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Yields of the Field Experiments 1972

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72/W/RN/5 Arable Reference Plots - Barley, Ley, Potatoes, W. Wheat, Kale

Rothamsted Research

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72/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 seventeenth year of the rotation, barley, ley, potatoes, winter wheat, kale. The thirteenth year of the same rotation on the additional plots. The sixteenth year of permanent grass.

For previous years see 58/Bc/1(t), 59/Bc/1(t), 60/E/3(t), 61-64/B/2, 65/B/2(t), 66/B/2(t), 67/B/2, 68/B/3(t) and 69-71/R/RN/5.

Whole plot dimensions: 2.13 x 2.44.

Seed: Winter wheat: Maris Nimrod sown at 270 kg.

Kale: Thousand Headed.

Barley: Deba Abed sown at 170 kg (Midas sown at 150 kg on additional plots), seed dressed with ethirimol in each case.

Grass-clover ley: R.V.P. Italian Ryegrass and Dorset Marl Red Clover.

Potatoes: King Edward.

Cultivations, etc.:

Winter wheat: Plots dug by hand: 14 - 16 Sept, 1971. Balancing Mg applied to half plots: 16 Sept. Test Mg applied to additional plots: 27 Sept. P, K and S applied, plots rotary cultivated lightly ('Nil' plot only on additional plots), seed drilled: 11 Oct. Ca applied: 29 Oct. First half N dressing applied: 23 Mar, 1972. Trace element spray applied, all N applied to additional plots, second half N dressing applied: 25 Apr. Sprayed with 2,4-DP plus MCPA ('Mephetol Plus' at 5.6 l in 900 l): 27 Apr. Harvested: Additional plots - 15 Aug, remainder - 23 Aug.

Kale: FYM applied, plots dug by hand: 3 Nov, 1971. P, K, Ca, Mg and S applied: 28 Feb, 1972. First half N dressing applied to additional plots, all N to remainder, plots rotary cultivated, seed drilled: 29 Mar. Trace element spray and second half N dressing applied: 8 June. Sprayed with dimethoate at 0.17 kg in 340 l: 3 Aug. Harvested: 25 Oct.

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Barley: Plots dug by hand: 3 - 4 Nov, 1971. P, K, Ca, Mg and S applied: 28 Feb, 1972. N applied, plots rotary cultivated, seed drilled: 23 Mar. Trace element spray applied: 8 June. Harvested: Additional plots - 14 Aug, remainder - 23 Aug.

Grass-clover ley: Seed drilled in barley stubble: 16 Aug, 1971. P, K, Ca, Mg and S applied: 8 Dec. N applied: 23 Mar, 1972. Trace element spray applied: 25 Apr. Cut three times: 25 May, 24 July, 3 Oct.

Potatoes: FYM applied and plots dug by hand: 4 - 5 Nov, 1971. P, K, Ca, Mg and S applied: 28 Feb, 1972. First half N dressing applied to additional plots, all N to remainder, plots rotary cultivated, Mg applied to half plots, potatoes planted: 24 Apr. Trace element spray and second half N dressing applied to additional plots: 8 June. All plots sprayed with mancozeb at 1.4 kg in 340 l, receiving at the same time menazon ('Saphi-Col' at 0.7 l): 13 July. All plots sprayed with mancozeb at 1.4 kg in 340 l: 1 Aug. Lifted: Plots of the main experiment with neither K nor FYM and no fertiliser plot of additional plots: 8 Aug. Remaining plots lifted: Additional plots - 8 Sept, remainder - 15 Sept.

Permanent grass: P and K applied: 8 Dec, 1971. FYM applied: 28 Feb, 1972. N applied: 23 Mar, 18 May, 24 July. Cut three times: 18 May, 24 July, 24 Oct.

- NOTES: (1) Yields of dry matter were obtained for each crop.
(2) The percentages of N, P and K were measured in each crop.
(3) The percentage of Mg in potato leaves was measured on main and additional plots and the percentage Mg in tubers on the main plots.
(4) The percentage of K in potato leaves was measured on main and additional plots.

