

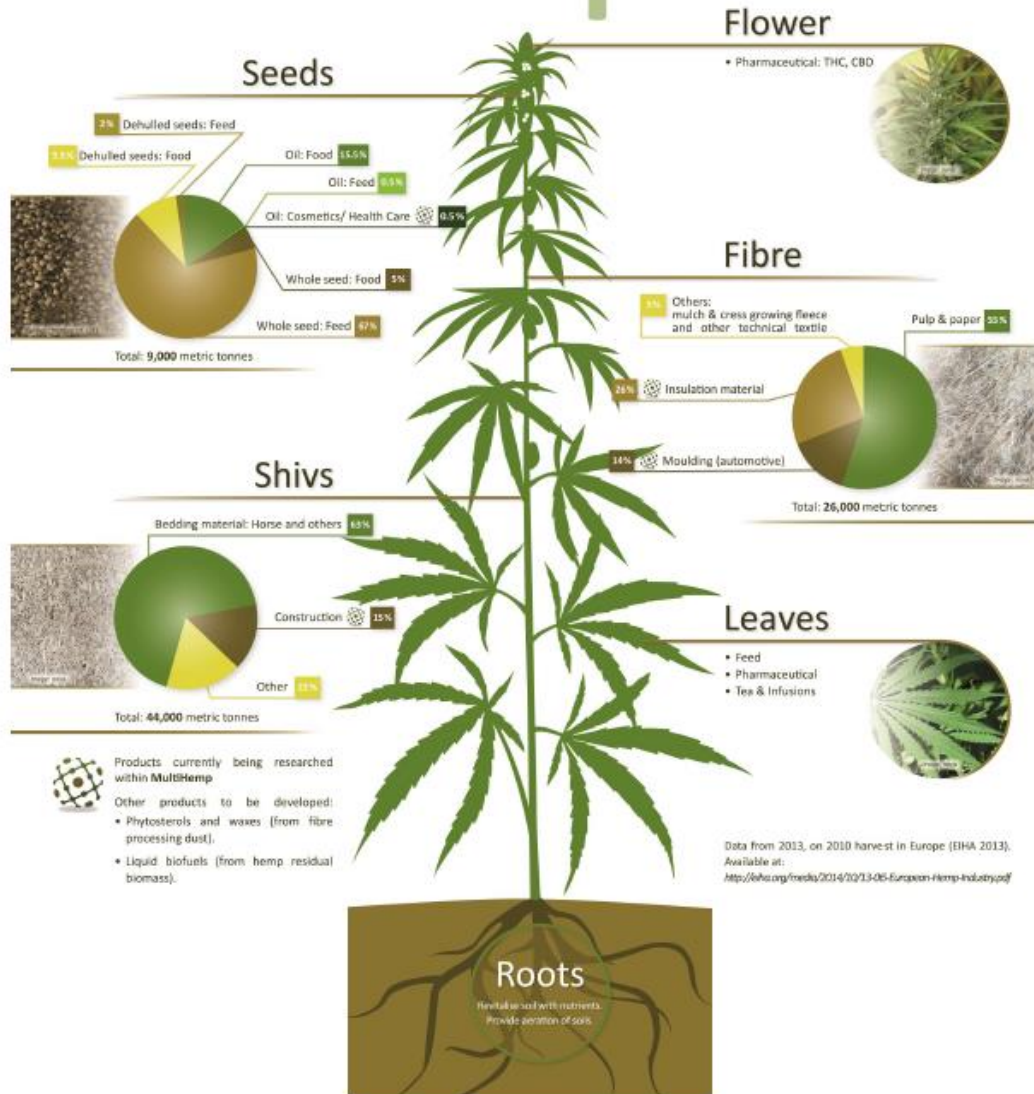
BIO- Industrial Opportunities for Hemp and Flax

March 30, 2017 - St. Paul, Alberta

April 4, 2017 - Whitecourt, Alberta

**Lori-Jo Graham, Biomaterials - Lead
Alberta Agriculture and Forestry**

A natural biorefinery Hemp



MultiHemp

European Industrial Hemp Association

Alberta
Government

ALL the RIGHT Ingredients in ALL the RIGHT Places!



