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INSTRUCTIONS  
FOR THE  
CULTURE AND PREPARATION OF FLAX  
IN IRELAND.

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INSTRUCTIONS  
FOR  
THE CULTURE AND PREPARATION  
OF  
FLAX IN IRELAND.

BY  
MICHAEL ANDREWS, JUN.

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SECOND EDITION REVISED.

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1869.



THE first issue of the following instructions for the culture and preparation of Flax in Ireland having been all distributed, I consider it expedient to publish a Second Edition, slightly revised.

These instructions having been appreciated, particularly by the Agricultural community outside of Ulster, I am, therefore, of opinion a further dissemination of information on the subject in this form will aid the important task this Association has undertaken, viz.:—to improve the culture of Flax in Ireland, and to extend its growth in the South and West.

MICHAEL ANDREWS, JUN.

*10, Donegall Square West,  
Belfast, 1st March, 1869.*





## INTRODUCTORY.

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In compiling the following instructions on the culture and preparation of flax my object has been to describe the several operations with such minuteness, and such language, as to make it comprehensible and available to those classes engaged in agricultural pursuits for whom it is specially intended. My design has been to point out a course which, if followed, would make the cultivation and manipulation less hazardous, not so exhaustive to the soil, more productive, and, consequently, more remunerative. In former publications I have strongly pointed out that an increased produce per acre is what will stimulate an increased growth of flax ; and I am very sanguine that an adherence to the directions I have given would produce this effect.

These instructions are applicable specially to the present mode practised almost universally in Ireland, of immediate steeping or retting after being pulled. It would be very imprudent to endeavour to change suddenly the manner the crop has been treated for such a length of time in Ireland. The first object is to obviate defects that exist in the system now pursued, and leave it to time to introduce new and improved methods which will undoubtedly follow.

Great advantage will be gained when the practice frequently followed on the Continent can be brought into operation here, viz :—Drying the flax in the field, and stacking it till the following Spring, then when the weather becomes warm enough, retting and grassing it. Hitherto this system has not been attended with success in Ireland ; but the difficulties, however, will no doubt yield as more skill is brought into operation.

Ireland has a climate that admirably answers the growth of the plant, but by the time it is ready for the dam the character of the weather has usually changed. Chilly nights are not unfrequent, which check the fermentation, and often the process of drying on the grass at so late a season is uncertain and difficult. Flax-spreading generally occurs at the time of the equinox ; the high winds which prevail at that period do great injury by lifting it off the grass, tossing and scattering it in every direction. I have known crops from this cause almost completely lost. Retting and grassing the same season as grown is always a very hurried business, more particularly as it occurs just at the time attention must be given to the grain crops. So long as the farmer performs the operations that follow the period



when the crop has reached maturity, the present system will be practised, more especially by the small farmers who cannot wait till the following summer for a return from the crop. The day, however, without doubt, will come, when the farmer's province shall only be to grow the crop, leaving the preparation to others, who will pursue it as a separate and distinct industry, and this time will be hastened when the culture shall be improved and more uniformity in the crop attained.

What I have advanced against immediate steeping and grassing may be said to be equally applicable to drying and stacking. The time, however, that would be occupied in steeping will be available for drying. Handling flax straw, as pulled, is very different from handling watered flax. The former will bear a great deal more inclement weather and high winds without material damage than the latter, which is a tender (I was going to say fragile) article, and much more susceptible of injury. At present flax is sometimes dried and stacked in the North, but the adaption of this method will probably be attended with more success in the South, where the better climate will facilitate the operation, and coming earlier to maturity will enable the drying to be done during a more favourable season.

From a perusal of the instructions that follow, it will be perceived that under the present system there are so many circumstances over which the grower has no control, that the most practical, skilful, and experienced will frequently be baffled in attaining favourable results ; but I am sanguine in time uncertainty will in a great measure disappear. The manipulation subsequent to the crop reaching the stage of maturity will eventually become a separate enterprise, and be attended with results equal in uniformity to what is produced in the majority of other manufacturing processes.

The conclusion of the preceding paragraph may appear ambiguous, but it has reference to a method of entirely altering the present system of retting flax, which has for a long time occupied my attention, and I cannot refrain from giving an outline of my ideas before closing this introduction.

