

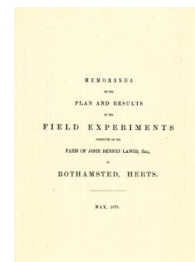
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Memoranda of the Field Experiments at Rothamsted, May 1873

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Experiments on Wheat; Broadbalk Field

Rothamsted Research

Rothamsted Research (1874) *Experiments on Wheat; Broadbalk Field* ; Memoranda Of The Field Experiments At Rothamsted, May 1873, pp 4 - 4 - DOI: <https://doi.org/10.23637/ERADOC-1-237>

BROADBALK FIELD.

EXPERIMENTS ON THE GROWTH OF WHEAT YEAR AFTER YEAR ON THE SAME LAND; WITHOUT MANURE, AND WITH DIFFERENT KINDS OF MANURE. Previous Cropping—1839, Turnips, with Farnyard Manure; 1840, Barley; 1841, Peas; 1842, Wheat; 1843, Oats; the last four Crops Unmanured. First Experimental Wheat Crop in 1844. Wheat every year since; and, with some exceptions, nearly the same description of Manure on the same Plots each year—especially during the last 21 years. Unless otherwise stated, the Manures are sown in the Autumn before the seed.

(Area under experiment, about 13 acres.)

PLOTS.	Manures, per acre, per annum.	PRODUCE PER ACRE.					
		Average per Annum, 20 Years, 1852-1871.			Twenty-ninth Season, 1872.		
		Dressed Corn.	Total Straw.	Weight per Bushel.	Dressed Corn.	Total Straw.	Weight per Bushel.
0	Superphosphate of Lime (three times as much as on No. 5 and succeeding Plots)	1 bushel = (about) 0.40 Hectare or 1.59 Prussian Morgen.	17 1/2	15 1/2	17 1/2	16 1/2	0
1	Sulphates of Potass, Soda, and Magnesia (twice as much as on No 5 and succeeding Plots)	1 lb. (pound avoird.) = (about) 0.36 Hectolitre or 0.66 Prussian Scheffel.	15 1/2	13 1/2	10 1/2	11 1/2	1
2	Farnyard Manure (14 tons every year)	1 cwt. (hundredweight) = (about) 51.0 Kilogrammes or 142.2 Centner.	35 1/2	33 1/2	32 1/2	33 1/2	2
3	Unmanured continuously	1 lb. per acre = (about) 1.12 Kilogramme per Hectare or 0.57 Zollv. Pfd. per Pr. Morgen.	14 1/2	13	10 1/2	10 1/2	3
4	Unmanured for Crop of 1852, and since; previously Superphosphate (made with Muriatic Acid), and Sulphate Ammonia	1 cwt. per acre = (about) 125.5 Kilogrammes per Hectare or 0.64 Centner per Pr. Morgen.	15 1/2	13 1/2	11 1/2	10 1/2	4
5 (a and b)	200 lbs. Ⓞ Sulphate Potass, 100 lbs. Ⓞ Sulphate Soda, 100 lbs. Sulphate Magnesia, 3 1/2 cwt. Superphosphate of Lime Ⓞ		17	15 1/2	12 1/2	60	5 (a and b)
6 (a and b)	200 lbs. Ⓞ Sulphate Potass, 100 lbs. Ⓞ Sulphate Soda, 100 lbs. Sulphate Magnesia, 3 1/2 cwt. Superphos., and 200 lbs. Ammonia-salts Ⓞ		26 1/2	24 1/2	20 1/2	22 1/2	6 (a and b)
7 (a and b)	200 lbs. Ⓞ Sulphate Potass, 100 lbs. Ⓞ Sulphate Soda, 100 lbs. Sulphate Magnesia, 3 1/2 cwt. Superphos., and 400 lbs. Ammonia-salts		85 1/2	59 1/2	35 1/2	60 1/2	7 (a and b)
8 (a and b)	200 lbs. Ⓞ Sulphate Potass, 100 lbs. Ⓞ Sulphate Soda, 100 lbs. Sulphate Magnesia, 3 1/2 cwt. Superphos., and 600 lbs. Ammonia-salts		38 1/2	59	41 1/2	60 1/2	8 (a and b)
9 { a } { b }	200 lbs. Ⓞ Sulphate Potass, 100 lbs. Ⓞ Sulphate Soda, 100 lbs. Sulphate Magnesia, 3 1/2 cwt. Superphos., and 550 lbs. Nitrate Soda Ⓞ		36 1/2	53 1/2	40 1/2	60	9 { a } { b }
10 { a } { b }	550 lbs. Nitrate of Soda Ⓞ. (The Nitrate for both 9a and 9b always sown in the Spring.)		26	58 1/2	28 1/2	55 1/2	10 { a } { b }
11 (a and b)	400 lbs. Ammonia-salts alone, for 1845, and each year since (excepting 1846 and 1850); Mineral Manure in 1844, '48, and '50		22 1/2	57 1/2	21 1/2	56 1/2	11 (a and b)
12 (a and b)	400 lbs. Ammonia-salts, 3 1/2 cwt. Superphosphate		28	57 1/2	26 1/2	59 1/2	12 (a and b)
13 (a and b)	400 lbs. Ammonia-salts, 3 1/2 cwt. Superphosphate, and 366 1/2 lbs. Ⓞ Sulphate of Soda		33 1/2	59 1/2	29 1/2	59 1/2	13 (a and b)
14 (a and b)	400 lbs. Ammonia-salts, 3 1/2 cwt. Superphosphate, and 200 lbs. Ⓞ Sulphate of Potass		33 1/2	59 1/2	30 1/2	59 1/2	14 (a and b)
15 { a } { b }	400 lbs. Ammonia-salts, 3 1/2 cwt. Superphosphate, and 280 lbs. Ⓞ Sulphate of Magnesia		37	59 1/2	32 1/2	59 1/2	15 { a } { b }
16 (a and b)	200 lbs. Ⓞ Sulph. Pot., 100 lbs. Ⓞ Sulph. Sod., 100 lbs. Sulph. Mag., 3 1/2 cwt. Superphos., Ⓞ; 400 lbs. Amm.-salts, sown in Spring Ⓞ		32 1/2	59 1/2	30 1/2	59 1/2	16 (a and b)
(10) { 17 (a and b) { 18 (a and b) { 19 { 20 { 21 { 22	{ 1852-54, 13 years, 200 lbs. Sulph. Potass, 100 lbs. Sulph. Soda, 100 lbs. Sulphate Magnesia, and 3 1/2 cwt. Superphos., and 800 lbs. Ammonia-salts; average produce 39 1/2 bush. Corn, 46 1/2 cwt. Straw { 1865 and since, unmanured; average produce (7 years, 1865-71) 19 1/2 bushels Corn, 16 1/2 cwt. Straw 200 lbs. Ⓞ Sulphate Potass, 100 lbs. Ⓞ Sulphate Soda, 100 lbs. Sulphate Magnesia, and 3 1/2 cwt. Superphosphate 400 lbs. Ammonia-salts 3 1/2 cwt. Superphosphate of Lime Ⓞ ⁽¹¹⁾ , 800 lbs. Sulphate of Ammonia, and 500 lbs. Rape-cake Unmanured continuously 200 lbs. Ⓞ Sulph. Potass, 100 lbs. Ⓞ Sulph. Soda, 100 lbs. Sulph. Magnesia, and 100 lbs. Muriate Ammonia 200 lbs. Ⓞ Sulph. Potass, 100 lbs. Ⓞ Sulph. Soda, 100 lbs. Sulph. Magnesia, 3 1/2 cwt. Superphos., and 100 lbs. Muriate Ammonia 200 lbs. Ⓞ Sulph. Potass, 100 lbs. Ⓞ Sulph. Soda, 100 lbs. Sulph. Magnesia, 3 1/2 cwt. Superphos., and 100 lbs. Sulphate Ammonia		17 1/2 (12) 18 1/2 (13) 19 20 21 22	16 1/2 (12) 15 1/2 (13) 19 18 1/2 (14) 19 1/2 (15) 19	16 1/2 (12) 15 1/2 (13) 19 18 1/2 (14) 19 1/2 (15) 19	16 1/2 (12) 15 1/2 (13) 19 18 1/2 (14) 19 1/2 (15) 19	17 (a and b) 18 (a and b) 19 20 21 22

