

**CIHM
Microfiche
Series
(Monographs)**

**ICMH
Collection de
microfiches
(monographies)**



Canadian Institute for Historical Microreproductions / Institut canadien de microreproductions historiques

© 1998

The In
copy a
may b
the in
signifi
checke



This item
Ce docu

10x



Technical and Bibliographic Notes / Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- Coloured covers / Couverture de couleur
- Covers damaged / Couverture endommagée
- Covers restored and/or laminated / Couverture restaurée et/ou pelliculée
- Cover title missing / Le titre de couverture manque
- Coloured maps / Cartes géographiques en couleur
- Coloured ink (i.e. other than blue or black) / Encre de couleur (i.e. autre que bleue ou noire)
- Coloured plates and/or illustrations / Planches et/ou illustrations en couleur
- Bound with other material / Relié avec d'autres documents
- Only edition available / Seule édition disponible
- Tight binding may cause shadows or distortion along interior margin / La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure.
- Blank leaves added during restorations may appear within the text. Whenever possible, these have been omitted from filming / Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.
- Additional comments / Commentaires supplémentaires:

- Coloured pages / Pages de couleur
- Pages damaged / Pages endommagées
- Pages restored and/or laminated / Pages restaurées et/ou pelliculées
- Pages discoloured, stained or foxed / Pages décolorées, tachetées ou piquées
- Pages detached / Pages détachées
- Showthrough / Transparence
- Quality of print varies / Qualité inégale de l'impression
- Includes supplementary material / Comprend du matériel supplémentaire
- Pages wholly or partially obscured by errata slips, tissues, etc., have been refilmed to ensure the best possible image / Les pages totalement ou partiellement obscurcies par un feuillet d'errata, une pelure, etc., ont été filmées à nouveau de façon à obtenir la meilleure image possible.
- Opposing pages with varying colouration or discolourations are filmed twice to ensure the best possible image / Les pages s'opposant ayant des colorations variables ou des décolorations sont filmées deux fois afin d'obtenir la meilleure image possible.

This item is filmed at the reduction ratio checked below / Ce document est filmé au taux de réduction indiqué ci-dessous.

	10x		14x		18x		22x		26x		30x	
				✓								
	12x		16x		20x		24x		28x		32x	

The copy filmed here has been reproduced thanks to the generosity of:

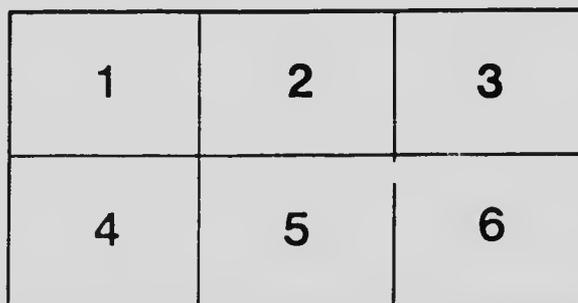
Library
Agriculture Canada

The images appearing here are the best quality possible considering the condition and legibility of the original copy and in keeping with the filming contract specifications.

Original copies in printed paper covers are filmed beginning with the front cover and ending on the last page with a printed or illustrated impression, or the back cover when appropriate. All other original copies are filmed beginning on the first page with a printed or illustrated impression, and ending on the last page with a printed or illustrated impression.

The last recorded frame on each microfiche shall contain the symbol \rightarrow (meaning "CONTINUED"), or the symbol ∇ (meaning "END"), whichever applies.

Maps, plates, charts, etc., may be filmed at different reduction ratios. Those too large to be entirely included in one exposure are filmed beginning in the upper left hand corner, left to right and top to bottom, as many frames as required. The following diagrams illustrate the method:



L'exemplaire filmé fut reproduit grâce à la générosité de:

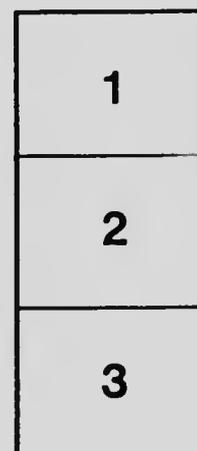
Bibliothèque
Agriculture Canada

Les images suivantes ont été reproduites avec le plus grand soin, compte tenu de la condition et de la netteté de l'exemplaire filmé, et en conformité avec les conditions du contrat de filmage.

