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93/R/CS/399 Cover Crops and N Cycling - Forage Rape, Tumbledown, W. Barley, S. Barley

Rothamsted Research

Rothamsted Research (1994) *93/R/CS/399 Cover Crops and N Cycling - Forage Rape, Tumbledown, W. Barley, S. Barley* ; Yields Of The Field Experiments 1993, pp 102 - 104 - **DOI:**

<https://doi.org/10.23637/ERADOC-1-48>

93/R/CS/399

COVER CROPS AND N CYCLING

Object: To assess how effectively cover crops take up nitrogen and to assess how much of that nitrogen is subsequently made available to the following crop - Webbs.

Sponsors: P.R. Poulton, D.G. Christian, A.J. Macdonald.

The first year, forage rape, rye, tumbledown, w. and s. barley.

Design: 3 blocks of 5 plots split into 2 sub plots.

Whole plot dimensions: 9.0 x 12.0.

Treatments:

Whole plots

1. **LAND TRT** Cover crops, sown in autumn, tumbledown and fallow.
All plots ploughed in spring and sown to s. barley:

FALLOWSB	Fallow
FO RA SB	Forage rape
RYE SB	Rye
TUMBDN SB	Tumbledown

Sub plots

2. **N** Nitrogen fertilizer (kg N) to s. barley:

0
75

plus one extra treatment

Whole plot

1. **EXTRA**

W BARLEY W. barley, sown in autumn, taken to maturity

Sub plot

2. **N EXTRA** Nitrogen fertilizer (kg N) to w. barley:

0
150

NOTE: **LAND TRT TUMBDN SB** was given 50 kg of seed from the previous s. barley crop to ensure volunteers.

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Experimental diary:

- 20-Aug-92 : T : **LAND TRT** FO RA SB, RYE SB, TUMBDN SB: Shallow cultivated with Bomford Dynadrive.
- 21-Aug-92 : T : **LAND TRT** FO RA SB: Forage rape broadcast at 30 kg.
: T : **LAND TRT** RYE SB: Amando broadcast at 180 kg.
: T : **LAND TRT** TUMBDN SB: S. barley (cv Alexis) broadcast at 50 kg.
: T : **LAND TRT** FO RA SB, RYE SB, TUMBDN SB: Rolled.
- 10-Sep-92 : T : **LAND TRT** FALLOWSB: Ploughed.
: T : **EXTRA** W BARLEY: Ploughed.
- 11-Sep-92 : T : **EXTRA** W BARLEY: Disced, rotary harrowed twice, Puffin, dressed Cerevax, drilled at 380 seeds per square metre.
- 16-Sep-92 : T : **LAND TRT** FALLOWSB: Rolled.
: T : **EXTRA** W BARLEY: Rolled.
- 19-Oct-92 : T : **LAND TRT** FO RA SB: Pilot at 75 ml with Cropspray 11E at 2.0 l in 200 l.
- 05-Mar-93 : T : **LAND TRT** FALLOWSB, FO RA SB, RYE SB, TUMBDN SB: Ploughed.
- 08-Mar-93 : T : **LAND TRT** FALLOWSB, FO RA SB, RYE SB, TUMBDN SB: Rotary harrowed twice, Alexis, dressed Cerevax Extra, drilled at 350 seeds per square metre.
- 14-Apr-93 : T : **N EXTRA** 150: 27% N at 556 kg.
- 06-May-93 : T : **N** 75: 27% N at 278 kg.
- 10-May-93 : B : Ally at 30 g and Starane 2 at 1.0 l in 200 l.
- 13-Aug-93 : B : Combine harvested.

Previous crops: S. barley 1991 and 1992.

NOTE: Plots were labelled with 15N in autumn. Crop, soil and soil water samples were taken for N analysis at various times during the season.

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GRAIN TONNES/HECTARE

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

SPRING BARLEY

	N	NONE	APPLIED	Mean
LAND TRT				
FALLOWSB		2.49	3.65	3.07
FO RA SB		2.37	2.62	2.50
RYE SB		1.99	2.76	2.38
TUMBDN SB		2.74	3.21	2.98
Mean		2.40	3.06	2.73

WINTER BARLEY

N EXTRA	0	150	Mean
	1.61	3.24	2.42

GRAND MEAN 2.67

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

LAND TRT	N	LAND TRT N & N EXTRA
0.296	0.148	0.362

Except when comparing means with the same level(s) of
CROPS 0.295

***** Stratum standard errors and coefficients of variation *****

Stratum	d.f.	s.e.	cv%
BLOCK.WP	8	0.362	13.6
BLOCK.WP.SP	10	0.362	13.6

GRAIN MEAN DM% 84.7

SUB PLOT AREA HARVESTED 0.00082