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50/BC/1 Ley and Arable Rotations - Rothamsted

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50/B₂/1.1

LEY AND ARABLE ROTATIONS

Highfield and Fosters Field - 1950

For details of treatments and rotations etc. see Appendix Z.

Cultivations, etc.:

Highfield

Wheat (Blocks 6 & 7). Ploughed: Oct 18-27. 1st application of ground chalk: Oct 27. Rolled and disced: Oct 27-28. Disced and harrowed: Oct 29. 2nd and 3rd applications of ground chalk: Nov 18 and 19. Seed drilled, basal fertilizer applied and harrowed in: Oct 31. Dusted against wireworms: Feb 14. Harrowed and ring rolled: Apr 6. Nitrochalk applied: Apr 15. Weeded: June 16. Harvested: Aug 11. Variety: Yeoman.

Potatoes (Blocks 1-4). Ploughed: Sept 1 and Jan 10-11. Springtined: Mar 21. Cultivated and harrowed: Mar 28. Ring rolled: Mar 30. Ridged: Apr 4. Dung, sulphate of ammonia and basal fertilizers applied, potatoes planted and covered in: Apr 5. Ridges rolled: Apr 8. Ridges harrowed: May 5 and again May 10. Grubbed: June 1. Hoed: June 21-22. Earthed up: June 26. Sprayed with Perenox: July 27. Sprayed with Coppecon: Aug 19. Sprayed with 15% B.O.V. to kill off haulm: Sept 27. Lifted: Oct 13. Variety: Majestic.

Hay, Cut Grass, Grazed Ley, Reseeded Grass and Lucerne, all 1st year (Blocks 5 and 8, Reseeded Grass 5-8). Ploughed: Oct 18-27. Ground chalk applied: Oct 27. Ring rolled and disced: Oct 27-28. Disced and harrowed: Oct 29. Ground chalk applied: Nov 18 and 19. Springtined: Mar 21. Basal fertilizer applied: Mar 22. Harrowed: Mar 23. Nitrochalk applied (none to Lucerne): Mar 28.

Hay. Harrowed, rolled, seeds sown, harrowed and rolled in: Mar 25. Cut: July 13.

Cut Grass. Harrowed, rolled, seeds sown, harrowed and rolled in: Mar 25. Cut 5 times: June 15, July 11, Aug 2, Aug 31, Oct 5. Nitrochalk applied after each cut except the last. Topped: Nov 15.

Grazed Ley. Harrowed: Mar 28. Rolled: Mar 30. Seeds sown, harrowed and rolled in: Apr 6. Nitrochalk applied: July 13. Grazed: 7 circuits June - Nov.

Reseeded Grass. Grazed: 7 circuits June - Nov.

Lucerne. Drilled: Mar 22. Cut: 3 times, June 20, Aug 1, Oct 5. Variety: Du Puits.

Permanent Grass, 1st year (Blocks 5-8). Three applications of ground chalk: Oct 27, Nov 18 and 19. Basal fertilizer applied: Jan 14. 1st application of nitrochalk: Mar 28. Rolled: Mar 29. 2nd application of nitrochalk: July 4-7. Grazed: 6 circuits June - Nov.

Cut Grass. 2nd year (Blocks 2 and 3). Basal fertilizers applied: Jan 14. Nitrochalk applied: Mar 28. Rolled: Mar 29. Cut 8 times: Apr 22, May 10, May 30, June 20, July 11, Aug 2, Aug 31, Oct 5. Nitrochalk applied after each of the first 5 cuts.

Grazed Ley and Reseeded Grass. 2nd year (Blocks 2 and 3). Basal fertilizer applied: Jan 14. Nitrochalk applied: Mar 28. Rolled: Mar 29. Topped after grazing: May 27, June 21. Nitrochalk applied: July 10-12. Grazed: Ley - 8 circuits, Reseeded - 9 circuits June-Nov.

Lucerne. 2nd year (Blocks 2 and 3). Basal fertilizer applied: Jan 14. Hoed and weeded: Apr 20. Cut 3 times: June 20, Aug 1, Oct 5.

Permanent Grass. 2nd year (Blocks 1-4). Basal fertilizers applied: Jan 14. 1st application of nitrochalk: Mar 28. Rolled: Mar 29. 2nd application of nitrochalk: July 10-12. Grazed: 7 circuits June - Nov.

