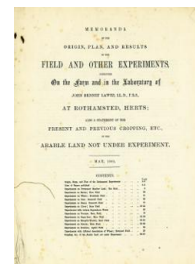


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ROTHAMSTED
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Memoranda of the Field Experiments at Rothamsted: May 1881



[Full Table of Content](#)

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.

During the first 19 years of the experiments, 1856-1874, the first crop only, each year, was mown, made into hay, removed from the land, and weighed. As a rule, the second crop was fed-off by sheep having no other food, the object being not to disturb the condition of the manuring. A given number was allotted to each Plot, according to the amount of produce, penned upon a portion of it, and the area extended, day by day, until the whole was eaten down. Frequently, however, the animals suffered considerably; and in 1866, 1870, 1873, and 1874, the second crops (and third, if any) were cut, and spread on the respective Plots. In the twentieth season, 1875, the second crops being unusually heavy, and the weather favourable, they were, for the first time, cut, weighed as hay, and removed. In 1877 and 1878 the second crops were again made into hay, weighed, and removed. In 1879 the second crops were cut, sampled, carted, and weighed, green; the dry matter in the weighed samples was determined, and the produce reckoned into hay by adding one-fourth to the calculated dry matter per acre. In 1880 the second crops were again made into hay, weighed and removed. It is intended in future to adopt this plan whenever the weather will permit. Owing to this change in the treatment of the crops, the average produce per annum is given, separately, for the first 20 years, 1856-1875, first crops only, and for the succeeding 5 years, 1876-1880, first and second crops (18).

(Area under experiments, about 7 acres.)

