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# Yields of the Field Experiments 1957

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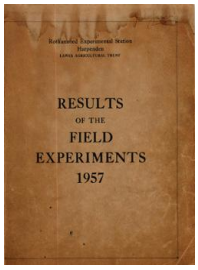


## 57/R/BC/1 Ley and Arable Rotations

### Rothamsted Research

Rothamsted Research (1958) *57/R/BC/1 Ley and Arable Rotations ;* Yields Of The Field Experiments 1957, pp 30 - 47 **- DOI: https://doi.org/10.23637/ERADOC-1-177**

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57/Bc/1.1

# LEY AND ARABLE ROTATIONS

Highfield and Fosters Field 1957 - the 9th year.

For details of treatments, rotations, etc. see "Details of the Classical and Long Term Experiments" 1956.

Rates of application of supplementary (corrective) potash ($K_2O$: cwt per acre)

| Crop | Year of cycle | Rate | |
|---|---|---|---|
| Cut grass | "1st treatment" | 3.0 | (3 years previous cutting) |
| | "2nd treatment" | 1.5 | (received supplement in 1956) |
| | "3rd treatment" | 1.5 | (received supplement in 1956) |
| Lucerne | "1st treatment" | 3.0 | (3 years previous lucerne) |
| | "2nd treatment" | 1.0 | (received supplement in 1956) |
| | "3rd treatment" | 1.0 | (received supplement in 1956) |
| Permanent and reseeded grass | "1st treatment" | 1.0 | (1 previous hay crop taken) |
| Remaining plot | | None | |

Cultivations, etc.:

N.B. 1959 PK plots on 1958 Nos. as equivalent

## HIGHFIELD

### 1st year Treatment Crops

Cut grass. Ploughed: Oct 29, 1956. 1st dressing of supplementary K applied: Mar 28, 1957. Basal PK applied: Apr 2. 'Nitro-Chalk' applied: Apr 3. Seed sown at 33 lb per acre: Apr 4. 2nd dressing of supplementary K applied: July 12. Cut 3 times: July 11, Aug 19, Oct 25. 'Nitro-Chalk' applied after each cut except the last.

Grazed ley. Ploughed: Oct 29, 1956. Basal PK applied: Apr 2, 1957. 'Nitro-Chalk' applied: Apr 3. Seed sown at 44 lb per acre: Apr 4. 'Nitro-Chalk' applied: July 3. Grazed: 6 circuits, June 25 - Sept 28.

Lucerne. Ploughed: Oct 29, 1956. 1st dressing of supplementary K applied: Mar 28, 1957. Basal PK applied: Apr 2. Seed drilled at 28 lb per acre: Apr 3. 2nd dressing of supplementary K applied: July 12. Cut 3 times: July 11, Sept 13, Oct 25. Variety: Du Puits.

Hay. Ploughed after failure of undersown seeds: Oct 31, 1956. Basal PK and 'Nitro-Chalk' applied, seed sown at 28 lb per acre: Mar 28, 1957. Cut: June 20.

### 2nd year Treatment Crops

Cut grass. Basal PK applied: Dec 5, 1956. Supplementary K applied: Apr 1, 1957. 'Nitro-Chalk' applied: Apr 1 and after each cut except the last. Cut 6 times: Apr 18, May 24, June 20, July 22, Aug 20, Oct 25.

Grazed ley. Basal PK applied: Dec 5, 1956. 'Nitro-Chalk' applied: May 6, 1957 and July 3. Grazed: 8 circuits, Apr 12 - Sept 30.

Lucerne. Basal PK applied: Dec 5, 1956. Supplementary K applied: Apr 1, 1957. Cut 4 times: May 29, July 2, Aug 10, Oct 24.

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Potatoes. Ploughed 3 times: July 5, 1956, Oct 16, Jan 28, 1957. Ridged: May 2. Basal PK, sulphate of ammonia and dung applied, potatoes planted: May 3. For later cultivations see Potato Test Crop.

3rd year Treatment Crops

Cut grass. Basal PK applied: Dec 5, 1956. Supplementary K applied: Apr 1, 1957. 'Nitro-Chalk' applied: Apr 1 and after each cut except the last. Cut 6 times: Apr 26, May 29, July 2, July 22, Aug 19, Oct 11.

Grazed ley. Basal PK applied: Dec 5, 1956. 'Nitro-Chalk' applied: May 6, 1957 and July 3. Grazed: 6 circuits, Apr 16 - Sept 6.

Lucerne. Basal PK applied: Dec 5, 1956. Sprayed with TCA (Sodium trichloracetate), 20 lb in 90 gallons per acre: Jan 11, 1957. Supplementary K applied: Apr 1. Cut 4 times: May 29, July 2, Aug 10, Oct 11.

Oats. Ploughed twice: Oct 16, 1956 and Jan 29, 1957. Seed drilled at $3\frac{1}{2}$ bushels per acre with basal PK, 'Nitro-Chalk' applied: Mar 13. Combine harvested: Aug 7. Variety: Sun II.

1st Test Crop, Wheat

Ploughed after oats: Oct 4, 1956. Ploughed leys: Oct 26. Seed drilled at $2\frac{3}{4}$ bushels per acre with basal PK: Nov 2. Supplementary K applied to previous cut grass and lucerne plots: Apr 1, 1957. 'Nitro-Chalk' applied: Apr 26. Sprayed with MCPA, 3 pints in 40 gallons per acre: May 7. Combine harvested: Aug 26. Variety: Yeoman.

2nd Test Crop, Potatoes

Ploughed twice: Oct 16, 1956 and Jan 28, 1957. Ridged: May 2. Dung, sulphate of ammonia, basal PK and additional P and K applied, potatoes planted: May 3. Earthed up: July 6. Sprayed with copper fungicide, 5 lb in 40 gallons per acre: Aug 1 and again Aug 21. Sprayed with sulphuric acid, 25% BOV at 100 gallons per acre: Sept 23. Lifted: Oct 4. Variety: Majestic.

