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# Yields of the Field Experiments 1981

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## 81/W/RN/6 Arable Reference Plots - W. Barley, W. Oats

### Rothamsted Research

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81/W/RN/6

ARABLE REFERENCE PLOTS

Object: To study the long term effects of FYM and N, P and K fertilisers on the yield and mineral content of crops - Woburn Stackyard C.

Sponsor: F.V. Widdowson.

The 22nd year, w. barley, w. oats.

For previous years see 60/B/3(t), 61-65/B/2, 66/B/2(t), 67/B/2(t), 68/B/3(t), 69/W/RN/6, 70/W/RN/6(t) and 71-80/W/RN/6.

Design: Blocks of 12 plots for each crop. Barley and oats one third replicate of 3 x 12 x 3 in 3 blocks of 12 plots.

Whole plot dimensions: 2.74 x 2.13.

Treatments: All combinations of:-

Blocks

1. CROP Crops in 1981 and previous crops:

W. oats after w. barley in 1980:

OW(OW)	After w. oats in 1979 (arable since 1960)
OW(BS)	After s. barley in 1979 (arable since 1960)
OW(BS G)	After s. barley in 1979 (grass 1960-73, arable thereafter)

W. barley after w. oats in 1980:

BW(P)	After potatoes in 1979
BW(SB)	After sugar beet in 1979
BW(L)	After one-year ley in 1979

Plots

2. MANURE(79) Fertilisers and farmyard manure (until 1979, none in 1980 & 1981):

O  
N1  
P  
N1P  
K  
N1K  
PK  
N1PK  
N2PK  
D  
N1PKD  
N2PKD

N1,2 (kg N): 31.5, 63 (ley): 63, 126 (s. barley and w. oats): 126, 252 (sugar beet and potatoes): 188, 376 (permanent grass) as ammonium nitrate.

P: P205 at 63 kg as triple superphosphate.

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K: K20 at 252 kg as potassium bicarbonate.

D: Farmyard manure at 25 tonnes (permanent grass): 50 tonnes (sugar beet and potatoes): none to other crops.

and some of the combinations of 1 & 2 with:

3. N 81	Nitrogen fertiliser (kg N) (cumulative to 1980):
90	25 kg N to seedbed, 30 kg N in March, 35 kg N in April
120	25 kg N to seedbed, 40 kg N in March, 55 kg N in April
150	25 kg N to seedbed, 50 kg N in March, 75 kg N in April

NOTE: The block in permanent grass was discontinued in 1981.

Standard applications:

Both crops: Weedkillers: Ioxynil at 0.32 kg and mecoprop at 0.94 kg in 280 l, ioxynil at 0.42 kg and mecoprop at 1.3 kg in 280 l, on both occasions with tridemorph. Fungicides: Tridemorph at 0.53 kg, benomyl at 0.28 kg in 280 l.

W. oats: Insecticides: Phorate at 2 kg as granules, pirimicarb at 0.14 kg in 280 l. Fungicides: Carbendazim, tridemorph and maneb (as 'Cosmic' at 3.9 kg) with the pirimicarb.

W. barley: Fungicides: Benodanil at 1.1 kg with tridemorph at 0.53 kg in 280 l.

Seed: W. oats: Pennal, sown at 210 kg.

W. barley: Igril, dressed with ethirimol, sown at 190 kg.

Cultivations, etc.:-

W. oats and w. barley: Rotary cultivated: 15 Sept, 1980. Weedkillers and tridemorph applied: 25 Nov, 26 Mar, 1981. Second N applied: 18 Mar. Benomyl applied: 26 Mar. Third N applied: 24 Apr.

W. barley only: First N applied, seed sown: 15 Sept, 1980. Benodanil with tridemorph applied: 13 May, 1981. Harvested: 21 July.

W. oats: First N applied, phorate applied, raked in, seed sown: 2 Oct, 1980. 'Cosmic' and pirimicarb applied: 1 June, 1981. Harvested: 11 Aug.

NOTE: N, P and K contents of grain were measured.

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WINTER BARLEY

GRAIN TONNES/HECTARE

\*\*\*\*\* TABLES OF MEANS \*\*\*\*\*

CROP	BW(P)	BW(SB)	BW(L)	MEAN
MANURE (79)				
0	3.76	4.45	3.37	3.86
N1	3.24	3.25	2.20	2.90
P	2.85	4.33	1.33	2.84
N1P	1.57	3.65	1.51	2.25
K	6.86	6.13	5.98	6.32
N1K	7.16	6.00	5.40	6.19
PK	6.91	6.20	6.43	6.51
N1PK	6.75	6.12	6.35	6.41
N2PK	5.54	7.25	5.60	6.13
D	6.11	7.07	6.12	6.43
N1PKD	5.92	6.69	4.98	5.86
N2PKD	6.23	5.99	5.17	5.80
MEAN	5.24	5.59	4.54	5.12

N 81	90	120	150	MEAN
MANURE (79)				
0	4.45	3.76	3.37	3.86
N1	2.20	3.25	3.24	2.90
P	4.33	2.85	1.33	2.84
N1P	1.51	3.65	1.57	2.25
K	6.13	6.86	5.98	6.32
N1K	5.40	6.00	7.16	6.19
PK	6.20	6.91	6.43	6.51
N1PK	6.35	6.12	6.75	6.41
N2PK	5.54	5.60	7.25	6.13
D	6.11	6.12	7.07	6.43
N1PKD	5.92	4.98	6.69	5.86
N2PKD	6.23	5.17	5.99	5.80
MEAN	5.03	5.11	5.24	5.12

