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# Yields of the Field Experiments 1987



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## 87/R/P/2 Seed Health Progeny - Potatoes

## **Rothamsted Research**

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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 1986 - Bones Close.

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

Design: 4 randomised blocks of 28 plots.

Whole plot dimensions: 1.5 x 19.0.

Treatments: All combinations of:-

VARIETY

Varieties:

**EDWARD** PIPER

King Edward Maris Piper

2. ROTHGROW

Frequency of cropping at Rothamsted:

ONCE

In 1986 only from Scottish FS seed

TWICE

In 1985 and 1986, from Scottish FS seed in 1985

PATHCONT[86]

Pest and pathogen control in 1985, to ROTHGROW TWICE only, and in 1986 to ROTHGROW ONCE and TWICE (in addition to basals):

STANDARD

1985 and 1986: Plants with virus symptoms were removed in June.

ENHANCED

1985 and 1986: Seed treatment with tolclofos methyl at 0.24 kg and imazalil at 0.01 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 14 June, 1985, and on 13 and 19 June, 1986. Plants with virus symptoms were removed in June 1985 and 1986.

FULL

1985: As for ENHANCED 1985, plus:-The imazalil was applied by charged electrostatic sprayer. Cypermethrin at 0.04 kg with 7.0 l oil in 500 l was also applied on 28 June, 11 July, 26 July and (to HAULM D LATER plots only) 14 Aug.

1986: As for ENHANCED 1986, plus:-The imazalil was applied by charged electrostatic sprayer. Cypermethrin at 0.04 kg with oil at 7.0 1 in 500 1 was also applied on 3 July,

18 July, 1 Aug, 19 Aug and (to HAULM D LATER plots only) 4 Sept.

4. HAULM D[86] Dates of destroying haulm and of lifting in 1985 to ROTHGROW TWICE only and in 1986 to ROTHGROW ONCE and TWICE:

EARLY 1985: Haulm mechanically destroyed, 12 Aug. Haulm desiccant applied 14 Aug and potatoes lifted

1986: Haulm desiccant applied 29 Aug. Haulm mechanically destroyed 16 Sept and potatoes lifted

23 Sept.

LATER 1985: Haulm mechanically destroyed 4 Sept. Haulm desiccant applied 5 Sept and potatoes lifted

11 Oct.

1986: Haulm mechanically destroyed 25 Sept. Haulm desiccant applied 27 Sept and potatoes lifted 13 Oct.

plus two extra treatments:

SCOTS AA

KE SAA King Edward Scottish AA seed bought in 1987 (duplicated)
MP SAA Maris Piper Scottish AA seed bought in 1987 (duplicated)

- NOTES: (1) Basal pest and pathogen control in 1985 (to ROTHGROW TWICE only) was phorate at 1.7 kg with the seed and mancozeb at 1.4 kg in 200 l on five occasions applied with pirimicarb at 0.14 kg on all but the first occasion.
  - (2) Basal pest and pathogen control in 1986 was phorate at 1.7 kg with the seed, mancozeb at 1.4 kg in 200 l on four occasions with pirimicarb at 0.14 kg on each occasion and (to HAULM D LATER plots only) fentin hydroxide at 0.28 kg in 200 l on two occasions applied with pirimicarb at 0.14 kg on the first.
- Basal applications: Manures: FYM at 35 t. (0:18:36) at 690 kg. (10:10:15+4.5 Mg) at 1960 kg. Weedkillers: Linuron at 1.6 kg and 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 on the second occasion. Fentin hydroxide at 0.28 kg in 200 l on two occasions. Insecticide: Pirimicarb at 0.14 kg. Haulm desiccant: Diquat at 0.80 kg ion in 300 l.
- Cultivations, etc.:- (0:18:36) applied: 28 Oct, 1986. FYM applied: 11 Nov. Ploughed: 21 Nov. (10:10:15+4.5 Mg) applied: 13 Apr, 1987. Rotary harrowed: 20 Apr. Potatoes planted by hand: 21 Apr. Rotary ridged: 27 Apr. Weedkillers applied: 8 May. Mancozeb applied: 24 June, 8 July, 28 July and 10 Aug. Pirimicarb applied: 8 July. Fentin hydroxide applied: 28 Aug, 9 Sept. Haulm desiccant applied: 21 Sept. Haulm mechanically destroyed: 26 Sept. Lifted: 29 Oct. Previous crops: S. barley 1985, w. beans 1986.