The method of retting by fermentation in water of moderate temperature is a very safe one ; and, as far as our present knowledge extends, hastening the process by the use of chemical agents is attended with danger to the safety of the fibre. The woody matter which it is necessary to get rid of is enveloped by the fibre, and any chemical substance that might be employed for the purpose of destroying it and dissolving the gum which causes the fibre to adhere to it, would have to penetrate the fibre before reaching this core, and thereby run the risk of injuring what is wanted to be preserved in the *soudest possible condition*. It may be said that my argument applies to the "water process" as well as to a "chemical process;" but to this I answer, in the one case a mild agent is employed, in the other an active and powerful one. If uniformity of temperature, and of the degree most



favourable to fermentation, could be depended on during the time flax requires to remain in the open dams now in use, the present system would do very well, but in this climate such circumstances cannot be reckoned on. A few days of hot weather may occur after putting the flax in the dam, and the process of fermentation goes on satisfactorily; but, as frequently occurs, the weather changes, and the operation of retting is retarded and deranged. The method of retting flax by what is generally known as the "Hot water system" has hitherto failed to produce a strong and tenacious fibre.

To attain *uniformly* results, equal to the best arrived at in the open dams so generally used in Ireland, is what is wanted, and this might be done by constructing retteries, where the flax would be steeped in tanks, and by artificial means a regular and suitable temperature maintained *in the chamber* in which the tanks are constructed, during the entire time it was undergoing the process of fermentation—drying on the grass in the ordinary way when the weather permits, but when unfavourable provision must be made for drying artificially under cover.

In this way I have no doubt a very superior sample would be produced, and of an average standard of quality much higher than at present.

One great advantage in this system, when perfected, would be, that retting, drying, and scutching could go on without intermission the entire year, quite irrespective of weather; and this, I need scarcely say, would be a great stimulus towards what I alluded to before, viz.:—the manipulation of flax becoming an enterprise completely isolated from the agricultural department.

I need not enter into the advantages that would attend this method of retting flax, which I have scarcely a doubt would be successful; and if once brought into operation, would revolutionise the treatment of the raw material that forms the basis of the manufacture of linen.\*

It has been my aim to treat the subject in a practical manner, avoiding all theoretical and fanciful ideas, describing the various stages connected with the culture and handling of the crop with as much brevity as is consistent with clearness.

Exception will, doubtless, be taken to some points in my instructions. I have, however, given care and consideration to the subject, and I trust my labour may not be in vain.

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\* Since this was "in type," I have observed in the annual report, for the year 1854, of the Royal Society for the Promotion and Improvement of the Growth of Flax in Ireland, that M. Reuter, of Vienna, had adopted this system, and that six retteries on the plan were about to be established by public companies, and four others, by private individuals in Austria. My idea, therefore, is not new; however, I never had before seen any description of artificial retting being done otherwise than by introducing the heat through which the temperature was raised and maintained directly into the vats containing the flax.

# Houses of the Oireachtas



# INSTRUCTIONS

FOR

## THE CULTURE AND PREPARATION

OF

## FLAX IN IRELAND.

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WITH every farmer the first consideration should be, is the land he holds suitable to produce a *profitable* crop of flax, and if the facility for watering can conveniently be had. Land intended for flax must be in good condition and clean.

Peaty land, where a clay bottom does not exist, also sandy land, with a gravelly bottom, are unsuitable for flax, and a small yield and poor fibre may be expected if grown in such soil. Medium and alluvial soils are the most suitable, and on an average of seasons easily brought into a proper state of tillage to receive the seed. On heavy land, if the season is favorable for pulverising the ground, crops of flax, rich in fibre, will be produced. Of course, I assume in all cases, where requisite, the land is properly drained. It is impossible to convey in an instruction such as this a proper idea as to every variety of soil that would be likely to give a good crop, but I may remark that land in "good heart" will produce the best yield, and the fibre will be of superior quality. Poor land will produce a weak fibre. Those who are ignorant of flax culture must depend on receiving advice as to soil from persons who possess practical knowledge. In selecting land for flax it is desirable to have it as flat as possible, with a cool bottom; hilly land will not produce flax of a uniform reed.