3rd Test Crop, Barley

Ploughed twice: Oct 16, 1956 and Jan 29, 1957. Ground chalk applied to blocks 1 and 4: Dec 3, 1956. 'Nitro-Chalk' applied, seed drilled at 2 bushels per acre with basal PK: Mar 14, 1957. Combine harvested: Aug 19.

Permanent grasses. Basal PK applied to all plots: Dec 5, 1956.

7th year reseeded, 7th experimental year of permanent grass, Blocks 9-12.

Blocks 9 and 12. Supplementary K applied: Apr 1, 1957. 'Nitro-Chalk' applied: Apr 1 and June 7. Cut for hay: June 6. Grazed aftermath: 3 circuits, Aug 5 - Sept 25.

Blocks 10 and 11. 'Nitro-Chalk' applied: May 6 and July 3, 1957. Grazed: 5 circuits, Apr 28 - Sept 22.

8th year reseeded, 8th experimental year of permanent grass, Blocks 5-8.

Blocks 5 and 8. Supplementary K applied: Apr 1, 1957.

Blocks 5-8. 'Nitro-Chalk' applied: May 6, 1957 and July 3. Grazed: 5 circuits, Apr 20 - Sept 18.



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9th year reseeded, 9th experimental year of permanent grass, Blocks 1-4.
Blocks 1 and 4. Ground chalk applied: Dec 3, 1956.
Blocks 1-4. 'Nitro-Chalk' applied: May 6, 1957 and July 3.
Grazed: 6 circuits, Apr 12 - Sept 29.

FOSTERS

1st year Treatment Crops

Cut grass. Ploughed twice: Oct 2, 1956 and Jan 23, 1957. 1st dressing of supplementary K applied: Mar 29. 'Nitro-Chalk' and basal PK applied: Apr 2. Seed sown at 33 lb per acre: Apr 3. 2nd dressing of supplementary K applied: July 19. Cut 3 times: July 19, Aug 24, Oct 24. 'Nitro-Chalk' applied after each cut except the last.

Grazed ley. Ploughed twice: Oct 2, 1956 and Jan 23, 1957. 'Nitro-Chalk' and basal PK applied: Apr 2. Seed sown at 44 lb per acre: Apr 3. 'Nitro-Chalk' applied: July 3. Grazed: 3 circuits, July 25 - Sept 28.

Lucerne. Ploughed twice: Oct 2, 1956 and Jan 23, 1957. 1st dressing of supplementary K applied: Mar 29. Basal PK applied: Apr 2. Seed drilled at 28 lb per acre: Apr 3. 2nd dressing of supplementary K applied: July 12. Cut 3 times: July 12, Sept 12, Oct 24.

Hay. Seeds undersown in barley at 28 lb per acre: Apr 24, 1956. Basal PK applied: Dec 4. 'Nitro-Chalk' applied: Mar 29, 1957. Cut: June 5.

2nd year Treatment Crops

Cut grass. Basal PK applied: Dec 4, 1956. Supplementary K applied: Mar 30, 1957. 'Nitro-Chalk' applied: Mar 30 and after each cut except the last. Cut 6 times: Apr 18, May 24, June 20, July 23, Sept 12, Oct 24.

Grazed ley. Basal PK applied: Dec 4, 1956. 'Nitro-Chalk' applied: May 4, 1957 and July 3. Grazed: 6 circuits, Apr 13 - Oct 2.

Lucerne. Basal PK applied: Dec 4, 1956. Supplementary K applied: Mar 30, 1957. Cut 4 times: May 30, July 5, Aug 8, Oct 24.

Potatoes. Ploughed 3 times: July 5, 1956, Sept 28 and Jan 24, 1957. Ridged, dung, sulphate of ammonia and basal PK applied, potatoes planted: May 2. For later cultivations see Potato Test Crop.

3rd year Treatment Crops

Cut grass. Basal PK applied: Dec 4, 1956. Supplementary K applied: Mar 30, 1957. 'Nitro-Chalk' applied: Mar 30 and after each cut except the last. Cut 6 times: Apr 26, May 30, July 1, July 23, Sept 12, Oct 11.

Grazed ley. Basal PK applied: Dec 4, 1956. 'Nitro-Chalk' applied: May 4, 1957 and July 3. Grazed: 6 circuits, Apr 17 - Oct 6.

Lucerne. Basal PK applied: Dec 4, 1956. Supplementary K applied: May 30, 1957. Cut 4 times: May 30, July 5, Aug 8, Oct 11.

Oats. Ploughed twice: Oct 17, 1956 and Feb 20, 1957. 'Nitro-Chalk' applied, seed drilled at $3\frac{1}{2}$ bushels per acre with basal PK: Mar 13. Combine harvested: Aug 7. Variety: Sun II.



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1st Test Crop, Wheat

Ploughed after oats: Sept 29, 1956. Ploughed leys: Oct 26. Seed drilled at 2¾ bushels per acre with basal PK: Nov 1. Supplementary K to previous cut grass and lucerne plots: Mar 30, 1957. 'Nitro-Chalk' applied: Apr 25. Sprayed with MCPA, 3 pints in 40 gallons per acre: May 7. Combine harvested: Aug 24. Variety: Yeoman.

2nd Test Crop, Potatoes

Ploughed twice: Sept 29, 1956 and Jan 24, 1957. Ridged, dung, sulphate of ammonia, basal PK and additional P and K applied, potatoes planted: May 2. Earthed up: July 6. Sprayed with copper fungicide, 5 lb in 40 gallons per acre: Aug 1 and again Aug 21. Sprayed with sulphuric acid, 20% BOV at 100 gallons per acre: Sept 19. Lifted: Oct 2. Variety: Majestic.