Quit Leaving Money in the Field!

Processing Hemp

Stalks



Seeds



Hurd



Fibre



Hulls



Oil



Protein



Dust/Particulates



“A New Look” for Cosmetics

- ✿ Hulls
- ✿ Oil
- ✿ Waxes
- ✿ Protein
- ✿ Hemp Milk
- ✿ Carbohydrates



Hemp in Cosmetic and Personal Care



Nature's Green Chemical

- Hemp biodiesel – pressed seed oil
 - Hemp ethanol/methanol – fermented stalk
 - Bio lubricant
 - Paints
 - Varnishes
 - Surfactants
- ✓ Proven over 20 years of use in Europe
 - ✓ Use in any diesel engine.
 - ✓ Safe to handle and transport
 - ✓ Clean burning
 - ✓ Can extend the life of diesel engines as it is more lubricating than petroleum based



People, Planet, Profits... and Polymers

- Spray-on Insulation
 - Resins
 - Automotive Parts
 - 3 D Printing
- ✓ Heat resistance
 - ✓ More strength
 - ✓ Biodegradable



HORTICULTURE

A Hull of an Opportunity

Soilless
Medium



- ✓ Nutrients
- ✓ Biodegradable



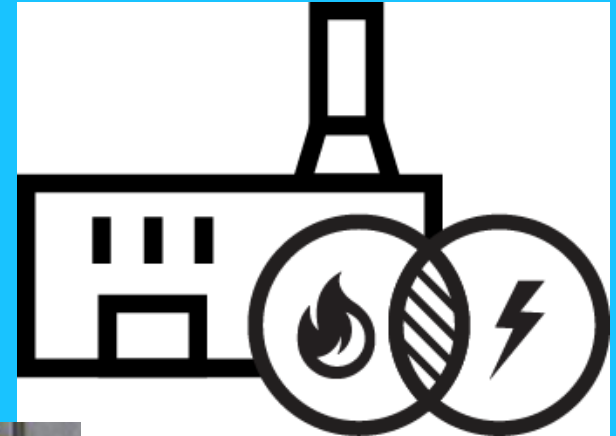
Have you heard of hempcrete houses?

- Replacement for concrete
- Different forms – blocks, poured slabs, or poured in place
- ✓ Ties up carbon long term



A Whole Lot of Hurd

- Energy source – Co-Gen
- Animal bedding
- Industrial Absorbents – spill kits
- Building products – interior panels
- Furniture
- Plasters



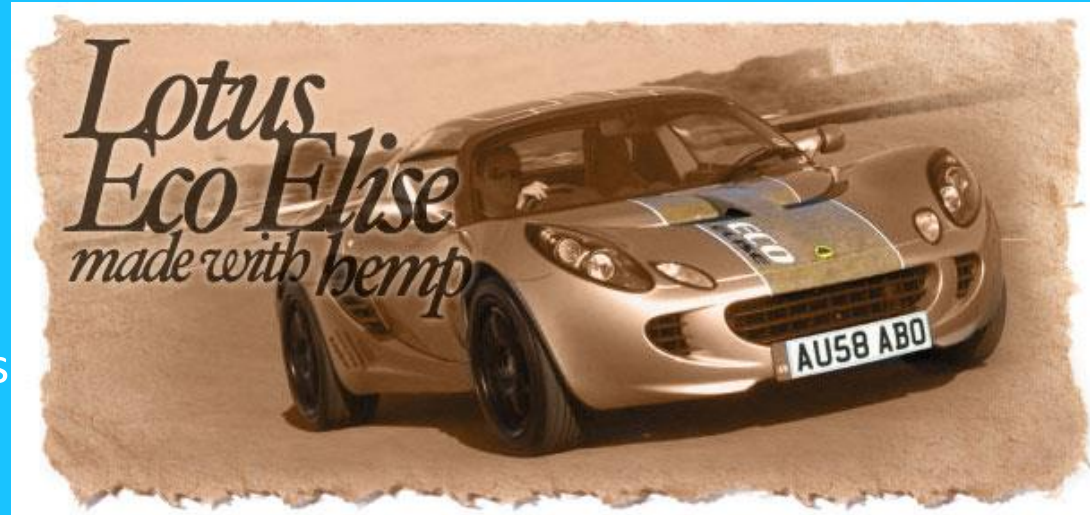
- ✓ Absorbent
- ✓ Sound Dampening
- ✓ Biodegradable
- ✓ Green Building
- ✓ Non-toxic – not on “red list”

