Binder Twine from Flax Straw

A New Process of Treating Flax Fibre which may prove of Tremendous Importance to the West

By Hopkins Moorhouse

Discovery of a new process of treating raw flax fibre so that it acquires the "permanence" of linen and a large spinning range while conserving all its tensile strength is an announcement from Regina, Saskatchewan, that is of great interest to every farmer in Western Canada. If the claims for the new method are substantiated in connection with the manufacture of binder twine, to mention but one product, it means that Western Canada can make its own binder twine supplies in commercial quantities at a considerable reduction in price. It means that instead of going up in smoke each year our waste piles of flax straw will be turned to economic advantage. Such a discovery under present conditions is a matter for national congratulation when the husbanding of national resources has become vital.

It has been the writer's privilege to seek information in regard to this matter for the readers of The Guide and to examine about fifty articles, made up from the new spinning material and at present on exhibition at the Parliament building, Regina. The finished products are remarkable for their evenness and strength and consist of the following:

Yarns—Drawn and spun up to 4,500 feet to the pound, ready for weaving into heavy sacking, burlaps or heavy toweling.

Commercial Twines—Heavy qualities with glazed surfaces and fine qualities with waxed surfaces, having wholesale values ranging from 50 cents to 83 cents per pound (according to independent appraisers.)

Binder Twine—With soft even surface, three-ply spun, giving 750 feet and 900 feet to the pound with a breaking strain at 60 pounds and 50 pounds respectively. The breaking strain does not vary more than 1½ pounds either way.

Experiments with this binder twine have been carried out in the field in the presence of a representative of the Saskatchewan department of agriculture and gave 99 per cent. of well bound sheaves. Sisal twine, using the same binder, did not give that percentage.

The Claims for the New Process

It is claimed that the new process for preparing and treating the raw flax fibre is simple and cheap; that it can be carried out rapidly under cover at all seasons of the year; that the treatment not only gives a spinning value of 4,500 feet per pound to the raw fibre but also gives it all the permanent qualities of linen, though but a near linen or bastard linen; that the product is vermin proof, gophers, mice or crickets not touching it any more than they would a handkerchief dropped in a warehouse, a granary or a field.

The importance of this will be recognized when it is recalled that it is here that former attempts have failed to solve the problem of giving a manufacturing value to these vegetable fibres, grown at our doors. One large corporation in the United States spent a million dollars in an attempt to make binder twine out of the raw fibre as it came from the decorticating machines. As it would not spin it was given a loose twist, as is done with sisal hemp, a hard fibre. Vermin destroyed this twine in the fields and in the warehouse and those stocks which escaped the attacks of vermin lost their tensile strength in time through disintegration.

Pure linen is the fibre taken from the flax plant by a process known as "retting." The straw has to be cultivated specially for its fibre and not for its grain. The land has to be prepared carefully, rotation adhered to strictly and seed selected for its fibre-producing qualities. When ripe or in condition the straw has to be pulled. It is then immersed in stagnant or slowly moving water for eight or ten weeks, a process known as "pit retting," one which gives to the fibre its highest qualities. In Eastern Canada the straw is spread on the fields, where the rain, dew and atmospheric moisture, in conjunction with the sun has the desired action. This is called "dew retting" but gives an inferior quality to the fibre. Both systems of retting require to be done out of doors and only in favorable seasons.

Now, Western Canada cannot produce linen fibre at a profit. The short growing season, early and late frosts, dry climate and high winds, lack of suitable water and the high price of labor—all these factors interfere with the production of linen on a paying basis in the West. For, while machinery has been invented for taking the fibre from flax straw without retting, the raw with-out retting, the crude fibre which results is not true linen as it retains all its gums, will not draw or spin, falls to pieces in course of time and besides is attractive to vermin.

Samples of the Finished Twine

A View of the Fibre in Different Stages of Treatment
(1) Raw Fibre. (2) Raw Fibre Straightened Ready for Baths. (3) Treated Fibre Drying. (4) Treated Fibre Ready for Bundling. (5) Treated Fibre Ready for Spinning Mills.

Utilizing a Waste Product

The problem of a practical method of overcoming these obstacles in the converting of our waste flax straw into a commercial product has been given considerable attention during recent years; but apparently it has remained for what is known as the "Flax Fibre Development Association" to achieve success after much painstaking experimenting both in laboratory and factory. The association was formed early in 1917 with offices in the parliament building at Regina, and with the avowed object of "the study and development of flax fibre as distinguished from linen and its utilization in the manufacture of the coarser commodities."

The Saskatchewan government was very much interested in the work of the association and when in the laboratory of Andrews & Cruickshank the experiments were successfully completed the Saskatchewan department of agriculture urged further experiments upon a factory basis. The government accordingly provided the necessary financial assistance and a factory was established at Rosetown, Saskatchewan, where machinery was installed to produce in commercial quantities a raw flax fibre with a "line" in proportion to the length of the straw furnished.