3rd Test Crop, Barley

Ploughed twice: Oct 17, 1956 and Jan 29, 1957. 'Nitro-Chalk' applied, seed drilled at 2 bushels per acre with basal PK: Mar 14. Combine harvested: Aug 19. Variety: Proctor.

Permanent grasses. Basal PK applied to all plots: Dec 4, 1956.

7th year reseeded grass, Blocks 6, 10, 11, 12.

Blocks 6 and 11. Supplementary K and 'Nitro-Chalk' applied: Mar 30, 1957. Cut for hay: June 5. 'Nitro-Chalk' applied: June 7. Grazed aftermath: 3 circuits, Aug 2 - Sept 18.

Blocks 10 and 12. 'Nitro-Chalk' applied: May 4, 1957 and July 3. Grazed: 5 circuits, Apr 29 - Sept 20.

8th year reseeded grass, Blocks 5, 7, 8, 9.

Blocks 5 and 7. Supplementary K applied: Mar 30, 1957.

Blocks 5, 7, 8, 9. 'Nitro-Chalk' applied: May 4 and July 3. Grazed: 5 circuits, Apr 21 - Sept 16.

9th year reseeded grass. Blocks 1-4.

'Nitro-Chalk' applied: May 4, 1957 and July 3. Grazed: 6 circuits, Apr 13 - Oct 6.

Standard errors per ¼ plot. Test Crops.

| | | | |
|---|---|---|---|
| Wheat, grain (at 85% dry matter). | | Highfield: | 2.70 cwt per acre or 7.7% (14 d.f.) |
| | | Fosters: | 1.58 cwt per acre or 4.4% (14 d.f.) |
| Potatoes, total tubers. | Highfield | ¼ plot: | 0.964 tons per acre or 7.5% (14 d.f.) |
| | | ⅛ plot: | 0.710 tons per acre or 5.5% (20 d.f.) |
| | Fosters | ¼ plot: | 0.712 tons per acre or 5.9% (14 d.f.) |
| | | ⅓ plot: | 0.917 tons per acre or 7.7% (20 d.f.) |
| Barley, grain (at 85% dry matter). | | Highfield: | 3.08 cwt per acre or 6.8% (15 d.f.) |
| | | Fosters: | 1.48 cwt per acre or 3.5% (15 d.f.) |



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## Summary of Results

### Wheat 1st test crop

| N: cwt per acre | Treatment crops 1954-1956 Lucerne | Ley | Cut Grass | Arable with hay | Mean |
|---|---|---|---|---|---|
| **Grain (at 85% dry matter): cwt per acre** | | | | | |
| **Highfield** | | | | | |
| Mean | 35.3 | 30.9 | 35.9 | 38.2 | 35.1 |
| To test crop | | | | | |
| 0.3 | 32.9 | 30.4 | 34.8 | 37.8 | 34.0 |
| 0.6 | 37.7 | 31.4 | 36.9 | 38.6 | 36.1 |
| Difference (±1.91) | +4.8 | +1.0 | +2.1 | +0.8 | +2.1 (±0.96) |
| To treatment crops | | | | | |
| Single rate | | 30.4 | 35.9 | 37.1 | 34.5 |
| Double rate | | 31.4 | 35.8 | 39.3 | 35.5 |
| Difference (±1.91) | | +1.0 | -0.1 | +2.2 | +1.0 (±1.10) |
| **Fosters** | | | | | |
| Mean | 40.6 | 33.4 | 33.2 | 35.4 | 35.6 |
| To test crop | | | | | |
| 0.3 | 39.3 | 31.9 | 31.2 | 32.9 | 33.8 |
| 0.6 | 41.9 | 34.9 | 35.2 | 37.9 | 37.5 |
| Difference (±1.12) | +2.6 | +3.0 | +4.0 | +5.0 | +3.7 (±0.56) |
| To treatment crops | | | | | |
| Single rate | | 32.9 | 33.2 | 35.0 | 33.7 |
| Double rate | | 33.9 | 33.2 | 35.8 | 34.3 |
| Difference (±1.12) | | +1.0 | 0.0 | +0.8 | +0.6 (±0.65) |



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## Wheat 1st test crop

| N: cwt per acre | Excluding Lucerne: N to previous treatment crop, Single rate | Excluding Lucerne: N to previous treatment crop, Double rate | Excluding Lucerne: Mean | Arable with hay only: Dung to potatoes 1955: tons per acre, None | Arable with hay only: Dung to potatoes 1955: tons per acre, 12 | Arable with hay only: Mean |
|---|---|---|---|---|---|---|
| **Grain (at 85% dry matter): cwt per acre** | | | | | | |
| **Highfield** | | | | | | |
| To test crop | (±1.10) | | (±0.78) | (±1.91) | | (±1.35) |
| 0.3 | 33.2 | 35.5 | 34.3 | 38.1 | 37.5 | 37.8 |
| 0.6 | 35.7 | 35.5 | 35.6 | 38.9 | 38.3 | 38.6 |
| Mean | 34.5 (±0.78) | 35.5 | 35.0 | | | |
| To previous treatment crops | | | | (±1.91) | | (±1.35) |
| Single rate | | | | 37.0 | 37.3 | 37.1 |
| Double rate | | | | 40.0 | 38.5 | 39.3 |
| Mean | | | | 38.5 (±1.35) | 37.9 | 38.2 |

