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# Harvesting & Logistics of Biomass for Bio Energy

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# Conversion Technique



- 25 million people still depend on firewood for heat and nutrition





# Conversion Technique





# Conversion Technique



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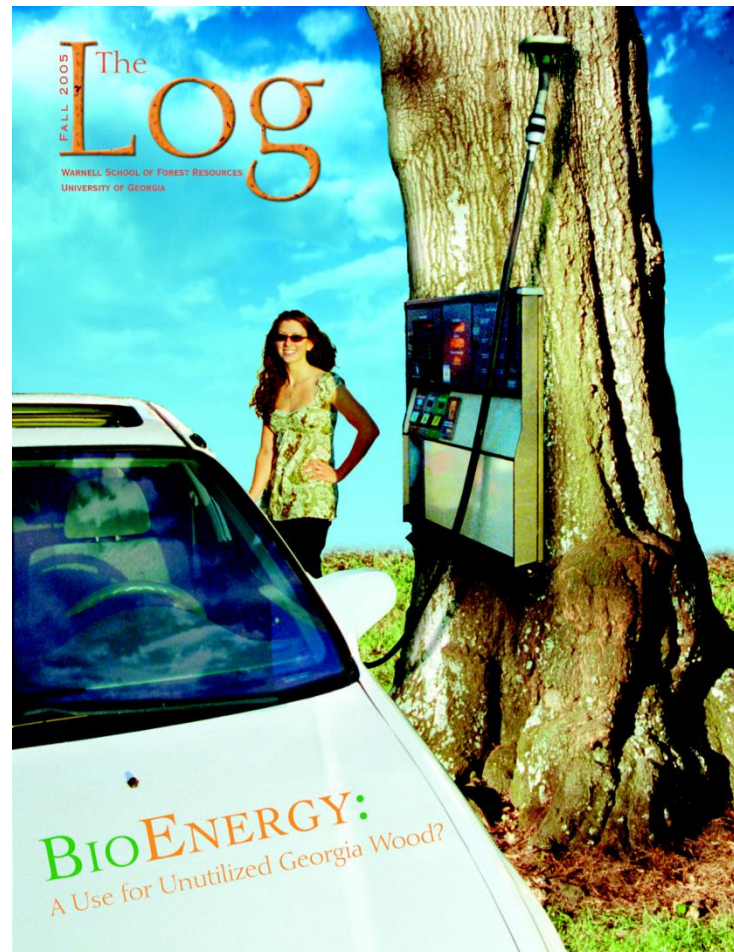


