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VINING PEAS

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June 1972

UNIVERSITY OF NOTTINGHAM
DEPARTMENT OF AGRICULTURE AND HORTICULTURE

VINING PEAS

A study of the production economics of the
1970 Vining Pea Crop in the
East Midlands Region

H.W.T. KERR

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FOREWORD

The vining pea crop has not been previously surveyed by University Departments either in this Region or in the other main growing area of East Anglia. In view of this a joint survey co-ordinated by Cambridge University was begun in co-operation with Leeds and Nottingham Universities with a pilot survey of the 1969 crop and continued with a main investigation on the 1970 crop. The pilot survey was undertaken because it was realised that an investigation of this crop presented problems of complexity not encountered with other arable crops. The pilot survey did in fact provide useful guides and helped to make a success of the main investigation. However, the results of this pilot survey were never finalised because of the difficulties encountered and it became apparent that the sample obtained for it was by no means representative. The experience gained was, therefore, used to avoid similar errors being made in the main survey. A full report on the whole investigation will be published by Cambridge University later this year, but it is the policy of this Department to produce a separate report on the East Midlands sample of any co-ordinated study. The survey represents the continuing interest of this Department in possible break crops. The report is cast in the same form as those on oil seed rape and field beans and its primary purpose is not to demonstrate the "full cost" of growing the crop but to indicate the output that might be obtained, the variable costs that might be incurred, the physical demands likely to be made on existing resources and the additional capital expenditure that might result from including vining peas in the rotation. Nevertheless, suggestions are given as to how the full cost of growing the crop can be assessed from the information contained in the report.

1. INTRODUCTION

1.1. The Vining Pea Crop in the East Midlands

The vining pea crop, which totalled 127,537 acres in England and Wales in 1970 is all processed either by freezing, dehydrating or canning. Of the 46,940 acres grown in the East Midlands Region the major proportion, about 85 per cent went for freezing. The regional acreage has doubled since 1960 with increased demand for the product and the need for break crops in current arable systems (Table 1). The acreage contracted for freezing is now concentrated on large farms within reach of Grimsby where the main processors have their factories. The acreage grown in the Region in 1970 was half that of both sugar beet and potatoes (Table 2), but in Lindsey where Grimsby is situated, it was almost the same as sugar beet and about three quarters of the potato acreage. The crop has assumed considerable importance on those farms on which it is grown, occupying 16 per cent of the arable acreage (tillage and temporary grass) on farms in the survey sample.

Table 1 ACREAGE OF GREEN PEAS GROWN FOR PROCESSING
(FREEZING, DEHYDRATING, CANNING). acres

	1960	1964	1967	1968	1969	1970	1971
England and Wales	68,625	81,398	97,236	104,472	111,387	127,537	102,189
East Midlands	13,847	27,674	39,525	41,847	41,503	46,940	36,234
Derby	-	2	-	1	30	2	2
Leicester	2	83	-	26	536	384	546
Kesteven	674	2,411	3,763	4,026	4,559	6,269	4,171
Lindsey	12,341	23,626	33,659	35,681	33,749	37,071	29,535
Northampton	188	258	122	-	38	214	43
Nottingham	642	1,294	1,980	2,114	2,592	3,000	1,939
Rutland	-	-	-	-	-	-	-

Source: M.A.F.F., June 4th Returns Finals.

Table 2 ACREAGE OF BREAK CROPS GROWN IN EAST MIDLANDS
AND IN LINCOLNSHIRE (LINDSEY) IN 1970.

	acres	
	East Midlands	Lincolnshire (Lindsey)
Green Peas for Processing	46,940	37,071
Peas Harvested Dry	9,565	4,714
Green Peas for Marketing	1,130	502
Other Vegetables for Home Consumption	28,436	18,658
Potatoes	98,022	46,818
Sugar Beet	90,297	37,818

Source: M.A.F.F., June 4th Returns Finals.

The crop is grown almost entirely on contract to the processors. Under the contract sowing and harvesting dates are ultimately determined by the processor who also supplies the seed so that the growers responsibilities are concentrated primarily upon the husbandry of the crop. Until the early sixties the peas were vined by static viners owned and run by the processors and the farmers were responsible for growing the crop, cutting it and delivering it to the viner. At this time, mobile viners were introduced first by the processors themselves and then by farmers who formed syndicates to harvest the crop. This development was assisted by government grants for co-operative operations administered by the Central Council for Agricultural and Horticultural Co-operation.

1.2. Selection and Distribution of the Sample

An attempt was made to obtain the sample of growers from a random list stratified by acreage grown but it proved impossible in practice since no co-operators could be found in the lower acreage groups. This was not due to unwillingness on the part of the farmer but because those with smaller acreages in previous years had either expanded their acreage or given up the crop. Eventually a sample of forty growers was obtained; fourteen of these were the members making up two groups for which both syndicate harvesting costs and the average direct growing costs and returns were obtained.

