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*Flaxseed*

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AN ECONOMIC STUDY  
of  
LINSEED PRODUCTION  
in  
THE UNITED KINGDOM

by

A. F. HUNT, B.Sc. (Econ.)



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1951

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## GENERAL BACKGROUND.

One of the most economically useful plants which it is possible to cultivate in this country is that given the botanical name of "Linum usitatissimum". When grown for its fibre it is known as flax but when cultivated for the seed it is usually called linseed. Flax is used in the manufacture of linen; linseed provides one of the most important industrial oils, as well as being a valuable protein food for animals.

The two varieties of the plant are similar but the fibre producing types are taller growing and do not branch to the same extent as the seed producers. They are both cultivated in most temperate regions of the world where conditions are cool and humid. The most important producing countries before the war were India, Argentina, the United States of America, the Soviet Union and the Baltic States. In the first three the plant was cultivated almost exclusively for linseed but in the others it was grown primarily for the flax.

The pre-war changes in world output of linseed and the relative importance of various producing countries have been described by the Commonwealth Economic Committee as follows:—

"The trend of production before the war was slightly downward, the annual average for 1934 to 1938 being about  $3\frac{1}{4}$  million tons as compared with  $3\frac{1}{2}$  million tons in 1929 to 1933 and  $3\frac{3}{4}$  million tons in 1924 to 1928. Argentina was by far the most important producer with an average annual production of about  $1\frac{3}{4}$  million tons. The Soviet Union held second place with an output of from  $\frac{1}{2}$  to  $\frac{3}{4}$  million tons, while India and the United States ranked third and fourth with annual crops of nearly  $\frac{1}{2}$  million tons respectively. The whole of the production of the Soviet Union and the United States went into domestic consumption."<sup>1</sup>

Output in the three principal producing countries declined during the war for various reasons:—in Argentina because of droughts in 1943 and 1944, in the Soviet Union because the main producing

<sup>1</sup> COMMONWEALTH ECONOMIC COMMITTEE. *Vegetable Oils and Oilseeds*, p. 23. H.M. Stationery Office 1948.

areas were occupied by the Germans in 1941, and in India because the critical food situation necessitated some change-over from oil producing crops to grain and pulse crops. In spite of this, world production was maintained and even increased to a peak in 1943 due mainly to greatly expanded production in the United States and Canada to meet increased domestic requirements. World production declined after this date, however, to about  $2\frac{3}{4}$  million tons annually for the period 1944 to 1946, but in 1948 it was estimated that the world total was in the region of  $3\frac{1}{4}$  million tons.<sup>1</sup>

The production figures of all the main producing countries were, in 1948, still below their pre-war levels, with the exception of the United States and Canada which were producing very much more than in the immediate pre-war years.

The most important exporter of linseed before the war was Argentina, but by 1947 this was no longer true. Some time before that date exports of linseed were controlled there, as also in Uruguay and India, so that in 1946 the principal exporters of seed in descending order of importance were India, Uruguay and Argentina with 82,000, 80,000 and 38,000 tons respectively, but an increasing proportion of the trade is now being done in oil, with Argentina and Uruguay as the chief exporters.

#### HISTORY OF LINSEED IN THE UNITED KINGDOM.

Before the 1939-45 war linseed was of very minor importance in this country, although flax had been grown a little more widely, especially in Northern Ireland. In the years immediately preceding 1939 the acreage devoted to linseed production increased very gradually year by year, yet it never exceeded 4,000 acres, an area representing only 0.25 per cent of the average acreage under wheat for the years 1929 to 1938.

The paint, linoleum and other industries using linseed oil and the farmers who used linseed cake and meal depended for the bulk of their supplies on foreign sources. These supplies came into this country in two main forms, as cake and meal, and as seeds. The residue of the seeds after the oil had been extracted in this country was by far the more important source of linseed cake and meal. "Imports of seed to the United Kingdom came almost entirely from India and

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<sup>1</sup> COMMONWEALTH ECONOMIC COMMITTEE. *Vegetable Oils and Oilseeds*, 1948.

Argentina, the latter being the principal source of supply up to 1932 and India the main source in the later pre-war years. Since 1939 the supplies obtained from these two countries have fluctuated very considerably. In 1943 and 1944 when imports from Argentina were heavy, consignments from India were greatly reduced by shipping difficulties."<sup>1</sup>

The following table shows how the imports of linseed products were distributed, the amount of cake and meal available from foreign sources and the most important suppliers in the years 1939 to 1949.