SOIL.

The next point to decide, and most important, is what extent of the farmer's holding it is proper and judicious for him to devote to flax. This it would be difficult to determine, as much depends on the capability of keeping up the condition. At present, one of the most serious defects in Ulster is the small farmers putting in too large a proportion of their holdings. A progressive scale might be adopted. But I admit this question is open to discussion. I would say, on

PROPORTION  
OF LAND.



farms up to thirty acres the extent of flax should not exceed 10 per cent., and as the farm increases in size the proportion of flax may be extended, but not greatly in excess of this ratio.

ROTATION.

After potatoes or old pasture, off which one white crop has been taken, a good flax crop may be grown; but it too frequently follows wheat or oats grown after green crop the previous year, which only answers when condition is kept up by extra manuring. I shall say little on the too frequent repetition of flax on the same ground, and for this reason, if the proportion I have already pointed out is adhered to, a sufficient interval of necessity will elapse. It should not be repeated more than once in seven years. In the South of Ireland flax is frequently put in lea land, and although heavy crops are often produced it is objectionable. One reason is the difficulties of bringing it into a proper state of tillage, another is the danger of the cut-worm, which attacks not only flax but corn sown in lea land, and is often a source of much disappointment to the farmer.

In flax culture sufficient importance has not been placed on a judicious rotation, and want of attention in this respect has been to a great degree the cause of the diminution of the yield per acre. Since the acreage under flax has so much increased, it has become too frequently a stolen or extra crop, without a compensating quantity of manure being given to the land. An examination of the following rotations will illustrate what I mean more clearly. When no flax is grown, the usual four-course rotation is pretty generally adopted, viz. :—

Potatoes and Turnips,  
Wheat laid down in,  
Clover and Grass,  
Oats.

When flax, however, is grown, the rotation has too often become one of five courses, viz :—

Potatoes and Turnips,  
Wheat,  
Flax, laid down in,  
Clover and Grass,  
Oats.

This, I confess, was my practice ; however, I gave additional manure, and kept up the condition of the land. In too many cases the manure, instead of being increased, is curtailed—flax only producing money, which is usually spent, *but not on the land*.

The system that will maintain the land in a fertile condition is to adhere to what is commonly called the four-course rotation, in which flax would be included ; but, instead of putting all the land in wheat that had been in green crop the preceding year, I would divide it, say, two-fifths in flax and three-fifths in wheat ; and, by examining the following rotation, it will be seen flax will not be repeated in the same land till after a lapse of nine years. When turnips and potatoes are both grown, it will also be observed by *shifting* the side of the field



flax will *never* follow turnips—flax following turnips is considered *very objectionable*.

YEAR.	CROP.	
1	TURNIPS.	POTATOES.
2	WHEAT OR OATS.	FLAX.
3	CLOVER AND GRASS.	
4	OATS.	
1	POTATOES.	TURNIPS.
2	FLAX.	WHEAT OR OATS.
3	CLOVER AND GRASS.	
4	OATS.	
1	TURNIPS.	POTATOES.
2	WHEAT OR OATS.	FLAX.

1

2

3

4

5

6

7

8

9th year.

I have prolonged the rotation to show the flax returning to the same land on the ninth year. The above two-fifths allotted to flax would be my ratio of 10 per cent., as a proper proportion of a farm to appropriate to flax. If this system were adopted, there would be fewer impoverished farms in Ulster than there are just now. What really would reinvigorate the growth of this valuable crop would be to decrease the acreage allotted to wheat and substitute flax.

These observations apply to the North of Ireland, but, of course, what I advise will require to be modified to suit the various kinds of land, in fact no definite rule can be laid down, the farmer must exercise his judgment. In the Southern and Western provinces, the small per-centage under flax, compared with Ulster, as shown in my Statistical Review, will make the period distant when it would be necessary to adopt in the South and West what I have recommended. A word of caution, however, to small farmers, even outside of Ulster, as to the too frequent repetition of flax in the same ground may not be unadvisable.

