Hemp

INDUSTRIAL HEMP DECORTICATORS

HEMP PROCESSING 2019

INTEGRATING AGRICULTURAL TECHNOLOGY
Over the past 130 years, machines to separate hemp fiber from the core have been designed. During the previous 77 years some work has been done to advance the decortication process. Research reveals that out of the many designs patented, very few have reached widespread usage. New modern technology has had an impact on the sector and new decorticator systems have now reached the industry.

Previous mechanical decorticators have required that the stalks first be “retted” - allowed to lie in the fields for several weeks to begin breaking down the lignum “gum” that holds the stalks together. In some regions where there is not enough moisture, the process fails. In regions where it is too damp, the stalks mildew and the crop is lost. This led to a journey of development in Canada called the “R-2” Decorticator that separates baled or retted hemp stalks to separate the fibre from the core hurd in one pass.

Some might consider this to be ‘impossible’ - until you see the results. Over the past year the design has been improved & re-engineered as an integrated unit: Input feed conveyor, decorticator to separate the materials; a fibre handling system plus core (hurd) conveyors provides a standard stationary model.

The modern decorticator design incorporates all of the results from previous installations over the past nine years. The evolution of a hemp decortication system developed over a decade of dedication.
We are bringing new revolutionary machine technology to North America for the first time in 90 years.

Currently less than 2% of Canadian hemp crops go to the fibre industry. The key to expanding the industrial hemp sector is processing: decortication in local regions down on the farm to provide bio-fibers for industrial manufacturing. Processing the existing crops generates additional revenue and value for hemp producers today.

CannaSystems has developed a hemp decorticator model that is suitable for installation in a factory or on the farm. Raw materials are fed straight into the decorticator via the front conveyor system. Fiber is collected and sent to one conveyor and the core hurd is sent out via a second conveyor. This produces decorticated fiber materials in just one pass. These modern systems provide low cost, efficient operations and superior processing of industrial hemp.
Steady supply of fiber and core material is critical for industrial consumers. Production must be in place for supply-chain fulfillment. Industry development of new machine technology in North America is essential. Hemp farm producers can increase their returns and provide valuable bio-fibers for manufacturing. Annual contracts to provide fiber are required.

Decortication in local regions and on the farm produces bio-fibers for industrial manufacturing. Separating the two product streams at source lowers costs, manages waste & increases efficiency. The ability to process materials on-site solves the logistics issue of long distance shipping of raw materials. The R-2 system provides decentralized, efficient processing of superior fiber & core hurd materials from industrial hemp.

Major industrial consumers will drive the hemp circular economy. As farm production increases, the R-2 technology provides hemp fiber and core material in quantity. Industrial manufacturers can then take advantage of the green bio-fiber economy and integrate hemp into their supply chains. This creates demand & allows large scale projects. These key factors are required to go from the farm to the factory to the marketplace.
CannaSystems R-2 technology enables the harvesting, decortication and processing of field crops in record time. It is possible to go from raw green stalk to finished “cotton-ized” textile grade fiber within days. This fiber can then be processed and spun using standard equipment. Methods of de-gumming the raw fiber allow smooth supply chain adoption for a range of applications: from composites to fabrics.

CannaSystems is sourcing new technology and methods for processing and treating hemp fibers and core cellulose material.

StexFibers in Holland is one example. They have developed a system to clean and de-gum the fiber for textiles using steam - no chemicals.

JustBioFiber in Alberta, Canada has developed a “hempcrete” block building system that works like Lego®. This innovation meets CSA one-hour fire wall rating. Strength and compression testing show three-story building applications. The blocks integrate both structural and thermal insulation properties. R-values range from R-27 to R-40.

CannaSystems is committed to hemp industry processing technology and methods for integrating hemp fibers in the industrial supply chain.
Development of the R-2 decortication machine technology by CannaSystems Canada Inc. transforms the industrial hemp sector. The new R-2 system reduces processing time to hours and increases the yields of undamaged fibres from 5% to 95% of truly superior fibre over other methods.

Modern decortication technology is key to agricultural fiber production on the farm. CannaSystems R-2 machine decorticator technology provides the latest engineering with a dependable, proven industrial solution.

**NO FIELD RETTING NECESSARY**

The R-2 mechanical system produces high quality fibers for manufacturing purposes. No delays or uncertainty with typical field retting. This technology produces superior bio-fibers comparable to modern materials.

**DRY DECORTICATION**

Increased yield and reduced costs compared to traditional methods. The R-2 machine innovation generates value for your farm production. This turns “waste” into profit: more income from your hemp farm operation.
Bulk industrial fibers for manufacturing
100% sourced from natural materials
Durable, strong, long-length fibers
Suitable for current processing equipment
Graded for specific applications
No water or chemical processing used
Clean, non-polluting & zero-carbon
Sustainable green technology

- Fibre for biodegradable matting
- Fibre for fabrics, carpets, upholstery and industrial textiles
- Material for hempcrete building
- Fibre for composites: panels, car parts, pallets & building materials.
- Cellulose and fibre for paper & pulp products
- Fibre for wool blend materials
- Fibre for clothing textiles, hospital bed sheets and bandages
- Fibre & hurd for food containers
- Hurd for horse & animal bedding
- Ropes, baling twine, string

R-2 DECORTICATOR will process between 1,000 - 16,000 tons of fibre and core material per year.
SUPPLY CHAIN

**R-2 machine decorticator technology** is designed to provide industrial materials for bio-fiber and core hurd cellulose. These are used in a wide array of products. Composites and engineered panels are being designed to increase strength and reduce weight.

Some of the current products are shown here: Hempcrete building material for walls, EnviroShake roofing system, Wafer and particle board sheets, Hemp-Fibre Insulation. These are just a few of the modern products being manufactured in today’s market.

