

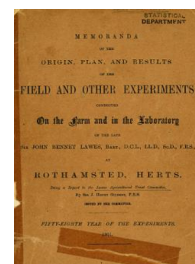
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Wheat Alternated With Fallow, and Wheat Grown Continuously

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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.

	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.	After Fallow + or - Wheat.	Wheat after each year.	Wheat after each year.	Wheat after each year.
1851	Bushels. 37	157	-157	lbs. 61.1	1388	1083	lbs. 1083	lbs. 1627	1558	1627	lbs. 1627	lbs. 1627	lbs. 2710	lbs. 2710	1851
1852	Fallow 37	183	+224	Fallow 56.6	2299	860	Fallow 4934	1597	1577	1597	+3337	Fallow 7022	2457	2457	1852
1853	Fallow 42	184	-54	Fallow 45.9	1630	359	Fallow 2709	1413	1670	1413	+1413	Fallow 7254	1772	1772	1853
1854	Fallow 42	21	+21	60.5	2709	1359	1080	2137	1459	2137	+2408	2814	3496	3496	1854
1855	Fallow 17	17	+0	54.0	1080	1072	1080	1787	1254	1787	-53	2814	2859	2859	1855
1856	21	14	+7	60.0	1388	892	1388	1558	1558	1558	+555	3501	2450	2450	1856
1857	38	20	+18	58.4	2299	1236	2299	1577	1577	1577	+1498	5374	2813	2813	1857
1858	25	18	+7	60.4	1630	1141	1630	1670	1670	1670	+798	4098	2811	2811	1858
1859	34	18	+16	55.0	1976	1051	1976	2175	2175	2175	+1511	5662	3226	3226	1859
1860	121	121	-0	54.8	697	738	697	1459	1459	1459	-233	1923	2197	2197	1860
1861	17	11	+6	58.8	1145	736	1145	1254	1254	1254	+818	3217	1990	1990	1861
1862	22	16	+6	57.1	1361	996	1361	1713	1713	1713	+581	3655	2709	2709	1862
1863	32	17	+15	61.4	2090	1127	2090	1600	1600	1600	+1300	4990	2727	2727	1863
1864	31	16	+15	61.7	2005	1078	2005	1350	1350	1350	+1396	4751	2428	2428	1864
1865	24	13	+11	57.6	1440	828	1440	1033	1033	1033	+1117	3590	1861	1861	1865

PRELIMINARY PERIOD.

PERIOD OF EXACT COMPARISON.