I do not wish it to be supposed that I recommend the rotation mentioned to be adopted without intermission. I know too much of farming operations not to be aware that ground cropped for a succession of years must have rest. I merely introduce these rotations to exemplify the judicious repetition of crops in ground under cultiva-



tion, assuming that a portion of the farm is undergoing the necessary renovation produced by remaining in pasture for some years.

PREPARATION  
OF LAND.

Stubble land intended for flax should be ploughed deep in the autumn. If light, allow it to remain till seed time ; medium may require a second ploughing, which should be done not less than two months before sowing ; heavy land will, without doubt, require the second ploughing, and, perhaps, grubbing, to bring it into a proper state. The second ploughing must not be deep ; say, three to four inches. When flax is intended to be sown in potato ground it must only receive one shallow ploughing, say three to four inches deep ; and, if the soil is light, this should not be done till a month or six weeks previous to sowing ; but, if heavy, it would be desirable to have it done earlier, so as to be exposed to the pulverising influence of the frost. When seed time arrives, should weeds, such as docks, sit-fast, couch grass, &c., appear, they should be removed, *previous to harrowing*, by men with grapes or spades, and children to gather. When this is done, harrow fine ; if in ridges, up and down *only*, if flat, cross harrow also. The reason for not cross harrowing ground in ridges is, it draws mould into the furrows and leaves too loose a bed for the seed in the furrows and brows. Flax likes a firm bed. When the land is drained or naturally dry I would recommend flax to be put in flat, which will make the crop more even in length. It is a great matter to have flax as uniform in length as possible. Where there are furrows in the field it will grow shorter in the furrows and brows which should be avoided if possible.

PULVERISING.

The extent of pulverising depends on the nature of the soil. On light and medium excessive pulverising does injury ; if it has received a deep ploughing in the autumn, and, when necessary, a shallow winter ploughing in addition, all that is required is a sufficient quantity of fine surface mould to give a good bed for the seed. Pulverise such soils to any great depth, and the chance of a good crop of flax is doubtful, unless in an unusually wet season. Heavy land, on the contrary, will bear any degree of pulverising.

SOWING.

After every harrowing, pick the land perfectly clean of weeds, remove any loose stones that are large—small stones will do no harm. Previous to sowing, roll once ; and after rolling some give a single stroke of a seed harrow before sowing. I would recommend sowing on the rolled surface. A dry calm day must be chosen for putting in the seed. Flat ground should be tracked out into lands to guide the sower. As to the time of sowing much depends on the situation. Near the sea coast it will be safe to sow early ; inland, too early sowing is hazardous, for fear of late spring frosts, which do material damage, frequently causing injury to the tender plant, and thereby making it branch, one of the greatest misfortunes that can befall the crop.

The object of early sowing is to have an early pulling ; but this is not always attained, as so much depends on the weather during the



summer. Late sowing will often produce a heavy crop. The largest crop I ever had was sown on 10th May, and it was ready for pulling nearly as soon as some of my neighbour's flax that was put in much earlier. Notwithstanding the dread of late Spring frost I would advise sowing to be completed before the last week in April, so as to have the flax abraid by the 1st May.

The kind of seed depends on the ground. If heavy, or after green crop, Dutch seed would be the most suitable; on light or medium soil Riga seed will answer best. As to the quantity of seed much depends on the kind sown, quality of seed, and the description of fibre wanted. Dutch seed produces a finer fibre than Riga; but the class is also affected by the quantity sown; thickly sown produces a finer fibre than when sown thin. The tendency in Ireland is to put too little seed in. Two bushels per statute acre is an average, but a man who understands sowing (and no other should be employed) need not be confined to specific quantity—experience will have taught him how properly to distribute the seed, having ascertained the wishes of the grower as to the nature of the flax he is desirous to produce. Riga seed should be passed through a flax riddle, previous to sowing, to get rid of the weed seeds; this will save expense and labour when weeding-time comes round. Dutch seed, being much better cleaned, will seldom require this operation. Flax riddles are made expressly for the purpose of perforated zinc, and can be purchased for 2s 6d each. After being sowed, harrow in with seed harrow; two strokes will usually do.

