

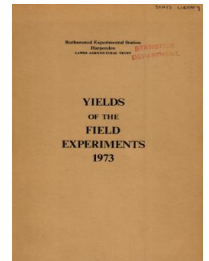
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Yields of the Field Experiments 1973

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73/R/RN/5 - Arable Reference Plots - Old Grass, Barley, Ley, Potatoes, Wheat, Kale

Rothamsted Research

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73/R/RN/5

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 - Great Field IV.

Sponsor: F.V. Widdowson.

The eighteenth year of the rotation, barley, ley, potatoes, winter wheat, kale. The fourteenth year of the same rotation on the additional plots. The seventeenth year of permanent grass.

For previous years see 58/Bc/1(t), 59/Bc/1(t), 60/B/3(t), 61-64/B/2, 65/B/2(t), 66/B/2(t), 67/B/2, 68/B/3(t), 69-72/R/RN/5.

Treatments: Fertilisers and farmyard manure:-

Original plots:

MANURE

None	O
N1	N1
P	P
N1 P	N1P
K	K
N1 K	N1K
PK	PK
N1 PK	N1PK
N2 PK	N2PK
D	D
N1 PK D	N1PKD
N2 PK D	N2PKD

N1, 2 (kg N): 19, 38 (ley): 56, 112 (barley): 75, 150 (wheat and potatoes): 125, 250 (kale and permanent grass) as 'Nitro-Chalk'

P: 63 kg P₂O₅ as superphosphate

K: 250 kg K₂O as muriate of potash

D: 38 tonnes FYM (permanent grass): 50 tonnes (kale and potatoes): none to other crops.

Additional plots:

MANURE

None	O
N2 PK	F
N2 PK Mg Ca	FMgCa
N2 PK Mg S	FMgS
N2 PK Ca S	FCaS
N2 PK Mg Ca S	FMgCaS
N2 PK Mg Ca S TE	FMgCaSTE

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N₂: rates as above, applied as urea
P: 126 kg P₂O₅ as potassium dihydrogen phosphate
K: 83 kg K₂O as potassium sulphate to S plots: 93 kg K₂O as potassium chloride to the remainder
Mg: 126 kg MgO as magnesium chloride
Ca: 126 kg CaO as calcium carbonate
S: 30 kg S supplied by potassium sulphate
TE: Trace element mixture including Mn, Cu, Zn, B, Mo, Co, Fe. Test varies with crop

Whole plot dimensions: 2.13 x 2.44.

Standard applications:

Winter wheat: Weedkiller: 2,4D-P plus MCPA ('Mephetol plus' at 5.6 l in 900 l).
Kale: Insecticide: Menazon ('Saphi-Col' at 0.7 l in 340 l).
Barley: Weedkiller: 2,4D-P plus MCPA ('Mephetol plus' at 5.6 l in 450 l). Fungicide: Tridemorph at 0.53 kg in 450 l (not applied to additional plots).
Potatoes: Insecticide: Menazon ('Saphi-Col' at 0.7 l in 340 l) applied on three occasions. Fungicide: Mancozeb at 1.3 kg applied with insecticide on the last two occasions.

Seed:

Winter wheat: Maris Nimrod, sown at 270 kg.
Kale: Thousand Headed.
Barley: Deba Abed sown at 200 kg. (Midas on additional plots, seed dressed with ethirimol).
Grass-clover ley: R.V.P. Italian Ryegrass and Hungaropoly Red Clover.
Potatoes: King Edward.

Cultivations etc.:-

Winter wheat: Plots dug by hand: 25 Sept, 1972. PK Mg Ca and S applied, seed sown: 13 Oct. First half N dressing applied: 16 Mar, 1973. Weedkiller applied: 5 Apr. Trace element spray applied, second half N dressing applied, all N applied to additional plots: 17 Apr. Harvested: 13 Aug.
Kale: FYM applied, plots dug by hand: 13 Mar, 1972. PK, Mg, Ca and S applied: 27 Feb, 1973. Plots rotary cultivated, seed drilled: 20 Mar. First half N dressing applied to additional plots, all N to remainder: 25 Apr. Second half N dressing applied: 18 May. Trace element spray applied: 6 June. Insecticide applied: 14 June. Harvested: 12 Oct.

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Barley: Plots dug by hand: 13 Nov, 1972. PK, Mg, Ca and S applied: 27 Feb, 1973. N applied, plots rotary cultivated, seed sown: 12 Mar. Weedkiller applied: 11 Apr. Trace element spray and fungicide applied: 18 May. Harvested: 3 Aug.