Mean dry matter % as harvested: 83.0

| | | | | | | |
|---|---|---|---|---|---|---|
| **Fosters** | | | | | | |
| To test crop | (±0.65) | | (±0.46) | (±1.12) | | (±0.79) |
| 0.3 | 31.5 | 32.5 | 32.0 | 37.2 | 36.3 | 36.8 |
| 0.6 | 35.9 | 36.1 | 36.0 | 42.2 | 41.3 | 41.8 |
| Mean | 33.7 (±0.46) | 34.3 | 34.0 | | | |
| To previous treatment crops | | | | (±1.12) | | (±0.79) |
| Single rate | | | | 39.6 | 38.2 | 38.9 |
| Double rate | | | | 39.9 | 39.5 | 39.7 |
| Mean | | | | 39.7 (±0.79) | 38.8 | 39.3 |

Mean dry matter % as harvested: 83.7



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Wheat 1st test crop

| N: cwt per acre | Treatment crops 1954-1956 Lucerne | Ley | Cut Grass | Arable with hay | Mean |
|---|---|---|---|---|---|
| Straw (at 85% dry matter): cwt per acre | | | | | |
| **Highfield** | | | | | |
| Mean | 41.5 | 40.6 | 34.0 | 42.6 | 39.7 |
| To test crop | | | | | |
| 0.3 | 38.5 | 41.9 | 34.5 | 42.8 | 39.4 |
| 0.6 | 44.5 | 39.4 | 33.5 | 42.3 | 39.9 |
| Difference | +6.0 | -2.5 | -1.0 | -0.5 | +0.5 |
| To treatment crops | | | | | |
| Single rate | | 42.1 | 33.0 | 39.9 | 38.3 |
| Double rate | | 39.2 | 35.0 | 45.3 | 39.8 |
| Difference | | -2.9 | +2.0 | +5.4 | +1.5 |
| **Fosters** | | | | | |
| Mean | 37.4 | 31.9 | 33.7 | 31.4 | 33.6 |
| To test crop | | | | | |
| 0.3 | 36.4 | 32.0 | 31.3 | 31.5 | 32.8 |
| 0.6 | 38.5 | 31.8 | 36.2 | 31.4 | 34.5 |
| Difference | +2.1 | -0.2 | +4.9 | -0.1 | +1.7 |
| To treatment crops | | | | | |
| Single rate | | 30.3 | 32.6 | 32.3 | 31.7 |
| Double rate | | 33.5 | 34.8 | 30.6 | 33.0 |
| Difference | | +3.2 | +2.2 | -1.7 | +1.3 |



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## Wheat 1st test crop

| N: cwt per acre | Excluding Lucerne: N to previous treatment crop: Single rate | Double rate | Mean | Arable with hay only: Dung to potatoes 1955: tons per acre: None | 12 | Mean |
|---|---|---|---|---|---|---|
| **Straw (at 85% dry matter): cwt per acre** | | | | | | |
| **Highfield** | | | | | | |
| To test crop | | | | | | |
| 0.3 | 38.1 | 41.4 | 39.7 | 40.7 | 44.9 | 42.8 |
| 0.6 | 38.5 | 38.2 | 38.4 | 40.2 | 44.4 | 42.3 |
| Mean | 38.3 | 39.8 | 39.1 | | | |
| To previous treatment crops | | | | | | |
| Single rate | | | | 37.8 | 42.0 | 39.9 |
| Double rate | | | | 43.1 | 47.4 | 45.3 |
| Mean | | | | 40.4 | 44.7 | 42.6 |

Mean dry matter % as harvested: 85.1

| | | | | | | |
|---|---|---|---|---|---|---|
| **Fosters** | | | | | | |
| To test crop | | | | | | |
| 0.3 | 30.0 | 33.2 | 31.6 | 28.8 | 34.2 | 31.5 |
| 0.6 | 33.5 | 32.7 | 33.1 | 28.6 | 34.1 | 31.4 |
| Mean | 31.7 | 33.0 | 32.3 | | | |
| To previous treatment crops | | | | | | |
| Single rate | | | | 29.4 | 35.3 | 32.3 |
| Double rate | | | | 28.1 | 33.0 | 30.6 |
| Mean | | | | 28.7 | 34.2 | 31.4 |

Mean dry matter % as harvested: 85.0



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Potatoes 2nd test crop. Total tubers: tons per acre

| | Treatment crops 1953-1955 | | | | |
|---|---|---|---|---|---|
| | Lucerne | Ley | Cut Grass | Arable with hay | Mean |
| **Highfield** | | | | | |
| Mean | 13.18 | 14.24 | 12.25 | 11.98 | 12.91 |
| N: cwt per acre | | | | | |
| 0.5 | 13.22 | 14.20 | 11.91 | 11.49 | 12.70 |
| 1.0 | 13.14 | 14.28 | 12.60 | 12.47 | 13.12 |
| Difference (±0.682) | -0.08 | +0.08 | +0.69 | +0.98 | +0.42 (±0.341) |
| Dung: tons per acre | | | | | |
| None | 12.45 | 14.17 | 11.48 | 11.14 | 12.31 |
| 12 | 13.92 | 14.31 | 13.02 | 12.83 | 13.52 |
| Difference (±0.682) | +1.47 | +0.14 | +1.54 | +1.69 | +1.21 (±0.341) |
| $P_2O_5$: cwt per acre* | | | | | |
| 0.9 | 13.18 | 14.22 | 12.22 | 12.18 | 12.95 |
| 1.8 | 13.18 | 14.26 | 12.28 | 11.78 | 12.87 |
| Difference (±0.355) | 0.00 | +0.04 | +0.06 | -0.40 | -0.08 (±0.178) |
| $K_2O$: cwt per acre* | | | | | |
| 0.9 | 12.26 | 13.94 | 11.36 | 11.36 | 12.23 |
| 1.8 | 14.10 | 14.54 | 13.14 | 12.60 | 13.60 |
| Difference (±0.355) | +1.84 | +0.60 | +1.78 | +1.24 | +1.37 (±0.178) |
| **Fosters** | | | | | |
| Mean | 12.39 | 11.66 | 11.15 | 12.67 | 11.97 |
| N: cwt per acre | | | | | |
| 0.5 | 12.85 | 12.28 | 11.29 | 12.38 | 12.20 |
| 1.0 | 11.93 | 11.04 | 11.02 | 12.95 | 11.74 |
| Difference (±0.503) | -0.92 | -1.24 | -0.27 | +0.57 | -0.46 (±0.252) |
| Dung: tons per acre | | | | | |
| None | 11.72 | 11.35 | 10.87 | 12.23 | 11.54 |
| 12 | 13.06 | 11.97 | 11.44 | 13.10 | 12.39 |
| Difference (±0.503) | +1.34 | +0.62 | +0.57 | +0.87 | +0.85 (±0.252) |
| $P_2O_5$: cwt per acre* | | | | | |
| 0.9 | 11.91 | 11.61 | 11.13 | 12.90 | 11.89 |
| 1.8 | 12.87 | 11.71 | 11.17 | 12.43 | 12.05 |
| Difference (±0.459) | +0.96 | +0.10 | +0.04 | -0.47 | +0.16 (±0.229) |
| $K_2O$: cwt per acre* | | | | | |
| 0.9 | 11.76 | 11.42 | 11.01 | 12.61 | 11.70 |
| 1.8 | 13.02 | 11.90 | 11.30 | 12.72 | 12.24 |
| Difference (±0.459) | +1.26 | +0.48 | +0.29 | +0.11 | +0.54 (±0.229) |

