

video

- common misconceptions; diameter/age relations
- negative effects of past practices
- structure and history of typical hardwood forests

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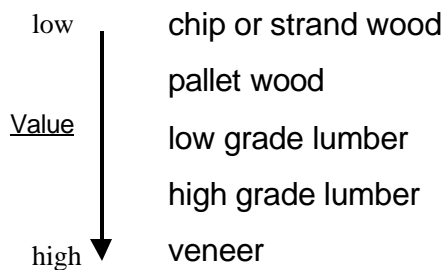
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### Hardwood Timber Products



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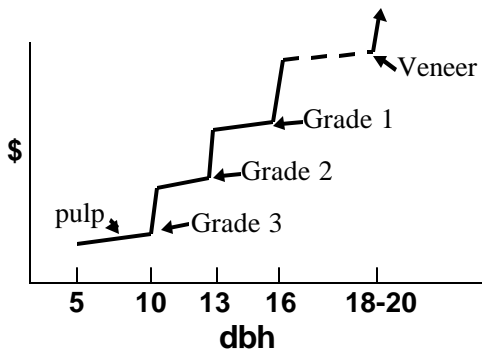
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video

### Characteristics of Hardwood Veneer

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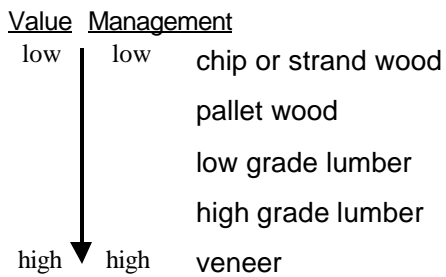
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### Hardwood Timber Products



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### Hardwood Timber Products

**low value markets make it much easier to produce high value**

chip or strand wood
pallet wood
low grade lumber
high grade lumber
veneer

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**Producing High Value Hardwoods**

- Characteristics of high value
- How to grow trees with these characteristics

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video

**Characteristics of High Value Hardwoods**

- straight – no sweep or crook
- clear bark – no knots, branches
- solid - no damage - rot
- proper species – long-term commercial
- large – 18-24 inches

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**QUESTION:  
How Do We Grow A Tree  
With These Characteristics?**

- Straight
- Clear Bark Pattern
- Solid
- Large
- Proper Species

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**How Do We Grow A Tree With  
These Characteristics?**

Straight

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picture

dense young regenerating stand

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**How Do We Grow A Tree With  
These Characteristics?**

Straight                      dense young forest

Clear Bark Pattern

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picture

dense young regenerating stand

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**How Do We Grow A Tree With These Characteristics?**

Straight                      dense young forest  
Clear Bark Pattern      dense young forest

Solid

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pictures

basal wounding of hardwoods  
fire  
logging equipment  
high stumps

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**How Do We Grow A Tree With These Characteristics?**

Straight            dense young forest  
Clear Bark Pattern   dense young forest  
  
Solid                logging damage  
                         low stumps  
                         fire suppression

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**How Do We Grow A Tree With These Characteristics?**

Straight            dense young forest  
Clear Bark Pattern   dense young forest  
Solid                reduce damage  
  
Large                long rotations  
                         grow quickly

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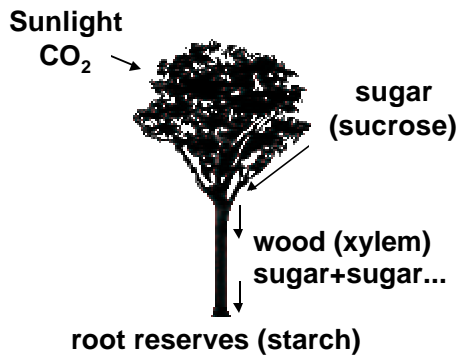
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pictures

1. tall thin tree - butt log established  
no diameter
2. small crown of previous tree
3. large crown after thinning

