

A Resource That Lasts Forever™



*Poplar Production and Options for
Business Development in Virginia*



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Presentation Outline

- GreenWood Resources (GWR) Profile and Global Organization
- Assets under management in the US
- Multiple market strategy for poplar wood fiber
- Current GWR efforts in developing dedicated poplar bioenergy feedstock
 - Production systems
- Future potential for poplar business development in VA
 - Elements of success
 - Biomass and the green economy – co-firing with coal, pellets, liquid fuels
 - Building partnerships



About GreenWood Resources

Global Investment and Asset Management Company for Plantation Forestry

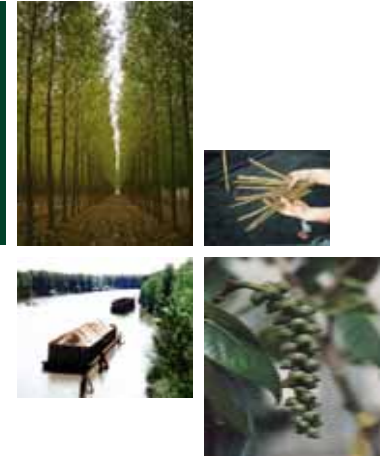


- Founded in 1998 and “dedicated to the innovative development and management of sustainable tree farms and their products”.
- Employs approximately 60 professionals and office staff located in three regions (North America, South America, and China) with expansion underway and planned in Europe and SE Asia.
- Vertically integrated company executing on a global platform:
 - ✓ Strong investment management experience and systems.
 - ✓ Leadership in creating higher returns by deploying improved plant material developed through GWR’s program of continuous tree improvement and global network of S&T collaboration.
 - ✓ Uniform systems (financial, forestry, SOPs) for plantation management to improve investment returns and reduce implementation risk.
 - ✓ Local and global marketing and sales networks to maximize return to stump and to investors.
- US \$410 million under management; Organizing \$500 million global tree farm fund- GreenWood Global Tree Farm Fund (GGTFF)

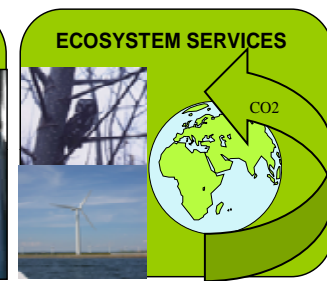
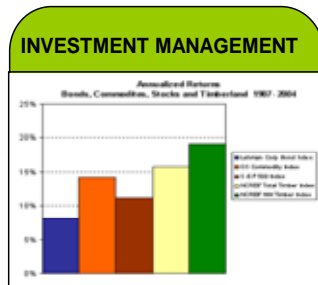


About GWR

Global Investment and Asset Management Company for Plantation Forestry



Business Area



Focus and Strategy

- > Organize and raise investment capital into boutique investment entities
- > Manage investment capital and report to investors
- > Maintain client service and BD
- > Global acquisition standards and execution

- > Manage of elite plant mtl for regional markets (poplar, teak, euc, paulownia, acacia, bamboo, ect.)
- > Nursery operations for production of elite plant material
- > Maintain cutting edge techn. for improved plant mtl and propag. for multiple market values