*Including basal dressing



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Potatoes 2nd test crop. Total tubers: tons per acre

| | Dung: tons per acre | | $P_2O_5$: cwt per acre* | | $K_2O$: cwt per acre* | |
|---|---|---|---|---|---|---|
| | None | 12 | 0.9 | 1.8 | 0.9 | 1.8 |
| **Highfield** | | | | | | |
| N: cwt per acre | (±0.308) | | (1) and (2) | | (1) and (2) | |
| 0.5 | 10.84 | 11.98 | 11.27 | 11.55 | 10.65 | 12.17 |
| 1.0 | 11.36 | 12.33 | 12.06 | 11.63 | 11.32 | 12.37 |
| Dung: tons per acre | | | (1) and (2) | | (1) and (2) | |
| None | | | 11.15 | 11.05 | 10.09 | 12.11 |
| 12 | | | 12.18 | 12.13 | 11.89 | 12.42 |

| Lucerne rotation only | $K_2O$: cwt per acre* 0.9 | 1.8 | Mean |
|---|---|---|---|
| $P_2O_5$: cwt per acre* | (3) and (4) | | |
| 0.9 | 11.14 | 12.76 | 11.95 |
| 1.8 | 10.98 | 12.74 | 11.86 |
| Mean | 11.06 | 12.75 | 11.90 |

| | Dung: tons per acre | | $P_2O_5$: cwt per acre* | | $K_2O$: cwt per acre* | |
|---|---|---|---|---|---|---|
| | None | 12 | 0.9 | 1.8 | 0.9 | 1.8 |
| **Fosters** | | | | | | |
| N: cwt per acre | (±0.242) | | (1) and (2) | | (1) and (2) | |
| 0.5 | 10.63 | 11.43 | 11.06 | 11.01 | 10.87 | 11.19 |
| 1.0 | 10.15 | 10.95 | 10.38 | 10.72 | 10.20 | 10.89 |
| Dung: tons per acre | | | (1) and (2) | | (1) and (2) | |
| None | | | 10.19 | 10.59 | 10.15 | 10.63 |
| 12 | | | 11.25 | 11.14 | 10.92 | 11.46 |

| Lucerne rotation only | $K_2O$: cwt per acre* 0.9 | 1.8 | Mean |
|---|---|---|---|
| $P_2O_5$: cwt per acre* | (3) and (4) | | |
| 0.9 | 9.62 | 11.79 | 10.70 |
| 1.8 | 11.47 | 11.68 | 11.57 |
| Mean | 10.55 | 11.73 | 11.14 |

*Including basal dressing

| Highfield | Fosters | |
|---|---|---|
| (1) ±0.181 | (1)±0.226 | for use in horizontal and interaction comparisons. |
| (2) ±0.253 | (2)±0.234 | for use in all others. |
| (3) ±0.617 | (3)±0.484 | for use only in testing the PK interaction. |
| (4) ±0.506 | (4)±0.468 | for use in all other comparisons. |



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Potatoes 2nd test crop. Percentage ware (1½" riddle)