Les exemplaires originaux dont la couverture en papier est imprimée sont filmés en commençant par le premier plat et en terminant soit par la dernière page qui comporte une empreinte d'impression ou d'illustration, soit par le second plat, selon le cas. Tous les autres exemplaires originaux sont filmés en commençant par la première page qui comporte une empreinte d'impression ou d'illustration et en terminant par la dernière page qui comporte une telle empreinte.

Un des symboles suivants apparaîtra sur la dernière image de chaque microfiche, selon le cas: le symbole \rightarrow signifie "A SUIVRE", le symbole ∇ signifie "FIN".

Les cartes, planches, tableaux, etc., peuvent être filmés à des taux de réduction différents. Lorsque le document est trop grand pour être reproduit en un seul cliché, il est filmé à partir de l'angle supérieur gauche, de gauche à droite, et de haut en bas, en prenant le nombre d'images nécessaire. Les diagrammes suivants illustrent la méthode.



MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



4.5

5.0

5.6

6.3

7.1

8.0

9.0

10

11.2

12.5

14

16

18

20

22.5

25

28

32



APPLIED IMAGE Inc

1653 East Main Street
Rochester, New York 14609 USA
(716) 482 - 0300 - Phone
(716) 288 - 5989 - Fax

1 M.-3-20.

DEPARTMENT OF AGRICULTURE OF THE PROVINCE OF QUEBEC

Horticultural Service

Home Gardens Section

CIRCULAR No. 32

FLAX GROWING

IN QUEBEC

— BY —

CHARLES-ARTHUR FONTAINE, B. A.; B. S. A.
Professor, Oka Agricultural Institute.

The high prices paid for flax and fibre have revived this culture which was about to be abandoned. In fact, last year, 5700 acres were sown in flax in our Province, against 500 and 600 acres in 1916 and 1915 respectively. In this respect we are ahead of Ontario where 4000 acres only were devoted to flax in 1917.

Use of flax

As already stated, flax is grown for seed and fibre.

The seed is used for various purposes; in the trade a precious oil is extracted which is employed in diluting paint. The wastes of this industry, called linseed cakes, are rich in protein and constitute a most precious feed for milch cows and for fattening animals.

As a feed for calves and young pigs, nothing is worth linseed as a substitute of milk fat after weaning. To brooding females, when fed in small quantities, particularly before parturition, whole linseed is the best laxative and digestive tract regulator.

Fibre which is used in the making of linen, is obtained from the stalk after the latter has undergone various operations ; *retting, drying, breaking, scutching*, which will be briefly treated later on. Let us simply say that the stalk of flax is formed of three principal parts, superposed ; a central part, called *pith*, another part called *wood*, and a surface part, stringy, surrounding the wood ; this part, called *fibre*, is detached from the pithy and stringy layers by the previous operations, and constitutes the *harl* which is worked into linen.

Description of flax

Flax is an annual plant, forming its stem and ripening its seed in the space of one season.

This plant, when ripe, is composed of a stringy stem, about two feet high, of a yellowish green, more or less ramified according to the mode and object of culture ; each branch ending in a brown spherical boll, containing from 8 to 10 seeds separated from each other by a thin partition.

It would be well to remind here that flax may be grown for seed only, as is done in the Western Provinces, or for both purposes, seed and fibre. The appearance of the plant, its method of culture, the rate of seeding, the harvesting and thrashing methods will differ considerably according to the object in mind, where the production of seed only or the production of both seed and fibre is desired.

