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RED BEET

H. W. T. Kerr

Agricultural Enterprise Studies
in England and Wales
Economic Report No. 21

August 1973

UNIVERSITY OF NOTTINGHAM

DEPARTMENT OF AGRICULTURE AND HORTICULTURE

RED BEET

A study of the production economics of
the 1971 Red Beet Crop in the East Midland
Region including the Holland Division of Lincolnshire

H. W. T. KERR

PRICE 30p

August 1973

AGRICULTURAL ENTERPRISE STUDIES IN ENGLAND AND WALES

University departments of Agricultural Economics in England and Wales have for many years undertaken economic studies of crop and livestock enterprises. In this work the departments receive financial and technical support from the Ministry of Agriculture, Fisheries and Food.

A recent development is that departments in different regions of the country are now conducting joint studies into those enterprises in which they have a particular interest. This community of interest is being recognised by issuing enterprise reports in a common series entitled "Agricultural Enterprise Studies in England and Wales", although the publications will continue to be prepared and published by individual departments.

Titles of recent publications in this series and the addresses of the University departments are given at the end of this report.

ACKNOWLEDGEMENTS

The author would like to gratefully acknowledge the help received in the conduct of this study and in the preparation of the report. Firstly, thanks are due to the farmers who co-operated so willingly and without whose assistance the investigation could not have been undertaken. Many others contributed to this publication but special mention should be made of Mr. George Le May of A.D.A.S. who advised on the agronomic aspects of the study, Dr. David Arthey of the Campden Food Preservation Association and Mr. L. Buchan of Smedley-H.P. who provided valuable information concerning the processing industry. The author would also like to express his thanks to Mrs. M. Davey who analysed the data and Mrs. J. Younger who typed the report in its several drafts.

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FOREWORD

This study of the 1971 red beet crop was carried out as part of the programme to gain further knowledge of crops which might be of value as break crops in the rotation of general arable farms in the East Midlands Region. The Holland division of Lincolnshire was also included by agreement with the University of Cambridge within whose province this county is located. Reports have already been published on oilseed rape, field beans, vining peas and threshed peas and another on dry bulb onions is imminent. This report is presented in the same form as the others in the series, the primary purpose of the study being to examine the potential for introducing red beet into the rotation of general arable farms. Since the crop makes a considerable demand upon fixed resources an assessment is also made of their cost so that the output and gross margin needed to provide a satisfactory net margin could be suggested.

Owing to limited resources, the sample was small, but it is hoped that this study, besides providing useful data in its own right, may act as a pilot for wider investigations in the future.

1. INTRODUCTION

1.1. The Red Beet Crop in 1971

The red beet crop grown in England and Wales totalled 8,468 acres in 1971. Of this 2,590 acres or 31% was grown in the East Midland Region plus the Holland Division of Lincolnshire. Over 60% was grown in the Eastern and East Midlands Regions taken together, the main locations being in Lincolnshire (Lindsey), 1,807 acres; Cambridgeshire, 917 acres; Bedfordshire, 668 acres; Norfolk, 600 acres; and Nottinghamshire, 524 acres. Outside these two regions, 785 acres were grown in the West Riding of Yorkshire, 689 acres in Lancashire and 505 acres in Kent.

Although the total acreage has risen by nearly 20% compared with 1961, the 1971 acreage was only 200 acres more than that grown in 1967. Nevertheless, there has been a substantial increase in the acreage grown in the East Midland Region since 1961, mainly in Lincolnshire (Lindsey). Details of the total acreages and the East Midland Region county acreages are given in Table 1. The acreage in Lindsey is largely confined to the Isle of Axholme. The original concentration of the crop in this relatively small area appears to be due to the local structure of small farms combined with the suitability of the soil for intensive crop production in general, rather than of red beet in particular. It was included in the rotation because of the demand for beetroot in the surrounding industrial areas. Although the farms have now grown larger, the tradition of growing red beet continues.

