

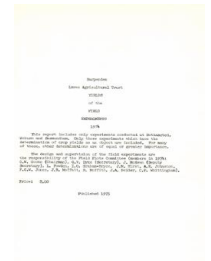
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## Yields of the Field Experiments 1974

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### 74/W/RN/15 Rotation and Fumigation - Potatoes, Barley, Sugar Beet

*74/W/RN/15 Rotation and Fumigation - Potatoes, Barley, Sugar Beet*, Rothamsted Research (1975)  
Yields Of The Field Experiments 1974, pp 130 - 135 - **DOI:**  
<https://doi.org/10.23637/ERADOC-1-119>

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# ROTATION AND FUMIGATION

Object: To study different ways of using nematicides in a three-course rotation and to determine the effects on crop yield and incidence of pathogenic nematodes - Woburn Butt Close.

Sponsors: F.G.W. Jones, D.C.M. Corbett, A.G. Whitehead, T.D. Williams.

The sixth year, potatoes, barley, sugar beet.

For previous years see 69/W/RN/15(t), 70/W/RN/15(t) and 71-73/W/RN/15.

Design: 3 series each of 2 blocks of 3 plots split into 7.

Whole plot dimensions: 5.33 x 31.1. Sub plot area harvested:

Potatoes - 0.00052, barley - 0.00052, sugar beet - 0.00130.

## Treatments:

All phases of the rotation potatoes, barley, sugar beet are present.

Each crop tests all combinations of:-

Whole plots: 1. Nitrogen fertiliser (kg N):

N

To potatoes and  
sugar beet

To barley

Potatoes &  
s.beet

Barley

75

38

75

38

150

75

150

75

225

113

225

113

## Sub plots: 2. Chemicals:

## CHEMICAL

None

0

Dichloropropane/dichloropropene ('D-D') at 448 kg  
before potatoes

DD(P)

Dichloropropane/dichloropropene ('D-D') at 448 kg  
before sugar beet

DD(SB)

Dichloropropane/dichloropropene ('D-D') at 448 kg  
before barley

DD(B)

Dichloropropane/dichloropropene ('D-D') at 448 kg  
before all crops

DD(ALL)

Dazomet at 224 kg before all crops since 1970 only

DAZ(ALL)

Benomyl at 22 kg before all crops since 1974 only

BEN(ALL)

## Standard applications:

Potatoes: Manures: (0:14:28) at 1080 kg. Weedkillers: Linuron at 1.2 kg  
plus paraquat at 0.28 kg ion in 280 l. Fungicide with insecticide:

Mancozeb at 1.3 kg plus demeton-s-methyl at 0.25 kg in 450 l. Fungicide:

Mancozeb at 1.3 kg in 450 l.

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Barley: Manures: (0:20:20) at 320 kg, combine drilled. Weedkiller: Ioxynil at 0.52 kg and mecoprop at 1.6 kg in 280 l.  
 Sugar beet: Manures: Magnesian limestone at 2.5 tonnes. (0:14:28) at 1080 kg. Boron at 6.7 kg B2O3 (as 'Solubor') applied with the second application of insecticide. Insecticide: Demeton-s-methyl at 0.25 kg in 280 l followed by 0.21 kg in 390 l. Weedkiller: Phenmedipham at 1.1 kg in 340 l.

Seed: Potatoes: Pentland Crown.  
 Barley: Julia, dressed with ethirimol, sown at 160 kg.  
 Sugar beet: Klein E, sown at 8.0 kg.

#### Cultivations, etc.:-

All series: Dazomet and benomyl applied, and these plots only, rotary cultivated: 27 Nov, 1973. DD injected, all plots spring-time harrowed: 17 Dec.

Potatoes: Ploughed twice: 23 Nov, 1973, 6 Mar, 1974. Spring-time cultivated: 28 Mar. PK and N applied, spring-time cultivated: 2 Apr. Rotary cultivated, potatoes planted: 11 Apr. Weedkiller applied: 15 May. Rotary ridged: 11 June. Fungicide with insecticide applied: 19 July. Fungicide applied: 7 Aug. Haulm mechanically destroyed: 11 Sept. Sprayed with undiluted BOV at 170 l: 18 Sept. Lifted: 1 Oct.

