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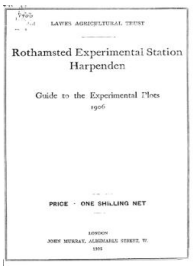
Rothamsted Experimental Station - Guide to the Experimental Plots 1906


LAWES AGRICULTURAL TRUST

Rothamsted Experimental Station
Harpenden

Guide to the Experimental Plots
1906

PRICE - ONE SHILLING NET

LONDON
JOHN MURRAY, ALBEMARLE STREET, W.
1906

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Hoosfield - Leguminous Plots and Potatoes

Rothamsted Research

Rothamsted Research (1906) *Hoosfield - Leguminous Plots and Potatoes ;* Rothamsted Experimental Station - Guide To The Experimental Plots 1906, pp 36 - 40 **- DOI: https://doi.org/10.23637/ERADOC-1-140**

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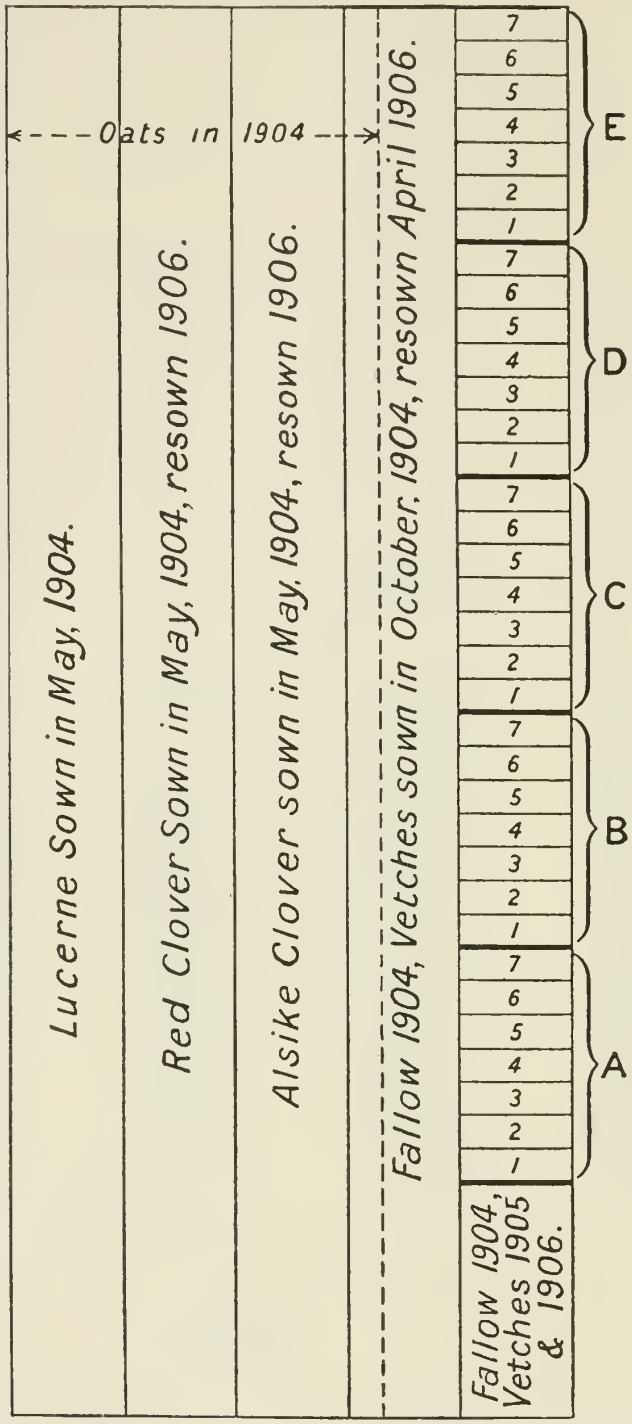
F.—*Hoos Field Leguminous Plots. Season* 1906.



[Total area under experiment about 3 acres.]

