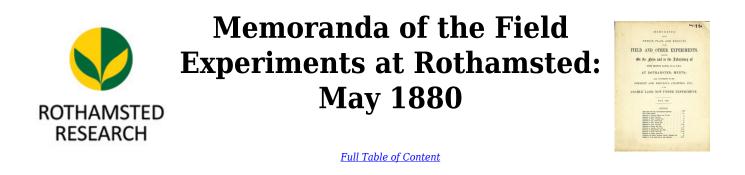
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## **Experiments on Wheat; Broadbalk Field**

## **Rothamsted Research**

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BROADBALK FIELD.

Experiments on THE GROWTH OF WHEAT YEAR AFTER YEAR ON THE SAME LAND; WITHOUT MANUR, AND WITH DIFFERENT KINDS OF MANUR. Previous Cropping -1839, Turnips, with Farnyard 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 commonement of the experiments in 1843-4 up to 1876-7 inclusive, the mineral manures, the ammonia-salts, and rupe-each were, some in the autumn, before the seed and since). From the commonement of the experiments in 1843-4 up to 1876-7 inclusive, the mineral manures, the ammonia-salts, and rup-each, were some in the autumn, before the seed and since). From the commonia-salts applied to Plot 15 were top-dressed in the excepting in 1845, when commonia-salts applied to Plot 15 were top-dressed in the spring. Niture of sola has, however, always been sown in the spring. But, in consequence of the accertained great loss of the mitrogen of the manures by drainage, especially in were manuscalts.

		T8.		1						5 (a and b)	7 (a and b)	t and b)			11 (a and b)	12 (a and b)	13 (a and b)	14 (a and b)		16 (a and b)	x  and  b) x  and  b)					
		PLOT8.				> +	4 63	en	4	5 (0	2 (0	8 (a	9)6 9)6	$10 \begin{cases} a \\ b \end{cases}$	11 (6	12 (6	13 (6	14 (6	$15\left\{ b \\ b \\ b \\ c \\$	16 (c	17 (a) 18 (a)			21	22	
*	leason,		Total		Cwta.	98 37	20	29	65 e	589 F	282	874	987 988	8 10 <b>4</b> }	18	22	273	258	88 28 12	14	$5_8^{g(14)}$ $29_8^{\gamma(16)}$	112	68	108	16	ting, the vhich are 6, and 17 material
	Thirty-Sixth Season, 1879.	Dressed Corn.	Wolaht	Bushel.	Ibs.	40 J	563 563	524	511	533	800 203	56 <u>3</u>	563 492	482 523	543	253	573	274	521 523	$52\frac{1}{8}$	51 58 <b>≵</b>	531	53	54	553	te in carl tively, w 8, 9, 16 hout any teor the
	Thir	Dresse		Quantity.	Bushels.	44 ( 214 1	28 1 6	48	4 68	28	101 101	104 206	212 45	4	- 11 <sup>1</sup>	14	16	162	2 <sup>2</sup> 2	44	31 208		_	00 00	117	a mistal b,' respe ts 5, 6, 7 herto, wit
				26 Years, 1862-77.	Cwta.	144	12 <b>4</b> 801	117	124	13§	278 877	202 268	413 264	201 221	24 <u>3</u>	30 <sup>8</sup>	32	30g	31 32§	30 <mark>1</mark>	294(12) 144(13)	274	$24\frac{3}{4}(^{16})$	173	18	owing to " and " " and " but, hit in the p
		Total Straw		13 Years, 1865-77.	Cwta.	126	946 100	0.2	26	108	18	282	42 <del>4</del> 24 <del>4</del>	164	20 <u>3</u>	$25\frac{1}{8}$	$27\frac{1}{8}$	$25_{\frac{1}{8}}$	28 29‡	$13\frac{1}{2}$	25 12	23	108	$14\frac{7}{8}$	$15\frac{2}{8}$	es. es. in 1868, in orbitions, " a "monues producede 13, 14, a
PER ACR	5	5	F	13 Years, 1852-64.	Cwts.	164	154	146	154	168	278 872	388 428	405 284	233	291 291	353	36	353	34 36	465	533	313	15	$20\frac{1}{8}$	204	, transpos al Manur monia-sal 1879. 79. nly; as, nly; as, the other aw (that