Barley: Ploughed: 12 Oct, 1973. Spring-time cultivated: 23 Nov. Ploughed: 6 Mar, 1974. Spring-time cultivated: 28 Mar. N applied: 29 Mar. Spring-time cultivated with crumbler, seed sown: 1 Apr. Weedkiller applied: 17 May. Combine harvested: 12 Sept.

Sugar beet: Subsoiled, tines 140 cm apart and 50 cm deep: 18 Sept, 1973. Magnesian limestone applied: 11 Oct. Ploughed twice: 12 Oct, 6 Mar, 1974. Spring-time cultivated: 28 Mar. PK and N applied, spring-time cultivated: 2 Apr. Power harrowed, rolled, seed sown: 3 Apr. Weedkiller applied: 26 May. Singled: 3-4 June. Insecticide applied: 5 June. Boron and insecticide applied: 24 June. Lifted: 30 Oct - 4 Nov.

NOTE: Soil samples were taken after harvest for eelworm counts.

#### Standard errors per sub plot.

|                                             |                          |
|---------------------------------------------|--------------------------|
| Potatoes, total tubers: tonnes/hectare:     | 7.55 or 15.8% (18 d.f.)  |
| Barley, grain: tonnes/hectare:              | 0.516 or 13.6% (18 d.f.) |
| Sugar beet, roots (washed): tonnes/hectare: | 2.73 or 14.9% (18 d.f.)  |
| total sugar: tonnes/hectare:                | 0.400 or 14.5% (18 d.f.) |

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TABLES OF MEANS

POTATOES

CHEMICAL

|      | O                            | DD(P) | DD(SB) | DD(B) | DD(ALL) | DAZ(ALL) | BEN(ALL) | Mean |
|------|------------------------------|-------|--------|-------|---------|----------|----------|------|
| N    | TOTAL TUBERS: TONNES/HECTARE |       |        |       |         |          |          |      |
| 75   | 32.0                         | 32.5  | 36.2   | 35.6  | 38.0    | 40.4     | 42.0     | 36.7 |
| 150  | 37.2                         | 44.1  | 53.0   | 42.6  | 55.5    | 62.6     | 59.7     | 50.7 |
| 225  | 39.0                         | 53.9  | 50.8   | 57.3  | 65.0    | 71.0     | 56.9     | 56.3 |
| Mean | 36.1                         | 43.5  | 46.7   | 45.2  | 52.8    | 58.0     | 52.8     | 47.9 |

STANDARD ERRORS OF DIFFERENCES

| CHEMICAL | N*   |
|----------|------|
| CHEMICAL |      |
| 4.36     | 7.55 |

\* Within the same level of N only

PERCENTAGE WARE: 3.81 CM (1.5 INCH) RIDDLE

|      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|
| N    |      |      |      |      |      |      |      |      |
| 75   | 98.3 | 97.9 | 98.2 | 97.3 | 98.3 | 98.4 | 97.7 | 98.0 |
| 150  | 98.1 | 99.5 | 98.5 | 99.5 | 97.7 | 99.0 | 97.9 | 98.6 |
| 225  | 98.9 | 98.1 | 98.5 | 98.5 | 98.3 | 97.9 | 99.0 | 98.4 |
| Mean | 98.4 | 98.5 | 98.4 | 98.4 | 98.1 | 98.4 | 98.2 | 98.4 |

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BARLEY

CHEMICAL

|                       | O    | DD(P) | DD(SE) | DD(B) | DD(ALL) | DAZ(ALL) | BEN(ALL) | Mean |
|-----------------------|------|-------|--------|-------|---------|----------|----------|------|
| GRAIN: TONNES/HECTARE |      |       |        |       |         |          |          |      |
| N                     |      |       |        |       |         |          |          |      |
| 38                    | 2.28 | 2.78  | 2.02   | 2.26  | 1.49    | 3.65     | 2.66     | 2.45 |
| 75                    | 4.35 | 4.44  | 4.54   | 3.55  | 4.13    | 3.99     | 4.66     | 4.24 |
| 113                   | 4.98 | 4.34  | 4.96   | 4.66  | 4.11    | 5.06     | 4.62     | 4.68 |
| Mean                  | 3.87 | 3.85  | 3.84   | 3.49  | 3.24    | 4.23     | 3.98     | 3.79 |