IMPORTS OF LINSEED PRODUCTS RETAINED IN THE UNITED KINGDOM

TABLE 1. ('000 TONS).

Year	1	2	3	4	5
	Seeds for expressing oil	Estimated yield of cake and meal (70% of Col. 1)	Cake and Meal	Oil (Raw Boiled and Refined)	Estimated total of cake and meal derived from imported products (Cols 2 + 3)
1939	† 329	230	31	15	261
1940	351	245	54	(a)	299
1941	232	162	† 7	—	169
1942	† 265	185	10	(a)	195
1943	* 507	355	—	—	355
1944	* 264	185	* 9	4	194
1945	† 142	99	* 77	* 8	176
1946	104	73	* 9	* 60	82
1947	† 40	28	* 181	* 112	209
1948	† 19	13	* 277	* 46	290
1949	83	58	86	85	144

(a) Negligible.

† Over 75% of the total supplied by British Countries e.g. India, British East Africa, Canada etc.

\* Over 75% of the total supplied by Argentina.

Sources—Cols. 1, 3 and 4—*The Annual Statement of Trade of the United Kingdom and the Monthly Trade and Navigation Accounts*. H.M. Stationery Office. The figures have been rounded to the nearest thousand.

Significant points which can be seen from the table are the recent decrease in imports of seed and the increases in the imports of oil and of cake and meal.

1 COMMONWEALTH ECONOMIC COMMITTEE. *Vegetable Oils and Oilseeds* p. 29.

The area planted to linseed in the United Kingdom in 1939 amounted to 3,000 acres. With the outbreak of war our overseas supply lines were threatened and it became essential to economise in shipping space. In consequence the acreage devoted to linseed increased considerably from 1939 as shown by the following figures :—

ACREAGE OF LINSEED IN THE UNITED KINGDOM

TABLE 2.

'000 Acres

1939	3	1945	11
1940	12	1946	11
1941	29	1947	38
1942	29	1948	86
1943	15	1949	58
1944	14	1950	38

Source—*Annual Abstract of Statistics No. 86* H.M. Stationery Office.

Even in the peak year of 1948, however, the home grown supplies of linseed contributed only a small proportion of the total amount of linseed cake and meal consumed in this country. No exact figures are available, but such supplies probably represented only about 10 per cent of the total amount used in the United Kingdom in that year and in other years the proportion was certainly considerably lower.

During the war the Government wished to encourage a high level of production of home grown linseed for the reasons given above and because linseed oil represents such an important proportion of the total supply of vegetable oils in the United Kingdom (for the years 1937 to 1946 it represented between nine per cent and 20 per cent of the total.) After the war the Government were anxious to maintain this high level of production because of the country's serious economic position, the world-wide shortage of oilseeds and animal feeding stuffs and because most of the principal suppliers were hard currency countries. Various inducements, therefore, were offered to farmers to persuade them to devote more of their land to the crop. New and better yielding strains of seed were obtained and distributed by the Government, information on methods of growing and harvesting was widely published, allowances of cake in addition to ordinary livestock rations were made available to linseed growers and the price offered for the crop was increased over a number of years. In 1940 the price of

linseed was £17 per ton. (Growers were also entitled to coupons for half a ton of cake for every ton of linseed sold). During and after the war the price offered to farmers for their seed continued to rise until by an order of 18th May 1948 it was fixed at £45 per ton for the 1947 harvest, the allowance of cake being 1 ton for every 3 tons of seed sold. From August 1948 the price was raised again, this time to £55 per ton with an increase or decrease of 11s. 0d. per ton for every one per cent increase or decrease in purity above or below 90 per cent. The entitlement was then 12 cwt of cake for every ton of clean linseed sold. From the 1st July 1949 the purity premium was altered to 12s. 3d. per cent per ton.

Such inducements had the effect of increasing the acreage of linseed to some extent, (as can be seen from Table 2—from 11,000 acres in 1946 to 38,000 in 1947, 86,000 the following year and 58,000 acres in 1949) but not to the extent that was required.