When flax is grown for fibre, the length and quality of the straw is particularly looked for ; these two features are obtained when the stem is long, rather thin and has few branches, (only three or four bolls carried by very short branches at the upper part of the stem). If flax is grown for seed only, one will endeavour to have stems with as many branches as possible, since there are as many seed-bearing bolls as there are branches ; we will briefly state how either of these two objects can be attained.

Climate

In order to grow fibre of good quality, flax must have a long season, moderately warm and very moist weather. British Columbia is the Province where these conditions

CFF
A3321
25/32
A

are best found. Next come the Maritime Provinces and the counties bordering the St-Lawrence and the Great Lakes. The climate of the Western Provinces is too dry and the season too short for the production of good fibre, therefore flax is grown almost exclusively for seed.

Soils

Flax may be grown in all soils providing they are sufficiently rich of essential fertilizing elements.

For the production of good seed, the best yields will be obtained in a good loamy soil, sandy clay loam; very good crops can also be raised in heavy clay soils, well drained and ploughed in the previous fall or summer.

Loamy soils, rather light than compact will yield the best fibre.

Place in rotation

Flax must not be grown in the same soil more than once in 5 or 6 years. It thrives in an old sod or a pasture copiously manured the year before; it is the best place if we have in mind the production of seed. For fibre, it will come better on a land which will have been cleared of weeds by a hoed crop, corn, potatoes, etc.

Fertilizers

Flax, when grown for fibre, is an exhausting plant; it requires much from the soil and does not reconstitute anything; a well-manured soil should therefore be provided.

Fresh manure is not recommendable on account of its promoting an abundant growth of wood and leaves to the detriment of fibre. It is more advantageous to give plenty of manure to the previous crop, hoed crop, corn, potatoes or pasture.

As regards fertilizers, potash is what is particularly needed; on account of their actual high prices, they are replaced, in soils naturally poor in potash as are most of the light soils, by wood ashes spread at the rate of 1000 to 1200 lbs per acre. Flax should not be sown after a beet crop because the soil will be too much exhausted of potash.

Preparation of the soil

The preparation of the soil for flax growing may be summed up in the perfect execution of the following operations ;

(1) *Ploughing*. — Fall ploughing is preferable, more or less deep, according as the soil is light, medium or heavy.

(2) *Drainage*. — What has already been said for wheat and other cereals may be more emphatically repeated for flax ; even an inferior crop cannot be hoped for if the soil is not drained naturally or artificially.

(3) *Loosening*. — This work is easily done when the soil has borne a hoed crop the year before ; it only requires a deep layer of earth, free of large lumps and weed roots. The *complete eradication of weeds* is particularly insisted upon.

When flax is grown for fibre, it is harvested by hand, and this operation is much longer and more tedious in a field infested by weeds apart of the fact that the yield is considerably decreased.

(4) *Rolling*. — In light soils, rolling will take place after seeding so as to put the seed in close touch with the earth and to harden the soil. It is however not recommended in heavy soils ; if it is done, it should be before seeding and the soil should be harrowed immediately after.

Seeding

In this respect, four important points should be given consideration :

(1) *Selection and preparation of the seed*. — Blue flowered flax will yield the best grade of fibre. Perfectly ripe seed, and free from weed seeds should be sown ; the latter point is of first importance because weedings are almost impossible after the grain has grown up ; hence the advisability of complete cleanings and fannings.

Another question is to ascertain the germinative power of the seed ; for this purpose make an early seeding in a pot and find out the percentage of seeds growing vigorous.

As flax seed is liable to various cryptogamic diseases, it should be treated in formalin before being sown. One ounce of formalin is diluted in 10 quarts of water and this solution is sprayed on the seed spread in a thin layer on a cloth.

(2) *Rate of seeding.*— This quantity depends on the germinative power of the seed and the object for which it is grown.

If it is intended for seed production only, from $\frac{3}{4}$ to 1 bushel per acre will be enough ; the stems will grow more branches and yield more bolls.

