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Numerical Results of the Field Experiments 1970

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70/R/RN/1 & 70/R/RN/2 Ley/ARABLE

Rothamsted Research

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LEY/ARABLE

(70/R/RN/1 & 70/R/RN/2)

Highfield and Fosters 1970, the 22nd year.

For details of treatments, rotations etc. see 'Details' 1967, 'Results' 68/B/1 and 69/R/RN/1&2.

Revised cropping on blocks 1-4 on both fields (blocks reserved for continuation of the original Ley/Arable contrasts):
From 1970 the treatment period is increased to 4 years:-

Treatments	1970	1971	1972	1973
Lucerne (LU)	LU	LU	LU	LU
Clover-grass (LC)	LC	LC	LC	LC
Grass (LN)	LN	LN	LN	LN
Arable with hay (AH) Barley	Barley	Seeds hay	Sugar beet	Oats
	(undersown)			

The basal manuring to the treatment barley crop was 0.4 cwt N, 0.3 cwt P2O5, 0.6 cwt K2O as 'Nitro-Chalk' broadcast, and compound (0:14:28) combine drilled.

Corrective K dressings, as muriate of potash, to 1st test crop potatoes, were applied before ploughing in Autumn 1969 as follows (in cwt K2O):-

Rotation	Highfield	Fosters
AH	5.3	4.4
LU	3.7	2.9
LC	0.2	0.0
LN	3.6	1.5
R	4.4	3.9

The variety of barley is now Julia.

Revised nitrogen levels to 3rd test crop, barley (both fields):-
Cwt N to 1/8th plots: None (N0), 0.4 (N1), 0.7 (N2), 1.0 (N3) as 'Nitro-Chalk'.

Revised manuring to permanent (GC,GN) and reseeded (RC,RN) grass and to leys (LC, LN), in cwt:-
RN,GN: 0.6 N and 0.38 K2O as (25:0:16) for each cut, (previously 0.6 N and 0.6 K2O for each cut).
LN: 0.6 N as 'Nitro-Chalk' in spring and NK revised as above after each cut except the last, (previously 0.6 N and 0.6 K2O for each cut).
LC,RC,GC: K2O for each cut is now 0.38 as muriate of potash, (previously 0.6 K2O for each cut).

70/R/RN/1&2

PK dressing for all the above is unchanged at 0.6 P2O₅ and 1.2 K₂O as (0:14:28) applied in winter (seedbed for 1st year leys).

HIGHFIELD

1st year Treatment Crops:

All-grass ley: Ploughed: 9 Oct, 1969. N and basal PK compound applied: 28 Apr, 1970. Seed drilled at 33 lb: 29 Apr. Sprayed with MCPB at 2.5 lb a.e. in 20 gals: 5 June. Cut twice: 3 Aug, 29 Sept. NK compound applied after first cut.

Clover-grass ley: Ploughed: 9 Oct, 1969. Basal PK compound applied: 28 Apr, 1970. Seed drilled at 34 lb: 29 Apr. Sprayed with MCPB at 2.5 lb a.e. in 20 gals: 5 June. Cut twice: 3 Aug, 29 Sept. Muriate of potash applied after first cut.

Lucerne: Ploughed: 9 Oct, 1969. Basal PK compound applied: 28 Apr, 1970. Seed drilled at 25 lb: 29 Apr. Cut twice: 4 Aug, 1 Oct.

Barley: Ploughed: 9 Oct, 1969. Seed combine drilled at 140 lb: 20 Mar, 1970. N applied: 2 Apr. Undersown: 7 May. Sprayed with MCPB/MCPA ('Tropotox Plus' at 5 pints in 20 gals): 26 May. Combine harvested: 13 Aug.

1st Test Crop. Potatoes:-

Corrective K applied, plots ploughed: 21 Oct, 1969. N, P and K fertiliser applied: 6 May, 1970. FYM applied, all plots rotary cultivated, potatoes machine planted: 7 May. Sprayed with linuron at 1 lb and paraquat at 0.375 lb ion in 39 gals: 23 May. Grubbed and rotary ridged: 17 June. Sprayed with mancozeb at 1.2 lb plus demeton-s-methyl at 3.5 oz in 40 gals: 29 July. Sprayed with mancozeb at 1.2 lb in 40 gals: 14 Aug. Sprayed with undiluted BOV at 15 gals: 15 Sept. Lifted: 21 Sept.