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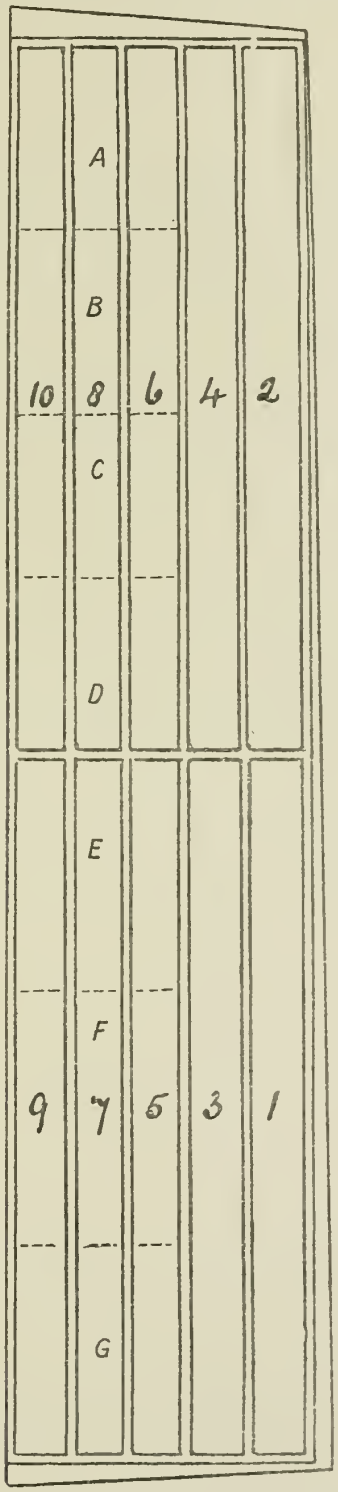
G.—*Plan of the Plots in Hoos Field, on which Potatoes were grown without Manure, and with various Manures.*

26 years, 1876-1901.

In 1902 and 1903 Barley, and in 1904 Oats, were sown, without manure, to determine the duration of the residues of the previous manuring. In 1905 Barley was again sown on Plots 1-4 without manure. Plots 5-10 sown with Leguminous seeds.



Total area of ploughed land about $2\frac{1}{16}$ acres. Area of each plot $\frac{1}{8}$ acre.
The double lines indicate division paths between plot and plot.

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HOOS FIELD LEGUMINOUS PLOTS

1848-9 ONWARDS

The small plots (see Plan on page 36) represent portions of the original plots on which attempts have been made to grow leguminous plants continuously since 1848. Various combinations of mineral manures have been used up till 1898, but after the first few years very small crops have been grown, and the clovers in particular generally fail. After fallowing in 1903 to clean the plots, they were resown as before in 1904.

The remainder of the area was formerly occupied by similar small plots of the same leguminous plants. These were ploughed up in 1898, and five crops of wheat were taken without manure in order to test the amount of nitrogen accumulated by the leguminous crop and left in the soil.

In 1904 black tartarian oats were sown, and in the oats, lucerne, red clover, and alsike clover were sown on three strips; a fourth strip, fallowed in 1904, was sown with vetches in October of that year, as shown in the Plan on page 36. The new plots run across the old ones at right angles. The following table shows the crop obtained in 1905, after which the clover and vetch plots were broken up and resown in a barley crop in 1906.

TABLE XVII.—*Produce per acre, as Hay. Season* 1905.

	First Crop.	Second Crop.	Total.
	Cwt.	Cwt.	Cwt.
Lucerne . . .	21·5	16·6	38·1
Red Clover . .	25·7	21·5	47·2
Alsike Clover . .	36·9	...	36·9
Vetches . . .	45·8	...	45·8

HOOS FIELD—POTATO PLOTS

RESIDUE OF MANURES

On ten plots potatoes were grown with various manures for 26 years (1876-1901), with the results set out in Table XVIII. In 1902 the manuring was discontinued and barley sown; this was again followed by barley in 1903, and by oats in 1904. The yield produced by the residues of the manures applied to the potatoes is shown in Table XVIII.