The importance which the Government attached to the crop can be gauged from their linseed acreage targets. Farmers were asked to grow 150,000 acres in 1948, 200,000 in 1949 and 400,000 in 1950. Nevertheless, although the 86,000 acres planted in 1948 was the greatest area of linseed ever sown in the United Kingdom, it was only about half of the target set. The situation deteriorated in subsequent years for in 1949 only 58,000 acres of linseed were grown as against a target of 200,000 acres, and in 1950 the area had shrunk further to 38,000 acres. In the Economic Survey for 1950<sup>1</sup> no mention is made of the target for 1950-51 and as the forecast acreage is given as only 50,000 acres it seems probable that the Government has virtually abandoned hope of converting the farmer to linseed growing. In fact, it has been stated recently that since linseed oil can now be readily obtained from soft currency areas overseas it is no longer necessary to call on home farmers to make special efforts to grow linseed. From 21st January 1951 the Home Grown Linseed (Control) Order, 1948 was revoked and growers may now sell their linseed to whom they please. Until 30th June 1951 the Ministry of Food will continue to buy linseed offered to it on the basis of £55 per ton for seed of 90 per cent purity. After 30th June 1951 the Ministry of Food will buy home grown linseed at prices related to those which it is at the time prepared to pay for imported linseed or linseed oil. But from that date there will be no further issues of coupons for linseed cake against such purchases.

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<sup>1</sup> *Economic Survey for 1950.* (Cmd. 7915.) H.M. Stationery Office.



This relaxation of control over home grown linseed does not extend to linseed cake or meal, which will continue to be subject to rationing and price control.

The lack of enthusiasm for linseed on the part of farmers in this country may be due in great part to inexperience in growing the crop; it may be due to some conservatism where rotations are concerned, but also, perhaps, to the great divergence of opinion that exists as to its profitability.

### COSTS AND RETURNS.

Some information on these questions is provided by an investigation which was undertaken by this department into the costs of and the returns from growing linseed on 32 farms in the East Midlands Province<sup>1</sup> in 1949. The farms were situated in Lincolnshire and Nottinghamshire and since three farmers undertook to provide details of more than one field the investigation covered a total of 35 fields.

There was a wide divergence in the soil types; a fact which will have had considerable influence on the costs and returns from individual fields.

Another important factor is the weather. During the 1949 season this was warm and dry for long periods. Such conditions are unfavourable for linseed which flourishes best under cool, humid conditions during its growing season. It is harvested more easily, however, in dry weather such as existed in the late summer of 1949, so that one would have expected the difficulties of harvesting to be minimised that year.

Being a new and minor crop on many farms, linseed naturally has no regular place in the rotation, but since it is known to do well after a straw crop and on ploughed-out grassland it is not surprising to find that in this investigation it followed either cereals or grass on over half the fields. On the remaining fields it followed roots, beans, brassicas or seeds.

The field sizes ranged from one acre to 19 $\frac{1}{4}$  acres. There were 14 fields under five acres, 11 ranging from five acres to under

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<sup>1</sup> Comprises Nottinghamshire, Leicestershire, Derbyshire, Rutland, Lincolnshire (Kesteven and Lindsey).

10 acres, seven of between 10 and 15 acres and only three over 15 acres in size.

The preponderance of small fields illustrates the point that linseed was only a minor crop, for in the majority of cases the fields investigated were the only ones devoted to the crop on the individual farms.

Several farmers who co-operated in this investigation had grown linseed for some years previously but to a large number of others the 1949 season was the first in which they had attempted to grow the crop. One of the main reasons given for growing linseed was the uncertainty of the protein-feed situation and the consequent need for supplementing cattle food rations, but many of those farmers who had grown it previously continued to grow it because they liked it as cattle feed; either because of its high protein value and its digestibility or because of its value for calves and lambs. There were also some other reasons. Two farmers sowed it on land which should have been fallow, a third sowed it in a field which was overrun by rabbits and a fourth undersowed his wheat with linseed as an insurance against failure of his wheat crop. (Unfortunately, this farmer's linseed was destroyed by flea beetle but, as it happened, he got a very good wheat crop). One farmer decided to grow linseed in 1949 as an experiment, in order to find out if he could make a success of growing it, with a view to continuing production in the future. The linseed in several fields was undersown with leys or clover. One or two farmers anticipated selling their chaff and straw as well as the seed but only one succeeded in doing so.

The most popular varieties of seed used were "Redwing" and "Royal", for of the total of 35 fields 32 were sown with one or the other of these varieties, the former being slightly more popular. Two fields were sown with "Plate" and one with "Bison". Of the 35 fields seven were sown with home grown seed.

It was impossible to estimate the yields and returns on one field as the farmer left a large amount of seed in the straw, put the straw through the hammer mill and fed it direct to his cattle. Average returns and yields could be calculated, therefore, for only 34 fields and the costs of these 34 fields only have been averaged.

