

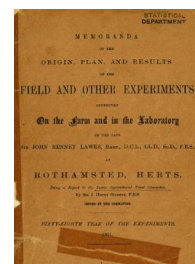
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## Yields of the Field Experiments 1901

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### Wheat Alternated With Fallow, and Wheat Grown Continuously

#### Rothamsted Research

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EXPERIMENTS ON WHEAT ALTERNATED WITH FALLOW, AND WHEAT GROWN CONTINUOUSLY.

The results given in the following Table show the produce of Wheat obtained on the Rothamsted soil for many years in succession, after bare fallow, compared with that of wheat grown continuously year after year on the same land, without the intervention of fallow; in both cases without manure.

*Hoos-field*, in which the experiments on alternate wheat and fallow are conducted, adjoins *Broadbalk-field*, in which wheat has now been grown continuously without manure (also with different descriptions of manure), for 58 years in succession; and the produce of the unmanured plot of that field, is compared with that grown in alternation with fallow, also without manure, in *Hoos-field*.

The description of seed sown has been the same in the two fields in the corresponding years; namely—for the crop of 1852 "Red Cluster"; for 28 years, 1854 to 1881 inclusive, "Red Rostock"; for 18 years, 1882-1899, "Club" or "Square Head" (Red); and for the crops of 1900, and since, "Square Head's Master" (Red).

During the first or preliminary period of 5 years, 1851-1855, the cropping of the acre set apart for the experiment on wheat alternated with fallow was as follows:—1851, Fallow (after wheat in 1850); 1852, Wheat; 1853, Fallow; 1854, Wheat; 1855, half Fallow, and half Wheat. From that time to the present the respective halves have been alternately fallow and wheat, giving therefore a crop of wheat succeeding fallow, on half the acre each year.

In the upper division of the Table are given the results for each of the five years of the preliminary period; and in the main division are recorded the results for each individual year of the exact experiment, from 1856 up to the present time.

In the first column of each main vertical division of the Table is given the produce per acre, on the half acre of wheat after fallow; and in the second column the produce per acre obtained in the adjoining field (*Broadbalk*), where wheat is grown year after year on the same land. Lastly, in the third column of each of the vertical divisions is given the amount of produce after fallow, + or - that grown year after year on the same land.

The results for the individual years show that during the earlier years of the experiments on alternate wheat and fallow, when the accumulations due to previous treatment were less exhausted, the produce after fallow was more in excess of that grown in the adjoining field year after year on the same land than afterwards. Referring to the two sets of averages at the foot of the Table, it is seen that if (as in the upper of the two divisions), the produce after fallow is reckoned at the yield per acre of the half in crop each year, it gives on the average several bushels more grain, and also more straw, per acre per annum, than where the crop is grown continuously. On the other hand, if the produce after fallow is reckoned (as in the bottom division) at the yield per acre of the whole area, half in crop and half fallow, it gives several bushels less grain, and also less straw, per acre per annum, than where the crop is grown year after year on the same land. The conclusion to be drawn is, that although there is an increase of produce after fallow compared with that of wheat grown continuously, it is obtained at the sacrifice of a crop every other year; and that a given area of land yields more when the crop is grown year after year than when alternated with fallow. The explanation doubtless is, that much of the nitrogen brought into an available condition under the influence of the fallow, is lost by drainage during the long period that the land is without a crop.

(Area under experiment, 1 acre.)

