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Currants

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VOL. VII No. 3

BLACKCURRANT SURVEY

Three-Year Report

1957 - 1959

by

J. RENDELL

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FOREWORD

AMONG the many studies of horticultural crops, this report is perhaps unique in that the findings are derived from a national survey covering three consecutive years. It is an interim report since it has been planned that the study should cover a period of not less than six years in order to obtain reliable data for this long-term crop. The significance of the information described and examined, however, goes far beyond the scope of an interim report and the wealth of data presented provides evidence on the many aspects of blackcurrant growing. Indeed, the report not only supplies basic material for further study of the economics of blackcurrant growing but also offers a wide range of information which can be used by the individual grower to improve his returns.

We are indebted to Beecham Foods Limited for providing the financial aid without which the work could not have been undertaken. We appreciate their help in establishing contacts with their contract growers who, together with those growers selling on the open market, provided the sample for the Survey. We are also grateful for their keen interest in the progress of the work and also for making available to us facilities for processing the bulk of the data.

Appreciation is acknowledged to all the growers who co-operated with us for their courtesy and unfailing interest in making their information so readily available to us. Many of them have co-operated with us from the commencement of the Survey.

The chief impression to be gained from the report is that blackcurrant growing appears to be a highly profitable business for many growers, especially where the crop has a guaranteed market based on contracts; and in consequence the price does not fluctuate so widely as for other horticultural crops. There are, however, many factors which have a bearing on this enterprise and should these be unfavourable they may well hinder successful production. These limitations may be physical, technical or managerial and are bound to have an adverse effect on financial results. The factors which ultimately determine the degree of success of an enterprise

are the site, soil and climate of the plantation, technical knowledge in growing the crop, availability of pickers and the standard of management.

The cost per ton of producing blackcurrants is relatively high and varies in inverse proportion with the fruit yield per acre. On average if a grower produces only one ton of fruit per acre, he might only clear his expenses without gaining any financial advantage. Thus the grower's success will depend upon the yield and, for the enterprise to be sufficiently rewarding, it would be necessary to have an average annual yield of at least two tons of fruit per acre in order to offset years of low yields, or possible loss, during the life time of a plantation. Whilst scrutinising the annual results of individual plantations, considerable variation in yield was found ranging from less than one ton of fruit to over four tons per acre. High yielding plantations were invariably run on specialist lines, with the blackcurrant-growing treated as a major enterprise, and all prevailing facilities on the farm were geared for that particular purpose.

As already mentioned, the ultimate findings of the survey will be based on the results of a six-year period. It is hoped that the data obtained from the results of the remaining three years will provide further information for the benefit of the industry.

E. B. FEKETE.

Description of Regional Sample

Number of Costs and Acreage Costed

The total number of costs on which the averages incorporated in this report are based is two hundred and seventy-one, covering more than seventeen hundred acres, and collected over a period of three cropping years. The distribution of these costs both regionally and annually is shown in Table 1.

TABLE 1

Number of Crop Costings Included in the Regional Analysis

Region	Number of Costs in Group				Proportion of Costs in Group			
	1957	1958	1959	Total	1957	1958	1959	Total
	No.	No.	No.	No.	%	%	%	%
Midland and Western Counties . .	19	37	42	98	43	35	35	36
Southern Counties .	13	23	28	64	30	22	23	24
Eastern Counties .	12	46	51	109	27	43	42	40
Total . . .	44	106	121	271	100	100	100	100

When the first approach was made to growers in the spring of 1957 with a view to obtaining blackcurrant costs, the cropping year was already well advanced and many were unable to provide accurate details of the work already done on their plantations since the picking of the previous season's crop. By 1958, however, most of the growers participating in the investigation were able to provide the necessary information and this accounts for the substantial increase in the number of costs in 1958 compared with 1957. This improvement was maintained in 1959 when even more results were forthcoming, despite the absence of a few of the 1958 plantations from the sample, due to their having been

grubbed, or to the grower being no longer in a position to provide costs. It should be noted that the Midland and Western group of counties accounted for a higher proportion of the costs in 1957, when nearly one-half of all costs were drawn from that area, than in 1958 and 1959 when only slightly more than one-third were drawn from there. This change in regional representation must be taken into consideration when comparing the financial results and, in particular, when analysing the yearly differences in the average yields. A direct comparison can be drawn between the overall results for 1958 and 1959, however, as representation in these years was virtually identical.

Since the bulk of the financial information presented in this report is based on the " per acre " results for each plantation, or group of plantations, on a holding, it is the number of costs rather than the total acreage represented which is of importance in determining the exact influence of any particular set of results on the overall average. However, the total acreages costed are given in Table 2, and it is evident

TABLE 2

Acreage of Blackcurrants Included in the Regional Analysis

Region	Total Field Acreage Surveyed				Per cent of Total Area Surveyed			
	1957	1958	1959	Total	1957	1958	1959	Total
	Acres	Acres	Acres	Acres	%	%	%	%
Midland and Western Counties .	123·65	216·80	254·81	595·26	38	34	34	35
Southern Counties .	58·75	121·95	156·00	336·70	18	19	21	19
Eastern Counties .	142·80	300·05	341·90	784·75	44	47	45	46
Total . .	325·20	638·80	752·71	1716·71	100	100	100	100

that for 1958 and 1959, at any rate, they correspond quite closely with the number of costs involved. In 1957, on the other hand, this is not so, the Eastern Counties having only 27 per cent of the number of costs but 44 per cent of the total acreage. The reason for the discrepancy is that in 1957 one holding in the Eastern Counties with some 75 acres of

blackcurrants in bearing was costed as a single unit. However, in 1958 and 1959 it was possible to allocate the costs on this farm to the individual plantations concerned, thus not only increasing representation of the Eastern Counties in the sample, but also bringing this holding more into line with the other results.

It may be useful at this point to compare the acreages and distribution of the sample plantations with the known distribution of blackcurrants in the country as a whole. Such a comparison will give some indication of the general validity of the averages derived from the sample figures.

As shown in Table 3, although, overall, some 5 per cent of the total blackcurrant acreage in England and Wales is included in these costings, the Midland and Western Counties

TABLE 3

Sample and Total Acreage Comparisons

Region	Average Field Acreage Costed 1957–59	National Blackcurrant Acreage June 1957	Costed Acreage as % of Total Acreage
	Acres	Acres	%
Midland and Western Counties	198	2,948	6·7
Southern Counties .	112	2,517	4·4
Eastern Counties .	262	4,753	5·5
Other Counties .	—	1,259	—
Overall . . .	572	11,477	5·0

are proportionately better represented than the Southern Counties. However, the difference is not sufficiently great to cause undue concern, and, generally speaking, the three principal blackcurrant-growing areas of the country are well represented in the sample. These figures are only approximate as it is not practicable to compare like years, and, in any case, the national acreage figures include non-bearing plantations. In the winter of 1956–57 planting exceeded grubbing by an area equal to 10 per cent of the total national acreage for 1956. Hence if allowance is made both for the area grubbed and also for plantations cut back for a second time in the winter of 1956–57, then the proportion of non-bearing plantations in 1957 could well have comprised some

15 per cent of the total acreage, and in all probability less than 10,000 acres cropped in England and Wales in that year.

Although the total field area costed is 1716·71 acres, the actual acreage under blackcurrants is considerably less and is at most, no more than 1514·44 acres. The remaining 202·27 acres, 11·8 per cent of the whole, is accounted for by headlands, access roadways through the plantations and so on. It is this crop acreage of 1514·44 acres which is most suited to the analysis of the distribution of varieties, the cropping age, and row widths of the plantations. However, for the purpose of producing costs the " per acre " calculations are based on field acreages.

Cropping Age

An analysis of the cropping ages of the plantations costed is of particular interest and it is evident from Tables 4 and 5 that representation of the various age groups is extremely uneven. If, on average, a plantation gives ten crops during its lifetime, as seems to be the case from the grubbing records collected during this investigation, then, in order to maintain the total acreage, an area equal to one-tenth of the cropping acreage should be replaced each year. Therefore, deviations from this figure of 10 per cent for any given age group are of interest, and indicate a net gain or loss of acreage. Of course, even if the total acreage is being maintained, one would expect a fall in proportions during the seventh to ninth years, as grubbing begins to take effect, followed by a rise again in the "tenth year and over" group, as the latter includes plantations cropping longer than average. No such trend is evident from the tables except possibly in the overall figures for 1957, which indicate a gradual fall from 16·8 per cent in the seventh year to 11·1 per cent in the ninth, followed by a rise to 17·9 per cent in the " 10 and over " group.

Despite the considerable acreage involved, it is evident from the tables that certain age groups in the middle years of the life of a plantation are virtually unrepresented and it is highly probable that this is true not only of the sample holdings but of blackcurrant plantations in the country as a whole. These poorly represented years correspond with a planting period from 1951 to 1955, approximately, and if

TABLE 4

Cropping Age of Plantations
(Regional Analysis)

Region .	Midlands and Western Counties			Southern Counties			Eastern Counties			Total		
Year . .	1957	1958	1959	1957	1958	1959	1957	1958	1959	1957	1958	1959
Cropping Age	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage
1	12·55	37·73	41·67	1·46	8·28	51·44	19·30	68·69	55·76	33·31	114·70	148·87
2	10·34	42·15	37·73	6·83	7·96	8·28	7·38	47·83	67·69	24·55	97·94	113·70
3	16·57	10·34	42·15	4·53	8·05	7·96	1·56	10·17	47·83	22·66	28·56	97·94
4	Nil	20·15	9·35	2·10	12·56	8·05	Nil	1·56	10·17	2·10	34·27	27·57
5	3·55	Nil	20·15	Nil	4·43	12·56	4·10	0·23	1·56	7·65	4·66	34·27
6	1·00	4·42	Nil	21·30	Nil	3·43	Nil	7·35	0·23	22·30	11·77	3·66
7	23·13	4·53	2·48	Nil	24·71	Nil	25·36	11·37	7·35	48·49	40·61	9·83
8	15·56	20·13	4·53	2·62	Nil	21·30	25·32	37·10	6·20	43·50	57·23	32·03
9	8·93	23·04	20·13	12·89	12·12	Nil	10·21	31·60	35·35	32·03	66·76	55·48
10 and over	18·02	28·37	45·75	1·74	31·90	25·12	31·86	45·00	70·24	51·62	105·27	141·11
Total .	109·65	190·86	223·94	53·47	110·01	138·14	125·09	260·90	302·38	288·21	561·77	664·46

Note.—Crop acreage in this and subsequent tables refers to the acreage of blackcurrants only.

TABLE 5

Cropping Age of Plantations
(Regional Analysis: Percentage Distribution)

Region .	Midland and Western Counties			Southern Counties			Eastern Counties			Total		
Year . .	1957	1958	1959	1957	1958	1959	1957	1958	1959	1957	1958	1959
Cropping Age	%	%	%	%	%	%	%	%	%	%	%	%
1	11·5	19·8	18·7	2·7	7·6	37·2	15·4	26·4	18·4	11·6	20·4	22·4
2	9·4	22·1	16·8	12·8	7·2	6·0	5·9	18·3	22·4	8·5	17·5	17·1
3	15·1	5·4	18·8	8·5	7·3	5·8	1·2	3·9	15·8	7·9	5·1	14·8
4	Nil	10·5	4·2	3·9	11·4	5·8	Nil	0·6	3·4	0·7	6·1	4·1
5	3·2	Nil	9·0	Nil	4·0	9·1	3·3	0·1	0·5	2·7	0·8	5·2
6	0·9	2·3	Nil	39·8	Nil	2·5	Nil	2·8	0·1	7·7	2·1	0·6
7	21·1	2·4	1·1	Nil	22·5	Nil	20·3	4·4	2·4	16·8	7·2	1·5
8	14·2	10·5	2·0	4·9	Nil	15·4	20·2	14·2	2·1	15·1	10·2	4·8
9	8·2	12·1	9·0	24·1	11·0	Nil	8·2	12·1	11·7	11·1	11·9	8·3
10 and over	16·4	14·9	20·4	3·3	29·0	18·2	25·5	17·2	23·2	17·9	18·7	21·2
Total	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0

reference is made to Table 6, which shows the national blackcurrant acreage since the war, it will at once be seen that it was during this very period that there was a sharp drop in the total acreage of currants, following a peak in 1950. Moreover, increased planting from 1956 onward is also evident from the national acreage totals, which have been rising since 1956.

According to the analysis of cropping-age the proportion of young plantations in the sample has tended to increase year by year, so that by 1959 over one-fifth of all plantations were cropping for the first time, and only 45·7 per cent had borne more than three crops.

As it is unlikely that the age distribution of currants in the country as a whole is greatly different from the proportions occurring in the sample, annual changes in yield and so on, will, within the limitations of the survey, be a reflection of the national output. For example, if climatic factors are disregarded the average potential yield per acre of blackcurrants at the present time is less than the average annual yield of a plantation over its cropping life owing to the unduly high proportion of first-year plantations. That is to say, even if the national acreage is maintained at its present level, the total tonnage of currants should rise as the plantations become older, and the different age groups become more evenly distributed.

Although the sample may in fact compare closely with the actual age distribution of currants in this country, the uneven nature of this distribution must still be reckoned with when interpreting the financial results, either annually or regionally, for the overall trends are not always reflected to a like degree. In 1959, for example, 37·2 per cent of the acreage costed in the Southern Counties was cropping for the first time, compared with about 18 per cent in each of the other two areas.

Row Width

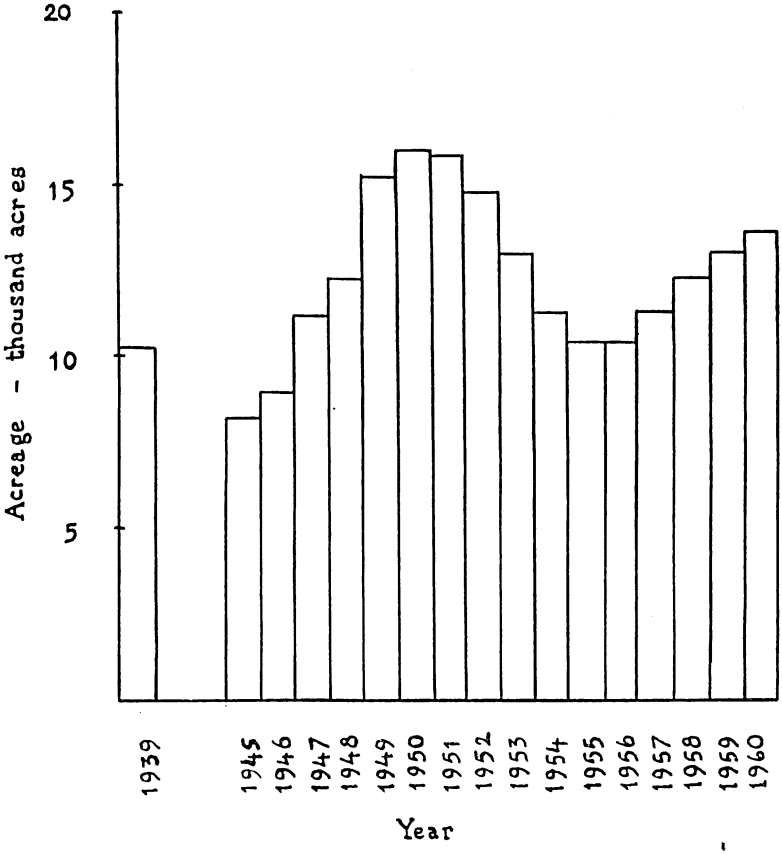
The spacing of the bushes has been recorded on all plantations visited, but there are in practice so many combinations of row width and distance apart of bushes in the rows that it is very difficult to classify the information. Basically it is possible to group according to row width or according to bush density.

TABLE 6

Blackcurrant Acreages in England and Wales, 1939, and 1945 to 1960*

Year	Acres	Year	Acres	Year	Acres	Year	Acres
1939	10,387	1948	12,415	1952	14,959	1956	10,436
1945	8,395	1949	15,271	1953	12,966	1957	11,477
1946	9,145	1950	16,026	1954	11,383	1958	12,347
1947	11,282	1951	15,911	1955	10,440	1959	12,901
						1960	13,400

DIAGRAM 1



* Based on the agricultural statistics published by the Ministry of Agriculture, Fisheries and Food.

Variations in row width are given in Tables 7 and 8, and this is a very useful measure as the distance apart of the rows helps to determine the system of management adopted. In practice, row width varies from about 5 ft. to 12 ft. and accordingly plantations have been divided into four groups, depending on whether the row width was 6 ft. or less, between 7 ft. and 8 ft., 9 ft., or 10 ft. and over. Since access to a plantation will depend on the amount of growth made by the bushes, a variable influenced by soil, age of bush, variety, and on the time of year, it is not possible to be precise about the degree of clearance for tractors and implements. In general, a 6 ft. row width is impassable for all but hand cultivators or horse-drawn equipment, and the bushes in such plantations are frequently planted in the form of blocks of three, four, or more rows at 6 ft. apart, with alleyways between adjacent blocks where a row has been omitted. Further, a 7 ft. to 8 ft. row width in a mature plantation is impassable to normal farm machinery other than during the winter when the bushes may have been tied back. Under certain conditions though, it is possible to make use of special tractors with a narrow wheel base, and with wheel guards, so as to minimise damage to the bushes. A 9 ft. row width on the other hand is usually passable at most times of the year.

The problem when increasing the row width is to maintain the density of bushes and hence the yield per acre. There is an obvious lower limit to the spacing of the bushes in the row, and although plantings as close as 2½ ft. are known for the sample plantations, 3½ ft. or 4 ft. is more usual. Table 8 shows that 9 ft. is by far the most popular row width and associated with this the currants are frequently 4 ft. or 3½ ft. apart in the rows. Although many plantations are at 7 ft. to 8 ft., relatively few are at 6 ft. or less, or at 10 ft. and over.

Regionally, it is in the Southern Counties that the narrower row width (7 ft. to 8 ft.) predominates, and in the Midland and Western area that the very wide and very narrow plantings principally occur. In the Eastern Counties the wide planting is also important, accounting for from one-quarter to one-fifth of the total acreage of currants. This table also indicates that there may be a tendency for the narrow row width to decrease in popularity, since by 1959 it only accounted for 4·4 per cent of the plantation area compared with 6·0 per cent in 1958, and 10·2 per cent in 1957.

TABLE 7

Row Widths of Plantations
(Regional Analysis)

Region .	Midland and Western Counties			Southern Counties			Eastern Counties			Total		
Year . .	1957	1958	1959	1957	1958	1959	1957	1958	1959	1957	1958	1959
Row Wdith	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage
6 feet or under .	20·26	21·51	21·24	1·00	7·64	6·46	8·18	4·51	1·50	29·44	33·66	29·20
7 feet to 8 feet .	18·23	29·71	41·16	26·20	58·97	45·04	12·89	65·91	62·16	57·32	154·59	148·36
9 feet .	54·71	82·60	104·11	24·17	39·10	78·70	78·66	137·28	161·51	157·54	258·98	344·32
10 feet and over .	16·45	57·04	57·43	2·10	4·30	7·94	25·36	53·20	77·21	43·91	114·54	142·58
Total .	109·65	190·86	223·94	53·47	110·01	138·14	125·09	260·90	302·38	288·21	561·77	664·46

TABLE 8

Row Widths of Plantations
(Regional Analysis: Percentage Distribution)

Region .	Midland and Western Counties			Southern Counties			Eastern Counties			Total		
Year . .	1957	1958	1959	1957	1958	1959	1957	1958	1959	1957	1958	1959
Row Width	%	%	%	%	%	%	%	%	%	%	%	%
6 feet or under .	18·5	11·3	9·5	1·9	6·9	4·7	6·5	1·7	0·5	10·2	6·0	4·4
7 feet to 8 feet .	16·6	15·5	18·4	49·0	53·6	32·6	10·3	25·3	20·6	19·9	27·5	22·3
9 feet .	49·9	43·3	46·5	45·2	35·6	57·0	62·9	52·6	53·4	54·7	46·1	51·8
10 feet and over .	15·0	29·9	25·6	3·9	3·9	5·7	20·3	20·4	25·5	15·2	20·4	21·5
Total .	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0

Varieties Grown

Although virtually all cultivated blackcurrants are of the species *Ribes nigrum L.*, there are in existence many varieties of this species. Indeed the number of distinct varieties is known to exceed seventy. These fall into five basic groups of which that represented by French Black (syn. Merveille de la Gironde) most closely resembles the wild " Siberian " form. Other groups are represented by Boskoop, Goliath and Baldwin respectively, and in addition there is a group of Canadian varieties.

However, very few of these many varieties are grown commercially to any great extent in this country. In fact in the bulletin on bush fruit issued by the Ministry of Agriculture and Fisheries only thirteen varieties are listed. A glance at Tables 9 to 12, which are based on an analysis of the plantations which have been costed, suggests that commercial production in this country is virtually restricted to even fewer varieties, only six being worthy of mention, namely Wellington XXX, Westwick Choice, Mendip Cross, Seabrook's Black, Amos Black and above all Baldwin. These six varieties together constitute some 90 per cent of the total sample acreage. A notable omission from the Ministry's list of thirteen varieties is Amos Black, a currant which originated at East Malling in 1926 from a Goliath–Baldwin cross, but was only introduced commercially after the war. In fact we have no record of this variety cropping prior to 1955.

Despite the fact that Baldwin proved to be the most widely grown of all blackcurrant varieties on the holdings visited, the tables show that only in the Midlands and West does it constitute over 50 per cent of the total currant acreage. In the Southern Counties it is of little, if any, greater importance than Wellington XXX and in the Eastern Counties both Wellington and Westwick Choice are frequently grown. The varieties Seabrook's Black and Amos Black on the other hand are mostly to be found in the Southern Counties and to a lesser extent in the Eastern Counties. This variation in the relative importance of a variety in different parts of the country can be traced to its response to climatic and other physical conditions, such as its degree of susceptibility to night frosts. The area within which any one particular variety can be grown to greatest advantage is probably relatively restricted; this is shown by the virtual absence of continental varieties of currants from this country. For

TABLE 9

Regional Distribution of Varieties

Variety . .		Amos Black	Baldwin	Boskoop	Cotswold X	Daniel's September	Mendip X	Seabrook's Black	Wellington XXX	Westwick Choice	Other Varieties	Total
Region	Year	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage
Midland and Western Counties	1957	Nil	57·83	3·69	3·37	Nil	9·73	3·42	20·46	2·38	8·77	109·65
	1958	3·05	103·21	3·69	0·83	0·25	12·18	4·38	47·28	3·69	12·30	190·86
	1959	8·40	124·86	3·69	0·83	0·25	11·88	3·39	50·02	3·89	16·73	223·94
Southern Counties	1957	5·59	17·35	0·12	0·38	1·19	5·39	4·12	17·86	0·40	1·07	53·47
	1958	6·59	26·08	0·59	0·38	1·73	6·14	14·82	37·39	2·49	13·80	110·01
	1959	6·59	48·53	1·02	0·38	1·78	6·70	21·62	30·29	10·66	10·57	138·14
Eastern Counties	1957	6·70	27·35	0·43	10·08	0·96	15·35	17·45	26·15	17·00	3·62	125·09
	1958	11·73	86·42	0·43	10·08	2·38	27·14	19·61	48·91	53·08	1·12	260·90
	1959	11·73	114·47	0·43	10·08	1·42	27·44	20·74	54·44	59·14	2·49	302·38
Total	1957	12·29	102·53	4·24	13·83	2·15	30·47	24·99	64·47	19·78	13·46	288·21
	1958	21·37	215·71	4·71	11·29	4·36	45·46	38·81	133·58	59·26	27·22	561·77
	1959	26·72	287·86	5·14	11·29	3·45	46·02	45·75	134·75	73·69	29·79	664·46

TABLE 10

Regional Distribution of Varieties: Percentage Distribution

Variety . .		Amos Black	Baldwin	Boskoop	Cotswold X	Daniel's September	Mendip X	Seabrook's Black	Wellington XXX	Westwick Choice	Other Varieties	Total
Region	Year	%	%	%	%	%	%	%	%	%	%	%
Midland and Western Counties	1957	Nil	52·7	3·4	3·1	Nil	8·9	3·1	18·6	2·2	8·0	100·0
	1958	1·6	54·1	2·0	0·4	0·1	6·4	2·3	24·8	1·9	6·4	100·0
	1959	3·7	55·8	1·6	0·4	0·1	5·3	1·5	22·4	1·7	7·5	100·0
Southern Counties	1957	10·5	32·4	0·2	0·7	2·2	10·1	7·7	33·4	0·8	2·0	100.0
	1958	6·0	23·7	0·5	0·3	1·6	5·6	13·5	34·0	2·3	12·5	100·0
	1959	4·8	35·1	0·7	0·3	1·3	4·9	15·6	21·9	7·7	7·7	100·0
Eastern Counties	1957	5·4	21·9	0·3	8·0	0·8	12·3	13·9	20·9	13·6	2·9	100·0
	1958	4·5	33·1	0·2	3·9	0·9	10·4	7·5	18·8	20·3	0·4	100·0
	1959	3·9	37·9	0·1	3·3	0·5	9·1	6·9	18·0	19·5	0·8	100·0
Total	1957	4·2	35·5	1·5	4·8	0·7	10·6	8·7	22·4	6·9	4·7	100·0
	1958	3·8	38·4	0·8	2·0	0·8	8·1	6·9	23·8	10·5	4·9	100·0
	1959	4·0	43·3	0·8	1·7	0·5	6·9	6·9	20·3	11·1	4·5	100·0

example in Holland the most highly recommended variety is Roodknop, whereas in Germany and Austria Rosenthal's Langtraubige Schwarze and Silvergeiter's Schwarze are commonly grown, and in the more northerly parts of Scandinavia the Finnish variety Brödtorp predominates.

Tables 11 and 12 are of particular interest in tracing changes in the popularity of certain varieties. As already mentioned, Amos Black is of relatively recent introduction and it is seen from these tables that on all holdings visited where it was one of the varieties costed, the bushes had yet to bear their sixth crop. Boskoop and Daniel's September on the other hand are primarily to be found in old plantations. Baldwin, if anything, seems to be increasing in popularity, as the proportion of new acreage of this variety in each of the last three years is greater than its overall percentage for these years. The only other variety of which this is true is Westwick Choice.

Despite the fact that on some holdings costed Baldwin is the only currant grown, this is not usual, for although it may prove to be the highest yielding variety for the holding in question, there are definite advantages to be gained from growing several varieties. For example, if the whole of a holding's currant acreage is of a single variety the picking of the crop may prove more of a problem than where several varieties, chosen for the purpose of extending the picking season, are grown on the same acreage. Mendip Cross is used in this way as an early variety and Amos Black or Daniel's September as a late one. Even Baldwin and Wellington XXX do not generally ripen at exactly the same time, the latter normally being picked first. Other advantages in growing several varieties include spreading the risk of frost damage, not all varieties being equally susceptible to damage on any single night in spring, and also possibly obtaining a better " set " of fruit. Work in Germany, and more recently in this country, suggests that cross pollination can improve the yield of certain varieties. For these and other reasons, including its own inherent disadvantages in particular situations, Baldwin is unlikely to displace all other varieties, and a figure of some 40 per cent of the total blackcurrant acreage in this one variety must be regarded as a very high proportion.