2nd Test Crop. Wheat:-

Basal PK compound applied: 14 Oct, 1969. Deep-tine cultivated: 15 Oct. Seed combine drilled at 180 lb: 16 Oct. Sprayed with 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals: 8 May, 1970. N applied: 12 May. Combine harvested: 17 Aug.

3rd Test Crop. Barley:-

Ground chalk applied: 6 Oct, 1969. Ploughed: 9 Oct. Seed combine drilled at 140 lb: 20 Mar, 1970. N applied: 2 Apr. Sprayed with 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals: 26 May. Combine harvested: 13 Aug.

70/R/RN/1&2

5th and 6th Test Crops. Wheat:-

Basal PK compound applied: 30 Sept, 1969. Ploughed: 9 Oct.
Rotary cultivated: 15 Oct. Seed combine drilled at 180 lb:
16 Oct. Sprayed with 2,4-D at 0.5 lb and dichlorprop at
2 lb in 20 gals: 8 May, 1970. N applied: 14 May. Combine
harvested: 17 Aug.

Permanent grasses:-

The 22nd experimental year permanent (old) grass, blocks 1, 2
and 4, the 22nd year reseeded grass, blocks 1 and 4. Basal
PK compound applied: 18 Nov, 1969. NK compound applied to
'all-grass' half plots, muriate of potash to 'clover-grass'
half plots: 18 Mar, 1970. Cut three times: 2 June, 3 Aug,
29 Sept. NK compound applied to 'all-grass' half plots and
muriate of potash to 'clover-grass' half plots after each
cut except the last.

FOSTERS

1st year Treatment Crops:

All-grass ley: Ploughed: 7 Oct, 1969. N and basal PK compound
applied: 28 Apr, 1970. Seed drilled at 33 lb: 29 Apr. A
few bare patches reseeded: 1 June. Sprayed with MCPB at 2.5 lb
a.e. in 20 gals: 5 June. Cut twice: 3 Aug, 29 Sept. NK
compound applied after first cut.

Clover-grass ley: Ploughed: 7 Oct, 1969. Basal PK compound applied:
28 Apr, 1970. Seed drilled at 34 lb: 29 Apr. A few bare
patches reseeded: 1 June. Sprayed with MCPB at 2.5 lb a.e.
in 20 gals: 5 June. Cut twice: 3 Aug, 29 Sept. Muriate of
potash applied after first cut.

Lucerne: Ploughed: 7 Oct, 1969. Basal PK compound applied:
28 Apr, 1970. Seed drilled at 25 lb: 29 Apr. Cut twice:
4 Aug, 1 Oct.

Barley: Ploughed: 7 Oct, 1969. Seed combine drilled at 140 lb:
20 Mar, 1970. N applied: 2 Apr. Undersown: 7 May. Sprayed
with MCPB/MCPA ('Tropotox Plus' at 5 pints in 20 gals): 26 May.
Combine harvested: 13 Aug.

1st Test Crop. Potatoes:-

Corrective K applied: 20 Oct, 1969. Ploughed: 21 Oct. N, P
and K fertilisers applied: 28 Apr, 1970 - 6 May. FYM applied:
6 May. All plots rotary cultivated, potatoes machine planted:
7 May. Sprayed with linuron at 1 lb and paraquat at 0.375
lb ion in 39 gals: 23 May. Grubbed and rotary ridged: 17 June.
Sprayed with mancozeb at 1.2 lb plus demeton-s-methyl at 3.5
oz in 40 gals: 29 July. Sprayed with mancozeb at 1.2 lb in
40 gals: 14 Aug. Sprayed with undiluted BOV at 15 gals: 15 Sept.
Lifted: 21 Sept.

70/R/RN/1&2

2nd Test Crop. Wheat:-

Basal PK compound applied: 14 Oct, 1969. Deep-tine cultivated 3 times: 15 Oct. Seed combine drilled at 180 lb: 16 Oct. Sprayed with 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals: 8 May, 1970. N applied: 13 May. Combine harvested: 18 Aug.

3rd Test Crop. Barley:-

Ploughed: 8 Oct, 1969. Seed combine drilled at 140 lb: 20 Mar, 1970. N applied: 2 Apr. Sprayed with 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals: 26 May. Combine harvested: 13 Aug.

5th and 6th Test Crops. Wheat:-

Basal PK compound applied: 30 Sept, 1969. Ploughed: 7 Oct. Rotary cultivated: 14 Oct. Seed combine drilled at 180 lb: 16 Oct. Sprayed with 2,4-D at 0.5 lb and dichlorprop at 2 lb in 20 gals: 8 May, 1970. N applied: 14 May. Combine harvested: 18 Aug.

