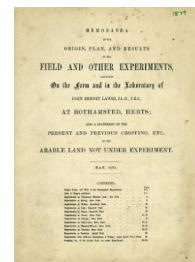


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ROTHAMSTED  
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# Memoranda of the Field Experiments at Rothamsted: May 1879



[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 was applied year after year to the same Plot. 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 1876 they were cut and spread on the Plots. In 1877 and 1878 the second crops were again made into hay, weighed, and removed; and it is intended, in future, to adopt this plan, whenever the weather will permit.

(Area under experiment, about 7 acres.)

Plots.	Manures, per acre, per Annum.	PRODUCE PER ACRE, WEIGHED AS HAY.													
		Average per Annum. (First Crops only.)						Twenty-second Season, 1877.						Twenty-third Season, 1878.	
		10 Years, 1856-65.	10 Years, 1866-75.	20 Years, 1866-75.	Cwts.	10 Years, 1856-65.	10 Years, 1866-75.	20 Years, 1866-75.	Cwts.	First Crop.	Second Crop.	Total.	First Crop.	Second Crop.	Total.
1	(1856-65, 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. }	45½	37½	43	42½	42½	42½	42½	30½	17½	62½	30½	17½	48½	
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	32½	32½	32½	32½	21	15½	48½	21	15½	36½	
3	Unmanured, continuously	42½	20	21½	21	21	21	21	17½	13½	38½	16½	13½	29½	
4	3½ cwts. Superphosphate of Lime (a)	25½	21½	22½	27½	27½	27½	27½	19½	15½	46½	19½	15½	34½	
5	3½ cwts. Superphosphate of Lime, and 400 lbs. Ammonia-salts	33½	30½	32½	42	42	42	42	32½	21½	55½	32½	21½	54	
6	400 lbs. Ammonia-salts	30½	22	26½	26½	26½	26½	26½	17½	18½	46½	17½	18½	36	
7	(1856-68, 13 years, 400 lbs. Ammonia-salts; average produce 30½ cwts. } (1869-78 300 lbs., Sulph. Potass., 100 lbs. Sulph. Soda, 100 lbs. Sulph. Mag., 3½ cwts. Superphos.; av. prod. (7 yrs., 1869-75) 31½ cwts. }	31½	30½	30½	37½	37½	37½	37½	37	18½	57½	37	18½	55½	
8	(1856-61, 6 years, 300 lbs. Sulph. Potass., 100 lbs. Sulph. Soda, 100 lbs. Sulph. Mag., 3½ cwts. Superphos.; av. prod. 36 cwts. } (1862 and since, 250 lbs. Sulph. Potass., 100 lbs. Sulph. Soda, 100 lbs. Sulph. Mag., 3½ cwts. Superphos.; av. prod. (14 years, 1862-75) 27½ cwts. }	33½	26½	30½	32½	32½	32½	32½	22½	17½	48	22½	17½	40	
9	(1856-78 300 lbs., Sulph. Potass., 100 lbs. Sulph. Soda, 100 lbs. Sulph. Mag., 3½ cwts. Superphos., and 400 lbs. Ammonia-salts	53½	48½	51	54	54	54	54	56	24½	76	56	24½	80½	
10	(1856-61, 6 yrs. 300 lbs. Sulph. Potass., 200 lbs. Sulph. Soda, 100 lbs. Sulph. Mag., 3½ cwts. Superphos., 400 lbs. Amm.-salts; av. prod. 55½ cwts. } (1862 and since, 250 lbs. Sulph. Potass., 100 lbs. Sulph. Soda, 100 lbs. Sulph. Mag., 3½ cwts. Superphos., 400 lbs. Amm.-salts; av. prod. (14 yrs., 1862-75) 42½ cwts. }	52½	39½	46½	43½	43½	43½	43½	41	22	68½	41	22	63	
