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Yields of the Field Experiments 1984

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84/W/RN/12 Organic Manuring - Sugar Beet, W. Oats, Ley

Rothamsted Research

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84/W/RN/12

ORGANIC MANURING

Object: To study, from crop yields and soil analyses, the effects of a range of types of organic matter - Woburn, Stackyard B.

Sponsor: A.E. Johnston.

The 20th year, sugar beet, w. oats, ley.

For previous years see 'Details' 1973 and 74-83/W/RN/12.

Design for sugar beet and w. oats: 2 blocks of 4 plots
3rd, 4th, 5th and 6th year leys: 2 blocks of 2 plots.

Whole plot dimensions: 8.53 x 30.5.

Treatments: From 1966 to 1971 the experiment had a preliminary period designed to build up organic matter, derived from different sources. An arable rotation was started on two blocks in 1972 and the remaining two blocks in 1973. After a period of testing the residues built up, a further period of accumulation was started; on two blocks (which included ley sown in 1979) in 1981 and on the other two (which included ley sown in 1980) in 1982. In addition to leys the first pair included w. oats in 1984 and the second pair sugar beet.

Sugar beet and w. oats tested:

MANURE	Organic manures and fertilizers in 1984, cumulative to 1983 and 1982 (both crops) and to 1981 (w. oats only) and to those applied in the preliminary period:
FYM	Farmyard manure at 50 tonnes
STRAW	Straw at 7.5 tonnes plus P ₂ O ₅ at 140 kg, K ₂ O at 140 kg, MgO at 50 kg
FERT-FYM	P ₂ O ₅ at 280 kg, K ₂ O at 560 kg, MgO at 100 kg
FERT-STR	P ₂ O ₅ at 140 kg, K ₂ O at 280 kg, MgO at 50 kg

All leys are clover/grass (LC) without N. 3rd and 4th year leys tested:

PREV LEY	Previous ley:
LC(LC)	Clover/grass ley in preliminary period
LC(LN)	Grass ley with N in preliminary period

5th and 6th year leys tested:

PREV MAN	Previous manure:
LC(GM)	Green manures in preliminary period
LC(PT)	Peat in preliminary period

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Standard applications:

W. oats: Manures: N at 90 kg as 'Nitro-Chalk'. Weedkiller: Methabenzthiazuron at 2.4 kg in 250 l.
Sugar beet: Manures: Ground chalk at 5.0 t, N at 150 kg as 'Nitro-Chalk'. Insecticide: Demeton-S-methyl at 0.24 kg in 250 l.
Leys, 3rd, 4th, 5th and 6th years: Manures: P₂O₅ at 140 kg, K₂O at 280 kg as (0:18:36), MgO at 50 kg as kieserite.

Seed: W. oats: Panema, sown at 200 kg.
Sugar beet: Monoire, sown by precision drill.

Cultivations, etc.:-

W. oats: Half PK and Mg applied to FERT-FYM plots, treatment FYM and straw applied, sugar beet tops spread over arable plots, ploughed: 19 Oct, 1983. Half PK and Mg applied to FERT-FYM, all PK and Mg applied to FERT-STR and STRAW plots only, spring-tine cultivated with crumbler attached, seed sown: 20 Oct. Weedkiller applied: 21 Oct. N applied: 3 Apr, 1984. Combine harvested: 3 Aug.
Sugar beet: Ground chalk applied: 30 Sept, 1983. Half PK and Mg applied to FERT-FYM plots, treatment FYM and straw applied: 20 Oct. Ploughed: 21 Oct. PK applied to STRAW plots: 11 Nov. Half PK and Mg applied to FERT-FYM plots, all PK and Mg applied to FERT-STR plots and all Mg applied to STRAW plots: 15 Nov. Heavy spring-tine cultivated: 14 Dec. N applied and spring-tine cultivated: 3 Apr, 1984. Spring-tine cultivated with crumbler attached, seed sown: 4 Apr. Singled: 16-18 May. Tractor hoed: 31 May, 11 June. Hand hoed: 11-12 June, 29 June-4 July. Insecticide applied: 29 June. Lifted: 26 Oct.
3rd, 4th, 5th and 6th year leys: PK and Mg applied to 4th and 6th years: 20 Oct, 1983. 3rd and 5th years: 15 Nov. Cut: 12 June, 1984, 10 Sept.

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SUGAR BEET

CLEAN BEET TONNES/HECTARE

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

MANURE	FYM	STRAW	FERT-FYM	FERT-STR	MEAN
	51.8	48.0	37.6	45.5	45.7

SUGAR PERCENTAGE

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

MANURE	FYM	STRAW	FERT-FYM	FERT-STR	MEAN
	18.2	18.3	17.9	18.2	18.2

TOTAL SUGAR TONNES/HECTARE

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

MANURE	FYM	STRAW	FERT-FYM	FERT-STR	MEAN
	9.44	8.77	6.83	8.32	8.34

TOPS TONNES/HECTARE

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

MANURE	FYM	STRAW	FERT-FYM	FERT-STR	MEAN
	24.1	18.7	19.2	19.7	20.4

PLOT AREA HARVESTED 0.00098

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W.OATS

GRAIN TONNES/HECTARE

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

MANURE	FYM	STRAW	FERT-FYM	FERT-STR	MEAN
	5.10	5.14	4.94	4.44	4.90

GRAIN MEAN DM% 87.0

STRAW TONNES/HECTARE

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

MANURE	FYM	STRAW	FERT-FYM	FERT-STR	MEAN
	5.19	4.90	4.06	3.70	4.46

STRAW MEAN DM% 84.3

PLOT AREA HARVESTED 0.00796

3RD YEAR LEY

DRY MATTER TONNES/HECTARE

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

	1ST CUT (12/6/84)	2ND CUT (10/9/84)	TOTAL OF 2 CUTS
PREV LEY			
LC(LC)	3.54	0.41	3.95
LC(LN)	3.88	0.59	4.47
MEAN	3.71	0.50	4.21
MEAN DM%	24.4	31.9	28.2

4TH YEAR LEY

DRY MATTER TONNES/HECTARE

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

	1ST CUT (12/6/84)	2ND CUT (10/9/84)	TOTAL OF 2 CUTS
PREV LEY			
LC(LC)	4.28	0.97	5.25
LC(LN)	4.46	0.76	5.22
MEAN	4.37	0.86	5.24
MEAN DM%	19.8	31.6	25.7

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5TH YEAR LEY

DRY MATTER TONNES/HECTARE

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

	1ST CUT (12/6/84)	2ND CUT (10/9/84)	TOTAL OF 2 CUTS
PREV MAN			
LC(GM)	2.59	0.69	3.28
LC(PT)	3.32	0.62	3.94
MEAN	2.96	0.65	3.61
MEAN DM%	21.6	32.5	27.1

6TH YEAR LEY

DRY MATTER TONNES/HECTARE

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

	1ST CUT (12/6/84)	2ND CUT (10/9/84)	TOTAL OF 2 CUTS
PREV MAN			
LC(GM)	4.52	0.77	5.30
LC(PT)	3.50	0.42	3.92
MEAN	4.01	0.60	4.61
MEAN DM%	20.2	35.9	28.1