Ground intended to be laid down in clover and perennial rye-grass should be sown immediately after the flax, and before it is harrowed in. I would particularly recommend that *no* Italian rye-grass should be sown with flax; its vigorous growth causes it to injure the lower portion of the reed of the flax, particularly in wet seasons. If Italian is wanted, let it be sown on the surface after pulling, choosing a wet day.

If dry, roll at once across the field, not up and down. The best chance for a good crop of flax is rain coming immediately after sowing is completed; it makes a strong and even braird, but if any weak spots appear, a dressing of soot, or a stimulating artificial manure will much improve it, and which should be applied in wet weather.

When about 4 to 7 inches high, it must be carefully weeded, pulling the seed weeds and cutting the larger ones that have strong roots. The weeders should either have no shoes on, or else shoes without large nails, and they must be most careful to tread on the flax as gently as possible, putting down the foot flat and not twisting it on the ground. In a few days the crop will recover the effects of careful weeding. After this operation nothing remains to be done till ready for pulling. When the blossom falls and the bolls are formed the crop has attained its height.

I must remark that when the crop has arrived at the proper stage

WEEDING.



of growth to require being weeded, if the weather is dry, and has been so for some time, do not, on any account, attempt to pull the weeds, as it will injure the crop materially by loosening the ground about the root of the tender plant, and cause it to yellow and become sickly, from which it will seldom recover. Better allow the crop to remain unweeded; in fact, never weed unless the ground is damp.

#### PULLING.

When ready for pulling, the stalk next the ground will become of a pale yellow, and the leaves will fall off 8 to 10 inches from the ground. The *top* seed bolls will also assume a *slight* brownish hue. Judgment is required. Taken too young will make a tender fibre, and loss will occur in scutching; allowed to get too ripe will make a dry, coarse flax. Experienced hands should, if possible, be procured for pulling; children will not do. The flax is caught a short way below the bolls, and by a dexterous jerk of the arm removed from the soil; the butts or root ends to be kept as even as possible, laid down in handfuls, as pulled, of a size that can be conveniently grasped, and crossed, so as not to entangle.

#### RIPPLING

If to be rippled, then carried by children to the rippers. I now pause to say a few words on rippling. The rippling comb need not be described, as it can be bought very suitable for the purpose; but I must not omit to say *round* iron for the teeth is much preferable to square; the latter is liable to tear the flax. It should be bolted to a plank, and securely lashed to the body of a cart, or to a frame, as may be most convenient. In this operation the flax should be handled with care; three or four strokes through the comb will be sufficient; each handful of flax must be held *very* tight, with both hands, and slightly opened like a fan; the extreme ends should only enter the comb at the first stroke, gradually increasing at each succeeding stroke as far as the bolls extend. As rippled, children carry it to be tied in beets, which ought to be loose in the band and small in size. Rushes make the best bands, but there is little or no waste using short flax to tie with. It is then ready to cart to the dam. The bolls in the green state should be at once removed and spread on lofts, turned frequently, and when partially dry, taken to a corn-mill and finished on the kiln, moderately heated. If the crop is very uneven in length, it is desirable to make two pullings, keeping the long and short separate, and steeping each apart.

#### DAMS AND WATER.

The dams should be made long before they are required, and dug out of clay, if possible. I would recommend a number of moderate sized dams in preference to large ones. Nine to twelve feet broad and four feet deep will answer; but the dimensions will vary according to the situation; four feet deep should not, however, be exceeded. Choose a sheltered situation, with an aspect exposed to the sun. Make them sound so as to retain the water; and bear in mind, flax water will leak through what will retain clean water. It would be difficult to give the capacity of a dam which would contain the produce of an acre of green flax, so much depends on the crop; a dam however about 50 feet long,



9 feet broad, and 4 feet deep, should contain the produce of a statute acre of an average crop.