Table 1 ACREAGE OF RED BEET GROWN IN ENGLAND AND WALES, EASTERN AND EAST MIDLANDS REGION AND THE EAST MIDLANDS COUNTIES

acres

	1961	1965	1967	1968	1969	1970	1971
England and Wales	7116	6438	8244	7271	7454	7679	8468
Eastern Region (less Lincs./Holland)	2296	1877	2267	2114	2246	2059	2739
East Midlands (plus Lincs/Holland)	1483	1598	2437	2260	2240	2528	2590
Lincs., Holland	128	105	173	86	88	107	114
Kesteven	14	50	50	70	32	49	24
Lindsey	989	1078	1737	1690	1660	1740	1807
Derby	59	74	106	55	65	98	84
Leicester	20	25	19	17	19	31	36
Northants	4	2	2	4	2	3	1
Nottinghamshire	269	264	349	339	375	500	524
Rutland	-	-	-	-	-	1	1

1.2 Outlets for the Product

Red beet reaches the consumer either fresh or processed in some way or another. The term "processed" can cover a number of activities from simply cooking to the factory processes of bottling or canning. In this broad sense a high proportion of the product is now sold processed rather than fresh. Figures are not available for the disposal of all the 109,000 tons[1] estimated by the Ministry of Agriculture to

(1) M.A.F.F. Annual Estimates of Area, Gross Production and Output of Vegetables for Human Consumption (Excluding Potatoes) in the United Kingdom.

have been sold off the farm in the United Kingdom in 1971, but approximately 22,000 tons were bottled and 5,500 tons were canned.[2] There is a considerable loss in these processes resulting from peeling and cooking and rejection of unsuitable beet of the order of one quarter to a half of the quantity leaving the farm, depending upon the seasonal effect on quality, the size of the beet and the time of delivery. Possibly as much as 20,000 tons of fresh beet is cooked and marketed in flexible packs of several sizes, the most popular being 5oz. and some are sold in vacuum packs. The rest is marketed either after boiling and dipping in preservative or fresh. The main outlet for fresh beet now is to institutions who prefer to do their own cooking and is handled through agents specialising in this trade.

The size of beet sold fresh in the market falls within the range 1½" to 3¼" in diameter. Baby beet 1" to 1¾" are bottled whole in vinegar and two grades 2" to 2½" and 2½" to 3¼" in size are sliced or diced first and then also bottled in vinegar. Whole small beet 1⅝" to 2" are used for canning and for vacuum packing. All sizes may be used for packing in flexible packs, the smaller beet being included whole and the larger chopped to a suitable size.

Beet for canning or bottling are generally grown on contract with the processor. A typical bottling contract in 1971 offered £18 to £21 per ton delivered for baby beet 1" to 1¾" in size and £13.50 to £15 per ton for baby beet grown specifically for harvest in August

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(2) Lawson, N. Statistical Review, Part III. U.K. Food Industry 1971 - Processed Foods and Agricultural Statistics. 1972 Edition. The Campden Food Preservation Association. September, 1972.

from which there is little or no ware. Normally the ware crop harvested during September and October is graded by the grower into two or more grades, depending on the contract requirement and the alternative outlets, since the contract does not usually cover the whole crop. Contracts are based on tonnage and stipulate even weekly delivery throughout the season from September to May. Loads may be rejected if too high a proportion of the beet are bolters, diseased, decayed, spongy, mechanically damaged, harbour parasites or carry excess foliage.

Some growers pack their own beet in flexible packs, sometimes contracting with other growers for additional supplies. There are also firms packing only who contract with growers for their requirements. Packing contracts are similar to those for bottling.

Agents who satisfy the institutional demand for fresh beet contract with the grower by agreement as to total quantity and timing of deliveries but pay at the ruling market price.

There is small demand for large beet over 3¼" in size from which cocktail appetisers are made similar in purpose to cocktail onions and pickled gherkins.

No figures are available for imports but it is known that some beet is imported bottled from the U.S.A., Poland and Sweden and fresh from Cyprus and Belgium.

