



FLAX AS AN ALTERNATIVE GRAIN FOR ORGANIC PRODUCTION

Interim Research Report E2006-04

INTRODUCTION

Canada is the world leader in flax production with over 750,000 tonnes produced in the prairie region (approximately 40% of global production). The agronomy of flax production is well understood as a result of extensive research and development conducted in Saskatchewan and Manitoba.

Despite the limited presence of flax in the Maritime Provinces, research has shown that the crop can be grown here with comparable results to that in Western Canada. Our study objective was to demonstrate the potential of organic flax production for the Maritimes.

SEEDING DATE AND INTERCROPPING (2004)

We selected two cultivars of flax, CDC Mons and Hanley, to investigate for organic flax production in Nova Scotia. Both varieties were sourced from Manitoba and were chosen for their above-average lodging resistance, high oil quality and disease resistance. Yield and weed competition in the two varieties were measured in response to planting date (early or late), and intercropping with wheat (AC Helena) or no intercropping. The early seeding date was May 13th; this included a disking operation on May 7th and s-tining on May 12th. The late seeding date was June 1st; this treatment was disked and s-tined on the day of seeding in addition to the earlier disking and s-tining. Flax is known to be a difficult crop to finger weed and so the weeder was set to be less aggressive. We found that if finger-weeding was done too early the flax plants (2.5 – 3 cm tall) were buried and couldn't recover (34% losses, 57% weed control). Too late (flax 10 cm tall) and the weeds (at the 3 leaf pair stage) are too big to get effective control (7% flax loss, 34% weed control). We had the best luck finger-weeding when the flax was 5 cm tall (9% flax loss, 54% weed control).

Initial data indicated a higher flax and wheat density at the later planting date. Crop density of the Hanley variety was higher than CDC Mons, and Hanley matured at a slightly faster rate. The annual



Flax cultivar trial (A. Hammermeister)

weed population was higher at the early seeding date. Flax yield of the individual plots without wheat intercrop ranged from 0.44 to 1.75 t ha⁻¹ depending on treatment. Very low yields were observed in plots with high couch grass competition. Overall, the wheat intercrop reduced flax yields by approximately 40%, however total yield of flax and wheat was comparable to total flax yield in plots not intercropped. Late seeding of flax produced comparable yields to early seeded flax, which may be due to benefits of additional weed control. There were negligible differences in yield between the flax varieties overall. Flax quality has not yet been determined.

CULTIVAR TRIALS (2005)

In 2005, cultivar trials were conducted at three locations in NS: the OACC research land in Brookside, and on two organic farms (Farm A and B). The flax was planted in late April at Brookside with medium fertility, early May at Farm A with low fertility and some couchgrass problems, and early June at Farm B, with very low fertility and very dry conditions through the summer. There were few differences to report among the flax cultivars aside from the cultivar Norlin. Yields were slightly lower than in exploratory trials in the previous year, with AC Emerson producing the highest yields across 2 sites (Brookside and Farm A) (Table 1).

Table 1. Flax yields in 2005 at three locations

Cultivar	Yield (kg ha ⁻¹)		
	Brookside	Farm A	Farm B
CDC Mons	1187	565	110
AC Carnduff	1312	461	47
AC Watson	1183	596	130
Hanley	1157	614	166
Vimy	1227	563	132
Norlin	473	265	134
AC Emerson	1320	630	54

Norlin was significantly later in emerging, flowering and maturity resulting in much lower yields. Fingerweeding at Brookside and Farm A resulted in a thinning of the stand at both locations, especially at Farm A where weeding was done too early. Lower yields at Farm A were also related to lower soil fertility, and higher weed competition, especially from couchgrass.

The flax was mature and ready for harvest in early September at both Brookside and Farm A, with the exception of Norlin. At Farm B, an even stand of all cultivars established, but drought and low soil fertility produced a short crop with obviously low grain quality. Late season rains also stimulated extended flowering and kept stems green resulting in a delay in harvest to October 5th. Even then, the flax was still somewhat green which posed problems with harvest as the knives would jam on the header, and the sample was difficult to clean. Cylinder speeds must be reduced on the combine to avoid damaging the seed. Late harvest reduces crop quality significantly, and flax becomes miserable to harvest. Swathing may be necessary to take this crop off successfully.

Remember, flax is a relatively high profile crop due to its health benefits. It is sold as a whole seed to consumers, bakers and processors. Poor management, harvest, cleaning and/or storage will result in a low quality product that will be unmarketable.

CREDITS

Andy Hammermeister, Kate Punnett and Roxanne Beavers (ed.)



Flowering flax (A. Hammermeister)

THE BOTTOM LINE...

Flax can be grown in the Maritimes, but must be well managed and handled. Planting early in a clean field with moderate fertility will produce reasonable yields and quality. Timely harvest is very important for achieving high quality.

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Technicians: Pamela Craig, Lloyd Rector, Shannon Urbaniak and Lynda Weatherby

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For more information:

Visit oacc.info or contact us at
P.O. Box 550 Truro, NS B2N 5E3
Tel: (902) 893-7256
Fax: (902) 896-7095
Email: oacc@nsac.ca



Nova Scotia
Agricultural
College