# Conversion Technique



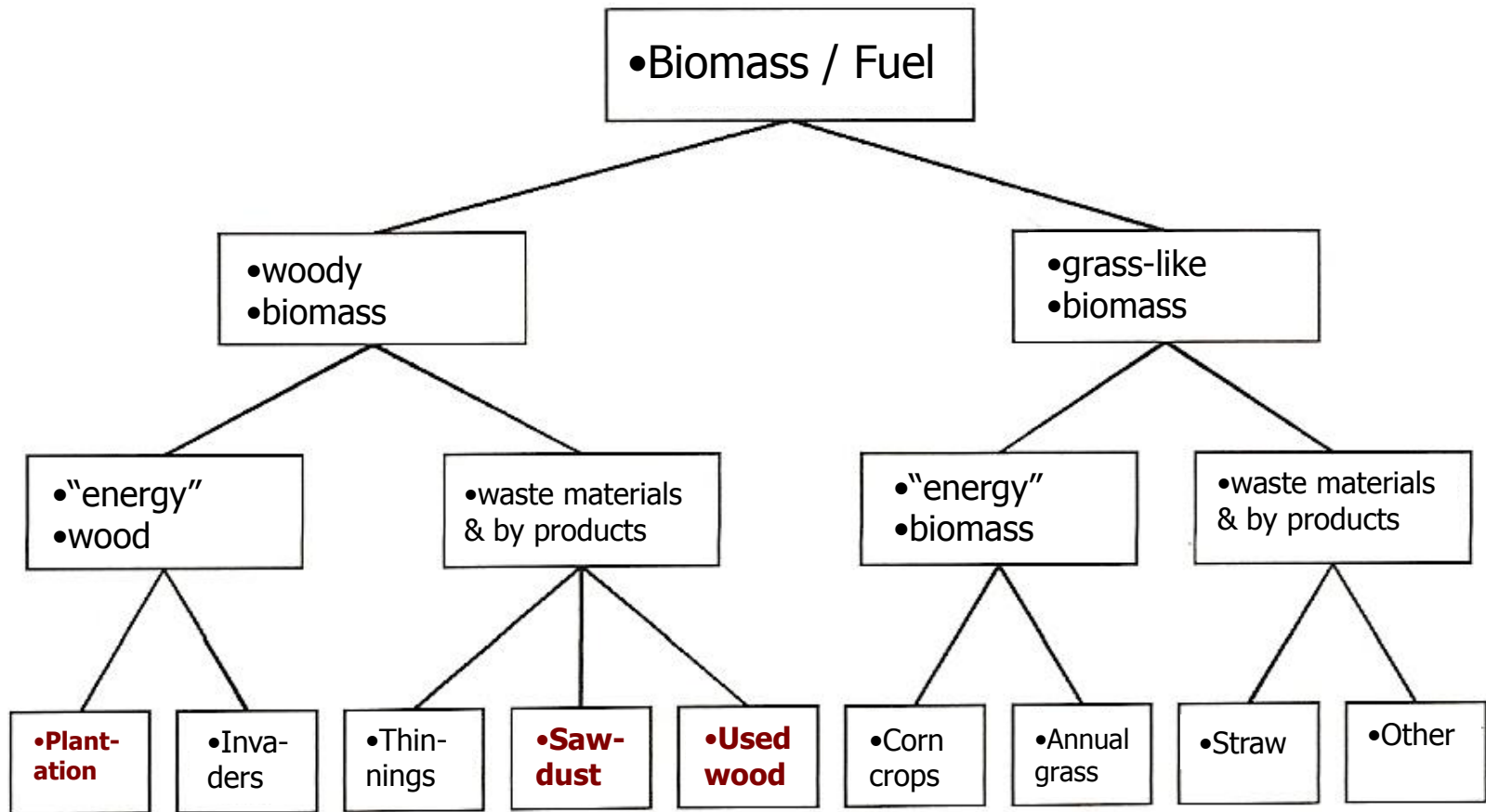


# Conversion Technique



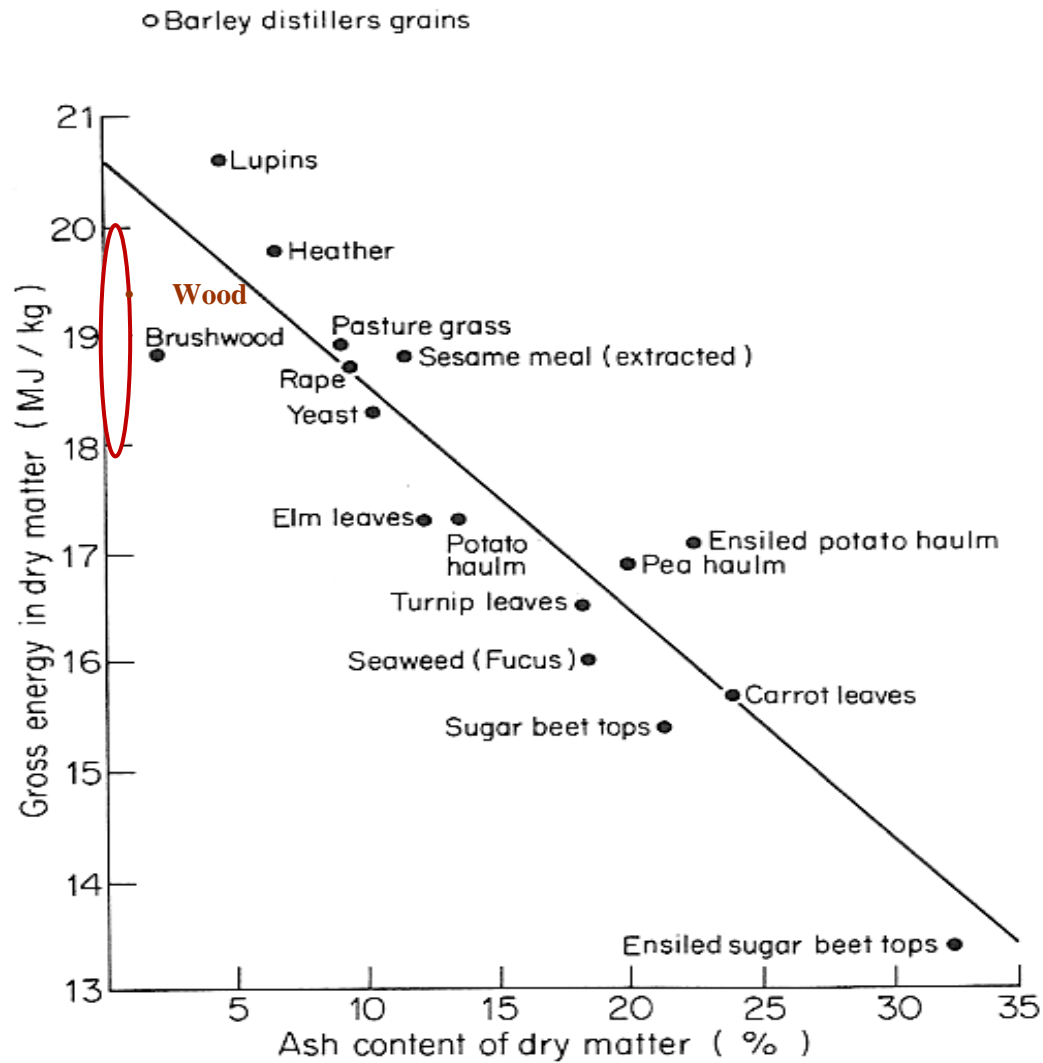


# Biomass Type





# Ash Content







# Biomass Sources



- Roundwood
- Off-cuts
- By products
- Sawmill residue





# Source Roundwood



Harvesting Activities				
	Stand	Landing	Road	Mill
Felling				
Debranching				
Extraction				
Logscaling				
X-Cutting				
Stacking				
Loading/Tpt				



# Off-Cuts



- Stack bell
- Hand fed
- Bandit 250
- Front end loader







# Waste Products



- Depo
- Manitou feed
- Tub Grinder 950
- Manitou load







# Sawmill Residue



- Debarked
- Chipped
- Conveyer
- Bin





# Preliminary Findings

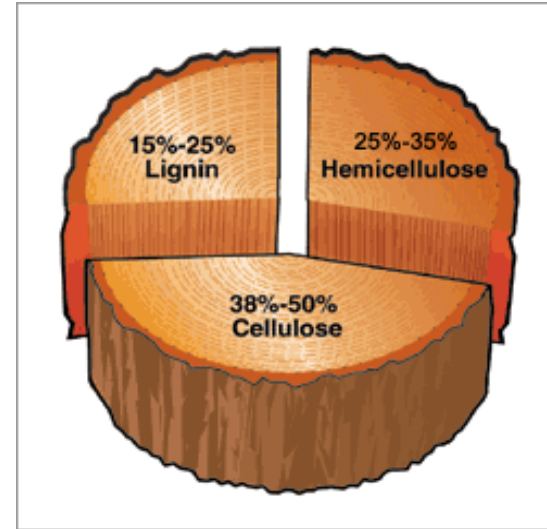


	 Logs	 Off- cuts	 Waste	 Sawmill Residue
Quality	2	3	4	1
Logistics	4	3	2	1
Value	4	2	1	3



# Relationship

- Wood composition
- Mineral content
- Moisture content





# Technical Info



End user	Biomass Fuel	Quality requirements	Technology for Energy conversion
<ul style="list-style-type: none"><li>• &lt;50kWh</li><li>• &gt;5MWh</li></ul>	<ul style="list-style-type: none"><li>• Wood Pellets</li><li>• Wood Pellets</li></ul>	<ul style="list-style-type: none"><li>• Mechanical durable</li><li>• Low Ash</li><li>• Boiler &amp; handling requirements</li></ul>	<ul style="list-style-type: none"><li>• Pellet boilers</li><li>• Pellet stoves</li><li>• Co Firing</li></ul>





# Biomass for energy specifications



Parameter	Value	Unit
Moisture content	10.3	wt%
Ash content	0.305	wt%
Volatile matter	81.07	wt%
CV (wet)	18.39	MJ/kg
CV (dry)	20.62	MJ/kg
Carbon content	44.05	wt%
Nitrogen content	0.18	wt%
Sulphur content	0.032	wt%







# Wood Biomass Pellets



- High density particles of wood
- Diameter 8mm or 6mm
- Length 35cm
- Moisture 14%
- CV 18MJ/ton
- Uniform
- Transport & Logistics







# Warehouse

- Water
- Dust
- Fire





# Shipping & Logistics



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# Thank You



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