

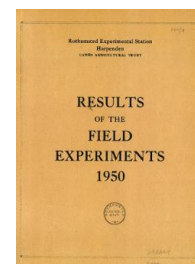
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50/BC/1 Ley and Arable Rotations - Rothamsted

Rothamsted Research

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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 Coppeason: 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 |
| 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 |
| | (± 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 |
| | | (± 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 |