

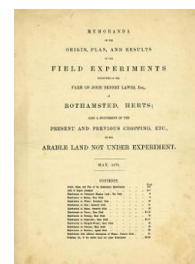
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Yields of the Field Experiments 1878

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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 27 years (1852 and since). 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; excepting 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 ammonia-salts 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 to be sown in the autumn; and on Plot 19, where the ammonia-salts are mixed in, when the superphosphate is made. This plan is adopted for the first time for the present crop, 1877-8.

Plots.	PRODUCE PER ACRE.												Plots.						
	Average per Annum.						Total Straw.												
	Quantity.		Weight per Bushel.		Dressed Corn.		Quantity.		Dressed Corn.		Total Straw.								
0	18 1/2	17 1/2	16 1/2	15 1/2	14 1/2	13 1/2	12 1/2	11 1/2	10 1/2	9 1/2	8 1/2	7 1/2	6 1/2	5 1/2	4 1/2	3 1/2	2 1/2	1 1/2	0
1	16 1/2	15 1/2	14 1/2	13 1/2	12 1/2	11 1/2	10 1/2	9 1/2	8 1/2	7 1/2	6 1/2	5 1/2	4 1/2	3 1/2	2 1/2	1 1/2	0	1	
2	15 1/2	14 1/2	13 1/2	12 1/2	11 1/2	10 1/2	9 1/2	8 1/2	7 1/2	6 1/2	5 1/2	4 1/2	3 1/2	2 1/2	1 1/2	0	2		
3	14 1/2	13 1/2	12 1/2	11 1/2	10 1/2	9 1/2	8 1/2	7 1/2	6 1/2	5 1/2	4 1/2	3 1/2	2 1/2	1 1/2	0	3			
4	13 1/2	12 1/2	11 1/2	10 1/2	9 1/2	8 1/2	7 1/2	6 1/2	5 1/2	4 1/2	3 1/2	2 1/2	1 1/2	0	4				
5 (a and b)	12 1/2	11 1/2	10 1/2	9 1/2	8 1/2	7 1/2	6 1/2	5 1/2	4 1/2	3 1/2	2 1/2	1 1/2	0	5 (a and b)					
6 (a and b)	11 1/2	10 1/2	9 1/2	8 1/2	7 1/2	6 1/2	5 1/2	4 1/2	3 1/2	2 1/2	1 1/2	0	6 (a and b)						
7 (a and b)	10 1/2	9 1/2	8 1/2	7 1/2	6 1/2	5 1/2	4 1/2	3 1/2	2 1/2	1 1/2	0	7 (a and b)							
8 (a and b)	9 1/2	8 1/2	7 1/2	6 1/2	5 1/2	4 1/2	3 1/2	2 1/2	1 1/2	0	8 (a and b)								
9 { a } b	8 1/2	7 1/2	6 1/2	5 1/2	4 1/2	3 1/2	2 1/2	1 1/2	0	9 { a } b									
10 { a } b	7 1/2	6 1/2	5 1/2	4 1/2	3 1/2	2 1/2	1 1/2	0	10 { a } b										
11 (a and b)	6 1/2	5 1/2	4 1/2	3 1/2	2 1/2	1 1/2	0	11 (a and b)											
12 (a and b)	5 1/2	4 1/2	3 1/2	2 1/2	1 1/2	0	12 (a and b)												
13 (a and b)	4 1/2	3 1/2	2 1/2	1 1/2	0	13 (a and b)													
14 (a and b)	3 1/2	2 1/2	1 1/2	0	14 (a and b)														
15 { a } b	2 1/2	1 1/2	0	15 { a } b															
16 (a and b)	1 1/2	0	16 (a and b)																
17 (a and b)	0	17 (a and b)																	
18 (a and b)	0	18 (a and b)																	
19	0	19																	
20	0	20																	
21	0	21																	
22	0	22																	

(Area under experiment, about 13 acres.)

Manures, per acre, per annum.

1 cwt. = (about) 0.40 Hectare ... or 1.59 Prussian Morgen.
 1 bushel = (about) 0.36 Hectolitre ... or 0.66 Prussian Scheffel.
 1 lb. (pound avoird.) = (about) 0.45 Kilogramme ... or 0.91 Zollverein Pfund.
 1 cwt. (hundredweight) = (about) 51.0 Kilogramme ... or 1.02 Centner.
 1 bushel per acre = (about) 0.9 Hectolitre per Hectare ... or 0.42 Pr. Scheffel per Pr. Morgen.
 1 lb. per acre = (about) 1.12 Kilogramme per Hectare ... or 0.57 Zoll. Pfd. per Pr. Morgen.
 1 cwt. per acre = (about) 125.5 Kilogramme per Hectare ... or 0.64 Centner per Pr. Morgen.

