


Hardwood Management

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- Why Grow Hardwoods?
 - Are You Sure? Requirements to Manage a Hardwood Stand
 - Economics & Silviculture
 - Natural Regeneration vs. Planting
 - Summary

The background of the slide is a solid dark brown color with a pattern of lighter brown, stylized autumn leaves scattered across it. The leaves have prominent veins and are in various orientations, creating a textured, naturalistic feel.

Why Grow Hardwoods?

Why Grow Hardwoods

- That hardwood wood lot is already there. You own it and can use what you have
- The wildlife carrying capacity is greater and more diverse; hence, hunting lease rates are higher
- The aesthetic and recreational properties of hardwood stands are generally much more attractive to the average private landowner than either natural or planted pine stands

Why Grow Hardwoods (Continued)

- The value of high grade hardwood logs generally exceeds that of pine logs of a similar size
- The multiple species present tend to hedge the risks from fire, insect and disease losses
- Luckily, the most valuable species from an economic standpoint are also some of the most valuable from a wildlife/aesthetic standpoint

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Are You Sure?

**Requirements To
Manage a
Hardwood Stand**

Requirements

1. Patience and a long term outlook are essential
 - Rotation ages will range from 50 to 90 years
 - Most landowners will not live to see a newly established hardwood stand through to final harvest
 - Landowner must be willing to live with the aesthetic and recreational limitations presented by the young sapling/pole age class- the “teenage years”

Requirements (Continued)

- Timing of intermediate and final harvests must coincide with good markets – must be flexible
- For economic returns, must be willing to harvest portions of that beautiful hardwood stand you have nursed and come to love- in many cases the beautiful, open stand of older hardwoods can in fact be unhealthy and in decay

Requirements (Continued)

2. Must accept the fact that profitable, sustainable management of hardwood stands requires a forester with silvicultural skills not frequently exercised in today's profession
 - Forget 90% of what you know about pine management – **it does not apply to hardwood management!!!**
 - Investment by landowner will be heavy on skilled forestry labor (inventory, marking, research, etc.) and less in typical pine timber stand improvements (competition control, fertilizer, etc)



Economics & Silviculture

Economics

- A Federal study using sophisticated, but somewhat suspect projection models suggests that over the next 50 years there will be an 80% increase in the consumption of hardwood lumber and a 40% increase in its value.
- In Alabama, hardwood sawtimber stumpage prices from 1977 to 1997 increased at an annual rate of 5.5% - pine sawtimber at 2%, hardwood pulpwood at 6.4% and pine pulpwood at 1.5%

Economic Future Hardwood Lumber

- Short Term (next 10 Years)
 - Stumpage prices for high quality hardwoods will increase
- Long Term (10-25 Years)
 - Low grade lumber requirements will be met through imports and alternative substitutes
 - Stumpage prices for high quality stabilize

Economic Future Hardwood Pulpwood

- Short Term (Next 10 Years)
 - Paper industry will continue to require hardwood
 - Stumpage prices will stabilize
- Long Term (10-25 Years)
 - Demand declines as pulp mills move offshore
 - Demand for hardwood fiber will remain strong as alternative uses come on line (energy?)
 - Increased demand from new breakthroughs in glues, resins and composites

Economic Future Veneers & Plywoods

- Short Term (Next 10 Years)
 - Increase from competition overseas
 - Less soft hardwood in pine plywood
 - Increase in hard hardwood to cut to size veneer mills for flooring
 - High quality hardwood will command high stumpage prices
- Long Term (10-25 Years)
 - Greater consumption of engineered wood products
 - Increase consumption of sliced veneer

Silviculture

1. There are Two Golden Rules

1. Location, Location, Location – Match species to site (maybe even (gasp) Sweetgum!☺)
2. Managing for quality stems, not maximum volume production – Managing trees as opposed to acres. **Do not confuse this rule with single tree selection (uneven aged management), which most often is not sustainable for desired species!**

Silviculture (Continued)

2. Hardwood forests are more complex than pine forests as multiple species are most common
 - Each with different ecological requirement
 - Possibly with several distinct age (or size) classes
 - Each with different rates of growth and development
 - This can mean that there are two or more optimum rotation ages in the same stand
 - Each with different economic values
 - With these different values largely dependent upon the species, size and grade

Silviculture (Continued)

3. Profits in hardwood silviculture are created for the most part by production of high quality grade logs

4. Commercial hardwood trees grow in five ways

1 Diameter (Less than actual growth if expressed as percentage)

2 Cross-sectional size or basal area (This is the important one)

3 Height (Important for first 30 years)

4 Grade or Quality

5 Market Value

Silviculture (Continued)

