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Details of the Classical and Long-term Experiments 1968-73

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R/HB/2 Hoosfield - Barley, Potatoes

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HOOSFIELD

BARLEY AND THREE COURSE ROTATION

(R/HB/2)

As on Broadbalk changes in the cropping system were made in 1968 to enable comparisons to be made of the effects of the long continued manurial treatments on barley in a rotation of potatoes, beans, barley and on continuous barley. At the same time some changes were made in the manurial treatments.

Manuring from 1968

- (i) Castor meal was discontinued after an equalising dressing in 1967 equivalent to 3 years application (144 kg N) to the half plots receiving the lower rate from 1964-66.
- (ii) FYM and minerals are now applied in autumn before ploughing.
- (iii) Sulphate of ammonia and nitrate of soda are no longer applied, and all N is given as 'Nitro-Chalk' as a top dressing for barley and in the seedbed for potatoes.
- (iv) The test of no minerals v. P v. KNaMg v. PKNaMg on the four main strips of plots (started in 1852) and the test of silicate of soda (from 1862) on plots 33-34 of strips 1-4 (formerly Series AAS) were continued.
- (v) All plots (except 551, 561, 571, 581) were split into four for a N test on barley.

Symbols, materials and rates of application

Annual dressings 1968-73

NO, N1, N2, N3	'Nitro-chalk' to supply 0, 48, 96 and 144 kg N to barley (0, 96, 192, 288 kg N to potatoes in 1973).
P	Powdered superphosphate (approx. 20% P ₂ O ₅) to supply 34 kg P
K	Sulphate of potash (approx. 50% K ₂ O) to supply 90 kg K
Na	Sulphate of soda (approx. 14% Na) to supply 16 kg Na
Mg	Sulphate of magnesia (approx. 10% Mg) to supply 11 kg Mg
Si	Silicate of soda at 448 kg
FYM	Farm yard manure at 35 t

The Series treatments discontinued after the 1966 crop (the whole area was fallowed in 1967) were:

O	None
A	48 kg N as Sulphate of Ammonia
AA	48 kg N as Nitrate of Soda
C	48 kg N as Castor bean meal

NOTE: Strip 3 (K, Na, Mg) has received the following additional dressings (kg/ha) because of the limitations of the fertiliser distributor.

1969	7.2 kg K	1.0 kg Na	0.9 kg Mg
1971	9.8 kg K	1.3 kg Na	1.1 kg Mg

Treatments (see plan)

- (i) Strip manures (applied annually since 1852)
 - Strip 1 Nil
 - 2 P
 - 3 KNaMg
 - 4 PKNaMg
- (ii) Farm yard manure (applied annually since 1852)
Plots 721 – 724 (formerly 7-2)
- (iii) Silicate of soda (applied annually since 1862)
Plots 33-34 of strips 1-4
(formerly Series AAS)
- (iv) Nitrogen. N is applied cumulatively
 - (a) From 1968-72 potatoes received a basal dressing of 144 kg N.
 - (b) Beans receive no nitrogen
 - (c) In 1968 plots 721 and 723 received no N and 722 and 724, N1. Thereafter as shown as plan.
 - (d) In 1968 plots 611-614, 621-624, 711-714 and 721-724 received nitrogen at 63 (N1), 129 (N2), 192 (N3) kg N in error.
- (v) Plots 551, 561, 571 and 581. From 1968, N where applied, is at 96 kg, P and K are at the same rates as strips. (From 1970-72 plots 551 and 561 received 18 kg P and 168 kg K in error).

Liming. No lime was applied in the period 1968-73.

Cropping and Weed Control

In 1968 plots formerly receiving castor bean meal (Series C) were divided into four, one quarter in continuous barley and the others in an annual rotation of potatoes, spring beans and barley.

The former nitrate of soda plots (Series AA) and nitrate of soda plus silicate of soda ones (Series AAS) were each divided into two, one in continuous barley and the other in one phase of the rotation each year.

The remaining plots continue to grow spring barley each year giving the following cropping sequences.