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

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## TOTAL TUBERS TONNES/HECTARE

\*\*\*\* Tables of means \*\*\*\*

**** lables of	means ~~~			
ROTHGROW	ONCE	TWICE	Mean	
V AR IETY EDWARD	76.4	77.9	77.1 82.9	
PIPER	84.6	81.2	02.9	
Mean	80.5	79.5	80.0	
PATHCONT[86] VARIETY	STANDARD	ENHANCED	FULL	Mean
EDWARD PIPER	76.9 83.3		77.7 83.0	77.1 82.9
Mean	80.1	79.5	80.4	80.0
PATHCONT[86] ROTHGROW	STANDARD	ENHANCED	FULL	Mean
ONCE TWICE	80.8 79.4	80.4 78.7	80.2 80.5	80.5 79.5
Mean	80.1	79.5	80.4	80.0
HAULM D[86] VARIETY	EARLY	LATER	Mean	
EDWARD PIPER	78.5 83.3	75.8 82.4	77.1 82.9	
Mean	80.9	79.1	80.0	
HAULM D[86] ROTHGROW	EARLY	LATER	Mean	
ONCE TWICE	81.4 80.4	79.5 78.6	80.5 79.5	
Mean	80.9	79.1	80.0	
HAULM D[86]	EARLY	LATER	Mean	
STANDARD ENHANCED	81.3 80.0		80.1 79.5	
FULL	81.4	79.3	80.4	
Mean	80.9	79.1	80.0	
VARIETY	PATHCONT[8 ROTHGR		ENHANCED	FULL
EDWARD	ON	CE 76.5	76.8	75.9
PIPER	TWI ON TWI	CE 85.2	77.0 84.0 80.4	79.5 84.5 81.5

TOTAL TUBERS TONNES/HECTARE

\*\*\*\*\* Tables of means \*\*\*\*\*

VARIETY	HAULM D[86] ROTHGROW	EARLY	LATER	
EDWARD	ONCE	77.3	75.5	
	TWICE	79.7	76.1	
PIPER	ONCE	85.6	83.5	
	TWICE	81.1	81.2	
VARIETY	HAULM D[86] PATHCONT[86]	EARLY	LATER	
EDWARD	STANDARD ENHANCED	80.2 77.1	73.5 76.7	
DIDED	FULL	78.2	77.1	
PIPER	STANDARD	82.3	84.3	
	ENHANCED FULL	83.0 84.6	81.3 81.5	
	FULL	04.0	01.5	
ROTHGROW	HAULM D[86] PATHCONT[86]	EARLY	LATER	
ONCE	STANDARD	82.4	79.3	
	ENHANCED	80.8	80.0	
	FULL	81.1	79.3	
TWICE	STANDARD	80.2	78.5	
	ENHANCED	79.3	78.1	
	FULL	81.7	79.3	
		HAULM D[86]	EARLY	LATER
VARIETY	ROTHGROW	PATHCONT[86]		ENTER
EDWARD	ONCE	STANDARD	80.1	72.9
		ENHANCED	75.9	77.7
	THEOR	FULL	75.9	75.9
	TWICE	STANDARD	80.4	74.1
		ENHANCED	78.2	75.8
PIPER	ONCE	FULL STANDARD	80.6 84.6	78.4
111 EK	ONCL	ENHANCED	85.7	85.7 82.3
		FULL	86.4	82.6
	TWICE	STANDARD	80.0	83.0
		ENHANCED	80.4	80.4
		FULL	82.8	80.3
SCOTS AA K	E SAA MP SA	AA Mean		
	67.5 78			
		,,,,,		
Grand mean	79.0			

## TOTAL TUBERS TONNES/HECTARE

\*\*\* Standard errors of differences of means \*\*\*

Table s.e.d.	VARIETY 0.71	ROTHGROW 0.71	PATHCONT[86] 0.87	HAULM D[86] 0.71
Table	VARIETY	VARIETY PATHCONT[86]	ROTHGROW PATHCONT[86]	VARIETY HAULM D[86]
s.e.d.	1.01	1.23	1.23	1.01
Table	ROTHGROW HAULM D[86]	PATHCONT[86] HAULM D[86]	VARIETY ROTHGROW PATHCONT[86]	VARIETY ROTHGROW HAULM D[86]
s.e.d.	1.01	1.23		1.42
Table	VARIETY PATHCONT[86] HAULM D[86]	ROTHGROW PATHCONT[86] HAULM D[86]		SCOTS AA
s.e.d.	1.74	1.74		1.74
**** Stratum standard errors and coefficients of variation ****				

Stratum d.f. s.e. cv% BLOCK.WP 83 3.48 4.4

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PERCENTAGE WARE 4.44 CM (1.75 INCH) RIDDLE
\*\*\*\* Tables of means \*\*\*\*\*

