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71/W/RN/6 Arable Reference Plots - Old Grass, Sugar Beet, Barley, Ley, Potatoes, Oats

Rothamsted Research

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71/W/RN/6

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 - Woburn Stackyard C.

The 12th year, oats, sugar beet, barley, ley, potatoes and old grass.

For previous years see 60/B/3(t), 61-65/B/2, 66/B/2(t), 67/B/2(t), 68/B/3(t), 69/W/RN/6 and 70/W/RN/6(t).

Whole plot dimensions: 2.74 x 2.13.

Cultivations, etc.:-

Winter oats: Balancing Mg applied to half plots, plots dug by hand: 1 Oct, 1970. P and K applied, seed drilled: 6 Oct. First N applied: 1 Mar, 1971. Sprayed ioxnil at 0.63 kg and mecoprop at 1.89 kg in 450 l: 15 Apr. Second N applied: 3 May. Harvested: 6 Aug. Variety: Peniarth.

Sugar beet: FYM applied, plots dug by hand: 1 Dec, 1970. P and K applied: 12 Dec. First N applied, rotary cultivated, Mg applied to half plots, seed drilled: 2 Apr, 1971. Singled, second N applied: 2 June. Sprayed menazon at 0.28 kg in 450 l on three occasions: 18 June, 7 July, 29 July. Harvested: 7 Oct. Variety: Klein E.

Barley: Balancing Mg applied: 29 Oct, 1970. Plots dug by hand: 2 Dec. P and K applied: 12 Feb, 1971. First N applied, rotary cultivated, seed drilled: 1 Mar. Second N applied: 4 May. Harvested: 6 Aug. Variety: Julia.

Grass-clover ley: Seed drilled in barley stubble: 14 Aug, 1970. P and K applied: 1 Dec. N applied: 1 Mar, 1971. Cut three times: 2 June, 29 July, 17 Sept. Varieties: R.V.P. Italian Ryegrass and Dorset Marl Clover.

Potatoes: FYM applied, plots dug by hand: 1 Dec, 1970. P and K applied: 12 Feb, 1971. First N applied, rotary cultivated, Mg applied to half plots, potatoes planted: 15 Apr. Second N applied: 2 June. Earthed up: 3 June. Sprayed mancozeb at 1.34 kg plus menazon at 0.28 kg in 450 l twice: 18 June, 7 July. Lifted plots without K, sprayed menazon at 0.28 kg plus captafol at 1.68 kg in 450 l to remaining plots: 29 July. Remaining plots lifted: 3 Sept. Variety: Desiree.

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Permanent grass: P and K applied: 1 Dec, 1970. FYM applied:
12 Feb, 1971. N applied: 1 Mar, 2 June, 20 July. Cut three
times: 2 June, 20 July, 8 Oct.

- NOTES: (1) Samples were taken for determination of dry matter for each crop, and the percentage of N, P and K.
- (2) The percentage of Mg in sugar beet tops, potato tubers and leaves was determined.
- (3) The percentage of K in potato leaves was determined.

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SUMMARY OF RESULTS

TONNES/HECTARE

Treatment	OATS		SUGAR BEET		BARLEY	
	GRAIN	STRAW	ROOTS	TOPS	GRAIN	STRAW
None	1.39	1.76	12.8	12.8	1.72	1.31
N1	3.49	4.55	19.5	24.2	2.08	2.04
P	1.74	2.27	15.7	12.6	1.82	1.34
N1P	3.48	4.64	19.5	25.0	0.93*	1.32*
K	1.49	2.56	18.2	16.1	2.07	1.74
N1K	3.45	5.05	32.0	29.1	4.12	4.46
PK	1.65	2.25	20.5	14.1	2.00	1.65
N1PK	3.56	6.33	39.5	32.2	4.28	3.93
N2PK	4.85	8.02	42.7	41.3	4.64	5.41
D	1.93	2.89	36.7	30.4	2.49	1.88
N1PKD	3.98	6.92	51.3	42.0	4.65	4.92
N2PKD	4.92	9.49	57.1	56.2	4.47	5.42
Mean D.M. %:	78.6	44.0			80.3	73.0

* Much of crop destroyed by mice

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TONNES/HECTARE

Treatment	LEY: DRY MATTER				POTATOES TOTAL TUBERS	OLD GRASS: DRY MATTER			
	1st cut	2nd cut	3rd cut	Total of 3 cuts		1st cut	2nd cut	3rd cut	Total of 3 cuts
None	2.71	0.52	0.32	3.55	8.4	1.86	0.17	0.76	2.79
N1	4.64	0.83	0.29	5.76	7.6	3.51	0.84	2.58	6.93
P	2.54	0.63	0.30	3.47	9.0	1.42	0.16	0.61	2.19
N1P	4.63	0.92	0.29	5.84	8.2	3.13	0.70	2.31	6.14
K	3.27	1.28	1.48	6.03	7.9	2.11	0.35	1.18	3.64
N1K	5.34	1.35	1.20	7.89	11.8	4.58	1.24	3.30	9.12
PK	3.98	1.70	1.48	7.16	5.4	1.84	0.21	0.88	2.93
N1PK	6.10	1.38	0.96	8.44	20.2	4.13	1.27	3.21	8.61
N2PK	6.72	1.83	0.99	9.54	26.3	5.28	1.47	2.73	9.48
D	4.14	1.49	1.35	6.98	20.2	3.64	0.44	1.30	5.38
N1PKD	6.73	1.79	1.11	9.63	30.7	5.18	1.55	3.99	10.72
N2PKD	7.59	2.41	1.13	11.13	40.6	4.54	2.38	4.09	11.01
Mean D.M. %:	29.2	31.1	20.6	27.0		28.9	36.5	30.5	32.0