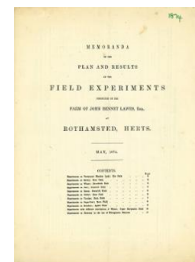


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Experiments on Wheat; Broadbalk Field

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 23 years (1852 and since). 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.			Thirtieth Season, 1873.				
		Dressed Corn.		Total Straw.	Dressed Corn.		Total Straw.		
		Quantity.	Weight per Bushel.	Quantity.	Weight per Bushel.	Quantity.	Weight per Bushel.		
0	Superphosphate of Lime (three times as much as on No. 5 and succeeding Plots)	17 1/2	58 1/2	15 1/2	57 1/2	15 1/2	57 1/2	10 1/2	0
1	Sulphates of Potass, Soda, and Magnesia (twice as much as on No. 5 and succeeding Plots)	15 1/2	58 1/2	13 1/2	56 1/2	10 1/2	56 1/2	8 1/2	1
2	Farmyard Manure (14 tons every year)	35 1/2	60	33 1/2	58 1/2	23 1/2	58 1/2	22	2
3	Unmanured continuously	14 1/2	57 1/2	13	57	11 1/2	57	8	3
4	Unmanured for Crop of 1852, and since; previously Superphosphate (made with Muriatic Acid), and Sulphate Ammonia	15 1/2	58 1/2	13 1/2	57 1/2	19 1/2	57 1/2	8 1/2	4
5 (a and b)	200 lbs. (c) Sulphate Potass, 100 lbs. (c) Sulphate Soda, 100 lbs. Sulphate Magnesia, 3 1/2 cwt. Superphosphate of Lime (c)	17	58 1/2	15 1/2	58 1/2	12 1/2	56 1/2	9 1/2	5 (a and b)
6 (a and b)	200 lbs. (c) Sulphate Potass, 100 lbs. (c) Sulphate Soda, 100 lbs. Sulphate Magnesia, 3 1/2 cwt. Superphosph., and 200 lbs. Ammonia-salts (c)	26 1/2	59 1/2	24 1/2	57	15 1/2	57	13 1/2	6 (a and b)
7 (a and b)	200 lbs. (c) Sulphate Potass, 100 lbs. (c) Sulphate Soda, 100 lbs. Sulphate Magnesia, 3 1/2 cwt. Superphosph., and 400 lbs. Ammonia-salts	35 1/2	59 1/2	35 1/2	57 1/2	22	57 1/2	18	7 (a and b)
8 (a and b)	200 lbs. (c) Sulphate Potass, 100 lbs. (c) Sulphate Soda, 100 lbs. Sulphate Magnesia, 3 1/2 cwt. Superphosph., and 600 lbs. Ammonia-salts	38 1/2	59 1/2	41 1/2	56 1/2	27 1/2	56 1/2	23 1/2	8 (a and b)
9 (a and b)	200 lbs. (c) Sulphate Potass, 100 lbs. (c) Sulphate Soda, 100 lbs. Sulphate Magnesia, 3 1/2 cwt. Superphosph., and 650 lbs. Nitrate Soda (c)	36 1/2	58 1/2	41 1/2	57 1/2	37 1/2	57 1/2	35 1/2	9 (a and b)
10 (a and b)	550 lbs. Nitrate of Soda (c). (The Nitrate for both 9a and 9b always sown in the Spring.)	28 1/2	56 1/2	28 1/2	54 1/2	21 1/2	54 1/2	21	10 (a and b)
11 (a and b)	400 lbs. Ammonia-salts alone, for 1845, and each year since; Mineral Manure in 1844	22 1/2	57 1/2	21 1/2	56 1/2	19 1/2	56 1/2	14 1/2	11 (a and b)
12 (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	25 1/2	58 1/2	24 1/2	56 1/2	20 1/2	56 1/2	14 1/2	12 (a and b)
13 (a and b)	400 lbs. Ammonia-salts, 3 1/2 cwt. Superphosphate	28	57 1/2	26 1/2	55 1/2	19 1/2	55 1/2	14 1/2	13 (a and b)
14 (a and b)	400 lbs. Ammonia-salts, 3 1/2 cwt. Superphosphate, and 366 1/2 lbs. (c) Sulphate of Soda	33 1/2	59 1/2	32 1/2	56 1/2	22 1/2	56 1/2	17 1/2	14 (a and b)
15 (a and b)	400 lbs. Ammonia-salts, 3 1/2 cwt. Superphosphate, and 280 lbs. (c) Sulphate of Magnesia	33 1/2	59 1/2	33 1/2	57 1/2	23 1/2	57 1/2	18 1/2	15 (a and b)
16 (a and b)	200 lbs. (c) Sulph. Pot., 100 lbs. (c) Sulph. Soda, 100 lbs. Sulph. Mag., 3 1/2 cwt. Superphosph. (c); 400 lbs. Amm.-salts, sown in Spring (c)	32 1/2	59 1/2	32 1/2	56 1/2	24 1/2	56 1/2	19 1/2	16 (a and b)
17 (a and b)	200 lbs. (c) Sulph. Pot., 100 lbs. (c) Sulph. Soda, 100 lbs. Sulph. Mag., 3 1/2 cwt. Superphosph. (c); 400 lbs. Amm.-salts, sown in Spring (c)	34	59 1/2	33 1/2	57 1/2	25 1/2	57 1/2	20 1/2	17 (a and b)
18 (a and b)	1852-54, 13 years, 200 lbs. Sulph. Potass, 100 lbs. Sulph. Soda, 100 lbs. Sulph. Mag., 3 1/2 cwt. Superphosph., and 800 lbs. Ammonia-salts; average produce 39 1/2 bush. Corn, 46 1/2 cwt. Straw	32 1/2	59	32 1/2	57 1/2	25 1/2	57 1/2	21 1/2	18 (a and b)
19	1865 and since, unmanured; average produce (9 years, 1865-73) 17 1/2 bushels Corn, 1 1/2 cwt. Straw	32 1/2	59	36 1/2	57 1/2	12 1/2	57 1/2	10 1/2	19
20	3 1/2 cwt. Superphosphate of Lime (c), 300 lbs. Sulphate of Ammonia, and 500 lbs. Rape-cake	31 1/2 (12)	59 1/2 (12)	31 1/2 (12)	57 1/2 (12)	11 1/2 (12)	57 1/2 (12)	9 1/2 (12)	20
21	Unmanured continuously	17 1/2 (13)	58 1/2 (13)	16 1/2 (13)	57 1/2 (13)	20 1/2 (13)	57 1/2 (13)	17 1/2 (13)	21
22	200 lbs. (c) Sulph. Potass, 100 lbs. (c) Sulph. Soda, 100 lbs. Sulph. Magnesia, 3 1/2 cwt. Superphosph., and 100 lbs. Muriate Ammonia	21 1/2	58 1/2	19 1/2	56 1/2	14 1/2	56 1/2	11 1/2	22

