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Potatoes - Cost of production
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ABERYSTWYTH**

THE PROSPECT FOR SEED POTATO PRODUCTION
IN WALES.

by

Mostyn Dummer, B.A.

**DEPARTMENT OF AGRICULTURAL ECONOMICS
CAMBRIAN CHAMBERS, CAMBRIAN PLACE
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ERRATA.

Table 3 For $2\frac{1}{2}$ tons ware at £13 read $2\frac{1}{2}$ tons.
(p. 10)

APPENDIX.

Table I
(p. 16) 1956. England Early. For 5.5 read 4.5

Table II
(p. 17) 1949. England Maincrop. For 660.0 read 669.0
 1957. Wales Maincrop. For 63.5% read 62.5%

Table III
(p. 18) 1960. Total N. Wales. For 2400 read 2420

Table IV
(p. 19) 1949. Carmarthen For 8.5% read 18.5%

Table V
(p. 20) 1951. Majestic For 119.3 read 119.9

SUMMARY.

The prospect for seed potato production in Wales is examined under four heads:-

1. Potato Production in Wales.

Although, in general, potatoes as a cash crop are of minor significance compared with the total output of Welsh agriculture, they occupy in certain areas a position of some importance. On the basis of the acreage registered with the Potato Marketing Board it is found that over 80% of the acreage is in the South Wales counties, particularly in Pembrokeshire.

2. Seed Potato Production in Wales.

The enterprise originated in certain North Wales counties and later spread to South-West and Mid-Wales. At present it is concentrated in the counties of Brecon, Radnor and Cardigan.

3. Profitability of Seed Potato Production.

Budgets compiled in terms of costs and prices obtaining in the autumn of 1959 show that the enterprise would enable farmers in upland areas to augment their incomes by the production of a cash crop.

4. Final Considerations.

Taking the P.M.B. registered acreage to represent the minimum seed potato requirements in Wales it is estimated that the supply of certified seed potatoes in the Principality is about one-ninth of these requirements. Applying similar assumptions and estimates to the P.M.B. registered acreage in Great Britain it is found that the supply of certified seed potatoes is less than that necessary to meet possible requirements. In view of this situation there is scope for some increase in the acreage under seed potatoes in Wales. Such an increase, however, should take place in the areas where the enterprise is at present concentrated. Three reasons are given in support of this statement.

1. POTATO PRODUCTION IN WALES.

Under the influence of physical and climatic factors the agriculture of Wales has been traditionally associated with the production of livestock and livestock products. Historically, owing to the mountainous nature of the country, and the consequent absence of good means of communication, a part of the crop production on most farms used to be devoted to meeting human needs in the rural areas. For this reason all farms would have had a certain acreage under potatoes. With the development of improved means of communication, however, and the movement of population from the rural into the urban districts and especially into the developing industrial towns of South Wales, the area devoted to meeting subsistence requirements in the countryside declined, and this has been reflected in a fall in the potato acreage. The requirements of the population in the urban areas are now more readily met by importing supplies of potatoes from sources outside Wales.

In 1900, 11 acres of potatoes per 1,000 acres of crops and grass were grown, but by 1939 this figure had fallen to 6 acres. After 1939, as a result of war-time necessity, an expansion took place; and this increased acreage was maintained in the immediate post-war years, reaching its peak in 1948. Since 1948 the pre-war trend has re-asserted itself, and the potato acreage has declined.

The minor importance of the potato crop in Wales is revealed when a comparison is made between the acreage grown there and that grown in England. In 1949, in England, nearly 40 acres of potatoes were grown per 1,000 acres of crops and grass as compared with 23 acres in Wales (Appendix, Table I). In 1959, these figures for England and Wales were 25 acres and 9 acres respectively. Between 1949 and 1959 the potato acreage in Wales fell by 59%, from 58.5 thousand acres to 23.5 thousand acres (Appendix, Table II). The fall in the acreage in England during the same period was relatively less, being from 870.1 thousand acres to 547.2 thousand acres - a matter of 37.1 %.

The June 4th agricultural statistics classify potatoes in two main categories: early potatoes, and main crop and second early potatoes. Both England and Wales show changes in the proportion of the total acreage found in

these two categories. Wales in 1949 had 27.8 % in the early category, and 72.2 % under main crop and second earlies. By 1959 the proportion under early potatoes in Wales had increased to 41.6 %, with a corresponding fall in that of main crop and second earlies to 58.4 %. In England, on the other hand, the reverse has been the case. In 1949 about 23 % of the total acreage was under early potatoes, and 76.9 % under maincrop and second earlies. In 1959 these proportions were 14.3 % and 85.7 % respectively, (Appendix, Table II).

With the re-establishment of the Potato Marketing Board in 1955 it has been possible to arrive at some indication of the production for market of potatoes in Wales. In its annual reports the Board provides information on the number of registered growers and the acreage of potatoes registered with it at 30th June in each year. Registration with the Board is necessary for any producer of an acre or more of potatoes if he intends to sell all or part of his crop. The acreage of potatoes registered during the years 1957-1960 is given in the Appendix, Table III.

