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Yields of the Field Experiments 1965

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65/R/B/2 and 65/W/B/2 Reference Plots (Ra, Rg, Wra, Wrf)

Rothamsted Research

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65/B/2.1

REFERENCE PLOTS

ROTHAMSTED (R) GREAT FIELD IV AND HIGHFIELD IX

AND

WOBURN (W) STACKYARD SERIES C, 1965

(RA, RG, WRA and WRF)

For details of previous year's results, and for rates of fertilisers, etc., see 'Results' 58/Bc/1, 59/Bc/1, 60/B/3, 61/B/2, 62/B/2, 63/B/2, 64/B/2 and 64/B/11. For Sitka spruce see 63/B/2 and 64/B/2.

The grass-clover ley (additional plots only) on Great Field IV (R) received 0.45 cwt N, an increase of 0.15 cwt on previous years.

Cultivations, etc.:-

Great Field IV (R)

Winter wheat: Dug by hand: Sept 21, 1964. P, K, Mg, Ca and S applied: Sept 24. Seed drilled: Oct 6. First N dressings applied (excluding additional plots), additional plots sprayed with mecoprop (Iso-Cornox at 6 pints in 100 gals): Mar 31, 1965. Second N dressings applied, all N applied to the additional plots: May 4. Trace element spray applied: May 5. Harvested: Aug 27.

Kale: Dung applied, plots dug by hand: Nov 9, 1964. P, K, Mg, Ca and S applied: Feb 9 - 18, 1965. First N dressings applied to additional plots, all N to remainder, seed drilled: Apr 4. Second N dressings applied to additional plots: May 26. Magnesium-free calcium carbonate applied to additional plots at 48 cwt: May 27. Trace element spray applied: June 10. Harvested: Oct 22.

Barley: Plots dug by hand: Nov 19, 1964. P, K, Mg, Ca and S applied: Feb 9, 1965. All N applied, seed drilled: Mar 1. Trace element spray applied: May 25. Harvested: Aug 13. Variety: Proctor, Deba Abed on additional plots.

Grass-clover ley: Undersown in barley: Mar 10, 1964. P, K, Mg, Ca and S applied: Feb 9 - 18, 1965. All N applied: Feb 23. Trace element spray applied: May 5. Magnesium-free calcium carbonate applied to additional plots at 48 cwt: May 27. Additional plots cut 3 times: May 26, July 22, Oct 8, 1965, remainder 4 times: Oct 29, 1964, May 26, July 22, Oct 8, 1965.

65/B/2.2

Potatoes: Dung applied, plots dug by hand: Nov 10, 1964.
P, K, Mg, Ca and S applied: Feb 9 - 18, 1965. First N dressing applied to additional plots, all N applied to remainder: Apr 14. All plots rotary cultivated, setts planted: Apr 23. Second N dressing applied to additional plots: May 26. Trace element spray applied: June 10. Earthed up: June 11. Sprayed twice with triphenyltin acetate at 9.8 oz in 120 gals: July 5 and 27. Harvested: Plots with neither K nor dung (where haulm died early): Aug 13, remainder: Sept 27.

Permanent grass: Dung, P and K applied: Feb 9, 1965. N applied - first dressing: Feb 23, second: May 20, third: July 22. Cut 3 times: May 20, July 22 and Oct 8.

Stackyard Series C (W):-

Oats: P and K applied: Feb 10, 1965. First N dressing applied, seed drilled: Mar 17. Sprayed with 17.5 lb DDT in 355 gals: Apr 30. Second N dressing applied: May 14. Harvested: Aug 23.

Sugar Beet: Dung applied, plots dug by hand: Nov 23, 1964. P and K applied: Feb 10, 1965. First N dressing applied, plots rotary cultivated, seed drilled: Apr 9. Sprayed with DDT at 15 oz in 40 gals: May 14. Sprayed with dimethoate at 6 oz in 40 gals: May 21. Singled: June 1. Sprayed four times with malathion and DDT (Kil at 12 fluid oz in 50 gals): June 21, July 5, July 16, Aug 2. Harvested: Oct 14.

Barley: P and K applied: Feb 10, 1965. First N dressing applied: Mar 17. Seed drilled: Mar 25. Second N dressing applied: May 14. Harvested: Aug 23.