For the production of fibre, about 2 bushels per acre are required, more or less, according as the percentage of the germinative power is below or above 90. Flax sown thick will ramify less, give longer and thinner stems, and a larger quantity of a higher grade of fibre ; this is the result of several experiments carried on in Canada and the United States.

(3) *Time of seeding.*— Flax is sown about the same time as wheat, as soon as the soil is warm enough ; late spring frosts, when not too severe, will not do any harm.

(4) *Method of seeding.*— Broadcasting is preferable when flax is grown for fibre, and it is done when it is not too windy. A good harrowing, lengthwise and crosswise is given after seeding ; and in a light soil, the roller will be run to harden the earth and bring moisture to the top.

Weedings will not be necessary if the soil has been properly loosened and drained and seed free from weed seeds used. In any case, no work should be done in flax fields when stems are more than 6 inches high.

Harvest

In the Western Provinces, flax is harvested in the same way as other cereals, with a binder when most of the seed bearing bolls are brown and ripe ; it is allowed to dry for a few days and the grain is separated from the stem with an ordinary thrasher.

It is different if the fibre is wanted. Then the harvest is done by hand and before complete maturity. The best time to start pulling is when about half of the bolls are ripe and the other half about to ripen.

Four men having some experience can pull an acre of flax per day.

Some precautions should however be taken ;

(1) To pull the smallest possible quantity of foreign plants with flax stems ; this work will be made easy if the soil has been properly loosened in the spring and if clean seed has been sown ;

(2) To break and detach as few seed bearing bolls as possible, whether the flax is put up in bunches or spread for immediate retting.

Retting

Retting is a maceration which flax has to undergo to facilitate the separation of fibre from the stringy part. There are two methods of retting ; *dew-retting* or *bleaching* and *water-retting*.

Dew-retting. — This is the method usually employed in our rural districts, it is equally the slower and less efficient.

It consists in spreading flax stems after pulling, in thin layers on short grass where they are left for 4 or 5 weeks during which time they are turned on 3 or 4 occasions. When, in wringing a handful of flax stems the fibre is easily removed from the pith and wood, it is time to bind flax in sheafs and store same ; the bleaching is over, operated by the daily dews, but the sun and weather conditions have lessened the quality of the fibre.

The other process, which is quicker and more satisfactory, is *water-retting* ; it consists in soaking flax sheafs for a few days in a bowel full of water at 70 degrees F.

The same method as previously mentioned is used to find out when the retting is over.

Before operating in this manner, the seed-bearing bolls must be detached ; this may be done immediately after pulling or the following spring. In the first case the top of the sheafs will be cut off before operating ; in the second the bolls are detached by quickly pulling the stems through the teeth of an iron comb.

Other operations

Retting is the first operation in the making of fibre. There are also the *breaking* and *scutching*. It would be too long, in this pamphlet, to enter into the details of these two operations ; let us simply say that they consist in

separating the stringy fibres from the remainder of the stem, which work is prepared and facilitated by retting. Moreover, they rather interest the manufacturer to a greater extent than the average flax grower.

Retting usually takes place on the farm while the breaking and scutching are operated at the mill.

Yield

The average yield of flax grown for seed may be 13 bushels per acre ; as many as 20 bushels per acre were harvested in favorable seasons. At the actual price of seed (\$3.50 to \$4.00) this crop may yield fair returns. It does not require much more work than cereals, oats or wheat and often yields larger crops.

In our Province, where we can produce a high grade fibre, it would be advantageous to grow flax for a double object. When properly cultivated an acre of flax may yield from 300 to 500 lbs of fibre which sold \$700.00 per ton in 1915. There is no reason to prevent all farmers from taking up again this culture which is very useful and remunerative, on at least a small scale. Half an acre of flax will provide all the seed necessary for farm use and will leave a fair profit in the shape of fibre.



