American Hemp

Farm-to-Fiber-to-Finished Good Value Chain

Spring Networking Conference Agenda
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American Hemp
Farm-to-Fiber-to-Finished Good Value Chain
Hemp Makes It Better

Guy Carpenter
Bear Fiber, Inc.
Hemp Fiber Properties

- Hemp is stronger than any other natural fibre, with approximately eight times the tensile strength and four times the durability of cotton and providing the highest UV protection of any natural fabric. Using hemp ensures long lasting bed linen (up to 10 years with normal use), making the initial cost an economic investment.
- Hemp progressively softens with every wash, without losing its shape, has superior inherent absorbency and breathability which helps promote good sleep. Hemp is warm in winter, cool in summer and is a natural insulator due to its hollow core fibre, a characteristic it shares with wool (without the scratchiness).
- Hemp is naturally hypo-allergenic, anti-viral, anti-mould and anti-bacterial, excellent for asthma and allergy sufferers.
“Dirt to Shirt”
Hemp is of first necessity to the wealth and protection of the country
- Thomas Jefferson

American Hemp History

In 1776

These Men Were Growing Hemp
Hemp Value Chain Challenges for Domestic Fiber to Fashion

1. Agriculture – Farming
2. Mechanical and Chemical Processing
3. Blending and Spinning Yarns
4. Textile Development
5. Apparel Manufacturing
Fiber Farming is straightforward.

Can we add value to the farmers role and have mechanical decortication at the farm level and make it more commercially worthwhile?
Agriculture

10,000 acres could justify a domestic processing facility

<100,000 pounds of seed at $3.00 per pound

Established farmer planting and harvesting cost ~$400 per acre
Decortication
Dry Processing
Wet Processing

Degumming and Cottonizing
Carefully controlling the degumming and opening process is critical.
Cottonizing

Fiber

Delignified hemp - single fibrils formed from one strand/bundle

Combed cotton (left) and cottonized hemp fiber (right)

Bleached cotton
Comparison of cottonized hemp and cotton

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<th>Hemp</th>
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<th>Cotton</th>
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<tbody>
<tr>
<td></td>
<td>retted</td>
<td>degummed</td>
<td></td>
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<tr>
<td>Fineness (Nm)</td>
<td>130-250</td>
<td>1500-2500</td>
<td>5000-6500</td>
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<td>Length (mm)</td>
<td>500-2000</td>
<td>25-40</td>
<td>25-38</td>
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<td>Tenacity (cN/tex)</td>
<td>3.2-4.7</td>
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<td>2-3.5</td>
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<td>CV of tenacity(%)</td>
<td>28-40</td>
<td>15-30</td>
<td>8-15</td>
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<td>Elongation (%)</td>
<td>2-3</td>
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<td>6-8</td>
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Four kinds of Fibers

- Golden Hemp from tall stalks 15 feet high
  - 3.5” to 5.5” inches long used for traditional high end fabrics and blends well with wools

- Chopstick Hemp Fiber from stalks 6 feet high
  - .75” to 1.3” the stalk is about as thick as a chopstick. This fiber is commonly cottonized and blended with cotton and/or other fibers

- Very short bast fiber for paper and other uses

- Fiber from the hurd
Spinning
Textiles
Apparel  Cut and Sew
“Clothes maketh the man”
The greater the supply of quality-controlled fiber for the marketplace, the more demand will increase - and in turn, cause supply to increase. This is because:

- Current large-scale users do not specify hemp because the volumes needed for the training, marketing and large-scale logistics required for a new product, can’t be cost justified today.
- Using hemp fiber in MANY existing product applications saves considerable cost, and in many cases has specific important benefits such as lighter weight or improved durability.
- Once commercial end-users understand that there is an increasing supply of availability at retail from brands, they will be encouraged to pursue the possibility of lower costs and better products.
- Growing demand will cause growing supply – not lower prices.
Thank You

Guy Carpenter
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