The advantage of growing several varieties of currants in order to minimise seasonal fluctuations in yields is very well shown by a holding in Suffolk, for which details of the yields

TABLE 11

Distribution of Varieties According to Cropping Age

Variety		Amos Black	Baldwin	Boskoop	Cotswold X	Daniel's September	Mendip X	Seabrook's Black	Wellington XXX	Westwick Choice	Other Varieties	Total
Cropping Age	Year	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage	Crop Acreage
1	1957	6·16	12·63	—	3·00	—	3·72	—	3·85	3·20	0·75	33·31
	1958	5·42	55·50	—	3·00	0·54	7·20	—	27·47	12·50	3·07	114·70
	1959	5·35	89·37	0·50	—	0·78	1·51	8·10	19·63	17·83	5·80	148·87
2	1957	3·46	—	—	4·00	—	1·19	1·72	10·85	0·19	3·14	24·55
	1958	8·94	42·00	—	3·00	—	4·13	0·50	20·75	11·37	7·25	97·94
	1959	5·42	55·50	—	3·00	0·54	7·20	—	27·47	11·50	3·07	113·70
3	1957	2·67	9·25	—	—	—	—	—	6·90	—	3·84	22·66
	1958	3·46	—	—	4·00	—	1·19	1·72	14·86	0·19	3·14	28·56
	1959	8·94	42·00	—	3·00	—	4·13	0·50	20·75	11·37	7·25	97·94
4	1957	—	—	—	—	—	—	—	2·10	—	—	2·10
	1958	3·55	11·70	0·47	—	0·25	0·23	3·10	6·90	1·23	6·84	34·27
	1959	3·46	—	—	4·00	—	1·19	0·73	14·86	0·19	3·14	27·57
5	1957	—	3·55	—	—	—	—	4·10	—	—	—	7·65
	1958	—	—	—	—	—	—	—	4·43	0·23	—	4·66
	1959	3·55	11·70	0·47	—	0·25	0·23	3·10	6·90	1·23	6·84	34·27
6	1957	—	9·30	—	—	—	4·50	3·50	5·00	—	—	22·30
	1958	—	7·37	—	—	—	0·30	4·10	—	—	—	11·77
	1959	—	—	—	—	—	—	—	3·43	0·23	—	3·66
7	1957	—	25·21	—	3·00	—	6·71	0·24	9·00	3·96	0·37	48·49
	1958	—	16·95	—	—	—	5·71	5·06	7·50	3·16	2·23	40·61
	1959	—	5·73	—	—	—	—	4·10	—	—	—	9·83
8	1957	—	14·30	0·10	3·36	0·46	10·49	3·67	3·43	5·33	2·36	43·50
	1958	—	25·21	—	—	0·33	8·86	0·24	11·59	10·63	0·37	57·23
	1959	—	13·73	—	—	—	4·50	3·50	7·50	2·80	—	32·03
9	1957	—	9·76	0·12	0·10	0·73	1·69	2·30	15·89	0·19	1·25	32·03
	1958	—	23·33	0·10	0·36	0·46	12·66	9·67	6·03	12·04	2·11	66·76
	1959	—	24·71	—	—	0·33	8·86	0·24	11·59	9·38	0·37	55·48
10 and over	1957	—	18·53	4·02	0·37	0·96	2·17	9·46	7·45	6·91	1·75	51·62
	1958	—	33·65	4·14	0·93	2·78	5·18	14·42	34·05	7·91	2·21	105·27
	1959	—	45·12	4·17	1·29	1·55	18·40	25·48	22·62	19·16	3·32	141·11
Total	1957	12·29	102·53	4·24	13·83	2·15	30·47	24·99	64·47	19·78	13·46	288·21
	1953	21·37	215·71	4·71	11·29	4·36	45·46	38·81	133·58	59·26	27·22	561·77
	1959	26·72	287·86	5·14	11·29	3·45	46·02	45·75	134·75	73·69	29·79	664·46

TABLE 12

Distribution of Varieties According to Cropping Age: Percentage Distribution

Variety		Amos Black	Baldwin	Boskoop	Cotswold X	Daniel's September	Mendip X	Seabrook's Black	Wellington XXX	Westwick Choice	Other Varieties	Total
Cropping Age	Year	%	%	%	%	%	%	%	%	%	%	%
1	1957	18·5	37·9	—	9·0	—	11·2	—	11·6	9·6	2·2	100·0
	1958	4·7	48·4	—	2·6	0·5	6·3	—	23·9	10·9	2·7	100·0
	1959	3·6	60·0	0·3	—	0·5	1·0	5·5	13·2	12·0	3·9	100·0
2	1957	14·1	—	—	16·3	—	4·8	7·0	44·2	0·8	12·8	100·0
	1958	9·1	42·9	—	3·1	—	4·2	0·5	21·2	11·6	7·4	100·0
	1959	4·8	48·8	—	2·6	0·5	6·3	—	24·2	10·1	2·7	100·0
3	1957	11·8	40·8	—	—	—	—	—	30·5	—	16·9	100·0
	1958	12·1	—	—	14·0	—	4·2	6·0	52·0	0·7	11·0	100·0
	1959	9·1	42·9	—	3·1	—	4·2	0·5	21·2	11·6	7·4	100·0
4	1957	—	—	—	—	—	—	—	100·0	—	—	100·0
	1958	10·4	34·1	1·4	—	0·7	0·7	9·0	20·1	3·6	20·0	100·0
	1959	12·5	—	—	14·5	—	4·3	2·6	54·0	0·7	11·4	100·0
5	1957	—	46·4	—	—	—	—	53·6	—	—	—	100·0
	1958	—	—	—	—	—	—	—	95·1	4·9	—	100·0
	1959	10·4	34·1	1·4	—	0·7	0·7	9·0	20·1	3·6	20·0	100·0
6	1957	—	41·7	—	—	—	20·2	15·7	22·4	—	—	100·0
	1958	—	62·6	—	—	—	2·6	34·8	—	—	—	100·0
	1959	—	—	—	—	—	—	—	93·7	6·3	—	100·0
7	1957	—	52·0	—	6·2	—	13·8	0·5	18·6	8·2	0·7	100·0
	1958	—	41·7	—	—	—	14·1	12·4	18·5	7·8	5·5	100·0
	1959	—	58·3	—	—	—	—	41·7	—	—	—	100·0
8	1957	—	32·9	0·2	7·7	1·1	24·1	8·4	7·9	12·3	5·4	100·0
	1958	—	44·1	—	—	0·6	15·5	0·4	20·2	18·6	0·6	100·0
	1959	—	42·9	—	—	—	14·0	10·9	23·4	8·8	—	100·0
9	1957	—	30·5	0·3	0·3	2·3	5·3	7·2	49·6	0·6	3·9	100·0
	1958	—	34·9	0·1	0·6	0·7	19·0	14·5	9·0	18·0	3·2	100·0
	1959	—	44·5	—	—	0·6	16·0	0·4	20·9	16·9	0·7	100·0
10 and over	1957	—	35·9	7·8	0·7	1·9	4·2	18·3	14·4	13·4	3·4	100·0
	1958	—	32·0	4·0	0·9	2·6	4·9	13·7	32·3	7·5	2·1	100·0
	1959	—	32·0	3·0	0·9	1·1	13·0	18·1	16·0	13·6	2·3	100·0
Total	1957	4·3	35·6	1·5	4·8	0·7	10·7	8·6	22·3	6·9	4·6	100·0
	1958	3·8	38·4	0·8	2·0	0·8	8·1	6·9	23·8	10·5	4·9	100·0
	1959	4·0	43·3	0·8	1·7	0·5	6·9	6·9	20·3	11·1	4·5	100·0

of four varieties of currants on a single plantation over a period of eleven cropping years are given in Table 13 and Diagrams 2 and 3. This plantation is one of about 10 acres with approximately equal areas of each of the four varieties grown, namely Westwick Choice, Wellington XXX, Seabrook's Black and Mendip Cross. However, at one stage the Wellington XXX were badly affected by reversion and a part of the area had to be grubbed. Westwick Choice is the only variety whose overall yield so far is markedly lower than the average for the plantation. In fact at some 26 or 27 tons per acre over a period of eleven years there is little to choose between the remaining varieties.

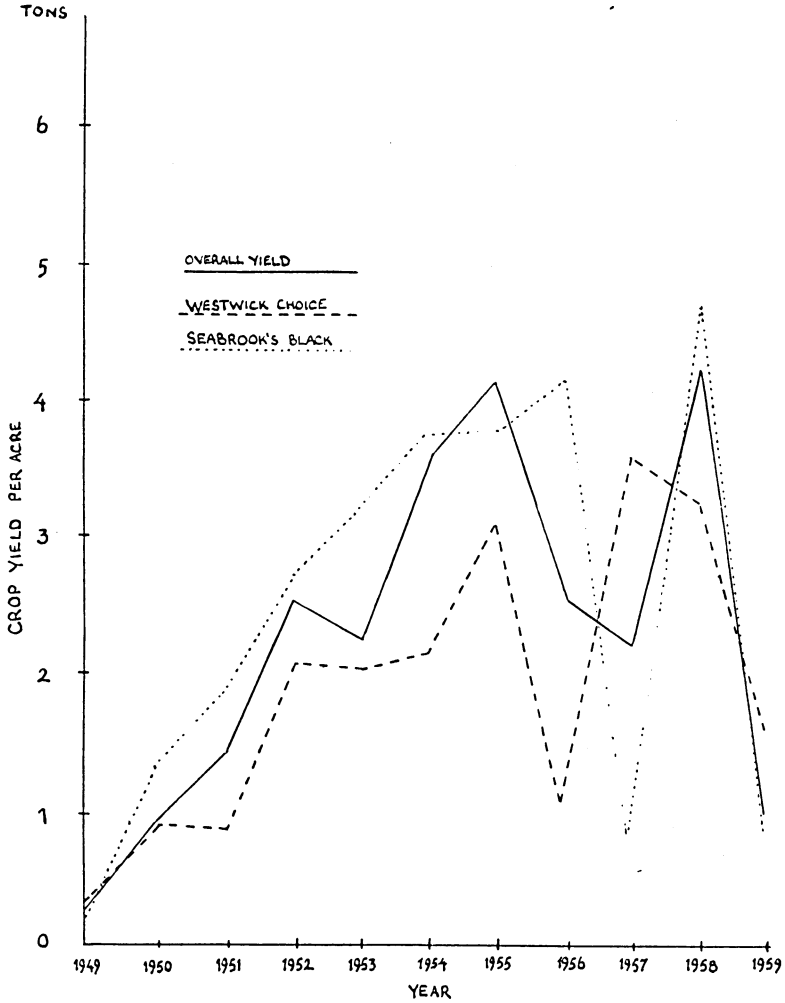
TABLE 13

Per Acre Yields by Varieties on a Suffolk Plantation, 1949–59

Year	Westwick Choice	Wellington XXX	Seabrook's	Mendip Cross	Total
	Tons	Tons	Tons	Tons	Tons
1949	0·31	0·36	0·28	Nil	0·23
1950	0·87	1·09	1·29	0·41	0·91
1951	0·81	1·23	1·84	1·81	1·43
1952	2·06	2·09	2·70	3·46	2·59
1953	2·02	1·18	3·20	2·63	2·27
1954	2·14	4·31	3·71	4·02	3·54
1955	3·11	6·49	3·79	3·26	4·13
1956	1·07	1·25	4·18	3·82	2·60
1957	3·64	3·09	0·81	1·44	2·23
1958	3·24	4·00	4·64	4·88	4·21
1959	1·61	1·12	0·86	0·56	1·03
Total to Date .	20·88	26·21	27·30	26·29	25·17

All varieties show considerable annual variations in yield and also in the early years of the plantation (1949 to 1952) a steady rise in yields as one would expect. However, since that time, with the exception of the year 1959 when all varieties were badly affected by frost, no general pattern can be traced in the fluctuations of the individual varieties. Whereas in 1956, for example, yields on Westwick Choice and Wellington XXX were considerably reduced by frost damage, on Seabrook's Black and Mendip Cross there were high yields. In 1957 on the other hand the yield from Seabrook's Black was very poor, due probably to cold winds,

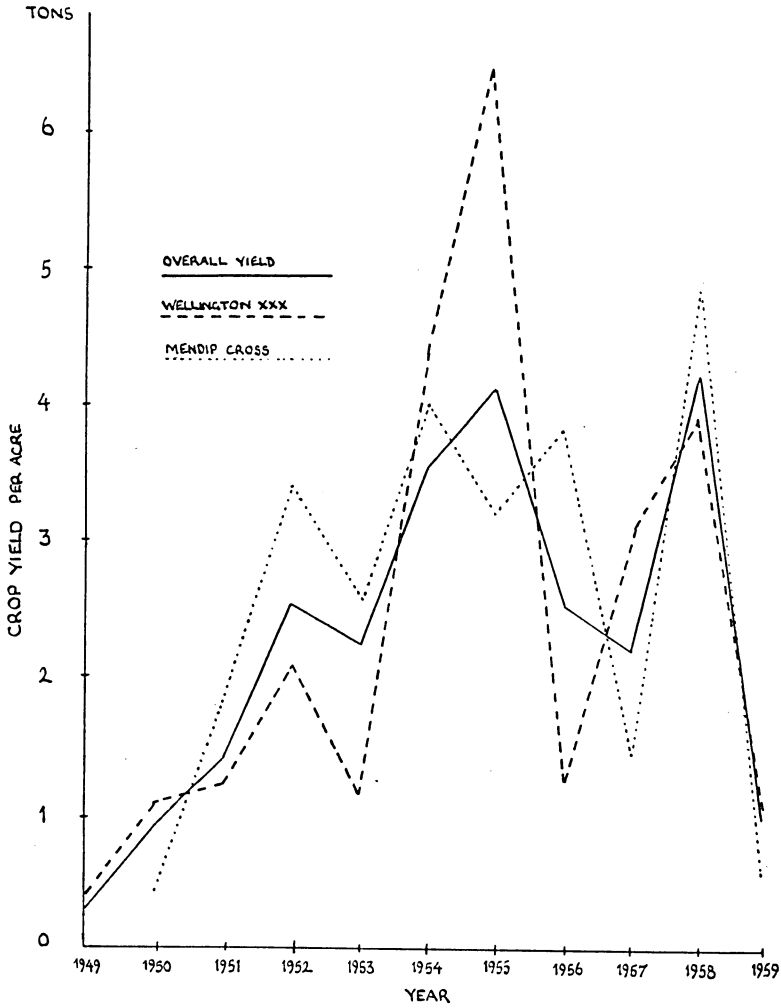
DIAGRAM 2



but for Westwick Choice it was the peak yielding year. Furthermore, in 1958, yields rose on all but Westwick Choice for which there was a decline.

It is evident then that the planting of several varieties can give the grower a certain measure of stability in yield, although even then, as witness the example quoted above, the annual overall yield may still vary considerably.

DIAGRAM 3



Type of Holding

The three years' costs are drawn from a total of seventy-nine holdings scattered over fourteen different counties. Of these holdings twenty-six are in the Midlands and West, eighteen in the Southern Counties, and thirty-five in the Eastern Counties. The county distribution is given in Table 14;

the principal counties concerned being Norfolk with sixteen, Worcestershire with nine, Suffolk with eight and Kent and Herefordshire with seven each.

TABLE 14

Type of Holding

County	Nursery	Market Gardens	Horti-cultural Farms	Fruit Farms	Fruit, Hops and General	General Farms	Total
Hereford .	1	—	—	3	2	1	7
Worcs. .	—	1	2	3	3	—	9
Warwick .	—	—	1	—	—	—	1
Glos. .	—	1	1	2	—	—	4
Somerset .	—	—	—	3	—	2	5
Kent . .	—	—	—	3	1	3	7
Sussex .	—	1	—	1	2	1	5
Hants. .	—	2	—	1	—	1	4
Berks. . .	—	—	—	1	—	1	2
Norfolk .	1	1	1	3	—	10	16
Suffolk .	—	—	—	5	—	3	8
Essex . .	—	—	—	3	—	3	6
Cambs. .	—	1	—	1	—	—	2
Lincs. . .	—	1	1	—	—	1	3
Total No. of Holdings .	2	8	6	29	8	26	79

As the wide regional distribution might suggest, the cultivation of the blackcurrant is not confined to any single type of farm and is not particularly associated with any other single crop, unless it be hops. Its cultivation fits in very well with that of hop-growing, both from the point of view of labour utilisation and also with regard to the use of specialised machinery. Moreover, well rotted hop bine can be used as a mulch for the currants. Needless to say, it is only in the relatively restricted hop-growing areas of the country, in Kent and Sussex, Worcestershire and Herefordshire, that this cropping combination occurs. In fact, as can be seen from the table, only eight farms fall into this category.

One may distinguish a further four distinct types of holding from which costs have been obtained, namely nurseries, market gardens, horticultural farms and fruit farms. Nurseries are holdings on which glasshouse crops form the principal source of income, whereas market gardens

flre small holdings on which outdoor vegetables, fruit and aowers are grown. On horticultural farms, on the other hand, although considerably larger in size, the emphasis is still on vegetable, and to a lesser extent, fruit production. Fruit farms, although very varied in area, form a coherent group of holdings in that the production of fruit is a specialised activity, to which other enterprises such as pig keeping are subsidiary. Due to the wide regional distribution of the holdings, the remaining group, comprised of " general farms ", is very mixed in character, covering principally the larger farms on which arable crops and livestock are of considerable importance, but where blackcurrants, and possibly other fruit, are of subsidiary interest.

It is evident from Table 14 that the majority of the holdings growing currants are either fruit farms or specialise in horticultural crops, and tend to be concentrated in those counties noted for their orchards, particularly Kent, Essex, Suffolk, Worcestershire, Herefordshire, Gloucestershire, and Somerset. In Norfolk, on the other hand, blackcurrant growing is often associated with the large arable farm of the district and in some cases it is the only fruit grown on the holding.

Other Fruits Grown

The diverse nature of the holdings on which blackcurrants are grown has already been discussed, but equally varied is the combination of blackcurrant growing with other fruits.

TABLE 15

Proportion of Blackcurrant-Growing Holdings with Additional Fruit Crops

Nature of Fruit Crops Grown in Addition to Blackcurrants	Percentage of All Holdings
No other fruit grown	11
Top fruit only	26
Soft fruit only	13
Top fruit and soft fruit	50
Total	100

On the seventy holdings for which this information is available about one-tenth grow blackcurrants as their only fruit crop, whereas one-half grow both top fruit and other soft fruits. Details are given in Table 15.

Of those holdings which have soft fruit in addition to blackcurrants, the majority (over three-quarters) grow strawberries. Raspberries are grown on one-third of these holdings and gooseberries on more than one-quarter. The proportions of these different fruits is shown in Table 16.

TABLE 16

Proportion of Other Soft Fruits on the Blackcurrant-Growing Holdings

Other Soft Fruits	Percentage of Holdings
Strawberries . .	77
Raspberries . .	32
Gooseberries . .	27
Loganberries . .	11
Red Currants . .	7

On about one-third of all holdings no other soft fruit is grown, while on a further one-third one other soft fruit variety is produced. However, on the remainder of the holdings two, three or even four soft fruits, in addition to blackcurrants, are grown. See Table 17.

TABLE 17

Number of Other Soft Fruits Grown

No. of Other Soft Fruits	Percentage of All Holdings
None . . .	37
1	36
2	14
3	7
4	6
Total . .	100

From Table 18 it is clear that on the majority of blackcurrant holdings where top fruit is grown, the apple is most commonly met with, but the pear and plum are also frequently grown. The cherry however, is not so important.

Only one-quarter of all holdings on which blackcurrants are grown have no orchards, but more than one-third grow only a single kind of top fruit, generally apples. Details are given in Table 19.

TABLE 18

Proportion of Top Fruits Grown on the Holdings in Addition to Blackcurrants

Top Fruits	Percentage of All Holdings
Apple . . .	89
Pear . . .	43
Plum . . .	38
Cherry . . .	9
Peach . . .	6

It is evident that the blackcurrant-growing holdings produce between them a wide range of other fruits which, in fact, are often of greater importance in the economy of the holding than the currant itself. However, relatively few businesses grow more than a few varieties of fruit.

TABLE 19

Number of Top Fruits Grown

No. of Top Fruits	Percentage of All Holdings
None . . .	24
1	37
2	19
3	14
4	6
Total . .	100

The Use of Standards

During the course of this investigation many growers have expressed their anxiety about providing costs as they have feared that the results would not be comprehensive, and hence would tend to give a false impression of the profitability of blackcurrant growing. Consequently, an attempt has been made to account for the complete cost of production. However, it has not proved possible to collect cost items such as managerial, office and general farm expenses from each holding individually and the calculation of these costs has been based on whatever information has been available. Indeed, one would have wished for considerably

more data on some aspects of the costings, and since the investigation is to continue it is hoped that in time it will be possible to collect supplementary information on some of these " elusive " items, such, for example, as the cost of implements. If necessary, the relevant cost items can be amended at a later date.

Basically the costs are of two types, namely those collected individually from each holding and those assessed for the sample as a whole. Moreover, for the purpose of preparing the "per acre" averages a uniform method of costing has, as far as possible, been adopted for each holding. Although labour costs have been based on an adjustment of the wages actually paid, and materials are generally at cost price, standards have been adopted for certain items such as power costs.

Manual labour, both paid and unpaid, has been charged at rates which take into account the farmer's share of national health insurance, holidays with pay, free cottages and other perquisites. Overtime work has been charged accordingly, and piece-work and contract work at the rates actually paid. The effect of this has been to add, on average, about one-sixth to the actual hourly rates paid for a job. The object of this adjustment has been to include all labour expenses as direct costs, chargeable to the particular job. Naturally, the use of farm labour on general maintenance and repairs to buildings and machinery is allowed for in the general overheads, tractor work standards and so on.

As the cost of labour is based on the wages actually paid and not on fixed rates, the average labour cost per hour should show an increase over the period of the investigation as a result of the three pay rises granted to agricultural workers in that time. Indeed, as will be discussed fully at a later stage, a comparison of the average labour cost year by year shows to what extent the rise in the minimum rates has been reflected in an actual rise in pay rates and whether or not the farmer has been able to keep these rising costs in check.

" Power " costs include tractor or horse operations but not the use of the implements. Tractor work has been charged at a flat rate of 3s. 6d. per hour as the majority of tractors used in blackcurrant plantations are light tractors such as the Ferguson 35 or its equivalent. However, adjustments have been made in specific instances as for example when a crawler tractor has been used for a particular job. Of the powered hand tools, rotary hoes such as the Howard Gem are charged

at 4s. per hour and mowers, rotary scythes, and other I.C. engines at 2s. 6d. per hour. The charge for a horse is at the rate of 1s. 6d. per working hour and for farm lorries at 9d. per mile and vans or cars at 6d. per mile.

The net cost of the fertilisers used has been charged, but farmyard manure, unless purchased, has been valued at 25s. per ton as carted to the plantation. The full cost of all manures has been allocated to the crop in the year of application only and residual values have been ignored. This course is unlikely to affect the overall averages since we are concerned with a permanent crop costed over a period of years. Water for irrigation is generally charged at 3s. per 1,000 gallons, inclusive of depreciation of the equipment and the labour involved in moving it from place to place.

If the complete cost of production of any crop is to be calculated, it will soon be found that there are a number of indirect costs, particularly managerial, which cannot be assigned directly, as all enterprises have to bear a share. For these costs standards have to be adopted. Although there is no completely satisfactory method of apportioning such costs, on most farms a division based on the wages bill is probably the fairest method. There is little concrete evidence of the total of general overheads or of their variation from farm to farm, but on two horticultural farms in Worcestershire in 1959 the cost of management (excluding managerial salaries) and general maintenance amounted to £15 and £27 per £100 labour respectively. Since, for blackcurrant production the average labour cost including picking is approximately £100 per acre, then an allowance for general farm overheads based on such a figure also represents the allowance in terms of cost per acre. It has been suggested that an allowance of £20 per acre for blackcurrants would be of the right order of magnitude, and it is this basic figure which has been adopted in these costs. However, this allowance is subject to an adjustment of plus or minus £2 10s. per acre to take into account variations in the managerial complexity of the business. This allowance is designed to cover cost of maintaining the farm buildings, roads, hedges, ditches and so on and all office and incidental expenses. Frost insurance premiums, however, are allowed as additional to the normal overheads.

The indirect costs are not all of this type however. For example, provision has to be made for "writing-off" the cost incurred in establishing the plantation and also a sum

has to be set aside to cover the expense of grubbing the plantation at the end of its economic life. Although the magnitude of these costs can be determined fairly accurately, they have to be divided over the cropping lifetime of the plantation, which for this purpose has been assumed to average ten years. Details of these costs and the methods used to calculate them are given later in the report.

A further item which, for convenience, is included as an indirect cost is the rent or rental value of the land. This is the bare-land value of the plantation and the economic rent of the farm has to be spread as evenly as possible over the complete cropped area. A basic figure of £4 an acre has been adopted for the rental value, but this has been subject to alteration where actual rents have been charged to the business or where the farm as a whole has obviously warranted a higher rent.

The final item included in the indirect costs is an allowance for the maintenance and replacement of implements. A scale of hourly charges has been drawn up and with these as a guide the allowance for each plantation has been calculated individually. The advantage of this method is that it takes into account the nature of the implement used and also the amount of use made of it. The hourly rates adopted may be subject to modification but it is the overall cost which is of importance and we are reasonably satisfied that on the majority of holdings the average of £3·54 per acre which results from these calculations is adequate to cover the costs mentioned. This allowance compares with the average for "power" of £4·62 per acre. On two farms in Worcestershire in 1959 the implement costs were 2s. 3½d. and 3s. 4½d. per hour respectively, but it should be remembered that, during a proportion of the time chargeable to " power ", no implements were being used.

The Regional Tables

It is now intended to discuss the financial results in detail and the basis of this analysis is regional. The main tables in this section show the averages of the "per acre" costs for each region, and also for the whole sample for the cropping years 1957, 1958 and 1959. In addition there is for each table the three-year average for the period 1957–59.

In the opening table the receipts and total costs for the regions are summarised, together with the average yields

TABLE 20

Returns Costs and Margins per Acre

Region	Midland and Western Counties				Southern Counties				Eastern Counties				Overall			
Year	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59
Sale of Fruit	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
Quantity	2·24	1·46	2·00	1·84	1·99	1·94	1·71	1·85	1·45	1·97	1·04	1·48	1·95	1·78	1·53	1·70
	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Gross Receipts	344·58	250·82	324·68	300·66	365·94	366·44	297·67	336·25	301·06	362·38	191·60	275·72	339·02	324·32	262·34	299·03
(less) Marketing Costs	0·11	0·07	0·02	0·06	9·75	8·44	7·73	8·40	2·30	1·86	1·54	1·75	3·55	2·66	2·45	2·71
Net Receipts	344·47	250·75	324·66	300·60	356·19	358·00	289·94	327·85	298·76	360·52	190·06	273·97	335·47	321·66	259·89	296·32
(less) Total Costs	163·90	143·98	156·93	153·40	177·24	173·85	162·69	169·95	166·43	163·84	139·56	152·77	168·54	159·08	150·94	156·98
Margin	180·57	106·77	167·73	147·20	178·95	184·15	127·25	158·20	132·33	196·68	50·50	121·20	166·93	162·58	108·95	139·34

associated with these results. The difference between the total costs as included in these tables and the net value of the receipts is termed the margin, the figures for which are given in the final line of the table.

