Industrial Hemp Supply-Chain Solutions

Modern Farm Machine Technology for the Global Industrial Hemp Sector

From the Farm to Fork to Factory
“History doesn’t repeat itself but it often rhymes,”

Mark Twain is often reputed to have said
(There is no compelling evidence that he actually uttered this nifty aphorism;
No matter — the line is too good to resist)

We build modern machine technology to produce hemp materials for green manufacturing.
With modern, proven and scalable technology, CannaSystems turns industrial hemp fields into Fibre and Core bio-material product streams. It begins on the hemp farm, creating value and revenue from the Farm to the Factory.
**Industrial Hemp Products**

**HEMP FARMING**
- Seed
- Food
- Oil Products
- Plastics
- Fuel

**STALK**
- Leaf
- Extraction
- Fibre 30%
- Composites
- Textiles

**CORE 70%**
- Hempcrete blocks
- Particle board
- Roofing shingles
- Cellulose products

**HEMP FARMING**
- Recreational Market: $22B
- CBD Market: $55B
- Hemp Industry Market: $110B
- Bio-Composites Markets: $500B
- Global Textile & Fibre Markets: $800B

**CRITICAL SUCCESS FACTORS**
- Multi-purpose cultivars
- Decortication technology
- Industrial processing systems
Competitors in the hemp processing sector are large scale “hammer mills” which have dominated the market since the 1970’s. Hammer mill systems require that the stalks be left in the fields for several weeks to begin breaking down the stems (“retting”). This degrades the fibre quality and the core hurd (cellulose) materials. Majority of the core material then becomes waste. Three European companies: HempFlax, Crete and Tamafa build large-scale hammer-mills. Typical cost is $15M - $30M for a complete line advertised to produce 20 tons per hour. This is both a capital and energy intensive process that requires a ‘strike-zone’ of at least 16,000 surrounding acres of hemp crop to sustain the mill on an annual basis.

Modern engineering has developed mechanical decortication solutions that provide superior results; increasing both yield and quality. Fresh green stalk or dried bales (or even retted materials) can be processed without the time, energy or waste involved with methods currently used.

Company strategy is to both develop and acquire hemp sector IP to develop the core machine technology critical for sector growth. Key technology enables volume production of bio-materials required for industrial supply chains. This core technology will allow the sector to progress rapidly and is essential to meeting industrial contracts on an annual basis.

Hemp bio-fibres can compete with sisal, jute, cotton and kenaf in world markets. Advantages of hemp farming include increased revenues, lower costs and extended operations beyond semi-tropical zones. This makes hemp farming a very logical choice for North America, Europe, South America, Africa and other regions that do not grow cotton.

Five existing North American hammer-mill installations:
- Composites Innovation Centre: Winnipeg. Government sponsored research
- Emmerson Hemp: Alberta: Private company – limited production
- Vegreville Alberta - limited production
- PlainsHemp: Gilbert, Manitoba: Private company
- Hemp Inc.: North Carolina: Public company – centralized *US based

Six new technologies coming into the market:
- R-2 & E-9 Decorticator projects from CannaSystems *Canada
- PowerZone Agricultural: - mobile decorticator project *US based
- CanFibre: Vancouver, BC - ribbon decorticator system – patented *Canada
- Hempco: Alberta - new system coming on-line this year. *Canada
- Bastcore: Nebraska - proprietary system – patent pending *US based

<table>
<thead>
<tr>
<th>Process</th>
<th>Size</th>
<th>Scalable</th>
<th>$ Required</th>
<th>Produces</th>
<th>Upstream Markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hammer mill</td>
<td>Large</td>
<td>No</td>
<td>$15M - $30M</td>
<td>• Very short fibres</td>
<td>Limited</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• Core hurd to dust</td>
<td></td>
</tr>
<tr>
<td>Decorticator</td>
<td>Small</td>
<td>Yes</td>
<td>&lt; $ 300,000</td>
<td>• 30% Fibre at lengths of 2” - 6”</td>
<td>Unlimited</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>• 70% Core hurd</td>
<td></td>
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**Hemp Processing Technology**
Farm technology needed to harvest, bale and process hemp materials for agricultural industrial markets:

- Dual-cutting field threshers
- Dual purpose grain harvesters
- Modern decorticator designs for processing hemp stalk. Stationary and portable units for scalable operations

MODERN PROCESSING

Decortication, Latin for “remove the bark from”, is the process of separating hemp stalk into raw fibre and core cellulose. Our initial focus is on the base technology: hemp farm equipment, processing machinery and industrial applications. Modern machine technology makes this KEY task cost-effective, efficient and scalable; turning farm ‘waste’ into valuable product streams.

