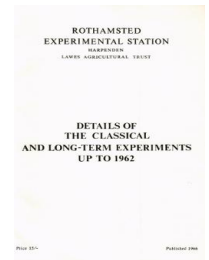


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Details of the Classical and Long-term Experiments Up to 1962

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Hoosfield- Barley

Rothamsted Research

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HOOSFIELD BARLEY

1852 ONWARDS

Before the experiment started the land carried turnips (dung and superphosphate) 1847, barley 1848, clover 1849, wheat 1850, barley (ammonium salts) 1851. The first experimental crop was harvested in 1852, and with the exception of 1912, 1933, and 1943, when the plots were bare fallowed, barley has been grown every year since. The manurial treatments are:

Table 3

Manures per acre 1852 onwards unless otherwise stated

Plot Number	D tons	Treatment									Notes
		P	K	Na	Mg	Si	N	N	R		
		P_2O_5 lb.	K_2O lb.	lb.	lb.	lb.	lb.	lb.	lb.		
		(1)	(2)	(2)		(5)	(3)	(4)	(6)		
1.0	-	-	-	-	-	-	-	-	-		
2.0	-	65	-	-	-	-	-	-	-		
3.0	-	-	98	100	100	-	-	-	-		
4.0	-	65	98	100	100	-	-	-	-	(7)	
5.0	-	65	98	-	-	-	-	-	-		
1A	-	-	-	-	-	-	43	-	-		
2A	-	65	-	-	-	-	43	-	-		
3A	-	-	98	100	100	-	43	-	-		
4A	-	65	98	100	100	-	43	-	-		
1AA	-	-	-	-	-	-	-	43	-		
2AA	-	65	-	-	-	-	-	43	-		
3AA	-	-	98	100	100	-	-	43	-		
4AA	-	65	98	100	100	-	-	43	-		
1AAS	-	-	-	-	-	400	-	43	-		
2AAS	-	65	-	-	-	400	-	43	-		
3AAS	-	-	98	100	100	400	-	43	-		
4AAS	-	65	98	100	100	400	-	43	-		
1C	-	-	-	-	-	-	-	-	43		
2C	-	65	-	-	-	-	-	-	43		
3C	-	-	98	100	100	-	-	-	43		
4C	-	65	98	100	100	-	-	-	43		
7-1	-	-	-	-	-	-	-	-	-	(8)	
7-2	14	-	-	-	-	-	-	-	-		
6-1	-	-	-	-	-	-	-	-	-		
6-2	-	-	-	-	-	-	-	-	-	(9)	
1N	-	-	-	-	-	-	-	43	-	(10)	
2N	-	-	-	-	-	-	-	43	-	(11)	

Plot areas: Mostly 0.18 acres, none less than 0.09 acres.

Treatments: D: farmyard manure. P: superphosphate. K: sulphate of potash. Na: sulphate of soda. Mg: sulphate of magnesia. Si: silicate of soda. N: sulphate of ammonia. N': nitrate of soda. R: castor meal.

HOOS BARLEY

Notes:

- (1) Until 1887 made from 200 lb. bone ash and 150 lb. sulphuric acid. 1888-1897 from rock phosphate. 1898-1902 basic slag.
- (2) From 1852-1857 the K_2O was 147 lb. and the sulphate of soda 200 lb. per acre.
- (3) Until 1916 the ammonium salts were equal parts of ammonium sulphate and chloride. From 1917 onwards only ammonium sulphate has been used.
- (4) The nitrate of soda treatment in the AA and AAS series started in 1868. Originally ammonium salts at 86 lb. N 1852-1857; the dressing of ammonium salts was halved from 1858-1867.
- (5) Silicate at 200 lb. sodium silicate and 200 lb. calcium silicate per acre was first applied in 1862: since 1868 400 lb. sodium silicate was given.
- (6) 2000 lb. rape cake per acre until 1857, 1000 lb. until 1940, 1000 lb. castor meal 1941-1954; since 1955 the castor meal was adjusted to supply 43 lb. N per acre.
- (7) Ammonium salts also in 1852 only.
- (8) 1852-1871 14 tons dung.
- (9) Until 1932 this plot received ashes from the laboratory furnace, subsequently no manure of any kind has been given.
- (10) In 1852 plots 1N and 2N had 65 lb. P_2O_5 and 147 lb. K_2O but no nitrogen; the nitrate of soda treatment began in 1853.
- (11) 86 lb. N 1853-1857.