The second of these tables is a summary of the various costs making up the total costs, as given in the previous table. Furthermore, in the separate Tables (*a*) to (*i*) each individual cost is itemised. Other tables furnish details of the maintenance costs, in terms of labour, power, contract work and materials.

Supplementary regional tables are also included showing the average price received per ton of fruit and also the cost of picking per ton of fruit.

FINANCIAL RESULTS

Returns, Costs and Margins

The first table of financial results (Table 20) deals with the returns, costs and margins per acre, year by year, and region by region. In addition, the yield is given, as this, more than any other single factor, determines the long-term profitability of blackcurrant growing.

Revenue is, of course, a function not only of the yield but also of the price and both have to be taken into consideration when comparing the net revenue figures. However, the yield also affects the per acre costs, and hence the margin, by its influence on the cost of picking per acre, which is inevitably greater with a higher yield than with a lower one. A considerable range of yields is shown in the table, the highest average being 2·24 tons for the Midlands and West in 1957, and the lowest 1·04 tons for the Eastern Counties in 1959. However, although the overall average yield falls from 1·95 tons in 1957 to 1·78 tons in 1958, and still further to 1·53 tons in 1959, this trend holds good for only one region, that of the Southern Counties. In the Eastern Counties, 1958 was the best of the three years, while in the Midland and Western Counties it was the worst.

It might be asked to what extent these yield differences are due to variations year by year in the proportion of first year plantations included in the sample but, with one exception, there seems to be little relationship between the two sets of figures. In fact if the Eastern Counties are taken as representative, then the comparison is as follows.

TABLE 21

Proportion of Young Blackcurrants in the Eastern Region

Cropping Year	Percentage of Currants Cropping for First Time	Yield per Acre
	%	Tons
1957	15·4	1·45
1958	26·4	1·97
1959	18·4	1·04

Thus the year with the highest proportion of young, low-yielding bushes was the year with the highest average yield. Hence variation in yield in this region cannot be attributed to this factor. In the Southern Counties, on the other hand, the comparison is as follows. Here there is a strong suggestion that the drop in the average yield in 1959 may be

TABLE 22

Proportion of Young Blackcurrants in the Southern Region

Cropping Year	Percentage of Currants Cropping for First Time	Yield per Acre
	%	Tons
1957	2·7	1·99
1958	7·6	1·94
1959	37·2	1·71

due to an increase in the proportion of young bushes in the sample in that year.

This remark also applies to some extent of course to the overall figures for which the comparison is as follows.

TABLE 23

Proportion of Young Blackcurrants in the Regional Sample

Cropping Year	Percentage of Currants Cropping for First Time	Yield per Acre
	%	Tons
1957	11·6	1·95
1958	20·4	1·78
1959	22·4	1·55

In the Midlands and West on the other hand, despite a decrease from 1958 to 1959 of only 1·1 per cent in the proportion of young bushes, the average yield rose by 0·54 tons per acre.

Sample changes, other than changes in the proportion of young plantations, are unlikely to have had any great influence on yields, particularly as the majority of plantations were included in 1958 and in 1959. The actual yield to be expected from first-year plantations is dealt with in another section of the report, in which the whole question of the effect of cropping age on costs, yields, and so on, is discussed in detail.

In addition to the regional analysis of all costs, the results for identical plantations have been recorded separately and averaged. An identical plantation is one which is substantially unchanged for a consecutive pair of years, or for the full three-year period. Hence, all plantations costed for one year only are excluded as are those on which grubbing or planting has greatly affected the acreage or composition. Similarly, plantations cropping for the first time are not considered identical in the following year and are excluded.

TABLE 24

Comparison of Yields on Identical Plantations in 1957 and 1958

Region	1957	1958
	Tons per Acre	Tons per Acre
Midland and West .	2·53	1·67
Southern . .	2·09	2·03
Eastern	1·70	2·50
Overall . .	2·18	1·99

TABLE 25

Comparison of Yields on Identical Plantations in 1958 and 1959

Region	1958	1959
	Tons per Acre	Tons per Acre
Midland and West .	1·40	2·05
Southern . .	2·37	2·48
Eastern . . .	2·59	1·32
Overall . .	2·14	1·88

If variations in the yield of identical plantations are taken as a better measure of comparison between years due to the elimination of first-year plantations and of other sample differences, then the figures are as shown in Tables 24 and 25.

It should perhaps be pointed out that the identical samples for comparison of pairs of years are not in themselves identical, there being twenty-eight plantations in the first instance and forty-eight in the second. In actual fact, if a direct comparison of the three years is required, only twenty plantations are available for this purpose and these give the results shown in Table 26.

TABLE 26

Three-Year Comparison of Yields on Identical Plantations

Region	1957	1958	1959
	Tons per Acre	Tons per Acre	Tons per Acre
Midland and West .	2·00	1·60	2·19
Southern . .	1·92	2·09	2·17
Eastern . . .	1·64	3·19	1·46
Overall . .	1·91	2·06	2·07

The conclusions to be drawn from these figures are that, on the whole, they only confirm the results shown in the original table, namely that 1958 was a bad year for the Midland and Western Counties and a good one for the Eastern Area, whereas in the East, both 1957 and 1959 saw poor yields. With regard to the overall yields, 1958 was worse than 1957 and 1959 worse than 1958, again a similar result to that shown in the main table. A difference in interpretation is afforded by the Southern Counties where Table 20 indicates a gradual decline in yield—1·99 tons per acre through 1·94 to 1·71—which is not confirmed by an analysis of identical plantations. These admittedly show little change in 1958 compared with 1957, but indicate that 1959 was a better year than 1958. Thus these tables tend to confirm the conclusion already reached that the fall in yield in the Southern Counties was due to the considerable increase in the proportion of young bushes in 1959 compared with 1957 and 1958.

If it be accepted that the average cropping of a blackcurrant plantation follows a regular pattern, and that yields approximate to the following estimates, namely, for first-year plantations ½ ton per acre, second to fifth years 2 tons, sixth

to ninth years $2\frac{1}{2}$ tons, and the tenth year, or over, $1\frac{1}{2}$ tons, then it is possible to determine the expected crop for any particular holding, and to compare this figure with the yield actually obtained. If every result within plus or minus 25 per cent of the standard be claimed as average and all outside this range as above or below average respectively, then it is possible to plot these results on a map, giving a visual picture for any given year of the areas of high or low production. This has been done in the following maps from which it is possible to draw a number of interesting conclusions.

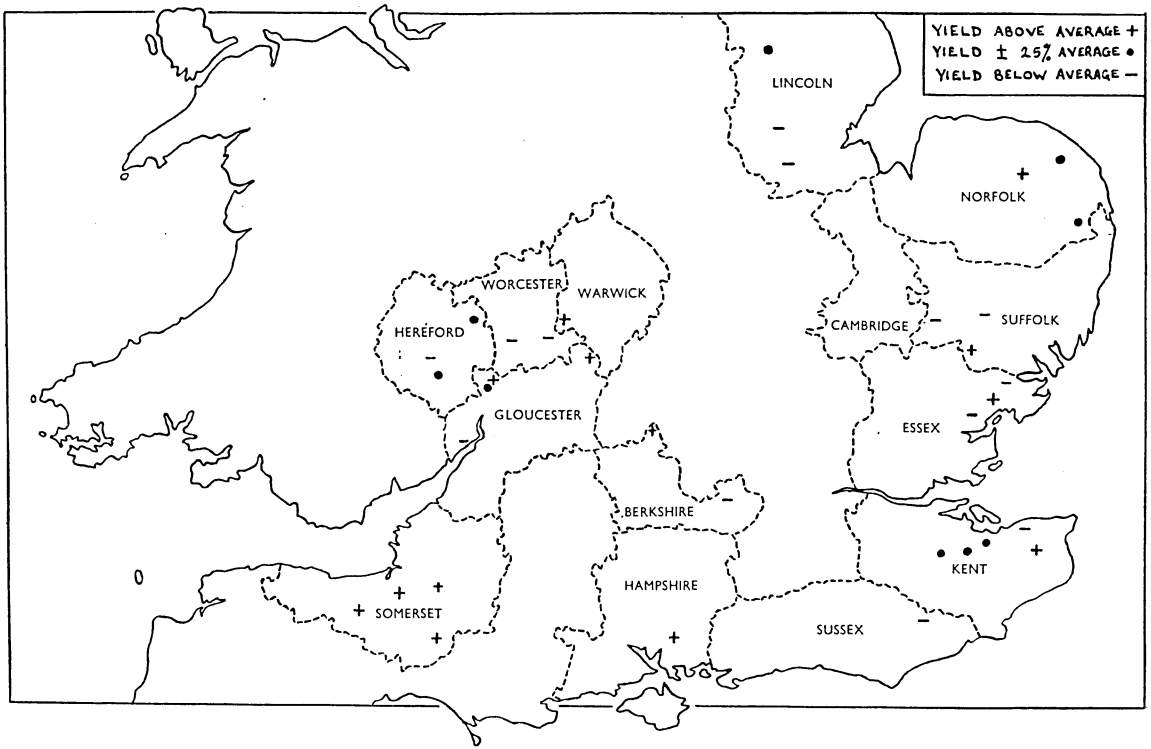
The picture for 1957 is not so clear as for 1958 or 1959 due to the comparatively small number of holdings involved, but the very good crops experienced by the Somerset holdings are quite evident. On the other hand, the Kent results were average and those for the Eastern Counties below average. In 1958 Somerset is equally prominent by its virtual crop failure, a failure not equally reflected in the Midland Counties of the area, where indeed a number of holdings experienced good yields. Kent and the Eastern Counties, on the other hand, had very good yields with the exception of Hampshire (which seems to have suffered much the same experience as Somerset), and Lincolnshire, where crops were only average. In 1959 it is the very poor yields of the Eastern Counties, particularly Norfolk, which show up most strongly. Kent again had quite good yields, and so did Somerset and most parts of the West Midlands.

If, on the other hand, one compares the results for any individual holding over the three years, it becomes evident from the maps that some have done very poorly whilst others have done very well over the whole three-year period. This may be due to a variety of reasons including the location of the plantation, management, the variety of currant grown, health of the bushes, and so on. For instance, one holding in Sussex has had below-average results for all three years, whereas one in Somerset and one in Essex have had above-average results for the same period.

This point of sustained high-level yields over a period of years is of some interest as it is sometimes argued that if the yield is exceptionally heavy one year it will be low the following year. The probability that this will be so, due to adverse weather conditions, and so on, is fairly high, but it does not inevitably follow, as records of the plantations yielding on average over 2 tons per acre tend to show.

MAP 1

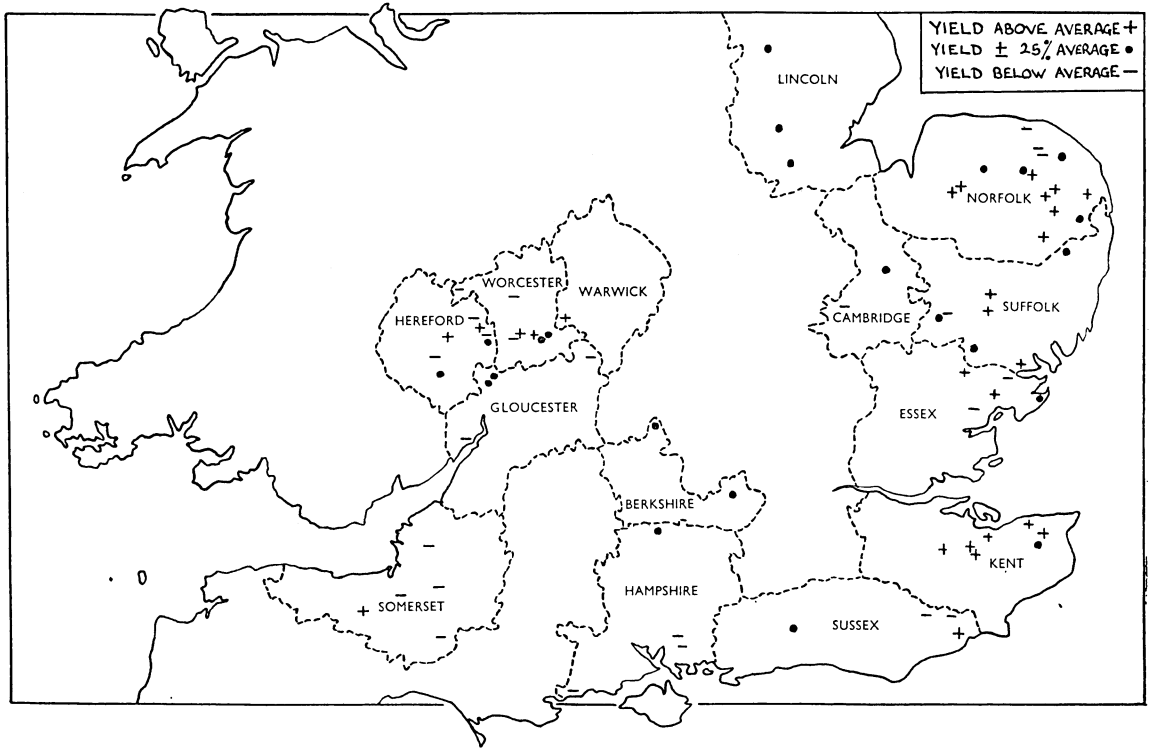
CROPPING YEAR, 1957.



Regions	*Counties*
Midland and Western:	Gloucestershire, Herefordshire, Somerset, Warwickshire, Worcestershire
Southern:	Berkshire, Hampshire, Kent, Sussex
Eastern:	Cambridgeshire, Essex, Lincolnshire, Norfolk, Suffolk

MAP 2

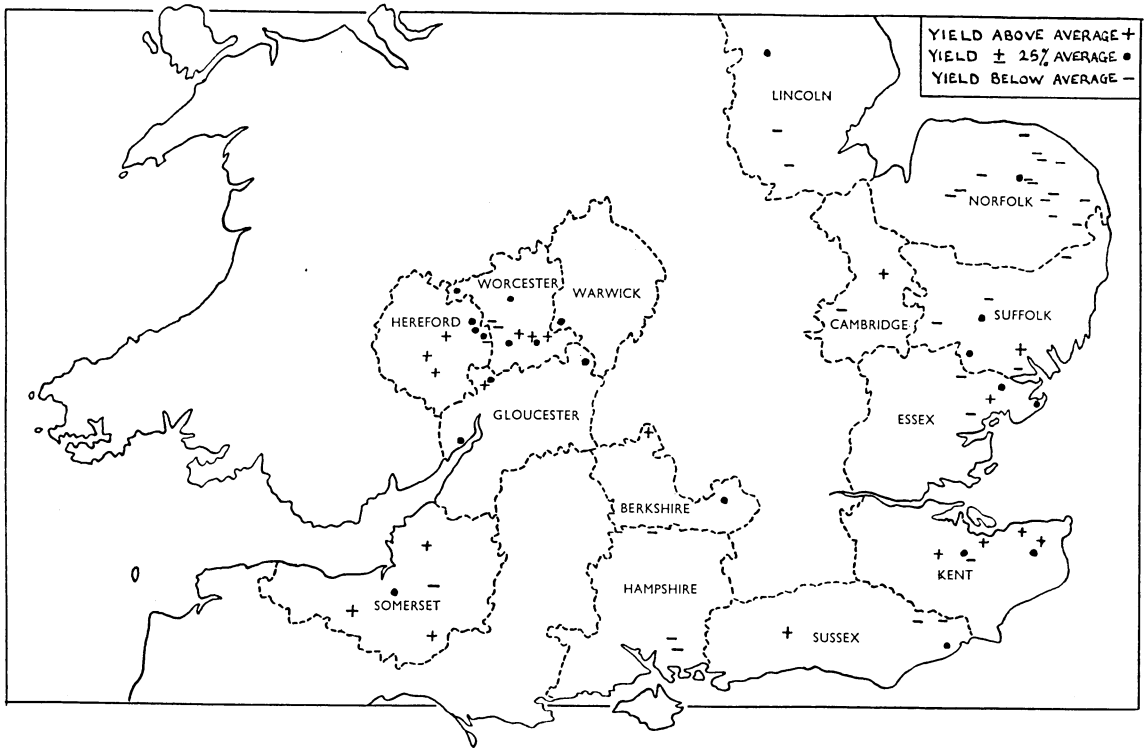
CROPPING YEAR, 1958.



Regions	*Counties*
Midland and Western:	Gloucestershire, Herefordshire, Somerset, Warwickshire, Worcestershire
Southern:	Berkshire, Hampshire, Kent, Sussex
Eastern:	Cambridgeshire, Essex, Lincolnshire, Norfolk, Suffolk

MAP 3

CROPPING YEAR, 1959.



Regions	*Counties*
Midland and Western:	Gloucestershire, Herefordshire, Somerset, Warwickshire, Worcestershire
Southern:	Berkshire, Hampshire, Kent, Sussex
Eastern:	Cambridgeshire, Essex, Lincolnshire, Norfolk, Suffolk

Thus five of the ten plantations given in Table 27 have not dropped below 2 tons an acre during the three-year period, and one has not even fallen below 3 tons per acre.

TABLE 27

High-Yielding Plantations 1957–1959

1957	1958	1959	3-Year Average
Tons per Acre	Tons per Acre	Tons per Acre	Tons per Acre
4·13	3·06	3·13	3·44
2·18	3·73	3·82	3·24
4·29	2·73	2·41	3·14
2·45	4·23	2·71	3·13
1·93	2·60	4·51	3·01
2·29	2·47	3·09	2·62
2·07	1·90	2·94	2·30
1·23	2·56	2·88	2·22
1·10	2·36	2·95	2·14
2·02	2·62	1·79	2·14

While on the subject of yields, it would probably be of interest to consider the analysis of yields by variety. Although not comprehensive, sufficient acreages of the principal varieties have been recorded to give some idea of their potentialities. However, it should be pointed out that these figures are not comparable with those obtained from variety trials as the regional distribution, cropping age of the varieties, and so on, are subject to variation. The figures are given in Table 28.

TABLE 28

Blackcurrant Yields Per Acre by Varieties 1957–1959

Variety	1957	1958	1959	3-Year Average Yield
	lb.	lb.	lb.	lb.
Amos Black	1,986	4,133	3,095	3,273
Baldwin	6,087	4,940	4,033	4,802
Cotswold Cross	1,299	4,512	2,225	3,004
Mendip Cross	3,348	5,360	3,501	4,223
Seabrook's Black	2,703	6,166	3,252	4,096
Wellington XXX	4,179	4,749	5,967	5,064
Westwick Choice	6,028	4,467	5,292	5,013
Overall Average	4,617	4,928	4,296	4,605

TABLE 29

Top Three Varieties by Yield

1957	1958	1959	Overall
BALDWIN	SEABROOK'S BLACK	WELLINGTON XXX	WELLINGTON XXX
WESTWICK CHOICE	MENDIP CROSS	WESTWICK CHOICE	WESTWICK CHOICE
WELLINGTON XXX	BALDWIN	BALDWIN	BALDWIN

It is noticeable that Baldwin appears among the first three varieties in each of the three years for which figures are available, and it is strongly suggestive that this is an all-round reliable variety to grow. Similarly, Wellington XXX and Westwick Choice seem capable of good results. Surely it is not chance that the three most widely-grown varieties in the sample are these very three. The year 1958, with the entry of Seabrook's Black and Mendip Cross into the field, is rather difficult to explain but is probably mainly due to unequal regional representation of the different varieties.

It may be noted that these overall average yields, if expressed in tons per acre, are higher than those given in Table 20 for the years in question but this is explained by the fact that they are based on the actual acreage of currants grown and not on the field acreages as are the yields shown elsewhere in the report.

It may be asked how this interpretation of the yields by year and by region compares with published reports on the subject.

In the *West Midlands* in 1957 there was a certain amount of damage reported from cold north-easterly winds in April, particularly on exposed sites. In Hereford it was being said in June that rain had come too late for there to be a heavy crop, whereas South Somerset reported some heavy crops. Some loss was experienced by wet conditions during picking.

In the *South* 1957 was generally reported as promising but by July north Kent was speaking of some shrivelling of fruit.

In the *East* in 1957, Norfolk mentions wind damage, and Suffolk frost damage. By mid-May it was evident that damage had been severe in East Norfolk and also in Linconlshire. Essex also reported considerable "run-off". In Norfolk even the crop which was left after frost damage was going mouldy.

In the *West Midlands* in 1958, promising crops were being reported by mid-May in the Vale of Evesham and patchy crops from Herefordshire. However, from Somerset came the news that " sets " were in some cases less than 75 per cent. This was put down to the fact that blossoms must have formed during a mild week in early March but had not stood up to the cold winds and frosts of April. Gloucestershire was speaking of a heavy crop by June, the Vale of Evesham of a fairly good yield, whilst in Herefordshire it was not considered up to that of the previous year.

In the *South* in 1958 good crops were generally reported, but by July in North Kent yields were not as heavy as at one time expected, particularly in the drier fields.

The *East* in 1958 was generally good and in East Norfolk by mid-July bushes were splayed open with the weight of fruit. However, Lincolnshire had an average crop and cases of hail damage occurred in Norfolk.

In the *West Midlands* in 1959, the Vale of Evesham in mid-May was reporting some frost damage and Herefordshire considerable reductions in crop. Gloucestershire was also reporting considerable damage from cold wind and frost, but in South Somerset the prospect was promising.

In the *South* 1959 was generally good, but in the *East*, although there was a good show of blossom in Norfolk, it was hit by frost in early May, with some growers losing 80 to 90 per cent of their crop, though others escaped damage.

Comparing these general impressions with the maps, agreement will be seen to be quite good and the main regional features of the seasons fairly shown, that is to say they are reflected in the yields as given in the tables.

Table 20 also shows the gross and net receipts. The difference between the two figures is the cost of marketing. However, under present conditions the bulk of the blackcurrant crop is sold under contract to processors and for this method of disposal few or no marketing costs are incurred. In fact, the average cost of marketing is negligible, particularly in the Midlands and West.

When the crop is sold on contract for an agreed price, the purchaser undertakes or pays for collection and supplies the trays. If, however, the grower sends the fruit to market or retails it, he has to pay not only marketing expenses but frequently the price of the chips in which it is packed as well. All these costs have to be deducted before his returns can be compared with those of the grower who sells on contract, and

hence it is the net receipt figure which is the more important of the two. This net receipt is dependent on the price per ton and on the quantity sold, but prices have not varied greatly over the last three years. Hence, for any particular region the total net receipts have varied in accordance with yields.

However, if the three-year averages be compared, it is evident that the average price per ton has not been identical in each region. Whereas, in the Midlands and West 1·84 tons brought in £300·60, in the Southern Counties virtually the same weight of crop realised £327·85. Also a much lighter crop of 1·48 tons in the Eastern Counties gave a revenue of £273·97. These differences are due in part to the fact that in recent years the open market price for blackcurrants has been appreciably above that offered for long-term contracts and the proportion of co-operating growers disposing of their crops at the higher price has been considerably greater in the Eastern and Southern Counties than in the Midlands and West. The whole question of prices and of cost per ton will be discussed at a later stage, and details are given in Table 30.

Total costs also vary with yield, but not to nearly the same degree as do the returns. Even so, without exception, the order of costs in each region is the same as the order of yields. Hence, if it is desired to compare costs from region to region, it is preferable to deduct the picking costs, as the value of these is largely dependent on yield, and also the overhead costs, which are similar throughout the sample. The remaining costs, that is to say, the maintenance costs, are shown in a separate table, which will be discussed later.

The difference between net receipts and total costs is termed the margin. It is evident from Table 20 that at present-day prices an average crop of about two tons per acre will yield a margin which is greater than the total cost of growing the crop. Below this figure the margin drops to about 40 per cent of revenue at 1½ tons and 30 per cent at 1 ton per acre. Over the three years of the survey, the average margin has been approximately £140 per acre, with a crop yield of 1 ton 14 cwt. per acre. Although the average yield for the Midland and Western Counties is virtually identical with that of the Southern Counties and the costs less, the margin is lower due to the difference in average price. Costs in the Eastern Counties are even lower but the average yield considerably less; hence the margin is down. The lowest

TABLE 30

Price Received per Ton of Fruit

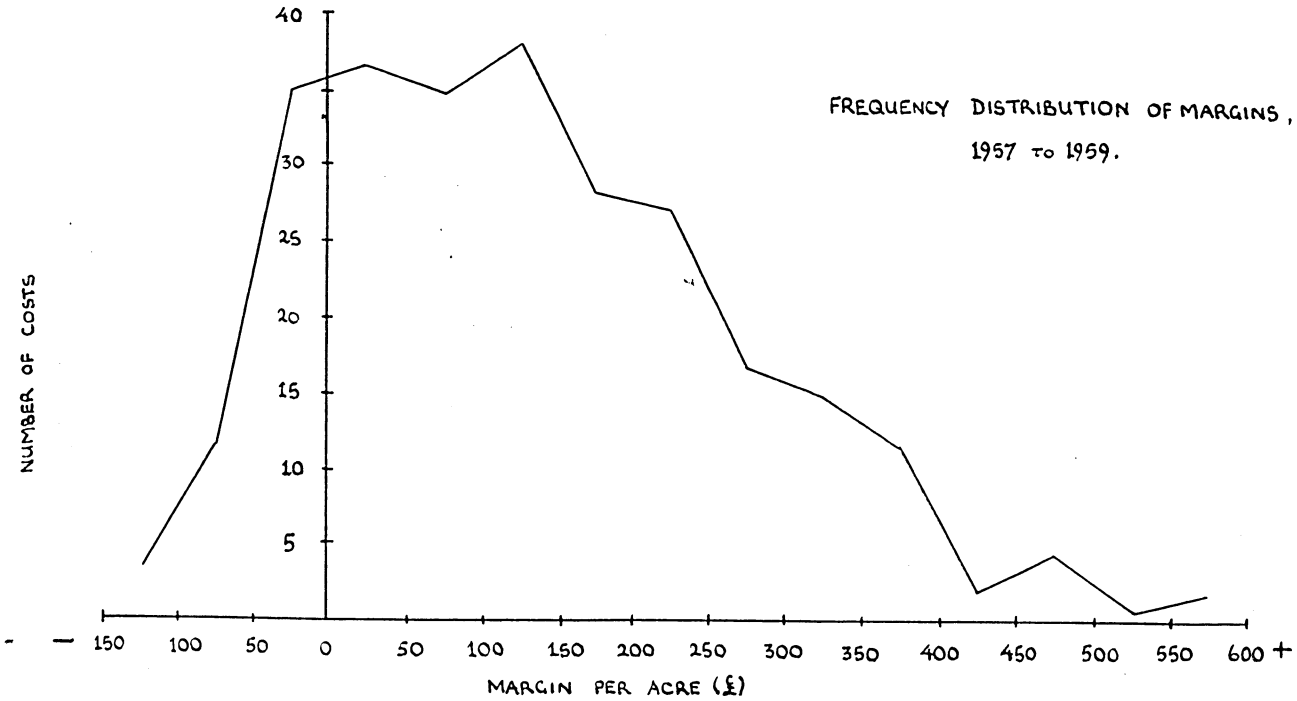
Region	Midland and Western Counties				Southern Counties				Eastern Counties				Overall			
Year	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59
	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Gross Price	148·96	170·20	162·95	162·97	189·77	194·01	178·35	186·30	206·66	185·67	173·65	182·36	176·75	182·08	171·02	176·28
Marketing Costs	0·04	0·03	0·01	0·02	5.58	7·66	6·03	6·52	2·61	0·95	1·20	1·25	2·38	2·08	1·90	2·05
Net Price	148·92	170·17	162·94	162·95	184·19	186·35	172·32	179·78	204·05	184·72	172·45	181·11	174·37	180·00	169·12	174·23

TABLE 31

Frequency Distribution of Margins 1957–1959

Value of Margin Per Acre	£ −150 to −100	£ −100 to −50	£ −50 to 0	£ 0 to 50	£ 50 to 100	£ 100 to 150	£ 150 to 200	£ 200 to 250
Number of Costs	3	12	35	37	35	38	28	27
Value of Margin Per Acre	£ 250 to 300	£ 300 to 350	£ 350 to 400	£ 400 to 450	£ 450 to 500	£ 500 to 550	£ 550 to 600	Over £600
Number of Costs	17	15	12	2	4	1	2	3

DIAGRAM 4


FREQUENCY DISTRIBUTION OF MARGINS, 1957 TO 1959.
NUMBER OF COSTS
40
30
25
20
15
10
5
- — 150 100 50 0 50 100 150 200 250 300 350 400 450 500 550 600 +
MARGIN PER ACRE (£)

margin was for the Eastern Counties in 1959 at £50 10s. per acre, but the highest was also in the Eastern Counties in 1958. This, however, did not correspond with the highest yield which was in the Midland and Western Counties in 1957.