Grass-clover ley: Seed sown in barley stubble, additional plots: 14 Aug, 1972, main experiment: 1 Sept. PK Mg Ca and S applied: 18 Dec. N applied: 16 Mar, 1973. Trace element spray applied: 17 Apr. Cut three times: 5 June, 16 July, 13 Sept.

Potatoes: FYM applied, plots dug by hand: 13 Nov, 1972. PK, Mg, Ca and S applied: 27 Feb, 1973. N applied, plots rotary cultivated twice and Mg applied to half plots of main experiment, potatoes planted: 29 Mar. Second half N dressing applied to additional plots: 18 May. Trace element spray applied: 6 June. Insecticide applied: 14 June. Insecticide with fungicide applied: 29 June and 18 July. Lifted: Plots of the main experiment with neither K nor FYM and no fertiliser plot of additional plots: 27 July. Remaining plots lifted: 4 Sept.

Permanent grass: P and K applied: 18 Dec, 1972. FYM applied: 27 Feb, 1973. N applied: 16 Mar, 18 May, 16 July. Cut three times: 18 May, 16 July, 27 Sept.

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TABLES OF MEANS

GREAT FIELD IV (R): ORIGINAL PLOTS

TONNES/HECTARE

MANURE	WINTER WHEAT:		KALE: FRESH WEIGHT	BARLEY:		LEY: DRY MATTER			POTATOES TOTAL TUBERS	PERMANENT GRASS:		
	GRAIN	STRAW		GRAIN	STRAW	1st cut	2nd cut	3rd cut		1st cut	2nd cut	3rd Total cut of 3 cuts
O	3.27	4.42	18.3	2.91	2.76	1.95	0.69	0.94	12.3	0.42	1.26	0.98
N1	3.24	6.15	23.5	2.72	3.08	3.51	0.92	1.29	10.7	1.00	1.45	1.48
P	2.60	3.93	30.5	2.91	2.74	2.05	1.26	2.15	9.2	0.48	1.01	0.71
N1P	0.84	3.55	47.1	0.72	2.31	3.54	0.83	0.64	10.5	1.71	1.77	1.74
K	4.21	5.72	17.4	3.89	3.00	2.22	1.57	2.94	32.3	0.55	1.23	1.18
N1K	6.18	8.27	13.1	4.46	4.00	3.56	1.43	2.19	42.1	1.88	2.35	2.35
PK	4.67	6.14	25.3	4.25	3.29	2.56	2.80	4.11	35.0	0.63	1.64	1.18
N1PK	6.55	9.49	60.2	5.25	5.73	4.26	1.96	4.06	51.5	2.22	2.56	1.90
N2PK	6.72	10.56	81.1	5.68	6.68	5.28	1.38	3.09	57.7	4.04	3.16	2.70
D	6.13	8.46	49.7	5.45	4.60	3.57	2.49	4.11	56.7	2.62	1.91	1.50
N1PKD	6.20	10.99	106.4	5.88	6.60	4.46	1.65	3.99	65.0	3.45	2.73	2.25
N2PKD	4.74	12.36	109.0	4.84	6.74	5.65	1.58	3.25	70.9	4.86	3.66	2.55
Mean												
D.M. %	85.7	80.4		80.0	57.0	26.6	18.1	24.6	23.1	28.3	25.3	25.6
												26.4

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GREAT FIELD IV (R): ADDITIONAL PLOTS

TONNES/HECTARE

	WINTER WHEAT: GRAIN	WHEAT: STRAW	KALE: FRESH WEIGHT	BARLEY:		LEY: DRY MATTER				POTATOES TOTAL TUBERS
				GRAIN	STRAW	1st cut	2nd cut	3rd cut	Total of 3 cuts	
MANURE										
O	3.81	5.34	25.3	3.75	3.25	2.04	1.42	1.77	5.23	15.9
F	6.19	9.71	92.4	5.73	6.92	6.16	1.80	2.96	10.92	55.2
FMgCa	6.49	10.93	90.7	7.01	7.45	6.61	1.59	2.99	11.19	51.1
FMgS	6.44	9.33	98.5	5.64	7.21	6.03	1.98	3.25	11.26	53.4
FCaS	5.91	10.54	87.2	6.33	7.58	7.04	2.20	3.34	12.58	51.1
FMgCaS	5.92	10.27	101.1	6.33	6.58	6.80	1.88	3.26	11.94	51.7
FMgCaSTE	5.88	10.79	89.8	5.71	6.85	6.90	1.83	3.02	11.75	47.1
Mean D.M. %	85.6	83.9		84.6	73.6	27.3	18.0	25.8	23.7	