ROTHGROW VARIETY EDWARD   81.9   81.3   81.6   83.6   82.6	***** Tables	of means **	***		
VARIETY EDWARD PIPER 83.7 83.5 83.6  Mean 82.8 82.4 82.6  PATHCONT[86] STANDARD ENHANCED FULL Mean VARIETY EDWARD PIPER 83.6 82.5 84.6 83.6  Mean 82.8 81.3 83.6 82.6  PATHCONT[86] STANDARD ENHANCED FULL Mean ROTHGROW ONCE 82.7 81.9 83.8 82.8  TWICE 83.0 80.7 83.4 82.4  Mean 82.8 81.3 83.6 82.6  HAULM D[86] EARLY LATER Mean VARIETY EDWARD 83.5 83.7 83.6  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean ROTHGROW ONCE 83.5 82.1 82.8 TWICE 82.2 82.6 82.4  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean PIPER 83.5 83.7 83.6  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean PATHCONT[86] STANDARD ENHANCED FULL ROTHGROW ONCE 83.5 82.1 82.8 TWICE 82.2 82.6 82.4  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean PATHCONT[86] STANDARD 83.8 81.9 82.8 ENHANCED 81.1 81.5 81.3 FULL 83.7 83.5 83.6  Mean 82.9 82.3 82.6  PATHCONT[86] STANDARD ENHANCED FULL ROTHGROW ONCE 83.5 STANDARD ENHANCED FULL ROTHGROW ONCE 83.5 STANDARD ENHANCED FULL ROTHGROW ONCE 82.3 81.1 82.3  FULL 83.7 83.5 83.6  PATHCONT[86] STANDARD ENHANCED FULL ROTHGROW ONCE 82.3 81.1 82.3  TWICE 81.8 79.1 83.1  PIPER ONCE 83.0 82.6 85.4	ROTHGROW	V ONCE	TWICE	Mean	
EDWARD   81.9   81.3   81.6   83.6	VARIETY				
PIPER 83.7 83.5 83.6  Mean 82.8 82.4 82.6  PATHCONT[86] STANDARD ENHANCED FULL Mean VARIETY EDWARD 82.1 80.1 82.7 81.6 83.6 82.5 84.6 83.6 82.6 82.5 84.6 83.6 82.6 82.5 84.6 83.6 82.6 82.5 84.6 83.6 82.6 82.6 82.7 81.9 83.8 82.8 82.4 82.4 82.4 82.4 82.4 82.4 82			81 3	81 6	
Mean   82.8   82.4   82.6					
PATHCONT[86] STANDARD ENHANCED FULL Mean VARIETY EDWARD 82.1 80.1 82.7 81.6 83.6 82.5 84.6 83.6 Mean 82.8 81.3 83.6 82.6 PATHCONT[86] STANDARD ENHANCED FULL Mean ROTHGROW ONCE 82.7 81.9 83.8 82.8 82.4 Mean 82.8 81.3 83.6 82.6 HAULM D[86] EARLY LATER Mean VARIETY EDWARD 82.3 81.0 81.6 PIPER 83.5 83.7 83.6 Mean 82.9 82.3 82.6 HAULM D[86] EARLY LATER Mean ROTHGROW ONCE 83.5 82.1 82.8 82.4 Mean 82.9 82.3 82.6 HAULM D[86] EARLY LATER Mean ROTHGROW ONCE 83.5 82.1 82.8 82.4 Mean 82.9 82.3 82.6 HAULM D[86] EARLY LATER Mean ROTHGROW ONCE 83.5 82.1 82.8 82.4 Mean 82.9 82.3 82.6 Mean 82.9 82.3 82.6 Mean 82.9 82.3 82.6 PATHCONT[86] STANDARD 83.8 81.9 82.8 ENHANCED 81.1 81.5 81.3 FULL 83.7 83.5 83.6 Mean 82.9 82.3 82.6 PATHCONT[86] STANDARD ENHANCED 81.1 81.5 81.3 FULL 83.7 83.5 83.6 Mean 82.9 82.3 82.6 PATHCONT[86] STANDARD ENHANCED FULL 83.7 83.5 83.6 FULL 83.7 83.5 FULL 83.7 83.5 FULL 83.7 83.5 FULL 83.7 83.5 FULL 83.7 83.	FIFLE	03.7	03.3	03.0	
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VARIETY EDWARD BY EDWARD PIPER B3.6  B2.1  B3.6  B2.7  B3.6  B2.6  PATHCONT[86] ROTHGROW ONCE TWICE B3.0  Mean B2.8  B1.3  B3.6  B2.6  PATHCONT[86] ROTHGROW ONCE B2.7  B1.9  B3.8  B2.8  B2.8  B2.8  B3.0  B0.7  B3.4  B2.4  Mean B2.8  B1.3  B3.6  B2.6  HAULM D[86] EARLY EDWARD PIPER B3.5  B3.7  B3.6  Mean B2.9  B2.3  B2.6  HAULM D[86] ROTHGROW ONCE B3.5  B3.7  B3.6  HAULM D[86] ROTHGROW ONCE B3.5  B2.1  B2.8  B2.8  HAULM D[86] ROTHGROW ONCE B3.5  B2.1  B2.8  B2.8  HAULM D[86] EARLY LATER Mean  ROTHGROW ONCE B3.5  B2.1  B2.8  B2.8  HAULM D[86] FARLY LATER Mean  B2.9  B2.3  B2.6  HAULM D[86] FARLY LATER Mean  B2.9  B2.8  B3.5  B3.6  HAULM D[86] STANDARD B3.8  B1.9  B2.8  ENHANCED B1.1  B1.5  B1.3  FULL B3.7  B3.5  B3.6  Mean B2.9  B2.8  ENHANCED B1.1  B1.5  B1.3  FULL B3.7  B3.5  B3.6  Mean B2.9  B2.8  ENHANCED B1.1  B3.7  B3.5  B3.6  Mean B2.9  B2.8  ENHANCED B1.1  B3.7  B3.1  B3.1  B3.1  PIPER ONCE B2.3  B1.1  B2.3  TWICE B1.8  FULL B3.1  B3.1  B2.3  FULL B3.1  B3.1  B2.3  FULL B3.1  B3.1  B3.1  B2.3  FULL B3.1  B3.1  B3.1  B2.3  FULL B3.1  B3.1  B2.3  FULL B3.1  B3.1  B2.3  FULL B3.1  B3.1  B3.1  B3.1  B3.1	riear	02.0	82.4	82.6	