The average yield per acre was 7.4 cwts. labour and material costs amounted to £14 15s. 6d. and returns (actual and estimated)

averaged £22 6s. 4d. per acre. After allowing for manurial and cultural residues and charging for overheads and machinery depreciation the average margin was a surplus of £3 12s. 8d. per acre.

AVERAGE COSTS AND RETURNS OF LINSEED PRODUCTION 1949  
TABLE 3. Per Acre

<b>Cost of Work:</b>	£ s. d.	£ s. d.
Manual labour	3 1 9	
Horse     "	1 11	
Tractor   "	1 7 10	
Work done on contract	3 2 2	7 13 8
<b>Cost of Materials, etc.</b>		
Rent	1 11 2	
Seed	3 3 6	
Manures (Incl. F.Y.M.)	2 1 0	
Other costs	6 2	7 1 10
<b>Residues and Overheads</b>		
Manurial Residues b/f	16 2	
Cultural Residues b/f	1 4	
Overheads including machinery depreciation	3 0 8	3 18 2
<b>Total</b>		£18 13 8
<b>Returns</b>		£22 6 4
<b>Margin</b>		Surplus of £ 3 12 8
Estimated yield per acre	7.4 cwts.	
No. of fields investigated	34	
No. of acres	234	

As one would expect these averages hide very wide variations in the yields, costs and returns of individual fields. Although the average yield was 7.4 cwts there were eight fields with yields below five cwts per acre and an additional two in which the linseed was so damaged by linnets or flea beetles that it was not worth threshing.

On the other hand, eleven fields had yields of 10 cwts or more, the highest yield in the sample being 16.5 cwts per acre.

There was also a wide variation in the margins obtained from the individual fields. The average was a surplus of £3 12s. 8d. per acre but this masks the fact that thirteen fields showed deficits. These deficits ranged from 11s. 7d. per acre to as much as £17 8s. 10d. per acre. The surpluses on 21 fields varied from 7s. 2d. per acre to £25 3s. 4d. per acre. In the following table the margins are related to the yields:—

YIELDS AND MARGINS PER ACRE.

TABLE 4.

Margin Yield (cwts.)	DEFICIT				SURPLUS				All fields
	£15 and under £20	£10 and under £15	£5 and under £10	Under £5	Under £5	£5 and under £10	£10 and under £15	£15 and over	
Under 7	1	3	3	5	1	—	—	—	13
7 and under 11	1	—	—	—	4	5	4	—	14
11 and under 15	—	—	—	—	1	—	2	3	6
15 and over	—	—	—	—	—	—	—	1	1
All fields	2	3	3	5	6	5	6	4	34

Fields with yields of less than seven cwts. per acre generally showed a deficit. There was one exception; a field with a yield of 6.5 cwts. per acre showed a small surplus of 7s. 2d. per acre. One field which had a yield of seven cwts also showed a deficit, but where yields exceeded this figure surpluses were realised without exception.

A number of other points emerge from this investigation. Relatively high expenses may be incurred in spraying or dusting or hoeing the linseed crop because of its susceptibility to weeds and flea beetle attacks. Several crops were badly infested with "Fat Hen" or "Brown Mustard" because of inefficient spraying or shortage of labour for hoeing. Two were so badly infested with "Fat Hen" that the farmers would have received very low prices for their crop had they tried to sell it. (For the purpose of this investigation these crops were valued, nevertheless, at the basic price of 55s. per cwt.) The extent of the farmers' inexperience in growing the crop was shown by the number of doubts expressed by the farmers regarding the methods which they had used. Some considered low yields were due to sowing their seed too deeply and there were conflicting opinions as to whether cross drilling was advantageous or not, what the proper rate of sowing should be and which time of the year was the best for sowing and threshing.

The greatest number of difficulties, however, were encountered in harvesting and threshing. Combine harvesters were generally found to be unsuitable and in this investigation two crops only were harvested entirely by this method. Several were mown and then combined with a pick-up, but by far the greatest number were cut by binder, stooked and threshed later. Those farmers who had

grown the crop for some years maintained that if the knives were kept sharp and if cutting were undertaken only during that part of the day when the linseed was dry no undue difficulties occurred. To keep the knives sharp might mean employing one man solely on sharpening during cutting. In one field the crop was stunted because of the dry weather and this caused breakages in the binder and difficulties in picking up and tying.