Grass-clover ley: Undersown in barley: Mar 9, 1964. P and K applied: Feb 10, 1965. All N applied: Mar 16. Cut four times: Oct 30, 1964, May 24, July 27, Oct 11, 1965.

Potatoes: Dung applied, plots dug by hand: Nov 25, 1964. P and K applied: Feb 10, 1965. First N dressing applied, plots rotary cultivated, setts planted: Apr 9. Second N dressing applied: May 25. Earthed up: June 2. Sprayed 3 times with malathion and DDT (Kil at 12 fluid oz in 50 gals): June 21, July 5, July 16. Sprayed 3 times with Bordeaux mixture at 7 lb in 40 gals: July 5, July 16 and July 28. Sprayed with malathion and DDT (Kil at 12 fluid oz in 50 gals): Aug 2. Harvested: Sept 23.

Permanent grass: Dung, P and K applied: Feb 10, 1965. N applied - first dressing: May 16, second: May 25, third: July 27. Cut three times: May 25, July 27, Oct 11.

Soft fruit: Dung and PK applied: Feb 10, 1965. N dressing applied: Mar 16.

65/B/2.3

Bed 1. For details of previous year's results see 63/B/2 and 64/B/2.

Cultivations, etc.:-

Formalin applied: Dec 8, 1964 in 4 l. per sq.yd. water. All manures (other than N) dug in: Apr 1, 1965. Seed sown: Apr 7. T.V.O. pre-emergent spray: Apr 29. N top dressed: July 7, July 30, Aug 24.

Bed 2.

Comparison of soluble and slow-release NPK Mg fertiliser applied to one-year seedbeds and transplant beds of Sitka spruce (*Picea sitchensis*) and Norway spruce (*Picea abies*).

Bed 2, which is alongside Bed 1, has had a similar history except that grass was not removed until winter 1962/63. The bed remained fallow until the spring of 1965 when Plots 1 to 6 were lined out with one-year seedlings and Plots 7 to 12 were sown. All twelve plots were split for Sitka spruce (S) v. Norway spruce (N).

Design: Seedbeds. 2 blocks of 3 plots split into 2 (unrandomised)
Transplants. 2 blocks of 3 plots split into 2 (unrandomised)

Area of each plot: 0.0002 acre (1 square yard).

No. of viable seeds per plot: Sitka spruce 1800
Norway spruce 1500

No. of transplants per species per plot: 54.

Treatments

None (D)
NPK Mg soluble (A)
NPK Mg slow-release + 'Nitro-Chalk' top dressed (B).

Symbols, rates and forms of materials applied (per sq.yd).

NPK Mg soluble

N: 'Nitro-Chalk 21' applied in three summer top dressings at 4.5 g.N per occasion for seedbeds, and 3 g.N per occasion for transplants.

PK: Potassic superphosphate (20% P₂O₅, 10% K₂O) at 9 g.P, 9 g.K.

NPK Mg slow-release + 'Nitro-Chalk'

N (part): 'Nitro-Chalk 21' applied in three summer top dressings at 4.5 g.N per occasion for seedbeds and 3 g.N per occasion for transplants.

NPK Mg: Magnesium ammonium phosphate supplying 2 g.N, 4.5 g.P, 3.5 g.Mg

Potassium metaphosphate supplying 4.5 g.P, 6 g.K.

Cultivations, etc.:- All manures (other than N) dug in: Apr 1, 1965. Seed sown: Apr 7. T.V.O. pre-emergent spray: Apr 29. N top dressed: July 7, July 30, Aug 24.

65/B/2.4

- NOTES: (1) Height assessments
Seedbeds: Three 2-inch grids (i.e. one-sixth) measured and counted per plot or half-plot.
Transplants: Two inside lines (i.e. 36 trees) per species measured.
- (2) Samples were taken for the determination of dry matter of tops and roots separately and for N, P, K, Ca, Mg in total crop.
- (3) During second half of October nearly all seedlings on 'no K' plots in Bed 1 had dead needle tips. A few plants were also affected in other plots. Later the whole of the 'no K' plots became severely discoloured. The symptoms resemble those attributable to frost damage on no-K or low-K plots at Wareham and Kennington, but it is possible that at Woburn smog was a contributory factor.

Grazed Reference Plots (Highfield IX (R)):-

Cultivations, etc.: P and K fertilisers applied: Nov 20, 1964.
Ground chalk applied to appropriate plots: Nov 30. First N dressings applied: Feb 26, 1965. Sample cuts taken 4 times: May 6, June 17, Aug 20, Oct 25. N dressings applied after first 3 cuts. Sampling cages moved after each cut.