RETURN ON INVESTMENT

The R-2 machine innovation generates value for your farm production. This turns field “waste” into profit: more income from your hemp farm operation.

Each acre will produce between four to ten tons per acre. A 200 acre farm would yield 800 tons or more. Value of raw hemp fibre products ranges upwards from $250 per ton. The supply chain demand follows bio-fibre production to create products.

Consumer products made from natural fibers are increasing popular in today’s marketplace for all sectors globally.
The R-2 machine is designed for a densely-planted crop for either fibre & hurd or dual-use production of fibre, hurd and seed. The crop planting should be 200 to 300 plants per square metre. This will require 40 to 60 kg of seed per ha, depending on variety.

This machine is not designed for large “orchard style” large diameter stalks. Further testing will be conducted in the fall of 2019.

Bringing modern technology to the cannabis fibre processing industry in North America. Higher yields, superior product & modern industrial level production are KEY to this market. The R-2 system processes both green & stored (round baled is preferred) raw stalk material. R-2 will also process retted stalk. Total throughput ranges from one ton per hour up to four tons per hour depending on automation which increases the production volume.

R-2 engineering design developed over ten years has produced a world class solution over previous technology. Return on capital investment is under two years with sufficient crop production.

R-2 technology works on dry material. Baled crops can be processed by the R-2 unit to extend seasonal machine run time and production value.
R-2 system is designed to put materials straight into the feed conveyor. This provides for a range of options: fresh stalks, round bales or square bales opened & fed to the machine.

Main decorticator unit takes hemp stalks and separates the fibre which is sent to the output chute. Core hurd is sent out via a second conveyor. Access to the main R-2 unit is from the side of the system. Unit is installed in a 40’ container for shipping with the conveyors.

The R-2 system is shipped complete with feed conveyor, R-2 Decorticator, fiber output handling system and core hurd conveyor. Optional baling equipment or optional bale rippers can assist with material handling and throughput.

Adding baling systems to the fiber & core output automates the process further. High volume operations will want to consider pneumatic core hurd material handling. The R-2 allows scaling of farm technology to meet increasing demand.
Modern machine technology for processing hemp fiber on-site: dried stalk material is separated into fiber and core (hurd) in one pass. Driven with hydraulic motors, the unit can be operated at any location. Materials are collected at two points: fiber output and core conveyor chute at side of the machine.
**CANADA AND THE US**

The R-2 engineering and innovation allows us to provide on-shore parts via modern manufacturing.

Partner companies in Ontario and Oregon provide parts as needed anywhere in North America under extended warranty.

On-demand parts fabrication covers every part of our assemblies. Partner firms have the identical specifications for all parts. Direct shipping to customer.

Holland Marsh: Premiere engineering firm for the design, specifications and fabrication of R-2 technology. Specializing in state of the art projects, Holland provides advanced farm machine design and performance: from prototype to full commercial production facilities.
SPECIFICATIONS

Processing speed: Variable according to feeding systems and rate: 1 ton/hr up to 4 tons/hr.
100 hp Hydraulic flow 100-150 L/minute w/ cooling
15 hp input conveyor
5 hp output conveyors

Weight: TBD
w/ conveyor systems: TBD
1.8m work face (6’) (72”)
12m length (40’) (480”)
Overall: 2.43m width (8’) (96”)
Conveyor 3.65m length (12’)
Height 2.9m (9.6”) (108”)

R-2 is equipped with safety rails & cutoff switches.
Follow all instructions.
R-2 Unit should be operated by two people at all times.

3 meter (10’) clearance front for material handling
3 meter (10’) minimum side clearance for material collection/cleaning.
Input conveyor is set for fast feed systems

POWER OPTIONS
• Hydraulic drive
• 220v AC motors

ENSURINGIMAL IMPACT
The R-2 is designed to be operated outdoors and the stalk brought to it to manage fiber, core and waste operations.
Impact also depends on whether it is driven by a hydraulics or from a diesel genset system.

NOISE LEVEL
This is a loud machine. The noise is significant and ear protection must be used. Ear protection is advised.
R-2 DECORTICATOR

STANDARD FEATURES & OPTIONS

1. Feed Conveyor system for input into decorticator
2. Fiber & Core hurd conveyors for decorticated materials
3. Two year warranty
4. Service contract

Option: Pneumatic core hurd material handling system
Option: Bale unwinder / ripper
Option: Fiber baling systems

R-2 Hemp Decorticator System will efficiently process between 1,000 to 16,000 tons / per year.
Variable factors include:
1. Cultivar strain grown for production.
2. Seasonal growth.
3. Timing of harvest.
4. Additional systems to increase the rate of feed and material handling.

R-2 Unit must be operated by two people.

Processed Bales
CANNASYSTEMS offers field contracts to qualified growers for the 2020 season in Canada. A minimum of 200 acres is required & specific strains must be cultivated for dual purpose fibre & seed grain. Smaller farms can contract for field clearing services to remove stalk from seed grain operations. Producers may also transport roll-baled straw for processing to local contractors in the region.

Green technologies, products and systems in today's world make good business sense. Clients and customers want products that reflect sustainable solutions. Sourcing materials from green agricultural production is now practical. Greater yields, lower costs, higher quality and superior performance increase your bottom line.

Our system provide carbon-neutral sources of fiber product from natural plant materials. This process captures CO2 on a continual basis. You and your customers are then working together to create a sustainable, green future.

Lightweight, strong and durable, agricultural fibers are being used in many manufacturing applications. Lower costs and customer satisfaction are the result.

Contact us today to explore how green carbon technology can lower your costs, improve your bottom line and benefit your business.

CANNASYSTEMS CANADA INC. Toronto, Ontario

1 416 939 6143   bruceryan@cannasystems.ca

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