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# Yields of the Field Experiments 1986

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## 86/R/CS/318 Nitrophosphates - Potatoes

### Rothamsted Research

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86/R/CS/318

NITROPHOSPHATES

Object: To study the effect of different amounts of water-soluble phosphate in nitrophosphate fertilizers on the growth and P uptake of potatoes following spring barley - Highfield V.

Sponsor: K.H.G. Copestake.

The second year, potatoes.

For previous year see 85/R/B/8.

Design: 3 randomised blocks of 13 plots.

Whole plot dimensions: 3.0 x 21.0.

Treatments: All combinations of:-

- |          |   |
|----------|---|
| 1. P SOL | Phosphate water solubility (%):   |
| 59       | Compound fertilizer (16.4 : 14.2 : 17.5) with 59% of the P205 water soluble |
| 73       | Compound fertilizer (15.9 : 16.2 : 15.3) with 73% of the P205 water soluble |
| 95       | Compound fertilizer (15.0 : 15.0 : 15.0) with 95% of the P205 water soluble |

- |           |   |
|-----------|---|
| 2. P RATE | Rate of phosphate (kg P205) in 1985 and 1986: |
|-----------|---|

- |         |  |
|---------|--|
| (20)100 | 20 to s. barley in 1985, 100 to potatoes in 1986 |
| (40)150 | 40 to s. barley in 1985, 150 to potatoes in 1986 |
| (60)200 | 60 to s. barley in 1985, 200 to potatoes in 1986 |

plus four extra treatments given rates of compound fertilizer, (3.7 : 37.6 : 0) with 94% of the P205 water soluble, in 1986 only:

EXTRA(94)

- |        |             |
|--------|-------------|
| (0)0   | None        |
| (0)100 | 100 kg P205 |
| (0)150 | 150 kg P205 |
| (0)200 | 200 kg P205 |

NOTE: The compound fertilizers used to apply the phosphate treatments supplied differing amounts of the total 231 kg N and 246.5 kg K20 required on all plots. Additional amounts of N (as 'Nitrotop' 33.5% N) and K20 (as muriate of potash, 60% K20) were applied as needed to achieve this total. Similar balancing was done in the previous year, see 85/R/B/8.

Basal applications: Manures: Kieserite at 500 kg. Weedkiller: Linuron at 1.3 kg in 500 l. Fungicides: Mancozeb at 1.4 kg in 200 l on four occasions, applied with the insecticide on the third and fourth. Fentin hydroxide at 0.28 kg in 200 l on two occasions, applied with the insecticide on the first. Insecticide: Pirimicarb at 0.14 kg on three occasions. Desiccant: Diquat at 0.60 kg ion in 200 l.

Seed: Pentland Crown.

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Cultivations, etc.:- Ploughed: 18 Nov, 1985. Spring-tine cultivated: 30 Apr, 1986. Fertilizer treatments applied: 13 May. Mg applied, rotary harrowed, potatoes planted: 14 May. Rotary ridged: 20 May. Weedkiller applied: 30 May. Mancozeb applied: 30 June, 14 July. Mancozeb with pirimicarb applied: 28 July, 12 Aug. Fentin hydroxide with pirimicarb applied: 29 Aug. Fentin hydroxide applied: 11 Sept. Haulm mechanically destroyed: 19 Sept. Desiccant applied: 27 Sept. Lifted: 14 Oct.

NOTE: Emergence and stem counts were made and a mid-season sample was taken for fresh and dry weight. Components of yield were measured. P contents of crop and soil were determined after harvest.

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TOTAL TUBERS TONNES/HECTARE

\*\*\*\*\* TABLES OF MEANS \*\*\*\*\*

| P RATE     | (20)100      | (40)150        | (60)200        | MEAN           |              |
|------------|--------------|----------------|----------------|----------------|--------------|
| P SOL      |              |                |                |                |              |
| 59         | 42.2         | 43.5           | 43.7           | 43.1           |              |
| 73         | 40.6         | 44.3           | 42.8           | 42.6           |              |
| 95         | 43.6         | 43.0           | 46.8           | 44.5           |              |
| MEAN       | 42.1         | 43.6           | 44.4           | 43.4           |              |
| EXTRA(94)  | (0)0<br>38.3 | (0)100<br>40.9 | (0)150<br>42.3 | (0)200<br>45.1 | MEAN<br>41.7 |
| GRAND MEAN | 42.9         |                |                |                |              |

\*\*\*\*\* STANDARD ERRORS OF DIFFERENCES OF MEANS \*\*\*\*\*

| TABLE | P SOL | P RATE | P SOL<br>P RATE | EXTRA(94) |
|-------|-------|--------|-----------------|-----------|
| ----- |       |        |                 |           |
| SED   | 0.98  | 0.98   | 1.97            | 1.97      |

\*\*\*\*\* STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION \*\*\*\*\*

| STRATUM  | DF | SE   | CV% |
|----------|----|------|-----|
| BLOCK.WP | 24 | 2.41 | 5.6 |

PERCENTAGE WARE 3.81 CM (1.5 INCH) RIDDLE

\*\*\*\*\* TABLES OF MEANS \*\*\*\*\*

| P RATE              | (20)100      | (40)150        | (60)200        | MEAN           |              |
|---------------------|--------------|----------------|----------------|----------------|--------------|
| P SOL               |              |                |                |                |              |
| 59                  | 98.6         | 98.6           | 98.4           | 98.5           |              |
| 73                  | 98.9         | 97.9           | 98.6           | 98.4           |              |
| 95                  | 98.1         | 98.4           | 98.4           | 98.3           |              |
| MEAN                | 98.5         | 98.3           | 98.5           | 98.4           |              |
| EXTRA(94)           | (0)0<br>98.6 | (0)100<br>98.2 | (0)150<br>98.2 | (0)200<br>98.0 | MEAN<br>98.3 |
| GRAND MEAN          | 98.4         |                |                |                |              |
| PLOT AREA HARVESTED | 0.00165      |                |                |                |              |