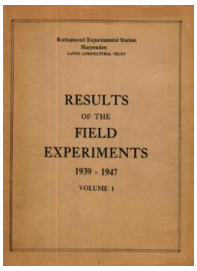
ROTHAMSTED RESEARCH

Yields of the Field Experiments 1939-1947 Volume 1



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BD/1 Highfield Grazing

Rothamsted Research

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GRAZING EXPERIMENT

Highfield (begun in 1937)

The residual manurial value of feeding stuffs consumed on grassland

The experiment consisted of 3 blocks each of 3 plots. Each year one block began a new three-year cycle. In the first year of each cycle all three plots of the block were grazed with cattle only, additional feeding stuffs being fed on one plot. In the following winter or early spring another plot of each block received fertilizers estimated to be equivalent to the residual manurial value of the feeding stuffs consumed on the first plot in the previous year. The third plot of each block received neither feeding stuff nor fertilizer. In the second and third years of the cycle each of the plots was grazed by cattle and sheep which were weighed regularly.

Area of each plot, 5 acres.

Details of the design of the experiment are as given in the 1937 Station Report, pp. 24-27.

In order to obtain a single measure of the yield of a plot, the amount of starch equivalent produced on each plot in each year has been calculated. In this way it is possible to include in a single figure the energy value of the food required to produce the observed live-weight increases, together with the energy value required to maintain the animals. The calculations are based upon the tables of average composition given by Woodman, H.E., in "Rations for Livestock", Min. of Agric. and Fish. Bull. No. 48. H.M.S.O., 1948.

A full report of the experiment is given by Boyd, D.A., Crowther, E.M., Moffatt, J.R. and Yates, F. in a paper entitled "A grazing experiment on residual manurial value of feeding stuffs consumed on grass". J.R.A.S.E., 110, (1949), 104-114.

Herbage analyses were made by the Botany Department.

Amounts of Feeding Stuffs and Fertilizers applied

		Feeding Stuffs cwt. per acre					Fertilizers cwt. per acre		
Year	Plot	1st Period	2nd Period	Total	Year	Plot	N	P_2O_5	K_2O
1938	4	3.00	5.98	8.98					
1938	2	3.38	6.74	10.12	1939	6	0.17	0.06	0.07
1939	7	3.06	3.78*	8.24	1939	3	0.19	0.07	0.07
1940	4	3.24	4.80	8.04	1940	8	0.17	0.05	0.05
1941	2	4.00	8.91	12.91	1941	6	0.16	0.05	0.06
1942	7	2.89	5.11	8.00	1942	3	0.25	0.09	0.09
1943	4	3.80	4.31	8.11	1943	8	0.16	0.06	0.05
1944	2	3.35	7.40	10.75	1944	6	0.17	0.07	0.07
1945	7	4.52	4.52	9.03	1945	3	0.25	0.09	0.10
1946	4	3.65	5.54	9.19	1946	8	0.18	0.07	0.06
					1947	6	0.19	0.08	0.07

*Plus 1.41 second-period ration fed during first period.
Feeding stuffs; equal parts of flaked maize and undecorticated cotton cake (1st period) or decorticated groundnut cake (2nd period).

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Starch Equivalent: lb. per acre

	Plot	1	2	3	5	4	6	9	7	8
		No Manure	Cake 1938,41, 44	Equivalent Manures	No Manure	Cake 1938,40, 43,46	Equivalent Manures	No Manure	Cake 1939,42, 45	Equivalent Manures
1937	Cattle	779	763	710	544	576	594	672	629	616
	Sheep	116	142	117	134	112	101	86	119	79
1938	Cattle							639	648	613
	Sheep							653	670	664
1939	Cattle	864	1033	985	917	1022	1059			
	Sheep	746	724	807	746	774	848			
1940	Cattle	680	847	719				769	993	963
	Sheep	601	560	631				646	650	625
1941	Cattle				747	1108	792	1027	976	950
	Sheep				598	713	629	702	655	652
1942	Cattle	780	849	768	775	813	783			
	Sheep	716	852	811	822	656	838			
1943	Cattle	870	872	1086				882	1195	1163
	Sheep	689	728	936				908	999	863
1944	Cattle				1182	1017	1408	1074	1399	945
	Sheep				716	551	674	622	680	591
1945	Cattle	811	1231	1037	1079	1006	1174			
	Sheep	445	680	743	696	624	731			
1946	Cattle	1296	1627	1312				1254	1799	1489
	Sheep	646	631	568				712	689	690
1947	Cattle				1549	1042	1625	1397	1694	1290
	Sheep				464	543	582	383	420	556

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Bd/1.2

Highfield Grazing Experiment

Bd/1.3

Live weight increase: lb. per acre

Plot		1 No Manure	2 Cake 1938,41, 44	3 Equivalent Manures	5 No Manure	4 Cake 1938,40, 43,46	6 Equivalent Manures	9 No Manure	7 Cake 1939,42, 45	8 Equivalent Manures
1937	Cattle	181	176	151	105	118	126	140	118	114
	Sheep	3	13	6	14	6	4	0	9	-1
1938	Cattle							126	130	114
	Sheep							105	115	111
1939	Cattle	193	274	231	205	237	242			
	Sheep	114	100	123	115	107	130			
1940	Cattle	135	178	133				148	235	229
	Sheep	91	74	95				84	111	96
1941	Cattle				128	214	147	217	192	180
	Sheep				89	79	101	91	74	72
1942	Cattle	154	177	133	160	190	144			
	Sheep	104	145	127	135	96	124			
1943	Cattle	222	221	263				237	312	300
	Sheep	69	84	108				108	113	79
1944	Cattle				332	296	404	315	398	236
	Sheep				54	30	19	52	31	29
1945	Cattle	175	276	237	209	210	219			
	Sheep	38	54	68	74	53	67			
1946	Cattle	276	339	264				278	388	328
	Sheep	62	59	48				66	63	56
1947	Cattle				343	215	373	319	378	290
	Sheep				46	81	73	38	48	90

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Bd/1.4

Grazing days per acre

Plot		1 No Manure	2 Cake 1938,41, 44	3 Equivalent Manures	4 Cake 1938,40, 43,46	5 No Manure	6 Equivalent Manures	7 Cake 1939,42 45	8 Equivalent Manures	9 No Manure
1937	Cattle	74	74	74	63	62	63	66	66	66
	Sheep	74	74	74	65	65	65	62	62	62
1938	Cattle							83	83	83
	Sheep							253	253	253
1939	Cattle	107	110	114	120	113	126			
	Sheep	344	356	342	362	343	379			
1940	Cattle	96	122	112				121	126	126
	Sheep	288	303	314				361	312	312
1941	Cattle				153	119	147	145	145	145
	Sheep				457	358	358	434	434	434
1942	Cattle	115	121	121	102	106	117			
	Sheep	339	355	366	316	338	374			
1943	Cattle	96	96	125				129	129	97
	Sheep	288	288	373				385	385	348
1944	Cattle				92	113	127	125	99	93
	Sheep				285	346	389	369	303	286
1945	Cattle	92	133	112	115	131	149			
	Sheep	198	293	303	257	268	301			
1946	Cattle	122	155	132				165	133	108
	Sheep	259	259	267				307	319	309
1947	Cattle				106	154	149	155	123	123
	Sheep				202	218	238	193	191	180

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