VARIETY EDWARD BY EDWARD PIPER B3.6  B2.1  B3.6  B2.7  B3.6  B2.6  PATHCONT[86] ROTHGROW ONCE TWICE B3.0  Mean B2.8  B1.3  B3.6  B2.6  PATHCONT[86] ROTHGROW ONCE B2.7  B1.9  B3.8  B2.8  B2.8  B2.8  B3.0  B0.7  B3.4  B2.4  Mean B2.8  B1.3  B3.6  B2.6  HAULM D[86] EARLY EDWARD PIPER B3.5  B3.7  B3.6  Mean B2.9  B2.3  B2.6  HAULM D[86] ROTHGROW ONCE B3.5  B3.7  B3.6  HAULM D[86] ROTHGROW ONCE B3.5  B2.1  B2.8  B2.8  HAULM D[86] ROTHGROW ONCE B3.5  B2.1  B2.8  B2.8  HAULM D[86] EARLY LATER Mean  ROTHGROW ONCE B3.5  B2.1  B2.8  B2.8  HAULM D[86] FARLY LATER Mean  B2.9  B2.3  B2.6  HAULM D[86] FARLY LATER Mean  B2.9  B2.8  B3.5  B3.6  HAULM D[86] STANDARD B3.8  B1.9  B2.8  ENHANCED B1.1  B1.5  B1.3  FULL B3.7  B3.5  B3.6  Mean B2.9  B2.8  ENHANCED B1.1  B1.5  B1.3  FULL B3.7  B3.5  B3.6  Mean B2.9  B2.8  ENHANCED B1.1  B3.7  B3.5  B3.6  Mean B2.9  B2.8  ENHANCED B1.1  B3.7  B3.1  B3.1  B3.1  PIPER ONCE B2.3  B1.1  B2.3  TWICE B1.8  FULL B3.1  B3.1  B2.3  FULL B3.1  B3.1  B2.3  FULL B3.1  B3.1  B3.1  B2.3  FULL B3.1  B3.1  B3.1  B2.3  FULL B3.1  B3.1  B2.3  FULL B3.1  B3.1  B2.3  FULL B3.1  B3.1  B3.1  B3.1  B3.1	DATHCONTEGE	CTANDADD	FAULANIAGO	122722	
BDWARD   82.1   80.1   82.7   81.6   83.6			ENHANCED	FULL	Mean
PIPER 83.6 82.5 84.6 83.6  Mean 82.8 81.3 83.6 82.6  PATHCONT[86] STANDARD ENHANCED FULL Mean ROTHGROW ONCE 82.7 81.9 83.8 82.8 TWICE 83.0 80.7 83.4 82.4  Mean 82.8 81.3 83.6 82.6  HAULM D[86] EARLY LATER Mean VARIETY EDWARD 82.3 81.0 81.6 PIPER 83.5 83.7 83.6  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean ROTHGROW ONCE 83.5 82.1 82.8 TWICE 82.2 82.6 82.4  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean ROTHGROW ONCE 83.5 82.1 82.8 TWICE 82.2 82.6 82.4  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean PATHCONT[86] STANDARD 83.8 81.9 82.8 ENHANCED 81.1 81.5 81.3 FULL 83.7 83.5 83.6  Mean 82.9 82.3 82.6  VARIETY ROTHGROW ONCE 82.3 81.1 82.3 TWICE 81.8 79.1 83.1 PIPER ONCE 82.3 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4					
Mean   82.8   81.3   83.6   82.6					81.6
PATHCONT[86] STANDARD ENHANCED FULL Mean ROTHGROW ONCE 82.7 81.9 83.8 82.8 TWICE 83.0 80.7 83.4 82.4 Mean 82.8 81.3 83.6 82.6 HAULM D[86] EARLY LATER Mean VARIETY EDWARD 82.3 81.0 81.6 PIPER 83.5 83.7 83.6 Mean 82.9 82.3 82.6 HAULM D[86] EARLY LATER Mean ROTHGROW ONCE 83.5 82.1 82.8 TWICE 82.2 82.6 82.4 Mean 82.9 82.3 82.6 HAULM D[86] EARLY LATER Mean ROTHGROW ONCE 83.5 82.1 82.8 TWICE 82.2 82.6 82.4 Mean 82.9 82.3 82.6 HAULM D[86] EARLY LATER Mean PATHCONT[86] STANDARD 83.8 81.9 82.8 ENHANCED 81.1 81.5 81.3 FULL 83.7 83.5 83.6 Mean 82.9 82.3 82.6 Mean 82.9 82.3 82.6 PATHCONT[86] STANDARD ENHANCED FULL 83.7 83.5 83.6 Mean 82.9 82.3 82.6 FULL 83.7 83.5 83.6 Mean 82.9 82.3 82.6 FULL 83.7 83.5 83.6 Mean 82.9 82.3 82.6 FULL 83.7 83.5 83.6 FULL 83.8 83.0 82.6 85.4	PIPER	83.6	82.5	84.6	83.6
PATHCONT[86] STANDARD ENHANCED FULL Mean ROTHGROW ONCE 82.7 81.9 83.8 82.8 TWICE 83.0 80.7 83.4 82.4 Mean 82.8 81.3 83.6 82.6 HAULM D[86] EARLY LATER Mean VARIETY EDWARD 82.3 81.0 81.6 PIPER 83.5 83.7 83.6 Mean 82.9 82.3 82.6 HAULM D[86] EARLY LATER Mean ROTHGROW ONCE 83.5 82.1 82.8 TWICE 82.2 82.6 82.4 Mean 82.9 82.3 82.6 HAULM D[86] EARLY LATER Mean ROTHGROW ONCE 83.5 82.1 82.8 TWICE 82.2 82.6 82.4 Mean 82.9 82.3 82.6 HAULM D[86] EARLY LATER Mean PATHCONT[86] STANDARD 83.8 81.9 82.8 ENHANCED 81.1 81.5 81.3 FULL 83.7 83.5 83.6 Mean 82.9 82.3 82.6 Mean 82.9 82.3 82.6 PATHCONT[86] STANDARD ENHANCED FULL 83.7 83.5 83.6 Mean 82.9 82.3 82.6 FULL 83.7 83.5 83.6 Mean 82.9 82.3 82.6 FULL 83.7 83.5 83.6 Mean 82.9 82.3 82.6 FULL 83.7 83.5 83.6 FULL 83.8 83.0 82.6 85.4					
PATHCONT[86] STANDARD ENHANCED FULL Mean ROTHGROW ONCE 82.7 81.9 83.8 82.8   TWICE 83.0 80.7 83.4 82.4   Mean 82.8 81.3 83.6 82.6   HAULM D[86] EARLY LATER Mean VARIETY EDWARD 82.3 81.0 81.6   PIPER 83.5 83.7 83.6   Mean 82.9 82.3 82.6   HAULM D[86] EARLY LATER Mean ROTHGROW ONCE 83.5 82.1 82.8   TWICE 82.2 82.6 82.4   Mean 82.9 82.3 82.6   HAULM D[86] EARLY LATER Mean ROTHGROW ONCE 83.5 82.1 82.8   TWICE 82.2 82.6 82.4   Mean 82.9 82.3 82.6   HAULM D[86] EARLY LATER Mean PATHCONT[86] STANDARD 83.8 81.9 82.8   ENHANCED 81.1 81.5 81.3   FULL 83.7 83.5 83.6    Mean 82.9 82.3 82.6    VARIETY PATHCONT[86] STANDARD ENHANCED FULL 83.7 83.5 83.6    VARIETY PATHCONT[86] STANDARD ENHANCED FULL 83.7 83.5 83.6    PATHCONT[86] STANDARD ENHANCED FULL 83.7 83.1 82.3   TWICE 81.8 79.1 83.1 PIPER ONCE 82.3 81.1 82.3   TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4	Mean	82.8	81.3	83.6	82.6