(11) 800 lbs. per annum for Crop of 1858; and previously.
 (12) 200 lbs. per annum for Crop of 1868, and previously.
 (13) Superphosphate of Lime—in all cases, excepting for Plot 19, made from 200 lbs. Bone-ash, 150 lbs. Sulphuric acid sp. gr. 1.7 (and water).
 (14) The "Ammonia-salts," in all cases, equal parts Sulphate and Muriate of Ammonia of Commerce.
 (15) 9a 475 lbs. Nitrate Soda in 1852, 275 lbs. in 1853 and 1854, 550 lbs. each year since; 9b 475 lbs. in 1852; 550 lbs. each year since; 550 lbs. is reckoned to contain the same amount of Nitrogen as 400 lbs. "Ammonia-salts."
 (16) For 1858, and previously—1 1/2 time as much.
 (17) For 1872 and previously, made with Muriatic instead of Sulphuric Acid.
 (18) For 1872 and previously, 400 lbs. Sulphate Ammonia, sown in the Autumn.
 (19) For 1872 and previously, 300 lbs. Sulphate Ammonia and 500 lbs. Rape-cake, sown in the Autumn.
 (20) The Manures of Plots 17 and 18 are, year by year, transposed.
 (21) Made with Muriatic instead of Sulphuric Acid.
 (22) Average of 20 years' Mineral Manures, alternated with Ammonia-salts.
 (23) Average of 20 years' Ammonia-salts, alternated with Mineral Manures.
 (24) Plots 17 had the Ammonia-salts for the Crop of 1872.
 (25) Plots 18 had the Mineral Manures for the Crop of 1872.
 (26) Average of 19 years only; as in 1868, owing to a mistake in carting, the produce could not be ascertained.
 The Plots marked "(a and b)" are divided into duplicate portions, "a" and "b," respectively, which are manured alike; excepting that, for the crops of 1864-5-6 and 7, the "a" portions of plots 5, 6, 7, 8, 9, 16, and 17 (or 18), received a mixture of soluble Silicates in addition to the other Manures, but, hitherto, without any material effect; and for the crops of 1868, and since, cut straw (that produced in the previous season) has been applied (instead of Silicates) on the "a" portions of plots 5, 6, 7, 8, 11, 12, 13, 14, and 17 (or 18).