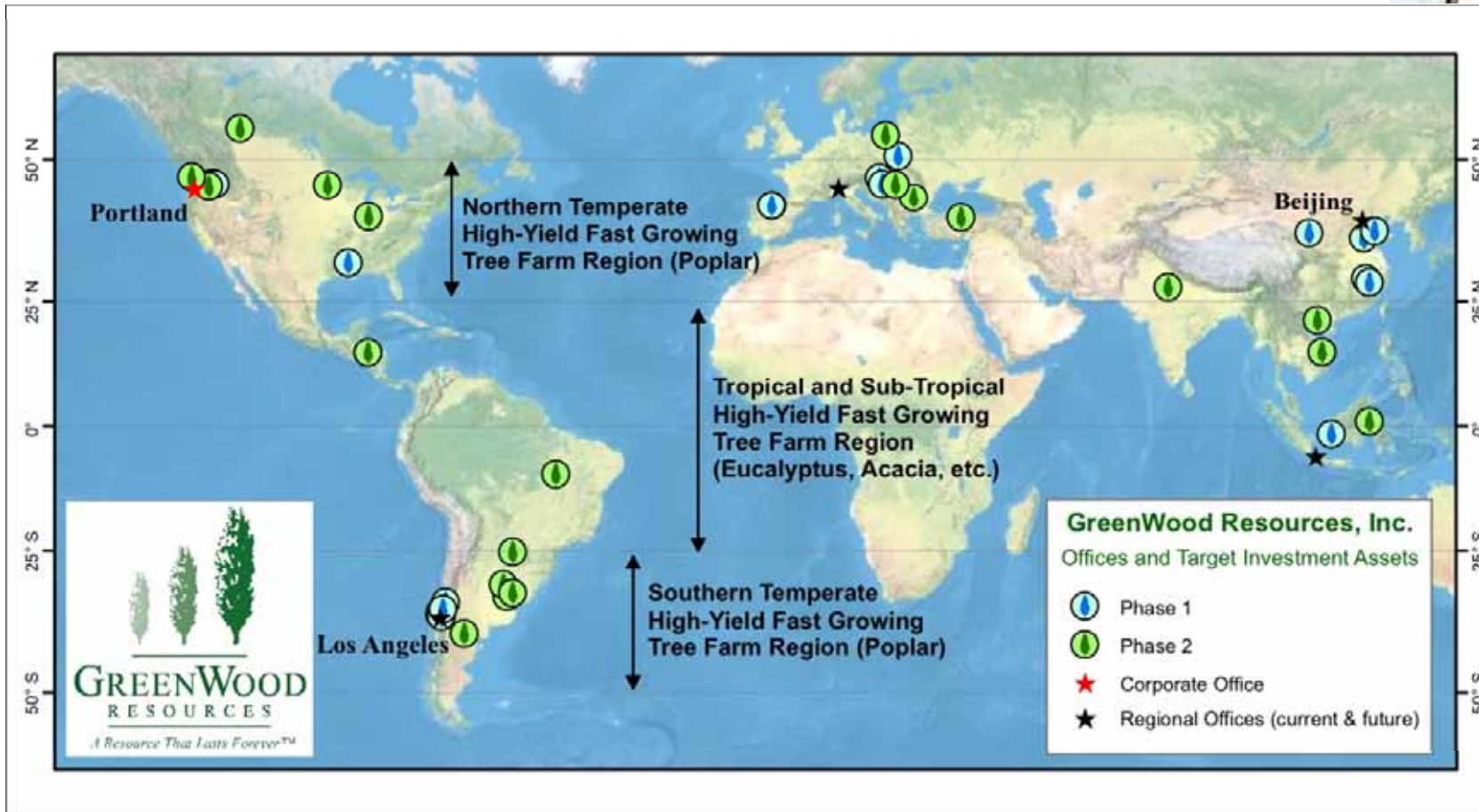
- > Professional silvicultural mgmnt for tree farm operations
- > Professional irrigation mgmnt for tree farm operations
- > Harvesting and log management
- > Research on improved methods for cost reduction and value enhancements

- > Link wood from tree farms to highest and best markets
- > Manage/Develop strategic partnerships with converting strategics and facilities
- > Provide linkage to markets for third party wood volume

- > Un-lock gains for tree farm investments and land mgmnt
- > Monetize carbon credits biodiversity credits, wetland credits water quality/quantity credits, and renewable energy credits
- > Manage land for total eco-sys. value

