

How to Successfully Grow Red alder

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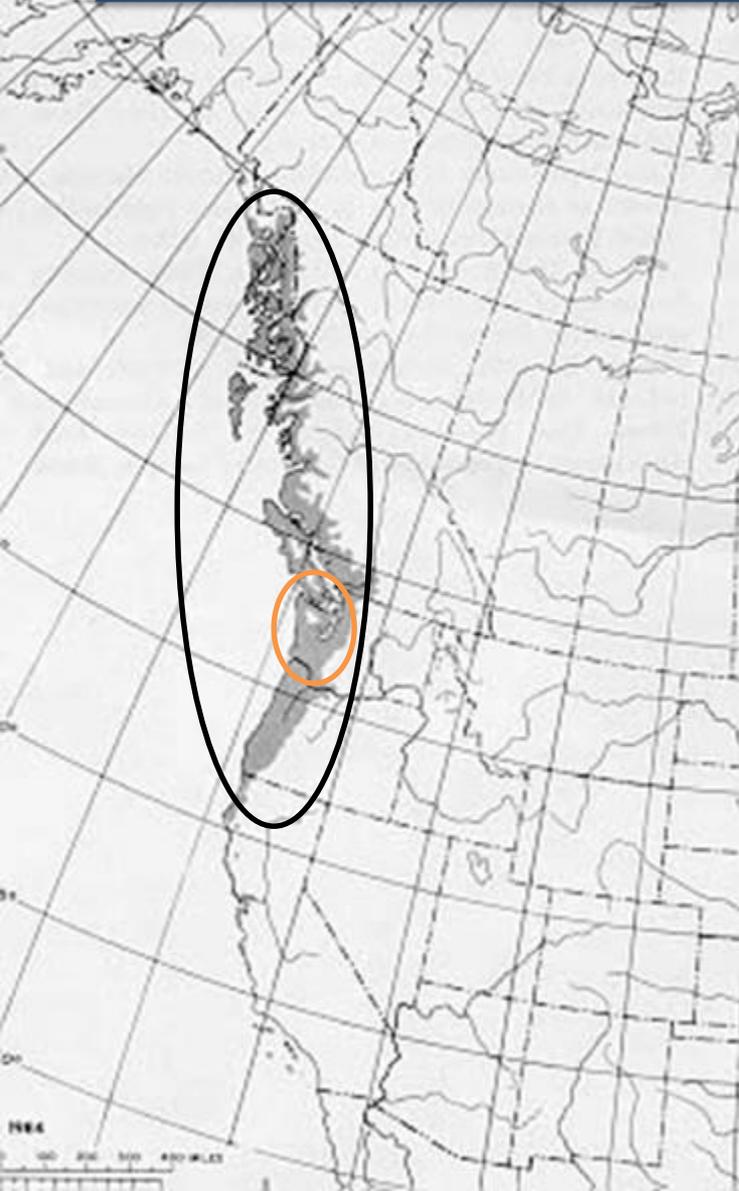


Outline

Five Steps to Achieving Success:

1. Selecting a suitable growing site
2. Site preparation
3. Seedling selection, care, & planting
4. Early plantation monitoring surveys
5. Pre-commercial thinning

The Range of red alder



Red alder benefits

Ecological/Social

- Native species
- Nitrogen fixer
- Restores soil stability, fertility after disturbances
- Immune to laminated root rot and Swiss Needle Cast
- Sustains forest health
- Contributes to wildlife habitat: bird foraging, understory ungulate forage
- Recognized as providing diversity in conifer landscapes

Economic

- > 150-200% Net Present Value vs. Douglas-fir
- Return on Investment (ROI) greatest of PNW native species
- Produces sawlogs and veneer on a short rotation (25-35 years)
- Produces high value end products: furniture, moldings, trim, doors

Step 1: Site Selection Criteria

READ THE FOLLOWING BEFORE PLANTING RED ALDER:

C.A. Harrington, 1986. A Method of Site Quality Evaluation for Red Alder.