GRAIN MEAN DM% 83.4

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WINTER BARLEY

STRAW TONNES/HECTARE

\*\*\*\*\* TABLES OF MEANS \*\*\*\*\*

CROP MANURE (79)	BW(P)	BW(SB)	BW(L)	MEAN
0	5.04	5.01	5.33	5.13
N1	4.40	4.48	3.72	4.20
P	6.19	5.40	3.92	5.17
N1P	5.20	4.92	2.68	4.27
K	7.69	6.21	8.13	7.35
N1K	7.81	7.39	6.66	7.29
PK	8.20	6.95	8.87	8.01
N1PK	9.08	7.62	7.63	8.11
N2PK	6.53	8.46	7.90	7.63
D	7.23	8.57	8.26	8.02
N1PKD	7.49	9.44	7.28	8.07
N2PKD	7.77	9.38	6.88	8.01
MEAN	6.89	6.99	6.44	6.77
N 81	90	120	150	MEAN
0	5.01	5.04	5.33	5.13
N1	3.72	4.48	4.40	4.20
P	5.40	6.19	3.92	5.17
N1P	2.68	4.92	5.20	4.27
K	6.21	7.69	8.13	7.35
N1K	6.66	7.39	7.81	7.29
PK	6.95	8.20	8.87	8.01
N1PK	7.63	7.62	9.08	8.11
N2PK	6.53	7.90	8.46	7.63
D	7.23	8.26	8.57	8.02
N1PKD	7.49	7.28	9.44	8.07
N2PKD	7.77	6.88	9.38	8.01
MEAN	6.11	6.82	7.38	6.77

STRAW MEAN DM% 72.1

PLOT AREA HARVESTED 0.00050

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WINTER OATS

GRAIN TONNES/HECTARE

\*\*\*\*\* TABLES OF MEANS \*\*\*\*\*

CROP MANURE(79)	OW(OW)	OW(BS)	OW(BS G)	MEAN
O	4.57	2.86	3.90	3.78
N1	3.06	3.24	3.94	3.41
P	4.42	2.56	2.69	3.23
N1P	2.29	3.36	4.07	3.24
K	4.68	4.31	5.85	4.95
N1K	4.25	4.58	4.73	4.52
PK	5.29	5.19	5.15	5.21
N1PK	3.53	4.71	4.19	4.14
N2PK	5.70	3.95	5.56	5.07
D	5.59	4.83	5.72	5.38
N1PKD	5.46	3.64	5.35	4.82
N2PKD	5.44	4.41	4.43	4.76
MEAN	4.52	3.97	4.63	4.38
N 81	90	120	150	MEAN
CROP MANURE(79)				
O	2.86	4.57	3.90	3.78
N1	3.94	3.24	3.06	3.41
P	2.56	4.42	2.69	3.23
N1P	4.07	3.36	2.29	3.24
K	4.31	4.68	5.85	4.95
N1K	4.73	4.58	4.25	4.52
PK	5.19	5.29	5.15	5.21
N1PK	4.19	4.71	3.53	4.14
N2PK	5.70	5.56	3.95	5.07
D	5.59	5.72	4.83	5.38
N1PKD	5.46	5.35	3.64	4.82
N2PKD	5.44	4.43	4.41	4.76
MEAN	4.50	4.66	3.96	4.38

GRAIN MEAN DM% 83.6

81/W/RN/6

WINTER OATS

STRAW TONNES/HECTARE

\*\*\*\*\* TABLES OF MEANS \*\*\*\*\*

CROP MANURE (79)	OW(OW)	OW(BS)	OW(BS G)	MEAN
O	5.94	2.96	5.91	4.94
N1	5.37	3.23	4.33	4.31
P	6.63	3.28	4.82	4.91
N1P	5.24	4.55	4.77	4.86
K	8.65	5.09	9.50	7.75
N1K	7.65	6.60	5.92	6.72
PK	8.57	7.43	9.66	8.56
N1PK	9.06	7.27	6.83	7.72
N2PK	8.97	6.70	7.99	7.89
D	8.30	10.51	11.38	10.06
N1PKD	8.68	8.49	11.37	9.52
N2PKD	8.88	9.33	10.17	9.46
MEAN	7.66	6.29	7.72	7.22
N 81 MANURE (79)	90	120	150	MEAN
O	2.96	5.94	5.91	4.94
N1	4.33	3.23	5.37	4.31
P	3.28	6.63	4.82	4.91
N1P	4.77	4.55	5.24	4.86
K	5.09	8.65	9.50	7.75
N1K	5.92	6.60	7.65	6.72
PK	7.43	8.57	9.66	8.56
N1PK	6.83	7.27	9.06	7.72
N2PK	8.97	7.99	6.70	7.89
D	8.30	11.38	10.51	10.06
N1PKD	8.68	11.37	8.49	9.52
N2PKD	8.88	10.17	9.33	9.46
MEAN	6.29	7.70	7.69	7.22

STRAW MEAN DM% 68.5

PLOT AREA HARVESTED 0.00050