The June 4th returns and the registered acreage given by the Potato Marketing Board are near enough in time to allow a comparison to be made between them. In Wales in 1957 and 1958 it was found that the Board's registered acreage was 60.8 % of the June 4th potato acreage, while in 1959 it was 65.2 %. Since the June 4th returns refer to all the potato acreage over $\frac{1}{4}$ acre on all holdings of one acre and over, these figures suggest that in 1957 and 1958 39.2 % of the potato acreage in Wales was between $\frac{1}{4}$ acre and one acre in extent, the proportion in 1959 being 34.8 %. This contrasts sharply with the situation in England. There the Potato Marketing Board registered acreage amounted to 94 - 95 % of the June 4th returns during the three years, so that apparently only 5 - 6 % of the total acreage in England was between $\frac{1}{4}$ acre and one acre in extent.

A similar comparison may be made between the June 4th returns and the P.M.B. registered acreage for early potatoes and maincrop and second early potatoes in Wales. In 1957 the early potato acreage registered with the P.M.B. amounted to 89 % of that shown in the June 4th returns, and in 1958 and 1959 the proportions were 83.1 % and 88.1 % respectively. Thus the bulk of the

early potato acreage was obviously devoted to production for the market. In respect of maincrop and second earlies the P.M.B. registered acreage amounted to 43.7 % of the June 4th returns in 1957, 46.4 % in 1958, and 48.8 % in 1959. From this it may be assumed that in 1959 just over half of the maincrop and second early acreage in Wales was between $\frac{1}{4}$ and one acre in extent, and intended for consumption on the farms.

The distribution of the P.M.B. registered acreage among the Welsh counties is given in the Appendix, Table III. Over four-fifths of it was in South Wales. The importance of the early potato enterprise in Pembrokeshire is shown by the fact that 72.9 % of the registered early potato acreage in Wales for 1957 was in that county, while in 1960 the proportion was just over three-quarters. During the four years 1957-60 Pembrokeshire also showed an increase in the total registered acreage for maincrop and second early potatoes; but the proportions changed during the period, the acreage of second early potatoes showing an increase and that of maincrop a decrease. In fact just over half the P.M.B. registered acreage in Wales in 1960 was to be found in Pembrokeshire. Certain other counties revealed definite trends during the four year period. Brecon showed an increase in the registered acreage, and this was accounted for by the increase in the acreage under early potatoes. The acreage of maincrop and second earlies in both Cardigan and Carmarthen fell during the four years. Monmouth, on the other hand, showed an increase in the acreage of maincrop and second early potatoes, and a fall in the early acreage up to 1959.

The proportion of the total registered acreage located in North Wales fell from 17.5 per cent. in 1957 to 15.2 per cent in 1960. In nearly all counties the fall took place in the acreage of maincrop and second early potatoes. Over half the acreage of these crops was to be found in the counties of Flint and Denbigh in 1957, and by 1960 this proportion had increased to about two-thirds. Anglesey contained the relatively largest acreage of early potatoes in the North Wales counties, having over half the total for that area in 1957 and in 1960.

2. SEED POTATO PRODUCTION IN WALES.

Seed potato production Wales dates from the institution of a small scheme in 1927 designed to test the suitability of certain districts in North Wales for

such a crop.

Of the factors which can affect the yield of potatoes the most important are the virus diseases. The danger is not that these diseases will kill the plants, but that they will reduce the vigour of the growing crop, thus resulting in a yield light in bulk. Virus diseases are spread by infection carried by potato aphide or greenfly. Experience had already shown that seed potatoes from certain localities in Scotland and Ireland could be relied upon to produce healthy crops with good yields; and it was found that the superiority of the "Scotch" and "Irish" seed was due to the fact that insect vectors of the virus diseases were usually fewer in numbers in the good seed growing areas. In these areas it was observed that the three factors contributing to the production of healthy seed were high altitude, isolation and exposed conditions.

From the trials conducted in 1927 it was found that healthy seed potatoes of good cropping capacity could be produced in North Wales, and that such seed was at least equal to that from Scottish sources. Thus the enterprise gained a foothold in Wales nearly 70 years after the origination of the Scottish seed potato trade, and was the result of pioneer research work undertaken by the University College of North Wales, Bangor.

In 1933 the first growers' association was formed to exploit the crop commercially, with the registration of the North Wales Seed Potato Growers, Ltd. Three years later the Crymmych Seed Potato Growers' Association was constituted. Such was the sum total of development in the pre-war years. During the war supplies of seed potatoes were unreliable, and certain War Agricultural Executive Committees successfully grew healthy crops of them in upland areas under their control. As a result of this work two new seed-potato growing societies were formed, the Powysland Seed Growers' Association in Montgomeryshire in 1942, and the Brecon-Radnor Seeds, Ltd., in 1943. The only development after the war was the formation of two societies in 1949, the Denbigh and Flint and the South Cardiganshire Seed Potato Growers' Associations.

The acreage of seed potatoes certified in Wales reached a peak of 1036 in 1949. From that year there was a decline until 1955, when 313.5 acres were

certified. Since 1955, however, there has been some increase; and during the past three years the figure has fluctuated around 390-396 acres. The acreage of seed potatoes certified in Wales from 1949 to 1959 is given in the Appendix, Table IV.

The following table sets out the percentage distribution of the certified seed potato acreage in the Welsh counties for certain years.

Table I.