Automotive: Have Yours Fast and Bast!

Interior and Exterior compression moulded parts and panels

- Cars
- Boats
- Tractors

BioPlastic injection moulded trims & compartments



Ford's **'Grown from the soil'**
HEMP CAR

One of Henry Ford's first cars ran entirely on **Hemp ethanol**. The body was also constructed from **Hemp plastic**, which was 10x stronger than steel.

Of course - Hemp was then outlawed in the US in 1937 due to the potential damaging effect it would have on many powerful industries at the time, including oil, plastics & paper giants.

Imagine where we would be today had these power hungry tyrants not suppressed the amazing bio-technologies of Hemp?

- ✓ Light weight
- ✓ High flexural and tensile strength
- ✓ Fuel Efficient
- ✓ Biodegradable or durable
- ✓ Safer in collision
- ✓ Renewable spread "the good news"

Fresh Fibre, Locally Grown!

- Insulation
- Concrete reinforcement
- Pallets and shipping
- Biocomposites - Fiberglass replacement
 - Kayaks and Canoes
 - Paddles
 - Skateboards
 - Helmets
 - Surfboards
 - Snowboards



Environmental Products

Designing in Nature's Image

- Erosion Control
 - Land Remediation
 - Oil and Gas Supply
-
- ✓ Biomimicry
 - ✓ Natural material
 - ✓ Biodegradable
 - ✓ Safer for wildlife and animals

Pulp & Paper

An Ancient Forest Harvest Alternative



- ✓ Non Wood Copy Paper
- ✓ Books
- ✓ Specialty Papers for artists & crafters
- ✓ Packaging material
- ✓ Cellulous for textiles

Textiles: From Jeans to Uniforms

What`s your style?

