



# Biomass Conversion Technologies Panel 1

Lumber, veneer and  
composites

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# Overview of Panel

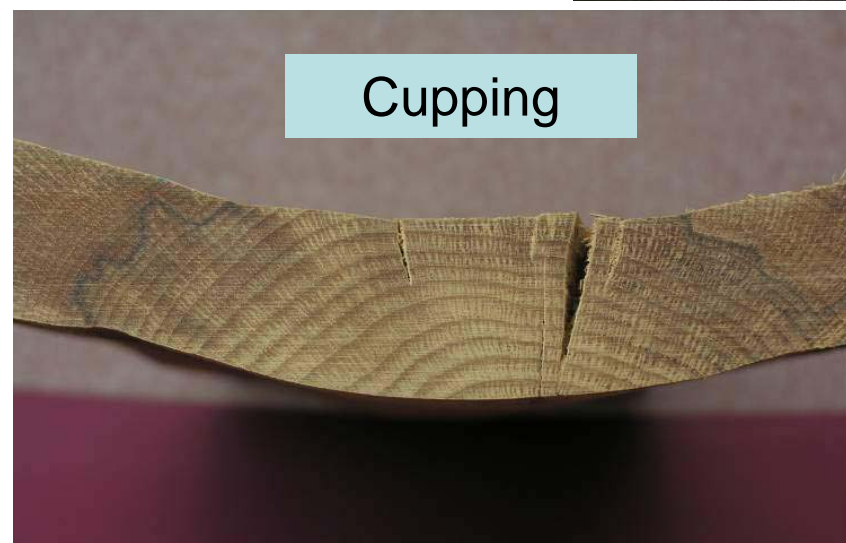
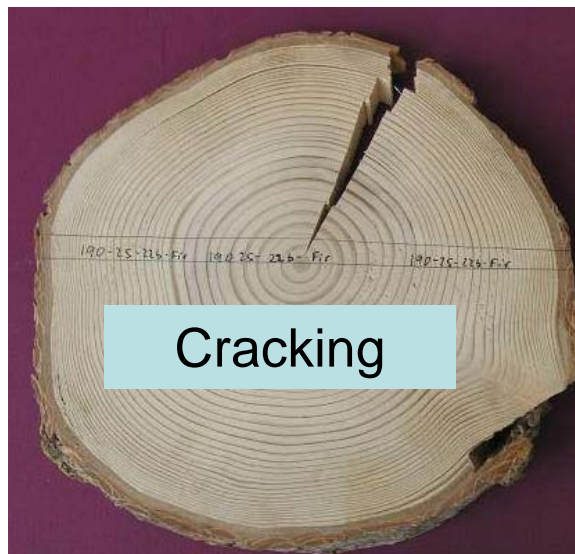
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- ★ Smallwood issues
- ★ Utilization options
- ★ Densified fuel
- ★ Roundwood
- ★ Animal bedding
- ★ Veneer and plywood
- ★ Lumber

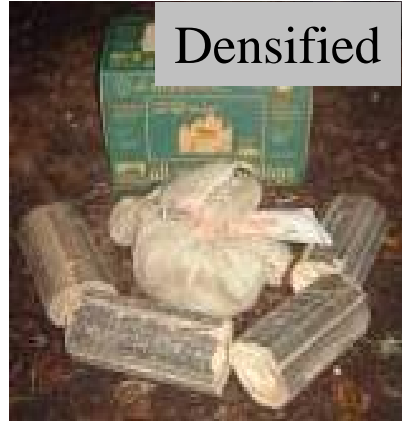
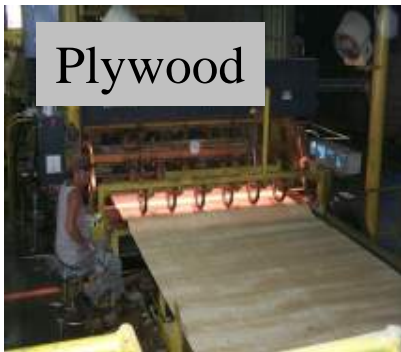


# Problems with smallwood?

- ★ Processing Cost
- ★ Product Quality
  - ★ juvenile wood
  - ★ differential shrinkage
  - ★ knots



# Creating uniformity through breakdown



# Densified Solid Wood Products

Firelogs



Fuel Pellets

# Densified Products



- ★ Breakdown
- ★ Screens
- ★ Drying
- ★ Compression and heat
- ★ Cutting
- ★ Cooling



# Wood pellets

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## ★ Uses

- ★ Fuel (seasonal)
- ★ Animal bedding/litter
- ★ Barbeque pellets

## ★ Markets:

- ★ N America: 1.5 million tons/year
- ★ Europe: 10-12 million tons/year





# Wood pellets for heat

- ★ Domestic grades – big demand?
- ★ Commercial grades
- ★ High energy content
- ★ Convenience
- ★ Consistent product
- ★ Stoves meet air quality
- ★ Global commodity
- ★ Equipment intensive
- ★ Energy input (70-80kWh/t)
- ★ Expensive end-product





- ★ 10,000-40,000 tons/yr typical plant production (Some are 100,000 tons+)
- ★ 60,000 tons optimal
- ★ Simple process requires much optimization – many variables



# Pellet feedstock

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- ★ For domestic market (<1% ash)
  - ★ Less than 10% MC
  - ★ **Clean** chips, shavings or sawdust
  - ★ Pay up to \$50BDT
  - ★ 100 mile sourcing radius
  - ★ Delivery: 0-1000+miles
  
- ★ Possible to use any biomass (high ash)
  - ★ Limited market
  - ★ Tool wear
  - ★ Consistency







## Example: 40,000 ton/yr facility

- 100 BDT/day
- \$5.5m build cost
- 24/7 operation
- 3-5 acre site
- 30-35 jobs



# Challenges for a Pellet facility

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- ★ Guaranteeing long-term supply of raw material
- ★ Distance to market and market size
- ★ Cash flow
- ★ Air quality
- ★ Quality control
- ★ Future overcapacity?
  - ★ New mills throughout USA and Canada
  - ★ New Oregon tax credits
- ★ Commodity product = downward price pressure