<http://www.treesearch.fs.fed.us/pubs/5556>

Key Physical Site Characteristics³:

1. Elevation:

- Low elevation < 1000-1,400' (Summarizes length of growing season and temperature).

2. Topography:

- Slopes 5-30% (allows for ground-based harvesting)
- Aspect: Key = sheltered from drying winds, storm winds
 - North or NE best, South worst, West aspects risk wind exposure
 - Effects of aspect greatly reduced when slopes <10%
- Free from frost in spring and fall before dormancy

3. Soils:

- Well drained, good rooting depth >30 inches
- Loam, silt loam, clay loam (high water holding capacity)
- Summer water table below 1-2 meters in depth

Site Selection: Use Plant Associations

Use Ground Vegetation Clues

- Salal = too dry/nutrient poor
- Sword fern = moist, nutrient rich
- If in doubt, verify your plant association
- Recommended plant association guide for SW WA:
<http://www.reo.gov/ecoshare/Publications/documents/FPAOlympicNF.pdf> (start on page 104)
- Exclude areas of dominant salal, Oregon grape from planting alder



Future red alder plantation site dominated by sword fern cover (POMU)

GIS-based Site Selection

Selecting harvest units for red alder management



Site Selection Steps

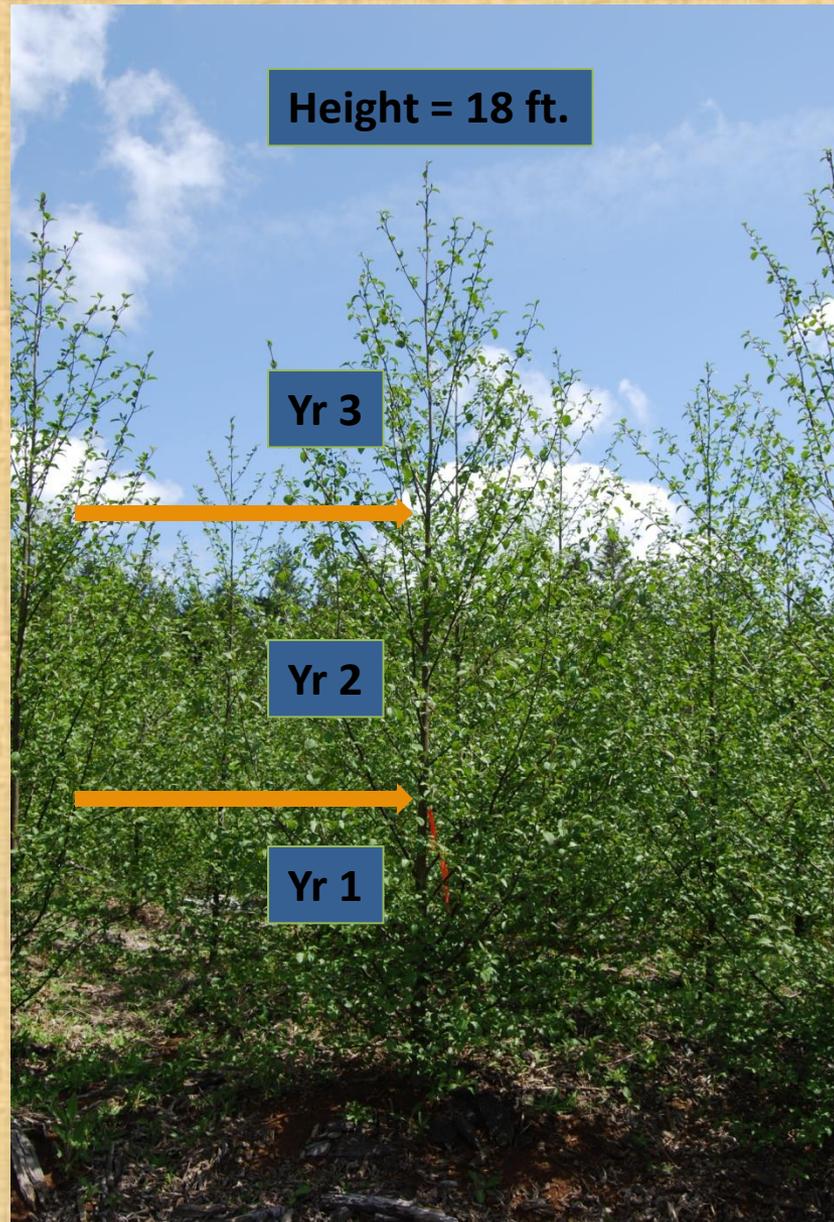
