

Intermediate Silvicultural Treatments in Young Stands: Thinning and Pruning

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Intermediate Silvicultural Treatments in Young Stands



Intermediate Stand Treatments

– any treatment done in developing stands to enhance growth, vigor, tree quality, and/or species composition after establishment and prior to final harvest

- Non-commercial treatments
 - PCT, Release, Improvement cuts, Pruning, Fert.
- Commercial treatments – includes the various methods of commercial thinning
 - Geometric, Low thinning, crown thinning, etc.
(and in some cases Improvement cuts)

Five types of

Non-commercial stand treatments

- 1) Precommercial thinnings
Uniform spacing, Row thin, crop-tree thinning
- 2) Release treatments
Cleaning, Liberation cuts
- 3) Improvement cuts
Timber Stand Improvement, can combine w/ Comm.
- 4) Pruning
- 5) Fertilization

Objectives of Thinning

1. Salvage trees that would eventually die from suppression
2. Increase growth rate and quality of remaining trees in stand
3. Provide a source of income prior to end of rotation
4. Economical means of Controlling species composition
5. Shorten the rotation period (Large trees sooner) – long rotations reduce \$
6. Reducing Risk of the stand being destroyed or reduced in value by natural causes
7. Improve habitat for certain wildlife species
8. Accelerate the development of old-growth characteristics

1) Precommercial thinnings (PCT)



- Designed to reduce stocking (stand density)
- Two primary objectives
 - to increase growth rate of remaining trees;
 - to shorten the rotation period.





Precommercial Thinnings Desirable when:

a) Natural regen results in young stand with desirable species, but it is so dense that stagnation or slow growth is likely.





4x4	1961
5x5	1971
6.5x6.5	1981
8x8	1991



15 x 15
1961

Effect of Stocking on Larch growth rate

Effect of stand density on individual tree crown width.

