ROTHAMSTED RESEARCH

Yields of the Field Experiments 1976

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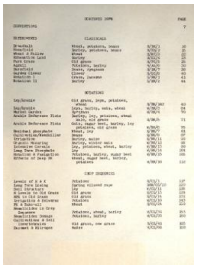

76/R/RN/5 Arable Reference Plots - Barley, Ley, Potatoes, Wheat, Kale, Old Grass

Rothamsted Research

Rothamsted Research (1977) *76/R/RN/5 Arable Reference Plots - Barley, Ley, Potatoes, Wheat, Kale, Old Grass ;* Yields Of The Field Experiments 1976, pp 71 - 75 **- DOI: https://doi.org/10.23637/ERADOC-1-15**

76/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 21st year of the rotation, barley, ley, potatoes, winter wheat, kale. The 17th year of the same rotation on the additional plots. The 20th 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 69-75/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

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

N1, 2 (kg N): 19, 38 (ley): 56, 112 (barley): 75, 150 (wheat): 125, 250 (potatoes - 75, 150 until 1975): 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 these plots all receive a standard dressing of 82 kg MgO as Epsom salts. Before 1976 potatoes tested 0 v 82 kg MgO on sub plots, dressing balanced-up after harvest.

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Additional plots

MANURE

O	None
F	N PK
FMGCA	N PK Mg Ca
FMGS	N PK Mg S
FCAS	N PK Ca S
FMGCAS	N PK Mg Ca S
FMGCASTE	N PK Mg Ca S TE

F: N PK
N: N applied as urea. N1 to wheat, N2 to other crops. Rates as above.
P: 126 kg P2O5 as potassium dihydrogen phosphate
K: 251 kg K2O total. As potassium dihydrogen phosphate (83 kg K2O) on all NPK plots. In addition plots without S receive 168 kg K2O as potassium chloride, plots with S receive 92 kg K2O as potassium sulphate plus 76 kg K2O as potassium chloride.
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, Ca, Fe. Test varies with crop

Standard applications:
Barley and winter wheat: Weedkillers: Ioxynil at 0.42 kg with mecoprop at 1.3 kg in 280 l. Fungicide: Tridemorph at 0.53 kg in 280 l.
Potatoes: Weedkiller: Linuron at 0.93 kg in 280 l. Insecticide: Menazon at 0.28 kg in 280 l on two occasions. Fungicide: Mancozeb at 1.3 kg with the second insecticide spray.
Kale: Insecticide: Menazon at 0.28 kg in 280 l on two occasions.

Seed:
Barley: Maris Mink, sown at 200 kg.
Grass-clover ley: RvP Italian ryegrass and Hungaropoly red clover.
Potatoes: Pentland Crown (King Edward on additional plots).
Winter wheat: Maris Fundin, sown at 210 kg.
Kale: Thousand Headed, sown at 7 kg.

Cultivations, etc.:-
Barley: Dug by hand: 29 Oct, 1975. P, K, Mg, Ca and S applied to additional plots: 27 Feb, 1976. P and K applied to remaining plots and seed sown: 2 Mar. N applied: 8 Apr. Weedkillers applied: 7 May. Trace elements applied: 17 May. Fungicide applied: 25 May. Harvested by hand: 19 July.
Grass-clover ley: Seed sown: 11 Aug, 1975. P, K, Ca, Mg and S applied: 12 Nov. N applied: 2 Mar, 1976. Trace elements applied: 14 Apr. Cut twice: 19 May, 12 July.

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Potatoes: FYM applied and dug by hand: 22 Oct, 1975. P, K, Ca, Mg and S applied to additional plots: 27 Feb, 1976. P, K and Mg applied to remaining plots: 2 Mar. N applied, plots rotary cultivated and planted: 8 Apr. Weedkiller applied: 6 May. Second N applied to additional plots: 3 June. Trace elements applied: 7 June. Insecticide applied: 10 June. Insecticide with fungicide applied: 29 June. Plots of the main experiment with neither K nor FYM and no fertiliser plot of additional plots lifted: 16 Aug. Remaining additional plots lifted: 8 Sept. Remaining plots lifted: 13 Sept.

Winter wheat: Balancing Mg applied: 26 Sept, 1975. Dug by hand: 30 Sept. P, K, Ca, Mg and S applied and seed sown: 3 Oct. Weedkillers applied: 5 Mar, 1976. N and trace elements applied: 14 Apr. Fungicide applied: 28 Apr. Harvested by hand: 12 July.