The two main difficulties in threshing were that the sheaves had to be fed more slowly than with cereals and in order to reduce waste of seed it was found that many crops had to be threshed twice. The resultant seed was, on the whole, fairly clean and no great amount of time was wasted in removing straw from the machine. The extra time involved in feeding the sheaves slowly or in threshing twice made the cost of threshing linseed higher than the cost of threshing cereal crops.

Few of the farmers in this investigation were able to sell their straw, since there is little demand in this country, as yet,<sup>1</sup> for linseed straw off the farm. There is only a small number of centres in the country willing to purchase linseed straw and one of the main difficulties of the farmers in the East Midlands Province was that the nearest centre was so distant that consignment charges were too heavy to make such a sale profitable. Because of this difficulty and because of the unsuitability of the straw for feeding or litter most farmers in this investigation decided to burn it. In the eyes of many farmers this is an additional disadvantage of linseed as compared with cereals.

## CONCLUSIONS.

Apart from the harvesting season, the weather of 1949 was unfavourable for linseed and this is reflected in the poor yields, not only in the East Midlands Province but also in the country as a whole. Figures of yields for England and Wales are available for only very recent years; in 1947, for instance, yields averaged 8.0 cwts. per acre, in the following year 8.7 cwts. but in 1949 they dropped to 7.9 cwts. Such a drop in yield, coupled with a decreased acreage means a serious reduction in the amount of home grown linseed available. The 1948 production was 35,000 tons of linseed but that in 1949 was only 23,000 tons.

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<sup>1</sup> It seems that the bulk of the cigarette papers used in the United States of America are now made from linseed straw

The position in the East Midlands Province seems to have been even more serious, to judge by this investigation. The average yield for the fields in this sample was 7.4 cwts. per acre, but according to an investigation carried out in this province on the 1948 crop (not on the same farms) the average yield was 8.75 cwts per acre, in spite of unfavourable weather conditions, especially during harvest.

Farmers who, in 1949 anticipated a similar yield to that in 1948, would have expected, on average, a surplus of about 45s. per acre more than that shown in this report i.e. without taking into consideration the increase of 1s. 3d. per cent per ton in the purity premium over the premium which operated in 1948. Even the prospect of such a surplus failed to prevent quite a considerable shrinkage in 1949 in the area devoted to linseed in the United Kingdom. Obviously, farmers generally in this country do not like the crop. If the experience of this investigation, where over one third of the fields made a loss, is common to other parts of the country, it will mean that the 1949 season was the last in which many farmers would attempt to grow linseed. In fact, the estimated acreage for 1950 bears out this conclusion for apparently the area devoted to linseed has decreased to 38,000 acres (compared with 58,000 in 1949).

The results of this investigation are confirmed by a report issued by the Farm Economics Branch of the University of Cambridge on linseed produced in the Eastern Counties in 1949. It shows that in that province there was also only a small average surplus of £4 15s. 5d. per acre for the farms investigated and an average yield of 7.67 cwts. per acre, just slightly higher than that in the East Midlands. The importance of this can be seen when it is realised that over one third of the linseed acreage of England and Wales in 1948 and 1949 was grown in the Eastern Counties. Even more significant is a report, by the same department, on the 1948 crop, which showed that although the average yield was 9.61 cwts. per acre there were eight fields in the sample of 40 which made losses. Such results over consecutive years do not encourage farmers to persevere with the crop nor do they persuade them to try growing it as a "new" crop, especially when the land can be used more profitably.

When land used for linseed can be put to an alternative use, for example wheat, oats or barley production, farmers considering their future cropping programmes may ask themselves how the financial return on linseed compares with that on cereal crops. As has been shown in the report issued by the University of Cambridge the average cost of growing an acre of linseed in the Eastern Counties in 1949 was

£17 7s. 10d. giving a surplus of £4 15s. 5d. In the East Midlands in 1949 the average cost was found to be £18 13s. 8d. and the surplus £3 12s. 8d. These are net returns of 27 per cent and 19 per cent respectively on the gross costs incurred.