PRODUCE PER ACRE	num.	Dressed Corn.	shel.	26 Years, 1852-77.	lbs.	581	581	608 677	583	583	594	59 <u>4</u> 591	584 564	57 573	573	59 <u>1</u>	597 °	291	597 592	58 <del>7</del>	598(12) 582(13)	583	57 <sup>3</sup> / <sub>4</sub> ( <sup>16</sup> )	583	583	<ul> <li>(10) The Manures of Plots 17 and 18 nrs, year by year, transposed.</li> <li>(11) Made with Murintie instead of Sulptures Acid.</li> <li>(12) Averages of Annonia-sults, alternated with Mineral Manures.</li> <li>(13) Averages of Annonia-sults, alternated with Mineral Manures.</li> <li>(14) Plots 17 had the Mineral Manures, alternated with Mineral Manures.</li> <li>(15) Plots 17 had the Mineral Manures, alternated with Mineral Manures.</li> <li>(15) Plots 17 had the Mineral Manures, alternated with Mineral Manures.</li> <li>(16) Plots 17 had the Mineral Manures, alternated with Mineral Manures.</li> <li>(17) Plots 17 had the Mineral Manures, alternated with Mineral Manures.</li> <li>(18) Plots 17 had the Mineral Manures, alternated for the Crop of 1879.</li> <li>(19) Plots 18 had the Mineral Manures, alternated in duplication scales.</li> <li>(19) Plots 17 had the Mineral Manures, alternated in duplication produce could not be ascertaina.</li> <li>(19) Plots 18 had the Mineral Manures, alternated the duplication scales.</li> <li>(10) Plots 18 had the Mineral Manures, alternated the Crop of 1879.</li> <li>(10) Plots 18 had the Mineral Manures, alternated the duplication scales.</li> <li>(10) Plots and 5, 6, 7, 8, 1, 1, 4, and 17 (not 18), alternated of (instead of Silicates) on the 'a' Protingue of the provide argonal could the provide argonal could be accelled: and the Plots manured plots 1964.56 and 7, the 'a' Protingue statemanus, but, hintherto, without any material contral dialection of the 'a' Protingue, out statawe (hast produced in the provider argonal could be accelled: and the Plot environ of Plots 5, 6, 7, 8, 11, 12, 13, 14, and 17 (not 18); also for the or opt of (instead of Silicates) on the 'a' Protingue of Plots 5, 6, 7, 8, 11, 12, 13, 14, and 17 (not 18); also for the or opt of (instead of Silicates) on the 'a' Protingue of Plots 5, 5, 6, 7, 8, 11, 12, 13, 14, and 17 (not 18); also for the or opt of (instead of Silicates) on the 'a' Protingue of Plots 5, 6, 7, 8, 11, 12, 13, 14, and 17 (not</li></ul>
Pi	Average per Annum		Weight per Bushel.	13 Years, 1865-77.	Ibs.	59	00 94 94	20 M	59 59	593	60	60 <sup>8</sup>	59 574	573	183	594	60	593	608 608	594	60 <del>1</del> 593	583	58	59 <del>1</del>	59	
	Avera			13 Years, 1852-64.	lbs.	573	578	10 10 10 10 10 10 10 10 10 10 10 10 10 1	57 <u>4</u>	581	583	584 584	573	564 573	563 \$63	583	59	585	59 59	58	59 584	583	572	583	58 <u>1</u>	
			Quantity.	26 Years, 1852-77.	Bushels.	$16_{g}^{2}$	134	544 191	143	156	243	334 362	36 <del>8</del> 24 <u>3</u>	214 214	268	32	323	328	31 <b>1</b> 33 <b>1</b>	27 <u>8</u>	$29\frac{7}{8}(12)$ 16 $\frac{1}{2}(13)$	294	132(16)	2.0	204	
1	1			13 Years, 1865-77.	Bushels.	153	114	53	124	131	202	29 <u>‡</u> 34#	37# 23#	194 21	23	28	295	283	30 <del>1</del> 31 <b>4</b>	158	26≩ 14	263	262 112 178 184	e Manure ade with errages of rerages of that 17 had that 17 had that 18 had th		
				13 Years, 1852-64.	Bushels.	184	164	α 44 - π 44 - π	17	$18\frac{1}{4}$	281	37 <u>8</u> 382	20.21 20.40 20.40	503 503 518 52 50 50 50 50 50 50 50 50 50 50 50 50 50	301	352	354	353	33 <u>1</u> 35	39 <u>2</u>	327 183	32	153	223	22	(19) The (19) The (11) Mas (13) Ave (13) Ave (13) Ave (13) Ave (14) Plot (14) Plot (14) Plot (14) Plot (14) Plot (14) Plot (14) Ave (14) Plot (14) Plot (14) Ave (14) Plot (14) Plot (14) Ave (14) Ave (1