If the dams are so situated as to allow the water to be run off, fix a pipe in the bottom or side for this purpose. Never use the same water a second time to steep flax in. Soft water is by far the best; however, exposure to the atmosphere will considerably improve water with some degree of hardness. Water impregnated with iron, unless in such quantities as to cause iron rust (this is seldom to be dreaded) should not be rejected *if no better is to be had*. The presence of iron will not make it hard; the only effect it has is to discolour the flax to some extent, and, of course, from this cause lessen its value. When a farmer has soil that promises to give a *good* yield, I would not discourage him from sowing flax because he has no other than water with a tinge of iron in it to steep in. Bog holes used as steeping dams are not objectionable, but should be of old formation, not recently dug out. What *must be avoided* is, water largely impregnated with lime, and if no other can be had, I certainly would not advise any farmer to grow flax if he would be obliged to use such water for steeping purposes. An easy test (call it chemical if you will) accessible to every one is—any water in which soap will *not* curdle is sufficiently soft to steep flax in. But as regards this important matter of water observation ought to be the guide to a great extent. Any farmer, however, having a choice of water on his farm can have it tested as to its suitability by sending specimens to the office of the Flax Extension Association.

The next operation I am about to describe I would call special attention to, as it is by far the most important and delicate process the crop undergoes, and on which the success of it as to quality depends, viz., steeping or retting. After the beets have been tied in the manner described, they are carted to the dam. What is pulled each day should be put into the dam the same evening, if possible, but never mix one day's pulling with what has been pulled the day previous. Begin at one end of the dam and place the beets in rows close together, side by side, with the root end down. When one row is completed, commence a second, placing the top of the beet about the strap of the first row, and so on, row after row, till the dam is full; a layer may be put on the top, laying the beets flat. The next thing to be done is to cover it with ragweeds (which are only too readily procured) and then put on stones or sods, with the grassy side down, to sink it below the surface of the water. The above is presuming there is already sufficient water in the dam; but if it could be so arranged to have a stock dam situated above the steeping dams, it would be more advantageous to put the flax in dry, and when stoned run the water in. The sooner fermentation commences the better. If the weather has been and is warm it will set in immediately, and will cause the flax to rise and come above the water. It must be well tramped down, and more stones put on. When the fermentation subsides, it will sink in the dam; it will then be necessary to remove

RETTING  
OR  
WATERING.



some of the stones to let it rise to the heat, but never allow it to get above the surface. After a few days, the flax must be examined, and now is the time when judgment is requisite to decide when it is sufficiently watered. Take a beet or two out of different parts of the dam; open and examine. If glit appears in the middle of the beet, and it feels soft when grasped in the hand, it is an indication that it is nearly ready to "take out." Take three or four reeds, which will be found covered with a greenish slimy substance, and if this can be removed from the surface by *delicately* passing it through the finger and thumb, it is an unmistakable indication that it is in a condition to leave the dam; also, bend them *gently* over the fore finger, and should the woody part freely separate from the fibre and start up, it is time to throw it out; the reed must be examined throughout its length, and will be found softer at the root end; but, if it yields to this test in the middle, it may safely be considered watered. Try both tests, and examine both coarse and fine reeds; the coarse will "water" before the fine, so an average of condition must be taken. The Dutch test it by taking a reed, and holding 10 inches of the middle of it, and twisting with each hand in the reverse direction; and if the fibre separates freely from the core it is considered watered. This is by far the most critical operation in flax manipulation. Flax is more frequently underwatered, calculating on the grass finishing the operation. Water well and leave little more than drying necessary on the grass. When you commence to examine, it must be done daily, and, as it approaches being finished, it should be looked at twice each day. When you are satisfied that it is done, take the stones off, and throw it out on the bank; allow it to drain for an hour or two, and then cart to the spread ground.

## GRASSING

Grazing or stunted pasture is best for this purpose. Any tall weeds or grass should be cut down with a scythe before spreading. Distribute the beets at convenient distances for the spreaders, who should shake it out thin and evenly in rows across the field, letting the top of each row lap the root end of the preceding one about two inches, which is a great protection if high winds happen when on the grass. Some object to overlap it as it has a tendency to entangle in the operation of lifting. Flax is sometimes turned while on the grass, which, no doubt, is an advantage, but, in my opinion, a dangerous operation at the season when flax is spread in Ireland, as it loosens it on the grass, and wind has more power on it; however, if it is to be turned, it must not be overlapped.

