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Yields of the Field Experiments 1951

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51/CE/1 Potatoes - Application of Dung - Rothamsted

Rothamsted Research

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51/Ce/1.1

POTATOES

Application of dung - Little Hoos 1951

System of replication: 4 randomized blocks of 12 plots each, plots being split into 2 for the application of N, P, and K; the three 2-factor interactions being confounded with whole plot differences, and certain high order interactions being confounded with block differences.

Area of each sub plot: 0.0175 acre. Area harvested: 0.0140 acre.

Treatments: All combinations of:-

Whole plots Dung: None; 5; 10; 15 tons per acre.
Method of application: W-Ploughed in, in winter;
S-Ploughed in, in spring; R-Placed in the ridges
in spring.

Sub plots Sulphate of ammonia: None; 0.6 cwt N per acre.
Superphosphate: None; 0.6 cwt P_2O_5 per acre.
Muriate of potash: None; 1.0 cwt K_2O per acre.

Basal manuring: None

Cultivations, etc.: Dung applied to 'W' plots; Sept 21. Ploughed all plots: Sept 22. Dung applied to 'S' plots, ploughed all plots: Mar 30. Ridged: May 8. Dung applied to 'R' plots, fertilizers applied in the ridges, potatoes planted: May 11. Earthed up: July 11. Sprayed with copper fungicide 5 lb per acre: Aug. 15 and again Sept 11. Sprayed with 15% sulphuric acid to kill off haulm: Oct 2. Lifted: Oct 10. Variety: Majestic. Previous crop: Wheat.

Standard errors per plot: total clean tubers.

Whole plot: 0.670 tons per acre or 12.0% (32 d.f.)

Sub plot: 0.911 tons per acre or 16.3% (30 d.f.)

Summary of Results

Total Clean Tubers: tons per acre

Dung: tons per acre

| | 0 | 5 | 10 | 15 | Mean |
|--|------|------|------------------|------|-----------------|
| Mean (± 0.193) | 3.78 | 5.51 | 6.20 | 6.81 | 5.58 |
| <u>Method of application</u> | | | (± 0.335) | | (± 0.193) |
| Ploughed in, in winter | | 5.19 | 6.07 | 6.76 | 6.01 |
| Ploughed in, in spring | | 5.03 | 6.19 | 6.41 | 5.88 |
| Placed in ridges in spring | | 6.30 | 6.35 | 7.27 | 6.64 |
| <u>Sulphate of ammonia</u> | | | (± 0.268)* | | |
| None | 3.55 | 4.65 | 5.54 | 6.12 | 4.96 |
| 0.6 cwt per acre N | 4.01 | 6.37 | 6.86 | 7.51 | 6.19 |
| Response to N (± 0.372) | 0.46 | 1.72 | 1.32 | 1.39 | 1.23 (1) |
| <u>Superphosphate</u> | | | (± 0.268)* | | |
| None | 3.19 | 5.12 | 5.81 | 6.46 | 5.14 |
| 0.6 cwt per acre P ₂ O ₅ | 4.37 | 5.90 | 6.60 | 7.17 | 6.01 |
| Response to P (± 0.372) | 1.18 | 0.78 | 0.79 | 0.71 | 0.87 (1) |
| <u>Muriate of Potash</u> | | | (± 0.268)* | | |
| None | 2.72 | 4.93 | 5.82 | 6.61 | 5.02 |
| 1.0 cwt per acre K ₂ O | 4.84 | 6.08 | 6.59 | 7.02 | 6.13 |
| Response to K (± 0.372) | 2.12 | 1.15 | 0.77 | 0.41 | 1.11 (1) |

Standard error (1) 0.186
 *Standard error for use in comparisons other than vertical.

51/0e/1.3

Total Clean Tubers: tons per acre

| | Method of application of dung | | |
|--|-------------------------------|------------------------------|----------------------------------|
| | Ploughed in, in winter | Ploughed in, in spring | Placed in ridges in spring |
| <u>Sulphate of ammonia</u> | | (± 0.268) [*] | |
| None | 5.13 | 5.45 | 5.73 |
| 0.6 cwt per acre N | 6.89 | 6.31 | 7.55 |
| Response to N (± 0.372) | 1.76 | 0.86 | 1.82 |
| <u>Superphosphate</u> | | (± 0.268) [*] | |
| None | 5.54 | 5.40 | 6.45 |
| 0.6 cwt per acre P ₂ O ₅ | 6.48 | 6.36 | 6.83 |
| Response to P (± 0.372) | 0.94 | 0.96 | 0.38 |
| <u>Muriate of potash</u> | | (± 0.268) [*] | |
| None | 5.30 | 5.53 | 6.53 |
| 1.0 cwt per acre K ₂ O | 6.71 | 6.23 | 6.75 |
| Response to K (± 0.372) | 1.41 | 0.70 | 0.22 |

