

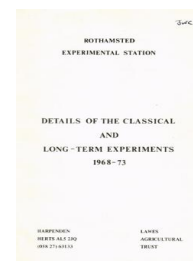
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Details of the Classical and Long-term Experiments 1968-73

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R/RN/8 Cultivation/WEEDKILLER - Wheat, Barley, Potatoes, Beans

Rothamsted Research

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CULTIVATION – WEEDKILLER
ROTHAMSTED GREAT HARPENDEN I
(R/RN/8)

The Rothamsted experiment has been continued, up to 1972 as set out in 'Details 1967, pp. 91-94. Winter wheat was grown each year except 1971 when this crop was spring-sown and spring beans were grown throughout. From 1973 only one phase of the rotation is maintained each year, starting with winter wheat to be followed by potatoes, barley, spring beans.

Treatments (from 1961 unless stated otherwise)

(1) *Whole plots.* All combinations of:

- (i) Primary cultivation for each crop by: mouldboard plough (P), rotary cultivator (R), deep-tine cultivator (T).
- (ii) Post planting weed-control in beans and potatoes: mechanical (no weedkiller) (M), persistent weedkiller with little or no cultivation (SX), persistent weedkiller (SY) (differing from SX in material, time of application or subsequent cultivation).

(2) '*Reserve plots*' have been used in addition:

- (a) (Since 1964) for spring sown crops, no cultivation in autumn or winter, rotary cultivated before sowing; for autumn sown crops: as treatment P. These crops are sprayed as X.
- (b) (Since 1966) all crops receive the minimum cultivations necessary to produce a seedbed. Details vary according to conditions and paraquat may be used at any stage in the rotation (see below). These crops are sprayed as X and cereals treated as H sub-plots. Since 1969 the cereal straw has been burnt and bean straw raked off as there has been insufficient to burn.
- (c) (Since 1969). 'Standard cultivations' applied where primary cultivations considered best for the crop are used:
Potatoes: plough in autumn, rotary cultivate in spring, weedkiller and rotary ridging as SY plots.
Barley: deep time cultivate, treat with same weed-killer as H plots.
Beans: plough, weedkiller as SX plots.
Wheat: plough or deep-tine cultivate, treat with same weedkiller as H sub-plots.

NOTE: Herbicide treatments on wheat and barley were omitted in 1969 on C plots.

(3) *Half-plots.*

Weed control in wheat and barley: no spray (0) v. post emergence herbicide (H).

(Since 1968) 0 v. paraquat (G) applied to stubbles after beans, wheat and barley applied cumulatively on half plots.

Rates: 1968-71 0 v. 0.84 kg ion
 1972 & 73 0 v. 0.56 kg ion

- NOTE:** (i) Paraquat at 1.68 kg ion applied to all bean stubbles in September 1970 instead of to half plots.
(ii) the interaction (0 v. H) x (0 v. G) is confounded with the block difference in each series.

Treatments from 1973

One series only is retained, and the treatments are continued except for reserve plots A, B and C which are now:

- Whole plots A Spike rotary cultivated direct on stubble
B Shallow ploughed
C Standard farm practice
Half plots A and C test (0 v. H) (0 v. G)
B tests (0 v. H) with basal G.

Weedkillers used 1968-73

- (a) Persistent weedkillers for beans and potatoes (a.i./ha)
- | | | |
|-------------|-----------------|--|
| | Beans | Potatoes |
| 1968 & 1969 | Simazine 1.1 kg | Linuron 0.84 kg with paraquat 0.42 kg ion. |
| 1970 | Simazine 1.1 kg | Linuron 1.68 kg |
| | SX,A,B,C, plots | SY plots |
| 1971 | Simazine 1.1 kg | Dinoseb acetate 2.8 kg |
| 1972 | Simazine 1.1 kg | Dinoseb acetate 2.8 kg |
| | | Linuron 0.84 kg with paraquat 0.84 kg ion |
| | | Linuron 0.84 kg with paraquat 0.42 kg ion |
- (b) Non-persistent weedkiller to wheat and barley (H sub-plots, B and C reserve plots)
- | | | |
|-------------|--|---|
| | Wheat | Barley |
| 1968 & 1969 | Mecoprop with 2,4-D. (9.8 l 'Methoxone Extra') | Mecoprop with 2,4-D (8.4 l 'Methoxone Extra') |
| 1970 | Mecoprop with 2,4-D (6.3 l 'Methoxone 4X') | Mecoprop with 2,4-D (5.6 l 'Methoxone 4X') |
| 1971 | Ioxynil at 0.84 kg with 2.52 kg mecoprop | Ioxynil at 0.84 kg with 2.52 kg mecoprop |
| 1972 & 1973 | Ioxynil at 0.63 kg with 1.90 kg mecoprop | Ioxynil at 0.53 kg with 1.60 kg mecoprop |
- (c) Weedkillers applied in autumn and winter:
- 1967-69 Sodium trichloroacetate (40 kg split dressing) before barley.
1969-70 Paraquat (0.84 kg) before wheat, beans, potatoes on B plots.
1970-71 Paraquat (0.84 kg) before beans and potatoes on B plots. (See above re treatment of bean stubble before wheat)
1971-72 Sodium trichloroacetate (40 kg split dressing) before barley.
Paraquat (0.56 kg) before wheat, beans, potatoes on B plots.

