ROTHAMSTED RESEARCH

Yields of the Field Experiments 1975

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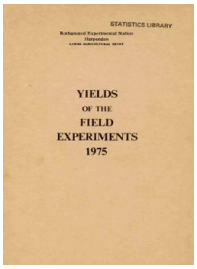

75/ R/RN/5 - Arable Reference Plots - Permanent Grass, Barley, Ley, Potatoes, Wheat, Kale

Rothamsted Research

Rothamsted Research (1976) *75/ R/RN/5 - Arable Reference Plots - Permanent Grass, Barley, Ley, Potatoes, Wheat, Kale ;* Yields Of The Field Experiments 1975, pp 83 - 88 **- DOI: https://doi.org/10.23637/ERADOC-1-141**

75/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 20th year of the rotation, barley, ley, potatoes, winter wheat, kale. The 16th year of the same rotation on the additional plots. The 19th 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) and 69-74/R/RN/5.

Design: 1 block of 12 plots for each crop on original plots. 1 block of 7 plots for each crop on additional plots.

Whole plot dimensions: 2.13 x 2.44.

Treatments: Fertilisers and farmyard manure:

	MANURE
Original plots:	
None	0
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 P_2O_5 as superphosphate

K: 250 kg K_2O as muriate of potash

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

NOTE: Potatoes on the original plots test, on sub plots: 0 v. Mg (82 kg MgO as Epsom salts). Untreated sub plots receive 82 kg MgO after potato harvest.

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Additional plots:	MANURE
None	0
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

F: N2PK
N2: rates as above, applied as urea
P: 126 kg P_2O_5 as potassium dihydrogen phosphate
K: 83 kg K_2O as potassium sulphate to S plots: 93 kg K_2O as potassium chloride to the remainder
Mg: 126 kg MgO as magnesium chloride
Ca: 126 kg CaO as calcium carbonate
S: 30 kg S applied by potassium sulphate
TE: Trace element mixture including Mn, Cu, Zn, B, Mo, Ca, Fe. Test varies with crop

Standard applications:
Winter wheat and barley: Weedkillers: Ioxynil with mecoprop ('Actril C' at 5.6 l in 450 l).
Potatoes: Weedkillers: Linuron at 1.1 kg with paraquat at 0.42 kg ion in 280 l. Insecticide: Menazon at 0.28 kg in 280 l on two occasions. Fungicide: Mancozeb at 1.3 kg in 280 l sprayed with insecticide on two occasions.

Seed:
Winter wheat: Maris Nimrod (Maris Fundin on additional plots) both sown at 210 kg.
Barley: Maris Mink, dressed with ethirimol, sown at 200 kg.
Potatoes: King Edward.
Kale: Thousand Headed.
Grass-clover ley: RVP Italian Ryegrass and Hungaropoly Red Clover.

Cultivations, etc.:-
Winter wheat: Balancing Mg applied to half plots: 9 Sept, 1974. Dug by hand: 11 Sept. P, K, Mg, Ca and S applied: 12 Sept. Seed sown: 24 Oct. Weedkiller, trace elements and first half N dressing applied: 16 Apr, 1975. Second half N dressing and all N to additional plots applied: 8 May. Harvested: 11 Aug.
Barley: Dug by hand: 2 Dec, 1974. P, K, Mg, Ca and S applied: 24 Feb, 1975. Rotary cultivated, N applied and seed sown: 26 Mar. Weedkiller applied: 19 May. Trace elements applied: 23 June. Harvested: 11 Aug.

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Kale: FYM applied and all plots dug by hand: 29 Nov, 1974. P, K, Mg, Ca and S applied: 24 Feb, 1975. Rotary cultivated and seed sown: 21 Apr. All N applied to original plots and first half N to additional plots: 16 May. Second half N to additional plots applied: 12 June. Trace elements applied: 23 June. Harvested: 24 Oct.

Potatoes: FYM applied and all plots dug by hand: 29 Nov, 1974. P, K, Mg, Ca and S applied: 24 Feb, 1975. All N applied to original plots and half N to additional plots and rotary cultivated, Mg applied to half plots of main experiment and potatoes planted: 8 May. Weedkillers applied: 4 June. Second half of N applied to additional plots: 12 June. Trace elements applied: 23 June. Fungicide with insecticide applied: 18 July and 7 Aug. Plots of the main experiment with neither K nor FYM and the no-fertiliser plot of the additional plots lifted: 10 Sept. Remaining plots lifted: 26 Sept.

Grass-clover ley: Seed sown: 15 Sept, 1974. P, K, Mg, Ca and S applied: 3 Dec. N applied: 17 Mar, 1975. Trace elements applied: 16 Apr. Cut four times: 19 May, 14 July, 3 Sept, 17 Oct.

