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# Memoranda of the Field Experiments at Rothamsted: May 1881



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## Experiments on Oats; Geescroft Field

### Rothamsted Research

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GEESCHOPT FIELD.

EXPERIMENTS ON THE GROWTH OF OATS YEAR AFTER YEAR ON THE SAME LAND; WITHOUT MANURE, AND WITH DIFFERENT KINDS OF MANURE.

Previous Cropping—1847 and 1848, Clover, Experimental Manures; 1849—1859, Beans, Experimental Manures; 1860, Fallow; 1861 and 1862, Wheat, Unmanured; 1863, Fallow; 1864, Beans, Dunged; 1865, Wheat, Unmanured; 1866, Beans, Unmanured; 1867 and 1868, Wheat, Unmanured.

The first Experimental Oat Crop was in 1869; the last in 1878, since which time, owing to the wetness and the foulness of the land, it has been left fallow.

(Area under Experiment,  $\frac{1}{2}$  acre.)

PLOTS.	MANURES, PER ACRE, PER ANNUM.	PRODUCE PER ACRE.																	
		1ST SEASON, 1869.			2ND SEASON, 1870.			3RD SEASON, 1871.			4TH SEASON, 1872.			5TH SEASON, 1873.			AVERAGE PER ANNUM 5 YEARS, 1869-1873.		
		Dressed Corn.	Total Straw.	Weight per bushel.	Dressed Corn.	Total Straw.	Weight per bushel.	Dressed Corn.	Total Straw.	Weight per bushel.	Dressed Corn.	Total Straw.	Weight per bushel.	Dressed Corn.	Total Straw.	Weight per bushel.	Dressed Corn.	Total Straw.	Weight per bushel.
1	Unmanured .. .. .	Bushels, 36 $\frac{1}{2}$	cwts. 19 $\frac{1}{2}$	lbs. 36 $\frac{1}{2}$	Bushels, 16 $\frac{1}{2}$	cwts. 9 $\frac{1}{2}$	lbs. 35	Bushels, 20 $\frac{1}{2}$	lbs. 33 $\frac{1}{2}$	cwts. 11 $\frac{1}{2}$	Bushels, 15	lbs. 36 $\frac{1}{2}$	cwts. 7 $\frac{1}{2}$	Bushels, 10 $\frac{1}{2}$	lbs. 27 $\frac{1}{2}$	cwts. 5 $\frac{1}{2}$	Bushels, 19 $\frac{1}{2}$	lbs. 33 $\frac{1}{2}$	cwts. 10 $\frac{1}{2}$