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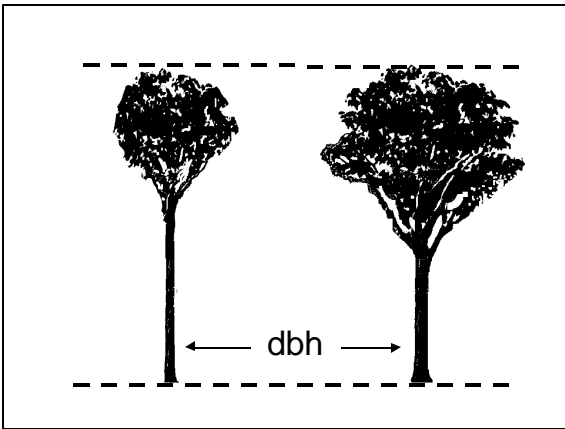
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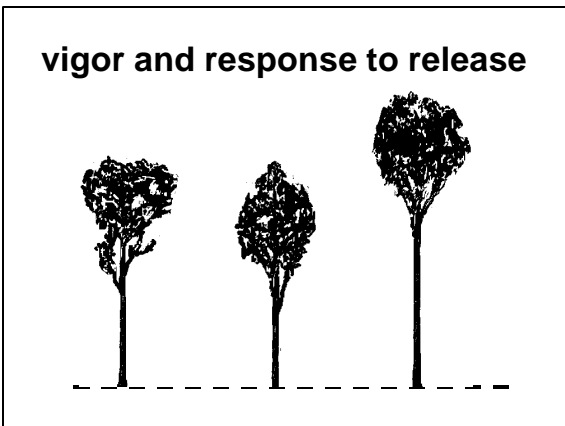
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vigor and response to release



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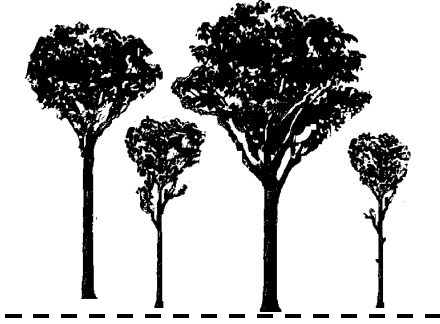
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**vigor and crown position**



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**How Do We Grow A Tree With These Characteristics?**

Straight	dense young forest
Clear Bark Pattern	dense young forest
Solid	reduce damage
Large	density – produce even moderate to fast dbh growth

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**How Do We Grow A Tree With These Characteristics?**

Straight	<u>dense</u> young forest
Clear Bark Pattern	<u>dense</u> young forest
Solid	reduce damage
Large	rapid growth - <u>density</u>

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**PROBLEM!**

**High Density**

Benefits:  
creates straight, clean stems

Costs:  
leads to small tops  
reducing dbh

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**ANSWER!**

**DENSITY must be REGULATED**

Initial regeneration must be dense.

Density regulated through thinning  
to improve dbh.

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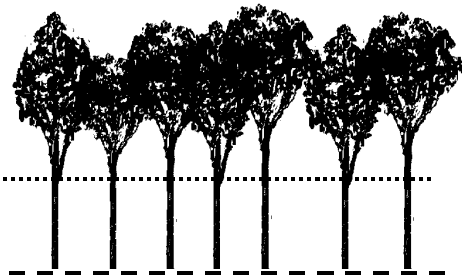
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**high density – form butt log**



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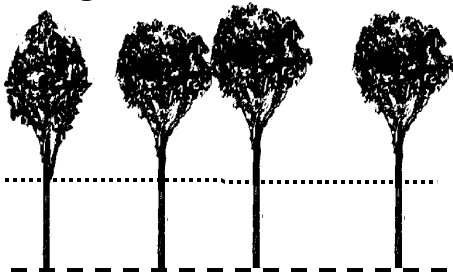
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**decrease density to increase dbh growth**



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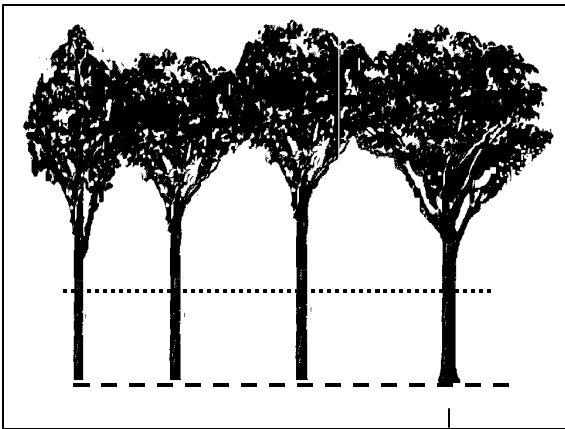
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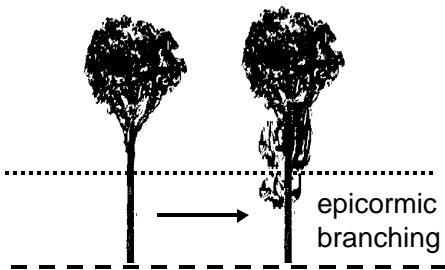
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**density must be controlled to maintain quality**



