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# Yields of the Field Experiments 1986

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## 86/R/P/3 Maintenance of Seed Health - Potatoes

### Rothamsted Research

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86/R/P/3

POTATOES

MAINTENANCE OF SEED HEALTH

Object: To study the effects of three amounts of pest and disease control on two potato varieties grown for seed - Appletree.

Sponsors: R.W. Gibson, R. Harrington, G.A. Hide.

Design: 2 randomised blocks of 4 plots split into 6.

Whole plot dimensions: 108.0 x 7.62.

Treatments: All combinations of:-

Whole plots

1. VARIETY Varieties:

EDWARD PIPER	King Edward Maris Piper
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2. SEEDSRCE Seed source:

ROTH OG SCOTS FS	Rothamsted once-grown from Scots F.S. in 1985 Scots F.S.
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Sub plots

3. PATHCONT Pest and pathogen control (in addition to basals) cumulative to 1985 for Rothamsted seed:

STANDARD	None
ENHANCED	Seed treatment with tolclofos methyl at 0.24 kg and imazalil at 0.010 kg per tonne of tubers, applied by hydraulic and uncharged electrostatic sprayers respectively. Cypermethrin at 0.04 kg with 7.0 l oil in 500 l applied by hydraulic sprayer on 13 June, 1986 and 19 June. Plants with 'virus' symptoms were removed on 7 June and 28 June

FULL	As for ENHANCED plus:- The imazalil was applied by charged electrostatic sprayer. Cypermethrin at 0.04 kg with oil at 7.0 l in 500 l was also applied on 3 July, 18 July, 1 Aug, 19 Aug and (to HAULM D LATER plots only) 4 Sept
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4. HAULM D Dates of destroying haulm and of lifting:

EARLY	Haulm desiccant applied 29 Aug, 1986. Haulm mechanically destroyed 16 Sept and potatoes lifted 23 Sept
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LATER	Haulm mechanically destroyed 25 Sept. Haulm desiccant applied 27 Sept and potatoes lifted 13 Oct
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NOTE: Winter oats were sown in autumn 1985 but ploughed up on 19 December to provide a site for this experiment.

Basal applications: Manures: (0:18:36) at 690 kg. (10:10:15+4.5 Mg) at 1960 kg. Weedkillers: Methabenzthiazuron at 2.4 kg in 200 l. Linuron at 1.3 kg with paraquat at 0.50 kg ion in 500 l. Fungicides: Mancozeb at 1.4 kg in 200 l on four occasions applied with the pirimicarb. Fentin hydroxide at 0.28 kg in 200 l on two occasions, applied with the pirimicarb on the first (to HAULM D LATER plots on both occasions). Insecticides: Phorate at 1.7 kg. Pirimicarb at 0.14 kg on five occasions. Haulm desiccant: Diquat at 0.80 kg ion in 500 l to HAULM D EARLY and at 0.60 kg ion in 200 l to HAULM D LATER.

Cultivations, etc.: - Ploughed: 2 Oct, 1985. Rotary harrowed: 4 Oct. Oats sown: 5 Oct. Methabenzthiazuron applied: 11 Oct. PK applied: 17 Dec. Ploughed: 19 Dec. NPK Mg applied: 5 May, 1986. Rotary harrowed: 7 May. Potatoes planted by hand, phorate applied: 9 May. Linuron with paraquat applied: 28 May. Mancozeb with pirimicarb applied: 30 June, 14 July, 28 July, 12 Aug. Fentin hydroxide applied to HAULM D LATER plots only, with pirimicarb: 29 Aug, without: 11 Sept. Previous crops : W. wheat 1984, w. beans 1985.

NOTE: Aphid counts were made and virus infection assessed, throughout the season. Plants were sampled in August for stem infections and tuber samples were taken at harvest for observations on storage diseases.

TOTAL TUBERS TONNES/HECTARE

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

SEEDSRCE VARIETY	ROTH OG	SCOTS FS	MEAN	
EDWARD	44.8	44.7	44.8	
PIPER	51.0	50.4	50.7	
MEAN	47.9	47.5	47.7	
PATHCONT VARIETY	STANDARD	ENHANCED	FULL	MEAN
EDWARD	45.6	43.5	45.2	44.8
PIPER	51.3	51.4	49.2	50.7
MEAN	48.4	47.5	47.2	47.7
PATHCONT SEEDSRCE	STANDARD	ENHANCED	FULL	MEAN
ROTH OG	48.4	47.3	47.9	47.9
SCOTS FS	48.5	47.6	46.5	47.5
MEAN	48.4	47.5	47.2	47.7