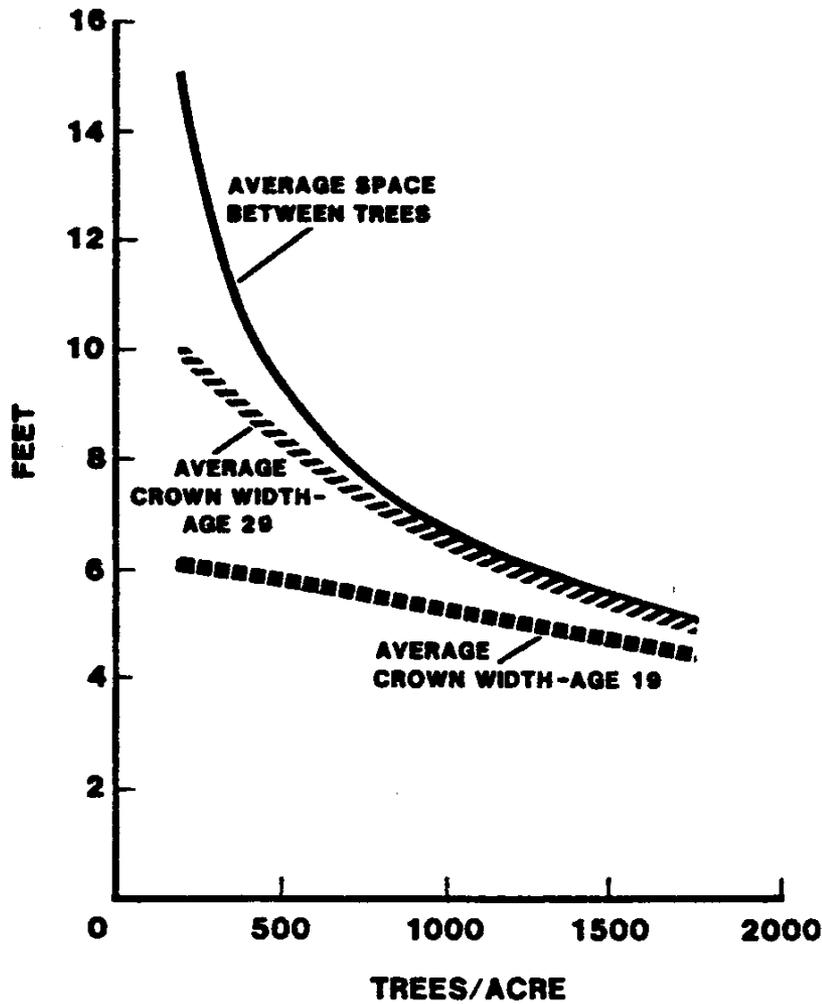


Figure 1—Relationship of average crown widths to average space between trees of larch growing under a range of stand densities.

