

Project “Own grown hemp” : Optimization of hemp fibres quality for textile applications through an integrated chain approach

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In Europe, hemp fibres are mainly used for pulp and paper industry, building, biocomposites, technical textiles, animal bedding, pellets, etc. In Belgium, an area of about 500 ha was cultivated in 2017, mainly in the southern part (Wallonia). In Flanders, farmers are interested in extending the cultivated area and spinning, weaving and clothing companies are keen to use locally grown hemp but some bottlenecks in the value chain have to be solved first.

The overall aim of the “Own grown hemp” project is to support the revival of the hemp industry in Flanders, especially for high-quality textile applications. This project will specifically investigate how the quality of hemp fibre can be controlled at several levels of the value chain. The choice of the hemp variety, sowing and harvesting conditions seem to be decisive factors during hemp farming and the retting process is responsible for a great deal of fibre yield and consistent high quality.

A field experiment was carried out at the University College Ghent experimental farm located in Bottelare (Flanders, Belgium). Five different hemp cultivars (for fibre purposes) from different origin and maturity were sown at two different sowing times. These factors were tested in a randomized complete block design with four replicates. Single plot size was 45 m². Plant density was estimated at 240 plant m⁻² and nitrogen fertilization was 108 kg N ha⁻¹. Crop development was monitored by measuring seedling emergence, flowering, plant density, plant height, stem diameter. Plants were harvested at initiation of flowering and each plot was divided in three fractions at harvest. One part of the straw stayed on the field for classical field (or dew) retting. A second part of the straw was sprayed with enzymes and remained on the field for enzymatic-field retting. Finally, the third part was harvested ‘green’ and was subjected to an enzymatic retting on lab-scale reactors. Several commercially available enzymes (or blends thereof) were employed. Yields were determined by measuring straw weight (green and retted straw). Straw was scutched on flax scutching lines. Fibre yield and fibre quality of the different retting methods was determined.

In this presentation the objectives and methodology of the project “Own grown hemp” (2017-2019) are briefly introduced as well as the results of the first year field experiment, including considerations about the retting approached foreseen. In this season (2018), the field experiment will be repeated (1), the cultivation of hemp as winter cover crop will be investigated (2) and (3) the fibre yield and quality will be assessed.