***** = (about) 0.40 Hectatre 01	0:36 Hectolitre	bushel per acre = (about) 0.9 Hectolitre per Hectare	1b. per acre = (about) 1.12 Kilogramme per Hectare over nor acre = (about) 125.5 Kilogrammes ner Hectare	urre, per auto – (novar) - e de manuera e manuera per autoro		Superphosphate of Lime (three times as much as on No. 5 and succeeding Plots)	Sulphates of Polass, Soda, and Magnesia (twice as much as on No. 5 and succeeding Plots)	svery year)	Unnanured continuously	200 lts. 40 Sulphate Potass, 100 lbs. 49 Sulphate Soda, 100 lbs. Sulphate Magnesia, 34 cwts. Superphosphate of Lime (9)	200 lbs. <sup>(1)</sup> Sulphate Potass, 100 lbs. <sup>(2)</sup> Sulphate Soda, 100 lbs. Sulphate Mag., 3½ ewts. Superphos., 200 lbs. Ammonia-salts <sup>(4)</sup>	2001bs. (1) Sulphate Potass, 100 lbs. (2) Sulphate Soda, 100 lbs. Sulphate Mag., 34 outs. Superphos., 400 lbs. Ammonia-sults 2001 lbs. (2) Sulphate Potass, 100 lbs. (2) Sulphate Soda, 100 lbs. Sulphate Mar., 31 outs. Sumerphos. 600 lbs. Ammonia-sults	2001bs. d18.11.01.01 (0) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1	400 lbs. Ammonia-salts alone, for 1845, and each year since; Mineral Manutar are 1844.	mauute 10775, 70,	and 366		400 lbs. Ammonia-salts, 33 evts. Superphosphate, and 280 lbs. (*) Sulphate of Magnesia	400 lbs. Amm 400 lbs. Amm	[1852–64, 13 years, 200 lbs. Sulph. Potass, 100 lbs. Sulph. Soda, 100 lbs. Sulph, Mag., 34 every potential and solver and solver and since unmanued in versus environde of the verse 1865–781 154 bushels Corn. 133 evers. Structure 5.			Unmanured continuously	Sulph. Soda, 100 lbs. Sulph. M	200 lbs. (1) Sulph. Potass, 100 lbs. (2) Sulph. Soda, 100 lbs. Sulph. Mag., 34 cwts. Superphos., 100 lbs. Sulphate Ammonia	<ol> <li>(1) 300 lbs, per annum för Crop of 1355, and previously.</li> <li>(2) 300 lbs, per annum för Crop of 1355, and previously.</li> <li>(3) « Supprisespitate of Line" — and ense, excepting för Plot 19, made from 200 lbs. Boue-selt, 150 lbs.</li> <li>(4) " Supprisespitate of Line" — and enses, excepting för Plot 19, made from 200 lbs. Boue-selt, 150 lbs.</li> <li>(5) 90. 475 lbs. Nitrate Soda in 1852, 275 lbs. in 1855 and 1854, 550 lbs. each year since. No Suphute of Potass, Soda, or Magnesia, or Superphosphate, in 1832, 1856, or 1854, 560 lbs. each year since. No Suphute of Potass, Soda, or Magnesia, or Superphosphate, in 1832, 1856, or 1854, 560 lbs. each year since. No Suphute of Potass, Soda, or Magnesia, or Superphosphate, in 1832, 1856, or 1854, 560 lbs. each year since. No Suphute of Potass, Soda, or Magnesia, or Superphosphate, in 1832, 1856, or 1854, 560 lbs. each year since. No Suphute of Potass, Soda, or Magnesia, or Superphosphate, in 1832, 1856, or 1854, 560 lbs. each year since. No Suphute of Potass, Soda, or Magnesia, or Superphosphate, in 1832, 1856, or 1854, 560 lbs.</li> <li>(a) For 1858, and previously Inde with Muriticia itstead of Suphuto Adum. (7) For 1872 and previously. Adum &amp; Within the Amonita, sown in the Antumn.</li> <li>(b) For 1872 and previously. For 1885, and since, 400 lbs. Automotic-salts, sown in the Autumn.</li> <li>(c) For 1872 and previously. For 1887 and since, 400 lbs. Automotic-salts, sown in the Autumn.</li> </ol>
		Dr orne	LLUIS.	5		0	1	61	4 X	5 ( $a$ and $b$ )	6 (a and b)	7 (a and b) 8 (a and b)	{a }	-	(q pu	-		-	-	16 ( $a$ and $b$ )	(10) { 17 (a and b) 1 (10) 1 (10)	-	20	21	22	