Kale: FYM applied and dug by hand: 21 Oct, 1975. P, K, Ca, Mg and S applied: 27 Feb, 1976. N applied and seed sown: 23 Mar. Second N applied to additional plots: 3 June. Trace elements applied:-7 June. Insecticide applied: 10 June, 17 Sept. Harvested by hand: 3 Nov.

Permanent grass: P and K applied: 12 Nov, 1975. FYM applied: 2 Mar, 1976. N applied: 2 Mar, 19 May, 16 July. Cut three times: 19 May, 16 July, 11 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	LEY : DRY MATTER 2ND CUT	LEY : DRY MATTER TOTAL OF 2 CUTS
MANURE								
0	3.00	3.88	7.0	1.86	1.47	1.06	0.46	1.52
N1	2.75	4.10	5.2	2.04	1.88	2.22	0.60	2.82
P	2.81	4.14	21.8	1.80	1.49	1.36	0.55	1.91
N1P	1.64	3.09	35.7	1.24	1.39	2.51	0.68	3.19
K	3.89	4.67	7.8	2.11	1.63	1.41	0.52	1.93
N1K	4.31	4.42	2.6	2.17	1.95	2.78	0.63	3.41
PK	5.15	7.03	27.0	2.85	1.94	1.78	0.75	2.53
N1PK	6.11	7.76	41.0	3.64	2.59	2.84	0.78	3.62
N2PK	5.93	8.01	54.9	3.46	2.63	4.38	0.81	5.20
D	5.81	7.28	36.6	3.37	2.54	2.63	0.75	3.39
N1PKD	6.23	8.87	59.3	4.48	3.31	4.48	0.97	5.45
N2PKD	6.43	9.51	73.2	3.72	2.98	6.00	1.09	7.10
MEAN DM%	84.2	74.7	84.7	77.3	28.2	46.0	37.1	

	POTATOES: TOTAL TUBERS	PERMANENT GRASS: DRY MATTER 1ST CUT	2ND CUT	3RD CUT	TOTAL OF 3 CUTS
MANURE					
0	7.4	0.58	0.53	0.28	1.39
N1	7.6	1.02	0.31	0.29	1.63
P	12.6	0.50	0.39	0.16	1.05
N1P	7.6	2.21	0.53	0.75	3.49
K	21.5	0.90	0.43	0.37	1.70
N1K	20.8	2.24	0.55	0.73	3.51
PK	26.9	0.71	0.77	0.43	1.91
N1PK	26.9	2.68	0.73	1.00	4.41
N2PK	28.4	4.71	0.42	0.97	6.10
D	26.5	2.68	1.10	0.62	4.39
N1PKD	35.0	3.70	1.17	1.26	6.14
N2PKD	33.0	5.65	1.12	0.74	7.50
MEAN DM%		27.7	65.9	21.3	38.3

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GREAT FIELD IV (R) : ADDITIONAL PLOTS

TONNES/HECTARE

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

	WINTER WHEAT: GRAIN	WINTER WHEAT: STRAW	KALE: FRESH WEIGHT	BARLEY: GRAIN	BARLEY: STRAW
MANURE					
0	3.51	4.48	9.6	1.68	1.51
F	5.16	8.11	64.5	3.78	3.45
FMGCA	5.11	8.56	66.3	4.11	3.96
FMGS	5.22	8.59	68.9	3.26	3.01
FCAS	5.13	8.47	68.0	4.18	3.82
FMGCAS	5.27	8.98	65.4	4.43	3.94
FMGCASTE	4.63	8.31	65.4	4.45	3.73
MEAN DM%	86.6	80.4		87.8	83.4

	LEY : DRY MATTER 1ST CUT	LEY : DRY MATTER 2ND CUT	LEY : DRY MATTER TOTAL OF 2 CUTS	POTATOES: TOTAL TUBERS
MANURE				
0	1.79	0.66	2.45	10.4
F	5.16	1.18	6.35	26.1
FMGCA	5.20	0.93	6.12	28.6
FMGS	4.45	0.96	5.41	28.6
FCAS	5.00	0.94	5.94	27.9
FMGCAS	5.93	1.14	7.07	31.5
FMGCASTE	5.39	0.96	6.35	25.6
MEAN DM%	28.4	48.7	38.6	

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