PLOTS.	Manures, per acre, per Annum.	PRODUCE PER ACRE, WEIGHED AS HAY.											
		Average per Annum, 20 Years, 1856-75. (First Crops only.)		Average per Annum, 5 Years, 1876-80. (First and Second Crops.)		Average per Annum, 20 Years, 1856-75. (First Crops only.)		Average per Annum, 5 Years, 1876-80. (First and Second Crops.)		Twenty-fifth Season, 1880.			
		Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	First Crops.	Second Crops.		
1	(1856-63, 8 years, 14 tons Farmyard Manure, and 200 lbs. Ammonia-salts (1); average produce 49½ cwts. (18))	48½	37½	43	32½	367	23½	167	12½	15	7½	22½	1
2	(1856-63, 8 years, 14 tons Farmyard Manure; average produce 42½ cwts. (18))	41½	32	367	23½	167	12½	15	7½	11	7½	18½	2
3	(1856-63, 8 years, 14 tons Farmyard Manure; average produce 42½ cwts. (18))	22½	20	21½	167	12½	29½	33½	14	7½	6½	14½	3
4	(1856-63, 8 years, 14 tons Farmyard Manure; average produce 42½ cwts. (18))	21½	21½	22½	33½	30½	33½	14	4½	9	9	18	4
5	(1856-63, 8 years, 14 tons Farmyard Manure; average produce 42½ cwts. (18))	33½	30½	32½	19½	14½	34½	8½	17	8½	8½	17	5
6	(1856-63, 8 years, 14 tons Farmyard Manure; average produce 42½ cwts. (18))	31½	30½	26½	20½	20½	33½	14½	49½	6½	6½	30	6
7	(1856-63, 8 years, 14 tons Farmyard Manure; average produce 42½ cwts. (18))	33½	36½	35½	35½	18½	53½	22½	6½	6½	6½	29	7
8	(1856-63, 8 years, 14 tons Farmyard Manure; average produce 42½ cwts. (18))	33½	26½	30½	26½	12½	37½	16½	4½	4½	4½	21	8
9	(1856-63, 8 years, 14 tons Farmyard Manure; average produce 42½ cwts. (18))	53½	46½	51	58½	20	73½	40½	15	15	15	55½	9
10	(1856-63, 8 years, 14 tons Farmyard Manure; average produce 42½ cwts. (18))	52½	39½	46½	40½	20½	60½	25½	14½	14½	14½	40½	10
11	(1856-78 300 lbs., 1879 and since, 500 lbs. Sulph. Potass., 100 lbs. Sulph. Magnesia, and 3½ cwts. Superphosphate; average produce 56½ cwts. (18))	61½	57½	57½	58	38½	61½	30	82	30	30	62	11
12	(1856-78 300 lbs., 1879 and since, 500 lbs. Sulph. Potass., 100 lbs. Sulph. Magnesia, and 3½ cwts. Superphosphate; average produce 56½ cwts. (18))	63½	61½	62½	62½	39½	62½	44½	27½	27½	27½	72½	12
13	(1856-78 300 lbs., 1879 and since, 500 lbs. Sulph. Potass., 100 lbs. Sulph. Magnesia, and 3½ cwts. Superphosphate; average produce 56½ cwts. (18))	25	22½	24	17½	14½	32½	9½	9½	9½	9½	19	13
14	(1856-78 300 lbs., 1879 and since, 500 lbs. Sulph. Potass., 100 lbs. Sulph. Magnesia, and 3½ cwts. Superphosphate; average produce 56½ cwts. (18))	55½	59½	57½	59	24½	88½	51½	17	17	17	68½	14
15	(1856-78 300 lbs., 1879 and since, 500 lbs. Sulph. Potass., 100 lbs. Sulph. Magnesia, and 3½ cwts. Superphosphate; average produce 56½ cwts. (18))	53½	60½	57	54½	15½	69½	51½	9	9	9	60½	15
16	(1856-78 300 lbs., 1879 and since, 500 lbs. Sulph. Potass., 100 lbs. Sulph. Magnesia, and 3½ cwts. Superphosphate; average produce 56½ cwts. (18))	36½	35	38½	28½	14½	48½	19	9½	9½	9½	28½	16
17	(1856-78 300 lbs., 1879 and since, 500 lbs. Sulph. Potass., 100 lbs. Sulph. Magnesia, and 3½ cwts. Superphosphate; average produce 56½ cwts. (18))	45½	47½	46½	44½	16	60½	37½	11	11	11	48½	17
18	(1856-78 300 lbs., 1879 and since, 500 lbs. Sulph. Potass., 100 lbs. Sulph. Magnesia, and 3½ cwts. Superphosphate; average produce 56½ cwts. (18))	34½	33½	33½	29½	13½	49½	21½	14	14	14	35½	18
19	(1856-78 300 lbs., 1879 and since, 500 lbs. Sulph. Potass., 100 lbs. Sulph. Magnesia, and 3½ cwts. Superphosphate; average produce 56½ cwts. (18))	21	33½	33½	33½	39½	16½	50½	20	20	20	34½	19
20	(1856-78 300 lbs., 1879 and since, 500 lbs. Sulph. Potass., 100 lbs. Sulph. Magnesia, and 3½ cwts. Superphosphate; average produce 56½ cwts. (18))	..	..	..	..	..	..	..	..	..	..	..	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 1868-69-70-71.
 (7) The application of Silicates did not commence until 1862; 8 years (1862-1870), 200 lbs. Silicate Lime, and 200 lbs. Silicate Soda; 1871, and since, 400 lbs. Silicate Soda.
 (8) As the second crops were not removed in 1876, those of 1875, which were, are brought in to give the 5 years, average of second crops.
 (9) 550 lbs. Nitrate of Soda is reckoned to contain the same amount of Nitrogen as 400 lbs. of Ammonia-salts.
 (10) The manures specified were first applied in 1859 (previously, 1856-7 and 8, Sawdust only).
 (11) Averages of 8 years, 10 years, and 18 years, as these experiments did not commence until 1868.
 (12) Averages of 4 years, 10 years, and 11 years, as the experiment only commenced in 1866.
 (13) Averages of 4 years only, 1872-75.
 (14) As the second crops were not removed in 1876, those of 1875, which were, are brought in to give the 5 years, average of second crops.