STANDARD ERRORS OF DIFFERENCES

| CHEMICAL | N*       |
|----------|----------|
|          | CHEMICAL |
| 0.298    | 0.516    |

\* Within the same level of N only

Mean D.M. % 84.1

|      |                       |      |      |      |      |      |      |      |
|------|-----------------------|------|------|------|------|------|------|------|
|      | STRAW: TONNES/HECTARE |      |      |      |      |      |      |      |
| N    |                       |      |      |      |      |      |      |      |
| 38   | 1.49                  | 1.78 | 1.84 | 1.72 | 1.48 | 2.61 | 2.05 | 1.85 |
| 75   | 2.22                  | 2.60 | 2.47 | 2.13 | 2.13 | 2.46 | 2.76 | 2.40 |
| 113  | 2.64                  | 2.26 | 2.77 | 2.52 | 2.06 | 2.79 | 2.53 | 2.51 |
| Mean | 2.12                  | 2.21 | 2.36 | 2.13 | 1.89 | 2.62 | 2.44 | 2.25 |

Mean D.M. % 82.0

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SUGAR BEET

CHEMICAL

|                                | O    | DD(P) | DD(SB) | DD(B) | DD(ALL) | DAZ(ALL) | BEN(ALL) | Mean |
|--------------------------------|------|-------|--------|-------|---------|----------|----------|------|
| ROOTS (WASHED): TONNES/HECTARE |      |       |        |       |         |          |          |      |
| N                              |      |       |        |       |         |          |          |      |
| 75                             | 13.0 | 14.4  | 15.1   | 16.0  | 14.2    | 19.0     | 14.0     | 15.1 |
| 150                            | 17.5 | 21.0  | 18.0   | 20.6  | 20.5    | 20.7     | 18.7     | 19.6 |
| 225                            | 21.6 | 21.0  | 20.2   | 22.6  | 16.2    | 20.8     | 20.6     | 20.4 |
| Mean                           | 17.4 | 18.8  | 17.8   | 19.7  | 17.0    | 20.2     | 17.7     | 18.4 |

STANDARD ERRORS OF DIFFERENCES

CHEMICAL N\*  
CHEMICAL

1.58 2.73

\* Within the same level of N only

|      | SUGAR PERCENTAGE |      |      |      |      |      |      |      |
|------|------------------|------|------|------|------|------|------|------|
| N    |                  |      |      |      |      |      |      |      |
| 75   | 15.8             | 15.4 | 15.3 | 15.0 | 14.8 | 15.6 | 15.5 | 15.4 |
| 150  | 15.4             | 15.4 | 15.1 | 15.1 | 14.7 | 14.8 | 15.3 | 15.1 |
| 225  | 14.8             | 14.7 | 14.3 | 14.3 | 13.9 | 15.1 | 15.0 | 14.6 |
| Mean | 15.3             | 15.2 | 14.9 | 14.8 | 14.5 | 15.2 | 15.3 | 15.0 |

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SUGAR BEET

TOTAL SUGAR: TONNES/HECTARE

CHEMICAL

|      | O    | DD(P) | DD(SB) | DD(B) | DD(ALL) | DAZ(ALL) | BEN(ALL) | Mean |
|------|------|-------|--------|-------|---------|----------|----------|------|
| N    |      |       |        |       |         |          |          |      |
| 75   | 2.06 | 2.22  | 2.31   | 2.39  | 2.11    | 2.97     | 2.17     | 2.32 |
| 150  | 2.70 | 3.24  | 2.71   | 3.11  | 3.01    | 3.08     | 2.86     | 2.96 |
| 225  | 3.20 | 3.09  | 2.89   | 3.23  | 2.26    | 3.14     | 3.09     | 2.98 |
| Mean | 2.65 | 2.85  | 2.64   | 2.91  | 2.46    | 3.06     | 2.71     | 2.75 |

STANDARD ERRORS OF DIFFERENCES

CHEMICAL N\*  
CHEMICAL

0.231 0.400

\* Within the same level of N only