Percentage distribution of certified Seed Potato
Acreage in Wales for certain years 1949-1959.

County	1949	1951	1953	1955	1957	1959
	%.	%.	%.	%.	%.	%.
Anglesey	3.1	3.3	1.0	1.1	1.4	0.9
Caernarvon	14.3	17.9	10.0	10.1	8.6	4.3
Denbigh	3.0	11.7	6.1	4.8	0.3	0.5
Flint	1.5	1.0	11.0	1.0	6.6	0.8
Montgomery	15.0	3.5	1.6	1.8	0.8	1.2
Merioneth	0.4	0.6	0.3	0.8	0.5	0.3
Brecon	19.1	22.0	15.6	15.2	24.0	35.7
Radnor	17.8	9.8	13.1	12.4	15.6	17.7
Cardigan	10.0	8.3	10.9	12.3	12.7	21.8
Pembroke	11.9	12.2	11.6	6.2	7.6	3.2
Carmarthen	1.8	7.5	5.7	7.8	3.9	2.3
Glamorgan	1.1	0.4	-	-	-	1.7
Monmouth	1.0	1.8	13.1	26.5	18.0	9.6
Total	100	100	100	100	100	100

In 1949 the certified acreage was fairly widely distributed over the counties of Caernarvon, Montgomery, Brecon, Radnor, Cardigan and Pembroke. By 1959, however it had become concentrated in the counties of Brecon, Radnor and Cardigan: in 1949 these counties accounted for only 46.9 % of the total, but by 1959 this proportion had increased to 75.2 per cent. Pembrokeshire in 1949 contained 11.9 % of the total certified acreage, but after that year its acreage declined to 19.5 in 1955 and, although a slight increase was shown between 1956 and 1958, there was a further fall to 12.7 acres in 1959, which was only 3.2 % of the total certified acreage. Some development in seed potato production occurred in Monmouthshire in 1952, when 38.8 acres were certified, this acreage reached a peak in 1955, but since then the trend has been downwards. In 1959 37.8 acres were certified in the county, representing 9.6 % of the total certified acreage in Wales.

In the six North Wales counties between 1949 and 1959 there was a considerable fall - from 36.3 % to 7.0 % - in the proportion of the total certified acreage which they grew. Caernarvon and Montgomery contained between them 29.3 % of the total certified acreage in 1949, but this proportion had fallen to 5.5 % by 1959.

The acreage of the principal varieties of certified seed potatoes grown in Wales is given in the Appendix, Table V. In 1949 58.3 % of the certified acreage was under Arran Pilot and Homeguard, and a further 27.7 % under Majestic. About four-fifths of the certified acreage in 1959 was under Arran Pilot and Homeguard, while the proportion under Majestic had fallen to 13 %. Among the early varieties the preference in 1949 was for Arran Pilot; and its popularity was maintained until 1954, when the acreage of Homeguard exceeded its own, as, apart from a lapse in 1955, it has continued to do up to 1959.

The distribution, according to purity of stock, of the acreage of seed potatoes certified in Wales between 1949 and 1959 is given in the Appendix, Table VI. The main grades of certificate in England and Wales are 'SS', 'A' and 'H'. 'SS' or Stock Seed is a very high grade; crops must be at least 99.95 % pure and true to type, and it is intended mainly for seed production. 'A' is first quality commercial seed, and crops must be at least 99.5 % pure and true to type. 'H' is healthy commercial seed, similar to 'A', except that a relatively greater degree of tolerance is allowed for the presence of pests and disease. The 'SS' certificate is granted only in respect of seed of the same category, should the crop fail to reach 'SS' standard then it is automatically considered for an 'A' certificate. Where 'A' seed is planted in the first place, however, it cannot be considered for a higher certificate. The percentage distribution of the stocks and acreage according to the certificate obtained is given in the following table.

Table 2.

Percentage Distribution of Stocks and Acreage
According to Certificate Obtained. Wales -
1949-59.

Year.	Stocks.				Acreage.			
	'SS'	'A'	'H'	Total	'SS'	'A'	'H'	Total
	%.	%.	%.	%.	%.	%.	%.	%.
1949	21.9	60.2	17.9	100	21.9	61.8	16.3	100
1950	19.7	63.3	17.0	100	14.0	69.3	16.7	100
1951	21.8	59.0	19.2	100	25.8	53.7	20.5	100
1952	21.2	63.0	15.8	100	23.5	55.7	20.8	100
1953	17.0	67.4	15.6	100	16.6	61.9	21.5	100
1954	22.2	55.1	22.7	100	22.3	49.6	28.1	100
1955	25.9	63.4	10.7	100	30.6	64.5	4.9	100
1956	26.4	60.4	13.2	100	28.0	63.1	8.9	100
1957	12.9	70.3	16.8	100	9.0	69.1	21.9	100
1958	7.8	58.6	33.6	100	5.4	60.1	34.5	100
1959	10.4	74.1	15.5	100	6.7	75.5	17.8	100

Source: Ministry of Agriculture, Fisheries and Food Register

3. PROFITABILITY OF SEED POTATO PRODUCTION.

During the years 1949 to 1952 this Department was responsible for an enterprise study of seed potato production in certain upland areas in Wales. The results of this investigation have been published*; and they show that the factors affecting the profitability of seed potato production were largely yield per acre, grade of certificate obtained, and management. Of these factors the last is probably the most important, because it is related to the degree of care and attention given to the growing crop.