Productivity assessment

- ARCGIS-based DNR model
 - Screening tool
- Field verify all sites using these steps:
 1. GTR PNW-192 (Harrington)
 2. Understory plant community
 3. Natural red alder site trees (when available)
 4. Map Phellinus root disease, frost pockets,
 5. Delineate any other areas unsuitable for alder



Site Selection

3-year old plantation on a
medium quality site
(SI20 = 65-69)



Shakers U1: Site estimate SI20 = 65 feet

Site Selection

**6-year-old plantation
on a poor site
(est.SI20 = <60 ft.)
Note salal cover**



Site Selection “Watch Outs”



Frost pockets

Frost Pocket Screening

1. Micro cold air settling: Any depressions on flat (<5%) topography
2. Macro cold air drainage: Draws connecting areas of high to low elevation that drain large masses of cold air or interior valleys.
3. Cold-air damming: Lower portions of units where cold air backs-up from vegetative barriers such as riparian areas, or topographical obstructions such as ridges

Frost Damage Illustration

Freeze damage prior to lifting in nursery, noticed in the field!



Frost kill in field (year 1)



Step 2: Site Preparation

GOALS OF SITE PREPARATION:

- 1) Create plantable spots (every 8-9 feet)**
- 2) Control competing vegetation prior to planting**