2	{ 200 lbs. Sulphate Potass, 100 lbs. Sulphate Soda, 400 lbs. Sulphate Magnesia, and 3 $\frac{1}{2}$ cwts. Superphosphate of Lime (1) .. .. .	45	24 $\frac{1}{2}$	38 $\frac{1}{2}$	19 $\frac{1}{2}$	9 $\frac{1}{2}$	35 $\frac{1}{2}$	22	35 $\frac{1}{2}$	13 $\frac{1}{2}$	19 $\frac{1}{2}$	37 $\frac{1}{2}$	10 $\frac{1}{2}$	17	28 $\frac{1}{2}$	8 $\frac{1}{2}$	24 $\frac{1}{2}$	35	13 $\frac{1}{2}$
3	400 lbs. Ammonia-salts (2) .. .. .	56 $\frac{1}{2}$	36 $\frac{1}{2}$	37 $\frac{1}{2}$	30	17 $\frac{1}{2}$	34 $\frac{1}{2}$	57 $\frac{1}{2}$	36 $\frac{1}{2}$	40 $\frac{1}{2}$	55 $\frac{1}{2}$	37 $\frac{1}{2}$	30 $\frac{1}{2}$	36 $\frac{1}{2}$	32 $\frac{1}{2}$	16 $\frac{1}{2}$	47	35 $\frac{1}{2}$	28 $\frac{1}{2}$
4	{ 400 lbs. Ammonia-salts, 200 lbs. Sulphate Potass, 100 lbs. Sulphate Soda, 100 lbs. Sulphate Magnesia, and 3 $\frac{1}{2}$ cwts. Superphosphate .. .. .	75 $\frac{1}{2}$	54	39 $\frac{1}{2}$	50 $\frac{1}{2}$	25 $\frac{1}{2}$	35 $\frac{1}{2}$	58 $\frac{1}{2}$	35 $\frac{1}{2}$	50	62 $\frac{1}{2}$	39 $\frac{1}{2}$	45 $\frac{1}{2}$	48 $\frac{1}{2}$	34 $\frac{1}{2}$	27 $\frac{1}{2}$	59	37	41 $\frac{1}{2}$
5	550 lbs. Nitrate of Soda (3) .. .. .	62 $\frac{1}{2}$	42 $\frac{1}{2}$	38 $\frac{1}{2}$	36 $\frac{1}{2}$	23	33 $\frac{1}{2}$	55	36 $\frac{1}{2}$	34 $\frac{1}{2}$	42 $\frac{1}{2}$	36 $\frac{1}{2}$	20 $\frac{1}{2}$	39 $\frac{1}{2}$	30 $\frac{1}{2}$	16 $\frac{1}{2}$	47 $\frac{1}{2}$	35 $\frac{1}{2}$	27 $\frac{1}{2}$
6	{ 550 lbs. Nitrate of Soda, 200 lbs. Sulphate Potass, 100 lbs. Sulphate Soda, 100 lbs. Sulphate Magnesia, and 3 $\frac{1}{2}$ cwts. Superphosphate .. .. .	69 $\frac{1}{2}$	49 $\frac{1}{2}$	38 $\frac{1}{2}$	50	23 $\frac{1}{2}$	33 $\frac{1}{2}$	60 $\frac{1}{2}$	33 $\frac{1}{2}$	48 $\frac{1}{2}$	44 $\frac{1}{2}$	37 $\frac{1}{2}$	24	63 $\frac{1}{2}$	33 $\frac{1}{2}$	24	57 $\frac{1}{2}$	35 $\frac{1}{2}$	35

