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Yields of the Field Experiments 1974



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74/W/RN/12 Organic Manuring - Sugar Beet, Wheat

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ORGANIC MANURING

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

Sponsor: G.E.G. Mattingly.

The tenth year, sugar beet and winter wheat.

For previous years see 66/C/31(t), 67/C/24(t), 68/C/18(t), 69/W/RN/12(t), 70/W/RN/12(t), 71/W/RN/12(t), 72/W/RN/12(t) and 73/W/RN/12.

Design: For each crop: 2 blocks of 8 plots split into 8.

Whole plot dimensions: 8.53 x 30.5. Sub plot area harvested: Sugar beet: 0.00130. Winter wheat: 0.00173.

Treatments: Between 1966 and 1971 the experiment had a preliminary period designed to build up organic matter, derived from different sources. A rotation of potatoes, wheat, sugar beet and barley was started on two blocks in 1972 and the remaining two blocks in 1973. Organic manures were last applied in 1971, leys were ploughed in autumn 1971 and 1972 before starting the rotation. The experiment now tests all combinations of:-

Whole plots: 1. Organic manures and fertilisers in the preliminary period:

Farmyard Manure	FYM
Straw	Straw
Peat	Peat
Green manures	Greenmr
Fertilisers equivalent to FYM	Fert-FYM
Fertilisers equivalent to straw	Fert-Str
Grass/clover ley no N	Clovrley
Grass ley with N for each cut	Grassley

MANURE

N

Sub plots: 2. Fertiliser nitrogen (kg N) in 1974:

Sugar beet	Wheat	S. Beet	Wheat
None	None	o	0
40	25	40	25
80	50	80	50
120	75	120	75
160	100	160	100
200	125	200	125
240	150	240	150
280	175	280	175

Standard applications:

Sugar beet: Manures: Ground chalk at 5 tonnes. (0:20:20) in autumn at 1140 kg. (0:20:20) in the seedbed at 580 kg. MgD at 100 kg as Epsom salts. Boron at 6.7 kg B203 (as 'Solubor') applied with the second application of insecticide. Insecticide: Demeton-s-methyl at 0.25 kg in 280 1 followed by 0.21 kg in 390 l. Weedkillers: Aminotriazole at 4.5 kg with ammonium thiocyanate at 4.1 kg in 370 l. Phenmedipham at 1.1 kg in 340 l.

Winter wheat: Manures: P205 at 110 kg as superphosphate. K20 at 60 kg as muriate of potash. Weedkiller: Ioxynil at 0.63 kg with mecoprop at 1.9 kg in 280 1.

Cultivations, etc .:-

Sugar beet: Aminotriazole with ammonium thiocyanate applied: 13 Sept, 1973. Ground chalk applied: 27 Sept. Subsoiled, times 140 cm apart and 50 cm deep: 20 Oct. FK applied: 25 Oct. Ploughed: 13 Nov. Spring-time cultivated: 30 Mar, 1974. N applied: 4 Apr. FK and Mg applied, power harrowed, seed sown: 5 Apr. Phenmedipham applied: 26 May. Singled: 29-30 May. Insecticide applied: 5 June. Boron and insecticide applied: 24 June. Lifted: 22-29 Nov.

Winter wheat: P and K applied, deep-tine cultivated, spring-tine cultivated: 18 Oct, 1973. Seed sown: 22 Oct. Weedkiller applied: 5 Apr, 1974. N applied: 10 Apr. Combine harvested: 29 Aug.

Standard errors per plot.