Mechanical Site Preparation

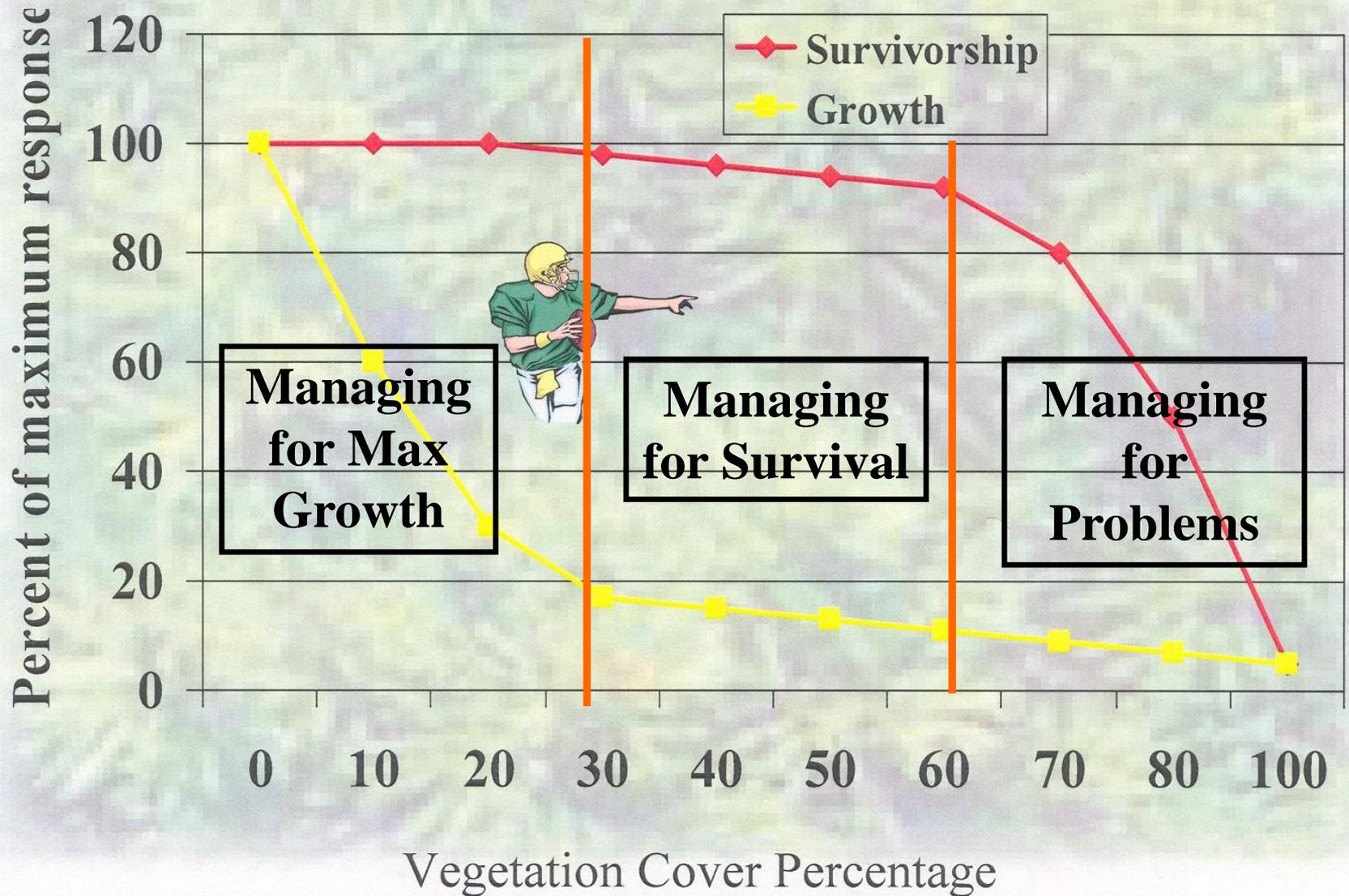


Chemical Site Preparation



Competition Football

(Wagner et al.)



Controlling Competing Vegetation

Goal: < 20% cover 1st growing season

December before planting

August 7th, 1st growing season



Shakers Unit 1: 1st Year Competing Vegetation

Senecio Sylvaticus

September: 1st Growing Season



May *Senecio* germinant

Herbicide Options

Site Preparation (pre-plant)

- Foliar herbicides
 - Glyphosate (Accord/Rodeo)
 - Clopyralid (Transline)
- Soil residual herbicides
 - Atrazine (Atrazine 90 WDG)
 - Metsulfuron methyl (Escort XP)

Release (year 1-2)

- Ground glyphosate directed application (low effectiveness, high cost)
- Ground transline broadcast
- Aerial or ground atrazine treatment dormant application

Potential future tools?

- Flumioxazin (SureGuard)
 - Esplanade

*Follow all current product label and forest practices laws when using herbicides

Target Growth

Target Height:

3-5 feet after 1st Growing Season



January prior to 2nd growing season



June 2nd growing season

Example of poor vegetation control



- **Grass, senecio, thistle in second growing season not controlled by fall site prep using Accord + Escort. Growth substantially reduced where total vegetation cover > 20%**

