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Final Report

Demonstration of Flax Harvesting and Fibre Conditioning Methods

**For:
Composites Innovation Centre**



Project Sponsors:

**Department of Agriculture and Agri-Food Canada
Schweitzer Mauduit Canada Inc.**

1. Executive Summary

An increased use of natural fibres in industrial applications has the potential to provide a widespread, value added commodity to grain producers. Flax in particular, is of interest because of the high fibre characteristics of the straw. Two main variables affect fibre yield after harvesting: the variety of the flax and the harvest method.

In this project, the implications of flax variety and harvesting method were studied during a field plot scale trial. Indicators used to determine the affect these variables included seed and straw yield as well as the quantity and quality of fibre in the straw. Flax straw from all trials was collected, yield determined and processed, at production scale, by Schweitzer-Mauduit Canada, at their current production facility in Carman, MB.

Two flax varieties were studied at two different locations in Manitoba, AC McDuff and Flanders. The AC McDuff was chosen as a common variety to benchmark the seed and straw yields against. The Flanders variety was selected because of its reputation as a high fibre variety. Excluding the different agronomic practices used and climatic conditions, the Flanders variety produced both a higher seed and straw yield than the AC McDuff variety when using comparable harvesting techniques. Historic yield data was used to normalize for the different agronomic and climatic conditions.

Three different harvest methods were studied to determine their impact on the seed and fibre yield of the AC McDuff flax variety. Two traditional harvest methods were studied as follows: windrower/conventional combine with pickup header combination and rotary combine with a straight-cut header. One non-traditional method of using a stripper header to collect the seed and a mower conditioner to cut the standing stubble was studied to determine if specialized, dedicated harvest equipment was capable of producing a higher quantity of better quality fibre from the straw without reducing the amount of seed collected.

In this case study comparing specialized, dedicated equipment and conventional techniques, the conventional harvest techniques produced the highest seed yields. The use of the rotary combine with straight cut header produced the highest seed yields but lowest straw yield and fibre quality. In this trial under these specific conditions, the stripper header produced the lowest seed yields but best quality of fibre due to the long standing stubble remaining after harvest.

In this case study, it was determined that if the highest quantity and quality of fibre is desired and can only be accomplished with dedicated harvesting equipment, then additional revenue is required for those involved in the seed and fibre production value chain to cover the additional capital and operating costs of dedicated equipment.