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*Silage - Cost of production o.s.*

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AGRICULTURAL ECONOMICS DEPARTMENT

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JUN 9 1960

ECONOMIC REPORT NO. 88

SILAGE PRODUCTION AND COSTS SURVEY: 1959 SEASON

by

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May, 1960

Price 1/6d.  
Plus Postage

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## SILAGE PRODUCTION AND COSTS SURVEY - 1959 SEASON

### The Objects of the Survey

The survey for 1959 was a continuation of that carried out in the 1958 season and which was reported upon in March, 1959<sup>‡</sup>. As in the previous year, the aim of the 1959 survey was to establish the level of production possible from leys set aside for silage production under commercial farming conditions. The choice of farmers was based on the sample used in the 1958 survey and was selective with the aim of including a number who went in for intensive production from one year leys. The remaining farmers used leys mainly of the three to four year type, cutting them mostly in their first or second year.

In addition to silage production, an estimation was also made of grazing yield per acre based on the number and types of animals kept and the duration of their grazing periods.

### The Design and Operation of the Survey

The survey which was carried out in the 1958 silage season was based on an original sample of 35 farmers which, for a number of reasons, was finally brought down to 20. In the 1959 season these twenty farmers continued to co-operate in the survey and eighteen satisfactory records were obtained. These eighteen records related to the types of ley as set out in Table II.

Two visits were made to each farmer in the survey; one in early Spring to measure the dimensions of the silos empty and another later in the year when the silos had been filled. Yield was estimated from the volume of silage made, using density figures of 42 cubic feet per ton on farms where forage harvesters were used and 47 cubic feet per ton on others.

Grazing output was measured in terms of utilised starch equivalent (U.S.E.) based on the normal standards.

### The Results of the Survey

The individual results for the eighteen farm records which could be accurately completed are shown in Table I. Analysis of these does not show any great degree of correlation between yield on the one hand and manuring or type of ley on the other.

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‡ Economic Report No. 78: "Silage Production and Costs Survey: 1958 Season: by A. B. K. Tracey.

Table I  
Individual Farm Results

Type of Ley	Code No.	Details of Manures Used	Summary of Manures Used				No. of Silage Cuts	Yield per Acre	
			Nitrogen Manures	Compounds		Total Manures		Silage	Grazing
				Conc.	Normal				
			----- Cwts. per Acre -----				tons	cwts. U.S.E.	
<u>One Year Leys</u>									
Cut in 1st yr.	SP 17	4½ Cwts. C.C.F. No. 2	-	4.50	-	4.50	1	10.6	6.5
	SP 6	3 " C.C.F. No. 2 )	5.25	3.00	-	8.25	2	9.4	2.2
		5¼ " Nitro Chalk )							
	SP 19	4 " Fisons 32 )	1.00	4.00	-	5.00	2	9.5	4.8
		1 " Nitro Shell )							
	SP 2	4 " Fisons 32 )	3.00	4.00	-	7.00	2	8.6	4.0
		3 " Nitro Chalk )							
	SP 12	4 " C.C.F. No. 2 )	2.00	4.00	-	6.00	2	6.1	3.1
		2 " Nitro Chalk )							
SP 22	4 " C.C.F. No. 2 )	3.00	4.00	-	7.00	2	10.0	nil.*	
	3 " Nitro Chalk )								
SP 3	2 " High Nitrogen Manure )	3.00	2.00	-	5.00	2	8.0	1.6	
	3 " Nitro Shell )								
SP 14	5 " C.C.F. No. 2	-	5.00	-	5.00	2	9.0	7.0	
<u>Three to Four Year Leys</u>									
Cut in 1st yr.	SP 16	4 " Low Nitrogen Manure	-	-	4.00	4.00	1	10.6	8.6
	SP 21	4 " C.C.F. No. 2 )	2.00	4.00	-	6.00	1	4.0	8.7
		2 " Nitro Chalk )							
	SP 5	3 " C.C.F. No. 1	-	3.00	-	3.00	1	8.0	5.4
	SP 8	4 " C.C.F. No. 1 )	3.00	4.00	-	7.00	2	6.4	2.6
	3 " Nitro Chalk )								
Cut in 2nd yr.	SP 14	5 " C.C.F. No. 2	-	5.00	-	5.00	1	6.0	7.0
	SP 10	3 " High Nitrogen Manure	-	-	3.00	3.00	1	5.0	6.7
	SP 4	5 " Fisons 32	-	5.00	-	5.00	1	7.7	6.7
<u>Longer Leys</u>									
Cut in 1st yr.	SP 1	3 " C.C.F. No. 1 )	2.00	3.00	-	5.00	1	13.2	7.5
		2 " Nitro Chalk )							
Cut in 4th yr.	SP 20	4 " C.C.F. No. 1 )	3.00	4.00	-	7.00	2	8.0	4.0
		3 " Nitro Chalk )							
	SP 9	5 " Hadfields A	-	-	5.00	5.00	1	6.0	12.9