CROWN CONFIGURATIONS OF LARCH CROP TREES AGE 29

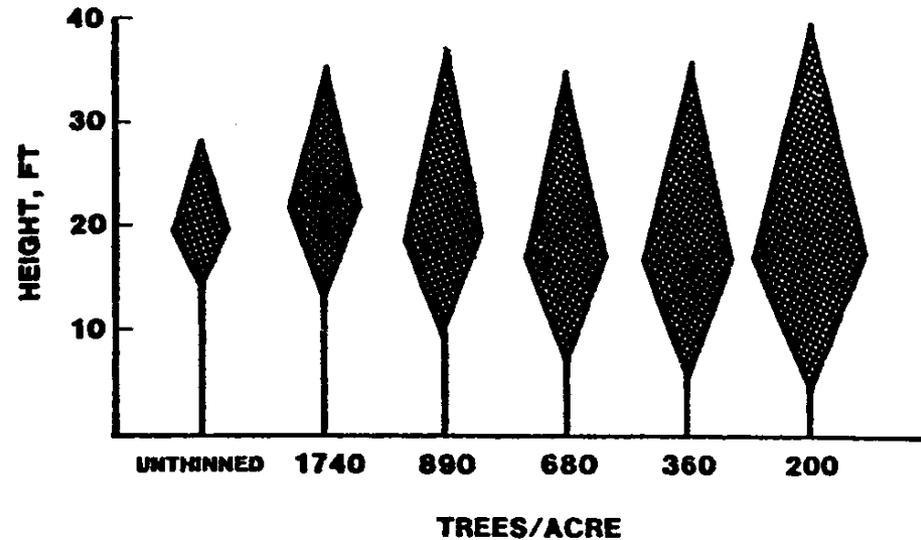
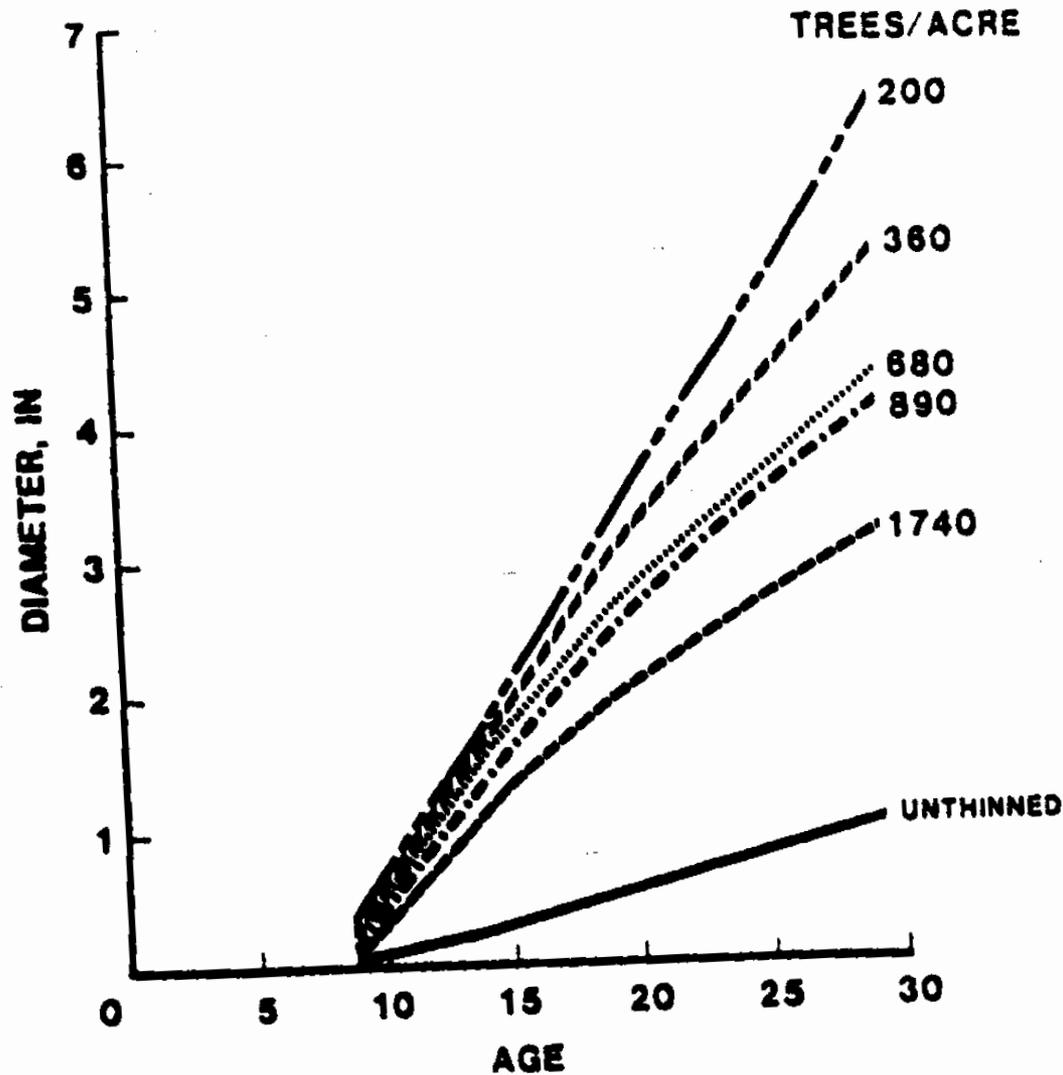