Such averages can be misleading as a study of individual results show (see Table 31).

Although the average margin is +£139·34 and the greatest number of costs (38) falls between £100 and £150, the emphasis is not very marked, for as many as thirty-seven plantations have margins between £0 and £50 and thirty-five between £50 and £100. Moreover, a further thirty-five have losses of up to £50 while fifteen show losses even greater than this. The number of costs from a peak in the £100 to £150 group decreases steadily as the margin rises, dropping to only two in the £400 to £450 group. However, a further ten plantations have margins greater than £450. This is truly a very wide range and it is incorrect to speak of an average margin of £139 without bearing this in mind.

Total Costs

The figures of total costs as given in Table 20 are divided into nine separate components, each of which will be discussed in turn. In Table 32 the total of each of these nine individual items is shown together with the overall total. It is evident from this table that the highest single cost is that of picking and that the indirect costs also account for a considerable proportion of the expenditure. Of the maintenance costs, the chief one is that of fertilisers, but cultivating is also of importance. In fact, in the Eastern Counties in 1957 the average cost of cultivations exceeded that of fertilisers. The only other appreciable costs are those of spraying and pruning. The remaining items, namely replacement of bushes, roguing and miscellaneous maintenance costs, may be virtually ignored, although on individual holdings one or more of these items may be quite expensive.

As one would expect, due to the considerable variations in average yield, the most variable cost is that of picking. On the other hand, great uniformity is shown by the indirect costs, also not unexpected, due to the nature of these costs, and to the method by which they were calculated.

If these two items are omitted, one is left with what one may term the " maintenance " costs. The totals of these are shown in a separate table (Table 33) and are of considerable interest. This table is in fact a summary of items (*a*) to (*g*) in Table 32.

TABLE 32

Total Costs per Acre

Region	Midland and Western Counties				Southern Counties				Eastern Counties				Overall			
Year	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59
	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
(a) Replacement of Bushes	0·04	0·31	0·51	0·35	—	0·21	0·24	0·18	0·08	0·55	0·69	0·56	0·03	0·40	0·52	0·39
(b) Fertilisers	22·45	21·95	17·13	19·98	23·09	24·62	23·80	23·95	21·39	20·24	21·47	20·94	22·34	21·79	20·50	21·30
(c) Cultivations	11·37	17·38	15·85	15·55	23·67	22·93	17·60	20·75	20·23	19·80	17·60	18·84	17·44	19·63	17·00	18·07
(d) Crop Protection Spraying	6·15	7·33	7·14	7·03	4·70	5·11	5·38	5·14	7·41	5·21	5·27	6·47	6·06	5·93	5·94	5·98
(e) Pruning	5·84	5·99	6·40	6·14	9·66	7·55	8·64	8·45	10·19	7·92	8·60	8·49	8·16	7·16	7·85	7·63
(f) Roguing	0·44	0·86	0·46	0·60	0·47	1·33	0·55	0·82	—	0·34	0·40	0·33	0·33	0·73	0·46	0·55
(g) Miscellaneous Maintenance Costs	1·18	0·53	1·79	1·20	2·35	1·05	1·76	1·63	2·02	1·49	2·04	1·80	1·76	1·06	1·88	1·55
(h) Picking	79·22	51·78	70·43	65·09	75·63	73·88	66·76	71·12	68·02	72·33	46·80	59·91	75·11	65·50	59·62	64·43
(i) Indirect Costs	37·21	37·85	37·22	37·46	37·67	37·17	37·96	37·61	37·09	35·96	36·69	36·43	37·31	36·88	37·17	37·08
Total	163·90	143·98	156·93	153·40	177·24	173·85	162·69	169·65	166·43	163·84	139·56	152·77	168·54	159·08	150·94	156·98

TABLE 33

Summary of Maintenance Costs Per Acre: Tables (a) to (g)

Year	1957					1958				
Costs	Labour	Power	Contract Work	Materials	Total	Labour	Power	Contract Work	Materials	Total
Region	£	£	£	£	£	£	£	£	£	£
Midland and Western	20·36	3·74	0·31	23·06	47·47	27·55	4·71	0·57	21·52	54·35
Southern	35·67	5·63	—	22·64	63·94	34·11	5·10	—	23·59	62·80
Eastern	33·72	4·80	1·23	21·57	61·32	31·40	4·84	0·45	18·86	55·55
Overall	28·53	4·59	0·47	22·53	56·12	30·64	4·84	0·40	20·82	56·70

Year	1959					Average 1957–59				
Costs	Labour	Power	Contract Work	Materials	Total	Labour	Power	Contract Work	Materials	Total
Region	£	£	£	£	£	£	£	£	£	£
Midland and Western	23·86	3·83	0·68	20·91	49·28	24·58	4·15	0·56	21·56	50·85
Southern	28·56	4·48	—	24·93	57·97	31·99	4·94	—	23·99	60·92
Eastern	29·38	4·91	0·40	21·38	56·07	30·71	4·87	0·52	20·33	56·43
Overall	27·28	4·43	0·40	22·04	54·15	28·80	4·62	0·41	21·64	55·47

The overall average of "maintenance" for the three years is approximately £55 per acre, and there is little departure from this figure in any one year. In fact, the variation is little more than plus or minus 2 per cent. The average for 1958 is higher than that for 1957 but the lowest figure is that for 1959. Despite the apparent constancy of the overall averages, the average costs for the individual regions show considerably greater variation, not only one from the other but also year by year. However, in each year the cost of maintenance has been greatest in the Southern Counties, with an average of nearly £61 per acre. Furthermore, the Midlands and West have spent least on maintenance in each of the three years, and the overall average for the region is only £51 per acre. The Eastern Counties are of course intermediate between the other two. There does, then, appear to be a genuine regional distinction with regard to the amount of money spent on the maintenance of blackcurrant plantations.

If the figures are studied in detail, it can be seen that it is principally on labour that the Midlands and West have been spending less, and only to a lesser extent is the cost of power and of materials lower than in the other regions. In fact, in 1957 the Midlands and West spent more on materials than either of the other two areas, and in 1958 also this region spent more on materials than did the Eastern Counties.

Study of the individual items will show also that fluctuations in the total maintenance cost are principally determined by the variations in the total cost of labour on maintenance, which was £28 10s. per acre in 1957, £30 10s. per acre in 1958, but only £27 5s. per acre in 1959. This is a point of particular interest, as it is rather different from what one would expect. It might well be thought that the several increases in minimum wage rates, which came into effect during the period 1957 to 1959, would have led to an annual increase in labour costs. It therefore needs to be determined whether or not such a trend is concealed by sample differences.

An analysis of maintenance costs for the identical sample (see Table 34) shows that whereas the cost of labour rises in 1958 by £4 compared with 1957, it drops again in 1959 by £3 compared with 1958.

It is evident, then, that the lower labour cost in 1959 compared with 1958 is not due entirely to differences in the sample. However, it is not certain that the figure for 1959

is lower than that for 1957. To what is this drop in the amount spent on labour by the co-operating growers due? Is it because the proportion of work done by lower paid labour has increased or has there been a definite decrease in the amount of work undertaken?

TABLE 34

Identical Sample: Summary of Maintenance Costs Per Acre

1957	1958	Maintenance Costs	1958	1959
£	£		£	£
32·19	36·15	Labour	31·99	28·96
4·77	5·02	Power	5·22	4·76
25·50	23·78	Materials	22·82	24·82
62·46	64·95	Total	60·03	58·54

Table 35 shows that on average the cost per hour of labour increased, and that the variations in total labour cost are due to substantial differences in the number of hours spent on maintenance in the different years.

TABLE 35

Identical Sample: Summary of Labour Hours Spent on Maintenance

1957	1958		1958	1959
£	£		£	£
31·57	35·72	Labour Cost Per Acre (Excluding P.W.)	31·15	28·16
185·40	193·20	Hours Worked Per Acre	168·90	145·50
3s. 5d.	3s. 8d.	Average Cost per Hour	3s. 8d.	3s. 10½d.

It should be pointed out that the hourly rates shown in the above table are for adjusted wages, which include N.H.I. and so on. The actual average rates paid to the workers are about 2s. 10d., 3s. 0½d. and 3s. 2½d. per hour respectively.

Table 36, which gives the proportion of the maintenance work done by male and female labour, emphasises the fact that changes in the composition of the labour force are not responsible for the variation in the average wage rates. Whereas annual variations in the proportion of work done by women do not differ greatly for the identical sample

holdings, being between 25 and 30 per cent, it is in 1959, the year with lowest labour costs per acre, that the proportion of work done by men and youths is greatest. That is to say, irrespective of any increase in minimum wage rates during the year, one would have expected the average cost per hour to rise, as indeed it has. Although the increase in the minimum rate is only 1d. an hour, the average cost per hour is up by 2d. from 3s. 0½d. to 3s. 2½d.

TABLE 36

Proportion of Work Done by Male and Female Labour

1957	1958		1958	1959
%	%		%	%
70	72	Men and Youths	71	75
30	28	Women	29	25
100	100		100	100

In 1958 more work was done than in 1957, while in 1959 less work was done than in 1958. This fact is probably related to the weather conditions in the years in question, 1959 in particular having a dry spring and summer with less time needed for cultivating and keeping the weeds under control. The figures in the table of total costs seems to confirm this observation.

A more detailed study of wage rates for the plantations costed is made for the cropping year 1956–57 and again for 1957–58, from both of which it is evident that the average wage rate varies from region to region and from job to job.

TABLE 37

Average Adjusted Wage Rate Per Hour: Regional Variations

Region	1956–57	1957–58
	s. d.	s. d.
Midlands and West	3 7	3 10½
Southern	3 4¼	3 7¾
Eastern	3 5	3 4½
Overall	3 5½	3 9

In both years the average rate is greatest for the Midland and Western group of holdings as can be seen from Table 37. The drop in the Eastern area between 1956–57 and

1957–58 may be due to sample differences as these figures are not based on an identical sample.

TABLE 38

Average Adjusted Wage Rate Per Hour: Variations by Job

	1956–57	1957–58
	s. d.	s. d.
Replacements . .	4 1	4 0¾
Fertilisers . .	3 7¼	3 11½
Hand Cultivations .	3 3	3 7
Machine Cultivations .	3 8	3 11½
Spraying . . .	3 10	4 1¼
Pruning . . .	3 5¾	3 8½
Roguing . . .	3 11½	4 2
Miscellaneous . .	3 4¾	3 6¾
Overall . . .	3 5½	3 9

The variations in the hourly cost of different jobs in any one year, as shown in Table 38, are due to differences in the type of labour employed on these activities. The most highly paid jobs, on average, are roguing, replacements, and spraying; the latter, in fact, frequently attracts a bonus. Also above average is fertiliser application and machine cultivation, both of which are almost entirely undertaken by men. Furthermore, tractor drivers are often paid higher wage rates than are the other farm workers. Jobs such as pruning and hand cultivation for which women and youths are frequently employed have even lower rates per hour.

The average adjusted rate of 3s. 5½d. per hour for 1956–57 corresponds with an actual rate of about 2s. 11d. per hour and the adjusted rate of 3s. 9d. for 1957–58 with an actual rate of about 3s. 1d. per hour. This is reasonable enough as during the cropping year 1956–57 the minimum agricultural wage rate for male workers 20 years old and over was 3s. 0d. an hour and for women over 21, 2s. 4d. an hour. The minimum rates increased to 3s. 3d. and 2s. 6d. an hour respectively in October 1957, that is to say during the 1957–58 cropping year. The average increase as shown by the cost figures was 2d. an hour, which is identical with the increase in the wage rates for the female workers, but less than that for men. This is understandable as the proportion of hours spent by male labour is only some 70 per cent of the whole and in any case the rises apply to three-quarters of the year only.

TABLE 39

Summary of Maintenance Costs per Acre
Percentage Distribution: Tables (a) to (g)

Year	1957					1958				
Costs	Labour	Power	Contract Work	Materials	Total	Labour	Power	Contract Work	Materials	Total
Region	%	%	%	%	%	%	%	%	%	%
Midland and Western	42·9	7·9	0·6	48·6	100·0	50·7	8·7	1·0	39·6	100·0
Southern	55·8	8·8	—	35·4	100·0	54·3	8·1	—	37·6	100·0
Eastern	55·0	7·8	2·0	35·2	100·0	56·5	8·7	0·8	34·0	100·0
Overall	50·8	8·2	0·9	40·1	100·0	54·0	8·5	0·8	36·7	100·0

Year	1959					Average 1957–59				
Costs	Labour	Power	Contract Work	Materials	Total	Labour	Power	Contract Work	Materials	Total
Region	%	%	%	%	%	%	%	%	%	%
Midland and Western	48·4	7·8	1·4	42·4	100·0	48·3	8·2	1·1	42·4	100·0
Southern	49·3	7·7	—	43·0	100·0	52·5	8·1	—	39·4	100·0
Eastern	52·4	8·8	0·7	38·1	100·0	54·4	8·6	0·9	36·1	100·0
Overall	50·4	8·2	0·7	40·7	100·0	51·9	8·3	0·7	39·1	100·0

Despite the large increase in the number of plantations costed in 1958 compared with 1957, it is of interest to note that the average total cost of maintenance for the two years is virtually identical. This would suggest that the forty-four costs obtained in 1957 are sufficient in number to give a satisfactory average of the cost of growing currants and that an even lesser number might have sufficed. It is, however, when the costs are subdivided in any way, as, for example, regionally or by cropping age, that the lack of sufficient data becomes apparent, and that an increase in sample size or the number of years for which costs are available are of particular importance.

Table 39 shows that the proportion of the total maintenance cost spent on labour, power, contract work and materials respectively, is remarkably constant and that the cost of labour exceeds that of materials in all but one case (Midlands and West in 1957), and is of the order of 50 per cent of the total maintenance cost. The blackcurrant is still a crop which requires a great deal of handwork, and although it is being increasingly mechanised, for example, wider row widths to enable greater use of machinery, weedkilling sprays being used instead of hand weeding, and so on, the power cost is still only some 8 per cent of the total maintenance cost. Although Contract Work is separated from the other items it is of little importance in the costings and generally consists of spraying.

Although the average cost of maintenance is £55·47 per acre, the cost on the majority of the sample plantations is in the range £40–£50 per acre. There are forty-five costs in this group compared with forty-one in the £50–£60 range, and thirty-six in the £30–£40 range. The frequency distribution of the maintenance cost is shown in the accompanying graph (Table 40). It is quite clear that whereas the number of plantations costing less than £40 an acre per year drops rapidly as expenditure decreases, there is a more gradual drop with increase in expenditure. In fact on nineteen plantations more than £100 per acre was spent, and it is this which accounts for the average cost not being in the same cost group as the majority of holdings.

Replacement of Bushes

On average, this is rarely an expensive item, being of the order of a few shillings per acre. However, replacements are only undertaken on about one plantation in every six.

TABLE 40

THE FREQUENCY DISTRIBUTION OF BLACKCURRANT MAINTENANCE COSTS - 1957 TO 1959

COST PER ACRE (£)	0 - 10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
NUMBER OF COSTS	1	10	35	36	45	41	31	23
COST PER ACRE (£)	80-90	90-100	100-110	110-120	120-130	130-140	140-150	150-160
NUMBER OF COSTS	17	13	11	6	1	0	1	0

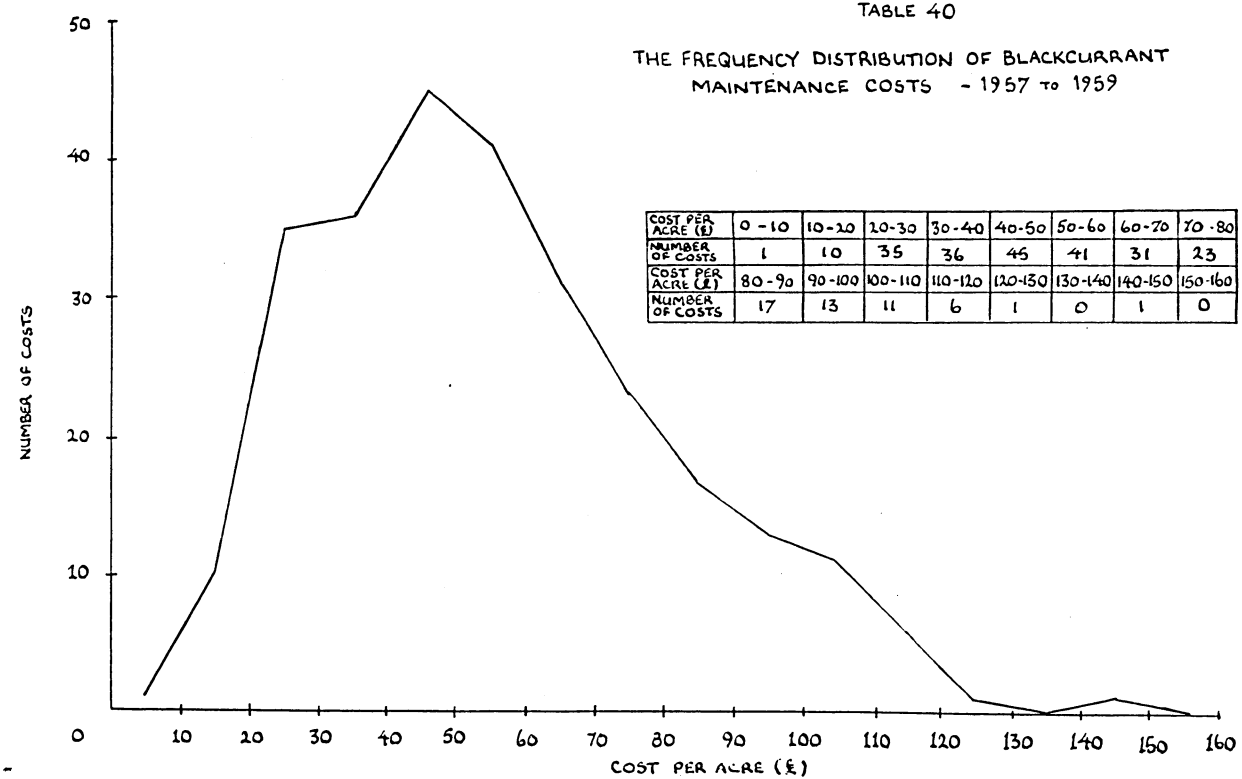


DIAGRAM 5—The Frequency Distribution of Blackcurrant Maintenance Costs

Hence, the average cost of the job on these plantations will be some six times the overall average, that is to say about £2 10s. per acre. Even so, this is still not very great expenditure. Replanting is virtually confined to young plantations, for as the bushes grow larger and the gaps more extensive, it becomes uneconomic to replace with fresh bushes. Generally speaking, it is only the occasional bush which fails to become established or shows early signs of reversion which is replaced, and then only for the first two or three years of the plantation's life. There are, of course, exceptions: one holding in the Eastern Counties, for example, spent over £11 an acre on replacements in 1958. The plantation was then in the ninth cropping year and despite this attempt to extend the economic cropping life, reversion was so widespread that the whole area was grubbed after picking, including the replacement bushes.

The principal costs associated with replanting are the cost of the bushes themselves and of the labour in planting them. The division between these two costs is approximately equal. In practice, it is not always possible to separate the cost of replacements from the cost of roguing, as it may happen that the reverted bushes are not removed until the time when the replacement bushes are put in. Full details are given in Table 41.

Fertilisers

Fertilisers of some form or another are almost without exception applied annually to the blackcurrant plantation. There are only three records amongst all those collected in the last three years, where nothing was spent on fertilisers. Low expenditure on fertilisers is generally associated with old plantations which are reaching the end of their useful life, and which it is the intention to grub after picking has taken place. In fact, there is no point in encouraging young wood for the following year.

A threefold division of the materials applied, into farmyard manure, mulches (including straw), and artificials (including concentrated organics), is given, and, as can be seen from Table 42, the total cost of the materials averaged between £15 and £20 an acre, in addition to which there was an application cost of some £5 an acre.

Although less was spent on these materials by holdings in the Eastern Counties than by those in the Midlands and West, the cost of application was higher, and the overall

TABLE 41

(a) Cost of Replacement of Bushes per Acre

Region	Midland and Western Counties				Southern Counties				Eastern Counties				Overall			
Year	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59
	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Labour	0·04	0·16	0·28	0·19	—	0·12	0·13	0·10	0·03	0·31	0·32	0·28	0·02	0·22	0·26	0·20
Power	—	—	—	—	—	—	—	—	—	—	0·01	0·01	—	—	—	—
Cost of Bushes	—	0·15	0·23	0·16	—	0·09	0·11	0·08	0·05	0·24	0·36	0·27	0·01	0·18	0·26	0·19
Total	0·04	0·31	0·51	0·35	—	0·21	0·24	0·18	0·08	0·55	0·69	0·56	0·03	0·40	0·52	0·39

TABLE 42

(b) Cost of Fertilisers per Acre

Region	Midland and Western Counties				Southern Counties				Eastern Counties				Overall			
Year	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59
Materials	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
F.Y.M.	6·58	6·07	3·19	4·93	4·81	4·53	3·93	4·32	6·00	7·96	7·57	7·56	5·90	6·56	5·20	5·84
Mulches	2·33	1·74	1·88	1·92	5·77	5·81	6·32	6·03	1·30	1·02	0·85	0·97	3·07	2·31	2·48	2·51
Artificials	9·86	9·14	8·28	8·91	8·35	9·09	8·15	8·53	8·60	5·21	6·74	6·30	9·06	7·42	7·60	7·77
Total Materials	18·77	16·95	13·35	15·76	18·93	19·43	18·40	18·88	15·90	14·19	15·16	14·83	18·03	16·29	15·28	16·12
Application																
Labour	3·15	4·15	2·95	3·44	3·48	4·06	4·62	4·18	4·54	4·76	4·55	4·64	3·62	4·40	4·01	4·10
Power	0·53	0·85	0·80	0·77	0·68	1·13	0·78	0·89	0·95	1·29	1·44	1·32	0·69	1·10	1·06	1·02
Contract Work	—	—	0·03	0·01	—	—	—	—	—	—	0·32	0·15	—	—	0·15	0·06
Total Fertilisers	22·45	21·95	17·13	19·98	23·09	24·62	23·80	23·95	21·39	20·24	21·47	20·94	22·34	21·79	20·50	21·30

average was also higher. However, the Southern Counties had the greatest expenditure on fertilisers, and this was true for all years. This was probably due to the relatively high average cost of mulching in the area, which at £6 an acre, compared with about £2 an acre in the Midlands and West, and £1 per acre in the Eastern Counties. More was spent on farmyard manure by holdings in the Eastern Counties than by those in the other two regions, but less was spent on artificials. The expenditure on fertilisers in the Southern and the Midland and Western areas was quite comparable, other than for the cost of mulch as already explained. Any contract work noted was for liming and was negligible in total.

Fertiliser application on the sample plantations was frequently by hand, the bulky organics being forked out of a tractor-drawn trailer to be spread around the bushes, and the artificials being scattered by hand from a bucket. However, where the bushes were small or the row widths wide enough to provide easy access for a tractor, the artificials might have been put on with a distributor.

Details of the total purchases of artificial fertilisers for the costed plantations are analysed and the details given in Table 43. There is little to be gained from comparing the totals for particular years, as these are not " per acre " figures and the acreages to which these materials have been applied are very different for each year. What is of interest, however, are the proportions of the different materials used and the way in which they varied over the years.

According to Table 43 by far the greatest expenditure on artificials is for straight nitrogenous fertilisers, but these are of lesser importance in 1959 than in 1958 or 1957. Even more marked than the decrease in the use of straight nitrogenous fertilisers is the increase shown in the percentage of compounds, from 17·1 per cent in 1958 to 30·9 per cent in 1959. Such a direct comparison is perfectly valid as there is no great change in the sample for that period. The principal compounds used on the plantations costed in 1959 were I.C.I's. C.C.F. amounting to £661 of the total of £1,821, and Fison's MG.5 amounting to £458. In that year, lesser amounts were also spent on Vitax compounds, the Littleton and Badsey Grower's G.P.C. and on Fison's 31. Organic fertilisers such as potassic meat and bone, meat and bone meal and fish products were used, but their total contribution was relatively small, accounting in all for less than one-fifth of

TABLE 43

Artificial Fertiliser Purchases, 1957, 1958 and 1959

	1957 £	s.	d.	%	1958 £	s.	d.	%	1959 £	s.	d.	%
Nitrogenous												
Sulphate of Ammonia	1,001	0	7		1,030	12	9		924	11	9	
Nitro Chalk	507	13	8		1,058	13	6		655	14	0	
Nitrashell	–	–	–		–	–	–		387	12	0	
Potash Nitrate	137	16	11		215	1	2		648	11	3	
Ammonium Phosphate	17	0	0		–	–	–		–	–	–	
Nitrate of Soda	–	–	–		52	9	0		–	–	–	
Urea	15	16	9		4	4	4		18	10	10	
	1,679	7	11	51·8	2,361	0	9	47·0	2,634	19	10	44·8
Phosphatic												
Superphosphate	57	6	8	1·8	59	12	1	1·2	74	5	1	1·3
Potassic												
Sulphate of Potash	211	5	6		425	3	10		451	6	7	
Muriate of Potash	125	19	4		219	4	9		37	13	2	
	337	4	10	10·4	644	8	7	12·8	488	19	9	8·3
Organic	548	1	11	16·9	999	13	9	19·9	769	3	9	13·1
Compounds	523	13	9	16·2	859	2	3	17·1	1,820	14	0	3·90
Miscellaneous												
Magnesium	93	17	2		102	5	3		91	6	6	
Manganese	1	3	0		–	–	–		–	–	–	
	95	0	2	2·9	102	5	3	2·0	91	6	6	1·6
	£3,240	15	3	100·0	£5,026	2	8	100·0	£5,879	8	11	100·0

the total cost of artificials. Although sulphate or muriate of potash was applied on more than one-third of all plantations costed in 1959, it accounted for only 8·3 per cent of the total fertiliser bill in that year. This was due to the relatively small quantities used and their comparatively low cost. Potash was also applied in the form of potash nitrate, which is included in the straight nitrogenous fertilisers. A further thirteen holdings applied potash in this form in 1959. Superphosphate was not at all widely used and its contribution to the fertiliser bill was negligible. Within the group of nitrogenous fertilisers, sulphate of ammonia was the one on which most was spent, followed by nitro chalk. However, nitrashell, a material which only came on the market in 1959, was widely adopted in that year. There was a small but steady use of urea as a foliar spray, and magnesium sulphate was applied by some growers, also at times as a foliar spray.

