

Researcher sees future for flax and hemp as particleboard alternative

April 11 2017, by Corey Allen

Wood scientist Solace Sam-Brew envisions a future where Canadian homes are furnished with products made from flax and hemp.

"Both flax and [hemp](#) are widely available in Canada, especially in the West," said Sam-Brew, a recent PhD graduate from the University of British Columbia's faculty of forestry. "It's worth considering their viability as alternative raw materials to [wood](#) for particleboard production."

Particleboards are used in products like countertops, shelves and flat-packed furniture. For her PhD, supervised by professor Gregory Smith, Sam-Brew evaluated the characteristics of flax and hemp residues. She determined their physical and mechanical board properties by soaking and breaking hundreds of particleboards to test their strength and durability.

While Sam-Brew found flax and hemp residues were technically better, she hit one snag. The current economics of manufacturing flax and hemp particleboards in Canada are too high for it to flourish as a competitive material.

"The resin, or glue, needed to produce flax and hemp particleboard is a financial barrier," she said. Resin holds the particles in the board together and flax and hemp products use expensive resin, called pMDI, as the substitute for cheap urea-formaldehyde.

Sam-Brew was able to show in her PhD research that the amount of resin needed for flax and hemp particleboards could be reduced, which would help lower the cost. Substituting lignin, a plant binder, for a portion of the pMDI resin, could also reduce the cost.

According to Sam-Brew, a burgeoning niche market for flax and hemp particleboards exists in Europe. Decades of flax and hemp processing there and the number of companies in business have led to more competitive pricing.

Sam-Brew said the business case for a similar industry in Canada lies in a facility willing to take a chance on the sustainable alternative considering the growing competition for wood residue. Wood residue is [wood waste](#) from sawmills and joinery manufacturers, like wood chips, shavings, sawdust and trims, all highly sought after for use by multiple industries, including biofuel, pellet, pulp and paper.

"They're all fighting over one resource, which can sometimes be in short supply," said Sam-Brew. "If a company has to travel long distances to collect the wood waste they need to make their products, that costs them money. The particleboard industry could benefit from using non-wood resources if the price is right."

For now, flax and hemp particleboard production is at a standstill in Canada. But Sam-Brew remains optimistic.

"Flax and hemp particleboards are lighter than wood," she said. "The downstream impacts of making a lighter product could mean faster production rates and significant energy and transportation savings."

"The economics don't look good now, but they could later."

Provided by University of British Columbia

Citation: Researcher sees future for flax and hemp as particleboard alternative (2017, April 11)
retrieved 16 June 2024 from <https://phys.org/news/2017-04-future-flax-hemp-particleboard-alternative.html>

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