^{*}Standard error for use in comparisons other than vertical

Responses to treatments (± 0.268)^{***}

| Response to: | Sulphate of ammonia | | Superphosphate | | Muriate of potash | |
|---------------------|---------------------|-------|----------------|-------|-------------------|-------|
| | Abs. | Pres. | Abs. | Pres. | Abs. | Pres. |
| Sulphate of ammonia | - | - | 0.71 | 1.75 | 0.53 | 1.93 |
| Superphosphate | 0.34 | 1.38 | - | - | 0.86 | 0.86 |
| Muriate of potash | 0.41 | 1.81 | 1.11 | 1.11 | - | - |

^{***}Standard error of horizontal difference between two responses
0.387

51/Cc/1.4

Percentage Ware
($1\frac{1}{2}$ " riddle)

Dung: tons per acre

| | 0 | 5 | 10 | 15 | Mean |
|------------------------------|------|------|------|------|------|
| Mean | 80.3 | 86.6 | 88.2 | 89.6 | 86.2 |
| <u>Method of application</u> | | | | | |
| Ploughed in, in winter | | 87.0 | 87.6 | 89.6 | 88.1 |
| Ploughed in, in spring | | 85.3 | 88.8 | 90.5 | 88.2 |
| Placed in ridges in spring | | 87.4 | 88.1 | 88.8 | 88.1 |
| <u>Sulphate of ammonia</u> | | | | | |
| None | 81.8 | 85.6 | 87.1 | 89.6 | 86.0 |
| 0.6 cwt per acre N | 78.9 | 87.6 | 89.3 | 89.6 | 86.4 |
| Response to N | -2.9 | 2.0 | 2.2 | 0.0 | 0.4 |
| <u>Superphosphate</u> | | | | | |
| None | 79.6 | 86.6 | 88.3 | 90.3 | 86.2 |
| 0.6 cwt per acre P_2O_5 | 81.1 | 86.6 | 88.1 | 88.9 | 86.2 |
| Response to P | 1.5 | 0.0 | -0.2 | -1.4 | 0.0 |
| <u>Muriate of potash</u> | | | | | |
| None | 73.2 | 84.7 | 87.4 | 90.3 | 83.9 |
| 1.0 cwt per acre K_2O | 87.5 | 88.5 | 89.0 | 88.9 | 88.5 |
| Response to K | 14.3 | 3.8 | 1.6 | -1.4 | 4.6 |

51/Cc/1.5

| | Percentage Ware ($1\frac{1}{2}$ " riddle) | | |
|-------------------------------|---|---------------------------|----------------------------------|
| | Method of application of dung | | |
| | Floughed in, in winter | Floughed in, in spring | Placed in ridges in spring |
| <u>Sulphate of ammonia</u> | | | |
| None | 86.5 | 87.6 | 88.2 |
| 0.6 cwt per acre N | 89.7 | 88.8 | 88.0 |
| Response to N | 3.2 | 1.2 | -0.2 |
| <u>Superphosphate</u> | | | |
| None | 87.9 | 88.6 | 88.7 |
| 0.6 cwt per acre $P_{2}O_{5}$ | 88.3 | 87.8 | 87.6 |
| Response to P | 0.4 | -0.8 | -1.1 |
| <u>Muriate of potash</u> | | | |
| None | 86.0 | 87.5 | 88.9 |
| 1.0 cwt per acre $K_{2}O$ | 90.1 | 88.9 | 87.3 |
| Response to K | 4.1 | 1.4 | -1.6 |

Responses to treatments:

| Response to: | Sulphate of ammonia | | Superphosphate | | Muriate of potash | |
|---------------------|---------------------|-------|----------------|-------|-------------------|-------|
| | Abs. | Pres. | Abs. | Pres. | Abs. | Pres. |
| Sulphate of ammonia | - | - | 1.2 | -0.4 | -0.6 | 1.4 |
| Superphosphate | 0.8 | -0.8 | - | - | -0.2 | 0.2 |
| Muriate of potash | 3.5 | 5.5 | 4.3 | 4.7 | - | - |