Standard errors per plot.

Highfield IX (R), Dry Matter:

1st cut: 3.73 or 24.9% (26 d.f.)
2nd cut: 4.09 or 11.0% (26 d.f.)
3rd cut: 4.48 or 10.6% (26 d.f.)
4th cut: 2.84 or 11.7% (26 d.f.)
Total of 4 cuts: 7.66 or 6.4% (26 d.f.)

Stackyard Series C (W) Sitka spruce Bed 1:

Mean height: 0.201 or 7.6% (13 d.f.)
Plant number: 167.32 or 11.4% (13 d.f.)

SUMMARY OF RESULTS

GREAT FIELD IV (R): ORIGINAL PLOTS

Treatment	Winter wheat		Kale:		Barley		Ley: DRY MATTER				Potatoes:		Permanent grass:			Total of 3 cuts
	GRAIN	STRAW	TOTAL WEIGHT	GRAIN	STRAW	1st cut	2nd cut	3rd cut	4th cut	Total TUBERS	1st cut	2nd cut	3rd cut			
None	30.9	35.8	7.12	15.2	13.2	0.6	16.4	15.0	10.8	42.8	3.48	7.0	20.1	14.9	42.0	
N1	40.9	44.9	11.80	15.9	16.1	0.9	18.8	15.0	10.3	45.0	3.48	15.1	20.5	19.0	54.6	
P	38.5	50.4	16.84	17.8	15.3	3.6	20.0	13.8	8.7	46.1	3.68	8.2	15.1	10.0	33.3	
N1P	32.2	45.9	22.57	26.4	27.2	0.4	19.1	8.7	5.9	34.1	3.56	20.1	20.4	19.1	59.6	
K	41.8	45.3	6.60	17.1	12.9	6.0	26.0	25.0	14.4	71.4	11.64	7.3	15.0	12.6	34.9	
N1K	48.0	55.4	3.12	20.9	20.9	4.1	30.0	26.3	14.7	75.1	12.59	20.9	27.1	23.8	71.8	
PK	39.1	58.2	13.72	17.1	15.8	5.1	34.1	23.1	21.2	83.5	13.02	8.0	20.1	13.2	41.3	
N1PK	50.7	69.1	27.08	26.8	30.8	3.5	35.9	26.1	22.1	87.6	17.71	24.0	25.7	21.4	71.1	
N2PK	44.9	68.2	32.82	28.6	40.7	2.0	43.2	26.5	22.1	93.8	17.97	45.6	30.6	28.0	104.2	
D	50.0	67.8	26.22	24.7	22.2	6.7	32.4	25.7	20.6	85.4	20.92	34.2	24.0	25.8	84.0	
N1PKD	46.1	72.9	32.99	22.6	36.2	9.4	37.8	28.7	22.6	98.5	25.87	42.7	26.5	30.0	99.2	
N2PKD	44.4	84.7	43.06	26.9	47.1	1.3	45.9	28.6	26.1	101.9	26.22	58.0	29.0	25.5	112.5	
Mean D.M.%	83.6	67.2		81.0	57.7	22.6	19.2	17.5	16.0	18.8		21.8	19.1	16.7	19.2	

65/B/2.5

65/B/2.6

GREAT FIELD IV (R): ADDITIONAL PLOTS

Treatment	Winter wheat		Kale:		Ley: DRY MATTER			Total Potatoes of TUBERS
	GRAIN	STRAW	TOTAL WEIGHT	Barley GRAIN	1st cut	2nd cut	3rd cut	
None	35.5	46.0	14.24	9.3	19.1	18.0	12.1	5.16
N2 PK	44.0	68.6	36.64	29.8*	40.9	15.7	19.2	16.14
N2 PK Mg Ca	42.0	70.2	38.20	30.7	41.9	16.0	17.3	18.75
N2 PK Mg S	46.4	69.8	35.07	31.4	39.6	12.9	14.9	18.66
N2 PK Ca S	46.5	67.8	35.42	33.6	42.0	23.7	19.7	19.88
N2 PK Mg Ca S	40.8	71.3	36.46	28.4*	43.0	20.9	17.7	17.71
N2 PK Mg Ca S TE	38.4	67.5	35.76	34.1	47.4	14.9	15.5	15.88
Mean D.M. %:	84.1	73.5		83.6	20.9	17.9	15.9	18.2

* Yields estimated from grain:straw ratios.

