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86/R/P/2 Seed Health Progeny - Potatoes

Rothamsted Research

Rothamsted Research (1987) *86/R/P/2 Seed Health Progeny - Potatoes* ; Yields Of The Field Experiments 1986, pp 301 - 307 - DOI: <https://doi.org/10.23637/ERADOC-1-36>

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POTATOES

SEED HEALTH PROGENY

Object: To compare the health and yield of two varieties of potatoes grown once or twice for seed at Rothamsted under three sets of treatments with the same varieties grown to AA standard in Scotland in 1985 - Delafield.

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

Design: 4 randomised blocks of 26 plots.

Whole plot dimensions: 1.5 x 19.0.

Treatments: All combinations of:-

1. VARIETY Varieties:

 EDWARD King Edward
 PIPER Maris Piper
2. ROTHGROW Frequency of cropping at Rothamsted:

 ONCE In 1985 only from Scottish FS seed
 TWICE In 1984 and 1985, from Scottish FS seed in 1984
3. PATHCONT(85) Pest and pathogen control in 1984, to ROTHGROW TWICE only, and in 1985 to ROTHGROW ONCE and TWICE (in addition to basals):

 ENHANCED 1984 and 1985: 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 31 May, 1984, and on 14 June, 1985. Plants with 'virus' symptoms were removed on 11 June, 20 June and 5 July in 1984 and on 4 June and 25 June in 1985.

 FULL 1984: As for ENHANCED 1984, plus:-
 The imazalil was applied by charged electrostatic sprayer. Plants with 'blackleg' symptoms were removed on 11 June, 20 June and 5 July. Permethrin at 0.10 kg with oil at 7.0 l, in 200 l for the first and last occasions and 500 l for the remainder, was applied on 15 June, 29 June, 16 July, 27 July and (to HAULM D LATER plots only) 13 Aug.

 1985: As for ENHANCED 1985, 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 28 June, 11 July, 26 July and (to HAULM D LATER plots only) 14 Aug.

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4. HAULM D(85) Dates of destroying haulm and of lifting in 1984 to ROTHGROW TWICE only and in 1985 to ROTHGROW ONCE and TWICE:

EARLY	1984: Haulm mechanically destroyed, 3 Aug. Haulm desiccant applied 6 Aug and potatoes lifted 6 Sept. 1985: Haulm mechanically destroyed, 12 Aug. Haulm desiccant applied 14 Aug and potatoes lifted 18 Sept.
LATER	1984: Haulm mechanically destroyed 8 Sept. Haulm desiccant applied 22 Sept and potatoes lifted 11 Oct. 1985: Haulm mechanically destroyed 4 Sept. Haulm desiccant applied 5 Sept and potatoes lifted 11 Oct.

plus eight extra treatments:

EXTRA

KE 1 0 E	King Edward, grown once at Rothamsted from Scottish FS seed, no pest and pathogen control in 1984 other than basals, haulm destruction and lifting dates as EARLY above
KE 2 0 E	As above, grown twice at Rothamsted
KE 1 0 L	As above, grown once at Rothamsted, haulm destruction and lifting dates as LATER above
KE 2 0 L	Symbols as above
MP 1 0 E	Maris Piper, symbols as above
MP 1 0 L	Symbols as above
KE SAA	King Edward Scottish AA seed bought in 1986 (duplicated)
MP SAA	Maris Piper Scottish AA seed bought in 1986 (duplicated)

NOTES: (1) Basal pest and pathogen control in 1984 (to ROTHGROW TWICE only) was phorate at 1.7 kg with the seed, fentin hydroxide at 0.28 kg in 200 l on six occasions (on the fifth and sixth to HAULM D LATER only) applied with pirimicarb at 0.14 kg on all but the fifth occasion
(2) Basal pest and pathogen control in 1985 (other than to Scottish AA varieties for which it is not known) was phorate at 1.7 kg with the seed, mancozeb at 1.4 kg in 200 l on five occasions, (on the fifth to HAULM D LATER only) applied with pirimicarb at 0.14 kg on all but the first occasion.