New decortication equipment & technology enables two more revenue streams - fibre & core. These are used in a wide array of both consumer and industrial products. Essential supply-chain solutions are required to develop the industrial hemp sector.

We are building some of the critical supply chain components required to expand the entire sector. This includes new decorticator machine development, as well as industrial supply contracts in the bio-composites sector plus the building materials sector.

There are several bio-fibre and manufacturing companies with industrial scale requirements. By combining new decorticators with modern processing technology we enable our customers to meet existing demand. We help generate sales from the farm to industrial level consumers of bio-materials.

Capturing CO2 via the industrial hemp supply chain effectively removes carbon dioxide from the atmosphere at a rate of 1.6 tons of CO2 per ton of material created. This is a green technology agriculture approach with significant benefits.

Off-the-shelf equipment:

- Mowers, swathers and windrowers.
- Round “flax” balers.
- Fibre cutting, combing and sorting equipment.
- Packing, baling and handling equipment for finished raw materials.
- Composite mat-making machines.
- Rope and yarn spinning equipment.
Our Team

CannaSystems brings extensive expertise to the industry with over 50 years of experience.

Our team focus is on the industrial applications needed in the sector.

Developing key technology for the hemp market is our goal.

Expanding the cannabis sector is our vision.

Bruce Ryan - Chief Executive Officer & Founder
• Cannabis sector expertise for forty plus years.
• Canadian Hemp Trade Alliance co-founder - 2003 - Current CHTA member
Mr. Ryan has extensive involvement in the cannabis sector including: farming, cultivation, seed breeding, processing and machine technologies required for industrial applications. His personal vision includes 85 million hectares of cannabis cultivated world-wide for all purposes. Bruce is a published writer and media specialist with 7,000+ sector contacts and thousands of followers worldwide.

Ron Larson - Chief Financial Officer & Speaker to Bankers
• PriceWaterhouse • Manulife • XPrize & NASA CFO
Mr. Larson has worked in the financial sector for over 30 years. Chartered Accountant and Insolvency expertise from Price Waterhouse. Ron has IPO and CPA Public Company expertise thru Manulife. He was also the CFO of X-Prize and NASA rocket business for ten years.

Duncan Horne - Chief Science Officer
• Sustainable Energy Applied Research Centre
Mr. Horne has a wide range of knowledge in alternative energy technologies and direct experience in developing new products & marketplaces. He has unique experience in NSERC funded applied R&D of emerging energy saving technologies at the Sustainable Energy Applied Research Center in Kingston, Ontario. Duncan has extensive expertise from seed-to-sale in the medical cannabis industry, plus he holds two Degrees from Bishop's University and St. Lawrence College.

Edward Melcarek - Chief Technology Officer
• Sono-Dyne Engineering
Mr. Melcarek has decades of experience in mechanical and electrical engineering. His expertise includes large scale projects, ‘difficult to solve’ engineering problems, farm equipment, fabrication and automation systems. Ed holds a number of professional memberships: Certified Engineering Technologist in Ontario, American Society of Mechanical Engineers, International Electronics & Electrical Engineers, American Physical Society and Audio Engineering Society. Ed is responsible for the engineering and design of the R-2 System.
Operations

Global bio-materials markets represent over $800B across several sectors. This includes composites, textiles, manufactured fibres and bio-plastics. This increasing use of bio-materials in manufacturing is a growing trend that includes building material applications. UN estimates indicate that the hemp industry will reach $110B within five years. Sector estimates show a global increase in fibre demand of 10% year over year.