\*Wheat sown in Autumn and no grazing was obtained.

The most interesting aspect of the table is that it shows that high yields of silage can be obtained in commercial farming practice even in a dry, sunny year such as 1959. The highest yield was 13.2 tons per acre and this was produced from only one cut of an eight year ley mixture cut in its first year. Normally two cuts would have been taken on this farm but the dry weather prevented this in 1959. Another six farms had yields of 9 tons or more per acre, making a total of seven farms with silage yields in this very productive category. No single reason accounts for the high yields on these farms but it is interesting to note that five of them were one year ley mixtures and the remaining two were longer mixtures, also cut in their first year.

The yields per acre obtained from the different types and ages of ley are summarised in Table II. In addition to the overall average yield of 8.1 tons per acre, it should be noted that grazing was obtained to the extent of 5.5 cwts. of utilised starch equivalent per acre.

Table II

Average Yields from Different Leys

Types of Ley 1959	No. of Farms 1959	Average Yield of Silage		
		1959	1958	Both Years
One Year Leys:	8	8.9	8.3	8.6
3-4 year Leys:				
Cut in 1st year	5	7.0	7.8	7.5
Cut in 2nd year	2	6.3	6.6	6.5
Cut in 3rd year	None	-	5.2	5.2
Longer Leys:				
Cut in 1st year	2	10.6	-	10.6
Cut in 3rd year	None	-	9.1	9.1
Cut in 4th year	1	6.0	15.8	10.9
Cut in 5th year	None	-	3.7	3.7
Average of all Leys:		8.1	7.9	8.0

From these figures it would appear that the highest yields are to be obtained from one year leys and from three or four year leys cut in their first year. However, the number of cases in each sub-group is small and conclusions should, therefore, be drawn with appropriate caution.

The manurial practices adopted by the farmers taking part in the survey are set out in Table III divided into high yield and low yield groups. The total amount of manures applied on the average was 5.6 cwts. in the case of the high yielding farms, compared with 5.3 cwts. for the low yielding group. There is little difference in the types of manures making up these respective totals which is very different from survey experience in 1958. In that year there was much more emphasis placed on the application of nitrogenous manure by the high yielding group than was the case with the low yielding group. Quite possibly this difference between the two years can be explained by the reluctance of farmers to use nitrogenous manures in very dry weather. Had the rainfall in the 1959 season been rather higher more nitrogen might have been employed and this could have made yields even better.

Table III

Manurial Policies

Types of Manures Applied	Type of Silage Production			
	High Yield (9 tons or more per acre)		Low Yield (less than 9 tons per acre)	
	1959 cwts/ac.	1958	1959 cwts/ac.	1958
Nitrogenous Manures	1.6	3.0	1.4	1.5
Concentrated Compound	3.4	1.3	3.2	2.1
Ordinary Compound	0.6	1.4	0.7	1.7
Other Manures	Nil	Nil	Nil	0.7
<b>TOTAL MANURES</b>	<b>5.6</b>	<b>5.7</b>	<b>5.3</b>	<b>6.0</b>
Silage Yield per Acre (tons)	10.3	10.9	6.7	6.3
Grazing Yield per Acre (cwts. U.S.E.)	5.2	6.4	5.7	5.6
Number of Cases Studied	7	7	11	13

The average quantity of silage produced per acre in the high yield group was 10.3 tons, while the corresponding figure for the low yield group was 6.7 tons. Grazing was obtained in addition to silage to the extent of 5.2 cwts. utilised starch equivalent (U.S.E.) per acre on the high yielding farms and 5.7 cwts. U.S.E. on the other group. Most of the grazing was obtained in the late part of the season after the silage had been cut and in general no additional manure was applied. It can be regarded as a modified form of the well known "late bite" practice and would be sufficient to keep two advanced store cattle per acre for at least a month.

