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Manufacturing Paper from Straw

Paper was not made from tree fibre until the 1800's – it was made from annual plant fibres like cotton and flax/linen. Today, what's old is new again. Several new, cleaner and more efficient technologies for pulping agricultural fibre, such as wheat straw (not the food kernel), have been developed in the last decade. North America's vast agricultural heartlands are untapped sources of pulp and paper fiber. Every year, millions of tons of agricultural residue like wheat and flax straw go unused while our forests are logged to make more paper.

Annually there are 13 to 20 million tons of available wheat straw in Canada left over from 22+ million acres of wheat grown¹. Canada also grows an additional 1.2 million acres of flax.

The top wheat-growing states in the U.S. harvest close to 40 million acres of wheat², while North Dakota harvested 107,000 acres of flax in 2018³

That leaves enough straw, if used for pulp and paper, to meet much of North America's book and copy paper needs without cutting down ancient and endangered forests.

Other fibers such as sorghum, rye and some crops planted specifically for stalk fiber can also be used for manufacturing pulp for paper and potentially for textiles.

Greenfield, Brownfield and Feeding into Existing Lines

¹ Agriculture and Agri-Food Canada, 2014

² <http://usda.mannlib.cornell.edu/usda/current/Acre/Acre-06-29-2018.pdf> Accessed on July 24, 2018

³ Idem

Greenfield refers to building a new manufacturing facility. Because paper making in North America has used wood as the fiber input, most pulp and paper mills are built near woodlands. Most viable straw pulp facilities need to access fiber from within a 75 to 100 mile radius (100 to 150 kilometre radius).

Brownfield refers to a retrofit of an existing mill. There are a few existing pulp and paper mills in North America that are near the agricultural fiber basket and that could be retrofitted to pulp straw.

Once straw pulp is made it can be fed into existing paper mills alongside post-consumer recycled paper or FSC certified wood pulps. Some companies will want to manufacture a specific pulp and paper product all in one mill facility. Others will want to produce a market pulp that can be sold to a number of different buyers who then manufacture different kinds of paper – from packaging to printing papers, newsprint, coated magazine paper, tissue and potentially as a rayon/viscose substitute.

Who is manufacturing in North America?

There are already a few companies leading the development of straw paper in North America, while straw and or sugarcane bagasse based paper is also being imported from India, Asia or South America. Here are a few of the proponents.

KIMBERLY-CLARK

In 2015, the Kimberly-Clark Professional division of this well-known global tissue products provider, expanded their line of Green Harvest products in North America, offering 20% US grown wheat straw⁴ tissue manufactured in the USA. In doing so Kimberly –Clark developed the first North American wheat straw supply chain. The company has committed to procure 50 percent of its fiber needs from ‘alternative sources’ (not trees) by 2025.

<http://www.kimberlyclarkprofessional.com>

COLUMBIA PULP

Columbia Pulp is a private company that is building a US\$185 million plant near Starbuck, Washington, USA to convert wheat and alfalfa straw from local farms into pulp for paper. The plant will require approximately 240,000 tons of straw annually within a 75-mile radius. The plant will produce 140,000 tons of unbleached wheat straw pulp per year for packaging and molded fibre grades (like clam shell take-out containers).

<http://www.columbiapulp.net/>

ALOTERRA

Aloterra now offers, on a small scale, an alternative fibre pulp for compostable foodservice ware made with a non-invasive perennial grass crop called Miscanthus. Aloterra plans to scale up to commercial production.

<http://www.aloterrallc.com/>

GENERA

Genera supplies renewable fiber market pulp. Genera's earthable™ fibers are used in a wide array of applications including tissue, paper, compostable food service tableware, and packaging.

<https://generaenergy.com/earthable/>