Results have justified expectation. Tables of losses, poundages and costs have been handed to the proper authorities and it is understood that the cost of all articles produced is much lower than the cost of equivalent commodities now on the market. It was proven that at least 270 lbs. of the finished article, yarns or twines, could be made from one ton of flax straw.

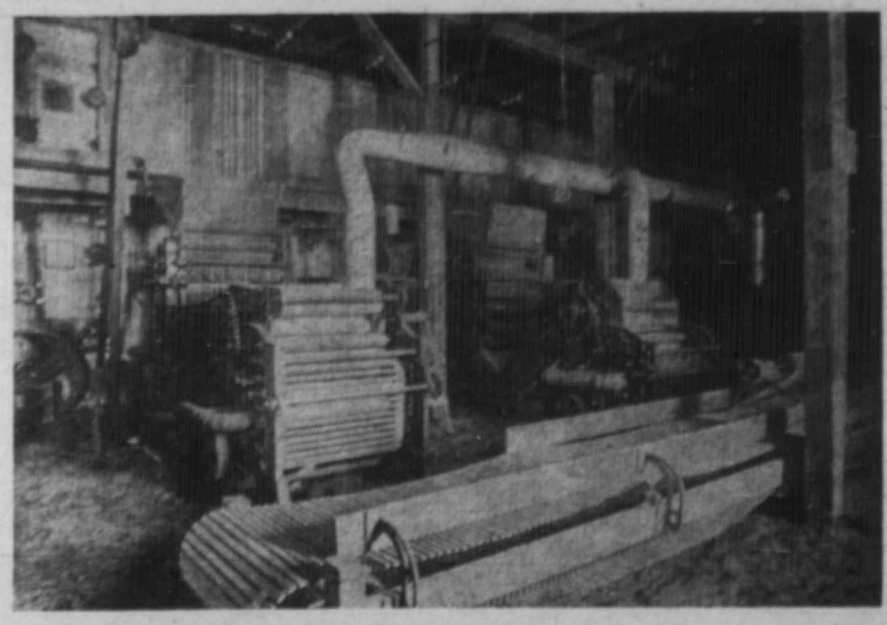
What does this mean to Western Canada? It is only necessary to remember that linen in its origin is flax straw to realize the waste which takes place annually in our Western grain growing provinces through the burning of flax straw after the seed (linseed) has been threshed from it. The acreage under cultivation to flax last year in the West was: Saskatchewan, 700,000 acres; Alberta, 230,000 acres; Manitoba, 63,000 acres. This million acres produced a general average of about one and a quarter tons of flax straw per acre, or a total of 1,250,000 tons. If the new process will produce 270 lbs. of the finished article per ton of straw, then the potential value in binder twine of these waste piles of flax straw each year would equal 350,000,000 lbs. At only 15 cents per lb. that would represent $52,500,000 going up in smoke!

May Help Meet the Fibre Shortage

Then there is the world wide fibre shortage to consider. It has been estimated that sixty million pounds of binder twine will be needed for the Canadian harvest in 1919 while experienced spinners state that Canada could absorb immediately ten million pounds of commercial twine. Also the increase of ship building on this continent will continue to make heavy demands upon cordages in general. As has happened in many other lines, the increased demand which the war has brought has faced a decrease in production. The linen fields of the world have been shell-plowed by the big guns—the Baltic Provinces of Russia, Northern France, Belgium, Germany and Italy. Before the war Courland and contingent territories supplied sixty-five per cent. of the world's needs in linen fibre and these territories are overrun at present by the Germans. There are no visible reserves of linen fibre, and war needs have monopolized linen production practically and will continue to do so, no doubt. The first order for American aeroplanes, for instance, required 3,850,000 square yards of linen.

It is the coarser commodities—such as heavy cordages, binder twines, commercial twines and sackings—however, with which we are more immediately concerned. The decrease in the supply of raw material is hitting these also. It is from hard fibres—such as sisal hemp, New Zealand hemp, Manilla hemp and different grasses—that heavy cordages ranging from ship cable to binder twine are made. The hard fibres cannot be spun. The soft fibres which can be spun—linen tows, retted Italian hemp and jute—make into commercial twines and coarse webbings.

Retted Italian hemp and linen tows cannot be secured now for cordage purposes, while New Zealand and Manilla hemp is produced only in limited quantities. Sisal hemp, from which our binder twine has been made in the past, is a strong, coarse fibre which is obtained from the leaves of the Agava rigida. It grows luxuriantly on the thin, calcareous soil of Yucatan, Mexico, requiring little moisture.



Making Twine from Straw. A View of the Interior of Flax Working Mills at Rosetown, Sask.

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