1.3 The Scope of the Study

The sample was drawn from a random list of growers in the East Midland Region plus Lincolnshire (Holland) growing more than one acre.

It was hoped to obtain fifteen cooperators but ultimately only thirteen could be found. Of these only one with 2¼ acres grew specifically for marketing fresh. The remaining twelve all sent their beet for processing, mostly on contract either to a processor or to a grader, but three sold part of their crop on the open market for processing. The distribution by county, of the sample which included two growers with over 80 acres and one with nearly 50 acres is shown in Table 2. The total of 331¼ acres covered by the sample represents 12.8% of the total acreage grown in the East Midland Region plus Lincolnshire (Holland) and 3.9% of the total grown in England and Wales.

Table 2 DISTRIBUTION OF THE SAMPLE BY COUNTY

County	No. of Growers	Acreage
Derbyshire	1	2¼
Nottinghamshire	1	20
Lincs. Lindsey	10	299
Lincs. Holland	1	10
	13	331¼

1.4 Special Features of the 1971 Crop

Weather conditions in 1971 were favourable to the growth of the crop and harvesting conditions were particularly good. Yields in the East Midlands were above average but the market was weak resulting in generally poor prices.

2. GENERAL HUSBANDRY

2.1 Place in the Rotation

Like its close relative sugar beet, red beet should not be grown at an interval closer than once in three years. There must be a similar gap between it and its related crops, sugar beet and mangolds, and also brassica crops which harbour beet eelworm (heteroda schactii).

2.2 Soil Type

Medium loam soils are ideal for this crop; light soils are too dry for sowing in May and heavy soils make harvesting too difficult. Nevertheless, between these two extremes there is a fairly wide spectrum of soils on which the crop can be grown successfully. Adequate lime is required but over-liming can lead to both boron and manganese deficiency as in sugar beet.

2.3 Cultivations

A fine level seed bed is required. The cultivations which will achieve this depend upon soil type and condition and machinery available but they need not be lengthy (see Table 6). The crop is usually rolled after drilling. Only three growers with 102¼ acres found it possible to eliminate inter-row cultivation. Gapping or singling is not necessary but seven growers with 159 acres had the crop hand-weeded by regular and casual labour.

2.4 Seed and Sowing

The crop is space or precision drilled from early May until mid-June. A wide variety of row widths were used; the most common was 19" single rows used by six growers covering 156½ acres, and another (2½ acres) used 24" single rows. The remainder used double rows of different widths and different centre distances between them. Plant populations were not generally known and spacings were not recorded in sufficient number to provide a basis for comment. Insufficient information was also supplied as to whether the seed was natural or rubbed, but the varieties grown, all of which were globe type, and the seed rates used are shown in Table 3. The

Table 3 VARIETIES AND SEED RATES BY ACREAGE GROWN

	Acreage Grown	Proportion of Total Acreage	Seed Rate per acre
	Acres	%	lbs
Early:			
Ruddigor	2	0.6	10
Boltardy	1½	0.4	10
Avon	¼	0.1	12
Maincrop:			
Detroit Globe	170½	51.5	9¼
Empire Globe	87	26.3	11
Crimson Globe	56	16.9	4¾ (a)
Sharp's	4	1.2	10
Not known	10	3.0	10

(a) 7 acres at 10 lbs. per acre 49 acres at 4 lbs. per acre with graded seed.

highest rate used was 12 lbs. per acre and the lowest 8½ lbs., except for 49 acres which were sown at 4 lbs. per acre with seed recorded as "graded". Even allowing for the fact that the seed may have been rubbed, the seed rates used appear to be considerably below the generally recommended rates for natural seed:-(3)

Early bunching crop:	8 lbs. per acre - 5 plants per square foot.
Ware crop:	16 lbs. per acre - 10 plants per square foot.
Pickling crop:	24-30 lbs. per acre - 15-20 plants per square foot.

