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RESEARCH

# Collection of Plans for the Woburn Organic Manuring Experiment

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## W/RN/12 - Woburn Organic Manuring 1970 - 1974

### Rothamsted Research

Rothamsted Research (1966-1988) *W/RN/12 - Woburn Organic Manuring 1970 - 1974* ; Collection Of Plans For The Woburn Organic Manuring Experiment, pp 5 - 9

201  
 STACKYARD 'B' 6th year 1970  
 Sponsor: G.E.G. Mattingly  
 Keys cut 496

TREATMENTS per acre  
 Organic Manures 1970  
 (874) Beans

Dg 20 tons F.Y.M. (3 tons DM/annum on average;  
 St 3 tons (DM) Straw } Total nutrients  
 Pt 3 tons (DM) Peat } balanced by  
 Gm Green manure } PK Mg additions  
 1968: clover (late flowering red).

Fertilisers

Fd PKMg equivalent to FYM (High PKMg).  
 Fs K<sub>2</sub>Mg equivalent to straw with P (Low PKMg).

N.B. In 1970 all plots receive 0.5 cut P<sub>2</sub>O<sub>5</sub>, 1.0 cut K;  
 as (0:14:28)

Supplementary fertilisers

Fd 0.3 cut K<sub>2</sub>O. Lc 0.4 cut K<sub>2</sub>O } as mural  
 St 0.3 cut K<sub>2</sub>O. Ln 0.8 cut K<sub>2</sub>O } of Potash  
 Nitrogen to Sugar Beet 1969 (after wheat 1968)  
 (1)(3)(5)(7) 0.2, 0.6, 1.0, 1.4 cut N as Nitro-chalk '21.