943	Sugar beet.	Roots (washed), tonnes/hectare:	Whole plot:	1.19 or 4.9% (7 d.f.)
	and the second		Sub plot:	2.01 or 8.3% (56 d.f.) 0.178 or 4.7% (7 d.f.)
		Total sugar, tonnes/hectare:	Sub plot:	0.317 or 8.5% (56 d.f.)
		Tops, tonnes/hectare:	Whole plot:	1.78 or 7.9% (7 d.f.)
			Sub plot:	3.09 or 13.8% (56 d.f.)
	Winter whea	t. Grain, tonnes/hectare:	Whole plot:	0.454 or 9.4% (7 d.f.) 0.572 or 11.9% (56 d.f.)
			PUD DIOC:	0.7 12 01 11.9% ()0 0.1.1

Seed: Sugar beet: Klein E, sown at 8.0 kg. Winter wheat: Cappelle, dressed with dieldrin, sown at 190 kg.

TABLES OF MEANS

SUGAR BEET

ROOTS (WASHED): TONNES/HECTARE

				1	N				
	0	40	80	120	160	200	240	280	Mean
MANURE									
FYM Straw Peat Greenmnr Fert-FYM Fert-Str Clovrley Grassley	12.8 11.2 7.0 11.0 4.4 6.5 10.7 17.1	21.1 19.9 20.6 22.3 13.7 19.1 25.2 24.3	27.3 23.9 23.6 24.1 24.4 25.9 29.5	29.0 27.3 27.6 25.9 27.3 25.3 25.6 30.0	30.9 26.4 26.5 26.6 29.8 28.2 27.5 30.2	29.9 29.3 27.7 23.7 27.8 29.3 29.5 29.8	31.8 25.7 26.9 23.8 27.4 27.1 27.0 27.6	28.1 28.3 27.5 22.5 24.7 23.0 29.6 27.1	26.4 24.0 23.4 22.5 22.5 22.8 25.1 26.9
Mean	10.1	20.8	25.3	2 7.2	28.3	28.4	27.2	26.3	24.2

STANDARD ERRORS OF DIFFERENCES

MANURE	N	MANURE
	0.71	2.22
	when comparing the same level	
1200	MANURE	2.01

			74/1	N/RN/12					
			SUG	AR BEET					
			SUGAR 1	PERCENT	AGE				
				1	N				
	0	40	80	120	160	200	240	280	Mean
MANURE									
FYM Straw Peat Greenmnr Fert-FYM Fert-Str Clovrley Grassley	16.2 15.7 16.0 15.6 15.9 15.4 16.1 16.0	16.3 16.2 16.1 15.7 16.1 15.9 16.3	16.2 16.2 15.9 16.3 16.0 16.0 16.2	15.7 15.7 16.3 15.6 15.9 15.9 16.1 15.9	15.7 15.4 15.7 15.3 15.8 15.5 15.2 15.2 15.3	15.4 15.4 15.1 15.6 15.0 15.0 15.0	14.6 15.3 15.0 14.8 15.1 14.8 14.8 14.8 14.8	14.7 14.6 15.0 14.6 14.5 14.7 14.6 14.4	15.6 15.7 15.1 15.1 15.6 15.1 15.5
Mean	15.9	16.1	16.1	15.9	15.5	15.2	14.9	14.6	15.5

SUGAR BEET

TOTAL SUGAR: TONNES/HECTARE

N

	0	40	80	120	160	200	240	280	Mean
MANURE									
FYM Straw Peat Greenmnr Fert-FYM Fert-Str Clovrley Grassley	2.08 1.76 1.12 1.71 0.70 1.02 1.72 2.74	3.44 3.24 3.32 3.61 2.16 3.06 3.99 3.95	4.43 3.87 3.82 3.84 3.98 3.84 4.13 4.78	4.57 4.30 4.48 4.04 4.34 4.03 4.13 4.76	4.85 4.07 4.17 4.07 4.71 4.37 4.19 4.62	4.62 4.51 4.25 3.58 4.35 4.40 4.43 4.47	4.66 3.92 4.05 3.53 4.12 4.01 4.00 4.07	4.12 4.13 3.28 3.59 3.39 4.33 3.89	4.10 3.72 3.67 3.46 3.49 3.52 3.87 4.16
Mean	1.61	3.35	4.09	4.33	4.38	4.33	4.04	3.86	3.75