About GWR

Global Investment and Asset Management Company for
Plantation Forestry



Pacific Northwest: OR and WA

Columbia River Basin: 28,000 Acres



- Desert environment
- Advanced irrigation technology
- 20 GT per ac per yr



Boardman Tree Farm



Pacific Northwest: OR

Lower Columbia River: 6,000 Acres



- Alluvial sites
- Network of levees and drainage canals
- 15 GT per ac per yr



Lower Columbia Tree Farm



Multiple Product Management



→ **Logs for veneers
and sawn wood
products**



→ **Chips for
pulping
fibers and
fiber
board**



→ **Biomass for
co-generation
and liquid fuels**



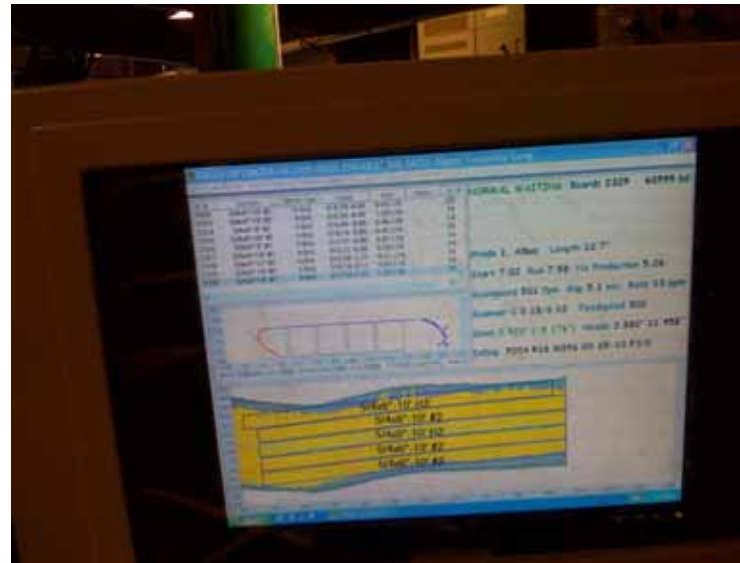
Saw Log Production

Key Silvicultural Activities

- Planting stock scale-up and propagation-poles or whips
- Site preparation and planting
 - Aggressive weed control
- Pruning - timing, frequency, intensity
- Planting density, rotation length
- Time to realize the pruning investment
 - Harvesting system and end use



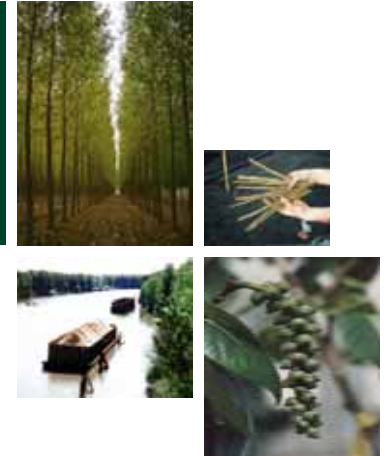
Upper Columbia Saw Mill



Upper Columbia Saw Mill



Key Elements of Chip Production Systems



- Selecting varieties with high pulp yield and favorable fiber characteristics for paper
- Silvicultural activities that optimize production in a short (5-8 year) rotation
 - Weed control, pest control, fertilization, irrigation
- Mechanized harvesting and processing
 - In field processing and delivery to mill



Pulp Chip Production

Keys Silvicultural Activities

- Plant material propagation
 - Cuttings from branches or stoolbeds
 - Intensive site preparation
- Weed control, weed control, weed control
- Insect and disease control and monitoring
 - Leaf rust, fungal cankers
 - Mechanized harvesting



GreenWood's Biomass Energy Strategy: Two Pathways



- Strategic Objective: Promote poplar from dedicated energy tree farms as the feedstock of choice for CHP and cellulosic ethanol

1. Production Systems

- Adapting Silvicultural techniques to multiple coppice cycle rotations – density, cultural treatments, cycle length
- Equipment automation – planting, cultivation, and harvesting

2. Feedstock Quality

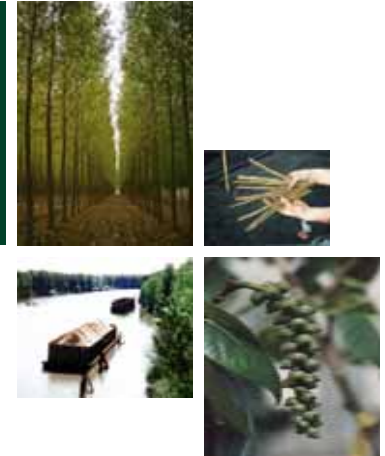
- Utilizing poplar genomics to drive breeding
- Screening for high wood density, favorable wood chemistry for ethanol conversion