Variety: Maris Bead. Sown at 200 lb/acre: 20 Mar

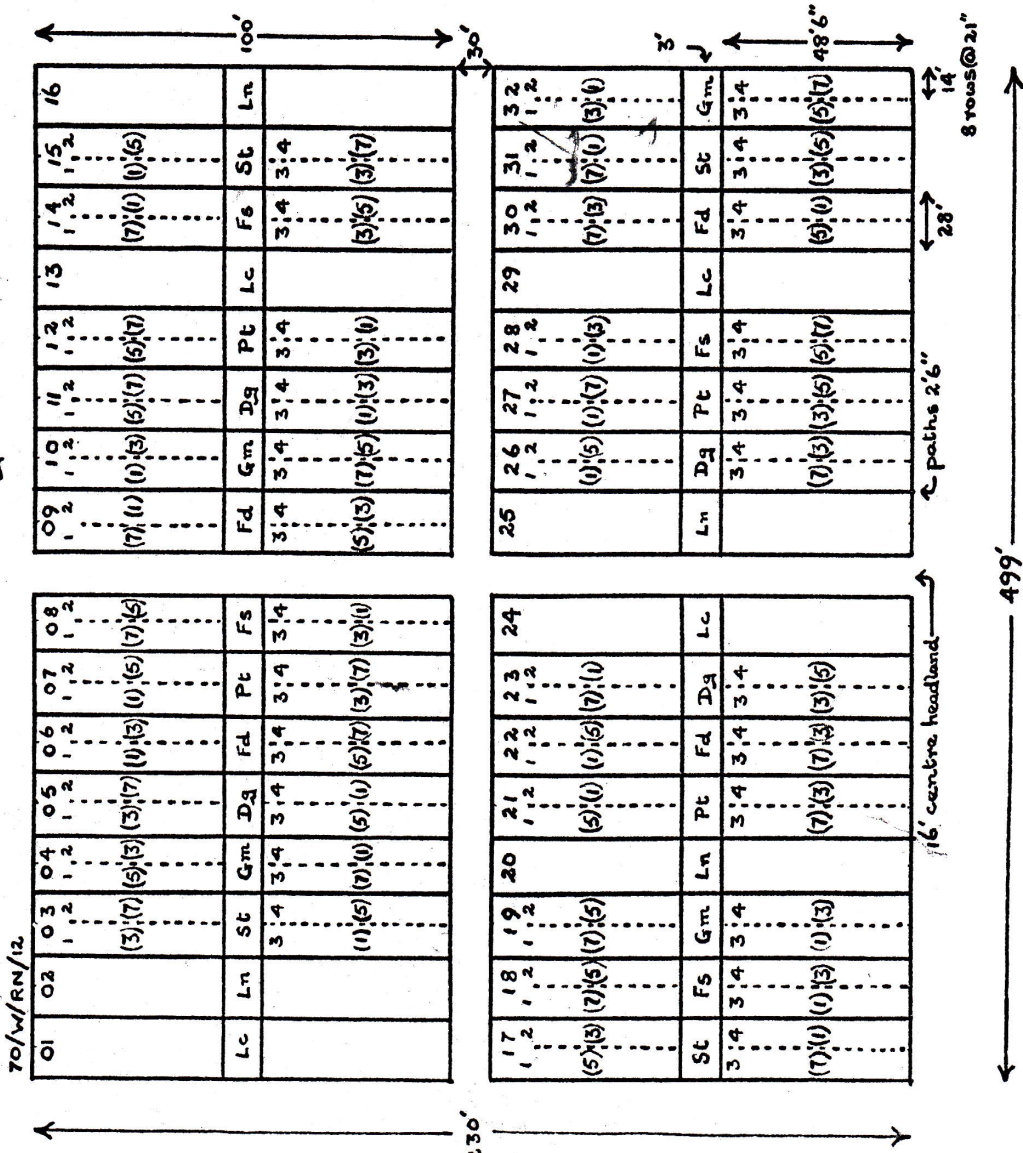
Keys: Sown: Apr 23, 1965

Lc: Mixture with clover

Ln: Mixture without clover, 1.0 cut N in Spring;  
 for each cut. Keys receive PKMg manuring  
 annually for nutrients removed in cut grass.