Figure 2—Crown configurations of average 29-year-old larch after growing at specific stand densities for 20 years.

ALL LARCH TREES



Effect of stand density on individual tree diameter for all trees.

Figure 5—Average diameter at breast height (DBH) of all trees in larch stands that were growing at specific stand densities from age 9 to 29.

LARCH CROP TREES

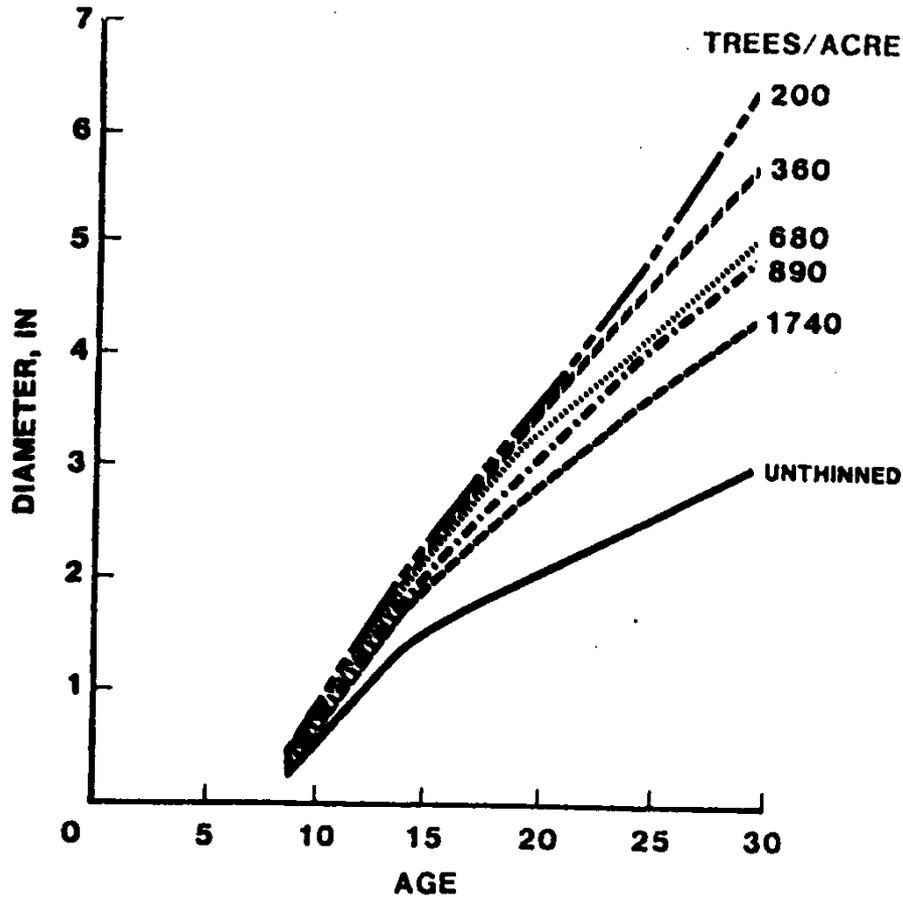


Figure 4—Average diameter at breast height (DBH) of larch crop trees (200 largest trees/acre [494/ha]) growing at specific stand densities from age 9 to 29.

LARCH CROP TREES

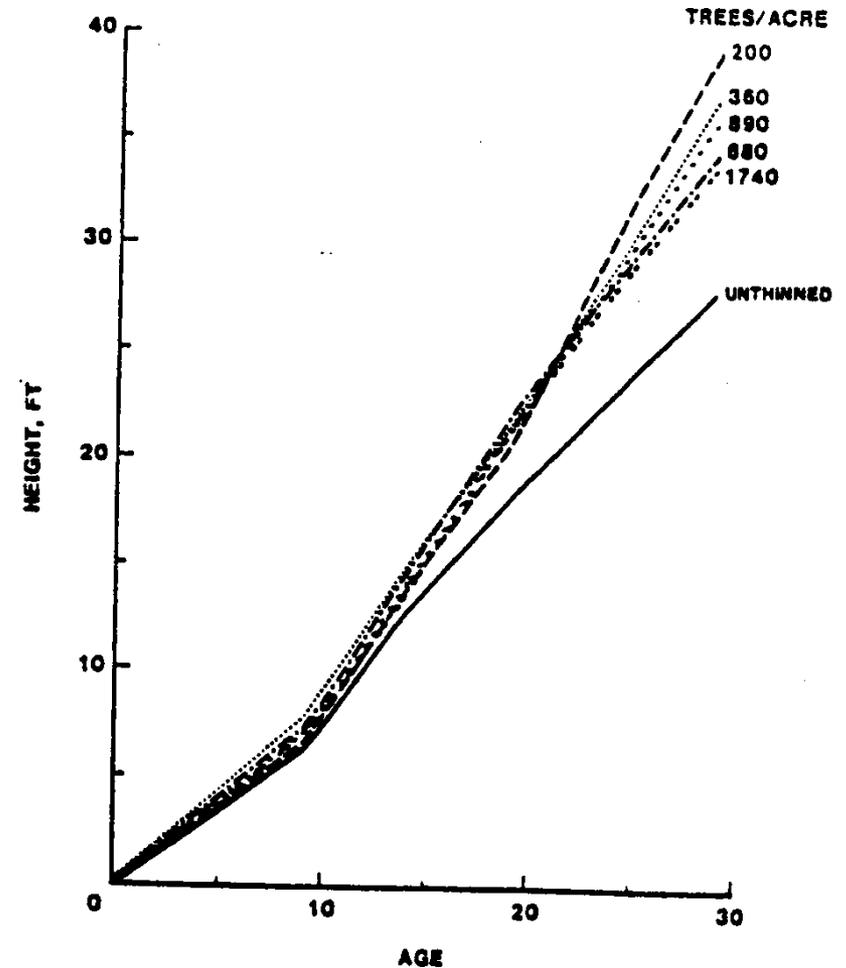


Figure 6—Average height of larch crop trees (200 largest trees/acre [494/ha]) growing at specific stand densities from age 9 to 29.