Basal applications: Manures: FYM at 35 t. (10:10:15+4.5 Mg) at 1960 kg.
Weedkillers: 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 insecticide on the third and fourth occasion. Fentin hydroxide at 0.28 kg in 200 l on two occasions, applied with the insecticide on the first occasion. Insecticide: Pirimicarb at 0.14 kg on three occasions. Haulm desiccant: Diquat at 0.60 kg ion in 200 l.

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Cultivations, etc.:- FYM applied: 27 Nov, 1985. Ploughed: 29 Nov. NPK Mg applied: 5 May, 1986. Rotary harrowed: 6 May. Potatoes planted by hand: 7 May. Weedkillers applied: 28 May. Mancozeb applied: 30 June, 14 July. Mancozeb with insecticide applied: 28 July, 12 Aug. Fentin hydroxide with insecticide applied: 29 Aug. Fentin hydroxide applied: 11 Sept. Haulm mechanically destroyed: 22 Sept. Haulm desiccant applied: 27 Sept. Lifted: 3 Oct. Previous crops: S. barley and s. oats 1984, w. wheat 1985.

NOTE: Viruses were assessed throughout the season. Tuber samples were taken at harvest to observe storage diseases.

TOTAL TUBERS TONNES/HECTARE

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

ROTHGROW	ONCE	TWICE	MEAN
VARIETY			
EDWARD	60.1	59.7	59.9
PIPER	65.0	63.4	64.2
MEAN	62.5	61.5	62.0
PATHCONT(85)	ENHANCED	FULL	MEAN
VARIETY			
EDWARD	59.9	59.9	59.9
PIPER	63.9	64.5	64.2
MEAN	61.9	62.2	62.0
PATHCONT(85)	ENHANCED	FULL	MEAN
ROTHGROW			
ONCE	62.6	62.5	62.5
TWICE	61.2	61.9	61.5
MEAN	61.9	62.2	62.0
HAULM D(85)	EARLY	LATER	MEAN
VARIETY			
EDWARD	60.0	59.8	59.9
PIPER	64.3	64.1	64.2
MEAN	62.1	62.0	62.0
HAULM D(85)	EARLY	LATER	MEAN
ROTHGROW			
ONCE	62.1	63.0	62.5
TWICE	62.1	61.0	61.5
MEAN	62.1	62.0	62.0
HAULM D(85)	EARLY	LATER	MEAN
PATHCONT(85)			
ENHANCED	61.9	61.9	61.9
FULL	62.4	62.0	62.2
MEAN	62.1	62.0	62.0

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TOTAL TUBERS TONNES/HECTARE

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

ROTHGROW	ONCE		TWICE		
PATHCONT(85)	ENHANCED	FULL	ENHANCED	FULL	
VARIETY					
EDWARD	60.1	60.2	59.8	59.5	
PIPER	65.1	64.8	62.6	64.3	
ROTHGROW	ONCE		TWICE		
HAULM D(85)	EARLY	LATER	EARLY	LATER	
VARIETY					
EDWARD	60.0	60.3	59.9	59.4	
PIPER	64.2	65.7	64.4	62.5	
PATHCONT(85)	ENHANCED		FULL		
HAULM D(85)	EARLY	LATER	EARLY	LATER	
VARIETY					
EDWARD	59.7	60.1	60.2	59.6	
PIPER	64.0	63.7	64.5	64.5	
PATHCONT(85)	ENHANCED		FULL		
HAULM D(85)	EARLY	LATER	EARLY	LATER	
ROTHGROW					
ONCE	62.1	63.1	62.1	62.9	
TWICE	61.6	60.7	62.6	61.2	
PATHCONT(85)	ENHANCED		FULL		
HAULM D(85)	EARLY	LATER	EARLY	LATER	
VARIETY					
EDWARD	ONCE	60.0	60.1	60.0	60.5
	TWICE	59.4	60.2	60.4	58.7
PIPER	ONCE	64.2	66.0	64.2	65.4
	TWICE	63.9	61.3	64.9	63.7
EXTRA					
KE 1 0 E	60.4				
KE 2 0 E	54.2				
KE 1 0 L	59.0				
KE 2 0 L	55.7				
MP 1 0 E	64.3				
MP 1 0 L	65.7				
KE SAA	57.4				
MP SAA	58.6				
MEAN	59.1				
GRAND MEAN	60.9				