(1) *Crop Sequences.*

Old Series	0	A	AA		AAS		C				1N	2N
New Plot Nos	111-714	121-724	131-431	132-432	133-433	134-434	141-441	142-442	143-443	144-444	551-581	5A
Year 1967			F A L L O W									
1968	B	B	B	P	P	B	B	B	P	BE	B	B
1969	B	B	B	BE	BE	B	B	P	BE	B	B	B
1970	B	B	B	B	B	B	B	BE	B	P	B	B
1971	B	B	B	P	P	B	B	B	P	BE	B	B
1972	B	B	B	BE	BE	B	B	P	BE	B	B	B
1973	B	B	B	B	B	B	B	BE	B	P	B	B

(2) *Varieties.*

Barley	1968 & 69	Maris Badger
	1970 & 71	Julia
	1972 & 73	Julia dressed with ethirimol

Beans	1968-70 1971-73	Maris Bead inoculated with <i>Rhizobium</i> Maris Bead
Potatoes	1968 1969-73	Majestic. Irish A, chitted. King Edward. Once grown, chitted from Rothamsted Farm, paracrinkle virus free.

(3) *Weed Control*

(i) *Weedkillers.*

Barley	1968 1969 1970 1971 1972 & 73	Dicamba with mecoprop and MCPA Non rotational barley only, paraquat in preceding autumn. Paraquat in autumn and dicamba with mecoprop and MCPA. Paraquat in autumn and ioxynil, bromo- xynil and dicamba. Paraquat in autumn and dicamba with mecoprop and MCPA.
Potatoes	1968 1969 1970 & 71 1972 1973	None Paraquat in autumn and paraquat plus linuron pre-emergence. Paraquat in autumn and linuron pre- emergence. Paraquat in autumn and paraquat plus linuron pre-emergence. Paraquat plus linuron applied pre- emergence.
Beans	1968 1971	Simazine Paraquat applied in preceding autumn.

(ii) *Hand weeding.* Wild oats in barley have been pulled by hand once or twice each year as necessary.

Other chemicals applied

- (i) Mancozeb. has been applied annually to the potato crop on two or three occasions.
- (ii) Demeton-S-methyl has been applied once annually to the potato crop with the exception of 1971.
- (iii) Demeton-S-methyl has been applied once annually to the beans in 1969 to 1971 and in 1973, and phorate once in 1968 and 1972.
- (iv) In 1968, 1970, 1972 and 1973: Potato haulm was destroyed by sulphuric acid.

Areas harvested

(i) 1968-71

Plot	Crop	Area harvested
111-424 (Old Series O & A)	Barley	0.0035
611-724 (Old Series 6-1 and 6-2 7-1 and 7-2)	Barley	0.0026
131-444 (Old Series AA, AAS, C)	Barley	0.00096
	Potatoes	0.0019
	Beans	0.0018*

551-581 (Old Series 1N, 2N, 50,
5A) Barley 0.0041

* Harvested in pairs 1968 and 1969. 0.0022 in 1971 as 6 rows harvested per sub-plot instead of 5 as in other years.

Barley was harvested by a small combine (1.4 m cut) on plots 131-444 and by a large combine (2.8 m) on the remainder as were the beans. In 1970 plots 111-724 were used for a comparison of these two combines and a 2.1 m one (See *Yields 1970*, p.257).

(ii) In 1972 and 1973 the 2.1 m combine was used on all cereal and bean plots giving the harvested areas:

Plot	Crop	Area harvested
111-424	Barley	0.0026
611-724	Barley	0.0020
131-444	Barley	0.0014
	Potatoes	0.0019
	Beans	0.0014
551-581	Barley	0.0031

Soil series. Batcombe series with small area of Winchester and shallow Batcombe series

WHEAT AND FALLOW, HOOSFIELD

(R/WF/3)

The wheat and fallow sequences started with a preliminary season in 1855 and following the modification in 1932, have continued unchanged providing a one and a three year fallow comparison. (*Details 1967*, pp 23-24).

Manuring. None since 1851

Cropping, fallowing and weed control

(1) *Crop Sequences.*

New Plot Nos.	Strip A				Strip B			
	A1	A2	A3	A4	B1	B2	B3	B4
1968	W	W	F	W	F	F	F	F
1969	F	F	F	F	F	W	W	W
1970	W	W	W	F	F	F	F	F
1971	F	F	F	F	W	F	W	W
1972	F	W	W	W	F	F	F	F
1973	F	F	F	F	W	W	F	W

F = Fallow W = Wheat

(2) *Variety.* Cappelle, dressed with dieldrin.

(3) *Weedkillers.* 1968-71 Ioxynil with mecoprop
1972 and 73 Dicamba, with mecoprop and MCPA.