The Average Costs of Production of Silage

Table IV shows how the average costs of production of silage can be calculated. A total of seven cost records were obtained with an average acreage of 14.6 each - a total of 102.5 acres for the whole sample. The average cost works out at £18:11:10 per acre and £2: 4: - per ton. The average yield of silage for these seven cases was 8.6 tons per acre.

Table IV  
Average Costs of Production

Operation	MAN		TRACTOR		Total
	Hours	£ s. d.	Hours	£ s. d.	£ s. d.
Pre-harvesting	1.46	-: 6: 7	1.45	-: 6: 3	-:12:10
Harvesting	13.70	3: 1: 2	10.50	2: 4:11	5: .6: .1
<b>TOTAL</b>	<b>15.16</b>	<b>3: 7: 9</b>	<b>11.95</b>	<b>2:11: 2</b>	<b>5:18:11</b>
Seed Cost				1:18: 1	
Rent				1:16: 5	
Manures Applied		5: 1: 3			
Plus R.M.V. b/f		<u>-: 8: 6</u>			
		5: 9: 9			
Less R.M.V. c/f		<u>1: 8: 7</u>		<u>4: 1: 2</u>	
Total Growing Cost				7:15: 8	
Less $\frac{1}{4}$ to Grazing				<u>1:18:10</u>	5:16:10
Other Costs (Equipment Depreciation, etc.)					2: 9: 5
Overheads					<u>4: 6: 8</u>
Average Cost per Acre					<u>£18:11:10</u>
Average Yield per Acre					8.6 ton
Average Cost per Ton					£2: 4: -
Acreage of Silage Costed					102.5
Acreage Costed per Farm					14.6

Variation from the average figures in Table IV was very wide. The lowest cost per acre was £12: 5: 9 and the highest £27:15: 7, while the corresponding range for cost per ton was from £1: 5: 7 to £3: 1: 7. A number of reasons were responsible for this, the most important being the yield per acre which ranged from 6.0 to 11.2 tons. In general, it was found that the higher the yield per acre, the lower was the cost per ton.



### Summary and Conclusions

The survey carried out in the 1959 silage making season showed that yields of silage averaging 8.1 tons per acre were obtained on the 18 farms for which accurate records were available (Table II). In addition, grazing was obtained to the extent of 5.5 cwts. U.S.E. per acre. The highest yield was 13.2 tons and this result, along with six others, made up a group of seven farms with yields of 9 tons or over of silage per acre. The average yield on these seven farms was 10.3 tons and the remaining eleven farms had yields of silage which were less than 9 tons per acre and which averaged out at 6.7 tons per acre (Table III).

The average yield per acre obtained from different types of ley did vary, with one year leys producing higher yields than three to four year leys, the respective average figures being 8.9 tons per acre for the former and 7.0 tons per acre for the latter cut in their first productive year. However, individual results from longer and older leys did exceed these figures, showing that there can be no general rule about the relationship of yield per acre to the type and age of ley (Table II).

The average costs of production were calculated in seven cases out of the eighteen included in the survey. These worked out at £18:11:10 per acre and £2: 4: - per ton, the average yield of these seven cases being 8.6 tons per acre. Costs per acre ranged from £12: 5: 9 to £27:15: 7 and per ton from £1: 5: 7 to £3: 1: 7. In general the variation in cost per ton was due to the yield obtained; the lower costs per ton tending to be associated with the higher yields per acre.

### Acknowledgment

The staff of this department wish to thank co-operating farmers for their care and trouble in seeing that the necessary information was made available and for their kindness and courtesy at all times.