Fosters

Wheat (Blocks 8 and 9). Ploughed: Oct 17-27. Harrowed, seed and basal fertilizers drilled and harrowed in: Oct 31. Nitrochalk applied: Apr 14. Rolled: Apr 25. Sprayed with D.N.O.C.: May 10. Weeded: June 16-20. Harvested: Aug 11. Variety: Yeoman.

Potatoes (Blocks 1-4). Ploughed wheat stubble: Aug 29-30. Ploughed hay stubble: Sept 5-6. Springtined: Mar 18. Cultivated: Mar 27. Harrowed twice: Mar 28. Ring rolled: Mar 29. Ridged: Apr 3. Dung sulphate of ammonia applied and basal fertilizers drilled: Apr 4. Potatoes planted and covered in: Apr 5. Rolled ridges: Apr 6. Chain harrowed: May 5 and again May 10. Grubbed: May 25. Hoed: June 20-21. Earthed up: June 26. Sprayed with Perenox: July 25. Sprayed with Coppesane: Aug 4 and again Aug 18. Weeded: Sept 4-5. Sprayed with 20% B.O.V. to kill off haulm: Sept 25. Lifted: Oct 9-10. Variety: Majestic.

Hay, Cut Grass, Grazed Ley, Reseeded Grass and Lucerne, all 1st year (Blocks 5 and 7, Reseeded Grass 5, 7, 8 and 9). Ploughed: various days Oct 17-27. Springtined: Mar 18. Basal fertilizers applied, harrowed, rolled and harrowed: Mar 21-22. Nitrochalk applied (none to lucerne): Mar 29.

Hay. Rolled, seeds sown, harrowed and rolled in: Mar 24. Weeded: June 12-14. Cut: Aug 10.

Cut Grass. Rolled, harrowed, seeds sown, harrowed and rolled in: Mar 22. Weeded: June 12-14. Cut 4 times: July 10, Aug 3, Aug 30, Oct 6. Nitrochalk applied after each cut except the last.

Grazed Ley. Seeds sown: Apr 4. Harrowed and rolled in: Apr 5. Nitrochalk applied: July 10. Topped: July 12 and Nov 14. Grazed: 4 circuits June - Oct.

Reseeded Grass. Seeds sown: Apr 4. Harrowed and rolled in: Apr 5. Topped: July 12 and Nov 14. Nitrochalk applied: July 25. Grazed: 4 circuits June - Oct.

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Lucerne. Harrowed, rolled, seeds sown: Mar 27. Rolled in:
 Mar 29. Hoed and weeded: Apr 21. Dusted with D.D.T. powder:
 Apr 27. Hoed: June 13. Weeded: June 12-14. Cut twice:
 July 31, Oct 6. Variety: Du Puits.

Cut Grass. 2nd year (Blocks 2 and 4). Owing to poor plant it was decided to resow. Ploughed: Jan 13. Springtined: Mar 18. Basal fertilizer applied, harrowed, rolled and harrowed: Mar 21. Rolled, seeds sown, harrowed and rolled in: Mar 22. Nitrochalk applied: Mar 29. Weeded: June 10-14. Cut: 4 times July 10, Aug 3, Aug 30, Oct 6. Nitrochalk applied after each cut except the last.

Grazed Ley and Reseeded Grass. 2nd year (Blocks 2 and 4). Basal fertilizer applied: Jan 13. Nitrochalk applied: Mar 29. Rolled: Mar 30. Topped: May 16, June 7, June 23, July 12, Nov 14. 2nd application of nitrochalk: to Grazed Ley - July 14, to Reseeded Grass - July 25. Grazed: 5 circuits May - Oct.

Lucerne. 2nd year (Blocks 2 and 4). Basal fertilizer applied: Jan 13. Hoed and harrowed: Apr 1. Hoed and weeded: Apr 21-22. Cut: 3 times - June 16, July 31, Oct 6.