Step 3: Seedling Selection, Care, Planting

Target Seedling Characteristics

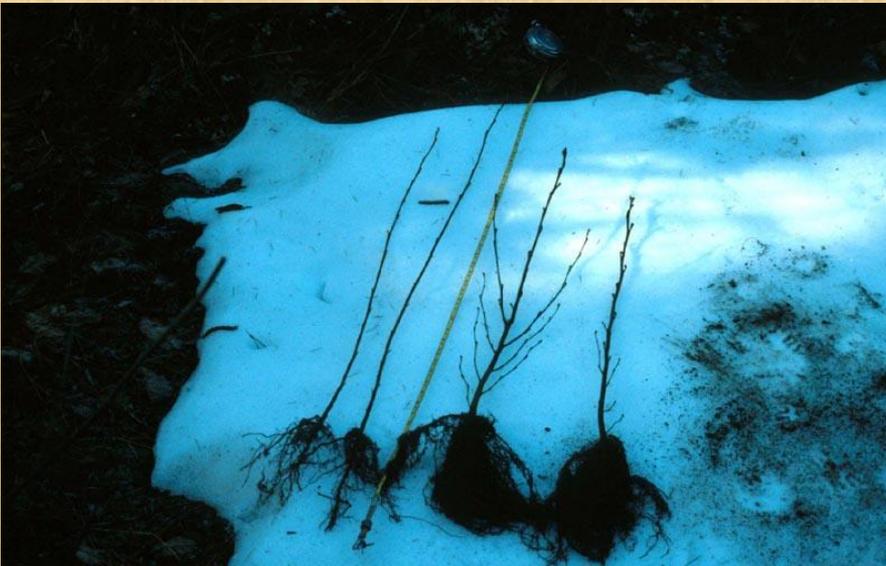
1. 1-year bare-root seedlings: P+½ (Webster) or 1+0 (Weyerhaeuser or IFA)
2. Sturdy, well-branched seedling; buds all along the main stem
3. Seedling height: 24-48+ inches, sturdy
4. Largest caliper possible (6-8mm+) Caliper is key!
5. Dense , healthy root systems with *Frankia* nodules
6. Minimal large diameter woody roots



Seedling Selection & Care

1+0 (left) vs. P+1/2 (right)

Styro 2 plugs ready for transplant



Seedling Care & Handling

- Nursery Procedures (verify with nursery)
 - Freezer store from early January
 - Thawed upon request 3-5 days before pick-up
 - Communicate your expectations to growers/nursery managers
- Nursery to Cold Storage
 - Keep in cold storage during long transports to cooler if possible
 - Store at 33-36 degrees F no more than 1-2 weeks following thawing
- Cold Storage to Planting Site
 - Do not stack bags greater than 3 bags deep without support
 - Transport under insulated tarp or canopy eliminating direct sun exposure, drying of fine roots
 - Only remove qty from cold storage that can be planted that day

Planting

- **Timing:**
 - Plant mid-March to mid-April (after risk of damaging frosts)
- **Planting Spot Characteristics (define in contract):**
 - Plant in mineral soil avoiding close proximity to stumps or slash piles (risks damage from reflective heat or mechanical abrasion)
 - Do not plant where obstructions intersect an imaginary 1 foot cylinder around seedling
 - Avoid excess scalping (minimizes reflective heat around stem)
 - Depth: settled groundline at root collar to 1 inch above
- **Stocking Levels:**
 - Target 540 tpa (9'x9') to 680 (8' x 8') – evenly spaced

Planting (continued)

- Handling At the Planting Site
 - Paint small seedlings with white or orange paint to facilitate visibility for spacing, planting compliance
 - Eliminate planters from overloading planting bags (scrapes off side buds during loading, unloading)
 - Minimize planters grabbing seedlings from tips (brittle tips snap off easily)
 - Avoid planter's boots touching stem (thin bark damages easily)

Results of Poor Planting

Mechanical abrasion caused by slash pile edges



Shallow, twisted roots wind-rocked out of planting hole in year 2



Step 5: MONITORING

Key = Trigger Necessary Actions for Year 2

Year 1:

- a. If >50% vegetation cover (mid-July) & overtopping seedlings then release spray spring year 2.
- b. If <440 live trees per acre or areas with trees greater than 13 feet apart then interplant year 2.
- c. If mortality >10% then identify causes: sun scald, frost pockets, botrytis, drought stress most common agents
 - a. Map any areas of frost pocket mortality and re-plant with conifer year 2.

Year 2:

- a. Reassess for the same trigger points as year 1!

Step 5:

Pre-commercial Thinning (PCT)

PCT Timing: 5 to 9 growing seasons depending on when following stand conditions are met.

