



FORESTRY NO. 4

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## Thinning Plantations and Natural Stands of Conifers

When you thin in a forest, you remove some of the youngest, immature trees so that remaining trees have a better chance to grow. By thinning, you also salvage trees that would otherwise be lost through overcrowding. Thinning means intermediate cutting between early weeding and the final harvest.

As trees grow, they compete with neighboring trees for light, moisture, and soil nourishment. As trees become larger, they require more space. Thriving trees are referred to as dominants or codominants--their crowns are above, or in, the general level of the forest canopy. Trees that fail to compete generally die out and are called suppressed or overtopped trees. Some trees, though continuing to live, do not show vigorous growth. These trees are called intermediates.

When thinning most coniferous trees in Minnesota, you should remove suppressed and intermediate trees. Such thinning is called "thinning from below." Rarely can "thinning from above," or the removal of dominants and codominants, be justified.

Besides increasing the quality and quantity of products removed from the forest, thinning keeps the stand free of unhealthy and dying trees in which insects and diseases develop. Thinning may improve water yield from forested areas by increasing snow storage and the period of snow melting.

### SPECIES TO THIN

Thinning is important for proper forest management of pure and mixed stands of red (Norway) pine, white pine, jack pine, Scotch pine, and upland white spruce-balsam fir. Thinning is not recommended in pure or mixed black spruce, white cedar, or tamarack stands.

### WHEN TO THIN

Thin during the winter after the ground is frozen and before the spring thaw. Then, there is less damage to remaining trees in the felling and skidding operations because trees are dormant. Too, the bark is tight, branches snap off rather than tear off, and the frozen ground reduces the possibility of compaction or mechanical damage to roots.

In the winter, it is often easy for you to get to stands which couldn't be reached in the summer. Then, too, reduced foliage allows better visibility

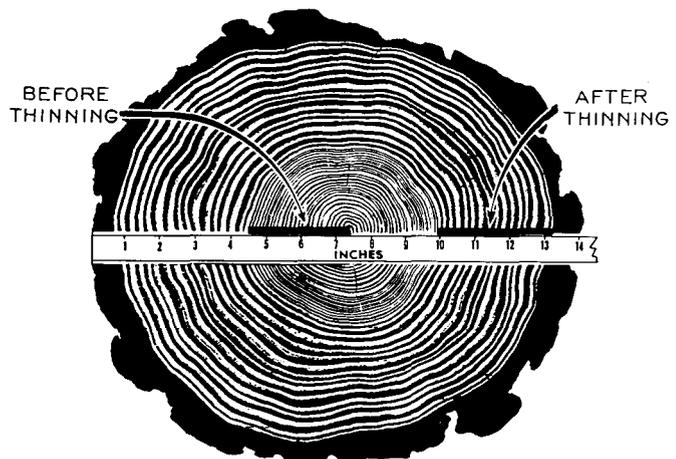
and there is generally less fire hazard. Insects and hot weather are not problems. Besides, winter is usually a slack period for the farm woodland owner.

### WHAT AGE TO THIN

Red and white pine--Thin even-aged red and white pine stands, first, at about 20 years of age when fully stocked. This is when you can do the most effective and cheapest timber stand improvement work. This first thinning may not pay for itself, depending on your opportunity to market products such as fenceposts and poles. The primary purpose is to release the young dominant and codominant trees.

You should thin stands to leave about 600 to 700 evenly distributed trees on each acre. White pine is frequently planted or is naturally established under hardwood overstories. Maintain this overhead shade until white pine trees are about 25 feet high to prevent infestation by white pine weevil.

When trees are 20 to 40 years old, you can make the first commercial cut. Your main concern should be to retain well spaced trees of good form and vigor. Remove all overhead shade trees after the stand is over 20 years old. Now, if you have not already, contact your local state forester. He will mark the trees to be removed and determine the basal area of remaining trees to assure adequate stocking for vigorous growth. During this period, undertake pruning of 100 to 150 final harvest trees.



Faster growth--after thinning.

## DETERMINE SPACING

You can follow several rule-of-thumb methods to determine proper spacing of trees in the thinning operation. The best method is the basal area method your forester uses. The most common method is the  $D + 4$  formula.  $D$  refers to the diameter, in inches of the trunk, at breast height (4.5 feet above ground). You just determine the average diameter of vigorous and healthy trees in the stand and add 4. For example, if the average diameter is 8 inches, 8 plus 4 equals 12, and 12 feet should be the average spacing left between the trees.

When trees are from 40 years old to the time of final harvest, make periodic cuttings. Remove trees which are suppressed or will not remain until the final harvest. The interval between these cuttings depends on how well the stand is growing and the market possibilities.

Jack and Scotch pine--Commercial thinning in even-aged plantations or natural stands of jack or Scotch pine is justified only on good sites where there is rapid growth. This thinning is generally for pulpwood and in stands 30 to 40 years old. Spacing of the remaining trees should be approximately the same as with red and white pine.

Upland white spruce-balsam fir--In pure, even-aged, stands of upland spruce and fir on good sites, you can make an improvement cut. Objectives are to: (1) retain only quality growing stock and develop an uneven-aged stand by gradually creating openings through removal of low vigor, deformed, or defective trees; and (2) improve forest composition by favoring more desirable species. It is desirable to increase the proportion of white spruce and species such as red and white pine and to reduce the proportion of balsam fir.

You may even want to sell some spruce as Christmas trees in connection with thinning. These should be only nonmerchantable pulpwood trees less than 20 feet high--not dominant or codominant trees. Extensive cutting of dense stands of this type balsam fir for Christmas trees is desirable if markets exist.

## THINNING EQUIPMENT AND METHODS

The standard tools used in logging are used in thinning. These include felling equipment, skidding machines or horses, loading equipment, and log trucks. You should always be aware of the rules of safety and wear a hard hat and safety shoes.

Before each thinning, select and mark the trees to be removed. Apply marking paint at eye level and ground level on the trees to be removed. Put paint on the side of the tree least affected by bad weather (generally the southeast side). You should never blaze trees with an axe. This action creates wounds and sources of infection if the stand is not later thinned.

In your initial thinning of plantations and dense natural stands, a main problem is getting trees to fall clear, without getting "hung up" in nearby trees. Start cuttings from the outer edges of the stand and work inward.

Two men should work together: one as the faller operating the saw, the other using a pole to help push the tree over. Make sure that all signals and warnings are loud and clear, especially when working with or near power equipment.

Be sure you carefully consider road layout for commercial thinning. As the stand matures, the trees harvested are larger and it is harder to handle the logs. Before the initial thinning, plan your skidding trails and clearings which can be used in periodic thinning and final harvest.

After trees are felled and limbed, you can saw them to the proper log lengths. This sawing is called bucking. To be sure you are preparing the felled trees to bring the best market price, ask what lengths of logs the mill you will sell to, accepts, and buck carefully to these lengths.

Skidding, or yarding, means moving logs from the bucked area, to the clearing or landing, to be loaded on trucks. You may use small lug-type tractors, farm tractors, or horses. Tree length skidding is not recommended in thinning because of the danger of damaging standing trees. Be careful not to rub or bruise standing trees or to cut trails or roads where roots of remaining trees may be injured.

As trees increase in size, you must take greater care to safeguard against damaging standing trees during the felling operation. Remember, trees must be felled so that they do NOT land on stumps.

A good forest manager is constantly watching for any disease or insect infestation in his forest. Consult periodically with your local forester on proper forest management. He has current information on insect and disease infestations and controls, cultural techniques, and economic opportunities. It will assist you in realizing the fullest benefit from your forest.



Commercial thinning in a red pine stand.

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