No further investigation of the crop has been made since those days. Nevertheless, it would be useful at this juncture to recall some of the evidence in support of the conclusions noted above. This evidence is presented in the Appendix, Tables VII, VIII and IX. Table VII shows the average results for 12 farms in the counties of Brecon and Radnor which provided complete records of costs and returns for the crop over the four years 1949-1952. Table VIII gives a comparison of results according to yields per acre on 24 farms for the year 1952. Table IX provides a comparison of results on the basis of grade of certificate awarded on 24 farms in 1952.

From the available data relating to the crop for the years 1949-1952 it

- * 1. Seed Potato Growing in an Upland Area of Wales. Costs and Returns on 36 Farms in Brecon and Radnor for Cropping Year 1949. A. M. Morgan Rees, M.Sc.
 2. Seed Potato Growing (Costs and Returns, 1950) A. M. Morgan Rees, M.Sc.,
 M. H. Dummer, B.A.

is possible to estimate the costs and returns of the enterprise in terms of present-day prices.

The estimate of the labour cost of the enterprise may be based on the average manual labour requirements per acre which were established by the investigation during the years 1949-52. These are given in the Appendix, Table X, and are shown in groups of operations. Operations before planting include ploughing, cultivating, ridging, carting and applying farm-yard manure and artificials. Planting operations include the preparation of seed before planting, such as sorting, boxing or bagging, as well as the actual planting itself. Weeding and summer operations cover re-ridging, some hand-hoeing, 'roguing', and spraying. Harvesting and subsequent operations extend to sorting, riddling, bagging and weighing after lifting the potatoes. These operations totalled, on the average over four years, 187.6 hours of manual labour per acre, and of this total 37.8 % was casual labour. The demand for casual labour is negligible for the operations before planting, but occurs during planting, harvesting and subsequent operations.

The quantity of seed planted per acre would vary with the size of the seed tubers: in this case it is assumed that one ton per acre is planted. The amount of fertilizer applied would depend on the place of the seed potatoes in the rotation: after corn it is assumed that, in addition to 10 cwt of compound fertilizer per acre, 10 tons of farm-yard manure are also applied, while after hay only the compound fertilizer would be applied at the rate of about 12 cwt per acre.

Other costs assumed are:- rent at £2 per acre; a charge in respect of repairs to and depreciation of potato equipment, planter, spinner etc.; the cost of materials used in spraying, petrol used for operating power sorter, etc., and finally, the inspection fee for certification and the levy payable to the Potato Marketing Board. To all these estimates a share of the general farm expenses, based on a charge of 10 % of the total labour cost for the enterprise, should be added.

Table 3.

Seed Potato Production.
Estimated Costs and Returns per Acre.

	£.
<u>COSTS:</u> Farm Labour - Manual @ 4/- per hour	
Horse @ 1/3d " "	
Tractor @ 4/6d " "	30
Casual Labour @ 3/- per hour	11
Seed - 1 ton @ £32	32
Farm-yard Manure 10 tons @ £1 per ton	10
Fertilizer 10 cwt @ £20 per ton	10
Rent	2
Repair and Depreciation of Potato	
Equipment and Other Costs	5
Share of General Farm Expenses	<u>4</u>
Total Estimated Costs	<u>104</u>
 <u>RETURNS:</u> - Assumed yield - 8 tons per acre of which 60% is seed	
5 tons of seed @ £26 per ton	130
2½ " " ware " £13 " "	29
15 cwt Chats " £3 " "	<u>2</u>
Total Estimated Returns	<u>161</u>
Estimated Margin per Acre	<u>£57</u>

Thus, on the assumptions made, seed potato production is potentially a profitable enterprise at today's prices. The enterprise study method, however, although giving useful comparisons between farms and providing information on cost structures, yields, and returns, nevertheless has its limitations. It isolates what is in effect a subsidiary enterprise from the general farm economy and attributes to that enterprise a share of all the costs involved on an accounting basis, e.g. farm labour, rent, overheads etc. This may not prove very helpful in relation to questions of management on a particular farm.

To illustrate this point, let us consider a farm of a given number of acres. The main enterprises are cattle and sheep; the land, other than that under grass, is devoted to the production of corn and green crops for livestock consumption. An adequate labour force is available to meet the farm requirements. The farmer is considering the introduction of seed potato production into his farming system as a complement to the existing enterprises. It can be readily seen that, whether he introduces seed potato production or not, the rent of the farm, the labour force, and the overheads will still have to be paid. These items, therefore, do not enter into his calculations. He is principally

concerned with the answers to at least two questions:- If I introduce seed potato production what extra costs will be incurred, and what extra income may be expected?

His extra costs will be in respect of the seed planted, the fertilizers applied to the crop and the casual labour employed to supplement the existing farm labour, especially for the harvesting and subsequent operations. The purchase of equipment, planter, spinner, etc. will involve an extra cost, and the crop will have to bear the interest charges and depreciation of the equipment. Other costs will be in respect of extra fuel beyond the customary requirements, the inspection fee and the Potato Marketing Board levy.