Variety: From 1917 onwards the variety has been Plumage Archer. Previously Chevalier 1852-1880, Archers Stiff Straw 1881-1890, Carters Paris Prize 1891-1897, Archers Stiff Straw 1898-1916. In 1929-1932 the plots were drilled in 18" rows to allow inter-row cultivation. Alternate strips of Plumage Archer and Spratt Archer were compared during this period.

Weed Control: Commencing in 1944 the barley was sprayed with DNOC until 1956; since 1957 various selective weedkillers have been used. 1958 and 1959 the stubble was sprayed in autumn with 2,4-D to check coltsfoot (*Tussilago farfara*).

Plot areas were reduced by pre-harvest cuts in 1948, 1952, 1954, and 1955 to control wild oats (*Avena fatua*) which were hand pulled in the reduced area taken for yield. In 1953 the wild oats were so bad that the whole field was cut green and the produce removed.

Liming: In winter 1954-1955 5 tons of chalk per acre were applied to Strips 3 and 4 including plots 5A and 5.0. Regular chalk supplements to all plots receiving sulphate of ammonia and castor meal were prescribed at the rate of 100 lb. $CaCO_3$ per 14 lb. N as ammonium sulphate and 50 lb. $CaCO_3$ per 14 lb. N as castor meal. These supplements are given every 5 years at a rate corresponding to all the sulphate of ammonia and castor meal used over this period. The first dressing was applied in spring 1955. See Rep. Rothamst. exp. Sta. for 1954, pp. 146-148.

Harvesting: Commencing in 1958 the plots were harvested by combine harvester.

For further information on manurial dressings see Memoranda of the Field Experiments 1901, pp. 26-27.

Results: Russell, E.J. & Watson, D.J. (1938). The Rothamsted field experiment on barley 1852-1937. Part I Emp. J. exp. Agric. 6, 268-314; Part II Ibid. 7, 193-220.