11	(1856-78 300 lbs., Sulph. Potass., 100 lbs. Sulph. Soda, 100 lbs. Sulph. Mag., 3½ cwts. Superphos., 800 lbs. Ammonia-salts } (1856-78 300 lbs., Sulph. Pot., 100 lbs. Sulph. Soda, 100 lbs. Sulph. Mag., 3½ cwts. Superphos., 800 lbs. Amm.-salts, and 400 lbs. Silic. Soda (c)	61½	59½	57½	60½	60½	60½	60½	51½	41½	109½	51½	41½	93	
12	Unmanured continuously	25	22½	24	19½	19½	19½	19½	16	16	44½	16	16	32½	
13	(1856-78 300 lbs., Sulph. Pot., 100 lbs. Sulph. Soda, 100 lbs. Sulph. Mag., 3½ cwts. Superphos., 400 lbs. Amm.-salts, 2000 lbs. Cut Wheat-straw } (1862 and since, 250 lbs. Sulph. Pot., 100 lbs. Sulph. Soda, 100 lbs. Sulph. Mag., 3½ cwts. Superphos., 400 lbs. Amm.-salts; av. prod. (14 yrs., 1862-75) 42½ cwts. }	55½	59½	57½	56	56	56	56	55	29½	85	55	29½	84½	
14	550 lbs. Nitrate of Soda (e), 1858-78 300 lbs., Sulph. Potass., 100 lbs. Sulph. Soda, 100 lbs. Sulph. Mag., 3½ cwts. Superphos., and 3½ cwts. Superphosphate	53½	60½	57	56	56	56	56	48	15½	75	48	15½	63½	
15	(1858-75, 18 years, 550 lbs. Nitrate Soda } (1876-78 300 lbs., Sulph. Potass., 100 lbs. Sulph. Soda, 100 lbs. Sulph. Mag., 3½ cwts. Superphosphate	36½	35	35½	33½	33½	33½	33½	25½	21½	51½	25½	21½	46½	
16	275 lbs. Nitrate of Soda, 1879 500 lbs., Sulphate Potass., 100 lbs. Sulphate Magnesia, and 3½ cwts. Superphosphate	45½	47½	46½	54½	54½	54½	54½	42½	20½	75	42½	20½	63½	
17	275 lbs. Nitrate of Soda, 1858-78 300 lbs., Sulph. Potass., 100 lbs. Sulph. Soda, 100 lbs. Sulph. Mag., and 3½ cwts. Superphosphate	34½	33½	33½	33½	33½	33½	33½	27½	14½	49½	27½	14½	41½	
18	Mixture supplying the quantity of Potass., Soda, Lime, Magnesia, Phosphate acid, Silica, and Nitrogen, contained in 1 ton of Hay (commencing 1865)	21	33½	32½	40½	40½	40½	40½	34½	17½	60	34½	17½	51½	
19	275 lbs. Nitrate of Soda, 280 lbs. Sulphate of Potass., and 3½ cwts. Superphosphate (commencing 1872)	..	..	38½	42½	42½	42½	42½	39½	17½	61½	39½	17½	56½	
20	327 lbs. Nitrate of Potass., and 3½ cwts. Superphosphate (commencing 1872)	..	..	36½	46	46	46	46	42½	14	62½	42½	14	56½	

(a) "Ammonia-salts" - in all cases equal parts Sulphate and Muriate of Ammonia of Commerce.  
 (b) The "Superphosphate of Lime" is, in all cases, made from 200 lbs. Bone-ash, 150 lbs. Sulphuric Acid Sp. gr. 1.7, and 10 water.  
 (c) 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.  
 (d) 200 lbs. 1856-63 inclusive.  
 (e) 500 lbs. in 1862 and 1863.  
 (f) Only 400 lbs. in 1859-60-61.  
 (g) The application of Silicates did not commence until 1862; 9 years (1862-1870), 200 lbs. Silicate Lime, and 200 lbs. Silicate Soda; 1871, and since, 400 lbs. Silicate Soda.  
 (h) 550 lbs. Nitrate of Soda is reckoned to contain the same amount of Nitrogen as 400 lbs. of "Ammonia-salts."  
 (i) The manures specified were first applied in 1859 (previously, 1856-7 and 8, Sawdust only).  
 (j) Averages of 8 years, 10 years, and 18 years, as these experiments did not commence until 1858.  
 (k) Averages of (1 year), 10 years, and 11 years, as the experiment only commenced in 1865.  
 (l) Averages of 4 years only, 1872-75.