Sub plot area 14' x 48'6" = 0.0156 acre

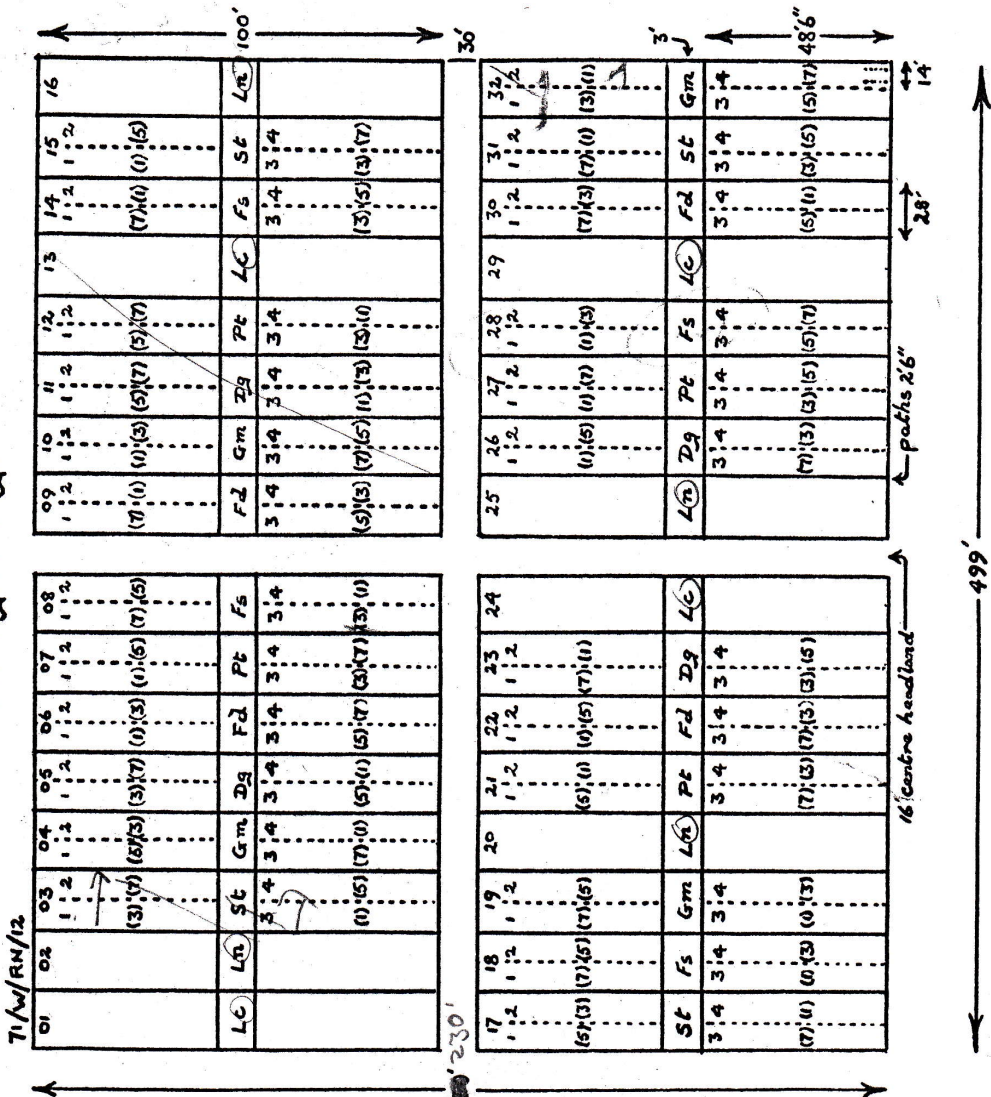
WOUBURN ORGANIC MANURING EXPERIMENT  
 1970 S. Beans & Keys



WOBURN ORGANIC MANURING EXPERIMENT  
 STACKYARD 'B' 7th year 1971 20'  
 Sponsor G.E.G. Mattingly



1971 Rye & Leys



TREATMENTS per acre (hectare)

Organic Manures 1971

- Dg 10 tons (25 tonnes) FYM (3 tons DM/annum on average
- St 3 tons (7.5 tonnes) (DM) Straw } Total nutrients balanced by PKMg
- Pt 3 tons (7.5 tonnes) (DM) Peat } additions to equal Fs
- Gm Green manure

1970: clover (late flowering red).

Fertilisers

- Fd P, K, Mg equivalent to Dg (High PKMg).
- Fs K, Mg equivalent to straw with P (Low PKMg)

Note: Additional P and Mg are applied in autumn and spring to balance nutrients differentially removed by previous crops.

BASAL NITROGEN TO RYE

0.25 cwt (31 kg) N as 'Nitro-chalk' 21 top dressed in Spring.  
 Nitrogen to sugar beet 1969 (after W. wheat 1968)

(1), (3), (5), (7) 0.2, 0.6, 1.0, 1.4 cwt (23, 75, 125, 175 kg) as Nitro-chalk 21

VARIETY: King II: 17 Oct. (No nitrogen to beans 1970)

Leys: Sown: Apr 23, 1965

Lc: Mixture with clover

Ln: Mixture without clover, 10 cwt (125 kg) N in Spring & for each cut. Leys receive PKMg manuring annually for nutrients removed in cut grass.

Sub plot area: 14 x 486" = 0.0156 acre (0.0063 ha)

**STACKYARD 'B' 8th year 1972 21**

Sponsor G.E.G. Mattingly

**TREATMENTS per acre (hectare)**

Residues of Organic Manures applied annually 1965-71

- (Dg) 4 tons (10 tonnes) (DM) FYM } Total nutrients
- (St) 3 tons (7.5 tonnes) (DM) Straw } balanced by PKMg
- (Pt) 3 tons (7.5 tonnes) (DM) peat } additions to equal Fs.
- (Gm) Green Manure

1971: Late flowering Red Clover : 22 Apr \* (16 tons (40 tonnes) F.M.)