STANDARD ERRORS OF DIFFERENCES

MANURE		N	MANURE N
0.178	0.	.112	0.346
		comparing	means
with		level of	
	MANUI	RE	0.317

74/W/RN/12

SUGAR BEET

TOPS: TONNES/HECTARE

54	

	0	40	80	120	160	200	240	280	Mean
MANURE				10					
FYM Straw Peat Greenmnr Fert-FYM Fert-Str Clovrley Grassley	7.0 7.0 3.1 8.4 2.4 4.9 8.7 10.1	11.2 10.8 9.8 13.3 4.5 13.9 13.6 10.8	13.9 16.7 12.2 17.8 11.5 19.5 18.5 18.8	20.9 20.2 18.8 22.3 18.1 25.5 24.4 26.5	25.5 29.3 25.5 32.1 24.4 32.4 26.9 26.2	27.9 32.4 27.9 28.9 27.2 37.7 31.4 31.7	34.5 31.0 33.5 30.3 30.3 40.1 30.7 30.7	32.4 34.5 33.5 33.1 26.5 34.9 37.3 30.0	21.7 22.8 20.5 23.3 18.1 26.1 23.9 23.1
Mean	6.5	11.0	16.1	22.1	27.8	30.6	32.7	32.8	22.4

STANDARD ERRORS OF DIFFERENCES

MANURE	N	MANURE
		N
1.78	1.09	3.40
Except	when comparing	means
with	same level of	
	MANURE	3.09

74/W/RN/12

WINTER WHEAT

GRAIN: TONNES/HECTARE

	0	25	50	75	100	125	150	175	Mean
MANURE									
FYM Straw Peat Greenmnr Fert-FYM Fert-Str Clovrley Grassley	2.17 2.03 1.88 1.70 1.71 1.72 3.51 3.64	3.38 2.60 2.21 3.12 2.25 2.62 4.67 5.12	3.75 3.61 3.80 3.28 3.20 3.83 5.38 5.47	5.52 5.12 4.80 4.21 4.90 6.71 6.41	5.58 5.85 5.86 5.57 5.57 5.51 6.47 6.51	6.13 6.66 6.24 5.69 4.88 6.51 6.15 6.21	5.61 7.01 6.46 5.42 4.78 6.13 6.01 5.52	6.03 6.54 6.06 6.03 4.55 6.36 5.82 4.90	4.77 4.93 4.66 4.38 3.95 4.70 5.59 5.47
Mean	2.29	3.25	4.04	5.27	5.89	6.06	5.87	5.79	4.81

STANDARD ERRORS OF DIFFERENCES

MANURE N MANURE N 0.454 0.202 0.701 Except when comparing means

with same level of MANURE 0.572

Mean D.M. \$ 82.4

74/W/RN/12

WINTER WHEAT

STRAW: TONNES/HECTARE

	0	25	50	75	100	125	150	175	Mean
MANURE									
FYM Straw Peat Greenmr Fert-FYM Fert-Str Clovrley Grassley	1.58 1.03 0.93 1.20 1.11 0.92 1.91 2.36	2.45 2.22 1.92 2.44 2.07 1.97 2.87 3.89	3.47 2.83 3.20 2.86 2.81 3.12 4.08 3.88	4.00 3.87 4.20 3.46 3.59 3.61 4.42 4.25	4.34 4.68 3.68 4.12 3.37 4.24 3.88 4.48	4.09 4.72 4.32 4.29 4.00 3.88 4.22 4.41	3.57 3.97 3.85 3.99 4.09 3.98 4.18 4.55	4.01 4.22 4.17 4.03 3.86 3.93 3.83 4.38	3.44 3.44 3.28 3.30 3.11 3.21 3.67 4.03
Mean	1.38	2.48	3.28	3•93	4.10	4.24	4.02	4.05	3.44

Mean D.M. % 84.9