In order to obtain a suitable plant population it is important to establish the number of seed contained in each cluster and the number of clusters per lb. following rubbing. The seed rate required can be calculated using a standard formula. (4)

In view of the general uniformity of the seed rate it would not appear that much attention is being given to the important question of plant population.

It is desirable to soak the seed with thiram to control seedling diseases, a process developed specifically for red beet by the National Vegetable Research Station. Most seed merchants

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(3) Frappell, B. D. "Plant Density Studies with Red Beet" M.Sc. Thesis. University of Birmingham, 1968.

(4) Seed/lbs per acre = $\frac{272 \times \text{No. of plants/sq. ft.}}{\text{No. of clusters/oz. in '000s} \times \text{No. of plants per 100 clusters} \times \text{Field tractor} \times \text{\%age germination}}$

now carry out this operation and include the charge for it in the cost of the seed.

2.5 Fertilisers

Fertiliser was applied to the whole acreage at an average rate of 9.4 cwts. per acre supplying 106 units of nitrogen, 94 units of phosphate, and 169 units of potash, a ratio of approximately 1:1:1¾. However, fertilisers having eight different analyses were used, supplying different quantities of nutrient per acre. Details are given in Table 4. The recommended rates are 100-120 units of nitrogen, 60 units of phosphate, and 120 units of potash adjusted according to soil analysis.(5) It would appear that these requirements are being met but that additional phosphate and potash is often applied.

Table 4 FERTILISER APPLICATION

Analysis of Fertiliser			Average Rate of Application	Units Applied per acre			Acreage Treated	Proportion of Acreage
N	P	K	Cwts. per acre	N	P	K	Acres	%
16	18	20	8.0	128	144	160	8	2.4
13	13	20	9.7	127	127	195	69¼	20.9
10	10	18	9.5	95	95	171	123	37.1
10	8	20	8.0	80	64	160	2½	0.8
7	7	10	10.0	70	70	100	49	14.8
17	8	24	7.9	134	63	189	37	11.2
13	6	20	10.2	132	61	203	32½	9.8
8	20	16	8.0	64	160	128	10	3.0
Mean			9.4	106	94	169	-	-
						Total	331¼	100.0

(5) M.A.F.F. Fertiliser Recommendation for Agricultural and Horticultural Crops. N.A.A.S. Advisory Papers No.4, July, 1967.

2.6 Crop Protection

Ninety per cent of the sample acreage was treated with a pre-emergence herbicide and eighty per cent with post-emergence, nearly three quarters of the acreage being treated with both. Details are given in Table 5. Half the acreage was sprayed to control aphids, almost all with Demeton-s-methyl preparations.

Table 5 CROP PROTECTION

Type of Spray	Chemical	Acreage Sprayed	Proportion of Acreage Grown	Purpose
Herbicides:				
Pre-emergence	Propham with Fenuron and Chlorpropam	224	67.7	Broad spectrum of germinating seeds
	Lenacil	85¼	25.7	Broad spectrum of germinating seeds
	Total pre-emergence	309¼	93.4	
Post-emergence	Phenmedipham	267¾	80.8	Annual broad leaved weeds
	Total	577	174.2	
Insecticides:				
Systemic	Demeton-s-methyl	166	50.1	Aphis control
Organo Phosphorus	Dimethoate	8	2.4	Aphis control
	Total	174	52.5	

2.7 Harvesting and Storage

The harvesting of crops grown specially for baby beet begins in late July or early August and the main crop is lifted during September and October. The crop must be out of the ground before there is any likelihood of frost so that harvesting should be completed by mid November at the latest. It is generally harvested using a potato or beet harvester. The lifting share of potato harvesters may need modification to provide a flat base with depth control and pulleys and belts may require adaption to speed up the elevators. Three growers harvested 16¾ acres by hand but the rest all harvested their crops with mechanical harvesters. Two harvested 34½ acres with Grimme harvesters and one (2½ acres) used a Massey Ferguson. The remaining 277½ acres were harvested with Whitsed harvesters, seven growers using the single row tractor-drawn machine and one (30 acres) the two row self-propelled model. No growers in the survey used the top-lifting beet harvester now becoming more popular. A forage harvester was used to top the beet except when the crop was pulled by hand.

