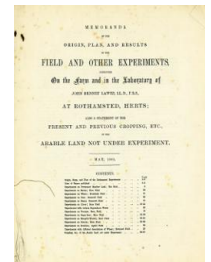


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Memoranda of the Field Experiments at Rothamsted: May 1881

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Experiments on Wheat; Broadbalk Field

Rothamsted Research

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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 Farmyard 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 30 years (1852 and since). The Crop of the present year, 1881, is, therefore, the 38th Wheat Crop in succession. From the commencement of the experiments in 1843-4 up to 1876-7 inclusive, the mineral manures, the ammonia-salts, and rape-cake, &c., if any, were sown in the autumn, before the seed; in 1845, when, owing to the wet autumn and winter, all the manures were spring-sown; and for the crops of 1873, 4, 5, 6, and 7, the ammonia-salts applied to Plot 15 were top-dressed in the spring. Nitrate of soda has, however, always been sown in the spring. But, in consequence of the ascertained great loss of the nitrogen of the manures by drainage, especially in wet winters, it has been decided to apply only the mineral manures (and Farmyard-manure) in the autumn, and the ammonia-salts, as well as the nitrate, in the spring; excepting on Plot 15, where, for comparison, the ammonia-salts are sown in the autumn. This plan was adopted for the first time for the crop of 1878.

(Area under experiment, about 13 acres.)

Plots.		PRODUCE PER ACRE.												Plots.
		Average per Annum.						Total Straw.						
		Dressed Corn.						Total Straw.						
		Quantity.						Quantity.						
		14 Years, 1852-65.	14 Years, 1866-79.	28 Years, 1852-79.	14 Years, 1860-73.	14 Years, 1874-87.	14 Years, 1888-01.	14 Years, 1860-73.	28 Years, 1860-79.	14 Years, 1874-87.	14 Years, 1888-01.	14 Years, 1860-73.	14 Years, 1874-87.	
0	Superphosphate of Lime (three times as much as on No. 5 and succeeding Plots)	18	14	16	15	15	11	13	12	15	11	0		
1	Sulphates of Potash, Soda, and Magnesia (twice as much as on No. 5 and succeeding Plots)	16	10	13	12	12	9	12	11	11	11	1		
2	Farmyard Manure (14 tons every year)	35	31	33	33	33	30	32	34	38	34	2		
3	Unmanured continuously	15	11	13	12	12	9	12	11	11	11	3		
4	Unmanured for Crop of 1852, and since; previously Superphosphate (made with Muratic Acid), and Sulphate Ammonia	16	11	14	13	13	10	12	12	12	12	4		
5 (a and b)	200 lbs. 0 Sulphate Potash, 100 lbs. 0 Sulphate Soda, 100 lbs. Sulphate Magnesia, 3 1/2 cwt. Superphos., 200 lbs. Ammonia-salts	28	19	24	24	24	18	23	26	26	26	5 (a and b)		
6 (a and b)	200 lbs. 0 Sulphate Potash, 100 lbs. 0 Sulphate Soda, 100 lbs. Sulphate Mag., 3 1/2 cwt. Superphos., 400 lbs. Ammonia-salts	37	28	35	35	35	29	33	34	34	34	6 (a and b)		
7 (a and b)	200 lbs. 0 Sulphate Potash, 100 lbs. 0 Sulphate Soda, 100 lbs. Sulphate Mag., 3 1/2 cwt. Superphos., 600 lbs. Ammonia-salts	39	33	36	36	36	29	34	35	35	35	7 (a and b)		
8 (a and b)	200 lbs. 0 Sulphate Potash, 100 lbs. 0 Sulphate Soda, 100 lbs. Sulphate Mag., 3 1/2 cwt. Superphos., 550 lbs. Nitrate Soda	36	30	33	33	33	25	30	31	31	31	8 (a and b)		
9 {a b}	550 lbs. Nitrate of Soda &c. (The Nitrate for both 9c and 9d always sown in the Spring)	26	21	24	24	24	17	22	23	23	23	9 {a b}		
10 {a b}	400 lbs. Ammonia-salts alone, for 1845, and each year since; Mineral Manure in 1844	23	18	21	21	21	15	19	20	20	20	10 {a b}		
11 (a and b)	400 lbs. Ammonia-salts alone, for 1845, and each year since (except 1846 and 1850); Mineral Manure 1844, '48, '50	27	19	23	23	23	17	21	22	22	22	11 (a and b)		
12 (a and b)	400 lbs. Ammonia-salts, 3 1/2 cwt. Superphosphate	30	22	26	26	26	21	25	26	26	26	12 (a and b)		
13 (a and b)	400 lbs. Ammonia-salts, 3 1/2 cwt. Superphosphate, and 366 1/2 lbs. 0 Sulphate of Soda	35	26	31	31	31	25	30	32	32	32	13 (a and b)		
14 (a and b)	400 lbs. Ammonia-salts, 3 1/2 cwt. Superphosphate, and 200 lbs. 0 Sulphate of Potash	35	27	31	31	31	25	30	32	32	32	14 (a and b)		
15 {a b}	400 lbs. Ammonia-salts, 3 1/2 cwt. Superphosphate, and 280 lbs. 0 Sulphate of Magnesia	35	27	31	31	31	25	30	32	32	32	15 {a b}		
16 (a and b)	200 lbs. 0 Sulph. Pot., 100 lbs. 0 Sulph. Sod., 100 lbs. Sulph. Mag., 3 1/2 cwt. Superphos., 400 lbs. Amm.-salts, in Autm.	33	27	30	30	30	23	27	29	29	29	16 (a and b)		
17 (a and b)	200 lbs. 0 Sulph. Pot., 100 lbs. 0 Sulph. Sod., 100 lbs. Sulph. Mag., 3 1/2 cwt. Superphos., 400 lbs. Amm.-salts, in Autm.	35	28	31	31	31	25	30	32	32	32	17 (a and b)		
18 (a and b)	1852-64, 13 years, 200 lbs. Sulph. Potash, 100 lbs. Sulph. Soda, 100 lbs. Sulph. Mag., 3 1/2 cwt. Superphos., and 800 lbs. Ammonia-salts; average produce 39 1/2 bush. Corn, 46 1/2 cwt. Straw	39	13	26	26	26	12	15	17	17	17	18 (a and b)		
19	1865 and since, unmanured; average produce 16 bush. Corn, 18 1/2 cwt. Superphos., 13 1/2 cwt. Superphos., 13 1/2 cwt. Superphos.	18	13	15	15	15	11	14	15	15	15	19		
20	1878-9, and since, 1700 lbs. Rape-cake; 1852-78, 3 1/2 cwt. Superph. Lime, 300 lbs. Sulph. Am., and 500 lbs. Rape-cake, in Autm.	32	24	28	28	28	20	24	26	26	26	20		
21	Unmanured continuously	15	11	13	12	12	9	12	11	11	11	21		
22	200 lbs. 0 Sulph. Potash, 100 lbs. 0 Sulph. Soda, 100 lbs. Sulph. Mag., 3 1/2 cwt. Superphos., 100 lbs. Muric Acid	22	17	19	19	19	14	17	18	18	18	22		
23	200 lbs. 0 Sulph. Potash, 100 lbs. 0 Sulph. Soda, 100 lbs. Sulph. Mag., 3 1/2 cwt. Superphos., 100 lbs. Sulphate Ammonia	21	18	19	19	19	14	17	18	18	18	23		