65/B/2.7

STACKYARD SERIES C (W)

Treatment	Oats GRAIN STRAW		Sugar beet ROOTS		Barley GRAIN STRAW		Ley: DRY MATTER				Potatoes: TOTAL TUBERS		Permanent grass: DRY MATTER			Total of 3 cuts
	GRAIN STRAW	GRAIN STRAW	ROOTS	ROOTS	GRAIN STRAW	GRAIN STRAW	1st cut	2nd cut	3rd cut	4th cut	Total of 4 cuts	1st cut	2nd cut	3rd cut		
None	34.7	28.2	5.64	15.8	14.6	4.1	21.1	15.9	11.5	52.6	2.93	18.0	10.3	7.7	36.0	
N1	50.6	44.2	8.07	29.9	24.1	2.2	29.8	13.4	8.0	53.4	4.48	24.0	18.4	15.9	58.3	
P	37.3	28.9	7.09	13.3	11.6	5.3	23.2	16.9	11.9	57.3	4.48	16.3	7.3	6.3	29.9	
N1P	52.1	43.4	8.12	30.5	21.1	2.0	27.4	11.9	6.8	48.1	3.78	23.8	17.2	14.9	55.9	
K	40.9	34.8	7.58	14.1	10.6	9.3	26.2	25.4	24.7	85.6	5.64	24.1	14.8	9.8	48.7	
N1K	49.9	43.5	11.94	30.9	31.3	6.2	32.9	22.8	21.1	83.0	9.03	34.6	21.1	20.4	76.1	
PK	35.1	31.3	7.18	16.7	15.5	13.9	28.6	26.0	23.1	91.6	5.32	26.4	16.4	12.0	54.8	
N1PK	53.6	50.5	10.78	34.4	34.5	6.2	32.6	22.9	22.1	83.8	8.88	33.0	21.3	21.9	76.2	
N2PK	57.5	56.5	16.11	40.7	44.4	2.6	38.0	21.1	20.9	82.6	11.19	36.0	25.1	28.0	89.1	
D	46.7	40.9	14.50	24.1	20.2	11.2	23.0	22.8	24.6	81.6	9.96	28.4	12.7	11.2	52.3	
N1PKD	55.1	52.4	19.12	36.0	41.9	5.3	37.2	21.2	24.4	88.1	17.06	26.2	22.4	23.8	72.4	
N2PKD	56.4	57.1	22.06	41.8	58.2	4.2	36.2	24.6	22.3	87.3	22.61	36.7	26.3	27.4	90.4	
Mean D.M. %:	72.7	44.3		77.0	51.4	20.6	19.9	25.3	20.6	21.6		21.1	24.8	24.1	23.3	

65/B/2.8

STACKYARD C (W). Bed 1

SITKA SPRUCE

Treatment	MEAN HEIGHT: INCHES	PLANT NUMBER: PER SQ YARD
	(±0.142)	(±118.3)
None	1.56 (1)	1552 (2)
PK Mg	1.52	1404
NK Mg	2.67	1416
NP Mg	2.67	1497
NPK	2.90	1578
NPK Mg	2.92 (1)	1443 (2)
NPK Mg F	3.23	1416
C	2.93	1464
C NPK Mg	3.57	1425
L NPK Mg	3.46	1353
Mean	2.66	1462
(1) (±0.101)	(2) (±83.7)	

Bed 2 PLOTS 1 - 6

	O	A	B	Mean
	MEAN HEIGHT: INCHES			
SS	6.94	7.43	8.98	7.78
NS	6.18	6.78	7.60	6.85
Mean	6.56	7.10	8.29	7.32

65/B/2.9

STACKYARD C (W)

Bed 2 PLOTS 7 - 12

	O	A	B	Mean
MEAN HEIGHT: INCHES				
SS	0.66	2.50	2.94	2.03
NS	0.95	2.10	2.52	1.86
Mean	0.80	2.30	2.73	1.94
PLANT NUMBER: SQ YD				
SS	14.04	13.68	16.74	14.82
NS	11.52	12.84	12.84	12.40
Mean	12.78	13.26	14.79	13.61

Erratum to Results 65/B/2.9

Plant number: square yard

Multiply all figures by 100 (i.e. delete decimal points).