A sample of vining groups was also obtained through the growers in the survey so that each group had at least one member in the grower sample. This proved a considerable assistance in understanding the relationship between the growers and the groups.

The distribution of the growers in the sample by county and by processor is shown in Table 3, and the groups by processor in Table 4. The forty farmers in the sample grew a total of 7,977 acres of peas, a much larger acreage than is usual in enterprise cost studies of this type and represents about 17 per cent of the total acreage grown in the East Midlands region in 1970. Of this total 295 acres were grown for dehydrating on one farm only and three farms grew a total of 227 acres for canning. Two hundred and seventy three acres were rented by farmers in the sample solely for the purpose of growing peas at an average rent of £21.47 per acre. The average acreage of peas grown per farm was 198 acres and the average acreage of the farms in the survey was 1,275 acres.

Table 3 DISTRIBUTION OF GROWERS BY COUNTY AND BY PROCESSOR

County	Number of Growers	Acreage Grown	Processor	Number of Growers	Acreage Grown
Lindsey	26	5,627	Birds Eye	16	2,655
Kesteven	11	1,749	Findus	9	3,005
Holland	1	470	Others	15	2,317
Yorkshire	1	75			
Nottinghamshire	1	56			
TOT AL	40	7,977	TOTAL	40	7,977

Table 4 DISTRIBUTION OF GROUPS BETWEEN PROCESSORS

Processor	Number of Groups	Acreage
Birds Eye	4	4,473
Findus	3	5,574
Others	3	3,417
TOTAL	10	13,464

1.3. Special Features of the 1970 Crop

The spring of 1970 was wet and rather late so that sowing conditions were consequently not ideal. This was followed by a dry summer particularly in May and June which seriously affected yields on light land but generally yields were good especially on the heavier loams. The harvesting conditions were easy which undoubtedly led to

low vining costs. Other favourable features of this year were the small acreage by-passed (only about two per cent of the sample) and the fact that the 1970 crop represented the peak acreage grown so far.

2. THE CULTURAL AND HUSBANDRY ASPECTS OF GROWING THE CROP

2.1. Place in the Rotation

There must be a sufficient gap between crops to prevent a build up of fusarium wilt, downy mildew and pea cyst eelworm for all of which there is no satisfactory chemical control. Field beans, horse beans, tick beans, broad beans and vetches are also hosts of the eelworm and should only be grown if they replace the pea break in the rotation. Dwarf beans, french beans, kidney beans, stringless beans, runner beans and clovers are not, however, attacked by any of these three organisms. There should be a minimum break of four years between crops of peas and the other susceptible crops. In fact, 16.4 per cent of the total arable (tillage and temporary grass) acreage of farms in the sample was sown to peas and susceptible legumes in 1970. Nevertheless, seven out of the 40 growers exceeded 20 per cent, the highest being 27 per cent, which may suggest that some growers are going a little closer than is perhaps advisable in the long term.

The crop is cleared early and so provides an excellent entry for winter wheat. It acts as a good cleaning crop and being a legume leaves residual nitrogen for following crops.

2.2. Yield

The average yield obtained by the 38 growers reporting data from

2.3. Soil Type

Peas can be grown on a wide range of soil types but they are particularly susceptible to conditions where bad drainage or poor soil structure has led to a lack of aeration and water-logging after heavy rain. They appear to grow best on a deep free-working loam. Adequate lime is required but peas are less sensitive to soil acidity than sugar beet or barley. A high pH, however, can lead to manganese deficiency which causes Marsh Spot particularly on organic soils and care must be taken, therefore, not to over-lime.

2.4. Cultivations

A fine seed bed is not necessary for this crop and can be dangerous in that excessive working of the land can destroy the tilth so that it becomes water-logged after heavy rain. The labour requirements are not, therefore, demanding and if the field is ploughed before the winter frosts a single pass with cultivating machinery may suffice on most soils before drilling. The labour and tractor requirements for growing the crop are shown in Table 6 divided into (i) ploughing, (ii) working down and drilling, and (iii) post-drilling and spraying. The only post-drilling operation apart from spraying is rolling which is usually carried out as soon after drilling as weather conditions permit but has to be timed to accommodate spraying with pre-emergent weed killer where it is used.

Table 6
LABOUR AND TRACTOR REQUIREMENTS FOR
GROWING UP TO HARVEST.