An unexperienced hand would feel alarmed on examining his flax the day after it is spread to find it quite "tight," and, without much rubbing, the fibre most unwilling to part from the woody core; but, if it has been properly watered, a day or two will remove all apprehension; it will begin to "bow"—that is, the fibre contracting, leaves the core and forms a string. When this takes place, and a slight rubbing causes the woody core to break and fly off, leaving the fibre entirely,



it is ready to lift. Never take flax off the spread, unless on a dry day, nor if the dew is on it. In lifting, great care must be taken to keep the butts or root ends very even. Lay it down in bundles sufficient to make *small* beets. Then tie moderately firmly, and stook for a day if the weather is settled, but if doubtful, carry it to a loft, or stack it, being now ready for the scutch-mill.

The foregoing directions as to these very nice operations assume that the weather has been such as is calculated to produce the most favourable results. But, suppose the steeping process is approaching its final stage, and the weather appears unsettled, with a falling barometer, I would be inclined to take the flax out of the dam before it was quite ready; it would in this condition (being what is termed somewhat hard) be better able to stand, without injury, unfavourable weather on the grass. On the other hand, had the flax been sufficiently watered before leaving the dam, and got thoroughly dry on the grass, and there appeared an indication of rain, I would not delay to lift it and put it in stacks, where, in a few months, it will attain that condition which the proper time on the grass would have effected. Indeed, it is advisable not to take flax immediately to the mill—stacking will improve it and make it in better condition for scutching. If, as I have frequently seen, a continuance of rain occurs while flax is on the grass, and before it can be got properly dried, it will do it much injury, causing it to mill-dew, more especially when the grass begins to grow up through it. In this case I would recommend it to be lifted in large handfuls, and set up in the shape of a cone. In lifting flax, when dry, off the grass, it is by gathering the root ends in the hand, but lifted to put in these cones it must be by the *boll* ends, and when formed into the cone, slightly twisted at the top, so as to make it stand, and, to some extent, prevent wind blowing it down.

I must not omit to say a few words on the seed, the supply of which is principally foreign. In this climate home production would be too precarious to depend on. Another consideration to treat flax, so as to save the seed suitable for sowing, reduces the quality of the fibre. However, it would be desirable that large growers of flax should reserve a small portion of each year's crop for seed—of course, assuming that the crop is grown from Riga seed. The portion set apart should be sown rather thinner than that from which no sowing seed is intended to be taken, and allowed to ripen on the foot. Seed must be selected by its appearance, choosing a plump, bright colour, and as free as possible from imperfect pickles. But even with all these characteristics, the farmer may not obtain a really good article. The best chance is to purchase a known brand from a reliable importer.

I have heard it stated that in Belgium seed two years old is preferred, and I think it very likely to be the case. I do not know the vegetating life of flaxseed, but this I know, there are some seeds which retain vitality for a considerable number of years, and they do not produce their crop in perfection till they have attained some age.



It may be observed I have said little about the time these several operations require ; for this reason, so much depends on the weather and other conditions where *observation can be the only guide*. For example, if the weather is warm, both day and night, during the period of steeping, it will take far less time than under reverse circumstances. Flax cannot be watered to advantage when the nights become chilly.

Every farmer should have a barometer, and regulate all his out-door operations according to its indications. It will prove a faithful friend, and save not only money but a vast amount of anxiety.

The value of the water as a liquid manure, in which flax has been steeped, has been overrated, and I think it is very doubtful if it is worth the cost of pumping and distributing with carts over the land ; certainly it is not practicable for the small farmer.

DRYING IN  
FIELD.

A few observations on drying the flax in the field the year it is grown, and stacking till the following summer before being steeped, may be useful. If the best fibre is wanted, pull as directed before, and, if sufficient bolls are on the flax to make it worth while, ripple, which will facilitate the drying operation. I omitted to mention that flax deficient in bolls is richest in fibre. As pulled, range it in rows in the field, set up in the form of an inverted  $\Delta$ , keeping the butt ends on the ground and the boll ends leaning against each other. The flax is set up in this manner by a man ranging it over his left knee and walking backwards, being supplied with flax by children carrying it to him. If the weather is fine, it will soon dry sufficiently to admit of it being stooked without risk of heating. Begin the stooks in the same manner as above described, in rows about twelve to fifteen feet long, adding to the rows till sufficiently broad to stand firmly, laying flax flat on the top and tapering it. Some thatch with flax, forming the ridge with the boll ends, but I would recommend it to be thatched with straw made into staples, similar to those used to thatch grain, then bind it with a single straw rope. In this state it remains till in a condition to go into a stack, and when ready it is tied in beets and carted to where it is intended to stand. The stacking is done in the same manner as grain, but should be built on hovels placed on pillars, which are vermin proof. Sometimes the flax is tied in the beets before being stooked ; if this is done the beets must be very small and loosely bound.

