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ROTHAMSTED
RESEARCH

Rothamsted Experimental Station - Guide to the Experimental Plots 1906

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Hoofield - Wheat - Little Hoos

Rothamsted Research

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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.

WHEAT AFTER FALLOW

TABLE XX.—*Experiments on Wheat, alternated with Fallow, without Manure (Hoos Field), 56 years (1851-1906); and grown continuously without Manure (Broadbalk Field), 56 years (1851-1906).*

Average produce of Grain per acre, and Produce last year, 1905.

| | Dressed Grain. | | |
|---|--|--|--|
| | Wheat after Fallow each year (Hoos Field). | Wheat after Wheat each year (Broadbalk). | After Fallow + or - after Wheat. |
| AVERAGES—Produce after Fallow, reckoned at the yield per Acre of the half in Crop each year. | | | |
| | Bushels. | Bushels. | Bushels. |
| 5 years (1851-55) | 19·2 | 14·7 | + 4·5 |
| 10 „ (1856-65) | 26·1 | 15·9 | + 10·2 |
| 10 „ (1866-75) | 13·5 | 11·9 | + 1·6 |
| 10 „ (1876-85) | 14·8 | 11·3 | + 3·5 |
| 10 „ (1886-95) | 15·1 | 12·1 | + 3·0 |
| 10 „ (1896-1905) | 14·3 | 11·7 | + 2·6 |
| 50 „ (1856-1905) | 16·7 | 12·5 | + 4·2 |
| Last year (1905) | 12·9 | 18·0 | - 5·1 |
| AVERAGES—Produce after Fallow, reckoned at the yield per Acre of the whole area, half in Crop and half Fallow. | | | |
| | Bushels. | Bushels. | Bushels. |
| 5 years (1851-55) | 9·6 | 14·7 | - 5·1 |
| 10 „ (1856-65) | 13·0 | 15·9 | - 2·9 |
| 10 „ (1866-75) | 6·8 | 11·9 | - 5·1 |
| 10 „ (1876-85) | 7·4 | 11·3 | - 3·9 |
| 10 „ (1886-95) | 7·5 | 12·1 | - 4·6 |
| 10 „ (1896-1905) | 7·2 | 11·7 | - 4·5 |
| 50 „ (1856-1905) | 8·4 | 12·5 | - 4·1 |
| Last year (1905) | 6·4 | 18·0 | - 11·6 |

LITTLE HOOS FIELD

RESIDUAL VALUE OF MANURES

The object of the experiments in this field is to test the residual value of certain typical manures, *i.e.*, the value of the residues left in the soil after one or more crops have been grown since the time of their application. To eliminate the effect of season, the result yielded by the residue is in all cases compared with that of a new application of the same manure, as well as with a continuously unmanured check plot.

The ordinary dung is made by feeding beasts with hay and roots only, the beasts making the cake-fed dung alongside receive also an ordinary allowance of linseed and cotton cake. The two lots of dung are then laid up in heaps for a short time, and weighed out immediately before applying. The yields obtained so far are not given as trustworthy; conclusions can only be drawn when the average over a long period can be taken.

H.—*Little Hoos Field. Plan of Rotation Plots arranged to test the Residual Value of various Manures—one, two, three, and four years after their application.*

Crops selected—Swedes (1904), Barley (1905), Mangels (1906), and Oats (1907).

Third Year, 1906—Mangels.

| | | | | | | |
|---------------------|---|-----------|---|--|---|---|
| Adjoins Hoos Field. | A | 5 1907 | 4 Dung (ordinary) 16 tons per acre, in 1906. | 3 Dung (ordinary) 16 tons per acre, in 1905. | 2 Dung (ordinary), 16 tons per acre, in 1904. | 1 |
| | B | 5 1907 | 4 Dung (Cake-fed), 16 tons per acre, in 1906. | 3 Dung (Cake fed) 16 tons per acre, in 1905. | 2 | 1 Dung (Cake-fed), 16 tons per acre, in 1904. |
| | C | 5 1907 | 4 Shoddy, 1 ton per acre, in 1906. | 3 | 2 Shoddy, 1 ton per acre, in 1905. | 1 Shoddy, 1 ton per acre, in 1904. |
| | D | 5 1907 | 4 | 3 Guano, 8 cwt. per acre, in 1906. | 2 Guano, 8 cwt. per acre, in 1905. | 1 Guano, 8 cwt. per acre, in 1904. |
| | E | 5 | 4 1907 | 3 Rape-cake, 10 cwt. per acre, in 1906. | 2 Rape-cake, 10 cwt. per acre, in 1905. | 1 Rape-cake, 10 cwt. per acre, in 1904. |
| | F | 5 1907 | 4 Superphosphate, 600 lb. per acre, in 1906. | 3 Superphosphate, 600 lb. per acre, in 1905. | 2 Superphosphate, 600 lb. per acre, in 1904. | 1 |
| | G | 5 1907 | 4 Bone Meal, 430 lb. per acre, in 1906. | 3 | 2 Bone Meal, 430 lb. per acre, in 1905. | 1 Bone Meal, 430 lb. per acre, in 1904. |
| | H | 5 | 4 1907 | 3 Basic Slag, 600 lb. per acre, in 1906. | 2 Basic Slag, 600 lb. per acre, in 1905. | 1 Basic Slag, 600 lb. per acre, in 1904. |

Each plot received 3 cwt. Superphosphate per acre in 1904, and 3 cwt. of Sulphate of Potash in 1906.

Each plot received 1 cwt. of Sulphate-Ammonia per acre in 1904 and 1905, and 2 cwt. in 1906, with 8 cwt. of Sulphate of Potash.

Adjoins Broadbalk Field.

Area of each plot $\frac{1}{8}$ th acre.

| | | |
|----------|------------------------------------|-----------------|
| Series A | deals with the residual effects of | Ordinary Dung. |
| “ B | “ | Cake-fed Dung. |
| “ C | “ | Shoddy. |
| “ D | “ | Guano. |
| “ E | “ | Rape-cake. |
| “ F | “ | Superphosphate. |
| “ G | “ | Bone-Meal. |
| “ H | “ | Basic Slag. |

In each series the manure is applied to one plot in 1904, to another plot in 1905, to a third plot in 1906, and to a fourth plot in 1907.

All the plots in the Series A to E, which deal with Nitrogenous Manures, receive, as necessary, equal amounts of Phosphates and Potash. Similarly, all the plots in the Series F, G, H, dealing with Phosphatic Manures, receive equal dressings of Nitrogenous or Potassic Manures as required.



Check plots receiving in Series A to E no Nitrogen throughout, Series F to H no Phosphates throughout.