	Dressed Grain.			Weight per Bushel.			Total Grain.			Total Straw.			Total Produce (Grain and Straw).		
	Wheat after each year.	Wheat after each year.	After Fallow + or - Wheat.	Wheat after each year.	Wheat after each year.	Wheat after each year.	Wheat after each year.	Wheat after each year.	Wheat after each year.	Wheat after each year.	Wheat after each year.	Wheat after each year.	Wheat after each year.	Wheat after each year.	Wheat after each year.
1851	Bushels. 37	157	-157	lbs. 61.1	1083	1083	lbs. 1083	lbs. 1627	1627	1627	lbs. 2710	2710	2710	lbs. 2710	2710
1852	Fallow 42	183	+23	Fallow 56.6	860	2088	Fallow 4934	1597	4934	1597	7022	7022	7022	+4565	1852
1853	Fallow 42	183	-5	Fallow 45.9	359	2709	Fallow 4545	1413	4545	1413	Fallow 7254	7254	7254	+1772	1853
1854	Fallow 42	183	+21	60.5	1359	2709	8	2137	4545	2137	2814	2814	2814	+8758	1854
1855	Fallow 17	17	+0	59.2	1072	1080	+	1787	1734	1787	53	53	53	-45	1855
1856	21	14	+7	60.0	892	1388	+496	1558	2113	1558	3501	3501	3501	+1051	1856
1857	38	20	+18	58.3	1236	2299	+1063	1577	3075	1577	5374	5374	5374	+2561	1857
1858	25	18	+7	60.4	1141	1630	+489	1670	2468	1670	4098	4098	4098	+1287	1858
1859	34	18	+16	55.0	1051	1976	+925	2175	3686	2175	5662	5662	5662	+2436	1859
1860	121	121	-0	54.8	697	697	-41	1254	1226	1459	1923	1923	1923	-274	1860
1861	17	11	+6	58.8	736	1145	+409	1254	2072	1254	3217	3217	3217	+1227	1861
1862	22	16	+6	57.1	996	1361	+365	1713	2294	1713	3655	3655	3655	+946	1862
1863	32	17	+15	61.4	1127	2090	+963	1600	2900	1600	4990	4990	4990	+2263	1863
1864	31	16	+15	61.7	1078	2005	+927	1350	2746	1350	4751	4751	4751	+2523	1864
1865	24	13	+11	60.6	828	1440	+612	1033	2150	1033	3390	3390	3390	+1729	1865

PRELIMINARY PERIOD.

PERIOD OF EXACT COMPARISON.