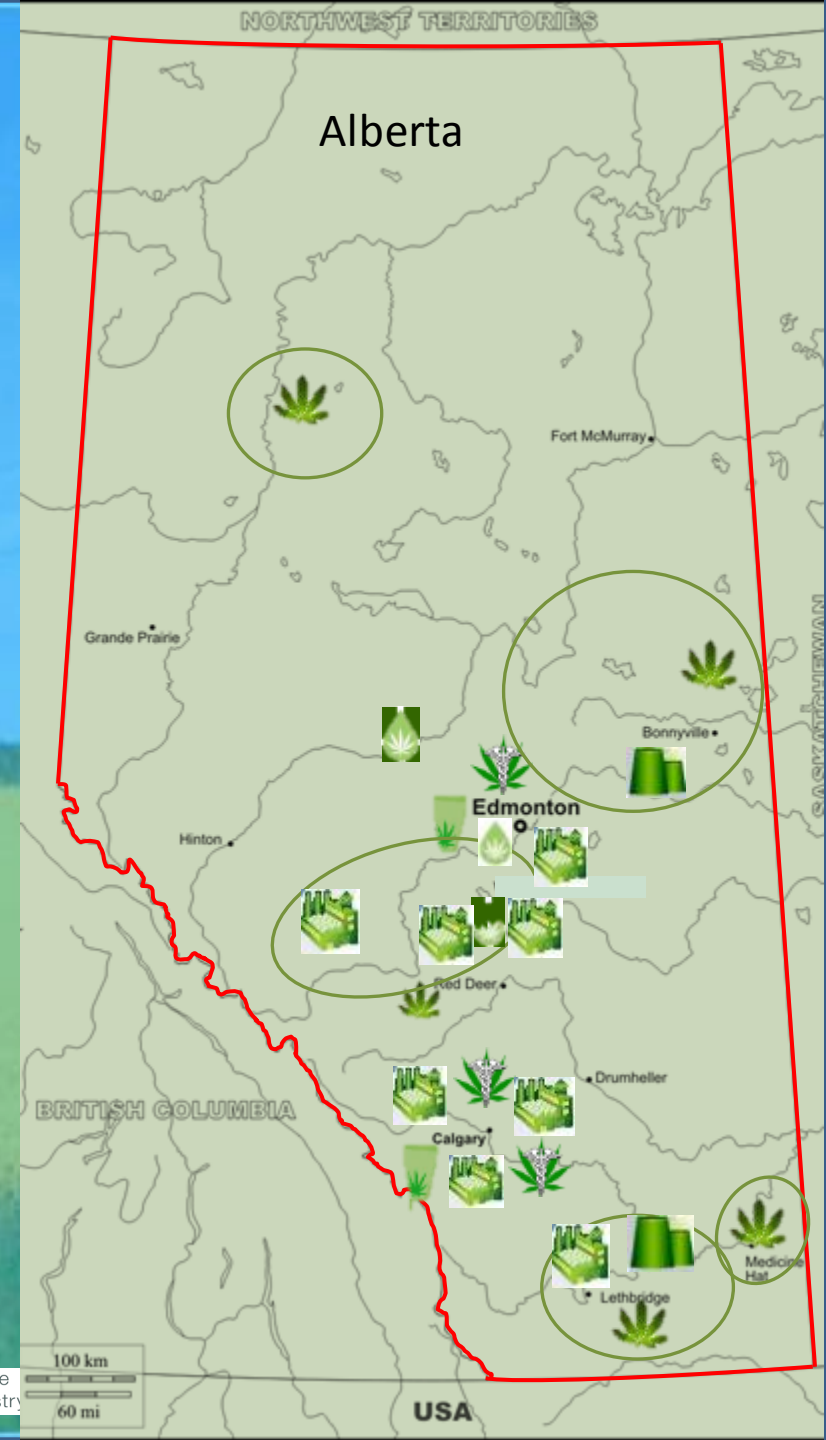


- ✓ Aesthetics
- ✓ Anti-mildew
- ✓ Anti-microbial
- ✓ Durable



Alberta's Hemp Industry 2017

- Growers 
- Primary fibre processors 
- Oil, Protein, Food 
- Fibre Manufacture 
- Cosmetics 
- Nutraceuticals & Medicinal 
- Regional Hemp BioCluster 





Growing Success Stories for Agriculture

Hemp/Flax/Wood Fibres

Hemp Hurd

Flax- Hemp

BioComposites Group (BCG)



First contract (5 year) from a Tier One Supplier for BCG mats to be included in 2017 General Motors model vehicle.

Hemp/flax fibre and wood waste for engineered fibre mats (EFM). First markets are automotive and erosion control markets.

TTS @ Mosaic Centre



First net zero office building in Alberta.

Hemp hurd panels

- ❖ Alberta grown hemp
- ❖ Processed at GoA's Decortication Facility in Vegreville
- ❖ Designed and manufactured at TTS

Synermulch Erosion Control



Innovative land reclamation product using flax straw.

New international markets for straw which was previously seen as waste. Built international customer base with flax, now introducing hemp into product mix.

Growing Success Stories for Agriculture

Hemp Fibres

Hemp and Flax Fractions

Hemp & Flax Fibres

Canadian Greenfield Technology



Company advancing hemp fibre for advanced green building products.

Hemp fibre for concrete reinforcement and other green building and industrial uses.