Hours per Acre

Operation	Man	Tractor
Ploughing	1.6	1.6
Working Down and Drilling	1.1	1.0
Post Drilling and Spraying	0.4	0.4
TOTAL	3.1	3.0
Range	1.5 to 6.2	1.5 to 6.1

2.5. Fertiliser

The application of fertilisers by type and rate is shown in Table 7, indicating that 5,886½ acres, 73.8 per cent of the total acreage drilled, received some fertiliser. Of the acreage treated just over 70 per cent received fertiliser containing no nitrogen applied at an average rate of a little over 2 cwts per acre to give approximately 40 units per acre each of phosphate and potash. Of the fertiliser containing nitrogen the one with an analysis of 8N: 20P: 16K was the most commonly used at an average rate of 2 cwts per acre giving 16 units per acre of nitrogen, 40 units of phosphate and 32 units of potash. The average application per acre of nitrogen to those acres receiving it was 15.7 units and of phosphate 40.3 units and potash 40.7 units. In general, the nitrogenous compounds were applied to the first sowings but some differences in the compounds chosen reflected the farmers assessment of his own soil requirements.

Table 7

FERTILISER APPLICATION

Analysis of Fertiliser			Average Rate of Application	Units Applied per Acre			Acreage Treated	Proportion of Treated Acreage
N	P	K	cwts per acre	N	P	K	acres	%
0	20	20	2.00	0	42	42	4,034½	68.5
0	14	28	2.12	0	30	59	200½	3.4
2.3	6	8	3.00	7	18	24	95	1.6
2.5	12.5	20	3.00	8	38	60	57	1.0
5	10	20	2.37	12	24	47	60	1.0
5	15	15	2.75	14	41	41	208	3.5
8	20	16	2.01	17	40	32	1,073	18.2
9	25	25	2.00	18	50	50	55	0.9
13	13	20	3.00	39	39	60	44	0.8
15	15	21	1.25	19	19	26	21	0.4
23	0	0	1.04	24	0	0	38½	0.7
				(1)				
				15.7	40.3	40.7	5,886½	100.0

Notes:

- (1) Average application per acre to those acres receiving nutrient.

Lime was applied to a total of 36 acres in all at an average rate of two tons per acre. No manganese was applied for the control of Marsh Spot to any of the acreage in the sample.

2.6. Sowing

In order to give six or seven weeks continuous work for the factory at harvest, sowing is spread over a period from late February

to mid May using early and late maturing varieties. The timing of successive sowings is determined by the processors using the "day-degree" or "accumulated heat-unit" system.⁽¹⁾ The accumulated heat units per day are the number of degrees by which the mean of the maximum and minimum screen air temperature for that day exceeds 40°F, the temperature at which peas will commence growth. Sowings are phased so that sufficient heat units are accumulated to give a continuous harvesting schedule. The drilling programme is divided into drilling periods, each period representing a sufficient estimated production at harvest to satisfy the factory's requirement for 24 hours.

The varieties sown and the average seed rates for each variety used by all growers in the sample are shown in Table 8. Most of the crop was sown in seven inch drills but some was drilled at four or four-and-a-half inches. This was determined more by the drill available on the farm than by any expected advantage to the crop itself.

The seed rate is decided by the processor in consultation with the grower. In general, apart from the special case of Marquis, the first earlies are sown at 280lbs (20 stone) per acre and all the others at 224lbs (16 stone), but to some extent the rate is varied according to the variety, seed size, soil type, and time of sowing, as recommended by the Pea Growing Research Organisation.⁽²⁾

(1) This system is fully described in M.A.F.F. Bulletin No. 81 "Peas" published by H.M.S.O., 1969.

(2) King, J.M. "Row widths and plant population in vining peas", Pea Growing Research Growing Organisation, Miscellaneous publications, No. 18, March 1966.

Table 8 VARIETIES AND SEED RATES BY ACREAGE DRILLED

Type	Variety	Average Seed Rate per Acre	Acreage	Proportion of Total	
		lbs	acres		
Very Early	Sparkle	252	8	0.1	
	Sprite	266	743½	9.4	9.5
Early	Kelvedon Wonder	308	9	0.1	
	Coronet	224	50	0.6	
	Galaxie	252	5	0.1	
	Swift	251	100	1.3	
	Jet	240	331	4.2	
	Scout	226	1,378½	17.5	
	Beryl	239	25	0.3	
	Jade	231	551	7.0	31.1
Late	Dark Skin Perfection	248	2,824½	35.7	
	Johnson's Freezer	229	1,321½	16.7	
	Puget	206	231	2.9	55.3
Petit Pois	Marquis	123	322	4.1	4.1
			7,900 ⁽¹⁾	100	100

Notes:

(1) Acreage actually drilled. Difference between this and total acreage in sample due to headlands, etc.