(1) 300 lbs. per annum for Crop of 1858, and previously.
 (2) 200 lbs. per annum for Crop of 1858, and previously.
 (3) 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).
 (4) Ammonia-salts, in all cases, equal parts Sulphate and Muriate of Ammonia of Commerce.
 (5) 9a, 47 1/2 lbs. Nitrate Soda, in 1852, 27 1/2 lbs. in 1853, and 1854, 550 lbs. each year since; 9b, 47 1/2 lbs. in 1852; 550 lbs. each year since; 550 lbs. is reckoned to contain the same amount of Nitrogen as 400 lbs. Ammonia-salts.
 (6) For 1858, and previously—1 1/2 times as much.
 (7) For 1872 and previously, made with Muriatic instead of Sulphuric Acid.
 (8) For 1872 and previously, 400 lbs. Sulphate Ammonia, sown in the Autumn.
 (9) For 1872 and previously, 300 lbs. Sulphate Ammonia and 500 lbs. Rape-cake, sown in the Autumn.
 (10) The Minures of Plots 17 and 18 are, year by year, transposed.
 (11) Made with Muriatic instead of Sulphuric Acid.
 (12) Average of 20 years' Ammonia-salts, alternated with Mineral Manures.
 (13) Average of 20 years' Mineral Manures, alternated with Ammonia-salts.
 (14) Plots 17 had the Mineral Manures for the Crop of 1873.
 (15) Average of 19 years only; as, in 1869, owing to a mistake in carting, the produce could not be ascertained.
 (16) The Plots marked "a" and "b" are divided into duplicate portions, "a" and "b," respectively, which are manured alike, excepting that, for the crop of 1861-63 and 7, the "a" portions of plots 5, 6, 7, 8, 9, 10, and 17 (or 18), received a quantity of soluble Silicates in addition to the other Manures, but, hitherto, without any material effect; and for the crops of 1868, and all since, the produce in the portions manured in the present 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).