Year	10 1/2	12 1/2	1 1/2	58.5	61.3	653	777	124	1146	1769	2046	247	1866
1866	10 1/2	12 1/2	1 1/2	58.5	61.3	653	777	-	1146	1769	2046	-	1866
1867	9 1/2	8 1/2	0 1/2	58.2	56.1	616	582	+	1126	1742	1505	+	1867
1868	25	16 1/2	8 1/2	63.4	61.0	1656	1054	+	2398	4054	2027	+	1868
1869	10 1/2	14 1/2	4	60.1	56.1	655	848	-	1350	1674	2198	-	1869
1870	17 1/2	15	2 1/2	62.5	61.8	1101	956	+	1046	2383	2002	+	1870
1871	9 1/2	9 1/2	0	58.5	64.8	605	615	+	1100	1892	1715	+	1871
1872	12 1/2	10 1/2	2	58.3	59.0	780	705	+	1287	2087	1857	+	1872
1873	2 1/2	11 1/2	9	42.0	57.0	181	701	+	1307	1056	1603	+	1873
1874	21 1/2	11 1/2	10	60.0	58.3	1370	694	-	2000	3370	1684	-	1874
1875	16 1/2	8 1/2	7 1/2	57.2	60.0	993	567	+	1725	2718	1575	+	1875
1876	10 1/2	8 1/2	2 1/2	58.7	59.0	635	543	+	790	1425	1142	+	1876
1877	10 1/2	8 1/2	1 1/2	60.5	58.9	649	540	+	829	1478	1291	+	1877
1878	19 1/2	12 1/2	7 1/2	57.9	59.0	1171	776	+	1634	2825	1857	+	1878
1879	6	4 1/2	1 1/2	55.6	52.5	379	330	+	808	1187	1093	+	1879
1880	15 1/2	11 1/2	3 1/2	58.7	56.9	937	689	+	1665	2602	1838	+	1880
1881	12 1/2	13 1/2	1 1/2	54.6	58.0	748	863	-	897	1645	2009	-	1881
1882	11 1/2	11 1/2	0 1/2	58.6	58.7	1160	879	+	1085	1774	1774	+	1882
1883	18 1/2	13 1/2	4 1/2	61.2	61.2	1160	872	+	1006	2461	1878	+	1883
1884	20 1/2	13 1/2	7 1/2	60.2	62.1	1240	824	+	1544	2784	1729	+	1884
1885	23	15 1/2	7 1/2	57.9	59.0	1351	925	+	1812	3163	2062	+	1885
1886	9 1/2	9	0 1/2	62.2	61.5	588	564	+	657	1245	1184	+	1886
1887	19	14 1/2	4 1/2	59.9	59.8	1153	906	+	1212	2365	1801	+	1887
1888	12 1/2	10	2 1/2	56.1	58.8	735	614	+	1239	1974	1515	+	1888
1889	13	12 1/2	0 1/2	59.5	59.8	796	743	+	916	1712	1645	+	1889
1890	17 1/2	14	3 1/2	59.8	59.4	1088	849	+	1657	2745	1853	+	1890
1891	23 1/2	13 1/2	9 1/2	58.9	57.4	1404	828	+	2241	3645	2142	+	1891
1892	11 1/2	9 1/2	2 1/2	60.2	59.6	731	589	+	1108	1839	1425	+	1892
1893	13 1/2	9 1/2	3 1/2	62.4	62.7	870	642	+	836	1724	1251	+	1893
1894	15 1/2	18	2 1/2	59.7	60.2	953	1121	-	1483	2436	2608	-	1894
1895	10	10	5 1/2	62.2	62.5	978	664	+	1151	2129	1384	+	1895
1896	16 1/2	16 1/2	0 1/2	60.7	61.4	1020	1087	-	1312	2332	2396	-	1896
1897	7	8 1/2	1 1/2	59.5	60.3	460	592	-	710	1170	1459	-	1897
1898	20 1/2	12	8 1/2	61.3	61.4	1314	823	+	2650	3964	2186	+	1898
1899	15 1/2	12	3 1/2	62.2	61.7	1004	769	+	1616	2620	1825	+	1899
1900	11 1/2	12 1/2	0 1/2	60.7	60.2	751	768	-	1050	1801	1776	+	1900

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	55.8	56.7	1175	947	228	2243	3418	2659	739	1851-'55
5 yrs. 1851-'55	19 1/2	14 1/2	4 1/2	55.8	56.7	1175	947	+	2243	3418	2659	+	1851-'55
10 yrs. 1856-'65	26 1/2	15 1/2	10 1/2	58.5	57.9	1603	982	+	2473	4075	2521	+	1856-'65
10 yrs. 1866-'75	13 1/2	11 1/2	1 1/2	57.9	58.5	861	745	+	1417	2278	1821	+	1866-'75
10 yrs. 1876-'85	14 1/2	11 1/2	3 1/2	58.4	58.5	899	700	+	1238	2137	1667	+	1876-'85
10 yrs. 1886-'95	15 1/2	12 1/2	1 1/2	60.1	60.2	930	752	+	1252	2182	1676	+	1886-'95
40 yrs. 1856-'95	17 1/2	12 1/2	4 1/2	58.7	58.8	1073	795	+	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.													
Year	9 1/2	14 1/2	5 1/2	587	587	587	947	360	1122	1712	2659	950	1851-'55
5 yrs. 1851-'55	9 1/2	14 1/2	5 1/2	587	587	587	947	-	360	1122	1712	-	1851-'55
10 yrs. 1856-'65	13	15 1/2	2 1/2	802	802	802	982	-	180	1236	1589	-	1856-'65
10 yrs. 1866-'75	6 1/2	11 1/2	5 1/2	430	430	430	745	-	315	709	1076	-	1866-'75
10 yrs. 1876-'85	7 1/2	11 1/2	2 1/2	449	449	449	700	-	251	619	967	-	1876-'85
10 yrs. 1886-'95	7 1/2	12 1/2	4 1/2	465	465	465	752	-	287	626	924	-	1886-'95
40 yrs. 1856-'95	8 1/2	12 1/2	4 1/2	536	536	536	795	-	259	798	1127	-	1856-'95