and injure it. 5. To create one which will also act as a reservoir of moisture, preventing rain from passing too rapidly away, and giving it out gradually by feeding springs, and otherwise—a most valuable quality, especially where the plantation can be located on the higher portions of the farm. 6. To plant so that the trees will never need pruning, but will prune themselves so that after two or three years no cultivation will be necessary, and no weeds appear.

All this is secured by planting trees not more than four feet apart each way. For two or three years they are cultivated to destroy weeds, and after that the depth of shade they cast prevents further growth. This great mass of trees then, growing up closely together, presents always on the upper surface of the grove a succession of bright, green-leaved, and healthy tree tops, while inside the grove the appearance will be very different. There will here, especially in the case of evergreens, be many decaying and falling branches. In fact

THE SHADE WILL KILL OFF ALL BRANCHES

but the upper ones. As the grove gets taller, and the trees larger, there will be too many trees, and the weakest of these will in turn be killed by the strongest depriving them of light and air, till the proper number of trees is left on the ground.

Nothing need be done so far to assist nature. But if the trees have been properly selected, this process of crowding can be made convenient to the uses of the owner of the plantation. If every here and there among the trees at proper distances have been planted such as are of slower growth, the quicker growing can be taken out as they mature, and those of slower growth left to continue the grove; or those whose timber is most valuable can be left, those least valuable removed. For instance, say we take the black walnut (where it will grow), ash, cherry, and yellow birch, all of which are very valuable timber. Plant them 8 by 8 feet apart. Let us then take maples—soft maple or sugar maple—and box elder, and fill up till all is planted 4 by 4 feet apart. Planted all together they will soon cover and shade the ground, will all grow up together to a dense grove, and will, when the maples and elders are taken out (doing which will give a great deal of timber), leave room for the more valuable trees, which in their turn will be taken out when mature. For instance, you will get the cherry in half the time that you would have to wait for the black walnut. Evergreen and larches are planted the same distance apart, but plantations of these are better by themselves. Plantations of this nature will fulfil the previous description.

When the ground is well-prepared and mellow they can be

PLANTED EASILY AND RAPIDLY,

and by persons who have had no previous experience Two men generally perform the planting, or a man and a boy, the latter holding a bundle of young trees under his arms, take some and stands it in place when the other has opened the ground for it by removing one spadeful of earth. This is then placed again in the cavity, against the root, which is held by the other firmly against the back of the opening. The earth is now pressed against the root with the foot, and the tree is planted Very few fail to take root. The trees are, of course, small, from one to two feet high, but being grown in nursery beds have generally good roots. Two people plant nearly a thousand a day. The cost of these young trees is small, in large quantities – say twelve thousand – they are quoted here, most of the varieties mentioned mixed, at two dollars a thousand; and I have no doubt that if a large demand existed, they would also be cheaply obtained in Canada, perhaps can now. In a few years, no part of our farms will pay as well as some acres so planted, counting wood alone. It is surprising how many cords of wood, in mere cuttings, can be taken from a small plantation, while, in yielding shelter and improving the adjacent soil by its retention and distribution of moisture, the advantages would be very great.

Waukegan, Ill., Oct. 25 R W. Phipps.

Letter from Hon. H. G. Joly.

Sir,—I read with much interest Mr. R. W. Phipps' letter published in your issue of the 4th inst., and his description of tree culture in the prairies of the West, noticing especially the great losses entailed by frosts. The protection of young plantations against frost is a question of vital importance to all planters of trees, either fruit or forest trees, in the north, and the windbreaks and hedges recommended by Mr. Phipps are certainly the best protection but it is important to ascertain how they act. The tree planters whose opinion is quoted by Mr. Phipps appear to think that those wind-breaks and hedges protect the trees against the frost by sheltering them from the wind. It is not out of any love of contradiction that I find this explanation insufficient; I think they protect the trees by stopping the snow and causing it to cover the ground at the foot of the trees.

If I may be allowed to quote my own experience, you will perhaps admit that it is more important than would appear at first sight, to *ascertain exactly how and why* those wind-breaks and hedges

PROTECT THE TREES AGAINST FROST;

in fact, it is the only way to arrive at a *reliable system of protection.*

Until this summer the experience of the last 12 years appeared to justify the conclusion that the black walnut (whose timber ranks, in commercial value, next to mahogany) can stand even our Quebec winters with impunity. The result of last winter's exceptional severity compels me to speak with less assurance, as it killed about three hundred of my young walnuts which had safely stood the ordeal of several winters. However, I do not regret the recurrence and provide against more serious loss in the future.

When the spring opened those young trees showed no signs of decay. The buds began to swell like those of other trees, a few even opened. It took some time to realize that vegetation was at a standstill within them. The stem and branches looked healthy, the bark fresh, and the underbark green A few bore marks of sunburn, but the same marks were found on some of the growing trees. I was quite puzzled as long as I looked *above ground.* It was *underground*, when digging up the trees, that the explanation was found:

THE BARK OF THE ROOTS WAS ALL MILDEWED,

burst, and completely separated from the wood, for a depth of from twelve to fourteen inches from the surface of the ground; below that it was quite sound, adhering closely to the roots.

It was evidently the result of frost acting on the water contained in the soil and the roots But why out of several thousand walnuts, growing on the same soil and with the same conditions of moisture, did we lose only three hundred?

The answer was easily found. All the trees killed by the frost stood in parts of the plantation where the first snow did not remain (as there happened to be no obstacles to prevent its being swept away by the wind) and where the unusually