ROTHGROW ONCE 82.7 81.9 83.8 82.8 TWICE 83.0 80.7 83.4 82.4  Mean 82.8 81.3 83.6 82.6  HAULM D[86] EARLY LATER Mean VARIETY EDWARD 82.3 81.0 81.6 PIPER 83.5 83.7 83.6  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean ROTHGROW ONCE 83.5 82.1 82.8 TWICE 82.2 82.6 82.4  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean ROTHGROW ONCE 83.5 82.1 82.8 TWICE 82.2 82.6 82.4  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean PATHCONT[86] STANDARD ENHANCED FULL 83.7 83.5 83.6  Mean 82.9 82.3 82.6  VARIETY ROTHGROW EDWARD ONCE 82.3 81.1 82.3 TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4					
ROTHGROW ONCE 82.7 81.9 83.8 82.8 TWICE 83.0 80.7 83.4 82.4  Mean 82.8 81.3 83.6 82.6  HAULM D[86] EARLY LATER Mean VARIETY EDWARD 82.3 81.0 81.6 PIPER 83.5 83.7 83.6  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean ROTHGROW ONCE 83.5 82.1 82.8 TWICE 82.2 82.6 82.4  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean ROTHGROW ONCE 83.5 82.1 82.8 TWICE 82.2 82.6 82.4  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean PATHCONT[86] STANDARD 83.8 81.9 82.8 ENHANCED 81.1 81.5 81.3 FULL 83.7 83.5 83.6  Mean 82.9 82.3 82.6  VARIETY ROTHGROW EDWARD ONCE 82.3 81.1 82.3 TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4	PATHCONT[86]	STANDARD	ENHANCED	FULL	Mean
TWICE 83.0 80.7 83.4 82.4  Mean 82.8 81.3 83.6 82.6  HAULM D[86] EARLY LATER Mean VARIETY EDWARD 82.3 81.0 81.6 PIPER 83.5 83.7 83.6  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean ROTHGROW ONCE 83.5 82.1 82.8 TWICE 82.2 82.6 82.4  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean PATHCONT[86] STANDARD 83.8 81.9 82.8 ENHANCED 81.1 81.5 81.3 FULL 83.7 83.5 83.6  Mean 82.9 82.3 82.6  VARIETY ROTHGROW EDWARD ONCE 82.3 81.1 82.3 TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4	ROTHGROW				110411
TWICE 83.0 80.7 83.4 82.4  Mean 82.8 81.3 83.6 82.6  HAULM D[86] EARLY LATER Mean VARIETY EDWARD 82.3 81.0 81.6 PIPER 83.5 83.7 83.6  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean ROTHGROW ONCE 83.5 82.1 82.8 TWICE 82.2 82.6 82.4  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean PATHCONT[86] STANDARD 83.8 81.9 82.8 ENHANCED 81.1 81.5 81.3 FULL 83.7 83.5 83.6  Mean 82.9 82.3 82.6  VARIETY ROTHGROW EDWARD ONCE 82.3 81.1 82.3 TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4	ONCE	82.7	81.9	83.8	82.8
Mean   82.8   81.3   83.6   82.6	TWICE				
HAULM D[86] EARLY LATER Mean VARIETY EDWARD 82.3 81.0 81.6 PIPER 83.5 83.7 83.6  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean ROTHGROW ONCE 83.5 82.1 82.8 TWICE 82.2 82.6 82.4  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean PATHCONT[86] STANDARD 83.8 81.9 82.8 ENHANCED 81.1 81.5 81.3 FULL 83.7 83.5 83.6  Mean 82.9 82.3 82.6  VARIETY ROTHGROW ONCE 82.3 81.1 82.3  PATHCONT[86] STANDARD ENHANCED FULL VARIETY ROTHGROW EDWARD ONCE 82.3 81.1 82.3 TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4			00.7	00.4	02.4
HAULM D[86] EARLY LATER Mean VARIETY EDWARD 82.3 81.0 81.6 PIPER 83.5 83.7 83.6  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean ROTHGROW ONCE 83.5 82.1 82.8 TWICE 82.2 82.6 82.4  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean PATHCONT[86] STANDARD 83.8 81.9 82.8 ENHANCED 81.1 81.5 81.3 FULL 83.7 83.5 83.6  Mean 82.9 82.3 82.6  VARIETY ROTHGROW ONCE 82.3 81.1 82.3  PATHCONT[86] STANDARD ENHANCED FULL VARIETY ROTHGROW EDWARD ONCE 82.3 81.1 82.3 TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4	Mean	82.8	81 3	83 6	92 6