Standard errors per sub plot

Per $\frac{1}{4}$ plot. Wheat, grain.	Highfield:	1.72 cwt per acre or 5.8%	(23 d.f.)
	Fosters:	2.90 cwt per acre or 18.1%	(23 d.f.)
Potatoes, total tubers	Highfield:	0.941 tons per acre or 6.7%	(27 d.f.)
	Fosters:	0.896 tons per acre or 6.2%	(27 d.f.)
Hay, dry matter.	Highfield:	1.46 cwt per acre or 12.7%	(5 d.f.)
	Fosters:	1.33 cwt per acre or 8.6%	(5 d.f.)
Cut Grass, dry matter.	Highfield:	3.47 cwt per acre or 5.1%	(10 d.f.)
	Fosters:	3.52 cwt per acre or 7.7%	(10 d.f.)
Per $\frac{1}{2}$ plot. Old Pasture, dry matter.	Highfield:	5.10 cwt per acre or 11.2%	(7 d.f.)
Ley and Reseeded grass, dry matter	Highfield:	3.40 cwt per acre or 7.8%	(11 d.f.)
	Fosters:	4.17 cwt per acre or 11.6%	(11 d.f.)

Wheat. cwt per acre	Highfield			Fosters		
	cwt N per acre			cwt N per acre		
	0.3	0.6	Mean	0.3	0.6	Mean
	(± 0.43)			(± 0.73)		
Grain	30.1	29.6	29.9	14.8	17.3	16.0
Straw	42.8	43.2	43.0	19.4	21.9	20.6

Potatoes

	Dung: tons per acre	cwt N per acre			cwt N per acre		
		0.5	1.0	mean	0.5	1.0	Mean
		(± 0.210)			(± 0.200)		
Total tubers tons per acre	None	14.19	13.56	13.88	14.15	14.09	14.12
		(± 0.297)			(± 0.283)		
	15	14.26	14.19	14.22	14.61	14.86	14.74
	Mean	14.23	13.87	14.05	14.38	14.48	14.43
		(± 0.210)			(± 0.200)		

Percentage Ware		cwt N per acre			cwt N per acre		
		0.5	1.0	mean	0.5	1.0	Mean
	None	81.4	83.6	82.5	87.5	85.2	86.4
	15	80.2	82.5	81.4	87.0	83.7	85.4
	Mean	80.8	83.1	81.9	87.3	84.4	85.9

Hay. Dry Matter: cwt per acre

	cwt N per acre			cwt N per acre		
	0.3	0.6	Mean	0.3	0.6	Mean
	11.1	11.9	11.5	14.3	16.7	15.5
	(± 0.73)			(± 0.67)		

Cut Grass Dry Matter: cwt per acre

	No. of cuts	cwt N per acre			No. of cuts	cwt N per acre		
		0.15	0.30	Mean		0.15	0.30	Mean
1st year	5	61.4	67.8	64.6	4	40.8	47.7	44.2
		(± 1.74)			(± 1.76)			
2nd year	8	66.3	78.6	72.4	4	42.8	51.9	47.3
Mean		63.8	73.2	68.5		41.8	49.8	45.8
		(± 1.23)			(± 1.24)			

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Lucerne. Dry Matter: cwt per acre	Highfield		Fosters	
	No. of cuts		No. of cuts	
1st year	2	51.3	2	46.2
2nd year	3	94.2	3	83.0

Grazed Plots. Estimates from Sample cuts of amount of Dry Matter cwt per acre, consumed by sheep.

	cwt N per acre			cwt N per acre		
	0.15	0.30	Mean	0.15	0.30	Mean
<u>Permanent Grass</u>			(±1.80)			
1st year blocks	40.2 (±2.55)	43.5	41.8			
2nd year blocks	49.0	49.7	49.4			
Mean	44.6 (±1.80)	46.6	45.6			

Ley & Reseeded Grass

	cwt N per acre			cwt N per acre		
	0.15	0.30	Mean	0.15	0.30	Mean
1st year	34.8 (±1.39)	36.4	35.6 (±0.98)	32.8 (±1.70)	37.8	35.3 (±1.20)
2nd year	52.0	51.8	51.9	36.3	36.7	36.5
Mean	43.4 (±0.98)	44.1	43.8	34.5 (±1.20)	37.2	35.9

Note. The estimates of Dry Matter calculated from the sheep weights were considered unreliable and have been omitted.

Mean Grazing Days per acre. (Mean of 1st and 2nd year blocks)

	Highfield			Fosters		
	cwt N per acre			cwt N per acre		
	0.15	0.30	Mean	0.15	0.30	Mean
Permanent Grass	2626	2667	2646			
Ley and Reseeded Grass	2309	2389	2349	1368	1393	1380