ROTHAMSTED RESEARCH

Yields of the Field Experiments 1977

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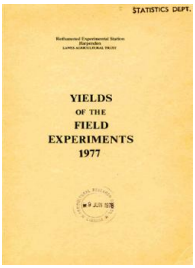

77/R/RN/5 Arable Reference Plots - Barley, Ley, Potatoes, Wheat, Kale, Old Grass

Rothamsted Research

Rothamsted Research (1978) *77/R/RN/5 Arable Reference Plots - Barley, Ley, Potatoes, Wheat, Kale, Old Grass ;* Yields Of The Field Experiments 1977, pp 63 - 67 **- DOI: https://doi.org/10.23637/ERADOC-1-29**

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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 22nd year of the rotation, barley, ley, potatoes, winter wheat, kale.
The 18th year of the same rotation on the additional plots.
The 21st 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 69-76/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
N1
P
N1P
K
N1K
PK
N1PK
N2PK
D
N1PKD
N2PKD

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 P205 as superphosphate
K: 250 kg K20 as muriate of potash
D: 38 tonnes FYM (permanent grass): 50 tonnes (kale and potatoes): none to other crops.

NOTE: Since 1977 all wheat on these plots receives 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 before wheat. Reference in the 1976 'Yields' to potatoes receiving a standard dressing of Mg in that year was incorrect, no Mg was applied.

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Additional plots

MANURE

0	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 P205 as potassium dihydrogen phosphate
K: 251 kg K20 total. As potassium dihydrogen phosphate (83 kg K20) on all NPK plots. In addition plots without S receive 168 kg K20 as potassium chloride, plots with S receive 92 kg K20 as potassium sulphate plus 76 kg K20 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: 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: Weedkillers: Linuron at 0.93 kg plus paraquat at 0.28 kg ion in 280 l. Fungicide: Mancozeb at 1.3 kg in 280 l, (applied twice to original plots). Insecticide: Menazon at 0.28 kg applied with the first fungicide spray.
Winter wheat: Weedkillers: Ioxynil at 0.47 kg with mecoprop at 1.4 kg in 280 l.

Seed: Barley: Maris Mink, sown at 200 kg.
Grass-clover ley: RvP Italian ryegrass and Hungaropoly red clover.
Potatoes: Pentland Crown.
Winter wheat: Maris Fundin, sown at 220 kg.
Kale: Thousand-headed.

Cultivations, etc.:-
Barley: Original plots dug by hand: 8 Nov, 1976. Additional plots dug by hand: 18 Nov. P, K, Mg, Ca and S applied: 3 Mar, 1977. N applied and seed sown: 9 Mar. Weedkillers applied: 6 May. Trace elements applied: 2 June. Fungicide applied: 20 June. Additional plots harvested by hand: 16 Aug. Original plots harvested by hand: 23 Aug.
Grass-clover ley: Rotary cultivated and seed sown: 4 Aug, 1976. P, K applied to original plots: 19 Nov. P, K, Mg, Ca and S applied to additional plots: 8 Dec. N applied: 3 Mar, 1977. Trace elements applied: 19 Apr. Cut three times: 18 May, 11 July, 26 Sept.

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Potatoes: FYM applied and dug by hand: 17 Sept, 1976. P, K, Mg, Ca and S applied: 3 Mar, 1977. N applied, rotary cultivated and planted: 25 Apr. Weedkillers applied: 23 May. Second N applied to additional plots: 2 June. Trace elements applied: 20 June. Fungicide with insecticide applied: 30 June. Plots of the original plots with neither K nor FYM and no fertiliser plot of the additional plots lifted: 1 Aug. Fungicide applied to remaining original plots: 7 Sept. Remaining plots lifted: 6 Oct.

Winter wheat: Dug by hand: 14 Sept, 1976. Test P, K, Mg, Ca and S and basal Mg to original plots applied: 27 Sept. Seed sown: 8 Oct. Weedkillers applied: 9 Mar, 1977. N and trace elements applied: 19 Apr. Additional plots harvested by hand: 16 Aug. Remaining plots harvested by hand: 23 Aug.

Kale: Additional plots dug by hand: 16 Sept, 1976. FYM applied and remaining plots dug by hand: 11 Oct. P, K, Mg, Ca and S applied: 3 Mar, 1977. N applied and seed sown: 5 Apr. Second N applied to additional plots: 2 June. Trace elements applied: 20 June. Harvested by hand: 24 Oct.