Fertilisers

(Fd) P, K, Mg equivalent to Dg (High PKMg)

(Fs) K, Mg equivalent to straw with P (Low PKMg)

Note: PKMg are applied in autumn and spring in addition, to balance nutrients differentially removed by previous crops

**Nitrogen to Potatoes 1972**

N0, N1, N2, N3, N4, N5, N6, N7  
0, 8, 16, 24, 32, 40, 48, 56, 64, 72, 80, 88, 96, 104, 112, 120, 128, 136, 144, 152, 160, 168, 176, 184, 192, 200, 208, 216, 224, 232, 240, 248, 256, 264, 272, 280, 288, 296, 304, 312, 320, 328, 336, 344, 352, 360, 368, 376, 384, 392, 400, 408, 416, 424, 432, 440, 448, 456, 464, 472, 480, 488, 496, 504, 512, 520, 528, 536, 544, 552, 560, 568, 576, 584, 592, 600, 608, 616, 624, 632, 640, 648, 656, 664, 672, 680, 688, 696, 704, 712, 720, 728, 736, 744, 752, 760, 768, 776, 784, 792, 800, 808, 816, 824, 832, 840, 848, 856, 864, 872, 880, 888, 896, 904, 912, 920, 928, 936, 944, 952, 960, 968, 976, 984, 992, 1000

Nitrogen to Sugar beet 1969 (after V. wheat 1968) as Nitro-Chalk 21

(1), (3), (5), (7) 0.2, 0.6, 1.0, 1.4 cut (55, 75, 125, 175)

**BASAL MANURING per acre (hectare)**

**Blocks I and III Potatoes**

183 cut (100kg) P<sub>2</sub>O<sub>5</sub> as superphosphate, 192 cut (200kg) K<sub>2</sub>O as muriate of potash ploughed in in autumn, and rotay cultivated at the same amount in spring. with 0.79 cut (99kg) MgO as Epsom Salts

**Blocks II and IV Rye**

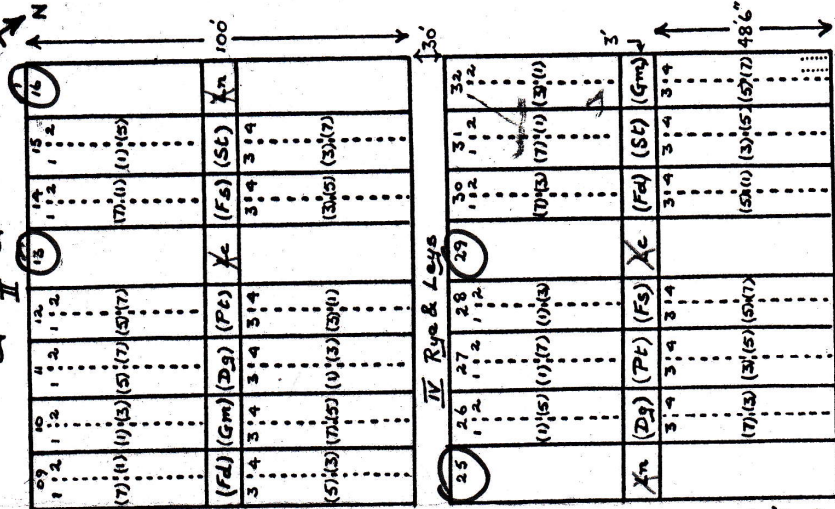
400b (448kg) (0.14:28), 0.3 cut (38 kg) MgO as Epsom Salts and 0.3 cut (40kg) N as Nitro-chalk 21 in spring