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TABLES OF MEANS

GREAT FIELD IV (R): ORIGINAL PLOTS

TONNES/HECTARE

Treatment	WINTER WHEAT		KALE: FRESH WEIGHT	BARLEY		LEY: DRY MATTER				POTATOES:		PERMANENT GRASS:		
	GRAIN	STRAW		GRAIN	STRAW	1st cut	2nd cut	3rd cut	Total of 3 cuts	TOTAL TUBERS	1st cut	2nd cut	3rd cut	Total of 3 cuts
O	3.09	3.96	14.0	3.08	2.45	2.27	1.24	1.01	4.52	8.5	0.61	1.15	0.40	2.16
N1	2.98	4.61	14.4	4.65	4.18	3.51	1.01	0.51	5.03	8.2	1.59	1.59	0.97	4.15
P	4.99	5.95	18.8	3.54	2.87	2.13	1.06	0.31	3.50	5.0	0.54	1.00	0.23	1.77
N1P	1.69	3.67	35.8	4.68	3.72	4.10	1.09	0.26	5.45	6.7	2.12	1.87	1.25	5.24
K	5.11	6.56	7.8	3.22	2.58	2.54	1.70	1.60	5.84	25.8	0.83	1.27	0.48	2.58
N1K	6.20	8.74	4.8	4.88	4.44	4.55	1.21	0.93	6.69	30.9	2.58	2.42	1.28	6.28
PK	5.12	7.08	17.1	3.34	2.45	3.20	1.83	1.95	6.98	32.6	0.77	1.77	0.48	3.02
N1PK	7.12	9.45	37.5	4.75	3.94	4.58	1.51	2.06	8.15	39.9	2.45	2.35	1.13	5.93
N2PK	7.42	11.56	46.2	6.18	6.00	5.72	1.51	1.29	8.52	42.4	4.19	3.04	1.94	9.17
D	6.19	7.19	31.0	4.21	3.38	4.05	1.81	2.47	8.33	35.4	3.38	1.70	0.82	5.90
N1PKD	7.34	10.65	52.3	5.85	5.28	5.64	1.60	1.48	8.72	46.1	4.83	2.44	1.52	8.79
N2PKD	7.51	12.12	65.0	6.26	6.62	6.52	1.53	0.87	8.92	54.8	4.34	4.07	2.37	10.78
Mean	85.8	65.4		81.7	47.5	25.5	29.6	25.3	26.8		26.7	29.3	33.2	29.7

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GREAT FIELD IV (R): ADDITIONAL PLOTS

TONNES/HECTARE

Treatment	WINTER WHEAT		KALE: FRESH WEIGHT	BARLEY		LEY: DRY MATTER			Total of 3 cuts	POTATOES: TOTAL TUBERS
	GRAIN	STRAW		GRAIN	STRAW	1st cut	2nd cut	3rd cut		
None	4.73	6.00	21.4	2.66	2.73	2.18	1.80	1.40	5.38	9.6
N2PK	8.14	10.35	52.3	6.99	7.47	6.03	1.78	1.44	9.30	39.2
N2 PK Mg Ca	7.11	10.42	54.5	6.82	6.69	5.94	2.35	2.69	10.98	37.5
N2 PK Mg S	7.88	10.31	60.6	6.88	7.25	5.02	1.59	1.02	7.63	39.4
N2 PK Ca S	6.85	9.33	57.1	7.01	7.25	6.05	2.14	1.99	10.18	38.2
N2 PK Mg Ca S	7.41	10.35	56.7	7.01	7.62	5.92	2.18	2.84	10.94	38.4
N2 PK Mg Ca S TE	7.58	9.73	60.2	6.99	7.98	5.79	2.40	2.72	10.91	37.7
Mean D.M. %:	82.3	67.1		80.2	67.4	23.8	28.3	23.2	25.1	