From an investigation carried out by the Department of Agricultural Economics of the University of Nottingham into the cost of growing wheat in Leicestershire and Nottinghamshire in 1949 an average outlay, after allowance had been made for overheads, of £16 18s. 4d. gave a surplus of £10 0s. 9d. Similarly, for oats grown in the East Midlands in 1949 average costs of £12 13s. 11d. gave a surplus of £6 5s. 4d. The net returns from these two crops are therefore 60 per cent and 49 per cent respectively of the gross costs. In addition, the proportion of farmers who made losses on these two crops was considerably below the proportion of linseed growers who suffered losses in the investigations quoted above. Thus in 1949 the financial return on linseed did not compare favourably with the return on wheat and oats and the risk of making a loss was greater. The financial aspect, of course, is not the only one to be considered where linseed is concerned for it does provide a valuable addition to cattle food rations and the fact that linseed cake contains four times as much protein as oats is important. Similar considerations may persuade some farmers to continue growing it, as for example the farmer writing in the "Farmers' Weekly" who decided that although barley was likely to prove more profitable than linseed he would continue to produce the latter because "the country wants linseed" and because he was only too pleased to take advantage of the linseed cake allocation.<sup>1</sup> On the other hand it may be more expensive than cereal crops because of the dusting, spraying or hoeing that is often necessary, the heavy wear and tear caused by the tough fibres on machinery and because of the longer time required for threshing and its consequent demands on labour when this can least be spared.

From the individual farmer's point of view the profitability of the crop can be increased either by lowering costs, increasing yields or obtaining a higher price for the crop. There is no doubt that poor yields and high costs have often resulted from the farmer's lack of experience of growing linseed, but there is much information available on the best known methods of cultivating and harvesting the crop which could be more widely publicised. With the aid of this knowledge and as farmers themselves learn more of the special needs of linseed from their own experience these difficulties could be minimised.

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<sup>1</sup> *Let's grow linseed.* FARMERS' WEEKLY, April 8th, 1949.

The question of improving yields is rather more difficult. The weather is very important in influencing the yields of linseed and it seems that, in any case, the growing of the crop in this country is likely to be a risky undertaking from this point of view. Although most text books give 10 cwts. per acre as a "normal" yield of linseed the average yields for the past four years in the United Kingdom have been only 8.0 cwts., 8.7 cwts., 7.9 cwts., and an estimated yield for 1950 of 7.4 cwts. If we turn to the countries which have had more experience of the crop we find that their average yields are even lower. In Argentina, for instance, the average for 1934 to 1938 was five cwts. per acre and the highest average yield for any year up to 1948 was 6.2 cwts. per acre. In Uruguay and Canada yields are slightly lower than this, while in India they range between 2.2 and 2.5 cwts. per acre.

Even in the United States of America, where one would expect yields to be higher, the average for the years 1938 to 1947 was only 4.6 cwts. and since then the highest average yield has been only 5.6 cwts. per acre (in 1948). There are two states, Arizona and California, which have consistently high average yields in the region of 12 cwts. and 10 cwts. per acre respectively,<sup>1</sup> but these are very much higher than the yields in the other states and are no doubt due to the climatic conditions or irrigation. It seems, therefore, that there is not very much scope at present for obtaining consistently higher yields in this country than those which have already been obtained.

Apparently the only method, immediately available, of making the crop more attractive generally, from the financial point of view, would be to raise its price.

This investigation does reveal, however, that some farmers can make linseed a profitable proposition and that they will continue to grow it for this reason. Others may do so for other reasons; its value as feed, its immunity from rabbit and wireworm attacks and its value, because of its short growing season, in allowing three crops to be grown in two years on one field. The general conclusion must, nevertheless, be that the financial returns from linseed have compared unfavourably with those from competitive crops, while the risk of loss has been significantly higher. However, when the price control of linseed is lifted the Government may have to buy their supplies on the world market at prices considerably above £55 per ton and this might cause linseed to become a competitive crop where British farmers are concerned.

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<sup>1</sup> *Crops and Markets* 1950 Edition, U.S. Dept. of Agriculture, Bureau of Agricultural Economics.



## FUTURE OUTLOOK.

The failure of the Government in the post-war years, to convert the farmer to linseed growing on any large scale causes one to consider what the future prospects for the supply of linseed are likely to be.

The demand for linseed oil comes chiefly from the linoleum, printing-ink, paint and varnish industries and the demand for seed and cake from the farming industry. Since linseed oil is valued mainly because of its drying properties there are few satisfactory substitutes for it—soya bean, tung and perilla oils seem to be the only ones and these form a very small proportion of the total vegetable oils imported into the United Kingdom—so that demand is not likely to be less in the future in this country than it was in pre-war days. Nor can the demand for cake and meal be expected to decrease if the livestock expansion programme is to be implemented. In addition, the United Kingdom is the only very large purchaser of linseed on the world market importing now on the pre-war scale. Germany, Japan and other areas are consuming linseed at a rate still significantly below the pre-war level and the probable future increase in their demand cannot be disregarded.