65/B/2.10

HIGHFIELD IX (R)

DRY MATTER
GRASS

	Granular	Triple	Mean
1ST CUT			
PK	(±2.64)*		(±1.87)
NO 00	6.5	7.5	7.0
N1 00	13.3	9.1	11.2
A1 00	14.9	13.4	14.2
NO 10	9.4	7.6	8.5
N1 10	15.6	16.5	16.1
A1 10	17.0	15.6	16.3
NO 01	13.2	10.5	11.9
N1 01	15.4	16.1	15.7
A1 01	16.5	14.4	15.4
NO 11	10.8	7.1	8.9
N1 11	27.3	24.5	25.9
A1 11	22.5	17.9	20.2
N2 11	15.2	21.6	18.4
A2 11	21.8	19.1	20.5
Mean	15.7	14.4	15.0
2ND CUT			
	(±2.89)*		(±2.04)
NO 00	22.9	25.9	24.4
N1 00	38.1	35.8	36.9
A1 00	34.2	33.6	33.9
NO 10	32.4	18.8	25.6
N1 10	44.2	42.9	43.6
A1 10	40.2	38.8	39.5
NO 01	24.3	26.8	25.6
N1 01	45.1	37.5	41.3
A1 01	34.8	39.3	37.0
NO 11	28.2	31.3	29.8
N1 11	45.2	46.8	46.0
A1 11	40.6	40.1	40.3
N2 11	48.1	49.5	48.8
A2 11	48.6	46.5	47.6
Mean	37.6	36.7	37.2

Mean D.M. %: 1st cut: 17.5
2nd cut: 18.0

* For use in vertical and interaction comparisons only.

65/B/2.11

HIGHFIELD IX (R)

DRY MATTER
GRASS

	Granular	Triple	Mean
3RD CUT			
PK	(± 3.17)*		(± 2.24)
NO 00	23.4	37.1	30.3
N1 00	37.6	45.1	41.4
A1 00	42.1	42.9	42.5
NO 10	30.4	28.2	29.3
N1 10	43.2	42.6	42.9
A1 10	48.0	44.7	46.3
NO 01	31.4	34.6	33.0
N1 01	49.6	48.5	49.0
A1 01	40.5	51.3	45.9
NO 11	33.5	35.2	34.3
N1 11	39.8	50.0	44.9
A1 11	45.6	47.5	46.5
N2 11	55.0	49.0	52.0
A2 11	51.3	58.0	54.7
Mean	40.8	43.9	42.4
4TH CUT			
	(± 2.01)*		(± 1.42)
NO 00	20.9	21.1	21.0
N1 00	25.4	28.9	27.2
A1 00	24.0	21.1	22.5
NO 10	20.4	22.1	21.3
N1 10	26.2	21.4	23.8
A1 10	24.7	21.0	22.8
NO 01	22.2	20.7	21.5
N1 01	24.5	30.4	27.5
A1 01	24.3	24.8	24.5
NO 11	21.6	23.5	22.6
N1 11	26.8	27.4	27.1
A1 11	25.4	21.9	23.7
N2 11	27.9	30.2	29.0
A2 11	26.8	27.6	27.2
Mean	24.4	24.4	24.4

Mean D.M. %: 3rd cut: 16.5
4th cut: 18.1

* For use in vertical and interaction comparisons only.

65/B/2.12

HIGHFIELD IX (R)

DRY MATTER
GRASS

	Granular	Triple	Mean
TOTAL OF 4 CUTS			
PK	(±5.42)*		(±3.83)
NO 00	73.6	91.6	82.6
N1 00	114.4	119.0	116.7
A1 00	115.2	110.9	113.0
NO 10	92.7	76.7	84.7
N1 10	129.2	123.4	126.3
A1 10	129.9	119.9	124.9
NO 01	91.2	92.7	92.0
N1 01	134.6	132.4	133.5
A1 01	116.1	129.8	123.0
NO 11	94.0	97.2	95.6
N1 11	139.2	148.7	143.9
A1 11	134.2	127.4	130.8
N2 11	146.1	150.3	148.2
A2 11	148.6	151.2	149.9
Mean	118.5	119.4	118.9

Mean D.M. %: 17.5

* For use in vertical and interaction comparisons only.