Beet can be stored satisfactorily in clamps up to February or March depending on the season. There is a tendency to heat up in store and if they are to be kept longer some form of ventilated storage is necessary. Most of the sample crop, the production of 294¼ acres, was stored in clamps: three growers with the remaining 37 acres stored inside, but only one was reported to have used cold air. Eight growers graded the crop themselves before sale.

2.8 Labour and Machinery Requirements

The average labour and tractor hours used are shown in Table 6. These figures include the casual and contract labour and contract or hired tractors. They refer only up to the point where the crop had been clamped or put into store. The subsequent work of removing from the clamp grading and despatching has been treated entirely as contract since several cooperators were unable to supply details of the actual hours worked, payment being made per

Table 6. LABOUR AND TRACTOR REQUIREMENTS

Hours per acre

Operation	Labour		Tractors	
	Average	Range	Average	Range
Ploughing	2.2[a]	0.5 - 6.0	2.2	0.5 - 6.0
Working down and Drilling	2.4	1.1 - 5.0	1.8	0.7 - 4.0
Post drilling	8.1[b]	0.9 - 44.1	1.9	0.9 - 7.2
Total Pre-Harvest	12.7	4.1 - 48.1	5.9	2.8 - 12.9
Harvesting	35.7[c]	12.7 -178.8	18.4	1.6 - 38.0
Total	48.4	16.8-227.4	24.3	9.8 - 50.1

Note: These figures include casual labour. The total figure relates to the total requirement to the point where the beet were either clamped or in store. They do not include removing from clamp, grading and sorting or haulage.

(a) Includes stubble cleaning when carried out.

(b) Including 5.2 hours per acre casual labour.

(c) Including 13.0 hours per acre casual labour.

ton handled. Haulage has been treated similarly for the same reason. Harvesting has the greatest labour and tractor requirement, approximately three times the total pre-harvest requirement. There is a very wide range about the mean of these figures which is connected with the use of labour for hand weeding and the different requirement for hand and mechanical harvesting.

The labour and tractor requirements of the ten growers who used mechanical harvesters are shown in Table 7, compiled on the same basis as the figures given in Table 6. There was a considerable variation in the number employed in the harvesting team. The smallest

Table 7 LABOUR AND TRACTORS REQUIRED FOR HARVESTING BY TEN GROWERS USING COMPLETE HARVESTERS

hours per acre

	Labour	Tractors
Average	28.5	19.0
Range	12.7 - 73.5	6.9 - 38.0

Note: The average labour figure includes 13.0 hours per acre casual. The average tractor hours include 0.2 hours per acre provided by contractor.

team including those at the clamp or store was four and the largest ten, comparable to that required for harvesting potatoes rather than sugar beet. The rate of work varied from six acres in an eight hour day down to three quarters of an acre and averaged two and a quarter acres (or 3.6 hours to clear one acre). The speed of operation was not related to the size of team employed. The harvester was used for one or more other crops as well as the red beet on all farms in the sample.

3. FINANCIAL RESULTS

The average output, variable costs and gross margin per acre are shown in Table 8. A margin over material costs (seeds, fertilisers and sprays) is also given because of the variability in the use of casual labour and contract services. Average figures given both for the whole sample and for the ten growers with processing contracts using mechanical harvesters show little difference. The ranges of all items for the group using mechanical harvesters are omitted since they were almost identical in every respect to those of the whole sample except for the cost of casual labour for which the upper limit was only £6.0 per acre.

3.1 Output

The price paid for the beet may be for collection at the farm, after delivery to a grader, or after delivery to a processing factory. When the grower is expected to deliver the beet the price paid allows for the cost of haulage. Similarly when the crop is graded by a grader the cost of grading is taken into account in setting the price paid to the grower.

