

# Developing Bio-economy of Flax Fibers in Atlantic Canada

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## Why Research Flax?

Flax has the greatest tensile strength of all natural fibers and is long lasting. Flax is of interest as the plant requires limited resources to grow, adds to local economy and has a level of sustainability due to the many byproducts. Through research of natural fibers in the Maritimes it is hopeful that a contribution to the Atlantic Canadian bio-economy will result. This study was aimed at providing a reference for research that would be conducted to optimize the water-retting process as well as for the applications of fibers produced from the water retting.



Mature Flax Grown in our Lab

## What is Retting?



Stems During Retting

Retting refers to the process of soaking plant stem tissue in water to soften and separate its fibers. The purpose of retting is to produce bast fibers at a low cost. The retting process largely affects the properties of the fibers produced.

Flax fiber exist in the form of bundles mainly surrounded by pectin. Retting allows the flax fibers to be separated from the non-fiber components of the stem, resulting in smaller fiber bundles and elementary fibers. Our research involved water retting; a method in which the decomposition of pectin by activity of anaerobic microorganisms takes place. This process is an easy and low cost method to produce bast fibers.

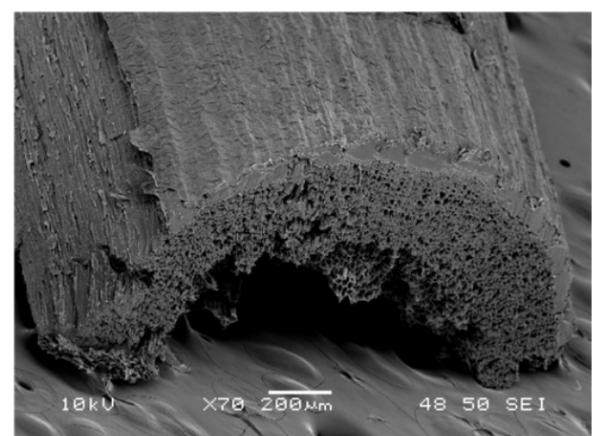
## Our Research



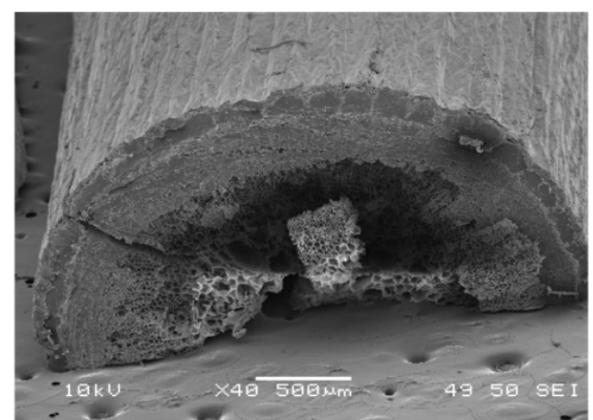
Flax Growing in Greenhouse

The initial germination and seedling growth trial was completed with 8 cultivars of flax considered to be good fiber sources. The seed used for testing was obtained from the Plant Gene Resource of Canada seed bank located in Saskatoon, Sask. Seedling emergence and growth was monitored in different soil types provided by TapRoot Farms and Maritime Hemp Manufacturers (MHM) Ltd. Height measurements were recorded and number of plants per pot were counted to assess the response of cultivars to the various soil types, and to determine potential fiber yields. Retting tests were begun after the plants were grown to maturity and seeds harvested. Data collection during the retting process included measurements of the pH levels, dissolved oxygen, conductivity, temperature and pressure.

After the retting process was finished, samples of each of the cultivars were collected for tissue analyses, scanning electron microscopy (SEM) of fibres as well as structural strength analyses of bio-composite structures.



Unretted Stem



Retted Stem



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