VARIETY EDWARD 82.3 81.0 81.6 PIPER 83.5 83.7 83.6  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean ROTHGROW ONCE 83.5 82.1 82.8 TWICE 82.2 82.6 82.4  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean PATHCONT[86] STANDARD 83.8 81.9 82.8 ENHANCED 81.1 81.5 81.3 FULL 83.7 83.5 83.6  Mean 82.9 82.3 82.6  VARIETY ROTHGROW EDWARD ONCE 82.3 81.1 82.3 TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4	rican	02.0	01.5	03.0	02.0
VARIETY EDWARD 82.3 81.0 81.6 PIPER 83.5 83.7 83.6  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean ROTHGROW ONCE 83.5 82.1 82.8 TWICE 82.2 82.6 82.4  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean PATHCONT[86] STANDARD 83.8 81.9 82.8 ENHANCED 81.1 81.5 81.3 FULL 83.7 83.5 83.6  Mean 82.9 82.3 82.6  VARIETY ROTHGROW EDWARD ONCE 82.3 81.1 82.3 TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4	HAIII M DERAT	FADI V	LATED	Moon	
EDWARD 82.3 81.0 81.6 PIPER 83.5 83.7 83.6  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean ONCE 83.5 82.1 82.8 TWICE 82.2 82.6 82.4  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean PATHCONT[86] STANDARD 83.8 81.9 82.8 ENHANCED 81.1 81.5 81.3 FULL 83.7 83.5 83.6  Mean 82.9 82.3 82.6  VARIETY ROTHGROW EDWARD ONCE 82.3 81.1 82.3 TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4			LAILK	mean	
PIPER 83.5 83.7 83.6  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean ROTHGROW ONCE 83.5 82.1 82.8 TWICE 82.2 82.6 82.4  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean PATHCONT[86] STANDARD 83.8 81.9 82.8 ENHANCED 81.1 81.5 81.3 FULL 83.7 83.5 83.6  Mean 82.9 82.3 82.6  VARIETY ROTHGROW EDWARD ONCE 82.3 81.1 82.3 TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4			01 0	01.6	
Mean         82.9         82.3         82.6           HAULM D[86] ROTHGROW ONCE 83.5 82.1 82.8 TWICE 82.2 82.6 82.4         82.6 82.4           Mean         82.9 82.3 82.6           HAULM D[86] EARLY LATER Mean PATHCONT[86] STANDARD 83.8 81.9 82.8 ENHANCED 81.1 81.5 81.3 FULL 83.7 83.5 83.6         81.9 82.8 83.6           Mean         82.9 82.3 82.6         82.8 83.6 83.6           Mean         82.9 82.3 82.6         82.6 83.6 83.6           VARIETY EDWARD ONCE 82.3 81.1 82.3 TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4					
HAULM D[86] EARLY LATER Mean  ONCE 83.5 82.1 82.8  TWICE 82.2 82.6 82.4  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean  PATHCONT[86] STANDARD 83.8 81.9 82.8  ENHANCED 81.1 81.5 81.3  FULL 83.7 83.5 83.6  Mean 82.9 82.3 82.6  VARIETY ROTHGROW  EDWARD ONCE 82.3 81.1 82.3  TWICE 81.8 79.1 83.1  PIPER ONCE 83.0 82.6 85.4	PIPER	83.5	83./	83.6	
HAULM D[86] EARLY LATER Mean  ONCE 83.5 82.1 82.8  TWICE 82.2 82.6 82.4  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean  PATHCONT[86] STANDARD 83.8 81.9 82.8  ENHANCED 81.1 81.5 81.3  FULL 83.7 83.5 83.6  Mean 82.9 82.3 82.6  VARIETY ROTHGROW  EDWARD ONCE 82.3 81.1 82.3  TWICE 81.8 79.1 83.1  PIPER ONCE 83.0 82.6 85.4	Mann	00 0	20. 2		
ROTHGROW ONCE 83.5 82.1 82.8 TWICE 82.2 82.6 82.4  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean PATHCONT[86] STANDARD 83.8 81.9 82.8 ENHANCED 81.1 81.5 81.3 FULL 83.7 83.5 83.6  Mean 82.9 82.3 82.6  VARIETY ROTHGROW EDWARD ONCE 82.3 81.1 82.3 TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4	mean	82.9	82.3	82.6	
ROTHGROW ONCE 83.5 82.1 82.8 TWICE 82.2 82.6 82.4  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean PATHCONT[86] STANDARD 83.8 81.9 82.8 ENHANCED 81.1 81.5 81.3 FULL 83.7 83.5 83.6  Mean 82.9 82.3 82.6  VARIETY ROTHGROW EDWARD ONCE 82.3 81.1 82.3 TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4	UAUL M. DEOCT	EADL W			
ONCE 83.5 82.1 82.8 TWICE 82.2 82.6 82.4  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean PATHCONT[86] STANDARD 83.8 81.9 82.8 ENHANCED 81.1 81.5 81.3 FULL 83.7 83.5 83.6  Mean 82.9 82.3 82.6  VARIETY ROTHGROW EDWARD ONCE 82.3 81.1 82.3 TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4		EARLY	LATER	Mean	