  

PLOTS.	MANURES, PER ACRE, PER ANNUM.	PRODUCE PER ACRE.																	
		6TH SEASON, 1874.			7TH SEASON, 1875.			8TH SEASON, 1876 (1).			9TH SEASON, 1877 (2).			10TH SEASON, 1878.			AVERAGE PER ANNUM 4 YEARS, 1874, 5, 6, and 8.		
		Dressed Corn.	Total Straw.	Weight per bushel.	Dressed Corn.	Total Straw.	Weight per bushel.	Dressed Corn.	Total Straw.	Weight per bushel.	Dressed Corn.	Total Straw.	Weight per bushel.	Dressed Corn.	Total Straw.	Weight per bushel.	Dressed Corn.	Total Straw.	Weight per bushel.
1	Unmanured .. .. .	Bushels, 12	cwts. 7	lbs. 31 $\frac{1}{2}$	Bushels, 12 $\frac{1}{2}$	cwts. 5 $\frac{1}{2}$	lbs. 29 $\frac{1}{2}$	Bushels, 8 $\frac{1}{2}$	lbs. 32	cwts. 2 $\frac{1}{2}$	Bushels, ..	lbs. ..	cwts. ..	Bushels, 22 $\frac{1}{2}$	lbs. 32	cwts. 5 $\frac{1}{2}$	Bushels, 13 $\frac{1}{2}$	lbs. 31 $\frac{1}{2}$	cwts. 6
2	{ 200 lbs. Sulphate Potass, 100 lbs. Sulphate Soda, 100 lbs. Sulphate Magnesia, and 3 $\frac{1}{2}$ cwts. Superphosphate of Lime (1) .. .. .	13 $\frac{1}{2}$	6 $\frac{1}{2}$	31 $\frac{1}{2}$	13 $\frac{1}{2}$	6 $\frac{1}{2}$	29 $\frac{1}{2}$	7 $\frac{1}{2}$	30	2 $\frac{1}{2}$	..	..	..	17 $\frac{1}{2}$	36 $\frac{1}{2}$	8 $\frac{1}{2}$	13 $\frac{1}{2}$	31 $\frac{1}{2}$	6 $\frac{1}{2}$
3	200 lbs. Ammonia-salts (2) .. .. .	37 $\frac{1}{2}$	22 $\frac{1}{2}$	33 $\frac{1}{2}$	30 $\frac{1}{2}$	15 $\frac{1}{2}$	32 $\frac{1}{2}$	17 $\frac{1}{2}$	34 $\frac{1}{2}$	6	..	..	..	30	32 $\frac{1}{2}$	12 $\frac{1}{2}$	25 $\frac{1}{2}$	33 $\frac{1}{2}$	14 $\frac{1}{2}$
4	{ 200 lbs. Ammonia-salts, 200 lbs. Sulphate Potass, 100 lbs. Sulphate Soda, 100 lbs. Sulphate Magnesia, and 3 $\frac{1}{2}$ cwts. Superphosphate .. .. .	46 $\frac{1}{2}$	24 $\frac{1}{2}$	34 $\frac{1}{2}$	30 $\frac{1}{2}$	20 $\frac{1}{2}$	34 $\frac{1}{2}$	29 $\frac{1}{2}$	35 $\frac{1}{2}$	12 $\frac{1}{2}$	..	..	..	45 $\frac{1}{2}$	37	22 $\frac{1}{2}$	88	35 $\frac{1}{2}$	20
5	275 lbs. Nitrate of Soda (3) .. .. .	35 $\frac{1}{2}$	16 $\frac{1}{2}$	30 (4)	23 $\frac{1}{2}$	11 $\frac{1}{2}$ (5)	31 $\frac{1}{2}$ (6)	12 $\frac{1}{2}$	30 $\frac{1}{2}$	8 $\frac{1}{2}$	..	..	..	34 $\frac{1}{2}$	34 $\frac{1}{2}$	12 $\frac{1}{2}$	26 $\frac{1}{2}$	31 $\frac{1}{2}$	11 $\frac{1}{2}$
6	{ 275 lbs. Nitrate of Soda, 200 lbs. Sulphate Potass, 100 lbs. Sulphate Soda, 100 lbs. Sulphate Magnesia, and 3 $\frac{1}{2}$ cwts. Superphosphate .. .. .	23 $\frac{1}{2}$	16 $\frac{1}{2}$	33 $\frac{1}{2}$	28 $\frac{1}{2}$	14 $\frac{1}{2}$	33 $\frac{1}{2}$	19 $\frac{1}{2}$	33 $\frac{1}{2}$	8	..	..	..	37	36 $\frac{1}{2}$	17 $\frac{1}{2}$	25 $\frac{1}{2}$	34 $\frac{1}{2}$	14 $\frac{1}{2}$

(1) "Superphosphate of Lime"—in all cases, made from 200 lbs. Bone-ash, 150 lbs. Sulphuric Acid sp. gr. 1.7 (and water).  
 (2) "Ammonia-salts"—in each case, equal parts Sulphate and Muriate of Ammonia of Commerce.  
 (3) 550 lbs. Nitrate of Soda is reckoned to contain the same amount of Nitrogen as 400 lbs. "Ammonia-salts."  
 (4) On these plots, where large quantities of Nitrate of Soda had been applied year after year, the land, though more worked, was so wet that it could not be got into favourable condition for sowing, and the plant was very irregular.  
 (5) Owing to the extremely wet condition of the land, especially on the Nitrate plots, it was not sown until April 6, and then with a very unfavourable seed bed; and there being a heavy fall of snow a week later, the plant came up very irregularly, and much of it perished from standing surface-water.  
 (6) Owing to the very wet winter, 1876-7, the land could not be worked in time for sowing, and was therefore left fallow in 1877; no manures being applied.

SECOND 5 YEARS; MINERAL MANURES AS BEFORE, AMMONIA-SALTS AND NITRATE OF SODA ONLY HALF AS MUCH AS PREVIOUSLY.