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83/W/RN/12 Organic Manuring - Sugar Beet, W. Wheat, Ley

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83/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 19th year, sugar beet, w. wheat, ley.

For previous years see 'Details' 1973 and 74-82/W/RN/12.

Design for sugar beet and w. wheat: 2 blocks of 4 plots
2nd, 3rd, 4th and 5th 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 sugar beet in 1983 and the second pair w. wheat.

Sugar beet and w. wheat tested:

MANURE	Organic manures and fertilizers in 1983, cumulative to 1982 (both crops) and 1981 (sugar beet 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 except to seedbed in first year. 2nd and 3rd year leys tested:

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

4th and 5th 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. wheat: Manures: N at 150 kg as 'Nitro-Chalk'. Weedkillers: Glyphosate at 1.5 kg in 280 l. Mecoprop with bromoxynil and ioxynil (as 'Brittox' at 4.2 l) in 280 l.
- Sugar beet: Manures: Ground chalk at 5.0 t, N at 150 kg as 'Nitro-Chalk'. Weedkillers: Glyphosate at 1.5 kg in 280 l. Phenmedipham at 1.3 kg in 280 l. Insecticide: Demeton-s-methyl at 0.24 kg in 280 l.
- Leys, 2nd, 3rd, 4th and 5th years: Manures: Ground chalk at 5.0 t to 3rd and 5th years only. P₂O₅ at 140 kg, K₂O at 280 kg as (0:18:36), MgO at 50 kg as kieserite.

- Seed: W. wheat: Avalon, sown at 190 kg.
Sugar beet: Monoire, sown by precision drill.

Cultivations, etc.:-

- W. wheat: Glyphosate applied: 10 Sept, 1982. Half PK and Mg applied to FERT-FYM plots: 5 Oct. Treatment FYM and straw applied, ploughed: 5 Nov. Half PK and Mg applied to FERT-FYM, all PK and Mg applied to FERT-STR and STRAW plots only: 8 Nov. Spring-tine cultivated with crumbler attached, seed sown, spring-tine cultivated: 11 Nov. N applied: 28 Apr, 1983. 'Brittox' applied: 29 Apr. Combine harvested: 12 Aug.
- Sugar beet: Glyphosate applied: 10 Sept, 1982. Half PK and Mg applied to FERT-FYM plots: 5 Oct. Ground chalk applied: 3 Nov. Treatment FYM applied and these plots ploughed: 5 Nov. Treatment straw applied, remaining plots ploughed, PK applied to STRAW plots: 8 Nov. Half PK and Mg applied to FERT-FYM, all PK and Mg applied to FERT-STR plots, all Mg applied to STRAW plots: 9 Nov. Deep-tine cultivated: 12 Jan, 1983. Heavy spring-tine cultivated, spring-tine cultivated, N applied: 22 Mar. Spring-tine cultivated with crumbler attached: 14 Apr. Rotary cultivated, seed sown: 30 Apr. Phenmedipham applied: 7 June. Singled: 9-14 June. Tractor hoed: 20 June, 1 July. Insecticide applied: 29 June. Hand hoed: 4-11 July. Lifted: 10 Oct.
- 2nd, 3rd, 4th and 5th year leys: Ground chalk applied to 3rd and 5th years only: 3 Nov, 1982. PK and Mg applied: 9 Nov. Cut: 16 June, 1983, 24 Aug.

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SUGAR BEET

ROOTS WASHED TONNES/HECTARE

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

MANURE	FYM	STRAW	FERT FYM	FERT STR	MEAN
	38.0	36.7	32.7	32.6	35.0

SUGAR PERCENTAGE

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

MANURE	FYM	STRAW	FERT FYM	FERT STR	MEAN
	16.7	16.9	17.0	16.2	16.7

TOTAL SUGAR TONNES/HECTARE

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

MANURE	FYM	STRAW	FERT FYM	FERT STR	MEAN
	6.32	6.20	5.56	5.34	5.85

TOPS TONNES/HECTARE

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

MANURE	FYM	STRAW	FERT FYM	FERT STR	MEAN
	30.4	27.1	25.9	24.8	27.1

PLOT AREA HARVESTED 0.00130

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W.WHEAT

GRAIN TONNES/HECTARE

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

MANURE	FYM	STRAW	FERT FYM	FERT STR	MEAN
	6.91	6.16	5.55	6.69	6.32

GRAIN MEAN DM% 86.3

STRAW TONNES/HECTARE

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

MANURE	FYM	STRAW	FERT FYM	FERT STR	MEAN
	4.69	3.73	3.19	3.70	3.83

STRAW MEAN DM% 91.5

PLOT AREA HARVESTED 0.00796

2ND YEAR LEY

DRY MATTER TONNES/HECTARE

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

	1ST CUT(16/6/83)	2ND CUT(23/8/83)	TOTAL OF 2 CUTS
PREV LEY			
LC(LC)	6.31	0.73	7.03
LC(LN)	6.95	1.05	8.00
MEAN	6.63	0.89	7.52
MEAN DM%	26.1	25.6	25.9

3RD YEAR LEY

DRY MATTER TONNES/HECTARE

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

	1ST CUT(16/6/83)	2ND CUT(23/8/83)	TOTAL OF 2 CUTS
PREV LEY			
LC(LC)	6.19	1.17	7.36
LC(LN)	5.49	1.42	6.91
MEAN	5.84	1.29	7.13
MEAN DM%	19.0	27.1	23.1

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4TH YEAR LEY

DRY MATTER TONNES/HECTARE

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

	1ST CUT(16/6/83)	2ND CUT(23/8/83)	TOTAL OF 2 CUTS
PREV MAN			
LC(GM)	5.08	1.04	6.12
LC(PT)	5.59	0.90	6.49
MEAN	5.33	0.97	6.30
MEAN DM%	24.0	30.2	27.1

5TH YEAR LEY

DRY MATTER TONNES/HECTARE

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

	1ST CUT(16/6/83)	2ND CUT(23/8/83)	TOTAL OF 2 CUTS
PREV MAN			
LC(GM)	5.84	1.32	7.16
LC(PT)	4.56	0.94	5.50
MEAN	5.20	1.13	6.33
MEAN DM%	18.4	27.5	23.0

PLOT AREA HARVESTED 0.00265