TWICE 82.2 82.6 82.4  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean PATHCONT[86] STANDARD 83.8 81.9 82.8 ENHANCED 81.1 81.5 81.3 FULL 83.7 83.5 83.6  Mean 82.9 82.3 82.6  VARIETY ROTHGROW EDWARD ONCE 82.3 81.1 82.3 TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4					
TWICE 82.2 82.6 82.4  Mean 82.9 82.3 82.6  HAULM D[86] EARLY LATER Mean PATHCONT[86] STANDARD 83.8 81.9 82.8 ENHANCED 81.1 81.5 81.3 FULL 83.7 83.5 83.6  Mean 82.9 82.3 82.6  VARIETY ROTHGROW EDWARD ONCE 82.3 81.1 82.3 TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4		83.5	82.1	82.8	
Mean         82.9         82.3         82.6           HAULM D[86]         EARLY         LATER         Mean           PATHCONT[86]         STANDARD         83.8         81.9         82.8           ENHANCED         81.1         81.5         81.3           FULL         83.7         83.5         83.6           Mean         82.9         82.3         82.6           VARIETY         ROTHGROW         ENHANCED         FULL           VARIETY         ROTHGROW         82.3         81.1         82.3           TWICE         81.8         79.1         83.1           PIPER         ONCE         83.0         82.6         85.4	TWICE	82.2	82.6	82.4	
HAULM D[86] EARLY LATER Mean PATHCONT[86] STANDARD 83.8 81.9 82.8 ENHANCED 81.1 81.5 81.3 FULL 83.7 83.5 83.6  Mean 82.9 82.3 82.6  PATHCONT[86] STANDARD ENHANCED FULL VARIETY ROTHGROW EDWARD ONCE 82.3 81.1 82.3 TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4					
HAULM D[86] EARLY LATER Mean PATHCONT[86] STANDARD 83.8 81.9 82.8 ENHANCED 81.1 81.5 81.3 FULL 83.7 83.5 83.6  Mean 82.9 82.3 82.6  VARIETY ROTHGROW EDWARD ONCE 82.3 81.1 82.3 TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4	Mean	82.9	82.3	82.6	
PATHCONT[86]  STANDARD 83.8 81.9 82.8 ENHANCED 81.1 81.5 81.3 FULL 83.7 83.5 83.6  Mean 82.9 82.3 82.6  PATHCONT[86] STANDARD ENHANCED FULL VARIETY ROTHGROW EDWARD ONCE 82.3 81.1 82.3 TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4				02.00	
PATHCONT[86]  STANDARD 83.8 81.9 82.8 ENHANCED 81.1 81.5 81.3 FULL 83.7 83.5 83.6  Mean 82.9 82.3 82.6  PATHCONT[86] STANDARD ENHANCED FULL VARIETY ROTHGROW EDWARD ONCE 82.3 81.1 82.3 TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4	HAULM D[86]	EARLY	LATER	Mean	
STANDARD 83.8 81.9 82.8 ENHANCED 81.1 81.5 81.3 FULL 83.7 83.5 83.6  Mean 82.9 82.3 82.6  PATHCONT[86] STANDARD ENHANCED FULL VARIETY ROTHGROW EDWARD ONCE 82.3 81.1 82.3 TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4			LATER	rican	
ENHANCED 81.1 81.5 81.3 FULL 83.7 83.5 83.6 Mean 82.9 82.3 82.6 PATHCONT[86] STANDARD ENHANCED FULL VARIETY ROTHGROW EDWARD ONCE 82.3 81.1 82.3 TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4		83 8	91 0	02 0	
FULL 83.7 83.5 83.6  Mean 82.9 82.3 82.6  PATHCONT[86] STANDARD ENHANCED FULL  VARIETY ROTHGROW EDWARD ONCE 82.3 81.1 82.3  TWICE 81.8 79.1 83.1  PIPER ONCE 83.0 82.6 85.4					
Mean 82.9 82.3 82.6  PATHCONT[86] STANDARD ENHANCED FULL VARIETY ROTHGROW EDWARD ONCE 82.3 81.1 82.3 TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4					
PATHCONT[86] STANDARD ENHANCED FULL VARIETY ROTHGROW EDWARD ONCE 82.3 81.1 82.3 TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4	FULL	03./	83.5	83.6	
PATHCONT[86] STANDARD ENHANCED FULL VARIETY ROTHGROW EDWARD ONCE 82.3 81.1 82.3 TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4	Mann	00 0	00.0		
VARIETY ROTHGROW  EDWARD ONCE 82.3 81.1 82.3  TWICE 81.8 79.1 83.1  PIPER ONCE 83.0 82.6 85.4	riean	82.9	82.3	82.6	
VARIETY ROTHGROW  EDWARD ONCE 82.3 81.1 82.3  TWICE 81.8 79.1 83.1  PIPER ONCE 83.0 82.6 85.4		DATIONITIOS			
EDWARD ONCE 82.3 81.1 82.3 TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4	WARTETW			) ENHANCED	FULL
TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4					
TWICE 81.8 79.1 83.1 PIPER ONCE 83.0 82.6 85.4	EDWARD		-		82.3
PIPER ONCE 83.0 82.6 85.4					
T1150 T	PIPER				
		TWIC	E 84.2		83.8

