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

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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