Permanent grasses:-

The 22nd year reseeded grass, Blocks 1 and 3. Basal PK compound applied: 18 Nov, 1969. NK compound applied to 'all-grass' half plots, and muriate of potash to 'clover-grass' half plots: 18 Mar, 1970. Cut three times: 2 June, 3 Aug, 29 Sept. NK compound applied to 'all-grass' half plots and muriate of potash to 'clover-grass' half plots after each cut except the last.

NOTE: LU, LC and LN are now cut by half plots (ignoring F v D residues). Yields are taken from alternate half plots on successive cutting occasions.

70/R/RIV/1&2

SUMMARY OF RESULTS

POTATOES 1ST TEST CROP

TOTAL TUBERS: TONS

HIGHFIELD

1967 - 69

	IU	LC	LN	AH	R*	Mean
Mean	21.25	21.63	20.40	19.54	21.02	20.77
F	21.17	21.85	19.99	18.26	20.70	20.39
D	21.34	21.42	20.81	20.82	21.34	21.15
NO	19.61	18.61	17.75	16.09	18.59	18.13
N1	21.58	22.82	21.14	20.56	20.82	21.38
N2	21.46	22.70	20.89	20.03	21.72	21.36
N3	22.37	22.40	21.81	21.49	22.96	22.21
PO	21.05	21.20	20.44	19.38	20.56	20.53
P1	21.46	22.07	20.36	19.70	21.48	21.01
K0	20.95	21.14	19.87	18.71	20.98	20.33
K1	21.56	22.13	20.93	20.37	21.06	21.21

* R 1949 - 63 then AH

70/R/RN/1&2

POTATOES 1ST TEST CROP

% WARE: 1.5 INCH

HIGHFIELD

1967 - 69

	LU	LC	LN	AH	R*	Mean
Mean	93.2	94.0	94.1	92.8	92.2	93.3
F	93.3	94.3	93.4	92.4	92.4	93.2
D	93.2	93.8	94.7	93.2	92.0	93.4
NO	92.4	92.8	93.1	89.2	91.3	91.8
N1	93.4	94.9	94.6	93.4	91.6	93.6
N2	93.9	94.4	94.4	94.0	92.6	93.9
N3	93.3	94.1	94.2	94.7	93.2	93.9
PO	93.3	93.8	94.1	93.2	92.1	93.3
P1	93.1	94.3	94.1	92.5	92.2	93.2
KO	93.4	94.2	93.9	93.0	91.9	93.3
K1	93.1	93.9	94.3	92.7	92.4	93.3

* R 1949 - 63 then AH

70/R/RN/1&2

POTATOES 1ST TEST CROP

TOTAL TUBERS: TONS

POSTERS

1967 - 69

	LU	LC	LN	AH	R*	Mean
Mean	14.68	14.46	15.41	13.35	15.32	14.64
F	13.72	13.83	14.28	12.29	14.73	13.77
D	15.65	15.09	16.55	14.40	15.91	15.52
NO	13.02	14.38	13.81	10.31	12.72	12.85
N1	15.39	14.69	15.55	13.22	15.17	14.80
N2	15.05	14.64	16.28	14.35	16.62	15.39
N3	15.27	14.12	16.02	15.51	16.77	15.54
PO	14.49	14.00	15.30	13.05	15.33	14.43
P1	14.88	14.91	15.53	13.64	15.31	14.85
KO	14.71	14.24	15.37	12.96	15.17	14.49
K1	14.66	14.68	15.46	13.73	15.46	14.80

* R 1949 - 63 then AH

70/R/RN/1&2

POTATOES 1ST TEST CROP

% WARE: 1.5 INCH

FOSTERS

1967 - 69

	LU	LC	LN	AH	R*	Mean
Mean	90.7	90.2	91.5	87.5	90.1	90.0
F	89.8	89.9	91.3	86.5	89.6	89.4
D	91.6	90.4	91.7	88.6	90.7	90.6
NO	89.7	88.1	88.4	80.2	87.5	86.8
N1	89.3	90.0	91.2	88.8	90.0	89.9
N2	91.4	91.8	93.2	89.5	91.3	91.4
N3	92.4	90.7	93.2	91.6	91.5	91.9
PO	90.7	89.1	91.9	87.7	90.2	89.9
P1	90.7	91.3	91.0	87.3	90.0	90.1
KO	91.5	90.2	91.7	87.3	90.1	90.2
K1	89.9	90.1	91.2	87.8	90.1	89.8