87/R/P/2

PERCENTAGE WARE 4.44 CM (1.75 INCH) RIDDLE

\*\*\*\* Tables of means \*\*\*\*

	HAULM D[86]	EARLY	LATER	
V AR I E T Y E DWARD	ROTHGROW ONCE	82.9	80.9	
Lomino	TWICE	81.6	81.0	
PIPER	ONCE	84.2	83.2	
	TWICE	82.8	84.2	
	HAULM D[86]	EARLY	LATER	
	PATHCONT[86]	04.0	00 1	
EDWARD	STANDARD	84.0	80.1	
	ENHANCED	79.9 82.9	80.3 82.5	
21252	FULL	83.5	83.7	
PIPER	STANDARD	82.3	82.8	
	ENHANCED	84.6	84.6	
	FULL	04.0	04.0	
	HAULM D[86]	EARLY	LATER	
PUTHERUM	PATHCONT[86]	Erine i		
ONCE	STANDARD	84.1	81.3	
ONCL	ENHANCED	82.9	80.8	
	FULL	83.5	84.1	
TWICE		83.4	82.5	
INIOL	ENHANCED	79.3	82.2	
	FULL	83.9	83.0	
		HAULM D[86]	EARLY	LATER
VARIETY		PATHCONT[86]	24.0	00 5
EDWARD	ONCE	STANDARD	84.2	80.5 80.2
		ENHANCED	82.1 82.4	82.1
	TUTOS	FULL	83.9	79.7
	TWICE	STANDARD	77.7	80.4
		ENHANCED FULL	83.3	82.8
	ONOF	STANDARD	84.1	82.0
PIPER	ONCE	ENHANCED	83.8	81.5
		FULL	84.7	86.1
	TWICE	STANDARD	83.0	85.4
	IMICE	ENHANCED	80.8	84.0
		FULL	84.5	83.1
		IOLL	01.0	0012
SCOTS AA	KE SAA MP	SAA Mean		
30013 AA		5.1 84.9		

82.9 Grand mean

PLOT AREA HARVESTED 0.00286