

unfavorable conditions for tree growth. The land, if in native prairie sod, is given two years of preparation before the trees are planted. If it has been in crop recently it is given one year of preparation. This might at first seem a loss of time, but it is not, as the preparation given the land stores moisture, and puts the soil in good condition for the trees to make a good start.

A nursery has been started at Drake, N.D., on light sandy soil. The plan is to grow all the seedlings and cuttings needed. Up to the present time a good deal of the stock has been bought from the

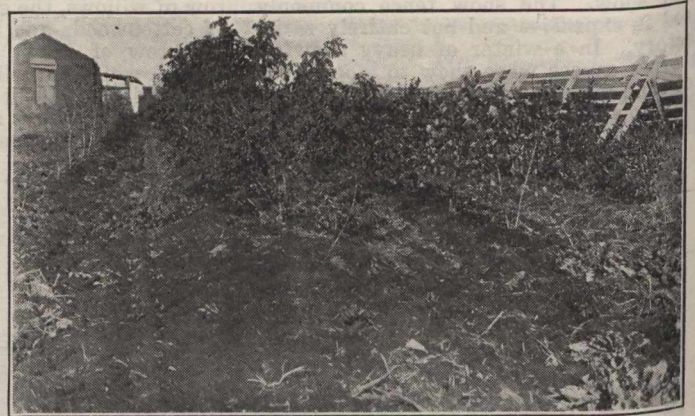
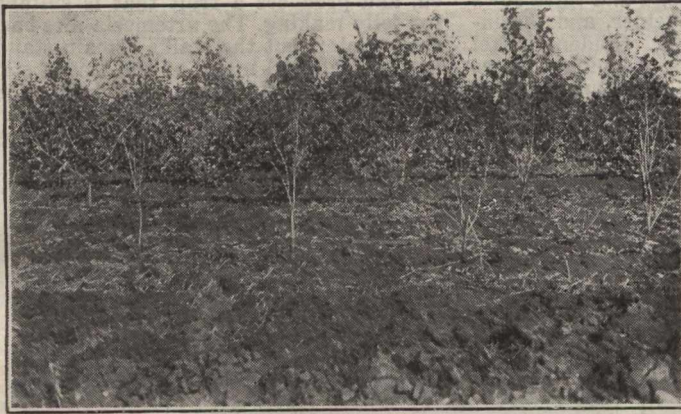
puts them down the desired depth, and to a uniform depth. The machine can be set to open a furrow any depth up to 12 in.

The tree planter is made up of a sub-soil plough, to which two vertically mold boards are attached 6 in. apart. This is the furrow opener, that can be set to open a furrow 12 in. deep. Behind this follow two discs, one on each side, set to throw the soil in so as to fill the furrow. Behind the discs follow two press wheels, set at an angle so as to press the soil firmly about the tree roots. Seats are provided for two men, so that they can

time saver. Horses must be brought to camp, the tractor can be left where the day's work ends. A double crew can be worked on the tractor, in two shifts, in that way securing more work from the equipment.

In 1915, 35,000 trees were planted, in 1916, 75,000 and in 1917 500,000. The land has been prepared along 230 miles of right of way and 250 miles have been planted. The plan is to prepare and plant about 100 miles of right of way each year.

In the timbered sections, Mr. Hoverstad advocates securing the additional right



Trees planted in 1915 on the Minneapolis, St. Paul & Sault Ste. Marie Railway.

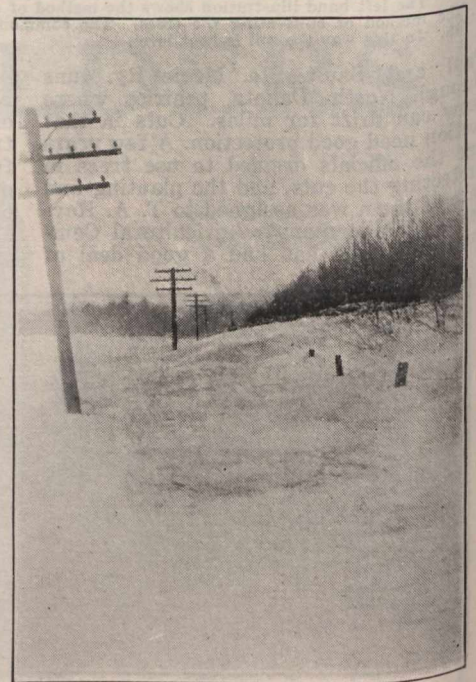
1st row, green ash; 2nd row, boxelder; 3rd row, cottonwood; 4th row, willow. The right hand illustration is from a photograph taken from the track, looking into the trees.

nurseries, but it has not proved so satisfactory as that raised in the nursery at Drake, which has a good deal the same soil and climatic conditions that the trees will have to grow in when set out on the right of way. The trees are dug while dormant, and are stored. They are conveyed in refrigerator cars to the cuts where they are to be planted. In this way it is possible to keep the trees dormant till July. The early planted trees do the best. In planting the trees are carried on motor cars to the cuts where they are to be set out and are heeled in for a day or two, or until needed. Two or three year old stock has been used. That which has been bought has been secured at \$2.50 to \$6.50 per thousand. The trees are planted 3 to 4 ft. apart in rows 8 ft. apart. This makes a strip of trees 72 ft. wide on the north and west sides, and 56 ft. wide on the south and east sides. The right of way being but 100 ft. wide, it is necessary to buy more land along the cuts so as to have 125 ft. wide on the north and west sides and 100 ft. on the south and east sides.

At first the trees were planted by hand, but this proved slow work, and not very satisfactory, as the laborers did not always set the trees deep enough and in case it was dry the dry soil would run into the holes and come into contact with the tree roots. One man would on the average plant 100 trees in a day. The best record made was the planting of 2,000 trees in one day by 12 men. Mr. Hoverstad set about devising a tree planter. The result is a machine with which three men will average from 5,000 to 10,000 trees a day, depending on the size of the places to be planted. The best record was the planting of 13,022 trees in an 8-hour day by three men. The average consumption of gasoline by the tractor is eight gallons a day. Three men will plant as many trees in a day with this machine as 50 to 100 would by hand. The machine planting, in addition to saving labor, puts the trees in contact with moist soil and

drop the trees to be planted into the furrow as it is opened, and the discs and press wheels immediately fill and press the moist soil against the tree roots. The first tree planter made was pulled by horses, but the last one is built on to a

of way before the land is cleared. It is then cheap and has trees growing on it. After the land is cleared the snow will give as much trouble as on the prairie and the land is then expensive and in addition to that trees will have to be



How the trees hold the snow on the Minneapolis, St. Paul and Sault Ste. Marie Ry.

tractor. A larger percentage of trees set out by the tree planter live than of those planted by hand. It was difficult to secure and keep enough men to do the tree planting by hand; the planter has solved this problem too. A good deal of the cultivating is done with the common disc and the orchard disc. They are used alternately, so as to keep the soil level. The weeds in the tree row are taken out by a hoe. The tractor is proving to be a

planted and cared for. In 1918 trees will be planted along some of the company's line in Wisconsin, on right of way that was once wooded.

Tree planting, when properly done, is a more effective protection against snow than the panel fences in common use, and tree planting also costs less. A 16 ft. snow fence panel costs at least \$2.50, and it takes 640 of them to furnish protection for a mile, or a total cost of \$1,600. The