PCT decision based on:

- Self-pruning height on CROP TREES: Target 8 to 12 feet (lower if pruning live branches)
- Live crown ratio of CROP TREES: Target 60%
- Diameter growth trend of CROP TREES: Avoid decreases
- Tree height range at PCT: 25-35 feet

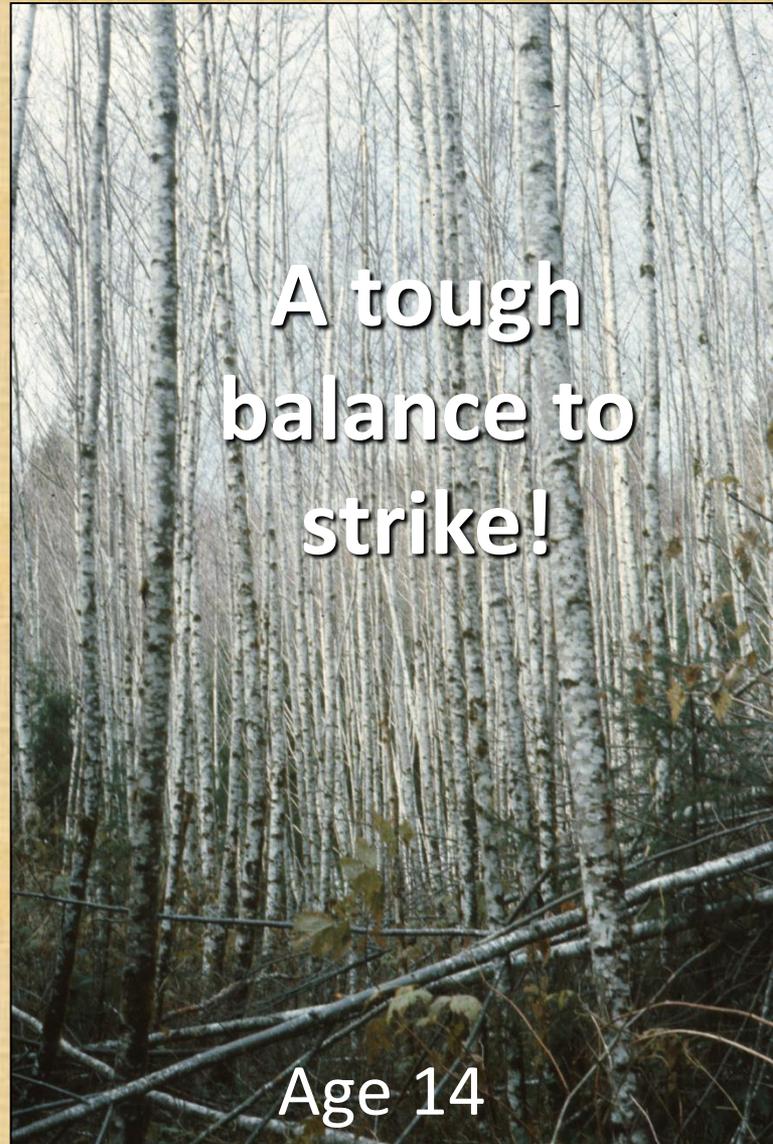
Density Management

Background:

- Height growth culminates in years 1-3!
- 50% of potential height at age 15
- Target of 22', clear butt log.

Density Management Objective:

- Balance wood quality with growing space: Small knotty core with trees retaining 60% live crown ratio.