HOOS BARLEY

Table 4 BARLEY - HOOSFIELD 1852-1962

Plot Treatment	10-Year Means										Means 1852-1962			
	1852-1861	1862-1871	1872-1881	1882-1891	1892-1901	1902-1911	1912-1921	1922-1931	1932-1941	1942-1951	(4) 1952-1961	Grain cwt, per acre	Straw cwt, per acre	No. of years
	Grain: cwt per acre													
1.0 O	11.4	8.8	6.8	6.2	5.3	5.2	6.5	3.7	6.9	9.3	7.4	7.0	7.9	107
2.0 P	13.9	11.8	9.0	9.6	7.1	9.3	10.2	6.7	11.6	11.7	10.6	10.1	9.8	107
3.0 KNaMg	12.5	10.2	7.8	6.0	4.8	5.5	7.5	3.8	9.0	11.7	7.6	7.8	9.0	107
4.0 PKNaMg	15.3	12.4	8.8	8.2	6.6	8.4	10.9	6.4	13.5	15.8	10.9	10.6	11.7	107
5.0 PK	12.3(a)	10.9	7.5	7.4	6.2	6.9	7.3	4.8	10.9	15.0	8.9	9.0	10.2	106
1A N	17.0	15.8	13.2	12.0	8.8	10.7	11.2	5.4	10.4	11.5	10.8	11.6	13.2	107
2A NP	22.9	24.7	20.4	18.0	15.5	16.1	16.2	11.8	18.8	15.9	16.8	17.9	19.4	107
3A NKNaMg	17.8	17.8	15.0	12.4	11.8	11.0	11.3	6.0	13.2	14.4	13.4	13.1	15.9	107
4A NPKNaMg	23.2	23.8	20.9	20.0	18.0	20.1	18.2	13.1	20.9	17.8	18.9	19.6	22.3	107
5A NPK	21.7	23.1	19.8	15.0	14.1	15.2	16.1	10.9	19.5	14.2	19.8(b)	17.2	21.9	106
1AA N ^c	16.0	14.2	14.0	11.6	12.6	12.3	7.1	12.1	13.0	12.9	15.8	15.6	91	
2AA N ^c P	24.0	21.1	21.0	19.4	20.3	19.7	14.7	22.0	18.5	20.2	24.3	22.5	91	
3AA N ^c NaMg	16.5(d)	15.1	14.2	12.8	11.6	12.1	6.3	14.4	15.9	13.9	16.5	16.8	91	
4AA N ^c NaMg	24.0	21.6	20.1	18.5	19.8	18.9	13.3	21.8	21.4	19.9	24.1	22.8	91	
1AAS N ^c Si	18.7	17.7	17.1	16.0	14.9	14.9	8.6	16.4	16.1	17.0	16.4	18.4	91	
2AAS N ^c PSI	24.6(d)	22.3	22.2	20.3	19.5	19.7	14.9	21.4	20.4	22.9	21.7	23.4	91	
3AAS N ^c KNaMgSi	21.5	19.4	17.5	16.7	15.5	14.2	8.4	16.7	17.3	18.3	17.2	19.8	91	
4AAS N ^c PKNaMgSi	25.5	23.6	22.1	20.2	21.4	17.9	14.1	23.1	22.5	23.3	22.3	24.6	91	
1C R	23.4	22.5	19.8	17.5	16.0	17.5	13.5	11.4	18.4	15.6	17.2	17.6	19.9	107
2C RP	23.9	23.7	21.2	19.1	17.1	18.3	14.6	14.8	21.3	20.9	19.5	19.5	21.4	107
3C RKNaMg	22.1	22.4	19.0	16.8	15.1	17.4	12.2	10.0	17.6	21.1	17.0	17.4	20.1	107
4C RPKNaMg	23.8	24.4	21.3	17.8	16.6	19.9	13.0	14.0	21.6	23.7	20.0	19.7	22.4	107
7-1 D until 1871			17.4	13.0	10.6	9.7	11.0	7.0	13.4	15.1	11.7	12.1	13.7	87
7-2 D	22.7	26.7	25.7	23.7	22.9	23.6	18.6	15.0	26.1	26.7	28.0	23.6	28.6	107
6-1 O	12.6	9.6	6.9	7.7	5.6	5.4	8.2	3.4	8.7	10.3	6.9	7.7	8.8	107
6-2 Ashes until 1932	12.1	10.2	7.7	8.2	6.1	7.1	9.9	4.4	8.9	9.8	8.7	8.4	9.4	107
1N N ^c	19.0(b)	18.8	15.6	15.6	14.1	13.5	11.5	6.2	14.1	14.6	12.1	14.1	17.3	106
2N N ^c	18.0(c)	20.5	17.9	17.0	16.8	16.8	14.8	9.4	17.5	18.1	15.9	17.7	19.4	101
(1) Omitting 1912 all plots followed														
(2) " " " " "	(a) omitting 1852													
(3) " " " " "	(b) " "													
(4) " " " " "	(c) " " 1852-1857													
	(d) " " 1852-1867 (plots 1AA, 2AA, 3AA, 4AA, 1AAS, 2AAS, 3AAS, 4AAS)													
	(e) " " 1954 No yield recorded.													

(1) Omitting 1912 all plots followed

(2) 1933 " " " (a) omitting 1852

(3) 1943 " " " (b) " " " 1852-1857

(4) " " " 1953 No yields recorded (c) " " " 1852-1867 (plots 1AA, 2AA, 3AA, 4AA, 1AAS, 2AAS, 3AAS, 4AAS)

(e) " " " 1954 No yield recorded.