| | Treatment crops 1953-1955 | | | | |
|---|---|---|---|---|---|
| | Lucerne | Ley | Cut Grass | Arable with hay | Mean |
| **Highfield** | | | | | |
| Mean | 78.1 | 76.8 | 76.2 | 74.6 | 76.4 |
| N: cwt per acre | | | | | |
| 0.5 | 79.8 | 77.6 | 77.6 | 74.4 | 77.4 |
| 1.0 | 76.4 | 76.0 | 74.8 | 74.8 | 75.5 |
| Difference | -3.4 | -1.6 | -2.8 | +0.4 | -1.9 |
| Dung: tons per acre | | | | | |
| None | 79.2 | 76.7 | 74.5 | 72.3 | 75.6 |
| 12 | 77.0 | 77.0 | 77.9 | 76.9 | 77.2 |
| Difference | -2.2 | +0.3 | +3.4 | +4.6 | +1.6 |
| $P_2O_5$: cwt per acre* | | | | | |
| 0.9 | 79.8 | 77.8 | 76.7 | 72.7 | 76.8 |
| 1.8 | 76.4 | 75.8 | 75.6 | 76.6 | 76.1 |
| Difference | -3.4 | -2.0 | -1.1 | +3.9 | -0.7 |
| $K_2O$: cwt per acre* | | | | | |
| 0.9 | 77.6 | 76.2 | 78.0 | 75.5 | 76.8 |
| 1.8 | 78.6 | 77.5 | 74.4 | 73.8 | 76.0 |
| Difference | +1.0 | +1.3 | -3.6 | -1.7 | -0.8 |
| **Fosters** | | | | | |
| Mean | 88.9 | 85.2 | 88.6 | 91.1 | 88.5 |
| N: cwt per acre | | | | | |
| 0.5 | 89.5 | 86.9 | 88.2 | 92.0 | 89.2 |
| 1.0 | 88.4 | 83.5 | 89.0 | 90.3 | 87.8 |
| Difference | -1.1 | -3.4 | +0.8 | -1.7 | -1.4 |
| Dung: tons per acre | | | | | |
| None | 89.6 | 84.1 | 88.2 | 90.5 | 88.1 |
| 12 | 88.2 | 86.3 | 89.1 | 91.8 | 88.8 |
| Difference | -1.4 | +2.2 | +0.9 | +1.3 | +0.7 |
| $P_2O_5$: cwt per acre* | | | | | |
| 0.9 | 89.6 | 85.8 | 89.3 | 92.2 | 89.2 |
| 1.8 | 88.2 | 84.6 | 87.9 | 90.1 | 87.7 |
| Difference | -1.4 | -1.2 | -1.4 | -2.1 | -1.5 |
| $K_2O$: cwt per acre* | | | | | |
| 0.9 | 87.8 | 84.1 | 88.6 | 91.3 | 87.9 |
| 1.8 | 90.0 | 86.3 | 88.6 | 91.0 | 89.0 |
| Difference | +2.2 | +2.2 | 0.0 | -0.3 | +1.1 |

*Including basal dressing



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Potatoes 2nd test crop. Percentage ware ($1\frac{1}{2}$" riddle)

| | Dung: tons per acre | | $P_2O_5$: cwt per acre* | | $K_2O$: cwt per acre* | |
|---|---|---|---|---|---|---|
| | None | 12 | 0.9 | 1.8 | 0.9 | 1.8 |
| **Highfield** | | | | | | |
| N: cwt per acre | | | | | | |
| 0.5 | 74.2 | 75.3 | 74.3 | 75.3 | 76.7 | 72.9 |
| 1.0 | 71.7 | 74.0 | 74.0 | 71.7 | 71.6 | 74.1 |
| Dung: tons per acre | | | | | | |
| None | | | 73.8 | 72.1 | 73.9 | 72.0 |
| 12 | | | 74.5 | 74.9 | 74.4 | 75.0 |

| Lucerne rotation only | $K_2O$: cwt per acre* 0.9 | 1.8 | Mean |
|---|---|---|---|
| $P_2O_5$: cwt per acre* | | | |
| 0.9 | 76.9 | 78.6 | 77.8 |
| 1.8 | 73.4 | 74.2 | 73.8 |
| Mean | 75.2 | 76.4 | 75.8 |

| | Dung: tons per acre | | $P_2O_5$: cwt per acre* | | $K_2O$: cwt per acre* | |
|---|---|---|---|---|---|---|
| | None | 12 | 0.9 | 1.8 | 0.9 | 1.8 |
| **Fosters** | | | | | | |
| N: cwt per acre | | | | | | |
| 0.5 | 87.4 | 88.6 | 89.5 | 86.5 | 87.6 | 88.4 |
| 1.0 | 86.1 | 86.7 | 86.5 | 86.2 | 85.6 | 87.2 |
| Dung: tons per acre | | | | | | |
| None | | | 87.2 | 86.2 | 85.8 | 87.7 |
| 12 | | | 88.8 | 86.5 | 87.4 | 87.8 |

| Lucerne rotation only | $K_2O$: cwt per acre* 0.9 | 1.8 | Mean |
|---|---|---|---|
| $P_2O_5$: cwt per acre* | | | |
| 0.9 | 86.9 | 90.0 | 88.4 |
| 1.8 | 85.9 | 87.9 | 86.9 |
| Mean | 86.4 | 88.9 | 87.7 |

*Including basal dressing



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Barley 3rd test crop. Grain (at 85% dry matter): cwt per acre

| | Treatment crops 1952-1954 | | | | |
|---|---|---|---|---|---|
| | Lucerne | Ley | Cut Grass | Arable with hay | Mean |
| **Highfield** | | | | | |
| Mean | 45.3 | 44.4 | 46.3 | 45.4 | 45.3 |
| N: cwt per acre | | | | | |
| None | 45.6 | 46.3 | 46.4 | 45.3 | 45.9 |
| 0.2 | 44.9 | 42.5 | 46.1 | 45.6 | 44.8 |
| Difference (±2.18) | -0.7 | -3.8 | -0.3 | +0.3 | -1.1 (±1.09) |
| Dung to potatoes 1956: tons per acre | | | | | |
| None | 47.1 | 43.2 | 47.0 | 44.2 | 45.4 |
| 12 | 43.5 | 45.6 | 45.6 | 46.6 | 45.3 |
| Difference (±2.18) | -3.6 | +2.4 | -1.4 | +2.4 | -0.1 (±1.09) |
| **Fosters** | | | | | |
| Mean | 43.7 | 42.4 | 42.8 | 41.2 | 42.5 |
| N: cwt per acre | | | | | |
| 0.2 | 44.2 | 42.1 | 42.9 | 40.2 | 42.3 |
| 0.4 | 43.3 | 42.8 | 42.8 | 42.3 | 42.8 |
| Difference (±1.05) | -0.9 | +0.7 | -0.1 | +2.1 | +0.5 (±0.52) |
| Dung to potatoes 1956: tons per acre | | | | | |
| None | 42.6 | 42.4 | 41.8 | 40.7 | 41.8 |
| 12 | 44.8 | 42.5 | 43.9 | 41.8 | 43.2 |
| Difference (±1.05) | +2.2 | +0.1 | +2.1 | +1.1 | +1.4 (±0.52) |

| | Highfield | | Fosters | |
|---|---|---|---|---|
| | N: cwt per acre | | N: cwt per acre | |
| | None | 0.2 | 0.2 | 0.4 |
| Dung to potatoes 1956: tons per acre | (±1.09) | | (±0.52) | |
| None | 44.9 | 45.8 | 41.7 | 42.0 |
| 12 | 46.9 | 43.8 | 42.9 | 43.5 |