The average yield of 14.7 tons was well above the Ministry of Agriculture's estimate for the average U.K. yield in 1971 of 12.4 tons per acre and the average for the last five years of 12.7 tons per acre, details of which are given in Table 9. The average price of £13.49 per ton sold was low and only 65% of the crop was sold for human consumption; nearly 20% was ploughed in or dumped - an indication of the weakness of the market. This sample, however, may not be representative of the country as a whole since according to

Table 8 OUTPUT, VARIABLE COSTS AND GROSS MARGIN - ALL GROWERS

	Average of all Growers	Range	10 Growers with Processing Contracts Harvesting Mechanically
Average Price per Ton Sold £	13.49	8.0 - 19.7	13.76
Yield (Ex Store) tons/acre	14.7	7.0 - 29.0	14.9
Proportion Sold for Human Consumption %	65.5	31.3 - 100.0	64.2
Proportion Fed to Livestock %	15.4		16.2
Proportion Ploughed in %	19.1		19.6
	per acre £	per acre £	per acre £
OUTPUT:			
Sold for Human Consumption	130.10		131.45
Fed to Livestock	4.51		4.78
Total	134.61	42.0 - 232.1	136.23
VARIABLE COSTS:			
Seeds	5.45	3.7 - 11.5	5.26
Fertilisers	12.24	9.2 - 16.1	12.35
Sprays: Herbicides	4.91 (a)	Nil - 12.1	4.92
Pesticides	0.78 (a)	Nil - 2.0	0.83
Sub-Total	23.38	16.4 - 32.6	23.36
MARGIN OVER MATERIAL COSTS	111.23	20.6 - 209.3	112.87
Casual Labour	4.80 (b)	Nil - 54.0	2.37
Haulage	15.52 (c)	Nil - 37.7	16.38
Grading	16.74 (d)	Nil - 46.6	17.70
Other Contract	0.27 (e)	Nil - 11.2	0.20
Miscellaneous	2.93	Nil - 10.1	3.10
	40.26	8.4 - 82.8	39.75
Total Variable Costs	63.64	32.6 - 105.7	63.11
GROSS MARGIN	70.97	4.7 - 145.1	73.12

(a) £1.48 per acre on 174 acres to which pesticide was applied.

(b) £6.98 per acre on 227¾ acres where casual labour used.

(c) £22.90 per acre (£2.13 per ton sold for human consumption) on those farms incurring haulage charges.

(d) £19.17 per acre (£2.05 per ton sold for human consumption) on those farms grading.

(e) £1.21 per acre on those farms employing other contract work.

Table 9 ESTIMATED GROSS PRODUCTION AND OUTPUT OF RED BEET IN THE UNITED KINGDOM

	1967	1968	1969	1970	1971
Gross Yield tons/acre	13.5	12.3	12.5	12.6	12.4
Gross Production '000 tons	122.0	106.1	109.2	114.6	119.9
Output (Sales) '000 tons	113.5	98.3	105.8	110.5	108.8
Waste or Fed to Livestock %	7.0	7.4	3.1	3.6	9.3

Source: M.A.F.F. Annual Estimates of Area, Gross Production and Output of Vegetables for Human Consumption (excluding potatoes) in the United Kingdom.

the Ministry's figures only 9% of the gross yield was fed to livestock or wasted in 1971.

3.2 Variable Costs

The cost per acre of seeds, fertilisers and sprays show a similar relationship to those of sugar beet (see Table 10). Haulage and grading charges were treated as contract and included in the variable costs. Where the grower used his own labour, tractors or lorries for these operations a charge was raised at 50p. per hour for labour, 55p. per hour for tractors and £2.00 per hour for lorries. Average haulage costs amounted to £2.13 per ton sold for human consumption and the average grading charge was £2.05 per ton. The casual, contract and miscellaneous costs amounted to almost double the material costs.