5. Value Increase in a High Grade Residual Tree Following Management

Age	50	60	70	80	90
DBH	12	14	16	18	20
Log Height	1	1.5	2	2.5	2.5
Volume (int 1/4)	60	110	180	280	350
Butt Log Grade	2	1	Select	Prime	Veneer
Value per MBF	\$50	\$130	\$240	\$410	\$760

6. Value Increase in a Low Grade Residual from a Diameter Limit Cut

Age	50	60	70	80	90
DBH	10	11	12	13	14
Log Height	0.5	0.75	1	1.25	1.5
Volume (int 1/4)	20	40	60	85	110
Butt Log Grade	4	4	3	3	2
Value per MBF	\$10	\$15	\$20	\$30	\$40

Silviculture (Continued)

7. Percent Butt-Log Grade Distributions

Yellow Poplar					
DBH	Number	Grade 1	Grade 2	Grade 3	Below
10	123	-	-	74	26
15	85	29	19	39	13
20	34	56	29	8	7
25	8	72	23	1	4
Red & Black Oak					
DBH	Number	Grade 1	Grade 2	Grade 3	Below
10	1661	-	-	81	19
15	126	19	25	46	10
20	79	43	33	18	6
25	31	57	38	1	4
White & Chestnut Oak					
DBH	Number	Grade 1	Grade 2	Grade 3	Below
10	264	-	-	76	24
15	196	6	25	55	14
20	99	23	34	34	9
25	23	33	39	22	6

Silviculture (Continued)

8. How can we obtain this good grade?
 - a. Focus the growth potential of a site on those trees of both good form and commercial value. This is best done by the manipulation of growing space (aka thinning)
 - b. The goal of this thinning is a crop tree release, not an area wide reduction in basal area. This practice takes a skilled marker , will leave the stand more aesthetically pleasing, and will provide periodic cash flow. **However, without a skilled logger, residual damage to crop trees can actually be worse than not thinning at all**

Silviculture (Continued)

- c. But, all too often one finds that the typical hardwood stand victimized by a series of unfortunate cuts is now so dominated by what in the past was unwanted that it has little if any productive future in an economic time frame. Then starting over may be the best procedure. How do we start over?



Natural Regeneration
vs.
Planting

Natural Regeneration

1. Evaluate the advanced regeneration already present and the potential for successful coppice and new seedling establishment and then do a clean, silvicultural clear-cut. Given the rising value of both the small and cull stems, this option might be quite profitable at the doing. However, regeneration must be carefully considered beforehand.

Natural Regeneration (Continued)

2. Moderately shade intolerant species such as oak must have adequate number of advanced regeneration of at least four feet in height before they can compete with fast growing pioneer species like pine, sweetgum, poplars and maple.

Natural Regeneration (Continued)

3. If desired species mix is present, but not advanced enough to compete, partial overstory (and understory) removal may be needed a few years before final harvest
4. Once there is adequate advanced regeneration, early control of other competing species is usually not needed
5. Oaks put early growth into roots, whereas light seeded species like pine and gum focus on top growth

Natural Regeneration (Continued)

6. High stocking of these fast growing but unwanted species will thin itself out
7. If yellow poplar is desired species and good seed source onsite, advance regeneration is not needed
8. Fire has and can play a role in improving the competitive position of oaks
9. Pine stands can be an excellent cover crop

Planting

1. Most valuable hardwood species originate as advanced regeneration. The inventory, planning and potential harvest scheduling must take place long before the final harvest to ensure the success of the next stand
2. This takes hands on, up front advice from a skilled and experienced forester

Planting (Continued)

3. The cost of an experienced forester is more than offset by the lack of seedling, site preparation and planting costs
4. If there is not a suitable species present or adjacent, or in an old field site, planting (or perhaps direct seeding) may be a viable alternative

Planting (Continued)

5. If so, the location rule becomes even more important:
 - a. Match the species to the site – If it is not meant to grow there, it won't!
 - b. If site index is not high enough, investment will not be recovered (SI 80 needed for Oak?)
 - c. If you are going to plant, do it right – do not cut corners!
 - d. Must have a high risk tolerance
 - e. Consider mixed species plantings, use of trainer trees (even pine)

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Summary

Hardwoods: Why and How

Summary

- Money can be made
- Hardwood management is not for the impatient or unskilled
- If properly done, it is aesthetically pleasing and environmentally sound
- Stands of mixed species are a hedge against the shifts in public demand and biological risk

Summary (Continued)

- Here in the eastern USA, we control one of the last great reservoirs of temperate climate hardwoods for which there will likely be a demand even if it is found largely in China or Europe

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