Assuming that the farmer decides to plant 3 acres of seed potatoes then the extra costs will be as follows:-

Extra Costs Involved in the Enterprise.

	£.
Seed Potatoes - 3 tons @ £32	96
Casual Labour - 3 acres @ £11 per acre	33
Fertilizer - 3 acres @ 12 cwt per acre @ £20 per ton	36
Depreciation of Potato Equipment and Other Costs	15
Extra fuel	<u>12</u>
Total	<u>192</u>

Returns from Enterprise.

Assuming yield of 8 tons per acre of which 60 % is seed.
Prices based on Autumn 1959.

	£.
15 tons of seed @ £26 per ton	390
$6\frac{3}{4}$ " " ware @ £13 " "	88
$2\frac{1}{4}$ " " chats @ £3 " "	<u>7</u>
Total	<u>485</u>

Extra Income from Enterprise.

£293

If a higher yield is obtained this will mean relatively better results. On the other hand, a higher yield will probably mean an increase in the amount of casual labour required to handle the increased tonnage. If the yield is 10 tons per acre, of which 60% is seed, and some extra casual labour is employed then the budget will be as follows:-

<u>Extra Costs Involved.</u>	£.
Seed Potatoes @ £32 per ton	96
Casual Labour 3 acres @ £13 per acre	39
Fertilizer 12 cwt per acre @ £20 per ton	36
Depreciation of Potato Equipment and Other Costs	15
Extra Fuel	<u>12</u>
Total	<u>198</u>
<u>Returns from Enterprise.</u>	
18 tons of seed @ £26 per ton	468
9 " " ware @ £13 " "	117
3 " " chats @ £3 " "	<u>9</u>
Total	<u>594</u>
<u>Extra Income from Enterprise.</u>	<u>£396</u>

In devoting 3 acres of grassland to seed potato production, the farmer may be faced with the need to purchase hay to replace that lost from the 3 acres. On the other hand, instead of buying hay he may decide to increase production from the remaining grassland by the application of more fertilizers. Such decisions will involve him in extra costs as a result of entering seed production, which must be set against the extra income he receives. For example, if he spent £80 on the purchase of hay, the deduction of this sum from the £396 extra income derived from seed potatoes would still leave him with £316.

Enough has been said to suggest that seed potato production is potentially profitable, and that it provides an opportunity for farmers in upland areas to augment their incomes by the production of a cash crop. A method has also been described whereby a farmer can arrive at a decision concerning the production of the crop in the light of present-day prices.

4. FINAL CONSIDERATIONS.

The potato acreage registered with the P.M.B. in Wales may be taken as providing an estimate of the minimum seed potato requirements in Wales. It may be regarded as the minimum because it does not take into account half the June 4th returns for maincrop and second earlies grown on farms,* or the potatoes grown on allotments and in gardens.

This acreage represents a possible demand for between 18,000 and 19,000 tons of seed potatoes, if we assume a seeding rate of 30 cwt per acre for earlies

* See p.3 paragraph 1.

and 1 ton per acre for maincrop and second earlies. The yield of seed potatoes from the certified acreage in Wales during the three years 1957-59 will have been under 2,000 tons, if we assume a yield of 5 tons per acre of seed. Thus on this basis it can be estimated that the seed grown in Wales is roughly about 1/9th of the possible requirements of the registered acreage.

How this compares with the general situation in Great Britain may be deduced by applying similar assumptions to the acreage registered with the P.M.B. in England, Scotland and Wales. In these three countries in 1958 670,050 acres of potatoes were registered with the Board of which 96,800 acres were under early potatoes. At a general seeding rate of 25 cwt per acre for earlies and 1 ton per acre for maincrop and second earlies, this acreage would represent a possible demand for 694,250 tons of seed. The seed potato acreage certified in England, Wales and Scotland in 1958 was 81,463 $\frac{1}{2}$ acres which, at a yield of 5 tons per acre of seed, would produce 407,317 $\frac{1}{2}$ tons. This tonnage of certified seed represents 58.7 % of the possible requirements noted above. Some of the seed used in Great Britain is obtained from Northern Ireland, where in 1958 25,599 acres were certified. If it is again assumed that this acreage would produce 5 tons per acre of seed, and that it was all sold in England, Scotland and Wales, the total tonnage of seed available would still amount to only 77.1 per cent of the total possible requirements of the P.M.B. registered acreage. Actually, however, the proportion would be even less than 77.1 per cent because some of the seed produced in Ireland would be retained for use in that country. The remaining requirements would be made up partly by seed once grown from certified seed and partly by uncertified seed.

There seems to be scope for raising the proportion of certified seed used at present to a higher figure. The importance of certified seed lies in the health of the seed, and the health of the seed is closely related to yield, and yield is a factor of considerable significance affecting the cash returns from the crop.

In view of the supply position of seed potatoes in Wales, and the potential demand, there is obviously scope for increasing the acreage of seed potatoes. At the moment seed potato production is concentrated in the counties

of Brecon, Radnor, and Cardigan. Any increase in its acreage should be in these areas, for at least three reasons. First, they are close to the relatively large market for seed in South Wales; second, growers' organisations are in existence in these areas; third, there is a considerable body of experience there conversant with the problems and technique of seed production, which would be of value to any new grower.