rows Lays: Sown: Apr 23, 1965, Blocks I & III ploughed autumn 1971

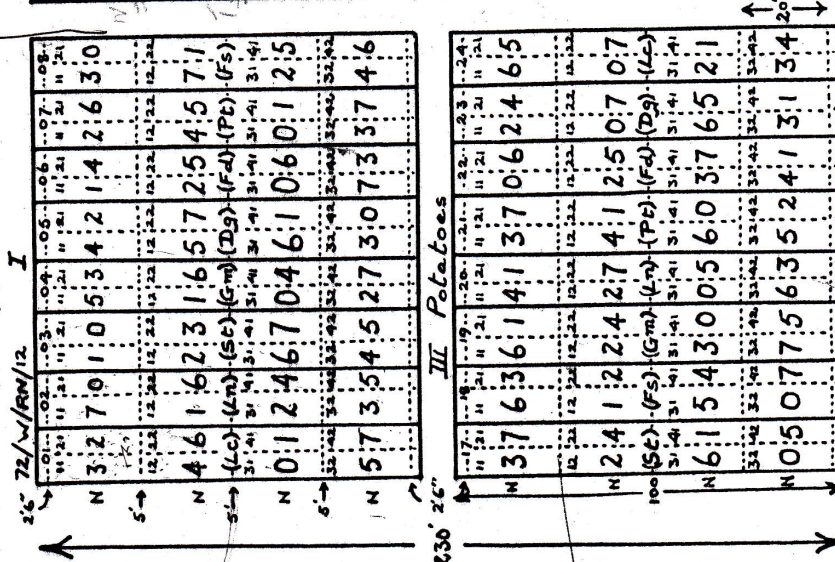
LC: Mixture with clover. L7: Mixture without clover 400b (448kg) (0.14:28), 0.3 cut (38kg) MgO as Epsom Salts, to Ln only, 1.0 cut (126 kg) N as Nitro-chalk 21 in spring and after each cut.

**WOBURN ORGANIC MANURING EXPERIMENT**

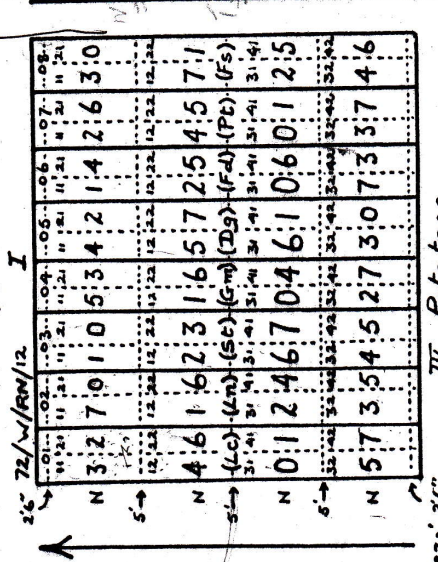
**Rye & Lays II**



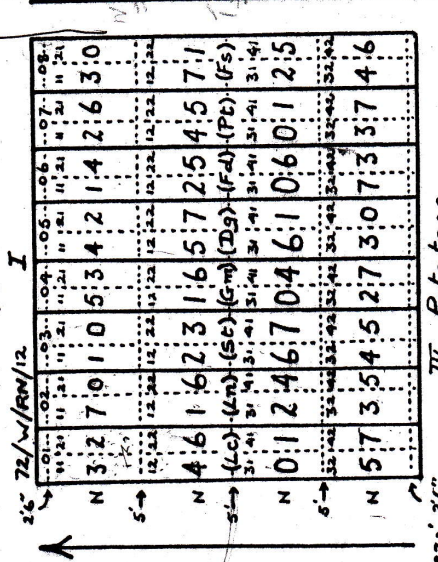
**Rye & Lays IV**



**Potatoes I**



**Potatoes III**



Sub-plot area Potatoes: 14' x 20' = 0.0064 acre (0.0026 ha)