Effect of stand density on individual tree diameter for only the best 200 trees in each stand (i.e., effect of early vs later thinning).

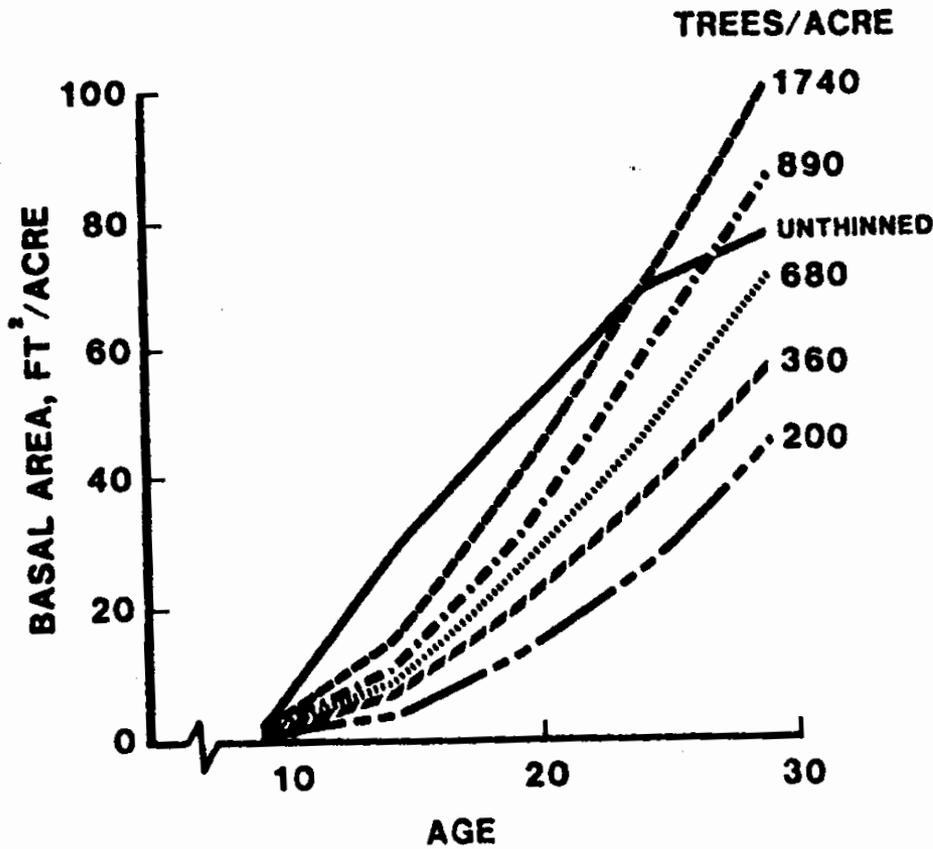


Figure 7—Basal area per acre of western larch growing at specific stand densities from age 9 to 29.