Short Rotation Coppice Biomass



Key Elements of Bioenergy Production Systems



- Selection of varieties for dedicated energy plantings
 - High wood density, high biomass productivity, favorable wood chemistry for ethanol conversion
- Silvicultural activities to maximize productivity
 - High density planting (up to 2500 TPA), coppice rotation (2-5 years), fertilizer, weed control, pest control, irrigation
- Harvesting and processing energy crops
 - Combine-like harvesters
 - Yields of 10-20 fresh tons/acre/year
 - Minimize handling, process to get desired product size, minimize transportation



Mechanized Planting



Mechanical Cultivation



Mechanical Cultivation – year 2



Harvesting and Processing

- Modified forage harvesters
- Cuts, shreds and loads feedstock
- Case New Holland Bio-Harvester on 18 March 2009



Advantages of Poplar Biomass for Energy & Liquid Fuels



1. Rich knowledge base in breeding and Silviculture
2. Known yield, logistics and economics
3. Stored on the stump
4. Superior energy budgets and environmental benefits
5. Wider site adaptability- marginal farmland
6. Perennial crop



Essential Elements of Poplar Business Development

- Agroforestry investments are increasingly attractive alternatives for institutional timberland investors – real returns >10%
 - Real assets with biological returns
- The role of farmers and community based partnerships are critical success factors
 - Unified voice in negotiating local and regional policy
 - Collaboration with government, industry and academia to establish the best integrated agroforestry systems
- Aggregation of larger land areas for development
 - Economies of scale – lower costs per acre, enough resource to attract conversion demand – pellets, CHP, liquid fuels
 - Efficiencies in growing, harvesting, transporting to market



Essential Elements of Poplar Business Development

- The role of Government is also critical
 - Establish clear, consistent and stable policies regarding agroforestry investments
 - Legal, administrative and tax regulations
 - Reduce bureaucratic obstacles to project development
 - Support grant and other funding activities that promote improvements in all aspects of short rotation forestry
 - Provide direct R&D support through appropriate agencies
 - Support field trial programs linked to landowners and other stakeholders

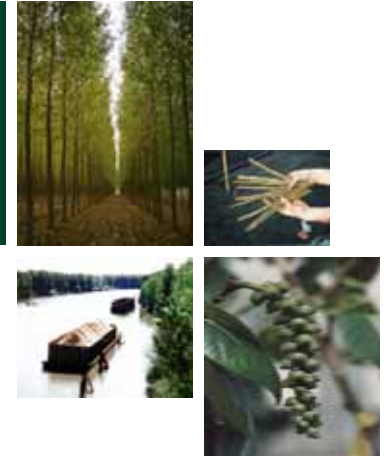


Poplar Biomass – Are there Opportunities in VA?

- Have the land base that was vacated by the decline in tobacco production
- Have the farming infrastructure, equipment and mindset
- Region is looking for alternative crops
- Poplar grows well here!
- Potential customers
 - Momentum to develop co-firing at coal power stations in the region
 - Pellet operations for local use or export
 - Plantations for hardwood lumber and veneer
- Positive environmental benefits



Business Development Ideas



- It's all about building partnerships
 - Co-firing with coal - State of VA, Regional farmers, Power generators
 - Pellet mills and fiberboard, Regional farmers,
 - Hardwood lumber and veneer
- GreenWood can take a prominent role
 - GWR can organize capital for project financing
 - Also look to State/National grants and loans
 - Plant material base for poplar production
 - GWR fully integrates the production cycle from land acquisition to product delivery - this is our core business



Concluding Remarks

- GWR is the largest poplar grower in NA
- GWR is well positioned to commercialize short rotation poplar tree farms for multiple markets
 - Global leader in developing elite *Populus* germplasm
 - Tested and selected poplar varieties for use across the US
 - Can organize capital – existing tree farm funds, new GreenWood Global Tree Farm Fund
- Very open to opportunities in VA and other US locations