Superphosphate of Lime (three times as much as on No. 5 and succeeding Plots) ...
 Sulphates of Potash, Soda, and Magnesia (twice as much as on No. 5 and succeeding Plots) ...
 Farmyard Manure (14 tons every year) ...
 Unmanured continuously ...
 Unmanured for Crop of 1852, and since; previously Superphosphate (made with Muriatic Acid), and Sulphate Ammonia ...
 200 lbs. (a) Sulphate Potash, 100 lbs. (b) Sulphate Soda, 100 lbs. Sulphate Magnesia, 3 1/2 cwt. Superphosphate of Lime (a) ...
 200 lbs. (a) Sulphate Potash, 100 lbs. (b) Sulphate Soda, 100 lbs. Sulphate Mag., 3 1/2 cwt. Superphos., 200 lbs. Ammonia-salts (a) ...
 200 lbs. (a) Sulphate Potash, 100 lbs. (b) Sulphate Soda, 100 lbs. Sulphate Mag., 3 1/2 cwt. Superphos., 400 lbs. Ammonia-salts ...
 200 lbs. (a) Sulphate Potash, 100 lbs. (b) Sulphate Soda, 100 lbs. Sulphate Mag., 3 1/2 cwt. Superphos., 600 lbs. Ammonia-salts ...
 200 lbs. (a) Sulphate Potash, 100 lbs. (b) Sulphate Soda, 100 lbs. Sulphate Mag., 3 1/2 cwt. Superphos., 550 lbs. Nitrate Soda (a) ...
 550 lbs. Nitrate of Soda (a). (The Nitrate for both 9a and 9b always sown in the Spring) ...
 400 lbs. Ammonia-salts alone, for 1845, and each year since; Mineral Manure in 1844 ...
 400 lbs. Ammonia-salts alone, for 1845, and each year since (except 1846 and 1850); Mineral Manure 1844, 48, 50 ...
 400 lbs. Ammonia-salts, 3 1/2 cwt. Superphosphate ...
 400 lbs. Ammonia-salts, 3 1/2 cwt. Superphosphate, and 366 1/2 lbs. (a) Sulphate of Soda ...
 400 lbs. Ammonia-salts, 3 1/2 cwt. Superphosphate, and 200 lbs. (a) Sulphate of Potash ...
 400 lbs. Ammonia-salts, 3 1/2 cwt. Superphosphate, and 280 lbs. (a) Sulphate of Magnesia ...
 200 lbs. (a) Sulph. Pot., 100 lbs. (b) Sulph. Sod., 100 lbs. Sulph. Mag., 3 1/2 cwt. Superphos. (a); 400 lbs. Amm.-salts, in Autm. (a) ...
 200 lbs. (a) Sulph. Pot., 100 lbs. (b) Sulph. Sod., 100 lbs. Sulph. Mag., 3 1/2 cwt. Superphos. (a); 400 lbs. Amm.-salts, in Autm. (a) ...
 {1852-64, 15 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, 4 1/2 cwt. Straw ...
 {1865 and since, unmanured; average produce (12 years, 1865-76) 16 1/2 bushels Corn, 1 1/2 cwt. Straw ...
 400 lbs. Ammonia-salts ...
 3 1/2 cwt. Superphosphate of Lime (a), 300 lbs. Sulphate of Ammonia, and 500 lbs. Rape-cake, in Autumn ...
 Unmanured continuously ...
 200 lbs. (a) Sulph. Potash, 100 lbs. (b) Sulph. Soda, 100 lbs. Sulph. Mag., 3 1/2 cwt. Superphos., 100 lbs. Muriate Ammonia ...
 200 lbs. (a) Sulph. Potash, 100 lbs. (b) Sulph. Soda, 100 lbs. Sulph. Mag., 3 1/2 cwt. Superphos., 100 lbs. Sulphate Ammonia

