Memoranda of the Plan and Results of the Field Experiments, May 1870

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Experiments on Permanent Meadow Land; the Park

Rothamsted Research

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Experiments with different Manures on PERMANENT MEADOW LAND.

THE PARK.

The Land has probably been laid down with Grass for some centuries. No fresh seed has been artificially sown within the last 30 years certainly; nor is there record of any having been sown since the Grass was first laid down. The experiments commenced in 1856, at which time the character of the herbage appeared uniform over all the Plots. Excepting as explained in the Table, and in the foot-notes, the same description of Manure has been applied year after year to the same Plot.

(Area under experiment, about 6¾ acres.)

1 acre .. .. = (about)	0·40 Hectare .. .. .. or 1·59 Prussian Morgen.
1 lb. (pound avoir.) .. = (about)	0·45 Kilogramme .. .. .. or 0·91 Zollverein Pfund.
1 cwt. (hundredweight) = (about)	51·0 Kilogrammes .. .. .. or 1·02 Centner.
1 ton .. .. = (about)	1016·0 Kilogrammes .. .. or 20·33 Centner.
1 lb. per acre .. .. = (about)	1·12 Kilogramme per Hectare or 0·57 Zollv. Pfd. per Pr. Morgen.
1 cwt. per acre .. .. = (about)	125·5 Kilogrammes per Hectare or 0·64 Centner per Pr. Morgen.

Plots.	Manures, per acre; fourteenth season—1869.	Produce per Acre, weighed as Hay. Average per Annum; 15 Years 1856-1870.	13th Season; 1868.	14th Season; 1869.	15th Season; 1870.
		Cwts.	Cwts.	Cwts.	Cwts.
1	200 lbs. Ammonia-salts [1] [also, for the first 8 years, 1856–1863, 14 tons Farmyard Manure per acre per annum]	46⅝	41¾	61	16¼
2	Unmanured, 1864 and since [for the first 8 years, 1856–1863, 14 tons Farmyard Manure per acre per annum]	41⅛	36¾	55¼	13⅞
3	Unmanured, continuously	22⅜	17½	38	5¾
4 a	Superphosphate of Lime [2]	24⅝	19¾	40½	7¼
4 b	ditto ; and 400 lbs. "Ammonia-salts"	36⅛	29¼	45½	8¼
5	400 lbs. "Ammonia-salts"	28⅜	24	35⅝	5⅜
[3] 6	Sulphates of Potass, Soda, and Magnesia [4]; and "Superphosphate of Lime" (previously, 1856–1868 inclusive, Ammonia-salts as Plot 5)	31⅛	27½	56½	16¼
7	Sulphates of Potass, Soda, and Magnesia [4]; ditto	35⅛	38	54¾	17½
[3] 8	Sulphates of Soda and Magnesia [5]; ditto	32⅜	27¼	46⅜	12¾
9	Sulphates of Potass, Soda, and Magnesia [4]; ditto ; and 400 lbs. "Ammonia-salts"	53⅛	59¼	68¾	29½
[3] 10	Sulphates of Soda and Magnesia [5]; ditto ; 400 lbs. "Ammonia-salts"	49¼	44½	57½	21⅛
11	Sulphates of Potass, Soda, and Magnesia [4]; ditto ; 800 lbs. [6] "Ammonia-salts"	61⅛	63⅝	75¼	42⅝
11a	Sulphates of Potass, Soda, and Magnesia [4]; ditto ; 800 lbs. [6] "Ammonia-salts"; and 200 lbs. each, Silicate of Soda and Silicate of Lime [7]	64 38⅜	72¼	78½	49½
12	Unmanured, continuously	25¼	24	38⅞	11¼
13	Sulphates of Potass, Soda, and Magnesia [4]; "Superphosphate of Lime" ; 400 lbs. "Ammonia-salts;" and 2000 lbs. Cut Wheat-straw	53¾	55¼	74¾	42⅜
14	Sulphates of Potass, Soda, and Magnesia [4]; "Superphosphate of Lime" ; and 550 lbs. Nitrate of Soda [8]	57⅝	69	76⅛	56¼
15	none ; none ; 550 lbs. ditto	36¾	32	53⅜	15¾
16	Sulphates of Potass, Soda, and Magnesia [4]; "Superphosphate of Lime" ; and 275 lbs. ditto	48	51¼	74¼	33⅛
17	none ; none ; 275 lbs. ditto	35⅜	29	54⅝	19¼
18	Mixture supplying the quantity of Potass, Soda, Lime, Magnesia, Phosphoric Acid, Silica, and Nitrogen contained in 1 ton of hay (commencing in 1865)	33⅛	27½	55⅜	14⅜

(1) Equal parts Sulphate and Muriate of Ammonia of Commerce.
(2) 200 lbs. Bone-ash, 150 lbs. Sulphuric Acid (Sp. gr. 1·7).
(3) Plots 6, 8, and 10, had, besides the Manures specified, 2000 lbs. Sawdust per acre per annum for the first 7 years, 1856–1862, but without effect.
(4) 300 lbs. Sulphate of Potass, 100 lbs. Sulphate of Soda (200 lbs. 1856–1863), and 100 lbs. Sulphate of Magnesia.
(5) 250 lbs. Sulphate of Soda (500 lbs. in 1862 and 1863), and 100 lbs. Sulphate of Magnesia (Sulphate of Potass also, as on Plots 7, &c., 1856–1861).
(6) 800 lbs. in 1856–7–8; only 400 lbs. in 1859–60–61; and 800 lbs. since.
(7) The application of Silicates did not commence until 1862.
(8) 550 lbs. Nitrate of Soda is reckoned to contain the same amount of Nitrogen as 400 lbs. of "Ammonia-salts."
(9) Average of 10 years only, as the manures specified were first applied in 1859 (previously, 1856–1868 inclusive, Sawdust only).
(10) Average of 11 years only, as these experiments did not commence until 1858.
(11) Average of 4 years only, as the experiment only commmenced in 1865.