Bio-materials are already used in multiple industries. Company technology produces hemp based fibre and cellulose products for manufacturers. Our focus is on composite fibre markets and bulk core hurd sales into existing operations. Industry analysis indicates that these two markets are (relatively) easy to develop. We will not initially target the more traditional fabric and textiles markets - subject to suitable supply-chain, infrastructure and partnerships being established.

Industry trends that: 1) incorporate “green” materials, 2) reduce energy requirements, and 3) reduce chemical inputs, are very relevant to manufacturing operations. These trends support the CannaSystems objective of providing ecological bio-materials for industrial applications.

The cannabis/hemp market will grow rapidly over the next ten years. Changing regulatory conditions are a driving factor in many countries. Projected growth in the emerging cannabis market is 29% year over year. Canada legalizing cannabis is encouraging industrial hemp production at all levels of government. For example, recent grants from the Ministry of Natural Resources target bio-materials development in Canada.

As the legal and social climate surrounding hemp and cannabis is changing and evolving, industrial hemp production is becoming more attractive to the wider farm and agricultural community. AgTech investments for food security, industrial manufacturing and climate change initiatives are increasing annually.

Transforming the current 130,000 acres of hemp crops in Canada into fibre & core materials represents a $1B opportunity. Ramping the industry to 3 million acres per Province creates a multi-billion dollar market over the next ten years.
We have prospects calling from:

Alberta   Kentucky   Mexico
Colorado  New Brunswick  Jamaica
Slovenia  North Carolina  Belize
Italy    Wisconsin  Uganda
Romania  Manitoba  Tunisia
Oregon  Washington  Sweden
Australia  Uruguay  Spain
Montana  Serbia  New York
California  Kansas  Columbia
Turkey  Germany  Tasmania
South Africa  Maine  Switzerland
Hungary  Illinois  Nebraksa
Brazil  Prince Edward Isl.  Kenya
Poland  South Carolina  New Jersey
Ontario  Latvia  Quebec
Thailand  British Columbia  Russia
India  Canary Islands  North Dakota
Africa  Romania  Vietnam
France  Saskatchewan  Ukraine
Madagascar  Zimbabwe....

Decorticator Machine Sales

CannaSystems has signed purchase orders, 340 direct sales inquiries via phone and over 870 prospects via our website.

- Where can I see a unit in operation?
- How much will it process?
- Do you have parts and service?
- How much for a system?
- Can you arrange financing?
- When can you ship a unit?

R-2 DECORTICATOR SYSTEM
Collaborators

CannaSystems is working with a worldwide network of hemp manufacturers, producers, farmers, innovators, developers and hemp enthusiasts around the planet. **We see a collaborative approach** as essential to hemp supply chain development and sector growth over the next ten years.

Canfiber Systems  
Valley Bio  
Arcadia Eco Energies  
Purity Hemp  
Just BioFiber  
HempSilk  
Canadian Industrial Hemp Corp.  
Canadian Hemp Trade Alliance  
Powerzone  
Stex Fibres - Holland  
Deity Metallurgy  
Global Hemp Corporation  
Kentucky Hemp  
Powerzone Agricultural  
Titan Hemp Bio-Plastics  
India Industrial Hemp Alliance  
Bombay Hemp Company  
Industrial Hemp Alliance  
National Hemp Association  
Flow Filters...
Cannabis is an ancient "C3" plant species which means it can absorb CO\textsubscript{2} up to 1200 parts per million. Our modern "C4" plants reach saturation and do not absorb additional CO\textsubscript{2} beyond 500 ppm as cannabis does.

Cannabis has this remarkable ability to absorb CO\textsubscript{2} directly from the atmosphere. As global CO\textsubscript{2} levels rise, cannabis (hemp) plants grow larger naturally. For every ton grown above-ground, another half a ton of carbon is stored in the soil as root mass, where it belongs. This creates a "carbon negative" opportunity to capture CO\textsubscript{2} for the life of the products made from the crop.

Carbon credits are a natural outcome of hemp carbon sequestration. This presents a business opportunity to acquire significant carbon credits directly or by proxy. JustBioFiber, for example, has received carbon-negative certification re: their hempcrete RSS building block system.

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