Although world production of linseed is only slightly below what it was before the war, the trend is for exports to be considerably less owing to the tendency of the producing countries to retain their output and owing to the slow recovery of some producing areas. In 1948 the linseed crop of North America was so large that that country was able to declare linseed to be a surplus commodity, which was an encouraging sign, but since then it has been stated that "In the United States the outlook is for a decline in output of vegetable oilseeds . . . . . This may mean larger imports of linseed and linseed oil . . . . ."<sup>1</sup>

While such conditions exist and while linseed for export (and its substitutes) are available principally from hard currency areas and from countries in the Far East, where recovery is only very slow, world supplies are likely to be limited. From the point of view of the United Kingdom linseed oil may be more readily available from soft currency areas but because of the high world demand in relation to supply the prices asked for it are likely to be higher than those which have been paid up to the present.

<sup>1</sup> FOOD AND AGRICULTURE ORGANISATION OF THE UNITED NATIONS, *The State of Food and Agriculture. A Survey of World Conditions and Prospects 1949*, p. 75. H.M. Stationery Office.

## APPENDIX I.

### CHARGES USED IN THE INVESTIGATION IN THE EAST MIDLANDS PROVINCE.

#### LABOUR.

The charges for labour were as follows, unless the farmer paid more than the standard rate when the full amount was charged :—

	s.	d.	
Men ....	2	3	per hour
Youths ....	1	6	per hour
Women ....	1	10	per hour
Tractor work (light and medium)	3	0	per hour
Tractor work (heavy i.e. crawlers)	4	6	per hour
Lorry ....	4	0	per hour
Horse labour ....	1	2	per hour

Contract work was taken at cost.

#### SEED.

Purchased seed was taken at cost and home grown seed at 55s. 0d. per cwt.

#### MANURES.

Artificial was taken at cost and F.Y.M. was charged at £1 per ton.

#### RENT.

The average farm rent per acre was charged. If drainage rates were paid these were added to rent before calculating rent per acre.

#### MANURIAL RESIDUES.

The residual debit or credit was reached by deducting any residues chargeable from previous crops from the sum of residues to be credited to the present crop. The residual value of F.Y.M. was taken to be one half of the cost of the manure after one growing season, one quarter after two growing seasons, and one eighth after three growing seasons. The residual value of artificial was calculated according to the Scott Watson tables for Residual Manurial Values of Fertilizers published in "Agriculture", the Journal of the Ministry of Agriculture, July 1946, Vol. LIII-No.4 pp. 163-170.

#### CLEANING BENEFITS.

Where potatoes preceded the 1949 linseed crop a debit for cleaning benefits was made at the rate of 35s. 0d. per acre.

#### OVERHEADS AND MACHINERY DEPRECIATION.

A charge of 3s. 9d. in the £ on total labour and material costs was made for overheads and machinery depreciation. This figure was calculated from material collected by this department from a number of farms.

#### RETURNS.

The actual amount received for crops sold was taken. If the linseed was retained on the farm for feeding purposes it was valued at the basic rate of 55s. 0d. per cwt., irrespective of its purity. If some was sold and the remainder retained on the farm it was all valued at the price received for that portion sold.

## APPENDIX II.

### BIBLIOGRAPHY.

#### GENERAL.

COMMONWEALTH ECONOMIC COMMITTEE. *Vegetable Oils and Oilseeds*. H.M. Stationery Office, London (1948).

*No Regrets. An account of another successful linseed season.* The Farmers' Weekly. (December 17th, 1948).

STREET, A. G. *A crop we can't afford.* The Farmers' Weekly. (October 1st, 1948).

HINCHLIFFE, EDWARD. *Without Prejudice.* The Farmers' Weekly (October 15th, 1948.)

COMBES, L. *Let's grow Linseed.* The Farmers' Weekly. (April 8th, 1949.)

*Linseed or Barley.* The Farmer and Stockbreeder. (October 12th, 1948).

WELLS, R. G. *Linseed.* Journal of the Land Agents' Society, Vol. 49, No. 4. (April, 1950). pp. 135 and 136.