MGO Systems & ATI Composites



Magnesium Oxide panel building company.

Company using hemp fibres to substitute for less environmentally responsible materials, enhancing insulation and sound proofing while maintaining some of the best fire rating in building industry.

Athena Bioplastics



Advanced ag fibre-based bioplastic pellets and parts.

Hemp and other ag fibres for injection molding pellets for advanced bioplastics parts in automotive, packaging/containers, industrial and recreational product markets.

Growing Success Stories for Agriculture

Hemp Hurd

Just BioFibre



Sustainable building system company.

Hemp hurd for concrete blocks in unique building solutions. Exceeding building code standard tests and customers awaiting their move into commercial scale production.

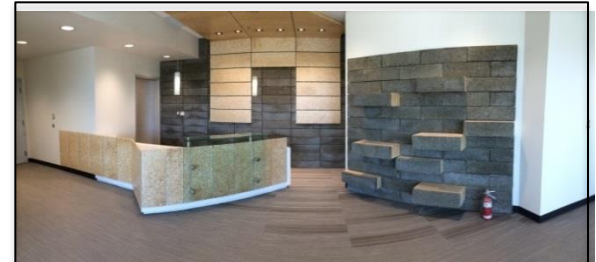
Hemp Stalks and Grain

Hempco



An innovative company with a whole plant utilization vision.

Expanding to Alberta to a 56,000 square foot building location in Nisku. Doing both food and fibre processing.

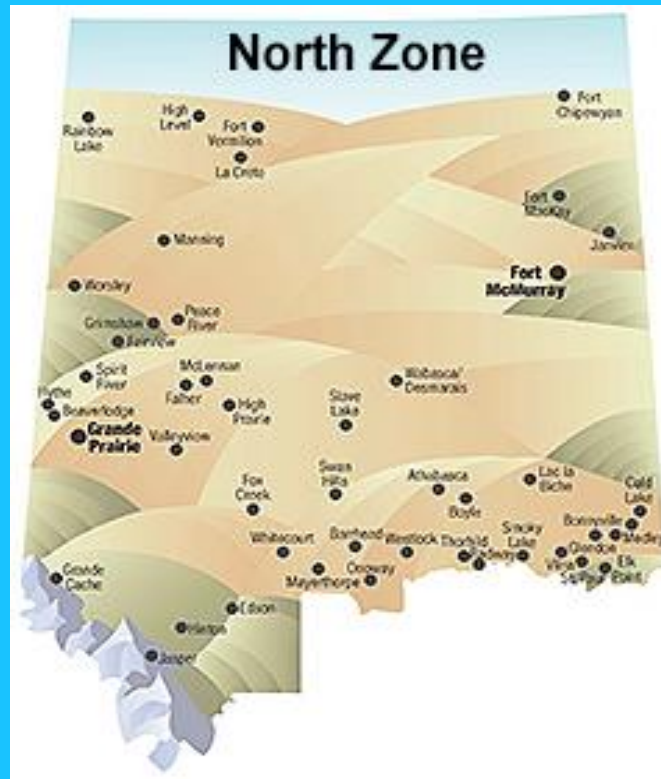


Watch this space for several other innovative Alberta products and companies as they make their activities public.

We'll get there tomorrow, if we leave yesterday!

WE THE NORTH

- ✓ N. America's largest R&D Decortication Facility at Vegreville
- ✓ Longer hours of sunshine & cooler temperatures at night - 30% increase in fibre
- ✓ Long dews - advances retting



HEMP NOW

- ✓ Renewable, fast growing plant
- ✓ Hemp brand name rising in N. America
- ✓ Advancing whole plant utilization
- ✓ Sequesters 5 times or more Co2 than the equivalent acre of forest
- ✓ Not a legal USA commercial crop

albertabiomaterials.ca

 @AlbertaAg

Advancing Renewable
Solutions



Transforming Agriculture
and Forestry Resources

Feedstock Supply | Manufacturing
Market Access

Thank You!

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