It is emphasised that this is only an analysis of actual fertiliser purchases for the sample plantations and is in no sense a recommended fertiliser programme for blackcurrants.

It may be asked what benefits accrue, if any, from using fertilisers and whether or not a consistent difference in the rate of dressing or of the materials used has any effect on the average yield of currants. This is, however, a very difficult question to answer with figures of the type collected in these costs, as the results are drawn from many different parts of the country, with consequent differences in soils and climatic conditions, in cropping ages, in varieties, and in systems of management. Moreover, the benefits to be expected from fertiliser application are not confined to the year of application, for, in addition to the residual values of the materials applied, there is the question of the increased amount of young wood obtained; wood which is the principal source of the crop in the following year. It should be realised that any attempted correlation between fertiliser application and yield must be treated with reserve and that the conclusions, drawn from these results, can only be regarded as general indications.

Bearing in mind these difficulties, it is of advantage to restrict the analysis to the identical sample, as this, to a certain extent, ensures continuity between successive years, and includes only those plantations which are comparable.

The first examination is of the advantages, if any, of applying farmyard manure and/or mulch. Of the forty-eight

comparable plantations in the years 1958 and 1959, eleven used little or no farmyard manure or mulch in two consecutive years and the average yield of currants from these plantations was 1·51 tons per acre per year. On the other hand, the thirty-seven plantations on which farmyard manure and/or mulch was used in at least one of the two years showed an average yield of 2·16 tons per acre per year. Comparable figures for the twenty-eight identical plantations of 1957 and 1958 show that from the five using neither farmyard manure nor mulch, the average yield was 1·85 tons per acre per year, and for the remainder 2·13 tons per acre per year. It is of interest to note that at least three of these five plantations did not use farmyard manure nor mulch in three consecutive years. These results strongly suggest that it is of advantage to use bulky materials such as farmyard manure, straw or shoddy, from time to time as part of the fertiliser programme of the blackcurrant plantation, although from these figures it is not evident whether the advantage is due to the additional manurial value of the materials applied or from their effect on the structure of the soil, particularly its water-holding properties.

The second examination is of the relationship, if any, between the total cost of the fertiliser programme and the average yield on the plantations of the identical sample for 1958 and 1959. The results are given in Table 44.

TABLE 44

Comparison Between Fertiliser Costs and Yields 1958–1959

Total Cost of Fertilisers Per Acre for 2 Years	£ 0–25	£ 25–50	£ 50–75	£ Over 75
No. of Holdings	15	15	13	5
Average Yield Per Acre Per Year .	Tons 1·17	Tons 1·61	Tons 2·37	Tons 3·13
Average Revenue Per Acre Per Year at £135 Per Ton . . .	£ 158	£ 217	£ 320	£ 423

The total cost of fertilisers includes the cost of application and is the combined cost for 1958 and for 1959. Hence holdings in the £0–25 range spent, on average, less than £12 10s. a year.

There was an appreciable increase in the average yield for the sample plantations as the amount spent on the fertiliser programme increased, and indeed those spending more than £25 per year had, on average, yields greater than the overall average of 2 tons an acre for the forty-eight plantations. Hence, it would appear that on certain plantations insufficient quantities of fertiliser were being applied, and that, generally speaking, an average of at least £25 should be spent each year. This would represent about 10 cwt. of artificials and 10 tons of farmyard manure per acre, more or less depending upon the kinds of artificials used and the efficiency with which the manure could be spread.

Cultivations

The primary reason for cultivating a blackcurrant plantation is to prevent the bushes becoming choked with weeds, and to achieve this two distinct methods of management are adopted. In one, the land is kept as clean as possible although a mulch or farmyard manure may be applied around the bushes; in the other, the plantation is grassed-down or allowed to " tumble-down ". Here also a mulch is usually applied to the bushes. The first method of management, that of arable cultivation, is by far the most common, though even on such plantations it may be necessary to go through with a hook or scythe prior to picking, to cut down the thistles and other erect weeds. On the " grassed-down " plantation the cultivation cost consists of keeping the grass mown. If the rows of currants are wide enough apart to allow access by a tractor then such may be used to draw a rotary scythe through the rows. However, the grass nearer the bushes still has to be cut with a hand-operated machine. Alternatively, if the bushes are heavily mulched, this may be sufficient to suppress most of the weed growth, and any perennials such as couch or docks may be forked out. Clean cultivation, on the other hand, entails keeping the land between the rows, as well as that around the bushes, free of weeds. The former is usually achieved by means of tractor-drawn implements such as the rotavator, harrow, or disc, the latter by the hand-operated rotary hoe, or by hand hoeing. It is also possible to cultivate reasonably close to the bushes with a steerage hoe.

Originally all cultivations were undertaken with horse-drawn implements, and on some holdings the horse is still

TABLE 45

(c) Cost of Cultivations per Acre

Region	Midland and Western Counties				Southern Counties				Eastern Counties				Overall			
Year	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59
	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Handwork																
Hoeing, etc.	6·56	11·21	9·83	9·72	14·79	16·15	10·54	13·42	13·56	12·20	9·74	11·20	10·91	12·71	9·95	11·18
Machine Work																
Cultivating, etc.	2·01	2·68	2·30	2·39	1·18	2·42	1·41	1·73	2·15	1·96	2·47	2·21	1·81	2·31	2·16	2·16
Rotavating	0·78	0·76	0·83	0·78	0·22	0·65	0·39	0·46	1·00	0·68	0·82	0·78	0·67	0·70	0·73	0·70
Rotary Hoeing	1·07	1·23	0·90	1·06	3·38	1·40	1·93	2·03	0·51	0·85	0·40	0·61	1·60	1·11	0·93	1·10
Steerage Hoeing	0·15	0·53	0·23	0·33	0·36	0·18	0·07	0·16	0·96	1·08	1·56	1·29	0·43	0·69	0·76	0·68
Ploughing	0·29	0·16	0·34	0·27	0·06	0·10	0·09	0·09	1·00	0·87	0·64	0·78	0·42	0·45	0·41	0·43
Grass cutting	0·51	0·80	0·22	0·49	3·68	1·37	1·31	1·81	1·05	0·80	0·65	0·76	1·60	0·92	0·66	0·92
Miscellaneous																
Weed killing Sprays	—	0·01	1·19	0·51	—	0·66	1·86	1·05	—	1·30	1·32	1·18	—	0·71	1·40	0·89
Contract Cultivations	—	—	0·01	—	—	—	—	—	—	0·06	—	0·03	—	0·03	—	0·01
Total	11·37	17·38	15·85	15·55	23·67	22·93	17·60	20·75	20·23	19·80	17·60	18·84	17·44	19·63	17·00	18·07
Labour	9·06	14·60	12·73	12·73	19·66	19·72	13·70	17·08	17·56	16·02	13·99	15·24	14·53	16·33	13·40	14·76
Power	2·31	2·77	2·19	2·43	4·01	2·77	2·61	2·95	2·67	2·60	2·66	2·64	2·91	2·69	2·49	2·63
Materials	—	0·01	0·83	0·35	—	0·44	1·29	0·72	—	0·88	0·90	0·80	—	0·48	0·97	0·62
Contract Work	—	—	0·10	0·04	—	—	—	—	—	0·30	0·05	0·16	—	0·13	0·05	0·06
Total	11·37	17·38	15·85	15·55	23·67	22·93	17·60	20·75	20·23	19·80	17·60	18·84	17·44	19·63	17·00	18·07

used for this purpose. The horse is of great value as it enables cultivations to be done in plantations where the bushes are too close together for tractors to get through. However, the use of horse-drawn implements is becoming less common as the numbers of farm horses become fewer and, what is more important, as skilled labour to look after them cannot be replaced.

The blackcurrant has a shallow-root system and it is always questionable as to how deep cultivations should take place; cases of damage are probably not infrequent, due to the rotavator being set too deep, hand hoes pulling soil away from the bushes, and so on.

As far as actual costs are concerned the table of averages (Table 45) shows the per acre cost of the various operations, but does not indicate what happens on any single plantation. For example, although one might expect to come across a plantation where hand hoeing is practised in association with rotavating, or another on which ploughing, cultivating and steerage hoeing are undertaken, one would hardly find a plantation on which all the jobs listed are done. Cultivating includes discing, harrowing and various other methods of breaking up the soil not specifically covered by the other categories. It also includes cultivating work done on some plantations, the exact nature of which it has been impossible to determine. This is the most important of the types of machine work, but rotary hoeing is nearly as expensive. Although it is possible to work the ground quite close to the bushes with this machine, it is slow moving and covers only a comparatively narrow strip of ground at any one time. Therefore, whenever possible, the tractor-drawn rotavator is preferred. In fact, in the Eastern Counties it is used more widely than the rotary hoe. A considerable amount of ploughing takes place in this region as well, and steerage hoeing is also more common there. This table also indicates the comparatively small number of holdings on which grass management is practised. In fact some of the cost of grass cutting detailed in this table is accounted for by the mowing of headlands on what are otherwise arable plantations.

Despite the variety of mechanical methods of cultivating the soil and of ridding the land of weeds, over one-half of the total cost of cultivations in all areas is attributable to hand-work, principally hoeing, but also including the digging of docks, and hand cutting of weeds and grass. In fact the

labour element in all cultivations accounts for over three-quarters of the total cost.

Although hand cultivations, such as hoeing, appear to average about £10 per acre, there are considerable variations in this figure, as shown by individual plantations. In the rare case, for example, of the old plantation which is due to be grubbed, the cost of hand cultivation is negligible, but on some plantations, particularly where *Agropyron repens* (couch grass or twitch) or *Convolvulus arvensis* (field bindweed) is a problem, the cost is very high. In fact in six instances the cost of hand cultivations alone exceeds £40 an acre, the greatest being £72 an acre.

It is for specific problems such as this that chemical weed control may be of considerable value, although on one or two plantations the complete suppression of weeds by the use of herbicides has been attempted. Because of the purpose for which chemical weed control is undertaken, and because in part it is a substitute for the traditional methods, the cost of such sprays is included in the detailed table of cultivation costs. However, as yet, it is not a particularly costly item compared with the cultivating costs already mentioned. Of great interest, however, is the fact that no herbicides at all were used by the sample holdings until 1958, but between that year and 1959 their use was doubled. Moreover, although on a significant number of holdings in the Eastern and Southern Counties in 1958 some form of chemical weed-killer was used, it was not until 1959 that their use spread to the Midlands and West.

This then is obviously a transitional period in the use of herbicides for blackcurrants, and it is impossible to say, as yet, what increase is likely to take place in the next year or

TABLE 46

Percentage of All Holdings Using Herbicides

Year	1957	1958	1959
Region	%	%	%
Midland and Western .	0	3	31
Southern . . .	0	13	21
Eastern . . .	0*	20	35
Overall . . .	0	12	31

* Does not include one plantation where a herbicide was used experimentally.

so. However, the rapid increase in the use of herbicides is most marked as Table 46 illustrates.

The most popular herbicide for blackcurrants so far is "dalapon", a translocated material toxic to grasses, and for this reason particularly effective against couch; however, it has to be applied while the blackcurrant is dormant. The list of purchases for 1959 (Table 47) shows the importance which has been attached to this product, which accounted for over 67 per cent of the total purchases of herbicides.

TABLE 47

Herbicide Purchases in 1958 and 1959

	1958		1959	
	£ s. d.	%	£ s. d.	%
Dalapon	84 5 0	21·5	388 10 9	67·6
Dormant Sprays (CIPC and PDU)*	319 4 6	77·0	11 2 9	1·9
Growing Season Sprays (2,4-DES and Simazine)	5 19 0	1·5	148 14 0	25·9
Bindweed Control (MCPB)	—	—	25 17 6	4·5
Others	—	—	12 3	0·1
	£414 8 6	100·0	£574 17 3	100·0

* CIPC or Chlorpropham and PDU or Fenuron.

In the Eastern and Southern Counties in 1958 a number of growers used, in the dormant season, formulations presumably containing mixtures of CIPC and PDU. These are residual herbicides which need to be applied to the soil before weed emergence. Sometimes they are used mixed with dalapon; they are also expensive, which explains the fact that in 1958 they accounted for 77 per cent of the total cost of weedkillers. The application of these sprays in 1959 was negligible, possibly due to the fact that they are used for the control of annual weeds, and the ground needs to be cleaned before they are applied. Hence growers have found that there is little to be gained from their general adoption, and those who used them in 1958 may not have considered it worthwhile to repeat the treatment in 1959.

In 1959, the group of herbicides which came next in importance to dalapon were the growing-season sprays. One of these was the new material "simazine" which in low doses is a selective residual pre-emergence herbicide, but the long-term effect of this and other such materials on the currants is not yet known.

The other major weed problems of blackcurrants are bindweed, buttercup and thistle: 4½ per cent of the total expenditure on herbicides in 1959 was for MCPB, and used specifically for the control of these species.

As yet, it is certainly too early to determine what effect the use of herbicides has on the cost of growing blackcurrants, and fluctuations in the total cost of cultivations during the three-year period are more likely to be a reflection of weather conditions. No doubt the dry spring and summer of 1959 led to the lower average costs of cultivations in all regions for that year compared with those for 1958.

Cultivation costs were at their maximum in the Southern Counties but this does not necessarily suggest that it is a characteristic of the area. In fact, one would have thought that, owing to the higher rainfall in the Midlands and West, the weed population would have been heavier and control measures more expensive in consequence. There was, however, no such indication. Indeed, the highest figure for the Midlands and West, namely, £17·38 in 1958, was less than the lowest figure of £17·60 for the Southern Counties in 1959.

Cultivation averages for the Southern Counties give a good example of the effect of external factors on costs, and their influence on management policy in particular. It came to our notice that, on one holding in the Southern Counties, the cost of hand cultivations was particularly high, and the grower was very concerned about it. Indeed, in 1957 the cost of hand cultivations on one of his plantations was £58·73 an acre, while in 1958 it was £72·54 an acre on the same plantation, whilst for 1959 it was £2·51 an acre. This reduction was far greater than could be expected from seasonal variations alone. It is of course gratifying to us if our figures in any way draw attention to possible economies which a particular grower might be able to make. However, many reductions in cost of this magnitude would obviously soon lead to changes in the annual averages of the sample holdings, and the possible influence of this factor over the three-year period should not be entirely discounted. It is evident from the instance just quoted, that the drop of some £56 per acre in the cultivation costs on this single plantation resulted in a reduction in the regional average of approximately £2 per acre, which would, in part, account for the fact that the percentage variation in cultivating costs for 1958 compared with 1959 was at 34·7 per cent greater in the

TABLE 48

(d) Cost of Crop-Protection Spraying per Acre

Region	Midland and Western Counties				Southern Counties				Eastern Counties				Overall			
Year	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59
	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Materials	3·34	3·74	4·51	3·99	2·66	3·30	3·68	3·34	2·86	2·69	2·79	2·75	3·01	3·19	3·59	3·34
Labour	1·74	1·84	1·37	1·62	1·36	1·12	1·04	1·13	1·40	1·48	1·41	1·43	1·53	1·52	1·31	1·43
Power	0·71	0·79	0·72	0·75	0·68	0·69	0·66	0·67	0·72	0·58	0·58	0·60	0·70	0·68	0·65	0·67
Contract Spraying	0·36	0·96	0·54	0·67	—	—	—	—	2·43	0·46	0·49	0·69	0·82	0·54	0·39	0·54
Total	6·15	7·33	7·14	7·03	4·70	5·11	5·38	5·14	7·41	5·21	5·27	6·47	6·06	5·93	5·94	5·98

Southern Counties than in either of the other two regions, for which it was 12·3 per cent and 20·2 per cent.

Finally, it should perhaps be stated that the average cultivation costs for the Eastern Counties group of plantations were of intermediate value, as in no year were they greater than those for the Southern Counties or less than those in the Midland and Western Counties.

Crop Protection Sprays

The overall average cost of spraying was almost £6 an acre, but more seems to have been spent on sprays for plantations in the Midland and Western Counties group than for those in the Southern or Eastern Counties. A feature of this operation is the relatively high proportion spent on contract spraying, being some 10 per cent of the total cost. The reason for this lies in the fact that on a number of the sample holdings, particularly in the Eastern Counties, the blackcurrant is the only fruit grown, and consequently the growers do not possess the specialised equipment needed for the spraying to be done economically. On the other hand, growers with orchard fruit or hops will, in all probability, have their own automatic spraying machine which can also be used for the currants. Details of spraying costs are given in Table 48.

With crop-protection, spraying materials are the most expensive item, accounting, generally, for over 50 per cent of the total cost, including contract work. In all but the Eastern Counties the cost of these showed a steady rise over the three-year period. This rise was particularly noticeable in the Midlands and West where the amount spent on spray materials in 1957 was £3·34 per acre, whilst by 1959 it had risen to as high as £4·51 per acre. Details of the spray materials purchased are given in Table 49, the most striking feature being the increasing proportion of the total costs attributable to fungicides. In 1957 they accounted for only 6 per cent of the total cost, yet by 1959 they had reached 15·1 per cent. Since it is reasonably certain that the amount spent per acre on insecticides has not decreased, the rise in the proportion of fungicides as already mentioned, might be responsible for the general increase in expenditure on spray materials. The rise is actually associated with the control of blackcurrant leaf spot, and in particular with the increased use of "zineb" (a dithiocarbamate fungicide) and

TABLE 49

Spray Material Purchases 1957, 1958 and 1959

	1957				1958				1959			
Insecticides	£	s.	d.	%	£	s.	d.	%	£	s.	d.	%
D.D.T.	205	2	11		355	15	6		576	13	4	
Endrin	84	12	6		221	19	9		163	4	8	
Lime Sulphur and Sulphur	243	7	7		392	14	7		364	1	4	
Nicotine		4	0		–	–	–			2	8	
Phenols	1	2	6		–	–	–		–	–	–	
Systemics and Organophosphorus Compounds	93	1	3		127	12	7		134	13	5	
Winter Washes	206	2	11		640	5	9		980	2	7	
	833	13	8	94·0	1,738	8	2	88·1	2,218	18	0	84·9
Fungicides												
Captan	–	–	–		44	7	0		1	15	2	
Copper	11	2	0		15	0	0		169	12	5	
Dithiocarbamates	–	–	–		31	11	6		161	5	4	
Ziram and Thiram	41	16	6		143	1	0		62	12	3	
	52	18	6	6·0	233	19	6	11·9	395	9	2	15·1
	£886	12	2	100·0	£1,972	7	8	100·0	£2,614	7	2	100·0

copper compounds. " Thiram ", as represented by " fernide ", was also used for the control of leaf spot, and, in 1958 in particular, it was the most commonly used fungicide. In fact, the bulk of the expenditure on thiram was incurred in the summer of 1957 following the picking of the crop in that year.

Of the insecticides, the normal spray programme adopted by the sample holdings included a winter wash of tar oil, and a spring spray of lime-sulphur, frequently mixed with D.D.T., used at the " grape-stage ". These three materials were the principal sources of expenditure on insecticides in each year. "Endrin ", however, has recently been used as an alternative to lime-sulphur, but its use is restricted by the fact that some processors refuse to accept currants which have been sprayed with the material. Finally, there is the group of systemic and organo-phosphorus compounds such as " metasystox "; these are normally used in the late spring to control outbreaks of specific pests such as red spider mite and aphis. These represent less than 10 per cent of the total expenditure on insecticides.

It is of interest to note that whereas on the majority of the holdings visited a very simple spraying programme was in operation, there were a few specialist fruit growers who had adopted a very comprehensive spraying schedule, which, for its complexity, approached that used in apple orchards. For example, the control of leaf spot with " dithane " requires at least three applications, to be made prior to picking.

So far we have been discussing average spraying costs, but these can be rather deceptive as there is a great range of individual costs. This variation is associated not only with the number and types of sprays used, but also with the method of application. In some instances, when applied by lance, the expenditure on labour and power was very high compared with the actual cost of the spray materials. It is perhaps significant that, from 1957 to 1959, as the cost of spray materials rose steadily so the cost of labour and power in applying them decreased.

Pruning

The bulk of the pruning cost is for wages, though a tractor and trailer may be used to help in clearing up the prunings. Alternatively, prunings may be left on the ground to be

TABLE 50

(e) Cost of Pruning per Acre

Region	Midland and Western Counties				Southern Counties				Eastern Counties				Overall			
Year	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59
	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Labour	5·68	5·76	6·04	5·86	9·41	7·20	8·24	8·10	9·73	7·65	8·41	8·24	7·89	6·89	7·55	7·35
Power	0·16	0·23	0·09	0·16	0·25	0·35	0·40	0·35	0·46	0·27	0·19	0·25	0·27	0·27	0·20	0·24
Contract Work	—	—	0·27	0·12	—	—	—	—	—	—	—	—	—	—	0·10	0·04
Total	5·84	5·99	6·40	6·14	9·66	7·55	8·64	8·45	10·19	7·92	8·60	8·49	8·16	7·16	7·85	7·63

TABLE 51

(f) Cost of Roguing per Acre

Region	Midland and Western Counties				Southern Counties				Eastern Counties				Overall			
Year	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59
	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Labour	0·43	0·80	0·43	0·57	0·46	1·17	0·52	0·74	—	0·33	0·37	0·31	0·32	0·67	0·43	0·51
Power	0·01	0·06	0·03	0·03	0·01	0·16	0·03	0·08	—	0·01	0·03	0·02	0·01	0·06	0·03	0·04
Total	0·44	0·86	0·46	0·60	0·47	1·33	0·55	0·82	—	0·34	0·40	0·33	0·33	0·73	0·46	0·55

chopped up and incorporated with the soil when the rotavator is next used. Both methods were used on the plantations costed. If the disposal of prunings is by rotavation then the cost is charged entirely to cultivations.

As for the actual work of pruning, the job is so dependent on the size of the bush and the amount of new growth made that it is rather meaningless to speak of average costs in this connection. It would be more appropriate to leave a detailed discussion of pruning costs until the effects of cropping age are dealt with in a later section of the report. In this way variation in bush size can be partially eliminated.

The pruning costs for the Midlands and West were, on average, £6·14 over the three-year period, and were lower than for the other two regions. In the Southern and Eastern Counties the average cost was nearly £8·5 over the same period, and in both cases 1957 was the year with the highest cost of about £10; the lowest was in 1958 when it was £7·5 to £8, but in 1959 it was £8·6. Whether or not these variations were due to seasonal fluctuations in the amount of bush growth is rather difficult to determine, because the same pattern was not shown in the Midlands and West where 1957 had the lowest cost and 1959 the highest. The position was further complicated by the annual variation in the proportion of young and old plantations being costed. Table 50 shows the pruning costs per acre.

Roguing

The blackcurrant is subject to attacks by the " reversion " virus which is spread by the big-bud mite. Infected bushes are unproductive and need to be removed if the disease is to be prevented from spreading throughout the plantation. In practice, it is the length of time this virus can be kept under control, usually about ten years, which determines the economic life of a plantation. An infected bush can be spotted at certain times of the year due to changes in bud colour and the shape of the leaves. " Roguing " is the term given to the job of walking the plantations to determine and mark the reverted bushes together with their subsequent removal. Details of roguing are given in Table 51.

The average cost of this operation was a little over 10s. an acre, but it is difficult to be precise about this figure, or to comment on the regional and seasonal variations. It was impossible to include all roguing costs in this section as, on

TABLE 52

(g) Miscellaneous Maintenance Costs per Acre

Region	Midland and Western Counties				Southern Counties				Eastern Counties				Overall			
Year	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59
	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Big Budding	0·06	0·18	—	0·09	0·09	0·31	0·19	0·21	0·15	0·56	0·30	0·39	0·10	0·38	0·16	0·24
Bird Scaring	0·10	0·01	0·12	0·07	—	0·20	0·01	0·08	0·10	0·13	0·10	0·11	0·07	0·10	0·08	0·09
Beehives	0·04	0·03	0·01	0·02	—	0·19	—	0·07	0·23	0·15	0·07	0·12	0·08	0·12	0·04	0·07
Tying Bushes	—	—	—	—	1·06	0·35	0·12	0·40	—	0·11	0·01	0·06	0·31	0·12	0·03	0·11
Irrigation	0·86	0·24	1·65	0·96	0·97	—	1·44	0·83	1·09	0·36	1·56	1·00	0·96	0·24	1·56	0·95
Sundries	0·12	0·07	0·01	0·06	0·23	—	—	0·04	0·45	0·18	—	0·12	0·24	0·10	0·01	0·09
Total	1·18	0·53	1·79	1·20	2·35	1·05	1·76	1·63	2·02	1·49	2·04	1·80	1·76	1·06	1·88	1·55
Materials and Irrigation	0·90	0·28	1·73	1·02	1·05	0·33	1·45	0·97	1·56	0·55	1·71	1·20	1·13	0·41	1·65	1·08
Labour	0·26	0·24	0·06	0·17	1·30	0·72	0·31	0·66	0·46	0·85	0·33	0·57	0·62	0·61	0·23	0·45
Power	0·02	0·01	—	0·01	—	—	—	—	—	0·09	—	0·03	0·01	0·04	—	0·02
Total	1·18	0·53	1·79	1·20	2·35	1·05	1·76	1·63	2·02	1·49	2·04	1·80	1·76	1·06	1·88	1·55

a number of holdings, roguing was carried out at the same time as the plantations were pruned, and no separate record of this operation was kept. It would therefore be more accurate to say that roguing cost at least 10s. an acre. Regional variations might then be due to differences in the percentage of the plantations for which separate roguing records were kept.

Miscellaneous Maintenance Costs

A number of separate items are included in this section but it is not suggested that all these jobs are done on many or even any one of the plantations. In fact, on the majority of plantations the cost of maintenance is covered by the main items already discussed. On the other hand, on any single plantation the "per acre" cost of one or more of these miscellaneous items is liable to be very much greater than the average figures; this is shown in Table 52.

Of the miscellaneous costs, irrigation is the most costly and undoubtedly the most important, and was a feature of thirty-two of the two hundred and seventy-one costs collected over the three-year period. The average cost of irrigation on these holdings was £8·02 an acre which at 3s. per thousand gallons of water represented an application of about 2½ in. per acre. However, the average cost in 1957 was £5·3 an acre, in 1958 £4·2 and in 1959 £10·5. Obviously the high figure for 1959 was due to the very dry spring and early summer whereas in 1958, which was a wet year, less extra water was required.

It is very difficult to demonstrate conclusively from the available data that irrigation is worthwhile, but the average crop yield for the thirty-two irrigated crops was 1·93 tons per acre, whereas that for the remainder was 1·67 tons per acre; this was an apparent gain of one-quarter ton per acre. The direct maintenance costs on these irrigated plantations averaged £63·72 per acre against £54·37 per acre on the non-irrigated crops. This was an increase of £9·35 per acre. Since irrigation alone cost, on average, £8·02 per acre on these holdings, the level of the remaining costs did not differ significantly from those on the other holdings. Hence, there was no evidence to suggest that they were better managed holdings than the average sample.