3.3 Gross Margin

The average gross margin of £70.97 per acre is of the order of that provided by sugar beet or potatoes, but like these crops, red beet has a relatively high fixed resource requirement, the cost of which

has to be covered by the gross margin if a profit is to be gained. The output, variable costs and gross margin of sugar beet and potatoes achieved by a group of farmers in the East Midlands in 1971 are shown in Table 10 and compared with those for red beet. These figures

Table 10 COMPARISONS OF THE OUTPUT, VARIABLE COSTS AND GROSS MARGINS RED BEET, SUGAR BEET, POTATOES 1971

	Red Beet	Sugar Beet	Maincrop Potatoes
OUTPUT	134.61	130.71	168.61
VARIABLE COSTS:			
Seeds	5.45	4.17	28.81
Fertilisers	12.24	15.49	16.50
Sprays	5.69	3.39	6.27
Sub-Total	23.38	23.05	51.58
Margin Over Material Costs	111.23	107.66	117.03
Casual Labour	21.54 (a)	4.01	18.40
Haulage	15.52	7.03	0.20
Contract	0.27	1.00	2.07
Miscellaneous	2.93	-	7.05
Sub-Total	40.26	12.04	27.72
Total Variable Costs	63.64	35.09	79.30
Gross Margin	70.97	95.62	89.31
Range	4.7 to 145.1	56.81 to 135.06	36.77 to 161.29

Source: Sugar Beet and Potatoes "Farming in the East Midlands" - Financial Results 1971-72.

(a) The cost of all labour employed for grading and sorting is here included under casual.

indicate that there was little difference between the output, material costs and margin over material costs of red beet and sugar beet. The margin over material costs for potatoes was also similar, the higher

output being offset by the higher cost of seed. The main differences are that red beet incurred heavy haulage charges - more than double those for sugar beet which are much higher than for potatoes - and casual labour charges (including grading) similar to those for potatoes. As a consequence the gross margin of red beet was £25 per acre less than sugar beet and £18 per acre less than potatoes.

3.4 Estimation of the Fixed Cost of Growing the Crop

An assessment of the fixed costs, the results of which are shown in Table 11, indicate that on average they completely absorb the gross margin. The assumptions used in the assessment are given opposite Table 11. These results emphasize that too small a proportion of the crop was sold for human consumption to provide a sufficient output to cover the cost of growing it. For instance if the whole crop had been sold at the average price £13.49 per ton received for that actually sold, output would have been £64 per acre higher.

Table 11 GROSS MARGIN, FIXED COSTS AND NET MARGIN

	£ per acre
GROSS MARGIN	70.97
FIXED COSTS:	
Regular Labour	14.92
Allowances for overhead labour	4.48
Tractors	13.28
Allowances for tractor overheads and share of general equipment	13.28
Special equipment:	
Depreciation	6.50
Repairs	2.31
Fuel	0.05
General Overheads	4.00
Rent including drainage rates	12.44
TOTAL FIXED COSTS	71.26
NET MARGIN	(-)0.29
Range	(-)134.97 to (+)70.14

BASIS OF

ASSESSMENT OF FIXED COSTS

Regular Labour:	Men 50p. per hour Women 30p. per hour
Overhead Labour:	Addition of 30% to total direct labour calculated as above.
Tractors:	55p. per hour
Tractors, Overheads and Share of General Equipment:	55p. per tractor hour
Special Equipment:	Depreciation: Machinery 20% diminishing balance Repairs: Estimate of annual cost by farmer Fuel: Estimate of annual cost by farmer
General Overheads:	£4 per acre based on average for Cash Cropping farms in East Midlands Farm Management Survey
Rent and Drainage Rates:	Actual or in the case of owner-occupiers raised rental value

Although some additional costs would have been incurred in handling, the extra tonnage would have been sufficient to provide a good return.