Permanent grass: P and K applied: 3 Dec, 1974. FYM applied: 17 Mar, 1975. N applied: 17 Mar, 19 May, 14 July. Cut three times: 19 May, 14 July, 17 Oct.

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TABLES OF MEANS

GREAT FIELD IV (R): ORIGINAL PLOTS

TONNES/HECTARE

	WINTER WHEAT: GRAIN	WINTER WHEAT: STRAW	KALE: FRESH WEIGHT	BARLEY: GRAIN	BARLEY: STRAW	LEY: DRY MATTER 1ST CUT	2ND CUT	3RD CUT	4TH CUT	TOTAL OF 4 CUTS
MANURE										
0	3.33	4.18	4.8	3.11	2.27	1.62	1.04	0.34	0.09	3.09
N1	4.11	6.78	3.5	3.46	2.80	2.98	1.18	0.41	0.12	4.69
P	4.54	5.27	15.7	2.87	2.27	2.68	1.97	0.78	0.10	5.45
N1P	4.14	6.89	29.6	2.56	2.05	3.98	1.51	0.38	0.16	6.03
K	3.86	5.01	5.2	2.93	2.64	2.63	2.13	0.72	0.10	5.58
N1K	5.89	8.01	3.9	3.95	3.07	3.60	2.13	0.51	0.14	6.38
PK	4.21	5.33	14.8	3.89	2.72	3.01	3.04	1.03	0.28	7.36
N1PK	6.06	9.02	30.1	4.59	3.39	3.95	2.55	0.79	0.33	7.62
N2PK	7.00	10.27	40.1	5.35	4.66	4.85	2.30	0.73	0.22	8.10
D	5.32	6.56	28.8	4.61	3.41	3.55	2.67	0.94	0.12	7.28
N1PKD	6.92	9.02	55.4	5.61	4.24	5.17	2.87	0.80	0.18	9.02
N2PKD	7.39	10.29	69.8	6.06	3.73	5.30	2.46	0.80	0.22	8.78
MEAN DM %	88.5	88.8		86.6	68.4	21.5	33.3	41.1	18.4	28.6

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GREAT FIELD IV (R): ORIGINAL PLOTS

TONNES/HECTARE

	POTATOES: TOTAL TUBERS			PERMANENT GRASS: DRY MATTER			
	0	MG	MEAN	1ST CUT	2ND CUT	3RD CUT	TOTAL OF 3 CUTS
MANURE							
0	6.9	9.6	8.3	0.96	0.34	0.25	1.55
N1	6.2	6.2	6.2	1.52	0.35	0.45	2.32
P	7.3	7.7	7.5	0.85	0.25	0.15	1.25
N1P	5.4	5.8	5.6	2.20	0.22	0.58	3.00
K	17.3	16.5	16.9	1.43	0.43	0.40	2.26
N1K	23.1	23.1	23.1	2.43	0.72	0.83	3.98
PK	23.1	28.8	26.0	1.07	0.64	0.38	2.09
N1PK	31.9	31.9	31.9	2.72	0.63	0.74	4.09
N2PK	25.4	23.8	24.6	3.92	0.73	1.24	5.89
D	30.8	31.9	31.3	3.69	0.54	0.73	4.96
N1PKD	38.4	35.8	37.1	4.34	0.96	1.31	6.61
N2PKD	34.6	40.0	37.3	5.48	1.95	0.90	8.33
MEAN DM%				20.6	35.7	18.8	25.0

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GREAT FIELD IV (R): ADDITIONAL PLOTS

TONNES/HECTARE

	WINTER WHEAT: GRAIN	WINTER WHEAT: STRAW	KALE: FRESH WEIGHT	BARLEY: GRAIN	BARLEY: STRAW	LEY: DRY MATTER 1ST CUT	2ND CUT	3RD CUT	4TH CUT	TOTAL OF 4 CUTS	POTATOES: TOTAL TUBERS
MANURE											
0	3.33	4.40	10.5	1.93	1.62	2.26	1.35	0.64	0.12	4.37	7.9
F	6.35	6.80	54.0	4.08	3.84	5.22	2.40	0.69	0.24	8.55	23.3
FMGCA	5.55	6.33	58.4	5.19	4.18	5.11	2.34	0.67	0.26	8.38	26.0
FMGS	6.58	6.98	46.6	4.94	4.36	4.87	2.17	0.83	0.28	8.15	27.1
FCAS	6.00	7.52	47.1	5.12	3.51	4.52	2.09	0.79	0.23	7.63	25.2
FMGCAS	5.78	6.15	54.5	4.51	4.36	5.33	2.51	0.95	0.25	9.04	24.0
FMGCASTE	6.16	6.84	55.4	5.05	4.66	5.32	2.19	0.70	0.30	8.51	26.1
MEAN DM%	89.2	90.8		86.8	70.1	21.5	33.4	41.4	18.3	28.6	