NOTE: The rates for certain weedkillers given above differ from those given in the reference and should be taken as the correct ones.

Standard manuring kg/ha

| | | |
|----------|-------------|-----------------------------|
| Beans | 1968-72 | (0-14-28) at 410 |
| Potatoes | 1968-72 | (13-13-20) at 1250 |
| Barley | 1968-72 | (25-10-10) at 377 |
| Wheat | 1968 & 1969 | (6-15-15) at 314 plus 75 N |
| | 1970 | (8-20-) at 235 plus 75 N |
| | 1971 | (25-10-10) at 377 |
| | 1972 | (10-24-24) at 251 plus 75 N |
| | 1973 | (10-24-24) at 251 plus 95 N |

Liming

Ground chalk t/ha applied autumn 1967

| | | |
|-----------|------------------------|-------------|
| Beans 2.9 | Wheat and potatoes 5.8 | Barley 11.6 |
|-----------|------------------------|-------------|

Varieties

| | | |
|----------|-------------|--------------------------------|
| Beans | 1968 & 1969 | Maris Bead |
| | 1970 | Maris Bead |
| | 1971 | Maris Bead |
| | 1972 | Maris Bead |
| | 1973 | — |
| Wheat | 1968 & 1969 | Capelle |
| | 1970 | Capelle |
| | 1971 | Kolibri |
| | 1972 | Cappelle |
| | 1973 | Bouquet |
| Potatoes | 1968 & 1969 | Pentland Dell Irish A. |
| | 1970 | Pentland Dell Once grown |
| | 1971 | Pentland Crown Irish A |
| | 1972 | Pentland Crown Once grown |
| | 1973 | — |
| Barley | 1968 & 1969 | Maris Badger |
| | 1970 | Julia |
| | 1971 | Julia |
| | 1972 | Julia (dressed with ethirimol) |
| | 1973 | — |

Other Chemicals to beans and potatoes

| | | |
|---------|------------------|---|
| 1968 | Beans | Potatoes |
| | — | Mancozeb and Demeton-S-methyl Tops burnt off with B.O.V. |
| 1969-71 | Demeton-S-methyl | Mancozeb and Demeton-S-methyl, B.O.V. |
| | | Mancozeb and Demeton-S-methyl, B.O.V. |
| 1972 | Phorate | Mancozeb and Demeton-S-methyl, B.O.V. |

Areas harvested

| | | | |
|----------|-------------------|----------------|---------|
| Beans | 0.00405 – 0.00488 | Wheat & Barley | 0.00434 |
| Potatoes | 0.00217 – 0.00434 | | |

Soil series

Shallow Batcombe and Batcombe series with small area of Charity complex.

Reference

1. Moffatt, J.R. (1975)
Cultivation weedkiller Experiment, Rothamsted, 1961-72.
Rothamsted Experimental Station. Report for 1974, Part 2, 155-170

Cultivation Weedkiller Experiment

Two statements regarding treatments applied included in the article in the *Report for 1974, Part 2*, appear to conflict with the records in the White Book.

1. Page 157

'in all years from 1965, except 1969 and 1970, the ground after potatoes for barley was sprayed with TCA at 20 lb/acre In 1966 the bean stubble was sprayed with aminotriazole at 2 gal/acre in 40 gal.'

The rates recorded were 'Tecane at 20 lbs per acre on two occasions each year. Tecane is reported to contain 90% acid equivalent i.e. approx. twice amount mentioned in the article was applied. The material applied to the bean stubble was 'Weedazol T-L' at 2 gal/acre. 2 gal contains 4 lb aminotriazole and 3.7 lb ammonium thiocyanate 'Results 1967' and 'Details 1967' Table 43. So the statement should refer to the material used or the rate should be altered.

2. Page 161

'The herbicides used were:

| | |
|---------|---|
| 1964-65 | linuron (2 lb/acre) plus paraquat (0.75 lb/acre) |
| 1966-68 | linuron (1 lb/acre) plus paraquat (0.37 lb/acre) |
| 1969-72 | linuron (1 lb/acre) plus paraquat (0.75 lb/acre)' |

The statement for 1964-65 agrees with the records for the SY plots but does not mention the SX plots which received 2 lb prometryne plus 0.75 lb paraquat. (*Details 1967, Table 41*).

The applications recorded in the White Book are:

| Year | Product | Active materials |
|-------------|--|-------------------------------------|
| 1966 & 1967 | 3 pints Gramoxone W + 2 lb linuron 50 | 0.75 lb paraquat 1 lb linuron |
| 1968 & 1969 | 1½ pints Gramoxone W + 1½ lb linuron 50 | 0.37 lb paraquat 0.75 lb linuron |
| 1970 | 3 lb linuron 50 | 1.5 lb linuron |
| 1971 | 3 pt. Gramoxone W 1½ lb linuron 50 | 0.75 lb paraquat 0.75 lb linuron |
| 1972 | 1½ pt Gramoxone W 1½ pt linuron 50 | 0.37 lb paraquat 0.75 lb linuron |

There are therefore some differences from the amounts in the article in all these years.