Permanent grass: P and K applied: 19 Nov, 1976. FYM applied: 3 Mar, 1977. N applied: 3 Mar, 18 May, 11 July. Cut three times: 18 May, 11 July, 30 Sept.

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GREAT FIELD IV (R): ORIGINAL PLOTS

TONNES/HECTARE

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

	WINTER WHEAT: GRAIN	WINTER WHEAT: STRAW	KALE: FRESH WEIGHT	BARLEY: GRAIN	BARLEY: STRAW	LEY : DRY MATTER 1ST CUT	2ND CUT	3RD CUT	TOTAL OF 3 CUTS
MANURE									
0	2.80	2.79	15.7	3.08	2.16	2.02	1.10	0.92	4.04
N1	3.12	3.57	19.2	3.96	3.70	3.02	1.66	0.65	5.33
P	3.52	4.08	26.2	3.20	2.50	2.33	1.20	0.56	4.10
N1P	1.35	2.29	38.4	3.69	3.79	3.35	1.49	0.53	5.38
K	4.31	5.28	6.1	3.14	2.34	2.15	1.46	1.47	5.09
N1K	6.19	7.18	7.4	4.70	3.82	3.13	1.97	1.34	6.44
PK	4.43	5.46	15.7	3.94	2.20	2.75	2.09	3.16	8.00
N1PK	7.30	8.57	49.3	5.21	4.05	4.09	1.89	2.42	8.40
N2PK	6.95	8.37	63.2	6.35	5.30	5.62	2.40	1.20	9.23
D	5.01	5.66	39.7	4.13	3.20	3.14	2.17	2.08	7.39
N1PKD	7.19	9.33	64.5	6.30	4.85	5.16	2.29	2.02	9.47
N2PKD	7.78	10.06	83.7	6.22	5.58	5.22	2.76	1.75	9.73
MEAN DM%	75.7	66.2		76.6	64.0	23.7	27.6	22.3	24.5

	POTATOES: TOTAL TUBERS	PERMANENT GRASS : DRY MATTER 1ST CUT	2ND CUT	3RD CUT	TOTAL OF 3 CUTS
MANURE					
0	6.1	0.33	1.39	1.12	2.84
N1	7.4	0.68	1.37	1.59	3.64
P	5.0	0.39	1.28	0.95	3.62
N1P	6.4	1.11	1.53	1.98	4.62
K	25.4	0.48	1.35	1.22	3.05
N1K	41.0	1.61	2.64	2.31	6.56
PK	29.0	0.37	1.43	1.21	3.02
N1PK	49.8	2.14	2.79	2.36	7.30
N2PK	55.1	3.37	2.51	2.82	8.70
D	36.7	3.10	1.83	1.93	6.87
N1PKD	57.1	4.16	2.11	2.59	8.86
N2PKD	59.4	3.92	4.35	3.59	11.86
MEAN DM%		24.8	28.4	26.1	26.4

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GREAT FIELD IV (R) : ADDITIONAL PLOTS

TONNES/HECTARE

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

	WINTER WHEAT: GRAIN	STRAW	KALE: FRESH WEIGHT	BARLEY: GRAIN	STRAW	POTATOES: TOTAL TUBERS
MANURE						
0	2.83	3.15	27.5	2.88	2.63	8.7
F	8.69	10.45	69.8	6.72	6.17	59.8
FMGCA	8.28	10.26	70.6	6.91	6.22	58.0
FMGS	8.14	9.17	75.9	6.90	6.12	63.6
FCAS	7.40	8.22	67.1	6.78	6.58	60.3
FMGCAS	7.98	9.35	69.8	6.47	6.08	60.0
FMGCASTE	8.34	9.30	75.4	6.71	6.08	57.6
MEAN DM%	78.9	69.7		80.9	73.5	

	LEY : DRY MATTER 1ST CUT	2ND CUT	3RD CUT	TOTAL OF 3 CUTS
MANURE				
0	2.08	1.08	0.71	3.86
F	5.54	2.37	1.43	9.34
FMGCA	4.98	2.74	2.01	9.73
FMGS	4.80	1.76	1.10	7.66
FCAS	5.34	2.51	1.97	9.82
FMGCAS	5.29	2.50	2.23	10.03
FMGCASTE	5.48	2.36	2.06	9.90
MEAN DM%	22.1	28.1	21.8	24.0

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