With regard to the actual financial gain from irrigation, if an increase in yield of one-quarter ton per acre can be

expected for the expenditure of an additional £8 per acre, and if the average price of currants, less picking costs, amounts to only £100 a ton, then the gain to the grower would be £17 per acre. However, at lower prices it becomes increasingly less economic.

None of the remaining miscellaneous costs are of any particular importance, but the removal of buds infested with with big-bud mite, is still practised on some holdings; in the Southern Counties in particular the bushes may be tied back in the autumn to allow of easier cultivation and for frost protection. A further cost which may be incurred is the hire of beehives: there is some evidence to show that under certain conditions excessive "run-off", that is to say premature dropping of the crop, may be due to insufficient pollination. However, it is generally considered that natural pollination is sufficient to ensure a heavy crop, providing subsequent weather conditions are favourable.

Finally, there is a need in some years to protect the mature crop in certain districts from the birds and the use of cartridge ropes or of a carbide banger is quite frequently resorted to for this purpose.

Picking Costs Per Acre

As previously mentioned, the highest single cost of blackcurrant growing is that of picking, and as such it is considered important to investigate the operation in some detail.

Table 53, giving the picking costs per acre, shows that, on average, 87·6 per cent of the expenditure on picking is for the pickers' wages. The remaining costs, amounting to £7·96 per acre are connected with the organisation of the picking. Of this amount, the major part is spent on supervision, weighing and loading the fruit. In fact, this part of the cost averages some 9 per cent of the amount spent on pickers' wages. Other items of expenditure which may be incurred are cartage of the fruit from the weighing point to a central point on the farm where it is loaded on a lorry; the provision of chip baskets or pails into which the fruit is picked, and the transport of the pickers to and from their homes. Sundries include the setting up and clearing of the picking equipment; payment of gangers' commissions; provision of tea and refreshments for the pickers; work on pickers' camps, as well as advertising and so on; but the cost per acre of these items is very low.

TABLE 53

(h) Cost of Picking per Acre

Region	Midland and Western Counties				Southern Counties				Eastern Counties				Overall			
Year	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59
	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Pickers' Wages	69·68	45·49	61·72	57·13	67·90	63·99	59·03	62·61	59·16	63·76	40·26	52·26	66·29	57·44	52·05	56·47
Supervision, etc.	6·35	3·84	4·80	4·74	5·17	6·67	5·16	5·71	6·41	5·66	4·38	5·14	6·02	5·24	4·71	5·13
Cartage	0·95	0·67	1·08	0·90	1·18	1·29	0·82	1·07	0·54	0·84	0·43	0·62	0·91	0·88	0·74	0·83
Containers	0·37	0·28	0·32	0·31	0·62	0·59	0·66	0·62	1·17	0·68	0·44	0·62	0·66	0·52	0·45	0·51
Transport of Pickers	1·75	1·35	2·29	1·83	0·68	1·30	0·96	1·03	0·65	1·07	0·84	0·91	1·14	1·22	1·37	1·27
Sundries	0·12	0·15	0·22	0·18	0·08	0·04	0·13	0·08	0·09	0·32	0·45	0·36	0·09	0·20	0·30	0·22
Total	79·22	51·78	70·43	65·09	75·63	73·88	66·76	71·12	68·02	72·33	46·80	59·91	75·11	65·50	59·62	64·43

TABLE 54

Cost of Picking per Ton of Fruit

Region	Midland and Western Counties				Southern Counties				Eastern Counties				Overall			
Year	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59
	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Pickers' Wages	30·79	32·73	31·96	32·03	33·92	34·62	36·33	35·22	44·98	33·21	41·44	38·36	35·59	33·35	36·97	35·33
Supervision, etc.	2·98	3·49	2·33	2·89	2·91	4·33	3·06	3·49	4·89	3·10	4·18	3·80	3·48	3·50	3·28	3·39
Cartage	0·46	0·80	0·51	0·61	0·38	0·59	0·35	0·44	0·36	0·53	0·38	0·43	0·41	0·63	0·41	0·50
Containers	0·13	0·24	0·15	0·18	0·22	0·21	0·33	0·27	0·73	0·38	0·37	0·42	0·32	0·29	0·29	0·30
Transport of Pickers	0·73	0·87	1·27	1·02	0·61	0·81	0·71	0·72	0·90	0·52	0·79	0·69	0·74	0·71	0·94	0·81
Sundries	0·05	0·19	0·10	0·12	0·05	0·01	0·10	0·06	0·09	0·19	0·43	0·30	0·06	0·16	0·23	0·18
Total	35·14	38·32	36·32	36·85	38·09	40·57	40·88	40·20	51·95	37·93	47·59	44·00	40·60	38·64	42·12	40·51

Costs over and above these, such as the provision of chips or trays and lining papers, and the carriage of the crop to factory or market, are normally borne by the purchaser. However, if the grower himself undertakes any of these commitments then these, together with the commission and handling charges, are classified as marketing costs and not included in this table.

Although the average cost of picking per acre is £64·43, there are considerable variations from this figure, both regionally and annually, due to differences in the average yields. It seems evident that a more useful guide for discussion is the average cost of picking per ton of fruit whereby the direct effects of yield differences are eliminated. What remains is the effect of yield differences on the time taken to pick the crop; hence piece-work rates for picking and so on.

Picking Costs Per Ton

Table 54 shows that the average cost of picking was £40 10s. per ton of fruit, and this figure has to be related to the prices paid for currants over the three-year period which was, approximately, £140 to £230 per ton. It is, in fact, useful to think in terms of the net price of the crop, after deducting picking costs, when calculating the returns of a plantation.

However, considerable variations in the total picking costs from the overall average figure, indicate the effects of varying yields on the rates of working.

Pickers' Wages

As far as the pickers are concerned, it is the amount of money they are able to earn in a day which is important to them and this is mainly governed by the ease with which the crop can be picked. Obviously then, other factors being equal, the heavier the crop the easier it is to pick and the lower need be the piece-work rate. However, although yields on first year plantations may be light, the bushes are small and relatively easy to pick. Hence, piece-work rates for such plantations tend to be lower than average, and for this reason have been omitted from Table 55, which shows the relationship between piece-work rates and tonnage.

This table indicates that, with a few exceptions, the piece-work rate decreases as the crop yield increases, as is to be expected. Moreover, there is a strong suggestion that,

weight for weight, there are consistent regional differences. Average rates for holdings in the Midland and Western Region were never greater than those for the Southern Region, and those in turn were never greater than the rates for the Eastern Region. The differences were not of great magnitude, rarely more than ¼d. or ½d. a lb., but were felt to be significant. Even so, it should be pointed out that for crops of over 3 tons per acre, the rate averaged 3¼d. lb. in all areas.

TABLE 55

Pickers' "Wage Rates"

Three-Year Average: 1957 to 1959

(Excluding First-year Plantations)

Yield Per Acre	Less than 1 Ton	1 Ton to 2 Tons	2 Tons to 3 Tons	Greater than 3 Tons	Overall Average
No. of Costs . .	48	67	60	30	205
	Average Cost Per lb.				
Region	d.	d.	d.	d.	d.
Midland and Western .	4	3¼	3¼	3¼	3½
Southern . . .	4	3½	3¾	3¼	3¾
Eastern . . .	5½	4	3¾	3¼	4¼
Overall Average .	4¾	3¾	3½	3¼	3¾

It is very difficult to speak of an average day's earnings, for not all pickers remain on the plantation for the whole of the picking time. Some indeed possibly only pick for an hour or so. There are also considerable variations in the rate of picking, even on a single plantation, due to the ability of the picker, and the sort of wage he or she hopes to draw in a day. Children also help with the picking and obviously are satisfied with lower earnings than their parents. However, if we take a specific example of an 18½-acre plantation of mature bushes in the Midland and Western Region in 1957, for which full details of the number of chips of fruit picked by each picker were kept, then it is possible to draw some general conclusions concerning average wages and so on. On this plantation the crop yield was 2·26 tons an acre and the piece-work rate 3¼d. per lb. Hence, it corresponds with the average piece-work rate for the tonnage and the area under consideration. The equivalent of eleven picking days were needed to clear the crop of 41·92 tons

and the number of pickers ranged from thirty-six to one hundred and twenty in any one day, but there were usually over one hundred present. The pickers averaged 7·36 chips, each of 12 lb. for every day of picking. Hence the average earnings per picker per day was £1 3s. 10d. Unfortunately, neither the length of the picking day nor the time worked by each picker were known, and there were great variations from this figure, some pickers returning as few as two or three chips per day and others more than ten.

Since the average wage for pickers for the period 1957 to 1959 (Table 54) was £35·33 per ton or 3¾d. per lb. of fruit, and the average tonnage for the same period 1·70, then this piece-work rate corresponds to the average for that weight of crop as given in Table 55, which deals with pickers' wage rates. If it was anticipated that the pickers would average a return of 25s. per day then they would have had to pick some 80 lb. of fruit each, which is equal to about 12 lb. or 1 chip per hour, giving an overall picking rate of one-fifth of a pound per minute.

Following a meeting of growers at Ledbury in 1959, it was agreed that we should undertake jointly with the Worcestershire N.A.A.S. a study of blackcurrant picking. As a result of this decision, visits were made during July 1959 to a number of holdings in Worcestershire and Herefordshire to watch picking in progress and to obtain as detailed records as possible.* The information collected at this time is tabulated and described in an appendix to this report.

From the data obtained from the study, it seems reasonable to suppose that with a piece-work rate of 3½d. per lb., the rate of picking fruit is of the order of a quarter of a pound per minute. However, if it is reckoned that only 90 per cent of the picker's time is spent actually picking, then the overall rate becomes nearer one-fifth of a pound per minute, as calculated above from the general table. There is also little difference between the theoretical calculations based on the results of the above work study, and the figures derived from the details of picking on a single plantation during 1957.

As already mentioned, the weight of crop is not the only factor which helps to determine the piece-work rate paid. One important aspect is the availability of pickers and the average earnings in alternative local jobs. The grower has to compete not only with neighbouring blackcurrant growers

* The visits were made by the writer and Mr. H. J. Eaton of the Worcestershire N.A.A.S.

for the available pickers in his area, but even with growers of other agricultural crops such as peas, of which considerable acreages may be grown in his district. Hence, in some regions pickers can command a better price than in others. In addition to enhancing the piece-work rates, a local shortage of pickers may involve the grower in considerable additional expense in having to provide transport. This is particularly true in rural areas with a sparse population, no nearby towns or cities, and a large acreage of currants. It may, indeed, curtail the expansion of currant growing in certain districts if the grower is not prepared to employ gipsy labour.

Physical factors, through their influence on the rate of picking, also indirectly affect the piece-work rate paid. These factors include the age and size of the bush; the nature and extent of any frost or bird damage to the crop; the weather during picking; and, indeed, the layout of the plantation, together with the organization of the picking. During the work study, it was found that the ease of picking was influenced primarily by the weight of fruit per branch, rather than the total weight per bush. For example, on one Herefordshire holding it was observed that on a plantation cropping for the first time with an exceptionally heavy crop of approximately 5 lb. of fruit per bush, the rate of picking was nearly twice that on an older plantation with 6 lb. of fruit per bush. The essential difference was that whilst on the young plantation the average number of branches per bush was ten to eleven, each branch averaging 0·48 lb. of currants, on the latter the average was twenty-three to twenty-four branches per bush with only 0·26 lb. of currants per branch. Although the older plantation gave a higher tonnage per acre, picking was far more difficult. Despite these considerable variations in the rate of picking, the piece-work rate on the holding was maintained at the same level throughout the whole of the picking season. This is typical of most holdings and it is only in exceptional cases that the piece-work rate is varied during the course of picking. In general, the pickers are expected to take the " rough with the smooth ", and are not too dissatisfied if they can maintain a fairly high average level of earnings. However, care has to be taken to see that every picker has a fair share of the easier picking and it is often necessary to clear one plantation or variety completely before transferring the pickers to another site. This is necessary even if it entails a large proportion of the available pickers hanging about for an

hour or so with nothing to do while the final stages of picking on the one plantation are completed.

It was noticeable, even on the few plantations visited during the course of the work study, that there were frequently considerable variations in the weight of crop on different parts of the same plantation, although the age of the bush and the variety was identical throughout. In practice, this made it difficult to determine with any degree of accuracy, the average weight of fruit per bush. These variations were due to a number of factors. For example, on one of the plantations there was considerable bird damage, with a noticeable decrease in the weight of fruit per bush as one neared that end of the plantation bordered by a wood. Another factor was the incidence of reversion: this resulted not only in gaps being left from roguing in previous years, but also in the presence of bushes which had more or less reverted during the current cropping season. These bushes, characterised by their reduced yields, were unlikely to be evenly distributed throughout a plantation. Another physical factor met with was the variation in soil depth on hilly sites. This variation resulted in differences in bush vigour and size, and hence the average weight of fruit per bush. Although not particularly noticeable on the plantations visited in 1959, which for Herefordshire and Worcestershire was, generally speaking, a frost-free season, plantations on a sloping site frequently suffer frost damage on those bushes at the lower end of the field. Alternatively, the blossom on the bushes on the more exposed tops of the slopes may suffer damage from cold winds.

With regard to weather, variations in the total daily weight of fruit picked may be considerable due to unfavourable picking conditions. A stormy day with frequent stoppages for rain will adversely affect the quantity of fruit picked as will an exceptionally hot day with a consequent slowing of the picking rate. Of course, continued stormy weather or very hot conditions may not only impede picking but cause actual loss in yield, as it may not be possible to clear the crop before the fruit becomes mouldy or overripe and drops.

A further factor governing the rate of picking is the layout of the plantation, together with the organisation of the picking. Plantations on a steep slope with long rows are more difficult to pick than level plantations with shorter rows. However, any division of a plantation by roadways, to reduce the distance the pickers have to walk, will inevitably

cause a reduction in the number of bushes, and this has to be weighed against any gain in the efficiency of the picking operation. Much waste of time can be eliminated by careful siting of the weighing point and, if possible, it should be moved across the plantation as picking progresses.

To sum up, the picking rate is dependent on many factors, not least of which is the availability of pickers, but, in general, the picker expects to earn about 25s. a day. If an average rate of picking is reckoned to be one 12 lb. chip per hour then it takes one hundred and eighty-seven labour hours to pick a ton of fruit. Alternatively, with average earnings of 25s. for an eight-hour day, and since the average picking cost per ton in the period 1957 to 1959 was £35·33, the number of labour hours is 226 per ton of fruit picked. Roughly speaking, it takes about two hundred hours, on average, to pick one ton of fruit, and twenty-five pickers should be able to pick this quantity in a good working day. In theory, if the picking period for any particular variety be reckoned to average ten days, then the quantity of fruit picked in this period by twenty-five pickers would be ten tons. Therefore, two to three pickers would be required for every ton of fruit to be picked. With an average yield of 1·7 tons per acre, the labour requirement for picking is about three hundred and forty hours per acre. In addition there is the time spent supervising picking; also the weighing and loading, and so on, by the regular labour force of the farm. If this is estimated at 10 per cent of the pickers' time, then the total labour requirement for picking is approximately three hundred and seventy-five hours per acre. Of course, this will vary greatly on individual plantations due to considerable differences in yield and in picking conditions.

The average labour cost for maintenance is £28·8 per acre, and the average wage rate adjusted for holidays with pay and other factors, about 3s. 8d. per hour. This represents a labour requirement of some one hundred and sixty hours per acre.* Hence the total labour requirement for blackcurrants is about five hundred and twenty-five hours per acre. This is very high compared with some farm

* It is the usual practice to calculate the labour hours for women and youths as 75 per cent of the value of man hours. Hence, since some 25% of the maintenance work on currants is done by women and youths, then their contribution is about forty hours per acre, which is equivalent to thirty man hours.

crops, but is very similar to hops which require five hundred hours per acre.

Moreover, more than two-thirds of this labour is required in a very short space of time, generally three to four weeks, and this demand cannot be met by the normal labour force of the farm. Hence a reliable and adequate supply of casual labour is essential if all but a very restricted acreage of currants is to be grown.

Indirect Costs

In addition to the maintenance and picking costs already discussed in some detail there is a further category of expenditure which may conveniently be called "indirect costs". Although these are shown regionally in the tables they have little significance and are only set out in this way to give a complete set of figures for each region. Neither are there any significant differences in the annual results, which is only to be expected as these costs have been based on standards which allow for little differentiation between individual holdings.

The items included are rent; an allowance for the wear and tear of the machinery used; a share of the cost of establishment, and an allowance for general overheads. The basis for most of these calculations has already been described, and, as far as rent and general overheads are concerned, the three-year averages of £3·95 per acre and £19·65 per acre respectively correspond quite closely to the standards of £4 per acre and £20 per acre generally assigned to these costs. Despite the fact that the calculation of the allowance for the depreciation and repair of implements, such as sprayers and rotavators used in the plantations, is made on an individual basis, according to the nature and extent of use of each implement, the regional averages, as given in Table 56, are remarkably uniform and vary very little from the overall three-year average of £3·54 per acre. The one exception is in the Southern Region in 1957 where the average was £4·59 per acre. However, this may well be due to the comparatively small number of holdings costed in that region in 1957 and to the fact that no work was done on contract. Generally speaking, spraying is the only job carried out on contract, and is the most expensive in terms of hourly rates allowed for repairs to machinery and depreciation.

TABLE 56

(i) Per Acre Allowances for Indirect Costs

Region	Midland and Western Counties				Southern Counties				Eastern Counties					Overall		
Year	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59	1957	1958	1959	Average 1957–59
	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£	£
Rent	3·82	4·07	4·27	4·11	4·02	3·90	3·79	3·87	3·55	3·86	3·92	3·85	3·81	3·94	4·01	3·95
Machinery Depreciation and Repair	3·32	3·92	3·40	3·58	4·59	3·51	3·48	3·71	3·78	3·30	3·41	3·41	3·82	3·56	3·42	3·54
Share of Establishment	9·81	9·71	9·97	9·84	9·44	10·19	10·78	10·30	10·18	9·51	10·00	9·81	9·80	9·73	10·17	9·94
General Overheads	20·26	20·15	19·58	19·93	19·62	19·57	19·91	19·73	19·58	19·29	19·36	19·36	19·88	19·65	19·57	19·65
Total	37·21	37·85	37·21	37·46	37·67	37·17	37·96	37·61	37·09	35·96	36·69	36·43	37·31	36·88	37·17	37·08

Finally, there is the question of the share of the establishment cost, and here two points have to be considered. Firstly, how is the total cost of establishment to be determined, and secondly, during what period of time should this cost be written off? An attempt to answer the first question was made on the basis of costs for individual plantations collected from growers over the same period of time as for the cropping plantations. The averages thus obtained were applied to the cropping plantations to determine a theoretical establishment cost in each case unless, of course, the actual cost was available from results already collected. The answer to the second question was based on the average length of the cropping life of blackcurrant plantations as calculated from records of grubbing.

It is proposed at this stage to examine in detail the establishment costs, and the averages obtained from them.

ESTABLISHMENT

THERE are several alternative definitions of the establishment period of a plantation and each will produce a different result when it comes to calculating the cost. However, cropping costs are most conveniently dealt with on an annual basis and related directly to the growth cycle of the bush; for every crop there is a related series of costs preceding it. With the exception of the first crop, these costs cover the whole period from one picking to the next, but similar costs are incurred in producing the first crop. Taking this view, the period between the planting and picking of the first crop should be divided into two parts: one being equivalent to the cropping year of the fully established plantation; the other being termed the period of establishment. The latter can be defined as " that period from the initial preparation of the ground for planting to the dormant period preceding the first crop ".

During the three-year investigation into blackcurrant growing, details of the costs of establishment, as defined above, have been obtained for a number of plantations from forty-four of which the averages given in these tables have been calculated. Although these plantations cropped for the first time in 1958, 1959 or 1960, the division of the costs is based on the method of establishment and not on the year of planting. The blackcurrant bush is virtually, without exception, cut almost to ground level soon after

ESTABLISHMENT COSTS: THREE-YEAR AVERAGES

TABLE 57

Varietal Composition of Sample

Varieties	Blackcurrant Acreage	%
BALDWIN . .	152·82	55
WELLINGTON XXX .	53·56	19
WESTWICK CHOICE .	38·55	14
AMOS BLACK . .	7·18	3
OTHERS . . .	25·40	9
Total . . .	277·51	100

TABLE 58

Number of Costs and Field Acreage

Type of Establishment	1958		1959		1960		Overall	
	No.	Acres	No.	Acres	No.	Acres	No.	Acres
Bushes Cut Once Only . .	4	9·10	13	67·73	5	22·25	22	99·08
Bushes Cut Twice	4	25·95	5	40·50	3	24·60	12	91·05
Other Plantations	4	47·00	4	41·50	2	35·00	10	123·50
Total . .	12	82·05	22	149·73	10	81·85	44	313·63

TABLE 59

Number of Bushes Per Acre

Type of Establishment	Average No. of Bushes Per Acre
Bushes Cut Once Only .	1,137
Bushes Cut Twice .	1,088
Other Plantations . .	1,087
Overall . . .	1,103

ESTABLISHMENT COSTS: THREE-YEAR AVERAGES

TABLE 60

Per Acre Cost of Bushes and Planting

Type of Establishment	Cost or Value of Bushes	Planting	Total
	£	£	£
Bushes Cut Once Only .	41·42	16·73	58·15
Bushes Cut Twice .	28·95	9·53	38·48
Other Plantations . .	33·15	15·58	48·73
Overall . . .	36·14	14·50	50·64

TABLE 61

Maintenance Costs Per Acre of Bushes Cut Once Only

1st Crop	Fertilisers	Cultivations	Spraying	Cutting Down	Contract Work	Miscellaneous	Total Maintenance
	£	£	£	£	£	£	£
1958	6·60	11·95	1·69	0·81	0·72	0·05	21·82
1959	15·80	18·50	1·80	1·21	—	0·08	37·39
1960	22·28	11·52	0·93	1·90	—	1·65	38·28
Three-year Average	15·60	15·73	1·58	1·29	0·13	0·43	34·76

TABLE 62

Costs Per Acre of First Year's Maintenance of Bushes Cut Down Twice

First Crop	Fertilisers	Cultivations	Spraying	Cutting Down	Contract Work	Miscellaneous	Total Maintenance First Year
	£	£	£	£	£	£	£
1958	8·26	10·49	—	0·81	1·15	0·41	21·12
1959	11·93	6·67	1·16	0·52	1·00	—	21·28
1960	18·48	11·61	1·79	0·16	1·85	—	33·89
Three-Year Average	12·34	9·18	0·93	0·53	1·26	0·14	24·38

ESTABLISHMENT COSTS: THREE-YEAR AVERAGES

TABLE 63

Costs Per Acre of Second Year's Maintenance of Bushes Cut Down Twice

First Crop	Fertilisers	Cultivations	Spraying	Cutting Down	Contract Work	Miscellaneous	Total Maintenance Second Year
	£	£	£	£	£	£	£
1958	12·20	14·76	1·05	0·83	0·60	0·22	29·66
1959	14·58	9·54	3·00	1·24	—	0·81	29·17
1960	18·47	13·59	1·36	0·88	2·86	—	37·16
Three-Year Average	14·76	12·29	1·94	1·01	0·92	0·41	31·33

TABLE 64

Maintenance Costs Per Acre on Other Plantations (Includes Two-Year Costs)

First Full Crop	Fertilisers	Cultivations	Spraying	Cutting Down	Contract Work	Miscellaneous	Total Maintenance
	£	£	£	£	£	£	£
1958	24·78	20·22	3·64	1·55	2·35	0·41	52·95
1959	37·28	21·28	1·60	1·52	0·89	0·61	63·33
1960	20·09	17·64	9·75	0·23	2·00	0·01	49·72
Three-Year Average	28·84	20·13	4·05	1·27	1·70	0·47	56·46

TABLE 65

Indirect Costs Per Acre

Type of Establishment	Rent	Machinery Allowance	General Overheads	Total
	£	£	£	£
Bushes Cut Once Only	3·72	3·22	5·93	12·87
Bushes Cut Twice .	7·47	4·34	6·00	17·81
Other Plantations .	7·68	4·92	7·50	20·10

ESTABLISHMENT COSTS: THREE-YEAR AVERAGES

TABLE 66

Crop Yield, Revenue and Picking Costs Per Acre on "Other Plantations"

Tons	Revenue	Picking Costs	Net Revenue
0·10	16·36	4·08	12·28

TABLE 67

Summary of Establishment Costs Per Acre: Three-Year Average

	Cut Once Only	Cut Twice	Others
	£	£	£
Bushes and Planting	58·15	38·48	48·73
First-Year Maintenance	34·76	24·38	56·46
Second-Year Maintenance	—	31·33	
Indirect Costs	12·87	17·81	20·10
Total Costs	105·78	112·00	125·29
Net Revenue	—	—	12·28
Net Cost	105·78	112·00	113·01

TABLE 68

First Full Crop: Yield Per Acre

	1958	1959	1960	Overall
	Tons	Tons	Tons	Tons
Cut Once Only	0·53	0·60	0·61	0·59
Cut Twice	1·08	0·58	0·51	0·66
Others	1·82	0·58	0·26	1·01

TABLE 69

Row Width

	6 ft. and Under	7 ft. to 8 ft.	9 ft.	10 ft. and Over	Total
	Acres	Acres	Acres	Acres	Acres
Bushes Cut Once Only	0·66	13·31	42·31	27·21	83·49
Bushes Cut Twice	14·58	10·15	35·75	19·41	79·89
Other Plantations	—	—	49·21	60·92	110·13
Overall	15·24	23·46	127·27	107·54	273·51*

* Four acres not included as planting distance was unknown.

planting, and no fruit is borne during the summer following this treatment. Hence, for a bush planted during the winter of 1957–58 and cut back once, the first crop would not develop until the summer of 1959. However, if growth is considered insufficient during the year following planting then the bush is cut down for a second time and hence cropping delayed for a further twelve months. The cost is obviously related to the length of the establishment period, and separate averages have had to be calculated for these two methods. Unfortunately, about ten plantations do not fit readily into either category because not all bushes have had the same treatment. For example, on a single plantation some bushes were planted in different years, and others cut down a different number of times.

Of the forty-four costs included in Table 58, twelve were from plantations yielding their first full crop in 1958, twenty-two in 1959 and ten in 1960. The relatively small number of plantations cropping for the first time in 1960, compared with 1959, was most probably due to the dry conditions experienced during the spring and summer of 1959. It is known that, on a number of plantations expected to crop for the first time in 1960, growth was insufficient and the bushes were cut back for a second time in the winter of 1959–60. Although the field acreage is roughly equal for each of the three types of establishment into which the costs have been grouped, there is not an equal number of costs since half of the bushes were cut only once. Of the twenty-two plantations cut down once only, eight were partly or entirely planted with yearling bushes. Similarly, of the twelve plantations cut twice, four consisted wholly or in part of two-year-old bushes. The decision whether or not to cut the second time is based on the growth and vigour of the bush, and is hence dependent not only on the age of the bush but also on the weather conditions during the season following planting, and the general suitability of the site. One plantation was established direct from cuttings planted *in situ* and was cut down once, twelve months after planting. The period of establishment was thus equivalent to that of bushes cut twice and so this one has been included with such plantations.

The results are based on a total bush area of some 277 acres, of which over one-half were of the Baldwin variety. The only other varieties at all widely planted were Wellington XXX and Westwick Choice, each occupying over one-tenth

of the total area. Amos Black is of interest as a comparatively new variety on a commercial scale. Details are given in Table 57.