Plots.	PRODUCE PER ACRE.												Plots.						
	Average per Annum.						Total Straw.												
	Quantity.		Weight per Bushel.		Dressed Corn.		Quantity.		Dressed Corn.		Total Straw.								
0	18 1/2	17 1/2	16 1/2	15 1/2	14 1/2	13 1/2	12 1/2	11 1/2	10 1/2	9 1/2	8 1/2	7 1/2	6 1/2	5 1/2	4 1/2	3 1/2	2 1/2	1 1/2	0
1	16 1/2	15 1/2	14 1/2	13 1/2	12 1/2	11 1/2	10 1/2	9 1/2	8 1/2	7 1/2	6 1/2	5 1/2	4 1/2	3 1/2	2 1/2	1 1/2	0	1	
2	15 1/2	14 1/2	13 1/2	12 1/2	11 1/2	10 1/2	9 1/2	8 1/2	7 1/2	6 1/2	5 1/2	4 1/2	3 1/2	2 1/2	1 1/2	0	2		
3	14 1/2	13 1/2	12 1/2	11 1/2	10 1/2	9 1/2	8 1/2	7 1/2	6 1/2	5 1/2	4 1/2	3 1/2	2 1/2	1 1/2	0	3			
4	13 1/2	12 1/2	11 1/2	10 1/2	9 1/2	8 1/2	7 1/2	6 1/2	5 1/2	4 1/2	3 1/2	2 1/2	1 1/2	0	4				
5 (a and b)	12 1/2	11 1/2	10 1/2	9 1/2	8 1/2	7 1/2	6 1/2	5 1/2	4 1/2	3 1/2	2 1/2	1 1/2	0	5 (a and b)					
6 (a and b)	11 1/2	10 1/2	9 1/2	8 1/2	7 1/2	6 1/2	5 1/2	4 1/2	3 1/2	2 1/2	1 1/2	0	6 (a and b)						
7 (a and b)	10 1/2	9 1/2	8 1/2	7 1/2	6 1/2	5 1/2	4 1/2	3 1/2	2 1/2	1 1/2	0	7 (a and b)							
8 (a and b)	9 1/2	8 1/2	7 1/2	6 1/2	5 1/2	4 1/2	3 1/2	2 1/2	1 1/2	0	8 (a and b)								
9 { a } b	8 1/2	7 1/2	6 1/2	5 1/2	4 1/2	3 1/2	2 1/2	1 1/2	0	9 { a } b									
10 { a } b	7 1/2	6 1/2	5 1/2	4 1/2	3 1/2	2 1/2	1 1/2	0	10 { a } b										
11 (a and b)	6 1/2	5 1/2	4 1/2	3 1/2	2 1/2	1 1/2	0	11 (a and b)											
12 (a and b)	5 1/2	4 1/2	3 1/2	2 1/2	1 1/2	0	12 (a and b)												
13 (a and b)	4 1/2	3 1/2	2 1/2	1 1/2	0	13 (a and b)													
14 (a and b)	3 1/2	2 1/2	1 1/2	0	14 (a and b)														
15 { a } b	2 1/2	1 1/2	0	15 { a } b															
16 (a and b)	1 1/2	0	16 (a and b)																
17 (a and b)	0	17 (a and b)																	
18 (a and b)	0	18 (a and b)																	
19	0	19																	
20	0	20																	
21	0	21																	
22	0	22																	

(a) 800 lbs. per annum for Crop of 1858, and previously.
 (b) 200 lbs. per annum for Crop of 1858, and previously.
 (c) 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).
 (d) The ammonia-salts, in all cases, equal parts Sulphate and Muriate of Ammonia of Commerce.
 (e) 94, 47 1/2 lbs. Nitrate of Soda in 1852, 97 1/2 lbs. in 1853 and 1854, 50 lbs. each year since. No Sulphate of Potash, or Magnesia, or Superphosphate, in 1852, 1853, or 1854, 96, 47 1/2 lbs. Nitrate in 1852, 550 lbs. each year since. Nitrate is reckoned to contain the same amount of Nitrogen as 400 lbs. "Ammonia-salts," for 1858, and previously—1 1/2 time as much.
 (f) For 1872 and previously, made with Muriate instead of Sulphuric Acid.
 (g) For 1872 and previously, 400 lbs. Sulphate Ammonia, sown in the Autumn; for 1873, 4, 5, 6, and 7, 400 lbs. Ammonia-salts, sown in the Spring; for 1878, 400 lbs. Ammonia-salts, sown in the Autumn.
 (h) For 1872 and previously, 300 lbs. Sulphate Ammonia and 500 lbs. Rape-cake, sown in the Autumn; for 1873, 4, 5, 6, and 7, 400 lbs. Ammonia-salts, sown in the Spring; for 1878, 400 lbs. Ammonia-salts, sown in the Autumn.
 (i) For 1872 and previously, 300 lbs. Sulphate Ammonia and 500 lbs. Rape-cake, sown in the Autumn; for 1873, 4, 5, 6, and 7, 400 lbs. Ammonia-salts, sown in the Spring; for 1878, 400 lbs. Ammonia-salts, sown in the Autumn.