



# 12<sup>TH</sup> CANADIAN POLLUTION PREVENTION ROUNDTABLE

June 10-12, 2008  
Edmonton, Alberta

Crowne Plaza- Chateau Lacombe





## **1.2 “Sustainable Packaging from Agrifibre Sources”**

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# Sustainable Packaging from Agrifibre Sources – Projects at the Alberta Research Council

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# Presentation Objectives

- Introduce ARC and its' programs
- Share information on sustainable packaging projects at ARC
- Promote agricultural material as viable and valuable feedstock

# Alberta Research Council – Who we are

- Not for profit R&D corporation wholly-owned by the Province of Alberta
- Operate in Edmonton, Calgary, Devon and Vegreville
- Over 600 employees
- Annual Budget of \$93 Million

# Alberta Research Council – What we do

- Areas of Research
  - Bitumen and Heavy Oil
  - Building Products and Systems
  - Carbon Conversion Capture and Storage
  - Enhanced Gas and Oil Recovery
  - Industrial Bioproducts
  - Integrated Landscape Management
  - Waste Management
  - Water Resource Management

# Industrial Bioproducts

- Industrial and consumer goods manufactured from renewable resources, specifically lignocellulosic material
  - Hemp, Flax, Cereal Crops, Grasses and Wood Fibres

# Lignocellulose

- All plant matter is composed of
  - Lignin
  - Cellulose
  - Hemicellulose
  - Extractives

# Industrial Bioproducts

- Potential Markets:
  - Pulp and Paper
  - Building Products
  - Textiles
  - Polymers
  - Lubricants
  - Solvents
  - Adhesives
  - Herbicides
  - Pharmaceuticals

# Agrifibre Processing Techniques

- Preprocessing
  - Chopping
  - Decortication



# Agrifibre Processing Techniques

- Pulping
  - Chemical
  - Mechanical



# Agrifibre Processing Techniques

- Finishing
  - Papermaking
  - Extrusion
  - Dry or wet laying
  - Molding
  - Pressing
  - Spraying

# Biobased Packaging from Agrifibres

- Two projects at ARC
  - Molded Pulp from Wheat Straw or Flax
  - Hemicellulose films from Wheat Bran

# Why Choose Agricultural Material?

- Existing Reserves
- Price
- Transportation
- Fibre Properties
- Processing Techniques

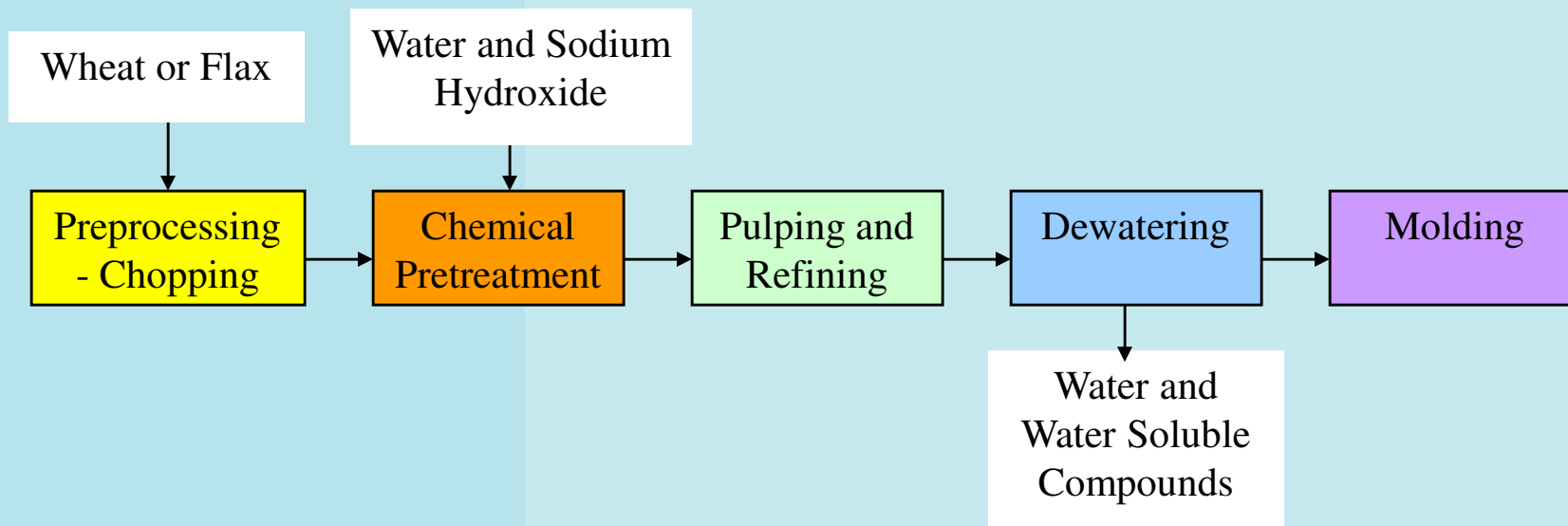
# Molded Pulp

- Saskatchewan based company currently makes egg cartons from recycled fibre
- Recycled fibre from Calgary expensive
- Seeking alternative fibre sources

# Molded Pulp

- Alternative Fibres: Flax or Wheat Straw
- Advantages
  - Locally sourced
  - Make use existing reserves of agriculture biomass
  - Fibre appropriate for end use

# Molded Pulp Process



# Hemicellulose Films

- Alberta Ethanol Producer looking for value added materials for Wheat Bran byproduct

# Hemicellulose Films

- Byproduct: Wheat Bran sold as animal feed
- 20% of wheat bran is hemicellulose
- Can extract hemicellulose and use rest as animal feed

# Hemicellulose Films

- Use hemicellulose as a film or coating for foodstuffs
- Good oxygen and carbon dioxide permeability

# Concluding Remarks

- Agrifibres can successfully be used as alternatives to wood or recycled fibres
- Value added products can be derived from byproducts

# References

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