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TOTAL TUBERS TONNES/HECTARE

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

TABLE	EXTRA	VARIETY	ROTHGROW	PATHCONT(85)
SED	1.73	0.61	0.61	0.61
TABLE	HAULM D(85)	VARIETY ROTHGROW	VARIETY PATHCONT(85)	ROTHGROW PATHCONT(85)
SED	0.61	0.86	0.86	0.86
TABLE	VARIETY HAULM D(85)	ROTHGROW HAULM D(85)	PATHCONT(85) HAULM D(85)	VARIETY ROTHGROW PATHCONT(85)
SED	0.86	0.86	0.86	1.22
TABLE	VARIETY ROTHGROW HAULM D(85)	VARIETY PATHCONT(85) HAULM D(85)	ROTHGROW PATHCONT(85) HAULM D(85)	VARIETY ROTHGROW PATHCONT(85) HAULM D(85)
SED	1.22	1.22	1.22	1.73

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

STRATUM	DF	SE	CV%
BLOCK.WP	77	2.44	4.0

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PERCENTAGE WARE 4.44CM (1.75 INCH) RIDDLE

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

ROTHGROW	ONCE	TWICE	MEAN	
VARIETY				
EDWARD	80.2	81.8	81.0	
PIPER	79.5	79.8	79.6	
MEAN	79.8	80.8	80.3	
PATHCONT(85)	ENHANCED	FULL	MEAN	
VARIETY				
EDWARD	80.2	81.8	81.0	
PIPER	79.5	79.7	79.6	
MEAN	79.9	80.8	80.3	
PATHCONT(85)	ENHANCED	FULL	MEAN	
ROTHGROW				
ONCE	79.4	80.3	79.8	
TWICE	80.4	81.2	80.8	
MEAN	79.9	80.8	80.3	
HAULM D(85)	EARLY	LATER	MEAN	
VARIETY				
EDWARD	81.0	81.0	81.0	
PIPER	81.0	78.2	79.6	
MEAN	81.0	79.6	80.3	
HAULM D(85)	EARLY	LATER	MEAN	
ROTHGROW				
ONCE	80.4	79.3	79.8	
TWICE	81.6	79.9	80.8	
MEAN	81.0	79.6	80.3	
HAULM D(85)	EARLY	LATER	MEAN	
PATHCONT(85)				
ENHANCED	80.5	79.2	79.9	
FULL	81.5	80.0	80.8	
MEAN	81.0	79.6	80.3	
ROTHGROW	ONCE	TWICE		
PATHCONT(85)	ENHANCED	FULL	ENHANCED	FULL
VARIETY				
EDWARD	79.2	81.2	81.2	82.4
PIPER	79.5	79.4	79.6	80.0
ROTHGROW	ONCE	TWICE		
HAULM D(85)	EARLY	LATER	EARLY	LATER
VARIETY				
EDWARD	80.0	80.4	82.0	81.6
PIPER	80.8	78.1	81.3	78.3

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PERCENTAGE WARE 4.44CM (1.75 INCH) RIDDLE

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

PATHCONT(85) HAULM D(85) VARIETY	ENHANCED EARLY	LATER	FULL EARLY	LATER
EDWARD	80.2	80.1	81.7	81.9
PIPER	80.8	78.3	81.3	78.1

PATHCONT(85) HAULM D(85) ROTHGROW	ENHANCED EARLY	LATER	FULL EARLY	LATER
ONCE	80.4	78.3	80.4	80.3
TWICE	80.6	80.2	82.7	79.7

PATHCONT(85) HAULM D(85) VARIETY	ROTHGROW	ENHANCED EARLY	LATER	FULL EARLY	LATER
EDWARD	ONCE	79.5	78.9	80.5	81.9
	TWICE	81.0	81.4	83.0	81.9
PIPER	ONCE	81.3	77.6	80.3	78.6
	TWICE	80.2	78.9	82.4	77.6

EXTRA	
KE 1 0 E	84.7
KE 2 0 E	80.8
KE 1 0 L	83.4
KE 2 0 L	79.8
MP 1 0 E	80.2
MP 1 0 L	80.6
KE SAA	82.2
MP SAA	80.1

MEAN 81.4

GRAND MEAN 80.7

PLOT AREA HARVESTED 0.00286