The close proximity of the seed growing districts to the market for seed offers a competitive advantage to the growers in those areas. In fact, the situation confers advantages on both the buyer and the producer. Transport costs are reduced. The seed may be transported by lorry over the relatively short distances, thus obviating the risk of damage by frost or by handling in transit. To the producer, the demand for seed by the Pembrokeshire grower in the early autumn for chitting purposes reduces the need for winter storage and the risk involved, so that adaptation of buildings or clamping are not required.

Since the early days of seed potato production in Wales, growers have formed themselves into organisations designed to promote the sale of their product. This is only natural when production is undertaken on many farms, each with a relatively small acreage under seed; the grower is thus relieved of the necessity to spend time in searching for a market. Some of these organisations have performed a useful function in the field of safeguarding the quality of the produce. For example, the Brecon-Radnor Seeds, Ltd. lay down certain rules which must be observed by their members. New stocks of seed have to be obtained from a source approved by the Society's Committee. The growers are advised to specialise in one variety, thus reducing the risk of impurities. It is stipulated that all seed potatoes offered for sale should be properly graded, and to this end seed is inspected and a certificate of grading given which is acceptable to the Society's agent for sale. The Brecon-Radnor Seeds, Ltd. have their own branded bags, and the task of selling has been entrusted to an agency specialising in the sale of farm products. Provided that the grower obeys the rules he will benefit from them, and be relieved of the task of marketing small lots of seed in a large market.

There are at least two problems which a new grower would encounter in undertaking this enterprise. The first is the need for casual labour to assist with planting and even more with harvesting and subsequent operations. This is probably one of the biggest obstacles to any expansion in the seed potato acreage. It is because of this obstacle that in many cases the acreage has been limited to that which can be dealt with by the existing farm labour, plus the help of family, friends and relatives. In many instances neighbouring farmers have sought to resolve their problem by pooling their labour resources and, with the resulting enlarged labour force, working in turn on the farms concerned. In one or two districts it has even been possible to organise village labour pools for this work. Where the seed potato acreage on a particular farm is limited to a small area because of the difficulty of obtaining casual labour, the scope for mechanisation of the crop becomes limited, and thus the labour problem is further aggravated. However, many ways of tackling this problem have been tried in the established areas of seed potato production, and it is here that a solution to it is likely to be found.

The second problem to be encountered by a new grower would be the operation of roguing. To ignore this operation would mean that the health of the crop would suffer, which would lead either to a loss of certificate or at least to a poor one. Roguing must be thorough and started as early as possible. In this respect the new grower could learn from the experience of an established seed grower in the neighbourhood, and in any case could call on the services of the N. A. A. S. in the area.

Finally, to be successful in the market and to meet the competition of seed from other sources the grower must achieve a high standard of management; and this will be reflected in the yield, health and careful grading of the seed potatoes.

APPENDIX.Table 1.

Acreage of Potatoes in England and Wales Per
1000 acres of Crops and Grass 1949 - 1959.

Acres.

Year.	England.		Wales.	
	Early.	Maincrop & Second Earlies.	Early.	Maincrop & Second Earlies.
1949	9.2	30.6	6.4	16.6
1950	7.7	29.5	5.6	14.7
1951	5.7	25.8	4.9	11.1
1952	5.0	24.3	4.5	10.6
1953	5.0	24.0	4.0	9.6
1954	5.0	23.2	4.1	7.9
1955	4.5	21.8	4.0	6.6
1956	5.5	23.2	4.0	6.7
1957	3.9	20.8	3.4	5.7
1958	3.4	21.7	3.6	5.6
1959	3.6	21.4	3.7	5.3

Table II.

Acreage of Potatoes in England and Wales 1949-1959.
(June 4th Returns).

'000.

Year.	England.						Wales.					
	Maincrop: & Second:			Maincrop: & Second:			Maincrop: & Second:			Maincrop: & Second:		
	Early.	Earlies.	Total.	Early.	Earlies.	Total.	Early.	Earlies.	Total.	Early.	Earlies.	Total.
	Acres.	Acres.	Acres.	%.	%.	%.	Acres.	Acres.	Acres.	%.	%.	%.
1949	201.1	660.0	870.1	23.1	76.9	100	16.2	42.3	58.5	27.8	72.2	100
1950	169.1	645.2	814.3	20.8	79.2	100	14.3	37.7	52.0	27.5	72.5	100
1951	124.2	566.6	690.8	18.0	82.0	100	12.5	28.6	41.1	30.4	69.6	100
1952	109.2	533.4	642.6	17.0	83.0	100	11.7	27.2	38.9	30.1	69.9	100
1953	109.7	526.9	636.6	17.2	82.8	100	10.2	24.8	35.0	29.2	70.8	100
1954	109.0	508.4	617.4	17.7	82.3	100	10.5	20.5	31.0	33.9	66.1	100
1955	98.0	477.9	575.9	17.0	83.0	100	10.3	17.3	27.6	37.3	62.7	100
1956	99.7	507.2	606.9	16.4	83.6	100	10.5	17.3	27.8	37.6	62.4	100
1957	86.6	454.6	541.2	16.0	84.0	100	8.9	14.8	23.7	37.5	63.5	100
1958	75.3	475.8	551.1	13.7	86.3	100	9.5	14.7	24.2	39.3	60.7	100
1959	78.0	469.2	547.2	14.3	85.7	100	9.8	13.7	23.5	41.6	58.4	100

Table III.