Year	AVERAGES—PRODUCE AFTER FALLOW RECKONED AT THE YIELD PER ACRE OF THE HALF IN CROP EACH YEAR.										Year	
	10 1/2	12 1/2	1 1/2	58.5	61.3	653	777	124	1146	1769		2046
1866	10 1/2	12 1/2	1 1/2	58.5	61.3	653	777	124	1146	1769	2046	1866
1867	9 3/4	8 1/2	0 3/4	58.2	56.1	616	582	84	1126	1742	1505	1867
1868	25	16 1/2	8 1/2	63.4	61.0	1656	1054	602	2398	4054	2027	1868
1869	10 1/2	14 1/2	4	60.1	56.1	655	848	193	1019	1674	2198	1869
1870	17 1/2	15	2 1/2	62.5	61.8	1101	956	145	1282	2383	2002	1870
1871	9 1/2	9 1/2	0	58.5	61.8	605	615	10	1287	1892	1715	1871
1872	12 1/2	12 1/2	2	58.3	59.0	780	705	75	1307	2087	1857	1872
1873	2 1/2	11 1/2	9	42.0	57.0	181	701	520	875	1056	1603	1873
1874	21 1/2	11 1/2	10	60.0	58.3	1370	694	676	2000	3370	1684	1874
1875	16 1/2	8 1/2	7 1/2	57.2	60.0	993	567	426	1725	2718	1575	1875
1876	10 1/2	8 1/2	2 1/2	58.7	59.0	635	500	135	790	1425	1142	1876
1877	10 1/2	8 1/2	1 1/2	60.5	58.9	649	543	106	829	1478	1291	1877
1878	19 1/2	12 1/2	7 1/2	57.9	59.0	1171	776	395	1634	2825	1857	1878
1879	6	4 1/2	1 1/2	55.6	52.5	379	330	49	808	1187	1093	1879
1880	15 1/2	11 1/2	3 1/2	58.7	56.9	937	689	248	1665	2602	1838	1880
1881	12 1/2	13 1/2	1 1/2	54.6	58.0	748	863	115	897	1645	2009	1881
1882	11 1/2	11	0 1/2	58.6	58.7	1160	679	40	1085	1774	1774	1882
1883	18 1/2	13 1/2	4 1/2	61.2	61.2	1160	872	288	1301	2461	1878	1883
1884	20 1/2	13	7 1/2	60.2	62.1	1240	824	416	1544	2784	1729	1884
1885	23	15 1/2	7 1/2	57.9	59.0	1351	925	426	1812	3163	2062	1885
1886	9 1/2	9	0 1/2	62.2	61.5	588	564	24	657	1245	1184	1886
1887	19	14 1/2	4 1/2	59.9	59.8	1153	906	247	1212	2365	1801	1887
1888	12 1/2	10	2 1/2	56.1	58.8	735	614	121	1239	1974	1515	1888
1889	13	12 1/2	0 1/2	59.5	59.8	796	743	53	916	1712	1645	1889
1890	17 1/2	14	3 1/2	59.8	59.4	1088	849	239	1657	2745	1853	1890
1891	23 1/2	13 1/2	9 1/2	58.9	57.4	1404	828	576	2241	3645	2142	1891
1892	11 1/2	9 1/2	2 1/2	60.2	59.6	731	589	142	1108	1839	1425	1892
1893	13 1/2	9 1/2	3 1/2	62.4	62.7	870	642	228	1251	1724	1251	1893
1894	15 1/2	18	2 1/2	59.7	60.2	953	1121	168	1483	2436	2608	1894
1895	10	10	5 1/2	62.2	62.5	978	664	314	1151	2129	1384	1895
1896	16 1/2	16 1/2	0 1/2	60.7	61.4	1020	1087	67	1312	2332	2396	1896
1897	7	8 1/2	1 1/2	59.5	60.3	460	592	132	710	1170	1459	1897
1898	20 1/2	12	8 1/2	61.3	61.4	1314	823	491	2650	3964	2186	1898
1899	15 1/2	12	3 1/2	62.2	61.7	1004	769	235	1616	2620	1825	1899
1900	11 1/2	12 1/2	0 1/2	60.7	60.2	751	768	17	1050	1801	1776	1900
	AVERAGES—PRODUCE AFTER FALLOW RECKONED AT THE YIELD PER ACRE OF THE HALF IN CROP EACH YEAR.											
5 yrs. 1851-'55	19 1/2	14 1/2	4 1/2	55.8	56.7	1175	947	228	2243	3418	2659	1851-'55
10 yrs. 1856-'65	26 1/2	15 1/2	10 1/2	58.5	57.9	1603	982	621	2473	4075	2521	1856-'65
10 yrs. 1866-'75	13 1/2	11 1/2	1 1/2	57.9	58.5	861	745	116	1417	2278	1821	1866-'75
10 yrs. 1876-'85	14 1/2	11 1/2	3 1/2	58.4	58.5	899	700	199	1238	2137	1667	1876-'85
10 yrs. 1886-'95	15 1/2	12 1/2	4 1/2	60.1	60.2	930	752	178	1252	2182	1676	1886-'95
40 yrs. 1856-'95	17 1/2	12 1/2	4 1/2	58.7	58.8	1073	795	278	1595	2668	1921	1856-'95
	AVERAGES—PRODUCE AFTER FALLOW RECKONED AT THE YIELD PER ACRE OF THE WHOLE AREA, HALF IN CROP AND HALF FALLOW.											
5 yrs. 1851-'55	9 1/2	14 1/2	5 1/2			587	947	360	1122	1712	2659	1851-'55
10 yrs. 1856-'65	13	15 1/2	2 1/2			802	982	180	1236	1539	2521	1856-'65
10 yrs. 1866-'75	6 1/2	11 1/2	5 1/2			430	745	315	709	1076	1821	1866-'75
10 yrs. 1876-'85	7 1/2	11 1/2	2 1/2			449	700	251	619	967	1667	1876-'85
10 yrs. 1886-'95	7 1/2	12 1/2	4 1/2			465	752	287	626	924	1676	1886-'95
40 yrs. 1856-'95	8 1/2	12 1/2	4 1/2			536	795	259	798	1127	1921	1856-'95