Sub-plot area Rye: 14' x 48' = 0.0156 acre (0.0063 ha)

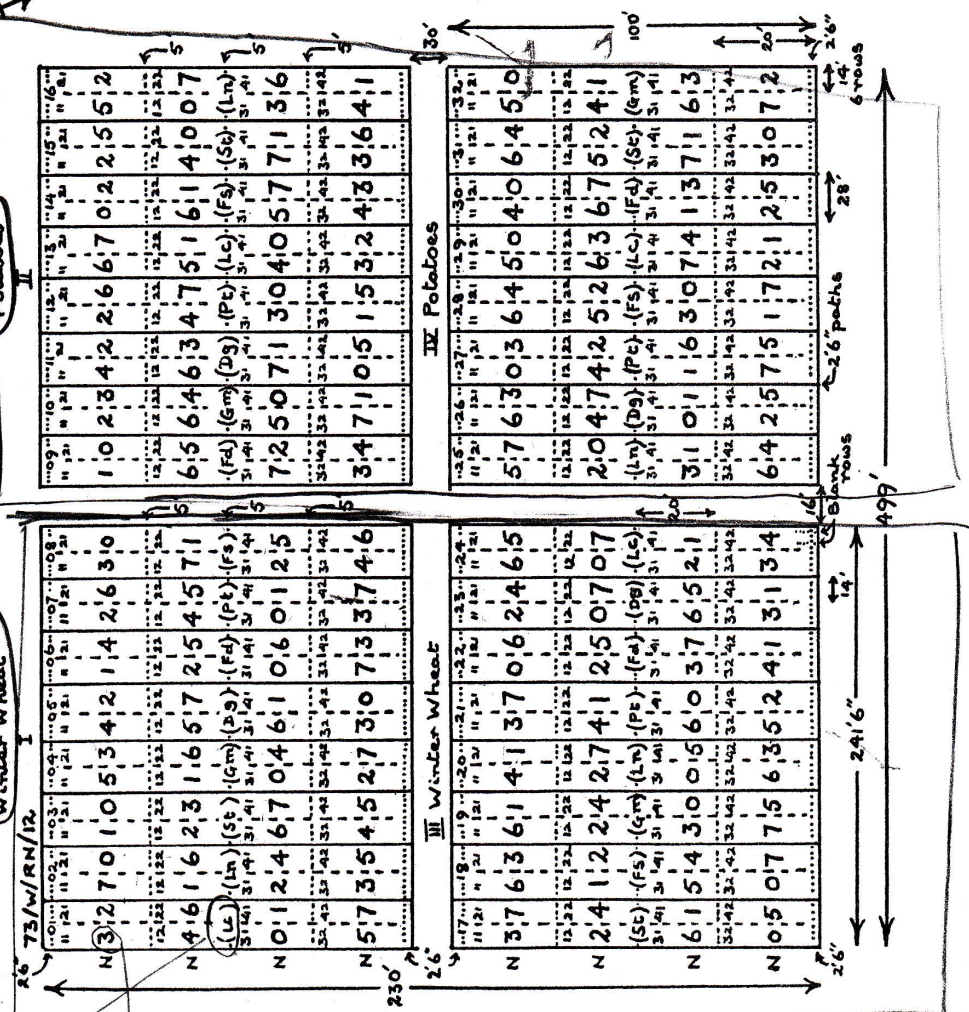
204

STACKYARD 'B' 1973

Sponsor: G.E. & Mattingly

9th year

573776  
573775  
WOBURN ORGANIC MANURING EXPERIMENT  
Potatoes  
Winter Wheat



TREATMENTS per acre (hectare)

