ROTHAMSTED RESEARCH

Yields of the Field Experiments 1977

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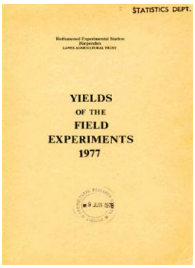

77/W/RN/12 Organic Manuring - W. Oats, Potatoes

Rothamsted Research

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77/W/RN/12

ORGANIC MANURING

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

Sponsor: G.E.G. Mattingly.

The 13th year, winter oats, potatoes.

For previous years see 'Details' 1973 and 74-76/W/RN/12.

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

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. Organic manures were last applied in 1971, the leys were ploughed in autumn 1971 and 1972 before starting the rotation. The experiment now tests all combinations of:-

Whole plots

1. MANURE — Organic manures and fertilisers in the preliminary period:

FYM	Farmyard manure
STRAW	Straw
PEAT	Peat
GREENMNR	Green manures
FERT-FYM	Fertilisers equivalent to FYM
FERT-STR	Fertilisers equivalent to straw
CLOVRLEY	Grass/clover ley, no N
GRASSLEY	Grass ley with N for each cut

Sub plots

2. N RES(76) N 77 — Fertiliser nitrogen (kg N) (residues of treatments to barley 1976 on winter oats, fresh dressings 1977 to potatoes):

W. OATS	POTATOES
0	0
25	75
50	150
75	225
100	300
125	375
150	450
175	525

No fresh nitrogen was applied to winter oats 1977. The crop was cut green in July.

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Standard applications:
Winter oats: Manures: (0:20:20) at 290 kg, combine drilled. Weedkillers: Glyphosate at 1.7 kg in 280 l. Ioxynil at 0.53 kg plus mecoprop at 1.6 kg in 220 l.
Potatoes: Manures: (0:20:20) at 1140 kg in winter. (0:20:20) at 1210 kg in spring. 60 kg Mg as kieserite. Weedkiller: Linuron at 1.3 kg plus paraquat at 0.42 kg ion in 420 l. Fungicide: Mancozeb at 1.3 kg on four occasions, the last three with insecticide, in 420 l, 390 l and twice in 370 l successively. Insecticide: Pirimicarb at 0.14 kg on three occasions with fungicide.

Seed: Winter oats: Peniarth, sown at 200 kg.
Potatoes: Pentland Crown.

Cultivations, etc.:-
Winter oats: Glyphosate applied: 23 Sept, 1976. Ploughed: 15 Oct. Spring-tine cultivated, seed sown: 8 Nov. Ioxynil plus mecoprop applied: 15 May, 1977. Harvested green: 7-8 July.
Potatoes: Heavy-tine cultivated: 28 July, 1976. Power harrowed: 16 Aug. Ploughed: 15 Oct. Winter PK applied: 17 Jan, 1977. Spring PK and kieserite applied: 6 Apr. Heavy-tine cultivated: 13 Apr. N applied: 19-21 Apr. Power harrowed, potatoes planted: 22 Apr. Grubbed and earthed up, weedkiller applied: 25 May. Fungicide applied: 23 June. Fungicide with insecticide applied: 8 July, 21 July, 12 Aug. Haulm mechanically destroyed: 21 Oct. Lifted: 1 Nov.

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WINTER OATS

GREEN CROP DRY MATTER TONNES/HECTARE

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

N RES(76) / MANURE	0	25	50	75	100	125	150	175	MEAN
FYM	0.99	0.98	1.05	0.98	1.05	1.09	0.86	0.95	0.99
STRAW	0.73	0.77	0.79	0.80	0.76	0.78	0.82	0.77	0.78
PEAT	0.71	0.76	0.81	0.84	0.79	0.84	0.83	0.81	0.80
GREENMNR	0.61	0.74	0.52	0.55	0.72	0.75	0.80	0.77	0.68
FERT-FYM	0.52	0.62	0.59	0.60	0.71	0.63	0.69	0.67	0.63
FERT-STR	0.68	0.80	0.80	0.87	0.86	0.83	0.78	0.82	0.80
CLOVRLEY	0.93	0.90	0.98	1.10	1.04	1.09	1.22	1.13	1.05
GRASSLEY	0.99	1.09	1.12	1.10	1.17	1.03	1.21	1.10	1.10
MEAN	0.77	0.83	0.83	0.86	0.89	0.88	0.90	0.88	0.85

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	MANURE	N RES(76)	MANURE N RES(76)
SED	0.097	0.034	0.132
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:			
MANURE			0.096

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	7	0.097	11.4
BLOCK.WP.SP	56	0.096	11.2

GREENCROP MEAN DM% 32.7

SUB PLOT AREA HARVESTED 0.00149

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TOTAL TUBERS TONNES/HECTARE

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

N 77 MANURE	0	75	150	225	300	375	450	525	MEAN
FYM	17.1	27.9	37.0	40.3	47.5	48.2	49.2	53.6	40.1
STRAW	18.8	32.6	34.7	45.2	46.3	47.6	48.3	43.7	39.7
PEAT	14.2	23.9	33.7	37.7	39.5	42.6	49.1	51.2	36.5
GREENMNR	15.5	34.3	35.5	43.6	44.5	52.4	49.6	52.0	40.9
FERT-FYM	15.2	26.1	33.1	38.3	40.1	44.9	49.9	45.6	36.6
FERT-STR	14.2	28.6	37.1	37.1	42.9	42.8	43.3	44.3	36.3
CLOVRLEY	24.3	32.8	44.1	54.0	50.4	57.4	55.7	54.3	46.6
GRASSLEY	25.3	38.2	43.8	52.8	54.5	52.4	54.7	52.9	46.8
MEAN	18.1	30.6	37.4	43.7	45.7	48.5	50.0	49.7	40.4

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	MANURE	N 77	MANURE N 77
SED	2.44	1.28	4.17
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:			
MANURE			3.61

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
BLOCK.WP	7	2.44	6.0
BLOCK.WP.SP	56	3.61	8.9

PERCENTAGE WARE 3.81CM (1.5 INCH) RIDDLE

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

N 77 MANURE	0	75	150	225	300	375	450	525	MEAN
FYM	81.4	89.3	93.2	93.6	93.0	93.8	95.6	95.2	91.9
STRAW	81.1	85.1	89.8	95.2	94.2	96.2	94.9	93.8	91.3
PEAT	73.6	84.0	91.5	91.9	94.0	95.2	95.2	92.9	89.8
GREENMNR	83.7	89.7	92.0	91.6	93.8	94.2	94.3	94.4	91.7
FERT-FYM	82.5	84.2	90.3	90.2	92.9	91.4	94.2	93.3	89.9
FERT-STR	87.0	89.4	93.0	93.2	93.6	94.1	93.2	94.8	92.3
CLOVRLEY	88.7	89.6	93.5	93.0	95.1	94.7	95.3	96.0	93.2
GRASSLEY	84.4	91.6	93.3	94.1	97.0	95.4	95.8	95.7	93.4
MEAN	82.8	87.9	92.1	92.8	94.2	94.4	94.8	94.5	91.7

SUB PLOT AREA HARVESTED 0.00087

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