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# Yields of the Field Experiments 1980

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## 80/R/P/4 Potatoes Effects of Spacing and Lodging

### Rothamsted Research

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80/R/P/4

POTATOES

EFFECTS OF SPACING AND LODGING

Object: To study the effects of spacing and artificial lodging on radiation interception, crop growth-rates and yield - Sawyers II.

Sponsor: D.W. Wood.

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

Whole plot dimensions: 4.27 x 15.2.

Treatments: All combinations of:-

Whole plots

1. SEEDSIZE                      Size range of seed tubers:

|       |            |
|-------|------------|
| SMALL | 20 to 40 g |
| LARGE | 70 to 90 g |

Sub plots

2. SPACING                      Spacing within ridges 71 cm apart:

|       |
|-------|
| 25 CM |
| 50 CM |

3. LODGING                      Artificial lodging:

|       |              |
|-------|--------------|
| NONE  | None         |
| EARLY | Early 9 July |
| LATE  | Later 19 Aug |

Basal applications: Manures: Chalk at 7.5 t. (0:20:20) at 1260 kg. Epsom salts at 145 kg mixed with kieserite at 145 kg. FYM at 25 t. (13:13:20) at 1510 kg. Weedkiller: Linuron at 1.2 kg in 250 l. Fungicides: Mancozeb at 1.3 kg in 250 l applied six times, with insecticide on the third and fourth occasions. Insecticide: Pirimicarb at 0.14 kg.

Seed: Pentland Crown.

Cultivations, etc.: Heavy spring-tine cultivated: 17 Sept, 1979. Chalk applied: 9 Oct. Subsoiled with tines 160 cm apart and 40 cm deep: 1 Nov. PK applied: 13 Nov. FYM applied: 21 Dec. Epsom salts and kieserite applied: 31 Dec. Ploughed: 8 Jan, 1980. Heavy spring-tine cultivated: 14 Apr. NPK applied, spike rotary cultivated, ridged: 15 Apr. Hand planted, ridges split back: 16 Apr. Grubbed: 24 Apr. Rotary ridged: 28 Apr. Weedkiller applied: 18 May. Fungicide applied: 18 June, 30 June, 11 July, 24 July, 5 Aug, 18 Aug. Insecticide applied: 11 July, 24 July. Harvested by hand: 10 Oct. Previous crops: W. oats 1978, w. wheat 1979.

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NOTE: Seed sprout characteristics were assessed at planting. Emergence counts were made daily in late May. Full growth analyses were done at intervals of 21 days between early July and late September. Radiation interception was measured at intervals of 10 days between early June and late September.

TOTAL TUBERS TONNES/HECTARE

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

|          |       |       |      |       |       |      |
|----------|-------|-------|------|-------|-------|------|
| SPACING  | 25 CM | 50 CM | MEAN |       |       |      |
| SEEDSIZE |       |       |      |       |       |      |
| SMALL    | 79.6  | 75.8  | 77.7 |       |       |      |
| LARGE    | 80.6  | 76.5  | 78.6 |       |       |      |
| MEAN     | 80.1  | 76.1  | 78.1 |       |       |      |
| LODGING  | NONE  | EARLY | LATE | MEAN  |       |      |
| SEEDSIZE |       |       |      |       |       |      |
| SMALL    | 78.1  | 76.3  | 78.7 | 77.7  |       |      |
| LARGE    | 80.2  | 77.9  | 77.6 | 78.6  |       |      |
| MEAN     | 79.2  | 77.1  | 78.1 | 78.1  |       |      |
| LODGING  | NONE  | EARLY | LATE | MEAN  |       |      |
| SPACING  |       |       |      |       |       |      |
| 25 CM    | 82.6  | 78.2  | 79.5 | 80.1  |       |      |
| 50 CM    | 75.7  | 76.0  | 76.7 | 76.1  |       |      |
| MEAN     | 79.2  | 77.1  | 78.1 | 78.1  |       |      |
| SPACING  | 25 CM |       |      | 50 CM |       |      |
| LODGING  | NONE  | EARLY | LATE | NONE  | EARLY | LATE |
| SEEDSIZE |       |       |      |       |       |      |
| SMALL    | 80.9  | 77.1  | 80.9 | 75.3  | 75.5  | 76.5 |
| LARGE    | 84.3  | 79.4  | 78.2 | 76.2  | 76.4  | 77.0 |

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TOTAL TUBERS TONNES/HECTARE

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

| TABLE | SPACING | LODGING | SEEDSIZE*<br>SPACING |
|-------|---------|---------|----------------------|
| SED   | 1.61    | 1.97    | 2.28                 |

| TABLE | SEEDSIZE*<br>LODGING | SPACING<br>LODGING | SEEDSIZE*<br>SPACING<br>LODGING |
|-------|----------------------|--------------------|---------------------------------|
|-------|----------------------|--------------------|---------------------------------|

|     |      |      |      |
|-----|------|------|------|
| SED | 2.79 | 2.79 | 3.95 |
|-----|------|------|------|

EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:

\* WITHIN THE SAME LEVEL OF SEEDSIZE ONLY

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

| STRATUM     | DF | SE   | CV% |
|-------------|----|------|-----|
| BLOCK.WP.SP | 10 | 3.95 | 5.1 |

PERCENTAGE WARE 4.44CM (1.75 INCH) RIDDLE

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

| SPACING  | 25 CM | 50 CM | MEAN |
|----------|-------|-------|------|
| SEEDSIZE |       |       |      |
| SMALL    | 87.5  | 92.2  | 89.9 |
| LARGE    | 87.1  | 91.5  | 89.3 |
| MEAN     | 87.3  | 91.9  | 89.6 |

| LODGING  | NONE | EARLY | LATE | MEAN |
|----------|------|-------|------|------|
| SEEDSIZE |      |       |      |      |
| SMALL    | 90.2 | 88.4  | 91.0 | 89.9 |
| LARGE    | 90.8 | 89.6  | 87.6 | 89.3 |
| MEAN     | 90.5 | 89.0  | 89.3 | 89.6 |

| LODGING | NONE | EARLY | LATE | MEAN |
|---------|------|-------|------|------|
| SPACING |      |       |      |      |
| 25 CM   | 89.7 | 87.7  | 84.6 | 87.3 |
| 50 CM   | 91.3 | 90.3  | 94.0 | 91.9 |
| MEAN    | 90.5 | 89.0  | 89.3 | 89.6 |

| SPACING  | 25 CM | EARLY | LATE | 50 CM | EARLY | LATE |
|----------|-------|-------|------|-------|-------|------|
| LODGING  | NONE  |       |      | NONE  |       |      |
| SEEDSIZE |       |       |      |       |       |      |
| SMALL    | 90.1  | 85.3  | 87.1 | 90.4  | 91.5  | 94.9 |
| LARGE    | 89.3  | 90.1  | 82.1 | 92.3  | 89.1  | 93.1 |

SUB PLOT AREA HARVESTED 0.00116