Residues of Organic Manures applied annually 1965-71 and Ley (saw) 1965

- (Dg) 4 tons (10 tonnes) (DM) FYM, (16 tons [40 tonnes] FYM)
- (St) 3 tons (7.5 tonnes) (DM) Straw
- (Pt) 3 tons (7.5 tonnes) (DM) peat
- (Gm) Green Manure 1972 Blocks II & IV Essex Broad Red Clover
- (Le) Grass-clover ley ploughed up 1971 Blocks I & III
- (Ln) Grass ley with N 1972 Blocks II & IV

Fertilisers

- (F) P, K, Mg equivalent to Dg (High PKMg)
- (S) K, Mg equivalent to straw with P (Low PKMg)

Note: P, K, Mg are applied in autumn and spring in addition to balance nutrients differentially removed by previous crops

Nitrogen to Winter Wheat 1973

- N0 - None, N1-0-4, N2-0-8, N3-0-6, N4-0-8, N5-1-0, N6-1-0, N7-1-39 cut N as Nitro-chalk 25
- (0 25 50 75 100 125 150 175 kg N)

Nitrogen to Potatoes 1973

- N0 - None, N1-0-4, N2-0-8, N3-1-19, N4-1-59, N5-1-99, N6-2-39, N7-2-79 cut N as Nitro-chalk 25
- (0 50 100 150 200 250 300 350 kg N)

BASAL MANURING per acre (hectare)

- Blocks II & IV Potatoes - Pentland Crown Planted: 6-7 Apr
- 183 cut (230 kg) P<sub>2</sub>O<sub>5</sub> as superphosphate, 192 cut (240 kg) K<sub>2</sub>O as muriate of potash ploughed in in autumn, and rotary cultivated in at the same amount in spring with 0.79 cut (100 kg) MgO as Epsom salt + balancing P & Mg differentially removed by rye in 1972
- Blocks I & III Winter Wheat - Cappelle @ 175 lb (196 kg) Date: 24 Nov

Sub-plot area

14 x 20 = 0.0064 acre (0.0026 ha.)

STACKYARD B' 1974

Sponsor: G.E. & Mattingly

10th year

WOBURN ORGANIC MANURING EXPERIMENT

Sugar beet

7A W/RN/12 I

08-11	09-11	10-11	11-11	12-11	13-11	14-11	15-11	16-11
11 21	11 21	11 21	11 21	11 21	11 21	11 21	11 21	11 21
3.2	7.0	1.0	5.3	4.2	1.4	2.6	3.0	
12 22	12 22	12 22	12 22	12 22	12 22	12 22	12 22	12 22
4.6	1.6	2.3	1.6	5.7	2.5	4.5	7.1	
(Lc)	(Ln)	(St)	(Gm)	(Dg)	(Fd)	(Pt)	(Fs)	
31 41	31 41	31 41	31 41	31 41	31 41	31 41	31 41	31 41
0.1	2.4	6.7	0.4	6.1	0.6	0.1	2.5	
32 42	32 42	32 42	32 42	32 42	32 42	32 42	32 42	32 42
5.7	3.5	4.5	2.7	3.0	7.3	3.7	4.6	

III Sugar beet

17-11	18-11	19-11	20-11	21-11	22-11	23-11	24-11
11 21	11 21	11 21	11 21	11 21	11 21	11 21	11 21
3.7	6.3	6.1	4.1	3.7	0.6	2.4	6.5
12 22	12 22	12 22	12 22	12 22	12 22	12 22	12 22
2.4	1.2	2.4	2.7	4.1	2.5	0.7	0.7
(St)	(Fs)	(Gm)	(Ln)	(Pt)	(Fd)	(Dg)	(Lc)
31 41	31 41	31 41	31 41	31 41	31 41	31 41	31 41
6.1	5.4	3.0	0.5	6.0	3.7	6.5	2.1
32 42	32 42	32 42	32 42	32 42	32 42	32 42	32 42
0.5	0.7	7.5	6.3	5.2	4.1	3.1	3.4