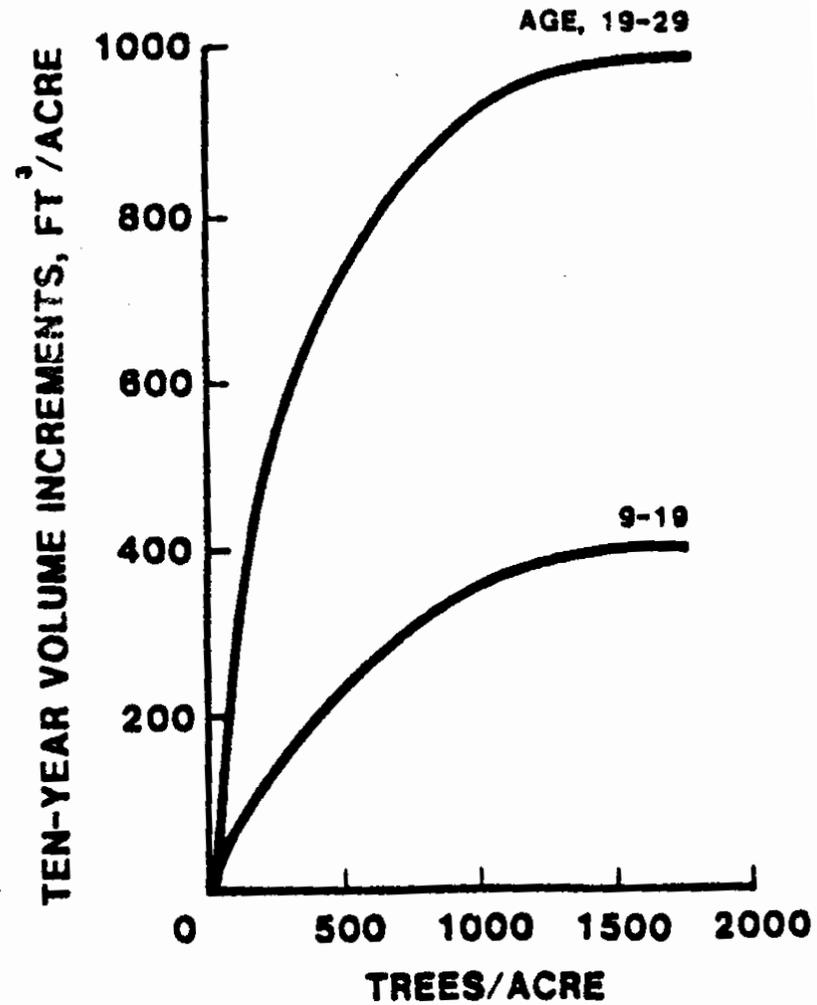


Figure 8—Ten-year cubic-foot volume increment of larch from ages 9 to 19 and 19 to 29 growing under a range of stand densities.

Effect of stand density on stand level basal area over time and effect on ten year volume growth.