The most popular planting distance on the sample holdings in the last two or three years has been the 9 ft. row width but a 10 ft. and over row width was also popular; details are given in Table 69. However, increasing row width does not automatically reduce the density of planting, as the bushes may be planted closer together in the rows, as shown in Table 59. Although the different row widths are not evenly distributed over the various types of establishment, there are on average some 1,100 bushes per acre and this average does not differ greatly from one type of establishment to the other.

The per acre cost of the bushes given in Table 60 is related to three factors; namely, the number of bushes per acre, the age of the bush and whether they are purchased or produced on the farm. Any variation in the proportion of own-produced and purchased bushes for the different types of establishment is reflected in the average cost of bushes, but the effect of this factor is not readily determinable. Bushes are valued at £20 per thousand for yearlings and £30 per thousand for two-year-olds. This is below the price frequently paid for bushes during the last few years owing to the sharp rise in prices occasioned by the heavy demand and the shortage of suitable planting material. The cost or value of the bushes (Table 60) obviously depends largely on the average number of bushes per acre (Table 59). As already mentioned, two-thirds of the bushes cut " once only " are two years old, and two-thirds of those cut twice are one year old. Hence, the average cost of bushes in the " bushes cut once only " group is higher than in the " bushes cut twice " group. At £33 per acre, the cost of bushes in " other plantations " is, as one might expect, of intermediate value.

With regard to the actual planting of bushes, the cost for " bushes cut twice " is less than £10 per acre. This is scarcely more than half the cost of planting " bushes cut once only ". This may be related to the fact that the bushes in the latter group tend to be larger than in the former, and thus may take longer to plant. However, in all probability it is more likely to be due to variations in the sample which, unfortunately, was not as large as one would have wished. The cost of planting for " other plantations ", at more than £15 per acre, came between the other two groups. This may

be due to the fact that in some instances planting was done in two consecutive years, and the overall cost of the job was therefore greater than if all the bushes had been planted at one time.

For general use, an average of £14 10s. per acre for planting is probably the most reliable value to adopt. Bushes and planting together account for from £38 to £58 per acre, but on individual holdings this cost may vary considerably. The range for the forty-four holdings in question was from £15 to £95.

The overall maintenance cost for " bushes cut once only " (Table 61) was about £35 per acre. Although there were considerable differences in the 1958, 1959 and 1960 totals, due probably to the relatively small number of costs involved, the overall average was based on twenty-two results and thus more reliable. Fertilisers and cultivations accounted for over 90 per cent of the maintenance cost, the remainder being divided between spraying, cutting down, contract operations and various miscellaneous jobs. This figure of £35 per acre for maintenance costs compared quite closely with the £41 per acre incurred during the first cropping year.

With regard to " bushes cut twice ", the corresponding maintenance costs for the two years in question were £24 and £31 per acre respectively, but in both establishment years the results drawn from the " 1960 " group of holdings were considerably greater than those for the " 1958 " and " 1959 " groups. Individual details of expenditure are given in Tables 62 and 63, and once again fertilisers and cultivations account for the bulk of the total cost. It is interesting to note that, for the sample plantations, less was spent on maintenance in a single year when the establishment was spread over two years than when the bushes were grown to crop within eighteen months or so of planting.

Table 64 shows details of maintenance costs on the mixed group of plantations. At an average of £56 per acre, these included a certain proportion of cropping bushes and of two years of maintenance. It is not surprising that the total cost slightly exceeded £55 per acre, which was the amount spent during two years for the " bushes cut twice ".

Some other costs incurred in establishing a plantation are given in detail in Table 65. These indirect costs consist o the rent or rental value of the land; an allowance for depreciation and repairs to the implements used, and an

appropriate share of the general overheads of the business. The average rents for the " bushes cut twice " and for the " other plantations " as given in Table 65 are approximately twice as great as for the bushes cut once, since the period of establishment covers two years instead of one. However, all machinery allowances are comparable, as the amount of machine work does not differ greatly with the type of establishment. General overheads, as in the case of cropping plantations, are based on a given percentage of the average wages bill. For cropping plantations of currants this was about £100 per acre. The comparable labour cost for establishment is about £30 per acre, irrespective of whether the bushes are cut once or twice. The overheads have been calculated at from 17½ per cent to 22½ per cent of this value. However, on " other plantations " where there is a small crop to be picked, labour costs are inevitably higher, and for the purpose of calculating the cost of establishment overheads, labour has been averaged at £45 per acre. The totals of these indirect costs range from some £13 per acre for bushes cut once to £20 per acre for " other plantations ".

All these costs are summarised in Table 67 and it is of considerable interest to note that the total cost for " bushes cut once " and those " cut twice " is not greatly different; the former being approximately £106 per acre and the latter £112 per acre. The average increase in the cost of bushes for the " cut once only " group is offset by the extra costs incurred in maintenance during the additional year for " bushes cut twice ". For " other plantations " the net total cost at £113 per acre is virtually identical with the cost for " bushes cut twice ", despite the fact that a proportion of this acreage was in its first cropping year. The net total cost for "other plantations " is calculated by deducting the net revenue, where applicable, from the total costs. The net revenue which is the difference between the revenue and the picking costs is shown in Table 66.

If, as seems possible from the figures, it costs little if any more to plant and crop two-year bushes than one-year bushes, it may well be asked if either method has any particular advantage. Certainly, by cutting twice cropping is delayed for a full year, an obvious waste of time, as the land returns no revenue for a longer period. The aim in cutting the bush twice is to increase vigour and ultimately produce heavier crops. Although for the sample plantations, such bushes gave, on average, a first crop of some 13 cwt.

per acre, against 12 cwt. for the bushes cut once only, this was an insignificant improvement, at least in the first cropping year. Furthermore, one would need to have averages based on far more results if a difference of this order is to be considered due to anything but chance factors. No records were kept of subsequent cropping years so it is not known if this yield advantage was maintained or even if the average length of cropping life was identical. Figures for the first full cropping year are given in Table 68. The rather high figure of 20 cwt. per acre for " other plantations " is due to the fact that certain of the bushes are cropping for the second time, and it is the plantation as a whole which is regarded as cropping for the first time. Moreover, it should be pointed out that, although for 1958 " bushes cut once only " gave a much lower yield than the other two groups, in 1959 and again in 1960 they gave the best yields. Hence, it is very difficult to put forward any general recommendations from the overall figures.

Finally, there is the question of the blackcurrant plantation as an investment. From this point of view it should be noted that the initial expense of establishment, details of which have already been given, is incurred for between twelve and twenty-four months after planting. However, before any revenue is received, a further £40 per acre has to be spent on maintenance over a further nine-month period together with the relevant indirect costs. Therefore the average cost per acre of a plantation, prior to the first return on capital investment, is approximately £110 plus £70 (costs excluding picking); that is to say, expenses incurred can amount to £180 per acre or even more before picking takes place. With a yield of 15 cwt. an acre for the first crop and a picking cost of £2 per cwt., even if the crop realises £8 per cwt., the net revenue per acre after picking costs have been deducted is only £90. It is therefore highly improbable that a profit would be obtained before the second cropping year, if then. This fact, however, is not apparent from an analysis of the costs and returns of the first-year crops as only one-tenth of the total establishment cost is charged to that year.

Establishment costs for cropping plantations have been calculated by taking the cost of the bushes at £20 or £30 per thousand, according to the age of the bush when planted, and then multiplying by the number of bushes planted; planting costs were taken at £10 per acre. Maintenance

costs, including indirect costs, were entered at £50 per acre when the period covered was one year and at £75 per acre when there were two establishment years. Thus, both the density of planting and the method of establishment were taken into account.

This calculation of establishment costs differs somewhat from the averages obtained from the three-year figures but, for practical reasons, the calculated costs have been based on two-year averages. Until the establishment costs have been calculated the full crop costs cannot be produced.

Secondly, consideration has to be given to the question of the period of time over which these establishment costs have to be written off. It is estimated that the average cropping life of blackcurrant plantations is 10 years, and this was the figure adopted for the purpose of calculating the share of the establishment cost chargeable to each cropping plantation. Although, until it has been grubbed, the actual length of life of an individual plantation cannot be known with certainty, and it might well be more or less than ten cropping years, it was felt that it would be impossible to allow for this in practice. However, if one-tenth of the calculated establishment cost is charged to the individual plantation for each cropping year, then, on average, those plantations that have cropped for more than ten years and for which a share of the establishment cost has been allowed, despite the fact that their full value has already been written off, will be offset by those plantations which due to premature grubbing will never be completely written off. This indeed will only be true if the actual average length of the cropping life is ten years. Obviously, if an accurate account of the profitability of any individual plantation is to be obtained, it is only possible to do this by considering the full cropping life, together with the total yield, cropping costs, grubbing cost, and so forth.

From 1957 to 1959, details of the grubbing of 152·54 acres of currants were obtained, and of these the greatest total acreage was grubbed following the ninth crop. The actual crop acreages and year of grubbing are given in Table 70.

Although some bushes were grubbed after cropping for the fourth time, which is an extremely short period and obviously uneconomic, others were cropped for fifteen years or more. However, the bulk of grubbing was done between the eighth and twelfth cropping year.

If the acreage grubbed in any particular cropping year is

multiplied or weighted by the number of years it has been cropped, then the result takes into account both the acreage and length of life. The grand total of these calculations comes to 1,528·37, which, divided by the total acreage grubbed, namely 152·54, gives an average cropping age of 10·02 years (Table 70). This is indeed startling confirmation of the estimated figure of ten years for the cropping life of a plantation, and there seems no reason to revise the original estimate.

TABLE 70

Acreage and Year of Grubbing

Cropping Year	*Crop Acreage*
4	0·99
6	9·36
7	7·10
8	16·32
9	34·98
10	16·63
11	28·55
12	22·31
13	11·25
15	3·50
17	1·55
Total	152·54

The overall three-year average annual allowance for establishment of the cropping plantations (Table 56) is £9·94 per acre, and both regionally and annually there are no great variations from this figure. This gives an average establishment cost of approximately £100 per acre, which might be considered to be on the low side especially under present conditions. However, even at the present time, there are a number of low-cost plantations on which, for example, the bush population is relatively sparse, and own-produced one-year bushes, or even cuttings, have been used and cropped after only eighteen months. Although it is not suggested that such plantations necessarily bear the yields or show the profits of more intensively managed plantations, such areas have an effect on overall average costs.

Total indirect costs, including rent, machinery depreciation and repairs, the share of establishment and general overhead costs, is £37 per acre. However, as already mentioned, this figure is rather low with regard to the share of establishment, and in any case does not include an allowance for grubbing.

ADDITIONAL COSTS

THE term " margin " as used in the tables is merely a convenient measure of the difference between the revenue and those costs detailed in the financial tables of the costings. However, it should be emphasised that this does not represent the profit of blackcurrant growing, as certain cost items have of necessity been omitted from the annual tables.

One of the items not included in the annual costs is grubbing. This has been left to the final stage for a number of reasons, the chief of these being that until a plantation has been grubbed it is not possible to be certain how the job will be done. Yet the cost of the operation largely depends on the method used. On an annual basis, it would only be possible to charge a proportion of an identical grubbing cost to every plantation, so that it seems preferable to allow for grubbing as a single adjustment of the " margin " applicable to all averages.

From details collected during the course of the survey, it appears that the average cost of grubbing is £7 or £23 per acre according to the method adopted. Hence, the overall average annual margin of +£139·34 per acre and all other margins are reduced by one-tenth of one or other of these amounts, that is to say by £0·7 or £2·3 per acre, when the cost of grubbing is taken into account. The resultant figure is the *management and investment income* which is the remuneration for the farmer's own management and for his own investment in the tenant's capital of the farm, whether borrowed or not.*

GRUBBING

GRUBBING is only the final stage of a process which is going on during much of the lifetime of a plantation, and the proportion of bushes remaining at this point is very variable. In fact, the amount of roguing which has taken place on the

* In this type of survey it is not customary for the Universities to analyse such costs, and the term profit is rarely used. However, "profit" to the grower generally means " that sum of money which is left after management and capital investment have been accounted for ". We do not intend to go into details but with regard to management it seems reasonable to suppose that a manager earning £1,000 a year would be able to look after 100 acres of currants or their equivalent in other crops and enterprises. Hence, an allowance of £10 per acre would seem adequate to cover this cost. Similarly, no definite calculations are made concerning the rate of interest on the capital invested.

TABLE 71

Grubbing: Details of Varieties of Blackcurrants and Acreages Grubbed

Variety	Grubbing with Rotavator		Grubbing by Other Methods		Overall	
	Crop Acreage	%	Crop Acreage	%	Crop Acreage	%
BALDWIN . .	34·09	48·8	22·38	48·5	—	—
MENDIP X . .	6·82	9·5	4·73	10·3	—	—
SEABROOK'S BLACK	5·47	7·6	7·91	17·1	—	—
WELLINGTON XXX	10·15	14·1	9·49	20·6	—	—
WESTWICK CHOICE	3·56	4·9	0·84	1·8	—	—
OTHERS . .	10·89	15·1	0·80	1·7	—	—
Total Crop Acreage	70·98	100·0	46·15	100·0	—	—
Regions						
Midlands and West . .	17·17	24·2	9·10	19·7	26·27	22·4
Southern . .	11·30	15·9	15·94	34·5	27·24	23·3
Eastern . .	42·51	59·9	21·11	45·8	63·62	54·3
Total Crop Acreage	70·98	100·0	46·15	100·0	117·13	100·0

Note: Four acres were grubbed with rotavator but varieties not known.

plantation, prior to the decision to grub the remainder of the bushes, will affect the final cost of grubbing. Although roguing is treated as an annual maintenance cost, the objective is the same as grubbing, namely to remove bushes; but the difference lies in the scale of the operation and the method adopted to achieve it. With roguing, the bushes generally occur scattered, either singly or in small groups, throughout the plantation and are normally dug out by hand; for grubbing, on the other hand, there are various means of removing the bushes mechanically, but all methods are essentially divided into two groups dependent on whether or not a rotavator is used.

TABLE 72
Cropping Age of Plantations at Grubbing

Cropping Age	Grubbing with Rotavator		Grubbing by Other Methods	
Years	Crop Acreage	%	Crop Acreage	%
6	1·50	2·1	5·39	12·2
7	—	—	4·10	9·3
8	11·30	15·9	1·00	2·3
9	8·76	12·3	10·69	24·3
10	9·00	12·7	2·88	6·5
11	14·76	20·8	16·73	38·0
12	9·36	13·2	3·24	7·4
13	11·25	15·9	—	—
15	3·50	4·9	—	—
17	1·55	2·2	—	—
Total Crop Acreage .	70·98	100·0	44·03	100·0

Note: Four acres grubbed with rotavator plus 2·12 acres grubbed otherwise, but cropping age not known.

Grubbing by rotavator consists of " chopping up " the bushes *in situ*, either as they stand or with the branches already cut off and carted away. This system is entirely satisfactory in many areas and since the costs involved are, on average, much lower than with traditional methods they have been analysed separately. There were fifteen such costs during the period 1957 to 1959 and the area thus grubbed covered 80·6 acres. Details of the plantations are given in Tables 71 and 72.

In addition there are costs for seventeen plantations grubbed by " other methods ", covering 59·3 acres; details of

these are included in the same tables. Although the number of costs for the two groups were about equal, the average acreage of the rotavated plantations was 5·37 acres, whereas that of the other areas was 3·52 acres. Baldwin and Wellington XXX were the principal varieties grubbed but these are also the most widely grown varieties. There is, however, one difference which may be significant, namely that whilst in the Midland and Western and the Eastern Regions the proportion of plantations grubbed by rotavators was above average, in the Southern Region the greater part of the grubbing was done by " other methods".

TABLE 73
Cost of Grubbing with Rotavator

Method	Hours	Per Acre
	No.	£
Rotavating: Labour .	7·9	1·67
Power	7·6	1·46
Other Work: Labour .	5·0	0·87
Power .	1·8	0·31
Contract Rotavating .	—	0·67
Machinery Allowance.	—	2·06
Total Cost . .	—	7·04

The average total cost of grubbing with rotavator was £7·04 per acre; details are given in Table 73. Other work included clearing-up and burning the rubbish remaining on the soil surface following rotavating, but not all growers considered this necessary. In two cases the rotavating was done on contract as the equipment was not available on the holding.

TABLE 74
Cost of Grubbing by Other Methods

	Hours	Per Acre
	No.	£
Ploughing: Labour . .	7·0	1·46
Power . . .	5·7	1·00
Pulling or Digging Out: Labour	26·4	5·28
Power .	12·9	2·26
Other Work: Labour . .	43·5	8·66
Power . .	4·1	0·71
Contract Work . . .	—	2·90
Machinery Allowance . .	—	0·74
Total Cost	—	23·01

Grubbing by other methods, Table 74, includes ploughing out the bushes, or pulling them out with a chain. In addition the bushes have to be cleared away and disposed of, principally by burning, which in itself is an expensive operation costing, on average, more than the total cost of rotavator grubbing. Contract work includes the hire of a bulldozer, and the total average cost of grubbing by these other methods was £23·01 per acre, being more than three times the average cost of rotavator grubbing, despite the relatively low machinery allowance.

The age distribution of grubbing has already been discussed in connection with the determination of the average cropping life of a plantation, but confirmation of this figure is afforded by the fact that the grubbed acreage represents 10·1 per cent of the crop acreage costed in the period 1957 to 1959. That is to say approximately one-tenth of the area has had to be replaced each year for the overall acreage to be maintained. The annual percentages were 10·4 per cent for 1957, 5·9 per cent for 1958 and 13·5 per cent for 1959. Further details were available for the

TABLE 75

Regional Distribution of Grubbing

Region	Crop Acres	%
Midland and Western	44·93	29·4
Southern . . .	27·24	17·9
Eastern . . .	80·37	52·7
Total . . .	152·54	100·0

TABLE 76

Incidence of Grubbing According to Variety

Variety	Crop Acres	%
BALDWIN . .	76·22	50·0
WELLINGTON XXX .	19·64	12·9
SEABROOK'S BLACK .	19·25	12·6
MENDIP X . .	13·86	9·1
WESTWICK CHOICE .	8·88	5·8
OTHERS . . .	14·69	9·6
Total . . .	152·54	100·0

152½ acres which were grubbed and Table 75 gives the regional distribution whilst Table 76 shows the incidence of grubbing according to varieties.

These figures compare quite reasonably with the sample acreage as a whole, particularly with regard to the regional distribution, where for the cropping sample of plantations 35 per cent of the area was in the Midland and Western Region, 19 per cent in the Southern Region and 46 per cent in the Eastern Region. As far as varieties are concerned, Seabrooks and Mendip X seem to account for a higher proportion of the grubbing than their acreage would warrant, but a study of Table 11 (Distribution of Varieties according to Cropping Age) shows that these varieties are more common on the older plantations of the sample than on the younger ones. Hence, the acreage of these varieties grubbed would be higher than that suggested by their overall occurrence.

It is sometimes stated that certain varieties of currants are more susceptible to the spread of " big bud " than others, but from the available data it is not possible to determine whether there is any basis for this belief.

CROPPING AGE ANALYSIS

ALTHOUGH initially all plantations were grouped and analysed regionally it cannot be suggested that this is the only, or even the most important, basis for division. It was in fact the one chosen to include the greatest possible number of results. All plantations have a single and unique location. Hence, boundaries can be drawn which split the results from these plantations into regional groups. As already described there are differences in the average costs and returns for the major regions into which the holdings were divided. However, greater and possibly more significant differences have been obtained by grouping and averaging the costs on the basis of cropping age. The number of plantations which can be included in such an analysis is not so great as with the regional grouping because certain of the plantations included bushes of two or more cropping ages for which it was not possible to obtain separate costs.

Nevertheless, two hundred and seventeen plantations have been included covering a total field area of 1,180·11 acres. This compares with two hundred and seventy-one

plantations and 1,716·71 acres for the complete sample. This is not a serious matter, however, as the overall costs and returns for this more restricted sample do not differ greatly from the full figures. Details are given in Table 77 from which the general similarity of the results is evident.

TABLE 77

Comparison Between Regional and Cropping Age Analysis

	Regional Analysis: Overall Average	Cropping Age Analysis: Overall Average
Sale of Fruit	Per Acre	Per Acre
Quantity . .	1·70 tons	1·68 tons
Net Receipts .	£296·32	£293·18
Total Costs . .	£156·98	£154·31
Margin . .	+£139·34	+£138·87
Maintenance Costs	£55·47	£54·66

As already explained in the regional analysis, immature and old plantations have been greatly over-represented and this is considered to be a reflection of the national position of blackcurrant growing at the present time. As a subsidiary effect of the unequal distribution of plantations by cropping age, the averages for some ages have been based on far fewer results than one would have wished and are therefore not fully representative of their particular years.

TABLE 78

Cropping Age Analysis of the Plantations

Cropping Age	Number of Costs in Group			Field Acreage		
Years	1957	1958	1959	1957	1958	1959
	No.	No.	No.	Acres	Acres	Acres
1	4	20	21	15·30	118·65	146·66
2	4	16	18	9·80	96·15	117·45
3	3	6	15	23·00	14·70	91·85
4	1	5	6	2·50	28·50	13·55
5	1	1	6	5·25	3·00	32·50
6	3	2	1	24·00	7·25	3·00
7	4	7	2	30·70	32·25	8·75
8	4	5	5	21·80	27·20	28·00
9	3	7	5	13·50	38·00	27·20
10 and over	7	13	22	32·00	70·75	96·85
Total .	34	82	101	177·85	436·45	565·81

This is evident from Table 78 where it is shown that although forty-five costs were included for the first cropping year, for the fifth and sixth cropping years only seven and six costs were included respectively.

Yields for each particular cropping year are given in Table 79, and although there are certain irregularities the general picture is pretty clear, with yields rising steadily from a first crop of around 17 cwt. per acre to about 2 tons per acre in the fourth year. The peak year appeared to be the eighth with 2 ton 7 cwt. per acre, after which the average weight of crop dropped by about 10 cwt. in the next two years. However, assuming for the moment that the yield figures for every year are characteristic, thereby giving each one equal weight, the average yield for a plantation throughout its cropping life can be calculated. The figure thus arrived at is 1·87 tons per acre. This compares with the actual "three-year" average of 1·68 tons per acre, this figure being depressed by an over-representation of the lower yielding years. In fact, this weighted average of approximately 1 ton 17 cwt. per acre is probably a truer assessment of the average crop of a blackcurrant plantation than the three-year average of 1 ton 14 cwt. of the regional analysis.

The receipts are also detailed in Table 79, and naturally correspond quite closely to the variations in yield. The total costs, however, follow a different pattern. With but two exceptions these costs rise steadily from £109·87 per acre in the first year to £187·98 per acre in the ninth. It is only in the "tenth year and over" group that there is a slight drop in the average cost. However, since these total costs include the cost of picking they are, like the receipts, partly dependent on yield variations.

A truer measure of cost changes, consequent upon the cropping age, are the maintenance costs given in Table 81. These costs show a range of £29·83 per acre, that is to say from a first-year cost of £41·16 per acre they rise fairly steadily by considerably more than 50 per cent to a peak of £71 per acre in the ninth year. Again there is a decrease to £59 per acre in the "10 year and over" group.

Despite the fact that there are cost increases with cropping age other than those due to increases in yield, they are more than compensated for by the rise in receipts. The margin, which is to say the difference between receipts and costs, also reaches a peak in the eighth cropping year of +£230 per acre, and is appreciably greater than the average total cost

TABLE 79

Returns, Costs and Margins per Acre: Three-Year Average (1957–1959)

Cropping Age (years)	1	2	3	4	5	6	7	8	9	10 and over	Overall Average
	Average per Acre										
Sale of Fruit											
Quantity	Tons 0·84	Tons 1·57	Tons 1·94	Tons 2·19	Tons 2·05	Tons 1·84	Tons 1·92	Tons 2·34	Tons 2·16	Tons 1·83	Tons 1·68
	£	£	£	£	£	£	£	£	£	£	£
Net Receipts	147·49	274·27	338·39	366·11	334·53	302·89	339·02	414·62	384·59	323·16	293·18
Total Costs	109·87	140·20	162·25	178·57	182·21	160·06	173·35	184·58	187·98	169·10	154·31
Margin	+37·62	+134·07	+176·14	+187·54	+152·32	+142·86	+165·67	+230·04	+196·61	+154·06	+138·87

TABLE 80

Total Costs per Acre: Three-Year Average (1957—1959)

Cropping Age (years)	1	2	3	4	5	6	7	8	9	10 and over	Overall Average
	Average per Acre										
Items:	£	£	£	£	£	£	£	£	£	£	£
(*a*) Replacements	0·82	0·31	0·46	0·35	0·56	0·07	—	0·03	0·76	0·11	0·39
(*b*) Fertilisers	18·14	20·22	18·92	27·73	29·25	24·01	26·72	25·69	26·90	17·98	21·26
(*c*) Cultivations	16·12	18·20	19·86	16·94	14·25	19·18	17·32	17·96	18·89	17·59	17·63
(*d*) Spraying	4·07	5·20	5·57	6·85	7·60	4·07	5·93	6·10	7·12	6·68	5·68
(*e*) Pruning	1·05	2·98	6·94	8·85	9·64	7·19	8·05	10·75	13·47	13·85	7·33
(*f*) Roguing	0·20	0·29	0·33	0·87	0·62	0·16	0·24	0·48	0·88	1·04	0·52
(*g*) Miscellaneous Maintenance Costs	0·76	2·08	2·71	0·63	4·58	1·03	1·62	2·29	2·97	1·79	1·85
(*h*) Picking	31·26	53·96	70·74	78·46	77·30	68·00	78·06	84·95	79·13	73·42	62·66
(*i*) Indirect Costs	37·45	36·96	36·72	37·89	38·41	36·32	35·41	36·33	37·86	36·64	36·99
Total Costs	109·87	140·20	162·25	178·57	182·21	160·03	173·35	184·58	187·98	169·10	154·31

TABLE 81

Summary of Maintenance Costs (Items (a) to (g)): Three-Year Average 1957 to 1959

Croping Age (Years)	1		2		3		4		5		6		7		8		9		10 and over		Overall Average	
	Average per Acre																					
	£	%	£	%	£	%	£	%	£	%	£	%	£	%	£	%	£	%	£	%	£	%
Labour . .	19·82	48	24·46	50	29·60	54	29·19	47	30·60	46	32·10	58	28·24	47	32·48	51	38·01	54	32·71	55	28·04	51
Power .	3·63	9	4·18	8	4·32	8	5·68	9	5·14	8	5·47	9	3·70	6	6·51	10	5·78	8	4·95	9	4·61	9
Materials . .	17·71	43	20·64	42	20·87	38	27·35	44	30·76	46	18·14	33	27·94	47	24·31	39	27·20	38	21·38	36	22·01	40
Total Maintenance Costs .	41·16	100	49·28	100	54·79	100	62·22	100	66·50	100	55·71	100	59·88	100	63·30	100	70·99	100	59·04	100	54·66	100

for the year. In contrast, in the first year there is a positive margin which, on average, is only about one-third of the total costs.

The proportion of the total maintenance cost devoted to labour, power and materials as shown in Table 81 displays a distinct trend for whereas the power share remains virtually constant at 9 per cent, labour increases with cropping age and materials decrease, the difference being 7 per cent of the total maintenance costs. This accords with expectation in that as the bushes grow older relatively less is spent on them in terms of fertilisers and sprays but their care becomes more costly from the point of view of labour.