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**How Do We Grow A Tree With These Characteristics?**

Straight	dense young forest
Clear Bark Pattern	dense young forest
Solid	reduce damage
Large	rapid growth -density

Proper Species

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**Controlling Light**

**Each species of tree has a specific requirement for light.**

Shade Tolerant

- species which can live in canopy shade

Shade Intolerant:

- species needing considerable sunlight

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**Examples of Shade Tolerance**

Tolerant:

- beech
- maples
- hickories

Intolerant:

- yellow-poplar
- black walnut
- cherry
- ash

Intermediate: oaks

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<b>Intact Canopies</b>	<b>Open Canopies</b>
low levels of light	high levels of light
if perpetuated	if canopies are allowed to opened
shade tolerants increase	shade intolerants increase

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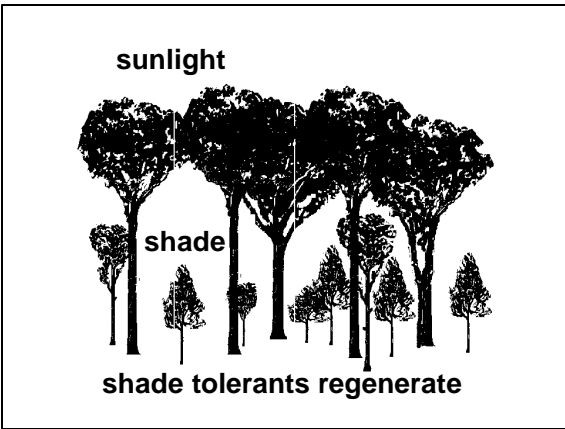
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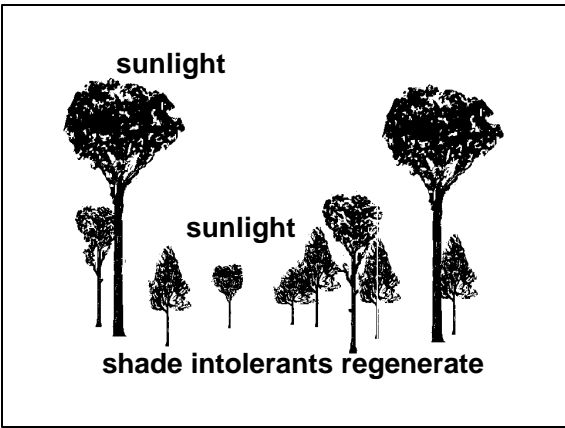
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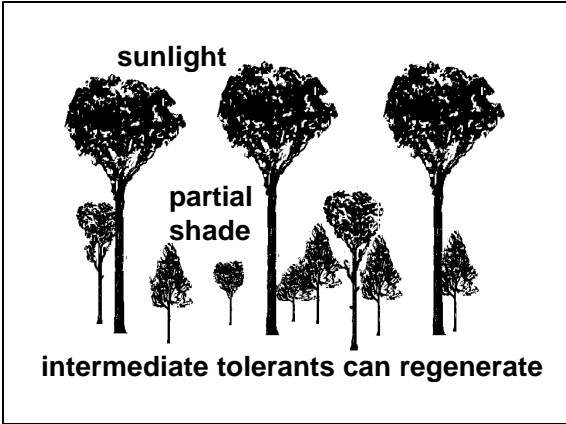
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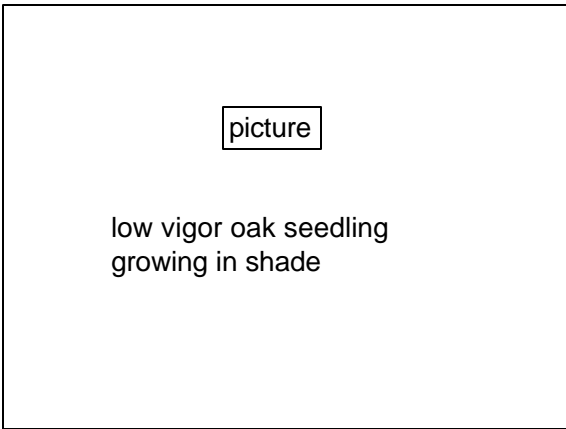
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**How Do We Grow A Tree With These Characteristics?**