Mean dry matter % as harvested:
Highfield: 81.4
Fosters: 82.0



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Barley 3rd test crop. Straw (at 85% dry matter): cwt per acre

| | Treatment crops 1952-1954 | | | | |
|---|---|---|---|---|---|
| | Lucerne | Ley | Cut Grass | Arable with hay | Mean |
| **Highfield** | | | | | |
| Mean | 34.9 | 36.3 | 30.7 | 27.3 | 32.3 |
| N: cwt per acre | | | | | |
| None | 32.2 | 34.5 | 30.4 | 26.8 | 31.0 |
| 0.2 | 37.6 | 38.2 | 31.0 | 27.9 | 33.7 |
| Difference | +5.4 | +3.7 | +0.6 | +1.1 | +2.7 |
| Dung to potatoes 1956: tons per acre | | | | | |
| None | 34.0 | 34.3 | 28.0 | 25.7 | 30.5 |
| 12 | 35.8 | 38.3 | 33.5 | 28.9 | 34.1 |
| Difference | +1.8 | +4.0 | +5.5 | +3.2 | +3.6 |
| **Fosters** | | | | | |
| Mean | 23.9 | 24.3 | 22.2 | 20.5 | 22.7 |
| N: cwt per acre | | | | | |
| 0.2 | 24.1 | 23.7 | 22.6 | 19.7 | 22.5 |
| 0.4 | 23.8 | 24.9 | 21.8 | 21.4 | 23.0 |
| Difference | -0.3 | +1.2 | -0.8 | +1.7 | +0.5 |
| Dung to potatoes 1956: tons per acre | | | | | |
| None | 22.7 | 22.7 | 21.4 | 19.7 | 21.6 |
| 12 | 25.2 | 26.0 | 23.0 | 21.4 | 23.9 |
| Difference | +2.5 | +3.3 | +1.6 | +1.7 | +2.3 |

| | Highfield | | Fosters | |
|---|---|---|---|---|
| | N: cwt per acre | | N: cwt per acre | |
| | None | 0.2 | 0.2 | 0.4 |
| Dung to potatoes 1956: tons per acre | | | | |
| None | 28.9 | 32.1 | 21.3 | 21.9 |
| 12 | 33.1 | 35.2 | 23.7 | 24.1 |

Mean dry matter % as harvested:
Highfield: 86.9
Fosters: 83.1



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57/Bc/1.15

Treatment crops Arable and Hay rotation

(values based on mean of 2 sub plots only)

| | Highfield N: cwt per acre applied in 1957 | | | Fosters N: cwt per acre applied in 1957 | | |
|---|---|---|---|---|---|---|
| | Single rate | Double rate | Mean | Single rate | Double rate | Mean |
| **Hay (dry matter): cwt per acre** | | | | | | |
| No dung | 23.8 | 23.8 | 23.8 | 39.3 | 46.8 | 43.0 |
| Dung in 1955 | 23.3 | 27.8 | 25.5 | 42.1 | 48.9 | 45.5 |
| Mean | 23.5 | 25.8 | 24.7 | 40.7 | 47.8 | 44.3 |
| **Potatoes, total tubers: tons per acre** | | | | | | |
| No dung | 9.94 | 10.11 | 10.03 | 11.15 | 11.36 | 11.25 |
| Dung in 1957 | 12.24 | 12.57 | 12.40 | 13.81 | 12.80 | 13.31 |
| Mean | 11.09 | 11.34 | 11.22 | 12.48 | 12.08 | 12.28 |
| **Potatoes, percentage ware (1½" riddle)** | | | | | | |
| No dung | 74.8 | 79.3 | 77.0 | 88.8 | 91.2 | 90.0 |
| Dung in 1957 | 78.2 | 76.1 | 77.1 | 92.6 | 90.6 | 91.6 |
| Mean | 76.5 | 77.7 | 77.1 | 90.7 | 90.9 | 90.8 |
| **Oats** | | | | | | |
| | None | 0.2 | | 0.2 | 0.4 | |
| **Grain (at 85% dry matter): cwt per acre** | | | | | | |
| No dung | 35.6 | 36.4 | 36.0 | 34.5 | 33.1 | 33.8 |
| Dung in 1956 | 34.0 | 36.5 | 35.3 | 34.0 | 36.1 | 35.0 |
| Mean | 34.8 | 36.4 | 35.6 | 34.3 | 34.6 | 34.4 |
| **Straw (at 85% dry matter): cwt per acre** | | | | | | |
| No dung | 21.9 | 24.0 | 22.9 | 15.9 | 14.9 | 15.4 |
| Dung in 1956 | 24.0 | 22.5 | 23.2 | 14.2 | 18.2 | 16.2 |
| Mean | 22.9 | 23.3 | 23.1 | 15.1 | 16.6 | 15.8 |

Highfield, Oats, Mean dry matter % as harvested Grain: 82.8 Straw: 84.2
Fosters, Oats, Mean dry matter % as harvested Grain: 83.0 Straw: 83.3