In Table 80 details of the costs are given for each cropping year of a plantation. These costs are of three types, namely those such as indirect costs which show little or no correlation with cropping age, those such as pruning which increase throughout all or most of the lifetime of the plantation, and finally the cost of replacements which differs from all other costs in decreasing with the increase in age of the plantation.

With regard to fertilisers, years one to three are below average, as is the " tenth and over " group. However, there is a suggestion of a maximum expenditure on fertilisers in the fifth year, although thereafter it continues at a relatively high level. Cultivations, including weedkilling sprays, on the other hand, belong to the first type of cost, in that there is no distinguishable pattern of variation, years one, four, five and seven being below average. With spraying, the years one to three are below average, and, as with fertilisers, there appears to be a peak in the fifth cropping year. Pruning is quite definitely a cost which increases with cropping age, despite the slight discrepancies shown by years six and seven. In fact, there is a very great range exhibited by pruning costs which in the first year averaged little more than £1 per acre yet by the " ten and over " group reached nearly £14 per acre. Roguing also increases with increase in cropping age but not to so marked a degree as pruning. However, the peak is again in the " 10 and over " group. Miscellaneous maintenance costs fluctuate considerably about an average of £1·85 per acre, but as many years are above average as are below, and there appears to be no definite order in the sequence of such years.

Picking costs rise to a peak in the eighth year and then decrease again, following very much the fluctuations in yield.

Indirect costs, however, as already mentioned, show little variation and bear no relationship to cropping age. From this detailed analysis of the costs of the sample plantations according to cropping age it seems evident that there is a definite tendency not to maintain the steady increase in total maintenance costs beyond the ninth cropping year. This decline in the " 10 and over " group is due most probably to the fact that a number of plantations in this group have reached the end of their economic life owing to the incidence of reversion. When it is the intention to grub such plantations immediately after cropping, expenditure on them is generally kept to a minimum; and this will be reflected in the average for the group as a whole, despite the large sums being spent on those plantations still being cropped.

ANALYSIS BY ROW WIDTH AND PLANTING DISTANCE

Two further divisions of the financial results have been undertaken for the 1957 cropping year, namely analyses of the effects of row width and of planting distance on the costs and returns. The averages obtained show such irregularity that neither analysis is repeated for 1958 or 1959; it is not certain that the results would justify the time spent in preparing the figures. However, for the sake of completing the record, the averages for 1957 are given below.

As previously explained, plantations are grouped according to their row widths and an analysis of the regional distribution of these spacings has already been included in the description of the regional sample. Since only one plantation was excluded from the row width analysis, due to the fact that the rows were at different widths, the overall details and averages were virtually identical with those of the full regional analysis.

Margins and receipts as given in Table 82 follow very closely the variations in yield, as indeed do the total costs. However, it is not obvious that the yield differences are in any way connected with variations in the row width. Maximum weight from the close planting is to be expected, but it is difficult to put forward any logical explanation for the increase in the " 10 ft. and over " group. The maintenance costs are given in Table 83. It is not possible to attribute to any differences of management the fact that the costs for

the " 6 ft. and under " and the " 9 ft. " groups are very similar or that those for the " 7 ft. to 8 ft. " and the " 10 ft. and over " groups are also comparable. There are, moreover, considerable differences between these two pairs of groups.

TABLE 82

Row Width Analysis: Returns, Costs and Margins per Acre, 1957

Row Width	6 ft. or under	7 ft. to 8 ft.	9 ft.	10 ft. and over	Overall
Sale of Fruit					
Quantity .	Tons 2·49	Tons 2·09	Tons 1·65	Tons 1·87	Tons 1·95
	£	£	£	£	£
Net Receipts .	441·28	385·07	268·46	290·05	334·56
Total Costs .	187·20	182·41	152·50	164·71	169·36
Margin . .	+254·08	+202·66	+115·96	+125·34	+165·20

TABLE 83

Row Width Analysis: Maintenance Costs Per Acre, 1957

Row Width	6 ft. or under	7 ft. to 8 ft.	9 ft.	10 ft. and over	Overall
	£	£	£	£	£
Labour . .	22·07	34·10	25·17	31·29	28·78
Power . .	5·19	5·73	3·55	4·40	4·65
Materials and Contract .	24·67	23·03	22·80	23·60	23·28
Total Maintenance .	51·93	62·86	51·52	59·29	56·71

A different method of approach is to work on bush density, or planting distance. If plantations are grouped according to the area of land occupied by a single bush, then the range of values covered by the sample holdings in 1957 is from 20 square ft. per bush to 50 square ft. per bush. This is a great difference, but comparatively few plantations are represented at the upper and lower limits of the range. Details are given in Table 84.

The greatest number of costs fall in the group " 30 to 35 sq. ft. per bush ". This includes planting distances of 9 ft. by 3½ ft., and 8 ft. by 4 ft. However, 6 ft. by 6 ft. and 9 ft. by 4 ft. plantings fall in the " 35 to 40 sq. ft. per bush "

group. This demonstrates the difficulty in attempting to relate costs to bush density, for the management of a 6 ft. by 6 ft. plant is very different from that of a 9 ft. by 4 ft. one.

TABLE 84

Frequency of Occurrence of Different Bush Densities, 1957

Area per Bush (sq. ft.)	Number of Costs
20 to 25	4
25 to 30	3
30 to 35	14
35 to 40	10
40 to 45	6
45 to 50	1
Total Number of Costs	38

Due to the frequency distribution of the thirty-eight costs available in 1957, it is only possible to consider the averages within the range 30 to 45 sq. ft. per bush as at all representative. Cost details are given in Tables 85 and 86. The overall results, particularly the maintenance costs, are not dissimilar to the averages of the full regional sample, although the overall yield and, consequently, revenue and margin are higher. Even within the range 30 to 45 sq. ft. per bush there is a great variation in yields. The highest yield within this range is shown by the " 35 to 40 sq. ft. group" and the lowest by the " 40 to 45 sq. ft. group". It is possible that with 30 to 35 sq. ft. per bush the older plantations are overcrowded and at over 40 sq. ft. per bush the density is too low to allow of maximum yields. However, the evidence is too slender to base any recommendations on it. Rather surprisingly, maintenance costs show a rise with a decrease in density.

PRICES

As shown in Table 31 and as already mentioned under the section on regional " returns, costs and margins ", the average price per ton received for blackcurrants has varied from region to region due to differences in the proportion of crops sold on a ten-year contract, the price for which over the three years covered by this report has been appreciably less than that to be obtained on the open market.

TABLE 85

Planting Distance Analysis: Returns, Costs and Margins Per Acre 1957

Area per Bush (sq. ft.)	20–25	25–30	30–35	35–40	40–45	45–50	Overall
Sale of Fruit:	Tons	Tons	Tons	Tons	Tons	Tons	Tons
Quantity . . .	2·55	0·88	1·62	2·40	1·39	0·54	1·80
	£	£	£	£	£	£	£
Net Receipts . .	402·95	161·06	318·16	372·05	255·40	75·00	312·56
Total Costs . .	207·75	111·88	156·27	183·74	150·60	87·14	162·70
Margin . . .	+195·20	+49·18	+161·89	+188·31	+104·80	−12·14	+149·86

TABLE 86

Planting Distance Analysis: Maintenance Costs Per Acre, 1957

Area per Bush (sq. ft.)	20–25	25–30	30–35	35–40	40–45	45–50	Overall
	£	£	£	£	£	£	£
Labour	38·70	22·45	27·98	27·01	30·59	10·19	28·35
Power . . .	6·09	3·82	4·87	4·68	4·70	2·75	4·78
Materials and Contract .	22·37	13·12	22·41	23·48	24·26	22·39	22·25
Total Maintenance . .	67·16	39·39	55·26	55·17	59·55	35·33	55·39

In Table 87 an attempt has been made to separate the long-term contract acreages from those plantations whose crops were sold on the open market, principally for processing, although a small proportion was retailed or sent to commission salesmen. The average price of the long-term contracts was £140 per ton in 1957 rising to £166 per ton in 1958, but falling to £156 per ton in 1959. On the other hand, the price of currants on the open market fell in 1958 from around £200 per ton and upwards in 1957 to about £190.

TABLE 87

Supplementary Table of Blackcurrant Prices Per Ton of Fruit

		1957	1958	1959
		£	£	£
" Ten-Year Contract " Prices		140·00	166·00	156·00
Average of Other Sales (Net Prices)	Midland and Western Counties	196·38	187·63	182·14
	Southern Counties	203·79	193·55	184·30
	Eastern Counties	225·40	191·94	194·39
Average Price for All Sales		174·37	180·00	169·12

Despite this general fall the overall price obtained by the sample holdings rose in 1958 due to the substantial increase in the long-term contract price. The year 1959 witnessed a further fall in the Midland and Western Region, and in the Southern Region, to £180 to £185 a ton and this, together with a drop in the long-term contract price, was reflected in the overall average. The Eastern Region was the exception in that in 1959 there was a slight increase in price on that for 1958. This was due to the fact that the average for the area was largely determined by the price paid by a large co-operative to whom the bulk of the crop was sold. Their price was a reflection of tonnages available in the area; that is to say that whereas in 1957 and 1959 the crop yields for the area were badly depleted by frost, in 1958 there were good average yields, and consequently the price offered was lower.

COSTS PER TON OF FRUIT

So far much of the expenditure has been discussed in terms of the cost per acre. However, it is often asked " What is the cost of growing a ton of blackcurrants?" There is obviously no precise answer to such a question as much will depend on the yield obtained.

Even so, it is possible to give an estimate of the costs likely to be incurred when the crop yield is average, that is to say when it is at 1·7 tons per acre. At this level of production, the costs per ton should be similar to those set out in Table 88.

TABLE 88

Costs of Producing a Blackcurrant Crop of 1·7 Tons Per Acre

	£ per Ton
Maintenance Costs	32·63
Picking Costs	37·90
Indirect Costs	21·82
Total Costs	92·35

As a general guide to the relative cost of blackcurrant growing Table 89 has been included to give estimates of the costs per ton at various levels of production. It is based on the assumption that the maintenance and indirect costs are a fixed amount per acre, but the cost of picking per ton is dependent on the weight picked.

TABLE 89

Costs of Blackcurrant Production Per Ton of Fruit

Blackcurrant Crop	Tons per Acre		
	1	2	3
Costs per Ton	£	£	£
Maintenance Costs	55	28	18
Picking Costs	41	36	33
Indirect Costs	37	19	12
Total Cost per Ton . . .	133	83	63

Whereas an average yield of one ton per acre would be unlikely to permit a management and investment income of more than £2 per ton of fruit sold, at a basic contract price

of £135 a ton, if the average yield were raised to 2 tons per acre, a not impossible target, then at the same price per ton, the return would be over £50 per ton. With a price of £200 per ton the profitability would be correspondingly greater. However, it is obvious that any return to the prices experienced in the 1953–55 period would be disastrous, and even at £100 a ton blackcurrant growing would not be a very attractive proposition. The uncertainty of cropping should not be overlooked in this context.

CONTINUATION OF THE SURVEY

ALTHOUGH this report covers the period 1957 to 1959, the costings are continuing and it is at present the intention to collect results until 1962. In all, a period of at least six cropping years will then be available for analysis. It is not anticipated that radical changes in the cost averages will occur, but the additional years will be of value in a number of ways. For example, in the cropping age analysis and certain other tables, supplementary information is needed to increase the reliability of some of the averages. Furthermore, the extension of the costing period will permit a more useful analysis of trends. As explained in this report, it is at present uncertain whether further extension in the use of herbicides is taking place or if a more stable position has been reached already. With regard to yields, the incidence of frost and so on is so irregular that records for as long a period of time as possible are needed if any reliability is to be placed on forecasts of the general suitability, or otherwise, of particular districts for blackcurrant growing. Since a high average yield over a period of years is the key to successful blackcurrant production and the easiest and cheapest method of achieving this is to experience as few crop failures as possible, a knowledge of the probable frequency of occurrence of damaging frosts in different districts is of great importance. Three years is far too short a period to draw any conclusions on this aspect of the results. It is sufficient merely to record the fact that in this period the Eastern Region was most and the Southern Region the least affected by frost.

APPENDIX

The Organisation of Blackcurrant Picking—Some Notes on a Study of Blackcurrant Picking in July, 1959.

DURING the 1959 picking season, visits were made with a member of the Worcestershire National Agricultural Advisory Service, Mr. Eaton, to five blackcurrant growers and, in all, nine separate studies were undertaken, each one being related to a particular plantation or block of currants. The organisation of the picking differed from holding to holding and although the degree of complexity was closely related to the acreage picked and the average number of pickers available, this does not mean that it is in any way a measure of efficiency. The grower does, in fact, adopt that method which, by experience, he has found to be best suited to his particular requirements. In all cases, one or more pickers are assigned to each row of currants and bushes are never picked in succession by the whole picking force.

On the first holding visited (studies 1, 2 and 3), the total acreage of currants to be picked was some 3 acres. The bushes were scattered about the holding in small blocks and consisted principally of the variety Baldwin. Organisation of the picking was very simple indeed, each of the ten pickers being responsible for weighing and stacking his own trays of currants. As the wooden trays supplied by the merchants were designed to hold 18 lb. of fruit, each picker took with him into the plantation two chips, one of 6 lb. and the other of 12 lb. The weighing point was never at any great distance from the pickers due to the small size of the blocks of currants being picked. The filled chips were tipped on to a tray which, when weighed, was removed from the scales and carried to a nearby hut where it was stacked in that space allocated to the picker concerned.

On the second holding visited (studies 4 and 5), all currants were of the variety Baldwin and the acreage in bearing was about 11 acres in three separate blocks. Some forty to fifty pickers were employed to deal with this crop and they were mostly local people, a number of whom had brought with them young children and babies. These pickers were supplied with 12 lb. chips for picking but some preferred to pick direct into the processor's trays. A woman was employed full time at the weighing point, which was situated at one end of the plantation, to assist with the weighing and to check it. She also booked to each picker the quantity of fruit picked.

Holding 3 (study 9) was similar to those already described, in that picking was into 12 lb. chips and the variety was Baldwin. On average, thirty-five pickers were employed for 3 acres of currants which were in one block, although previously other plantations had been cleared. These pickers, together with their children, were brought by coach from neighbouring villages. Each picker used one or more 12 lb. chips and these when filled were brought to the weighing point, which was situated on the upper headland. The pickers themselves brought the filled chips, or when circumstances permitted, this job was undertaken by the farm staff.

The fourth system (studies 7 and 8) differed considerably from those already described in that no booking was done and the fruit was picked directly into the 18 lb. metal trays supplied by the processor. Once again the variety was Baldwin, situated on two plantations, one of 3½ acres and the other of 5 acres. However, Wellington XXX had been picked previously on one of the plantations and elsewhere on the holding. There were up to seventy pickers employed, some of whom were locals, whereas others had been brought from Hereford and Leominster. When one or more of the metal trays had been filled and carried to the weighing point the picker was paid in cash on the spot for the weight, to the nearest pound, of currants brought in.

The remaining system employed (study 6) was the most highly organised of all in that some 300 to 400 pickers were involved, brought mainly by coach from the principal towns and villages in the area. The weighing of the crop was divided between two weighing points each with its own gang of three men. In addition there were two supervisors and one tractor driver in the plantation. The variety being picked was Baldwin, but Wellington XXX had already been cleared from this plantation, which was of considerable size. Picking was into 12 lb. chips and these, when filled, were brought by the picker to one or other of the weighing points. For each filled chip the picker was given a ticket which was cashable later. The weighing gang at full strength consisted of one man weighing and handing out tickets, one receiving the weighed chips and tipping the currants into the trays and one papering and stacking the 24 lb. wooden trays, removing odd leaves and so on from the filled trays, and inserting the grower's identification ticket.

Although in all cases observed the variety of currant

picked was Baldwin, the bushes on the various plantations were of different ages. In fact records were made of bushes cropping for the first, second, third, fourth, seventh, tenth and fourteenth time. To a certain extent the bigger the bush the heavier the crop on it and in order to compare different plantations it is necessary to have some idea of the size of bush as well as of the weight of crop. In this way it becomes possible to talk in terms of the relative weight of crop. For example, although a young bush may bear a heavy crop for its size the overall production of the young plantation will be considerably less than that of a mature plantation.

It was found in practice that the most significant and readily observed feature of any bush was the number of fruiting branches it possessed, and therefore for each plantation visited the average number of these branches per bush was determined. The calculated averages are given in Table 90.

TABLE 90

The Relationship Between Number of Fruiting Branches and Age of Bush

Study No.	Average Number of Fruiting Branches	Picking Year
1	3½	1st
4	8	1st
7	10½	1st
9	18	2nd
3	20	4th
8	23½	10th
2	28	7th
5	30	3rd
6	47	14th

It is evident that, given an equal weight of fruit per fruiting branch, the yield per bush would be greater for older bushes than for younger ones and would depend directly on the number of branches. However, the figures in Table 91 suggest that, other factors being equal, the greater the number of fruiting branches the less the weight of fruit per branch. Hence a convenient measure of comparison between bushes of different cropping ages is the weight of fruit per branch. In practice it is easier to obtain such figures for young bushes than for old ones.

TABLE 91

The Relationship Between Number of Fruiting Branches and Crop Weight

Study No.	Number of Branches	Average Weight of Fruit per Branch	Approximate Weight of Fruit per Bush
		lb.	lb.
1	3½	0·44	1½
4	8	0·36	3
7	10½	0·48	5
9	18	0·25	4½
3	20	0·21	4¼
8	23½	0·26	6
2	28	0·16	4½
5	30	0·20	6
6	47	(0·22)	(14)

Note: Study 6 relates to one bush only.

Picking was studied in detail, and although the rate of picking varied from person to person, it was evident that some bushes were easier to pick than others. This is illustrated by the fact that there were a number of records of identical pickers picking at different rates on different plantations. Before discussing average picking rates it is necessary to state that for the purpose of these studies " picking time " includes time spent picking, moving about, sorting leaves and picking up dropped fruit, but excludes time spent walking to the weighing point and resting. The picking rates given in Table 92 have been calculated on this basis.

TABLE 92

The Relationship Between Weight of Fruit and Picking Rate

Study No.	Average Weight of Fruit per Branch	Approximate Weight of Fruit per Bush	Time to Pick 1 lb.
	lb.	lb.	Minutes
7	0·48	5	1·60
8	0·26	6	2·90
9	0·25	4½	3·11
4	0·36	3	3·31
1	0·44	1½	3·82
5	0·20	6	5·34
3	0·21	4¼	5·48
2	0·16	4½	6·10

The average time to pick 1 lb. of fruit varied considerably, as shown in the table, despite the fact that on none of the plantations visited was the crop exceptionally poor. Variations in picking time are attributable principally to differences in the weight of fruit per branch, and in general the picking rates on older bushes tended to be lower than on young ones. There is, however, no direct correlation between branch weight and picking rate as Table 93 makes clear. Given an equal weight of fruit per branch, bushes with more branches are picked at a faster rate than those with less. Furthermore, at low weights per bush the weight per branch does not seem to be a very important factor in determining the picking rate.

TABLE 93

The Relationship Between Picking Time and Piece-Work Rates

Study No.	Time to Pick 1 lb.	Piece-Work Rate per lb.
	Minutes	Pence
7	1·60	3
8	2·90	3
9	3·11	3
4	3·31	3½
1	3·82	4
5	5·34	3½
3	5·48	4
2	6·10	4

It was found that piece-work rates for picking (Table 93) were not directly related to the picking rate on any given plantation and were determined more by the picking conditions on each holding as a whole, by the general availability of pickers in the locality and indeed by the grower's own readiness, or otherwise, to fix a high price.

It is perhaps of interest to point out that studies 7 to 9 were of plantations in Herefordshire and 1 to 5 of Vale of Evesham plantations. On 6, another Herefordshire plantation, the rate was also 3d. per lb.

However, only a certain proportion of the worker's day is spent in " picking ", the remainder being taken up with carrying the currants to the weighing point, having them weighed, and resting. The amount of rest time depends largely upon the picker's own inclination, but the weighing time is outside his control. Even so, the distance to the weighing point, the method of weighing the fruit and so on

all play a part in determining the quantity of currants which he can pick in a day, and hence to some extent the price at which he is prepared to pick the fruit.

The walking time depends on the distance to be walked and it is assumed that one yard is covered every 0·011 minutes. However, the longer distances to be walked in some plantations may be offset by the fact that the weight of fruit carried per journey is greater and hence the number of journeys fewer. This is shown in Table 94. All distances and times include the return journey.

TABLE 94
Carrying Distances and Walking Times

Study No.	Average Carrying Distance	Walking Time	Average Weight of Fruit Carried	Walking Time per lb. of Fruit
	Yards	Minutes	lb.	Minutes
1	148	1·63	18	0·09
2	105	1·16	18	0·06
3	78	0·86	18	0·05
4	218	2·40	24	0·10
5	204	2·24	24	0·09
7	254	2·79	35	0·08
8	184	2·02	35	0·06
9	155	1·70	24	0·07

On plantations 7 and 8 the average distance was particularly long, and although carrying time per lb. compared favourably with the remainder, this was due to the greater weight of fruit carried per journey. Picking was into metal trays on this plantation and the carrying was very tiring for the pickers, many of whom were unable to manage two filled trays, weighing ½ cwt. approximately, at a time. On 9 the walking time per lb., though given as 0·07 minutes in the table, was in fact less than this for the pickers because a certain proportion of the crop was brought to the weighing point by the farm staff. On all holdings studied, with the exception of 6, the weighing point was fixed, whereas if it had been mobile the average carrying distance could have been greatly reduced, particularly as in some cases the site was not well chosen.

With regard to the actual weighing of the currants, three factors are of importance to the picker; namely the general efficiency of the system adopted, the extent to which he himself is involved in the weighing and the quantity of currants he can carry for weighing at one time.

TABLE 95

Time Taken to Weigh One Pound of Blackcurrants

Study No.	Time per Weighing	Average Weight per Weighing	Time per lb. Weighed	Weighing Unit	Methods Used
	Minutes	lb.	Minutes	lb.	
1–3	2·18	18	0·12	18	Weighed by picker
4–5	0·98	24	0·04	24	Crop booked
6	0·40	21	0·02	12	Ticket issued
7–8	0·27	35	0·01	1 or 2 trays each averaging 20 lb.	Payment in cash
9	0·65	24	0·03	12	Crop booked

In Table 95 are given for the systems studied the average amount of the picker's time taken up with weighing. Generally speaking booking of the crop proves to be slower than handing out tickets or cash on the spot.

The third element of the picker's time which has to be considered is the time spent waiting for weighing. This is indeed wasted time and a measure of the efficiency of the system adopted. For any given number of pickers and weighing staff, the hold up of pickers on plantations 6 to 9 tended to be less. Some systems were undoubtedly better equipped than others to deal with a rush of pickers. In studies 1 to 3 the problem did not really arise as there were only about ten pickers present and it was improbable that one picker would unknowingly walk to the weighing point whilst another was there. In 4 and 5 waits were prolonged at times as there was no means of speeding up the weighing if need arose. In 9, on the other hand, this difficulty

TABLE 96

Waiting Time

Study No.	Average Length of Wait	Weight of Fruit Carried	Waiting Time at Weighing Point
	Minutes	lb.	Minutes per lb. of Fruit
4–5	0·38	24	0·02
6	0·41	21	0·02
7–8	0·19	35	0·01
9	0·40	24	0·02

was partly solved by the employment of someone to do the booking, in place of the weigher, at times when pressure on the weighing point was expected to be heavy. It should be understood that the figures for waiting time (Table 96) refer to typical periods in the day and are not necessarily a measure of the time a picker may waste if he arrives at a peak period. It is noticeable that in all cases the normal waiting time per lb. of fruit picked is very low.

If all the items considered in detail above, that is to say walking, weighing and waiting time, are combined they still do not amount to more than 3 or 4 per cent of the picker's working day, as is shown in the following table (Table 97). The percentage " weighing " time, of course, tends to be higher when the picking rate is faster owing to the increased frequency of visits to the weighing point.

TABLE 97

Summary of the Picker's Day (Excluding Periods of Rest)

Study No.	Picking Time	Walking Time	Weighing and Waiting Time
	%	%	%
1–3	97	1	2
4–5	97	2	1
7–8	96	3	1
9	96	2	2

It may be noted that for plantations 6 to 9, weighing was not necessarily completed while the picker remained at the weighing point. The additional times involved are given in Table 98.

TABLE 98

Total Time to Weigh and Stack One Pound of Blackcurrants

Study No.	Picker's Time	Other Time	Total Time
	Minutes	Minutes	Minutes
1–3	0·12	—	0·12
4–5	0·04	*	0·04
6	0·02	0·01	0·03
7–8	0·01	0·02	0·03
9	0·03	0·04	0·07

*In studies 4 and 5 a certain proportion of the trays were prepared and placed on the scales by the weigher who also removed and stacked some. This time was not recorded but would amount, on average, to at least 0·01 minutes per lb.

It is of interest to see details of how the staff spent their time at the weighing point. Records were made of this on a number of plantations, and the results are embodied in Table 99.

TABLE 99

Labour Utilisation at the Weighing Point

Study No.	Weigher		Assistant		Notes
	Work	Rest	Work	Rest	
	%	%	%	%	
6	34	66	12	88	Another assistant also available
7	76	24	No records		Assistant principally patrolling plantations
8	88	12			
9	70	30	93	7	Assistant(s) also collecting some chips for pickers

The principal feature of this table is to show the advantage of having alternative work for the weighing staff. The very low percentage of weighing time for 6 is, however, partly due to the fact that, on the day on which records were made, the picking force was considerably under strength and hence the crop dealt with was below average. In general, there was not much to be done on any plantation for an hour or so after the arrival of the pickers as it took this length of time to fill any quantity of chips or trays.

The whole concept of work study and of possible improvements in blackcurrant harvesting depends on an acceptance of the need to clear the crop as rapidly and efficiently as possible. The value of possible improvements is not always apparent as they may involve the grower in additional expense without any tangible increase in revenue. All would be well if one could depend on both ideal picking conditions throughout the whole of the period when it is possible to harvest the currants, and on sufficient pickers to deal with the crop during that time. Such, however, is rarely the case: any delay in picking, due perhaps to the onset of a rainy period, might result in an appreciable loss of crop; also, the greater proportion of the crop harvested at its optimum period of development the better.

The studies made on these holdings have brought out two main ways in which time may be saved; firstly by reducing the distance the pickers have to walk and secondly

by speeding the turn round of pickers at the weighing point. To achieve the former the scales should be mobile and placed as near to the pickers as possible. Even putting the weighing point midway along the headland is preferable to having it at one corner of the field. Access to the field is also important: ideally, it should be accessible not only by lorry but also by coaches which bring the pickers. This could involve considerable expense in the construction of suitable approach roads, but it is surprising how much time is spent in walking to and from the plantation.

With regard to speeding the turn round of pickers at the weighing point, there are a number of ways in which this might be done without causing overstaffing at slack periods. In the first place, the use of graduated scales rather than the balancing of trays, might speed up the actual process of weighing. Furthermore, the completion of the weighing operation at a later stage might speed up the turn round of pickers at the weighing point as well as even out the work of the weighing staff. It might also be possible to simplify the method of booking the crop and paying the pickers, and finally, it might be an advantage to call in extra help at the end of the day or at other peak periods.