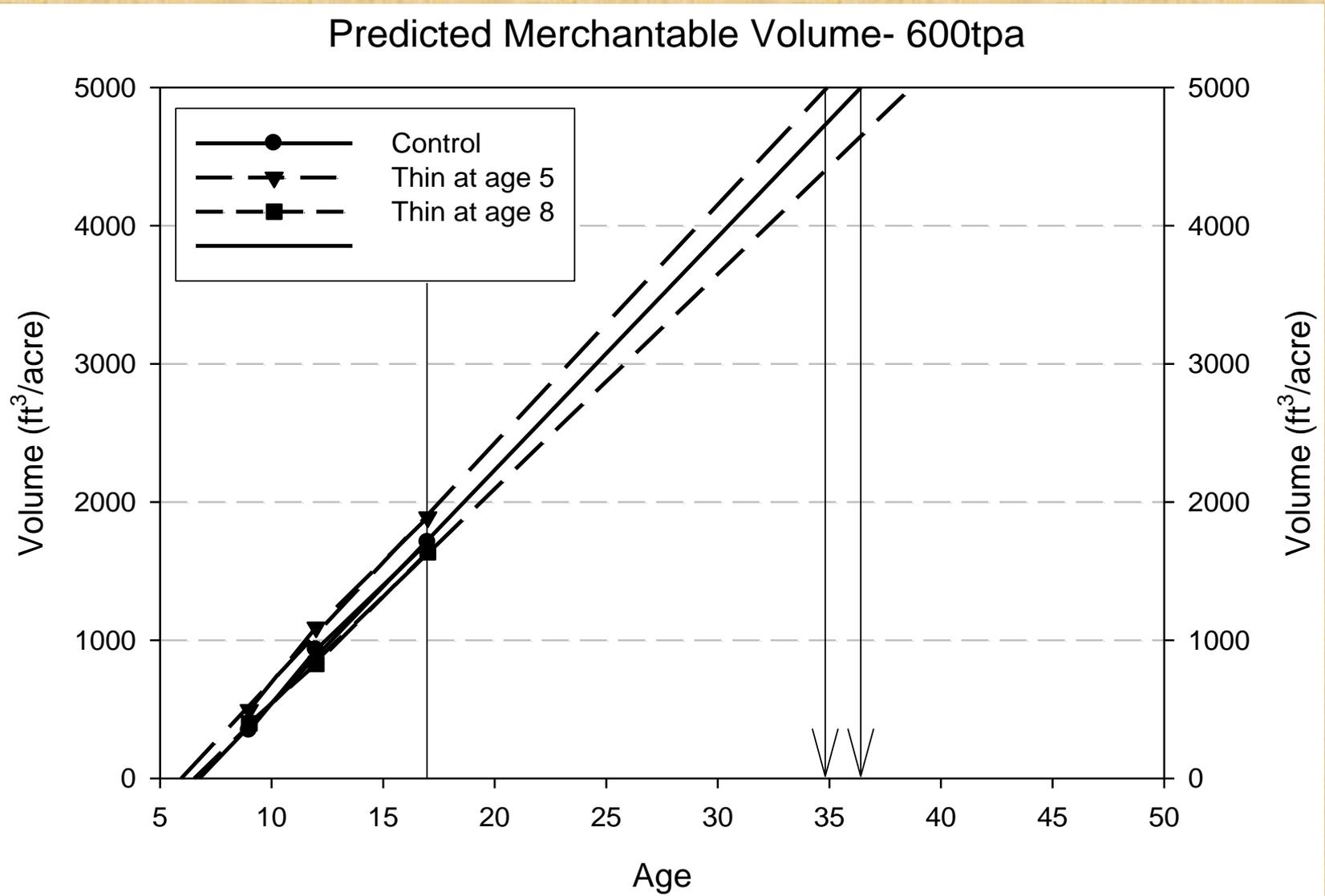
Density Management

Pre-Commercial Thinning:

- **Thin for equal spacing and quality**
- **Remove multiple stems, forks, bole damage, excessive sweep, lean**
- **Knock dead branches off by falling take trees against residuals**
- **Timing: leaves off to see defect, spacing while thinning**



PCT Timing Critical!



Density Management Regimes

With Commercial Thinning

- Plant 540-680 TPA
- PCT age 5-9 to 230-300 tpa at 60% LCR
- Thin to 160 - 180 tpa at age 15-19 at 50-60% LCR
- Harvest at age 30-35 years

Without Commercial Thinning

- Plant 540 TPA
- PCT age 5-9 to 230-250 tpa at 60% LCR
- Harvest at age 25-35 years
 - 13-20 mbf/ac

A photograph of a person standing in a field of purple flowers. In the background, a white SUV is parked on a dirt road. The scene is set in a hilly, forested area with a large pile of logs on the left.

SUMMARY:
FOLLOW ALL 5 STEPS TO GROW RED ALDER
ON YOUR SITE

Questions?

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References

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