SCUTCHING  
AND  
BREAKING.

It would be impossible to convey how the scutching operation should be done to the best advantage. Experienced scutchers, with care, will turn out good flax, *provided* it has been properly handled by the grower. If care has been taken in the several stages to keep the flax even it will facilitate the scutching—I mean when pulled, when tied in beets after being rippled, when spread, when lifted off the grass, and when finally tied in beets for the mill. If this is done it will go even into the rollers, and the streakers, unless very careless, can give it in nice order to the scutchers, who will be enabled to do their work with much less loss than would arise if it arrived at the mill in slovenly-made beets.



I may further remark that all attempts which have hitherto been made to construct machines, with a view of improving the scutching of flax, have proved defective, and the old system, with some modifications, has been found the most effective. If perfect uniformity in the condition of the straw as it comes from the farmer could be attained, the recently-constructed machines would answer and save labor, but the variable state of the flax straw makes the present method more applicable. However, the preliminary operation of breaking is likely to undergo much improvement, and when more perfect breaking is attained less scutching will be necessary, which will diminish the waste, so general now, by lessening the quantity of tow produced.

In Ireland the mode of cleaning flax by hand-scutching is not sufficiently attended to, and the method adopted in some parts of the country of breaking the flax previous to scutching is of the rudest kind. The pernicious practice of "fire drying" is very detrimental to the quality of the flax by robbing it of its oily nature and producing a dry harsh fibre. The implements used in Ireland are very inferior to those employed on the Continent, where nearly all the flax is manipulated by hand, but frequently, previous to being scutched, it is broken by rollers driven by steam power. In districts where hand-scutching is extensively practised in Ireland, I would suggest the use of rollers similar to those used in scutch-mills, which could be driven by horse-power, where the farmers could have their flax efficiently broken, and be thus enabled to hand-scutch it without submitting it to the injurious process of fire drying. Belgian and Dutch stocks and handles have been brought to this country by the Flax Extension Association, and can be procured on application.

In entering into all the operations that the flax crop has to undergo, I have found the detail more lengthened than I anticipated, and this has arisen in some degree by not only describing them, but dwelling fully upon the reasons why these operations should be performed; and in some cases explaining what would be the effect of adopting a contrary method.

Farmers beyond the limits of Ulster are too apt to depend on others as to how a flax crop should be managed, and are not sufficiently reliant on their own judgment to guide them in the several operations. The growing and handling of a crop of flax only requires a little more care and attention than *should be* bestowed on a well-cultivated crop of oats. The foregoing instructions if followed by any moderately careful farmer will make him in a short time master of the art (if art it be) of flax culture. A farmer will never gain the requisite knowledge so long as he depends entirely on the supervision of another to direct him. Never till the farmers in Connaught, Munster, and Leinster, acquire that habit of independence will they place themselves, as flax growers, in the same position that our Ulster farmers enjoy.

Another consideration should inspire the Southern farmers with self-confidence and stimulate them to grow flax, is the advantage



possessed by them in soil and climate, which will enable them to produce crops larger in yield and at a less cost than is done in the North of Ireland.

I have avoided some points that may be considered essential, such as "sub-soiling," but agricultural operations of this nature, under existing circumstances, would rarely be attempted by those who produce in the aggregate the large proportion of the flax grown in Ireland. Entering into such topics, I consider, would be more adapted to a treatise on general agriculture, but introduced into an instruction solely on the culture and preparation of flax would tend to embarrass and perplex those who may read it.

I now conclude by hoping that those who peruse these pages may obtain some useful hints on the culture and manipulation of flax. My endeavour has been to point out how to attain what is just now so necessary, viz., an increased yield per acre, and an improved quality of this fibre, which is so indispensable to the staple industry of Ireland.