Acreage Planted by Producers Registered with the Potato Marketing Board.WALES.(Acres).

County.	1957.			1958.			1959.			1960.		
	:Maincrop: :& Second:			:Maincrop: :& Second:			:Maincrop: :& Second:			:Maincrop: :& Second:		
	Early.	Early.	Total.	Early.	Early.	Total.	Early.	Early.	Total.	Early.	Early.	Total.
Anglesey	350	170	520	340	140	480	340	110	450	410	120	530
Caernarvon	90	400	490	80	380	460	90	360	450	90	340	430
Denbigh	120	490	610	110	520	630	150	520	670	110	450	560
Flint	130	600	730	150	630	780	140	580	720	140	650	790
Merioneth	10	30	40	10	20	30	10	20	30	-	10	10
Montgomery	-	130	130	10	110	120	10	110	120	10	90	100
Total	700	1,820	2,520	700	1,800	2,500	740	1,700	2,440	760	1,660	2,400
Brecon	110	70	180	110	80	190	130	70	200	180	80	260
Cardigan	160	1,000	1,160	170	950	1,120	170	910	1,080	150	820	970
Carmarthen	200	560	760	160	550	710	180	470	650	220	440	660
Glamorgan	640	1,120	1,760	670	1,230	1,900	620	1,160	1,780	730	1,090	1,820
Monmouth	250	930	1,180	160	940	1,100	130	980	1,110	150	1,050	1,200
Pembroke	5,790	880	6,670	5,860	1,150	7,010	6,580	1,320	7,900	7,070	1,340	8,410
Radnor	90	100	190	60	100	160	60	80	140	70	120	190
Total	7,240	4,660	11,900	7,190	5,000	12,190	7,870	4,990	12,860	8,570	4,940	13,510
Total Wales	7,940	6,480	14,420	7,890	6,800	14,690	8,610	6,690	15,300	9,330	6,600	15,930

Source: Potato Marketing Board.

Table IV.

Number of Growers and Acreage of Seed Potatoes Certified by Counties in Wales.

Number.

County.	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959
Anglesey	14	9	4	3	1	-	2	1	2	1	2
Caernarvon	48	53	36	27	20	18	17	15	13	11	10
Denbigh	16	19	26	26	17	8	3	3	1	2	1
Flint	6	-	1	4	4	2	1	2	3	2	1
Montgomery	47	24	7	7	3	4	2	-	1	2	2
Merioneth	2	1	2	1	1	1	2	2	2	-	1
Brecon	65	62	43	36	25	17	9	15	23	21	25
Radnor	21	16	14	18	13	11	7	7	10	12	9
Cardigan	40	30	21	23	25	24	21	25	28	27	32
Pembroke	45	29	26	23	23	17	10	12	12	10	5
Carmarthen	7	7	8	6	6	10	7	5	6	3	3
Glamorgan	4	3	1	1	-	1	-	-	-	1	1
Monmouth	5	2	3	18	17	8	16	13	13	8	6
Total	318	255	192	193	155	121	97	100	114	100	98

19.

Acreage.

Anglesey	32.0	35.0	17.0	29.0	5.0	-	3.5	1.0	5.5	2.0	3.8
Caernarvon	147.9	130.5	92.0	64.6	50.4	40.8	31.8	38.2	34.0	29.6	17.0
Denbigh	31.2	56.2	60.0	67.5	30.5	15.0	15.0	13.0	1.0	9.5	2.0
Flint	15.2	-	5.0	36.8	55.2	9.5	3.0	9.0	26.0	5.0	3.0
Montgomery	155.3	68.9	17.8	15.1	8.0	8.8	5.8	-	3.0	7.2	4.8
Merioneth	4.5	2.0	3.0	1.2	1.5	1.8	2.0	2.0	2.0	-	1.0
Brecon	198.0	179.6	113.0	114.5	78.5	64.2	47.7	78.0	95.3	114.5	140.4
Radnor	184.8	153.6	50.2	61.5	65.5	79.0	39.0	53.5	62.0	71.0	69.5
Cardigan	103.6	66.8	42.8	49.8	54.8	56.5	38.5	55.8	50.5	59.2	86.0
Pembroke	123.5	68.8	62.9	48.0	58.1	41.2	19.5	28.0	30.0	31.5	12.7
Carmarthen	8.5	18.2	38.7	35.4	28.9	31.7	24.5	25.2	15.5	8.0	9.0
Glamorgan	11.1	5.5	2.0	1.0	-	2.0	-	-	-	4.0	6.7
Monmouth	10.5	8.4	9.5	38.8	65.5	41.5	83.2	63.5	71.5	48.5	37.8
Total	1036.1	793.5	513.9	563.2	501.9	392.0	313.5	367.2	396.3	390.0	393.7

Source: Ministry of Agriculture, Fisheries & Food Register.

Table V.

Acreage of Principal Varieties of Seed Potatoes
Grown in Wales.
 (Acres).