UNTHINNED LARCH STANDS NATURAL MORTALITY

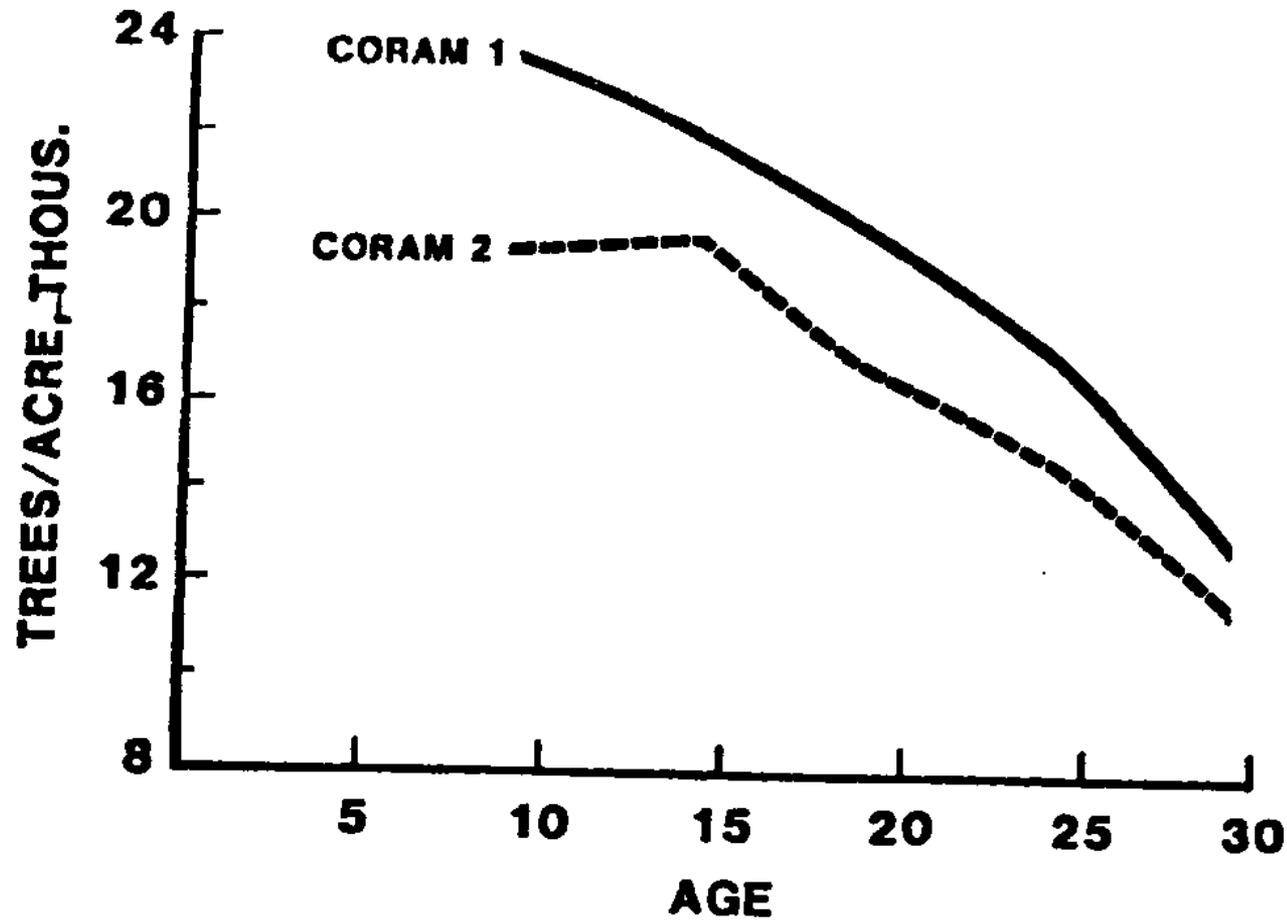


Figure 9—Natural attrition in number of trees of unthinned larch stands from ages 9 to 29.

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- d) An overly dense stand is likely to impede operability at time of first commercial thinning.









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Methods of Precommercial Thinning

- Set Spacing – Uniform single-tree thinning
- Crop tree thinning
- Row or Clump thinning

Methods of Precommercial Thinning

- Set Spacing single-tree thinning; 15'X15'



Methods of Precommercial Thinning

- Set Spacing (Uniform spacing)
 - Most commonly done in sapling or young pole stands of conifers.
 - Spacing often 12X12 to 15x15 ft.
 - Often done by manual labor (e.g., brushsaws, chainsaws).
 - Labor intensive and expensive, but growth better than in clump thinning, and greater selectivity.



Methods of Precommercial Thinning

- Set spacing thinning
- Row or Clump thinning
- Crop tree thinning



Methods of Precommercial Thinning

- Crop tree thinning (aka Daylighting)
 - Crop trees identified ~20-25 feet apart and given full crown release from competition.
 - Especially appropriate where species selection or individual differences are great e.g., in quality hardwoods.
 - Ideal time is sapling or early pole stage after crowns have closed and best trees evident.
 - Trees not directly competing with crop trees are usually not cut.
 - Option for mitigating effects on hiding cover

Methods of Precommercial Thinning

- Row or Clump thinning





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Methods of Precommercial Thinning

- Row or Clump thinning
 - Mechanized operation in which clumps of trees are released 6-10 feet apart.
 - Work done with large equipment.
 - Most feasible in sapling stands < few feet high.
 - Less expensive, but growth and quality not as good.



Pruning





When to Prune

Objectives:

- Increase clear wood, i.e., knot free
- fuel hazard reduction
- reduce susceptibility to blister rust infection



- Prune to the branch collar, not beyond
- Angle of cut may vary w/ branch collar, see handout.
- Saws tend to make cleaner cuts



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Power pruner



UGA0976028



How much to prune?

Because you do not want to reduce live crown excessively, typically aim for 50% of height, which leave a 50% live crown ratio.

Tree at right is shown after it's second lift.

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Managing Canopy Base Height

Thinned and pruned



Removal of ladder fuels reduces likelihood of torching

