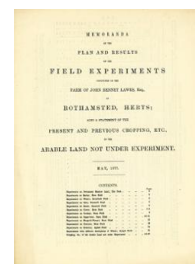


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# Memoranda of the Field Experiments at Rothamsted: May 1877



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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.)

PLOTS.	Manures, per acre, per Annum.	PRODUCE PER ACRE, WEIGHED AS HAY.										PLOTS.	
		Average per Annum.					Twenty-fourth Season, 1875 (18).						
		10 Years, 1866-66, (C)	Cwts.	1866-76, (C)	Cwts.	20 Years, 1866-76, (C)	Cwts.	First Crop.	Cwts.	Second Crop.	Cwts.		Total.
1	{1856-63, 8 years, 14 tons Farmyard Manure, and 200 lbs. Ammonia-salts; average produce 49½ cwts. } {1864 and since, 200 lbs. Ammonia-salts alone; average produce (12 years, 1864-75) 38½ cwts. }	48½	37½	43	33½	32	26½	33½	17½	51½	29½	1	29½
2	{1856-63, 8 years, 14 tons Farmyard Manure; average produce 42½ cwts. } {1864 and since, unmanured; average produce (12 years, 1864-75) 32½ cwts. }	41½	32	36½	26½	20	21½	20	19½	38½	20½	2	20½
3	Unmanured, continuously.	22½	20	21½	20	21½	20	19½	19½	32½	12½	3	12½
4	3½ cwts. Superphosphate of Lime (1)	23½	21½	22½	21½	21½	21½	15	16	36½	16½	4	16½
5	3½ cwts. Superphosphate of Lime, and 400 lbs. Ammonia-salts	33½	30½	32½	32½	30½	30½	14	14	51	36½	11	36½
6	400 lbs. Ammonia-salts	30½	22	26½	24½	22	26½	18	18	42½	17½	5	17½
7	{1856-63, 13 years, 400 lbs. Ammonia-salts; average produce 30½ cwts. } {1869 and since, 300 lbs. Sulph. Potass, 100 lbs. Sulph. Soda, 100 lbs. Sulph. Magnesia, and 3½ cwts. Superphosphate	31½	30½	30½	30½	30½	30½	35	15	50½	32	6	32
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. Sulphate Soda, 100 lbs. Sulphate Magnesia, and 3½ cwts. Superphosphate; average produce (14 years, 1862-75) 27½ cwts. }	33½	26½	30½	26½	26½	30½	40	24	64½	34½	7	34½
9	300 lbs. Sulphate Potass, 100 lbs. Sulph. Soda, 100 lbs. Sulph. Magnesia, and 3½ cwts. Superphosphate	53	48½	51	48½	48½	51	28	16	44½	24½	8	24½
10	{1856-61, 6 yrs. 300 lbs. Sulph. Potass, 200 lbs. Sulph. Soda, 100 lbs. Sulph. Magnesia, and 3½ cwts. Superphosphate; average produce 55½ cwts. } {1876 and since, 300 lbs. Sulph. Potass, 100 lbs. Sulph. Soda, 100 lbs. Sulph. Magnesia, and 3½ cwts. Superphosphate; average produce (14 years, 1876-90) 42½ cwts. }	52½	39	46	43	39	46	52	24	76½	50	9	50
11	300 lbs. Sulph. Potass, 100 lbs. Sulph. Soda, 100 lbs. Sulph. Magnesia, and 3½ cwts. Superphosphate	61½	58	57	46	57	46	43	67½	40	40	10	40
12	300 lbs. Sulph. Potass, 100 lbs. Sulph. Soda, 100 lbs. Sulph. Magnesia, and 3½ cwts. Superphosphate	63½	61½	62½	60	62½	60	52	67½	57	11	57	
13	Unmanured continuously	25	25	24	24	24	24	14	14	37½	14	12	14
14	300 lbs. Sulphate Potass, 100 lbs. Sulph. Soda, 100 lbs. Sulph. Magnesia, and 3½ cwts. Superphosphate	55½	59	57	57	59	57	65	30	95	66½	13	66½
15	550 lbs. Nitrate of Soda, 800 lbs. Sulphate Potass, 100 lbs. Sulphate Soda, 100 lbs. Sulphate Magnesia, and 3½ cwts. Superphosphate	53	60½	57	62½	57	62½	62	17	80½	64½	14	64½
16	275 lbs. Nitrate of Soda, 300 lbs. Sulphate Potass, 100 lbs. Sulphate Soda, 100 lbs. Sulphate Magnesia, and 3½ cwts. Superphosphate	36	35	38	29	38	29	29	42	30	15	30	
17	275 lbs. Nitrate of Soda	45½	47	46	45	47	46	45	16	61½	41½	16	41½
18	Mixture supplying the quantity of Potass, Soda, Lime, Magnesia, Phosphoric acid, Silica, and Nitrogen, contained in 1 ton of Hay (commencing 1865)	34½	33	33	30	33	30	30	18	43	25	17	25
19	275 lbs. Nitrate of Soda, 290 lbs. Sulphate of Potass, and 3½ cwts. Superphosphate (commencing 1872)	21	33	32	32	33	32	34	50	31	18	31	
20	327 lbs. Nitrate of Potass, and 3½ cwts. Superphosphate (commencing 1872)	..	..	..	41	..	41	20	61	37	19	37	
		..	..	..	38	..	38	21	63	38	20	38	

(1) "Ammonia-salts" - in all cases equal parts Sulphate and Nitrate 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, laid, 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) The manures specified were first applied in 1859 (previously, 1856-7 and 8, Sawdust only).  
 (10) Averages of 8 years, 10 years, and 18 years, as these experiments did not commence until 1858.  
 (11) Averages of 4 years only, 1872-75.  
 (12) In previous years the second crop has either been fed off by sheep, without other food, or mown and left on the ground; but in the twentieth season, 1875, it was so unusually heavy, that it was cut, weighed as hay, and removed.  
 (13) The second crop of the twentieth season (1875) is not included in these averages, as in all other years the first crop only was weighed and removed.