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TOTAL TUBERS TONNES/HECTARE

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

HAULM D VARIETY	EARLY	LATER	MEAN				
EDWARD	37.0	52.5	44.8				
PIPER	43.0	58.4	50.7				
MEAN	40.0	55.4	47.7				
HAULM D SEEDSRCE	EARLY	LATER	MEAN				
ROTH OG	40.3	55.5	47.9				
SCOTS FS	39.7	55.3	47.5				
MEAN	40.0	55.4	47.7				
HAULM D PATHCONT	EARLY	LATER	MEAN				
STANDARD	39.6	57.3	48.4				
ENHANCED	39.6	55.3	47.5				
FULL	40.8	53.6	47.2				
MEAN	40.0	55.4	47.7				
SEEDSRCE PATHCONT VARIETY	ROTH OG STANDARD	ENHANCED	SCOTS FS FULL	STANDARD	ENHANCED	FULL	
EDWARD	45.2	43.0	46.2	45.9	44.1	44.2	
PIPER	51.6	51.7	49.7	51.1	51.2	48.8	
SEEDSRCE HAULM D VARIETY	ROTH OG EARLY	LATER	SCOTS FS EARLY	LATER			
EDWARD	37.3	52.3	36.8	52.6			
PIPER	43.2	58.7	42.7	58.0			
PATHCONT HAULM D VARIETY	STANDARD EARLY	LATER	ENHANCED EARLY	LATER	FULL EARLY	LATER	
EDWARD	36.6	54.5	36.1	50.9	38.4	52.0	
PIPER	42.6	60.1	43.1	59.8	43.2	55.3	
PATHCONT HAULM D SEEDSRCE	STANDARD EARLY	LATER	ENHANCED EARLY	LATER	FULL EARLY	LATER	
ROTH OG	39.5	57.3	39.7	54.9	41.6	54.3	
SCOTS FS	39.7	57.3	39.5	55.8	40.0	53.0	
VARIETY SEEDSRCE	PATHCONT HAULM D EARLY	LATER	ENHANCED EARLY	LATER	FULL EARLY	LATER	
EDWARD	ROTH OG	36.3	54.2	35.8	50.2	39.8	52.6
PIPER	SCOTS FS	37.0	54.8	36.5	51.6	37.0	51.4
	ROTH OG	42.7	60.4	43.7	59.7	43.3	56.0
	SCOTS FS	42.5	59.8	42.5	59.9	43.1	54.5

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TOTAL TUBERS TONNES/HECTARE

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

TABLE	PATHCONT	HAULM D	VARIETY* PATHCONT	SEEDSRCE* PATHCONT
SED	0.81	0.66	1.14	1.14
TABLE	VARIETY* HAULM D	SEEDSRCE* HAULM D	PATHCONT HAULM D	VARIETY* SEEDSRCE PATHCONT
SED	0.93	0.93	1.14	1.61
TABLE	VARIETY SEEDSRCE HAULM D	VARIETY* PATHCONT HAULM D	SEEDSRCE* PATHCONT HAULM D	VARIETY* SEEDSRCE PATHCONT HAULM D
SED	1.32	1.61	1.61	2.28

\* WITHIN THE SAME LEVEL OF VARIETY, SEEDSRCE ONLY

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

STRATUM	DF	SE	CV%
BLOCK.WP.SP	20	2.28	4.8

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PERCENTAGE WARE 4.44CM (1.75 INCH) RIDDLE

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

SEEDSRCE	ROTH OG	SCOTS FS	MEAN	
VARIETY				
EDWARD	73.7	76.1	74.9	
PIPER	77.9	74.6	76.3	
MEAN	75.8	75.3	75.6	
PATHCONT	STANDARD	ENHANCED	FULL	MEAN
VARIETY				
EDWARD	73.0	74.7	76.9	74.9
PIPER	72.7	76.8	79.2	76.3
MEAN	72.9	75.8	78.1	75.6
PATHCONT	STANDARD	ENHANCED	FULL	MEAN
SEEDSRCE				
ROTH OG	72.4	76.9	78.1	75.8
SCOTS FS	73.3	74.6	78.1	75.3
MEAN	72.9	75.8	78.1	75.6
HAULM D	EARLY	LATER	MEAN	
VARIETY				
EDWARD	67.3	82.4	74.9	
PIPER	69.2	83.3	76.3	
MEAN	68.3	82.9	75.6	
HAULM D	EARLY	LATER	MEAN	
SEEDSRCE				
ROTH OG	69.0	82.6	75.8	
SCOTS FS	67.5	83.2	75.3	
MEAN	68.3	82.9	75.6	
HAULM D	EARLY	LATER	MEAN	
PATHCONT				
STANDARD	65.3	80.4	72.9	
ENHANCED	68.1	83.4	75.8	
FULL	71.4	84.8	78.1	
MEAN	68.3	82.9	75.6	
SEEDSRCE	ROTH OG	SCOTS FS		
PATHCONT	STANDARD	ENHANCED	FULL	STANDARD
VARIETY			ENHANCED	FULL
EDWARD	71.1	74.8	75.1	74.9
PIPER	73.8	78.9	81.1	74.5
			71.7	74.7
				78.8
				77.3

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PERCENTAGE WARE 4.44CM (1.75 INCH) RIDDLE

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

SEEDSRCE	ROTH OG	LATER	SCOTS FS	LATER
HAULM D	EARLY	LATER	EARLY	LATER
VARIETY				
EDWARD	65.4	81.9	69.2	82.9
PIPER	72.6	83.3	65.8	83.4

PATHCONT	STANDARD	LATER	ENHANCED	LATER	FULL	LATER
HAULM D	EARLY	LATER	EARLY	LATER	EARLY	LATER
VARIETY						
EDWARD	65.1	80.9	66.5	82.8	70.4	83.5
PIPER	65.5	79.9	69.6	84.0	72.4	86.1

PATHCONT	STANDARD	LATER	ENHANCED	LATER	FULL	LATER
HAULM D	EARLY	LATER	EARLY	LATER	EARLY	LATER
SEEDSRCE						
ROTH OG	65.3	79.6	69.4	84.3	72.4	83.8
SCOTS FS	65.4	81.3	66.7	82.5	70.5	85.7

VARIETY	SEEDSRCE	STANDARD	LATER	ENHANCED	LATER	FULL	LATER
		EARLY	LATER	EARLY	LATER	EARLY	LATER
EDWARD	ROTH OG	62.4	79.8	66.1	83.6	67.9	82.2
	SCOTS FS	67.8	82.0	67.0	82.1	72.9	84.7
PIPER	ROTH OG	68.2	79.4	72.8	85.1	76.8	85.5
	SCOTS FS	62.9	80.5	66.4	83.0	68.0	86.6

SUB PLOT AREA HARVESTED 0.00457