Winter Wheat

II

09-11	10-11	11-11	12-11	13-11	14-11	15-11	16-11
11 21	11 21	11 21	11 21	11 21	11 21	11 21	11 21
1.0	2.3	4.2	2.6	6.7	0.2	2.5	5.2
12 22	12 22	12 22	12 22	12 22	12 22	12 22	12 22
6.5	6.4	6.3	4.7	5.1	6.1	4.0	0.7
(Fd)	(Gm)	(Dg)	(Pt)	(Lc)	(Fs)	(St)	(Ln)
31 41	31 41	31 41	31 41	31 41	31 41	31 41	31 41
7.2	5.0	7.1	3.0	4.0	5.7	7.1	3.6
32 42	32 42	32 42	32 42	32 42	32 42	32 42	32 42
3.4	7.1	0.5	1.5	3.2	4.3	3.6	4.1

IV Winter Wheat

25-11	26-11	27-11	28-11	29-11	30-11	31-11	12-12
11 21	11 21	11 21	11 21	11 21	11 21	11 21	11 21
5.7	6.3	0.3	6.4	5.0	4.0	6.4	5.0
12 22	12 22	12 22	12 22	12 22	12 22	12 22	12 22
2.0	4.7	4.2	5.2	6.3	6.7	5.2	4.1
(Ln)	(Dg)	(Pt)	(Fs)	(Lc)	(Fd)	(St)	(Gm)
31 41	31 41	31 41	31 41	31 41	31 41	31 41	31 41
3.1	0.1	1.6	3.0	7.4	1.3	7.1	6.3
32 42	32 42	32 42	32 42	32 42	32 42	32 42	32 42
6.4	2.5	7.5	1.7	2.1	2.5	3.0	7.2

TREATMENTS per acre (hectare)  
 Residues of Organic Manures (applied annually 1965-71) and Ley (Sown 1965)  
 (Dg) 4 tons (10 tonnes) (DM) FYM, (16 tons [40 tonnes] FYM)  
 (St) 3 tons (7.5 tonnes) (DM) Straw.  
 (Pt) 3 tons (7.5 tonnes) (DM) Peat.  
 (Gm) Green Manure  
 (Lc) Grass-clover ley (ploughed up 1971 Blocks I & III)  
 (Ln) Grass ley with N (1972 Blocks II & IV)  
 Fertilisers  
 (Fd) P, K, Mg equivalent to Dg (High P, K, Mg)  
 (Fs) K, Mg equivalent to Straw with P (Low P, K, Mg)  
 Nitrogen to Winter Wheat 1974 Series II and IV  
 N0-None, N1-0.2, N2-0.4, N3-0.6, N4-0.8, N5-1.0, N6-1.19, N7-1.39 cat N as  
 ( 0 25 50 75 100 125 150 175 kg N/ha )  
 Nitrogen to Sugar beet 1974 Series I and III  
 N0-None, N1-0.3, N2-0.6, N3-0.9, N4-1.3, N5-1.6, N6-1.9, N7-2.2 cat N as  
 ( 0 40 80 120 160 200 240 280 kg N/ha )  
 BASAL MANURING per acre (hectare) sown at:  
 Blocks II and IV W. Wheat - Cappelle 170 lb (190 kg) 22 Oct  
 0.9 cat (114 kg) B<sub>2</sub>O<sub>5</sub> as Superphosphate, 0.48 cat (60 kg) K<sub>2</sub>O as Muriate of Potash  
 Blocks I and III Sugar beet - Kleira E sown at: 7 lb (78 kg) Data: 5 Apr  
 1020 lb (1143 kg) compound fertiliser (0:20:20) ploughed in in  
 autumn. 510 lb (572 kg) compound fertiliser (0:20:20), 89 lb (100 kg)  
 MgO as Epsom salts in the seedbed, 73 lb (82 kg) B<sub>2</sub>O<sub>5</sub> as Solubar in  
 Sub-plot area.  
 14' x 20' = 0.0064 acre (0.0026 ha)