* R 1949 - 63 then AH

70/R/RN/182

WHEAT 2ND TEST CROP

GRAIN: CWT

HIGHFIELD

		1966 - 68			1951 - 62			1951 - 68		
		LU	LC	LN	AH	Mean	R*	GC	GN	Mean
Mean		56.5	60.0	55.4	53.4	56.3	57.0	57.9	59.5	57.4
1970										
N0		47.8	51.9	45.4	43.9	47.3	49.0	52.6	53.5	51.0
N1		58.4	60.7	55.6	53.7	57.1	54.9	52.2	60.3	55.6
N2		59.1	62.9	60.4	58.1	60.1	59.2	60.2	60.1	59.6
N3		60.7	64.4	60.4	58.1	60.9	64.8	59.2	64.2	63.3
1969										
F		56.3	59.2	54.1	51.4	55.3	56.1			
D		56.8	60.8	56.7	55.5	57.4	57.9			
1969										
N0		56.2	58.6	52.3	51.7	54.7	55.8	57.7	54.5	55.9
N1		57.3	60.0	55.5	50.0	55.7	54.7	54.3	62.8	56.6
N2		55.6	59.9	56.4	55.4	56.8	58.6	57.4	59.1	58.4
N3		57.0	61.6	57.5	56.7	58.2	58.9	54.7	61.8	58.6

Mean D.M. % (All plots): 84.8

70/R/RN/1&2

WHEAT 2ND TEST CROP

GRAIN: CWT

FOSTERS

	1966 - 68					1951 - 62
	IU	LC	LN	AH	Mean	R*
Mean	52.5	50.6	47.7	46.0	49.2	51.1
1970						
N0	46.7	46.3	42.6	37.9	43.4	45.8
N1	52.4	50.3	48.3	45.3	49.1	49.7
N2	54.9	52.2	49.7	49.4	51.5	53.8
N3	56.0	53.6	50.1	51.3	52.8	55.2
1969						
F	50.6	48.6	46.2	44.4	47.5	49.3
D	54.5	52.5	49.1	47.5	50.9	53.0
1969						
N0	51.2	49.2	47.0	45.4	48.2	49.1
N1	52.1	49.6	46.5	44.3	48.1	49.9
N2	52.6	51.1	47.8	45.9	49.4	52.0
N3	54.1	52.4	49.5	48.3	51.1	53.4

Mean D.M. % (All plots): 85.2

* AH since 1963

BARLEY 3RD TEST CROP

GRAIN: CWT

HIGHFIELD

70/R/RN/1&2										
	1965 - 67				Mean	1950 - 67				Mean
	LU	LC	LN	AH		RC	RN	GC	GN	
Mean	44.8	44.3	43.7	42.0	43.7	49.7	50.1	49.9	49.8	49.9
1970										
N0	37.3	36.9	35.0	29.4	34.7	45.9	46.3	48.0	48.7	47.2
N1	46.7	47.6	45.5	44.6	46.1	50.9	51.8	49.4	50.7	50.7
N2	47.1	46.4	47.2	46.3	46.7	53.0	52.4	52.1	51.3	52.2
N3	48.2	46.2	46.9	47.8	47.3	49.1	49.7	50.2	48.6	49.4
1969										
N0	43.4	43.9	44.0	42.7	43.5	52.6	49.0	47.0	51.2	50.0
N1	45.8	43.9	43.0	40.8	43.4	48.2	53.2	49.2	46.6	49.3
N2	45.5	43.4	43.4	42.0	43.6	46.8	51.0	52.2	50.6	50.2
N3	44.6	45.9	44.3	42.6	44.3	51.3	47.0	51.2	50.8	50.1
1968										
F	44.9	44.3	43.6	42.0	43.7					
D	44.7	44.2	43.7	42.0	43.7					

Mean D.M. % (All plots): 85.4

70/R/RN/1&2

BARLEY 3RD TEST CROP

GRAIN: CWT

FOSTERS

70/R/RN/1&2

	1965 - 67					1950 - 67		
	LU	IC	LN	AH	Mean	RC	RN	Mean
Mean	36.0	34.3	34.4	33.5	34.6	35.0	35.9	35.4
1970								
N0	26.4	26.7	28.8	22.7	26.2	27.4	30.7	29.1
N1	37.8	35.9	35.3	35.5	36.1	38.0	36.0	37.0
N2	40.3	38.5	37.1	37.4	38.3	37.2	37.0	37.1
N3	39.7	36.2	36.6	38.2	37.7	37.2	39.9	38.6
1969								
N0	34.6	35.1	33.9	33.1	34.2	36.2	35.0	35.6
N1	36.9	34.3	32.8	31.8	33.9	32.4	36.6	34.5
N2	36.5	33.6	35.6	33.7	34.8	32.2	36.3	34.2
N3	36.2	34.3	35.5	35.3	35.3	39.0	35.6	37.3
1968								
F	35.3	33.4	34.3	33.1	34.1			
D	36.7	35.2	34.5	33.9	35.1			
Mean D.M.% (All plots): 83.5								