FOOD AND AGRICULTURE ORGANISATION OF THE UNITED NATIONS. WASHINGTON. *The State of Food and Agriculture: A Survey of World Conditions and prospects*, 1948. H.M. Stationery Office, London. (1948).

WANNOP, A. R. AND WATSON, J. SCOTT. *Linseed.* Scottish Agriculture: Journal of the Department of Agriculture for Scotland. Vol. 27 No. 3. (per H.M. Stationery Office, Edinburgh) (January, 1948).

#### COSTS AND RETURNS.

ROBERTS, M. B. AND THOMAS, W. J. *Some experiences in growing Linseed for Feed on Welsh farms.* University College of Wales, Department of Agricultural Economics, Aberystwyth. (1945).

*Linseed costs and returns 1947: An example from Fife.* Farm Economics No. 15 (Issued by Department of Agriculture for Scotland, Edinburgh) (Spring 1948).

PRICKETT, W. J. *Comparative costs of growing Linseed and Barley: 1947 and 1948.* The Farm Economist. Vol. 6 No. 5. The Agricultural Economics Research Institute, Parks Road, Oxford. (1949).

*Linseed Costs Investigation 1948: Interim Report.* University of Nottingham School of Agriculture, Department of Agricultural Economics, Sutton Bonington, Loughborough. (January, 1949).

*A Survey of the Cost of Growing Linseed in Two Districts in the Eastern counties 1948.* (Mimeographed Report No. 38) University of Cambridge, Department of Agriculture, Farm Economics Branch, Cambridge. (1949).

*A Survey of the Cost of Growing Linseed in Two Districts in the Eastern counties 1949.* (Mimeographed Report No. 41). University of Cambridge, Department of Agriculture, Farm Economics Branch, Cambridge. (1950).

MORRIS, S. T. *Cost of growing Linseed 1949.* (Interim of a 3 year enquiry) University of Bristol, Department of Economics, Agricultural Economics. (1950).

## GROWING AND HARVESTING TECHNIQUES.

- MINISTRY OF AGRICULTURE AND FISHERIES. *Arable Crops*. (Bulletin No. 72). H.M. Stationery Office. (1940).
- MINISTRY OF AGRICULTURE AND FISHERIES. *Home grown Linseed*. (Growmore Leaflet No. 13). M.A.F. 55, Whitehall, London. S.W.1.
- MINISTRY OF AGRICULTURE AND FISHERIES. *Linseed Harvesting and Thrashing*. (Growmore Leaflet No. 96) M.A.F. 55, Whitehall, London. S.W.1.

## GENERAL STATISTICAL INFORMATION.

- CENTRAL STATISTICAL OFFICE. *Annual Abstract of Statistics*. H.M. Stationery Office, London. (1949 and annually).
- FOOD AND AGRICULTURE ORGANISATION OF THE UNITED NATIONS. *Yearbook of Food and Agricultural Statistics*. H.M. Stationery Office, London. (1950 and annually.)
- BOARD OF TRADE. *Annual Statement of Trade of the United Kingdom*. H.M. Stationery Office, London. (1949 and annually).
- BOARD OF TRADE. *Monthly Trade and Navigation Accounts*. H.M. Stationery Office, London. (1950 etc.).

## AMERICAN LITERATURE.

- Crops and Markets*. Vol. 27 United States Department of Agriculture, Bureau of Agricultural Economics, Washington. D.C. (1950).
- Crop Production*. United States Department of Agriculture, Crop Reporting Board, Bureau of Agricultural Economics, Washington D.C. (November 10th, 1950).
- CARPENTER, G. A., LANDERMAN, H. LEE, AND SULLIVAN, WALLACE. *Flax Management Practices in Imperial Valley with World Statistics*. (Bulletin 641). University of California, Berkeley, California. (August 1940).
- Practices on Flax-producing farms in Texas, 1949*. (Miscellaneous Publication No. 41) Texas Agricultural Experiment Station, College Station, Texas. (1950)
- BUREAU OF AGRICULTURAL ECONOMICS. *Economics of Flax Production in Kansas*. United States Department of Agriculture, Bureau of Agricultural Economics, Washington D.C. (January 1946).
- BUREAU OF AGRICULTURAL ECONOMICS. *Flaxseed in American Farming*. (Technical Bulletin No. 938) United States Department of Agriculture, Bureau of Agricultural Economics, Washington. D.C. (November 1947.).
- The South American Handbook 1950*. Trade and Travel Publications Ltd. (1950). 14, Leadenhall St., London, E.C.3.