(a) The Manures of Plots 17 and 18 are, year by year, transposed.
(b) Made with Muratic instead of Sulphuric Acid.
(c) Averages of Mineral Manures, alternated with Ammonia-salts.
(d) Averages of Ammonia-salts, alternated with Mineral Manures.
(e) Averages of Ammonia-salts, alternated with Mineral Manures.
(f) Averages of Ammonia-salts, alternated with Mineral Manures.
(g) Averages of Ammonia-salts, alternated with Mineral Manures.
(h) Averages of Ammonia-salts, alternated with Mineral Manures.
(i) Averages of Ammonia-salts, alternated with Mineral Manures.
(j) Averages of Ammonia-salts, alternated with Mineral Manures.
(k) Averages of Ammonia-salts, alternated with Mineral Manures.
(l) Averages of Ammonia-salts, alternated with Mineral Manures.
(m) Averages of Ammonia-salts, alternated with Mineral Manures.
(n) Averages of Ammonia-salts, alternated with Mineral Manures.
(o) Averages of Ammonia-salts, alternated with Mineral Manures.
(p) Averages of Ammonia-salts, alternated with Mineral Manures.
(q) Averages of Ammonia-salts, alternated with Mineral Manures.
(r) Averages of Ammonia-salts, alternated with Mineral Manures.
(s) Averages of Ammonia-salts, alternated with Mineral Manures.
(t) Averages of Ammonia-salts, alternated with Mineral Manures.
(u) Averages of Ammonia-salts, alternated with Mineral Manures.
(v) Averages of Ammonia-salts, alternated with Mineral Manures.
(w) Averages of Ammonia-salts, alternated with Mineral Manures.
(x) Averages of Ammonia-salts, alternated with Mineral Manures.
(y) Averages of Ammonia-salts, alternated with Mineral Manures.
(z) Averages of Ammonia-salts, alternated with Mineral Manures.