WHEAT 5TH TEST CROP

GRAIN: CWT

HIGHFIELD

	1963 - 65					1951 - 68					Mean
	IU	LC	LN	AH	Mean	RC	RN	GC	GN	Mean	
N1	29.4	26.9	20.8	28.8	26.5	51.5	44.3	50.5	54.3	50.2	
N2	35.5	31.9	22.8	31.4	30.4	42.9	53.5	55.1	51.8	50.8	
N3	32.7	30.3	27.8	31.4	30.5	49.8	56.2	39.0	50.8	49.0	
N4	30.1	34.8	32.0	34.0	32.7	54.8	55.6	51.3	41.0	50.7	
Mean	31.9	31.0	25.8	31.4	30.0	49.7	52.4	49.0	49.5	50.2	

70/R/RN/1&2

Mean D.M. % (All plots): 85.9

70/R/RN/1&2

WHEAT 5TH TEST CROP

GRAIN: CWT

FOSTERS

	1963 - 65				1951 - 68		Mean
	IJ	LC	LN	AH	RC	RN	
N1	25.2	37.1	32.0	31.0	44.7	42.6	43.6
N2	26.7	37.3	37.2	32.4	42.0	47.6	44.8
N3	31.7	39.1	40.4	34.2	45.5	46.9	46.2
N4	32.1	43.0	42.2	37.4	44.5	47.9	46.2
Mean	28.9	39.1	38.0	33.8	44.2	46.2	45.2

Mean D.M. % (All plots): 86.3

WHEAT 6TH TEST CROP

GRAIN: CWT

HIGHFIELD

70/R/RN/1&2

	1962-64				1950-64				1950-67		
	IJ	LC	LN	AH	R	Mean	GC	GN	Mean	GC	GN
N1	24.2	26.8	23.1	27.4	25.2	25.3	39.8	33.3	36.6	32.3	39.3
N2	24.0	29.8	27.4	25.5	25.6	26.5	51.7	46.2	44.8	41.4	37.9
N3	26.9	33.5	31.8	25.0	29.7	29.3	41.4	44.2	42.8	41.4	44.2
N4	30.7	32.7	28.3	30.8	31.1	30.7					
Mean	26.4	30.7	27.6	27.2	27.9	28.0	41.3	40.4	40.9		

Mean D.M. % (All plots): 85.4

70/R/RN/1&2

WHEAT 6TH TEST CROP

GRAIN: CWT

FOSTERS

1962 - 64

1950 - 64

	IJ	LC	LN	AH	R	Mean
N1	37.7	39.0	35.3	32.3	34.8	35.8
N2	33.3	40.4	43.0	34.8	41.1	38.5
N3	38.0	40.8	43.3	37.7	43.8	40.7
N4	43.7	42.8	46.3	40.5	44.5	43.5
Mean	38.2	40.7	42.0	36.3	41.0	39.6

Mean D.M. %: 86.2

70/R/RN/1&2						
HIGHFIELD				FOSTERS		
	Mean			Mean		
LUCERNE, DRY MATTER: CWT						
TOTAL OF 2 CUTS						
1st year	29.5			28.0		
ALL-GRASS LEY, DRY MATTER: CWT						
TOTAL OF 2 CUTS						
1st year	53.4			37.4		
CLOVER-GRASS LEY, DRY MATTER: CWT						
TOTAL OF 2 CUTS						
1st year	31.2			24.0		
RESEEDED GRASS, DRY MATTER: CWT						
TOTAL OF 3 CUTS						
HIGHFIELD				FOSTERS		
	Blocks	RC	RN	Blocks	RC	RN
22nd Expt1 year	1 & 4	22.5	70.0	1 & 3	29.4	43.2

70/R/RN/1&2

PERMANENT GRASS, DRY MATTER: CWT

TOTAL OF 3 CUTS

	GC	GN
HIGHFIELD		
22nd Exptl year		
Blocks 1 & 4	16.0	67.6
Block 2	14.3	67.8

(C) Clover-grass management
(N) All-grass management