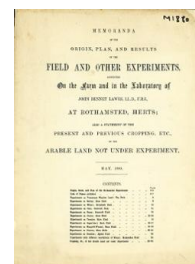


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Experiments on Wheat; Broadbalk Field

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 29 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 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 1875.

(Area under experiment, about 13 acres.)

PLOTS.	PRODUCE PER ACRE.												PLOTS.	
	Average per Annum.													
	Dressed Corn.						Total Straw.							
	Quantity.		Weight per Bushel.		Average per Annum.		Quantity.		Weight per Bushel.		Average per Annum.			
0	18 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	0
1	18 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	1
2	18 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	2
3	18 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	3
4	18 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	4
5 (a and b)	18 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	5 (a and b)
6 (a and b)	18 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	6 (a and b)
7 (a and b)	18 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	7 (a and b)
8 (a and b)	18 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	8 (a and b)
9 (a and b)	18 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	9 (a and b)
10 (a and b)	18 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	10 (a and b)
11 (a and b)	18 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	11 (a and b)
12 (a and b)	18 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	12 (a and b)
13 (a and b)	18 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 (a and b)
14 (a and b)	18 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	14 (a and b)
15 (a and b)	18 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	15 (a and b)
16 (a and b)	18 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	16 (a and b)
17 (a and b)	18 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	17 (a and b)
18 (a and b)	18 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	18 (a and b)
19	18 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	19
20	18 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	20
21	18 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	21
22	18 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	13 Years, 1862-71.	26 Years, 1862-71.	22

(1) 300 lbs. per annum for Crop of 1858, and previously.
 (2) 200 lbs. per annum for Crop of 1853, and previously.
 (3) 400 lbs. per annum for Crop of 1853, and previously.
 (4) 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).
 (5) The "Ammonia-salts," in all cases, equal parts Sulphate and Muriate of Ammonia of Commerce.
 (6) 96, 475 lbs. Nitrate of Soda in 1852, 275 lbs. in 1853, and 1854, 550 lbs. each year since. No Sulphate of Potash, Soda, or Magnesia, or Superphosphate, in 1852, 1853, or 1854. 96, 475 lbs. Nitrate in 1852, 550 lbs. each year since. 550 lbs. Nitrate is reckoned to contain the same amount of Nitrogen as 400 lbs. "Ammonia-salts."
 (7) For 1858, and previously—1/3 time as much.
 (8) For 1872 and previously, made with Muriatic instead of Sulphuric Acid.
 (9) 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 and since, 400 lbs. Ammonia-salts, sown in the Autumn.
 (10) 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 and since, 400 lbs. Ammonia-salts, sown in the Autumn.
 (11) Made with Muriatic instead of Sulphuric Acid.
 (12) Averages of Ammonia-salts, alternated with Mineral Manures.
 (13) Averages of Mineral Manures, alternated with Ammonia-salts.
 (14) Plots 17 had the Mineral Manures for the Crop of 1879.
 (15) Plots 18 had the Ammonia-salts for the Crop of 1879.
 (16) Averages of 13 years, 12 years, and 25 years only; as, in 1868, owing to a mistake in carting, the produce could not be ascertained.
 (17) The Manures of Plots 17 and 18 are, year by year, transposed.
 (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 to 1879 inclusive, cut straw (that produced in the previous season) was applied (instead of Silicates) on the "a" portions of plots 5, 6, 7, 8, 11, 12, 13, 14, and 17 (or 18); also for the crop of 1874, and each succeeding crop to 1879 inclusive, the straw of the previous season was cut up and applied to the "a" portion of Plot 13. For the crop of 1880, the straw is in no case returned to the land.