Varieties.	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959
Arran Pilot	404.5	315.2	205.9	234.6	196.9	125.0	106.9	101.3	105.0	111.7	116.0
Homeguard	199.9	112.8	103.6	131.3	143.5	133.0	100.0	152.2	164.7	142.5	203.9
Majestic	287.4	219.0	119.3	142.6	108.1	68.8	68.8	62.5	84.3	101.8	51.2
Arran Banner	41.5	41.2	40.4	24.7	18.8	20.0	15.2	19.0	15.0	10.5	5.8
Gladstone	48.4	33.0	11.8	3.2	-	-	-	-	-	-	-
Kerr's Pink	14.2	17.7	6.0	1.7	3.0	4.5	2.5	5.3	2.0	2.0	1.0
Sharpe's Express	11.0	12.7	3.2	2.0	3.2	1.5	2.5	3.5	1.8	0.5	1.8
Ulster Premier	0.5	0.5	-	5.0	7.5	22.7	8.8	8.5	2.5	5.8	7.0
Others	28.7	41.4	23.1	18.1	20.9	16.5	8.8	14.9	21.0	15.2	7.0
Total	1036.1	793.5	513.9	563.2	501.9	392.0	313.5	367.2	396.3	390.0	393.7

Table VI.

Distribution of Stocks and Certified Acreage of Seed Potatoes According to
Certificate Obtained.

Wales 1949-1959.

Year.	'SS'		'A'		'H'		Total.	
	Stocks	Acreage	Stocks	Acreage	Stocks	Acreage	Stocks	Acreage
1949	93	226.4	256	640.4	76	169.3	425	1036.1
1950	67	111.4	216	550.1	58	132.0	341	793.5
1951	59	132.3	160	276.1	52	105.5	271	513.9
1952	59	132.3	175	313.6	44	117.3	278	563.2
1953	38	83.3	151	310.6	35	108.0	224	501.9
1954	37	87.2	92	194.5	38	110.3	167	392.0
1955	34	96.0	83	202.2	14	15.3	131	313.5
1956	38	102.9	87	231.8	19	32.5	144	367.2
1957	20	35.8	109	273.8	26	86.7	155	396.3
1958	10	21.0	75	234.5	43	134.5	128	390.0
1959	12	26.5	86	297.0	18	70.2	116	393.7

Table VII.

Average Costs and Returns from Seed Potato Production in 12
Identical Farms. Brecon & Radnor 1949-1952.

	1949.	1950.	1951.	1952.
Acreage Costed	42 $\frac{1}{4}$	36	28 $\frac{3}{4}$	26 $\frac{1}{2}$
Average acreage grown per farm	3.5	3.0	2.4	2.2
Average Total Yield per Acre	6t. 3 $\frac{1}{4}$ c.	8t. 11 $\frac{1}{2}$ c.	8t. 19c.	7t. 18c.
Percentage Seed to Total Yield	70%	61%	53%	60%
Average Cost per Acre	£62	£69	£70	£70
Average Receipts per Acre	£84	£107	£111	£105
Average Margin per Acre	£22	£38	£41	£35

Table VIII.

Comparison of Results According to Yield per Acre in 1952.
24 Farms in Brecon & Radnor.

	Yield per Acre of :-		
	Under 6 tons	6-8 tons.	Over 8 tons
Number of Farms	6	7	11
Acreage Costed	14	15	47 $\frac{1}{2}$
Yield per Acre	5t. 9c.	6t. 19c.	8t. 12c.
Percentage Seed to Total Yield:	69%	69%	59%
Cost per Acre	£54	£62	£78
Receipts per Acre	£75	£95	£117
Margin per Acre	£21	£33	£39

Table IX.

Comparison of Farms on Basis of Grade of Certificate Awarded.
24 Farms Brecon & Radnor 1952.

	Average for :-		
	4 Farms where all or part of obtained 'SS' Certificate.	16 Farms where 'A' Certificate obtained.	4 Farms where 'H' certificate obtained or where crops were failed.
Acres Costed	40 $\frac{1}{4}$	28 $\frac{1}{4}$	8
Average Yield per Acre	7t. 14c.	7t. 12c.	7t. 15c.
Percentage Seed to Total Yield	63%	66%	44%
Average Cost per Acre	£69	£74	£67
Average Receipts per Acre	£111	£101	£93
Average Margin per Acre	£42	£27	£26

Table X.

Average Labour Requirements Per Acre (Manual, Horse
and Tractor).

1949-1952.

Hours per Acre.

	: Manual Labour :	: Casual :	: Labour :	: Total as % of:	: Farm : Casual: Manual: Total :	: Horse :Tractor
Operations.	: Labour:	: Labour:	: Labour:	: Labour:	: Labour:	: Labour:
Operations before Planting	: 23.2 :	: 0.3 :	: 23.5 :	: 1.2 :	: 0.6 :	: 13.9
Planting	: 18.2 :	: 4.2 :	: 22.4 :	: 18.9 :	: 0.9 :	: 3.5
Weeding and Summer Operations:	: 13.4 :	: 1.5 :	: 14.9 :	: 9.8 :	: 1.9 :	: 2.1
Harvesting & Other Operations:	: 61.8 :	: 65.0 :	: 126.8 :	: 51.2 :	: 1.2 :	: 10.2
Total	: 116.6 :	: 71.0 :	: 187.6 :	: 37.8 :	: 4.6 :	: 29.7