A feature of these financial results is the very wide range about the average for all the major factors, indicating the risk involved in growing this crop. An examination of the results of the three growers in the sample who obtained positive net margins showed that they each returned gross margins in excess of £100 per acre with outputs of over £180 per acre. To achieve this they had yields well above the average for the sample and ploughed in less of their crop.

4. INTRODUCING RED BEET INTO THE ROTATION

Owing to the limited demand for the product and the special requirements relating to harvesting grading and storage of the crop, red beet is unlikely to occupy the full break crop acreage but it could, perhaps, be used to extend it where there are limitations on the acreage of other more suitable crops. Crops such as potatoes, sugar beet, carrots and onions for which the same harvesting and grading equipment could be used were grown on each of the farms in the survey. Where these crops are grown already red beet could be introduced without much additional expenditure on equipment and regular and casual labour for harvesting and grading is also likely to be available. However, if it were intended to introduce a crop as a sole break in a rotation, considerable capital expenditure for a mechanical harvester and possibly for grading equipment and even ventilated storage might be required. This could only be justified for an acreage sufficient to qualify the grower as a specialist.

5. CONCLUSIONS

1971 was a bad year for red beet growers, excellent yields from the highest acreage grown in the last ten years created a weak market and returns for the grower were discouraging. In 1972 the acreage fell by 2,000 acres but on this occasion yields were low and the quality of the crop was poor because of bolting caused by low temperatures in June. The home grown product has, therefore, been in short supply and prices have been firm, but because of the low yield and poor quality of the crop, growers in general are unlikely to have done any better than they did in 1971.

There is little evidence of an increase in the total demand for the product over the last ten years. The total acreage in England and Wales fluctuated between 6,500 acres and 8,500 acres (see Table 1) and the total estimated sales off the farm between 100,000 tons and a 110,000 (see Table 9). However, the housewife is becoming less inclined to cook and pickle the beetroot herself and the demand for the bottled and pre-packed product is likely to increase. This may result in an increase in the acreage of the crop grown on contract and consequently there may be a greater opportunity for it to be grown on a larger scale in arable farm rotations, but such a change of emphasis would be unlikely to alter substantially the overall demand for the product. There may be some scope for import substitution of the bottled product especially as the main sources, are outside the E.E.C. There may also be some opportunity for exports of processed beet to other E.E.C. countries, but because of its bulk substantial movementsof the fresh product are unlikely to take place.

To sum up, although there may be some possibility for expansion in certain lines, the dangers of over supplying the market are well illustrated by the situation in 1971 when an excellent crop had to be sold on a weak market. Both the limited demand for the product and the specific requirements of the crop are likely to ensure that red beet will continue to be grown mainly by specialists in field scale vegetable crops.

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BRISTOL	Agricultural Economics Reserach Unit, Department of Economics, University of Bristol 79 Woodlands Road, Bristol, BS8 1UT.
CAMBRIDGE	Agricultural Economics Unit, Department of Land Economy, University of Cambridge, Silver Street, Cambridge. CB3 9EP
EXETER	Agricultural Economics Unit, Department of Economics University of Exeter, Lafrowda, St. Germans Road, Exeter. EX4 6TL.
LEEDS	Agricultural Economics Department, University of Leeds, 34 University Road, Leeds LS2 9JT.
LONDON	School of Rural Economics & Related Studies, Wye College (University of London), Nr. Ashford, Kent.
MANCHESTER	Department of Agricultural Economics, The University, Manchester. M13 9PL.
NEWCASTLE	Department of Agricultural Economics The University of Newcastle upon Tyne, Newcastle upon Tyne, NE1 7RU.
NOTTINGHAM	Department of Agriculture and Horticulture, University of Nottingham School of Agriculture, Sutton Bonington, Loughborough. Leics. LE12 5RD.
READING	Department of Agricultural Economics and Management, University of Reading, Building No. 4, Earley Gate, Whiteknights Road, Reading, RG6 2AR.
WALES	Department of Agricultural Economics, University College of Wales, Institute of Rural Science, Penglais, Aberystwyth, Cards. SY23 3DD.