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86/R/CS/318 Nitrophosphates - Potatoes

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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 P2O5 water soluble |
| 73 | Compound fertilizer (15.9 : 16.2 : 15.3) with 73% of the P2O5 water soluble |
| 95 | Compound fertilizer (15.0 : 15.0 : 15.0) with 95% of the P2O5 water soluble |

- | | |
|-----------|---|
| 2. P RATE | Rate of phosphate (kg P2O5) 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 P2O5 water soluble, in 1986 only:

EXTRA(94)

- | | |
|--------|-------------|
| (0)0 | None |
| (0)100 | 100 kg P2O5 |
| (0)150 | 150 kg P2O5 |
| (0)200 | 200 kg P2O5 |

NOTE: The compound fertilizers used to apply the phosphate treatments supplied differing amounts of the total 231 kg N and 246.5 kg K2O required on all plots. Additional amounts of N (as 'Nitrotop' 33.5% N) and K2O (as muriate of potash, 60% K2O) 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 P SOL	(20)100	(40)150	(60)200	MEAN	
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 38.3	(0)100 40.9	(0)150 42.3	(0)200 45.1	MEAN 41.7

GRAND MEAN 42.9

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

TABLE	P SOL	P RATE	P SOL 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 P SOL	(20)100	(40)150	(60)200	MEAN	
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 98.6	(0)100 98.2	(0)150 98.2	(0)200 98.0	MEAN 98.3

GRAND MEAN 98.4

PLOT AREA HARVESTED 0.00165