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90/W/CS/342 Catch Crops - Clover, Forage Rape, Phacelia, Ryegrass, Rye, Mustard, W. Wheat, S. Barley

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90/W/CS/342

CATCH CROPS

Object: To compare a range of catch crops for their ability to take up N during the autumn, to measure rates of mineralization of N after incorporating them in spring and to measure their effects on the yield of a subsequent spring barley crop - Woburn, Road Piece.

Sponsors: D.S. Powlson, D.G. Christian.

The first year, clover, forage rape, Phacelia, ryegrass, rye, mustard, w. wheat, s. barley.

Design: 3 randomised blocks of 11 plots split into 2 sub plots criss cross.

Whole plot dimensions: 8.0 x 10.0.

Treatments: All combinations of:-

Whole plots

1. **CROPS** Catch crops and subsequent crops:

Sown 11 Aug, 1989, ploughed in on 6 Mar, 1990,
s. barley sown 8 Mar:

AL CL SB	Alsike clover
FA CU SB	Fallow, cultivated to keep soil bare
FA UC SB	Fallow, uncultivated, weeds and volunteers allowed to grow
FO RA SB	Forage rape
PH TA SB	Phacelia tanacetifolia
RY GR SB	Ryegrass
RYE SB	Rye
WH MU SB	White mustard
WM+RY SB	White mustard + rye

Sown 5 Oct, 1989, ploughed in on 6 Mar, 1990, s. barley
sown 8 Mar:

WW SB	Winter wheat
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Sown 5 Oct, 1989, taken to normal maturity:

W WHEAT	Winter wheat
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Sub plots

2. **N** Nitrogen fertilizer on 8 Mar, 1990 (kg N) as 'Nitro-Chalk' (27% N):

0
50

Standard applications: Manure, to w. wheat taken to maturity: 150 kg N as 'Nitro-Chalk'. Weedkillers to all w. wheat: Glyphosate at 0.36 kg in 200 l. Isoproturon at 1.5 kg with isoxaben at 75 g in 220 l.

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Basal applications: Weedkillers: Bromoxynil at 0.24 kg and clopyralid at 0.05 kg with mecoprop at 1.8 kg in 220 l. Fungicide: Fenpropimorph at 0.75 kg in 220 l.

Seed: Alsike clover: Sown at 10 kg.
Forage rape: Giant, sown at 30 kg.
Phacelia tanacetifolia: Sown at 12 kg.
Ryegrass: Contessa, sown at 25 kg.
Rye: Halo, sown at 180 kg.
White mustard: Sown at 30 kg.
White mustard + rye: Sown at 30 and 180 kg respectively.
W. wheat: Mercia, sown at 180 kg.
S. barley: Blenheim, seed dressed triadimenol and fuberidazole, sown at 160 kg

Cultivations, etc.:-

All crops except w. wheat: Rotary cultivated twice, except on uncultivated fallow, seeds sown: 11 Aug, 1989. Deep-tine cultivated fallow only: 21 Sept. Ploughed: 6 Mar, 1990. Treatment N applied, rotary harrowed with crumbler attached, s. barley sown: 8 Mar. Weedkillers applied: 23 May. Fungicide applied: 24 May. Combine harvested: 9 Aug.

W. wheat: Rotary cultivated twice: 26 Sept, 1989. Glyphosate applied: 4 Oct. Seed sown and rolled: 5 Oct. Isoproturon and isoxaben applied: 11 Dec. Wheat not taken to maturity ploughed: 6 Mar, 1990. Remaining wheat, test N applied: 8 Mar, standard N applied: 6 Apr, bromoxynil, clopyralid and mecoprop applied: 23 May, fungicide applied: 24 May, combine harvested: 7 Aug.

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GRAIN TONNES/HECTARE

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

	N	0	50	Mean
CROP				
AL CL SB		2.38	3.04	2.71
FA CU SB		2.78	3.65	3.21
FA UC SB		2.87	4.01	3.44
FO RA SB		3.19	3.47	3.33
PH TA SB		3.45	1.96	2.71
RY GR SB		2.33	2.61	2.47
RYE SB		2.87	2.64	2.76
WH MU SB		2.42	3.23	2.82
WM+RY SB		2.49	3.94	3.21
WW SB		2.72	3.77	3.25
W WHEAT		5.34	5.38	5.36
Mean		2.99	3.43	3.21

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

CROP	CROP*
	N
0.531	0.75

* Within the same level of N only

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

Stratum	d.f.	s.e.	cv%
BLOCKN.BLOCK.WP	40	0.919	28.7

GRAIN MEAN DM% *

SUB PLOT AREA HARVESTED 0.00003