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HOOS FIELD

TABLE XVIII.—*Produce of Barley per acre in* 1902 *and* 1903, *without Manure, on the Plots which had grown Potatoes, variously Manured, in the* 26 *years*, 1876-1901, *inclusive. In* 1904 *Black Tartarian Oats were sown, again without Manure.*

Plot.	Potatoes, 1876-1901.		Barley, Unmanured.				Oats, Unmanured.	
			1902.		1903.		1904.	
	Manures per acre per annum. (In the 5 years, 1897 to 1901, 400 lb. Basic Slag was used throughout instead of Superphosphate.)	Average Produce of Total Tubers per acre.	Dressed Grain.	Total Straw.	Dressed Grain.	Total Straw.	Dressed Grain.	Total Straw.
		Tons.	Bush.	Lb.	Bush.	Lb.	Bush.	Lb.
1	Unmanured, 1876 and since	1·4	33·2	1799	9·6	544	23·1	1346
2	Unmanured, 1882 and since. Previously Farmyard Manure, 14 tons	2·8	35·4	1872	15·2	1020	21·5	1176
3	Farmyard Manure, 14 tons, 1883 and since. Previously Superhosphate also	4·8	71·0	5216	46·9	3474	55·5	3060
4	Farmyard Manure, 14 tons, 1883 and since, 1882 and previously Superphos., and in 1881 and previously Nitrate Soda = 86 lb. Nitrogen also	5·1	72·4	5115	44·9	3486	61·5	3258
5	Ammonium-salts = 86 lb. Nitrogen	1·7	59·1	3774	19·2	1018	24·1	1170
6	Nitrate Soda = 86 lb. Nitrogen	2·1	62·9	4275	18·6	911	22·7	1263
7	Ammonium-salts = 86 lb. Nitrogen, and Mixed Mineral Manure *	5·3	64·4	4286	28·9	1634	30·9	1693
8	Nitrate Soda = 86 lb. Nitrogen, and Mixed Mineral Manure	5·4	67·0	4629	26·2	1748	32·6	1635
9	Superphosphate only	2·7	35·1	1811	13·3	890	22·7	1104
10	Mixed Mineral Manure only	2·9	24·8	1610	12·8	887	20·6	1151

* "Mixed Mineral Manure," Superphosphate, and Sulphates of Potash, Soda and Magnesia.

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On Plots 1, 2, 3, and 4 barley was again sown (without manure) in 1905, and gave the following results:—

TABLE XIX.—*Produce per acre in* 1905.

Plot.	Dressed Grain.		Straw.	Total Produce.
	Yield.	Weight per Bushel.		
	Bush.	Lb.	Cwt.	Lb.
1	4·6	52·0	3·0	613
2	7·1	52·3	3·4	799
3	28·3	55·7	14·8	3317
4	30·3	55·9	17·2	3693

HOOS FIELD

INOCULATION OF LEGUMINOUS PLANTS

Since the land on which potatoes had been formerly grown (see Plan on page 37) is known to have carried no leguminous crop for the last fifty years, it was decided to use those plots which no longer showed much residue of the manures previously applied, *i.e.*, Plots 5-10, for testing the comparative effects of different media for inoculating leguminous plants with their appropriate bacteria. Plots 6, 8, and 10 were divided transversely into four plots; on A, soil inoculated with Hiltner's preparation from Munich; on B, soil inoculated with Moore's preparation from the United States; on C, soil from a field which had carried red clover in 1904, were sown on 7th April; D being left uninoculated. Red clover seed was sown on 15th May over the whole area.

Plots 5, 7, and 9 were similarly divided into three plots and sown with cow peas (*Vigna catjang*), a leguminous plant quite new to this land. On E, the seed was inoculated with Moore's medium just before sowing; on F, soil obtained from an old cow pea field in the United States was spread; and G was not inoculated. The cow peas were sown on 16th May, but failed to give a satisfactory plant, and were ploughed up. The plots were sown with red clover in 1906, as part of a further trial of the continuous growth of clover.

HOOS FIELD—WHEAT AFTER FALLOW

The two half-acre plots in Hoos field are never manured, but every year one carries a wheat crop and the other is given a bare summer fallow, the treatment alternating, so that every year one plot is carrying a wheat crop following a bare fallow. By comparing the results obtained with the yield of the unmanured plot growing wheat continuously, the benefit of the bare fallow can be estimated.