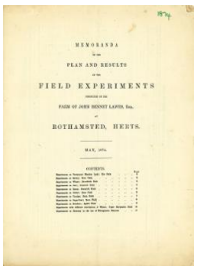
Memoranda of the Field Experiments at Rothamsted May 1874



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Experiments on Permanent Meadow Land; the Park

Rothamsted Research

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THE PARK.

Experiments with different Manures on PERMANENT MEADOW LAND.

The Land has probably been laid down with Grass for some centuries. No fresh seed has been artificially sown within the last 40 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 7 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.
1 ton per acre .. .. = (about) 2510·0 Kilogrammes per Hectare or 12·82 Centner per Pr. Morgen.

Plots.	Manures, per acre, per Annum.	Produce per Acre, weighed as Hay. 14th Season; 1869.	15th Season; 1870.	16th Season; 1871.	17th Season; 1872.	18th Season; 1873.	Average per Annum; 18 Years 1856-1873.	Plots.
		Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	
1	1856–63, 8 years, 14 tons Farmyard Manure, and 200 lbs. Ammonia-salts [1]; average produce 49½ cwts. 1864 and since, 200 lbs. Ammonia-salts alone; average produce (10 years, 1864–73) 40⅜ cwts.	61	16¼	43¾	31½	29¾	44¾	1
2	1856–63, 8 years, 14 tons Farmyard Manure; average produce 42⅞ cwts. 1864 and since, unmanured; average produce (10 years, 1864–73) 35⅛ cwts.	55¼	13⅞	33⅞	25¼	18⅞	38⅝	2
3	Unmanured, continuously	33	5¾	25⅜	14⅝	12¼	21⅞	3
4 {1	3½ cwts. Superphosphate of Lime [2]	40¼	7½	24⅞	15⅜	13½	23½ [9]	1
4 {2	3½ cwts. Superphosphate of Lime, and 400 lbs. Ammonia-salts	45½	8¼	38¼	28½	26	35⅛ [9]	2 } 4
5	400 lbs. Ammonia-salts	35⅝	5½	29⅝	22½	16⅝	27½	5
[3] 6	1856–68, 13 years, 400 lbs. Ammonia-salts; average produce 30⅛ cwts. 1869 and since, 300 lbs. Sulph. Potass, 100 lbs. Sulph. Soda, 100 lbs. Sulph. Magnesia, 3½ cwts. Superphos.; av. prod. (5 yrs., 1869–73) 32¼ cwts.	56½	16¼	37½	25½	26	31⅛	6
7	300 lbs. Sulphate Potass, 100 lbs. [4] Sulphate Soda, 100 lbs. Sulphate Magnesia, and 3½ cwts. Superphosphate	54⅜	17½	39⅜	37¾	34¾	35½	7
[3] 8	1856–61, 6 years, 300 lbs. Sulph. Potass, 200 lbs. Sulph. Soda, 100 lbs. Sulph. Magnesia, and 3½ cwts. Superphosphate; average produce 36 cwts. 1862 and since, 250 lbs. [5] Sulphate Soda, 100 lbs. Sulphate Magnesia, and 3½ cwts. Superphosphate; average produce (12 years, 1862–73) 28½ cwts.	46⅜	12¾	30	22⅞	18⅜	31	8
9	300 lbs. Sulphate Potass, 100 lbs. [4] Sulphate Soda, 100 lbs. Sulphate Magnesia, 3½ cwts. Superphosphate, and 400 lbs. Ammonia-salts	68¾	29⅛	58¾	50½	43¾	52⅛	9
[3] 10	1856–61, 6 yrs. 300 lbs. Sulph. Potass, 200 lbs. Sulph. Soda, 100 lbs. Sulph. Magnesia, 3½ cwts. Superphos., 400 lbs. Amm.-salts; av. prod. 55⅓ cwts. 1862 and since, 250 lbs. [5] Sulph. Soda, 100 lbs. Sulph. Magnesia, 3½ cwts. Superphos., 400 lbs. Amm.-salts; av. prod. (12 yrs., 1862–73) 43¾ cwts.	57¼	21¼	46½	38⅝	33	47⅝	10
11 {1	300 lbs. Sulph. Potass, 100 lbs. [4] Sulph. Soda, 100 lbs. Sulph. Magnesia, 3½ cwts. Superphosph., 800 lbs. [6] Ammonia-salts	75¼	42⅜	56⅝	63⅝	46¾	60¼	1
11 {2	300 lbs. Sulph. Potass, 100 lbs. [4] Sulph. Soda, 100 lbs. Sulph. Magnesia, 3½ cwts. Superphosph., 800 lbs. [6] Ammonia-salts, and 400 lbs. Silicate Soda [7]	78½	49½	65¾	63⅞	56½	65¼	2 } 11
12	Unmanured continuously	38¾	11¼	26⅜	20⅛	16⅛	24½	12
13	300 lbs. Sulph. Potass, 100 lbs. [4] Sulph. Soda, 100 lbs. Sulph. Magnesia, 3½ cwts. Superphosph., 400 lbs. Ammonia-salts, 2000 lbs. Cut Wheat-straw	77⅝	48	63	62⅝	57	57⅜	13
14	550 lbs. Nitrate of Soda [8], 300 lbs. Sulphate Potass, 100 lbs. [4] Sulphate Soda, 100 lbs. Sulphate Magnesia, and 3½ cwts. Superphosphate	76⅛	56¼	61⅞	55½	51¾	57⅜	14
15	550 lbs. Nitrate of Soda	53½	15½	38⅝	32⅝	33⅜	36⅜ [10]	15
16	275 lbs. Nitrate of Soda, 300 lbs. Sulphate Potass, 100 lbs. [4] Sulphate Soda, 100 lbs. Sulphate Magnesia, and 3½ cwts, Superphosphate	74¼	33⅛	57	40	41⅛	47⅛ [10]	16
17	275 lbs. Nitrate of Soda	54¾	19¼	38½	29⅝	28½	34¾ [10]	17
18	Mixture supplying the quantity of Potass, Soda, Lime, Magnesia, Phosphoric acid, Silica, and Nitrogen, contained in 1 ton of Hay (commencing 1865)	55⅝	14⅝	37⅞	33⅜	26⅛	33 [11]	18
19	275 lbs. Nitrate of Soda, 290 lbs. Sulphate of Potass, and 3½ cwts. Superphosphate (commencing 1872)	..	..	..	40	38⅜	39⅜	19
20	327 lbs. Nitrate of Potass, and 3½ cwts. Superphosphate (commencing 1872)	..	..	..	38½	36	37¼	20

(1) "Ammonia-salts"—in all cases equal parts Sulphate and Muriate of Ammonia of Commerce.
(2) The "Superphosphate of Lime" is, in all cases, made from 200 lbs. Bone-ash, 150 lbs. Sulphuric Acid Sp. gr. 1·7 (and water).
(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) 200 lbs. 1856–63 inclusive.
(5) 500 lbs. in 1862 and 1863.
(6) Only 400 lbs. in 1859–60–61.
(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 15 years only, as the manures specified were first applied in 1859 (previously, 1856–7 and 8, Sawdust only).
(10) Average of 16 years only, as these experiments did not commence until 1858.
(11) Average of 9 years only, as the experiment only commmenced in 1865.