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57/Bd/1.16

Cut grass. Dry Matter: cwt per acre

| 1st year | Corrective dressing of $K_2O$: cwt per acre 3.0 | Highfield N: to previous 3 test crops Single rate | Highfield N: to previous 3 test crops Double rate | Highfield Dung to potatoes 1955: tons per acre None | Highfield Dung to potatoes 1955: tons per acre 12 | Highfield Mean | Fosters N: to previous 3 test crops Single rate | Fosters N: to previous 3 test crops Double rate | Fosters Dung to potatoes 1955: tons per acre None | Fosters Dung to potatoes 1955: tons per acre 12 | Fosters Mean |
|---|---|---|---|---|---|---|---|---|---|---|---|
| N (1) to cut grass (3 cuts) | | | | | | | | | | | |
| Single rate | | 42.7 | 44.0 | 41.6 | 45.1 | 43.4 | 28.5 | 29.3 | 29.6 | 28.2 | 28.9 |
| Double rate | | 50.5 | 48.8 | 47.1 | 52.2 | 49.6 | 39.7 | 38.6 | 37.3 | 41.0 | 39.1 |
| N to test crops | | | | | | | | | | | |
| Single rate | | | | 43.8 | 49.3 | 46.6 | | | 34.2 | 34.1 | 34.1 |
| Double rate | | | | 44.9 | 48.0 | 46.4 | | | 32.7 | 35.1 | 33.9 |
| Mean | | | | 44.3 | 48.6 | 46.5 | | | 33.4 | 34.6 | 34.0 |

| | Highfield N to cut grass (1) Single rate | Highfield N to cut grass (1) Double rate | Highfield Mean | Fosters N to cut grass (1) Single rate | Fosters N to cut grass (1) Double rate | Fosters Mean |
|---|---|---|---|---|---|---|
| 2nd year (6 cuts) | 63.3 | 85.5 | 74.4 | 49.9 | 62.9 | 56.4 |
| 3rd year (6 cuts) | 43.6 | 66.0 | 54.8 | 39.2 | 53.1 | 46.1 |

(1) 0.15 v. 0.3 cwt N as 'Nitro-Chalk' for every cut.

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Lucerne. Dry matter: cwt per acre

| 1st year (3 cuts) | Corrective dressing of $K_2O$: cwt per acre | Highfield N to 3 previous test crops Single rate | Highfield Double rate | Highfield Mean | Fosters N to 3 previous test crops Single rate | Fosters Double rate | Fosters Mean |
|---|---|---|---|---|---|---|---|
| Dung to potatoes 1955 | | | | | | | |
| None | | 29.8 | 33.7 | 31.7 | 24.1 | 24.1 | 24.1 |
| 12 tons | | 33.5 | 33.5 | 33.5 | 25.3 | 25.3 | 25.3 |
| Mean | | 31.7 | 33.6 | 32.6 | 24.7 | 24.7 | 24.7 |
| 2nd year (4 cuts) | 1.0 | | | 92.6 | | | 92.6 |
| 3rd year (4 cuts) | 1.0 | | | 63.0 | | | 98.4 |

Grazed Ley. Dry matter: cwt per acre (estimated from sample cuts)

| | Highfield N: cwt per acre (yearly) 0.15 | Highfield 0.30 | Highfield Mean | Fosters N: cwt per acre (yearly) 0.15 | Fosters 0.30 | Fosters Mean |
|---|---|---|---|---|---|---|
| 1st year | 27.9 | 32.5 | 30.2 | 17.7 | 18.7 | 18.2 |
| 2nd year | 34.5 | 42.8 | 38.7 | 39.6 | 36.7 | 38.2 |
| 3rd year | 20.1 | 22.5 | 21.3 | 18.3 | 23.9 | 21.1 |



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Reseeded Grass. Dry matter: cwt per acre

| | Corrective dressing of $K_2O$: cwt per acre | Cut for hay N Single rate | Cut for hay N Double rate | Cut for hay Mean | Grazed Estimated from sampling cuts N Single rate | Grazed Estimated from sampling cuts N Double rate | Grazed Estimated from sampling cuts Mean |
|---|---|---|---|---|---|---|---|
| **Highfield** | | | | | | | |
| 7th exptl.year | 1.0 | | | | | | |
| Blocks 10 and 11 | | | | | 39.8* | 42.1* | 40.9* |
| Blocks 9 and 12 | | 39.0 | 41.8 | 40.4 | 18.0* | 21.4* | 19.7* |
| 8th exptl.year | None | | | | | | |
| Blocks 5-8 | | | | | 25.4 | 31.7 | 28.6 |
| 9th exptl.year | None | | | | | | |
| Blocks 1-4 | | | | | 29.4 | 32.6 | 31.0 |
| **Fosters** | | | | | | | |
| 7th exptl.year | 1.0 | | | | | | |
| Blocks 10 and 12 | | | | | 25.6* | 22.8* | 24.2* |
| Blocks 6 and 11 | | 17.5 | 21.1 | 19.3 | 20.4* | 23.1* | 21.7* |
| 8th exptl.year | None | | | | | | |
| Blocks 5,7,8 and 9 | | | | | 21.8 | 21.1 | 21.4 |
| 9th exptl.year | None | | | | | | |
| Blocks 1-4 | | | | | 28.7 | 25.9 | 27.3 |

Permanent Grass. Dry matter: cwt per acre

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Highfield** | | | | | | | |
| 7th exptl.year | 1.0 | | | | | | |
| Blocks 10 and 11 | | | | | 28.5* | 36.4* | 32.4* |
| Blocks 9 and 12 | | 65.5 | 78.8 | 72.2 | 17.9* | 23.1* | 20.5* |
| 8th exptl.year | None | | | | | | |
| Blocks 5-8 | | | | | 23.4 | 29.8 | 26.6 |
| 9th exptl.year | None | | | | | | |
| Blocks 1-4 | | | | | 26.9 | 34.2 | 30.6 |

*Aftermath grazing.



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