Straight	dense young forest
Clear Bark Pattern	dense young forest
Solid	reduce damage
Large	rapid growth -density
Proper Species	light at ground

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**Question:**

**How Do We Grow High Value Hardwoods?**

**Answer:**

**by controlling Density and Light**

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**Density Controls**

**Stem Quality**

- straightness
- cleanness
- diameter

**Light Controls**

**Species Composition**

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**Produce High Value Hardwoods**

**we must insure**

- light levels to foster species composition
- adequate density of regeneration
- regulate density through rotation

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## Stands

Forested areas with similar site productivity and forest structure.

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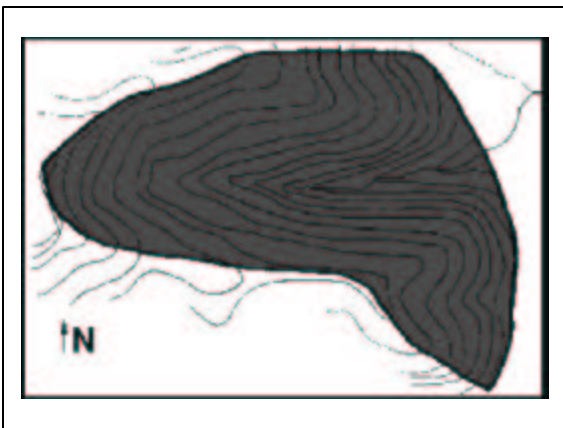
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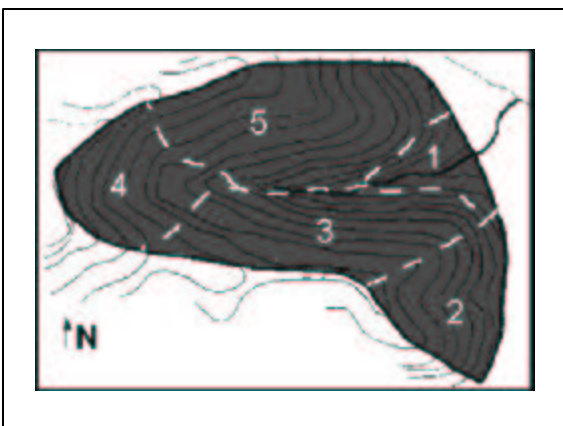
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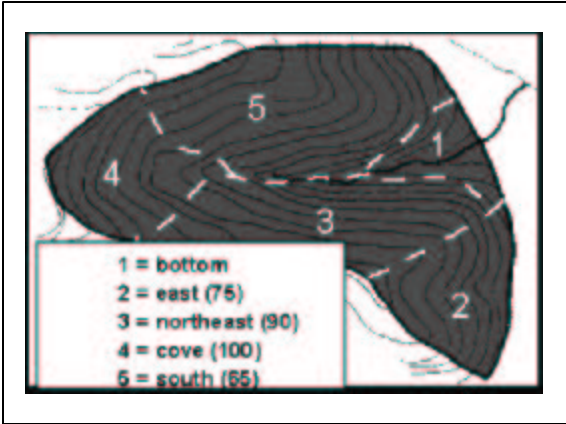
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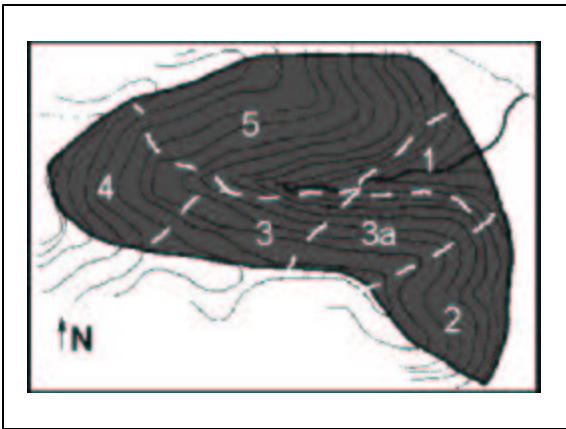
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**Hardwood Management**  
  
 Wayne K. Clatterbuck  
 Associate Professor  
 Forestry Extension Specialist  
 Dept. of Forestry, Wildlife & Fisheries  
 The University of Tennessee, Knoxville

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