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93/W/M/1 Methods of Cover Crop Establishment - Mixed Crops

Rothamsted Research

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93/W/M/1

MIXED 1

METHODS OF COVER CROP ESTABLISHMENT

Object: To examine the effectiveness of a range of methods of establishing cover crops and their effect on a following crop of linseed - Woburn, Far Field II.

Sponsor: D.G. Christian.

W. barley, forage rape, then linseed.

Design: 3 blocks of 15 plots split into 2 sub plots.

Whole plot dimensions: 6.0 x 12.0

Treatments:

Whole plots

- | | |
|-------------|---|
| 1. CROP | Crop: |
| W BARLEY | Winter barley |
| F RAPE | Forage rape |
| 2. SOW METH | Method of sowing: |
| DISC | Disced, broadcast |
| DYNADRV | Rotary cultivated with Bomford Dynadrive, broadcast |
| DR DRILL | Direct drilled |
| 3. SOW DATE | Date of sowing: |
| HARV+2 | Two days after harvest of previous crop |
| END SEPT | Last week of September |

Sub plots

- | | |
|-------------|--|
| 4. SPRING N | Nitrogen fertilizer (kg N) in spring to linseed: |
| 0 | |
| 75 | |

plus 2 extra treatments

Whole plots

- | | |
|------------|--|
| 1. CROP BC | Crop broadcast into previous standing crop five days before harvest: |
| W BARLEY | Winter barley |
| F RAPE | Forage rape |

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Sub plots

2. **SPR N BC** Nitrogen fertilizer (kg N) in spring to linseed:

0
75

plus one extra plot

1. **CROP ST** Stubble from previous crop:

STUBBLE

Sub plot

2. **SPR N ST** Nitrogen fertilizer (kg N) in spring to linseed:

0
75

Experimental diary:

11-Aug-92 : T : **CROP BC W BARLEY**: Puffin, dressed Cerevax Extra, broadcast at 180 kg.
: T : **CROP BC F RAPE**: Ember broadcast at 30 kg.
18-Aug-92 : B : Combine harvested previous w. wheat.
21-Aug-92 : T : **SOW DATE HARV+2, SOW METH DISC**: Disced, harrowed.
: T : **SOW DATE HARV+2, SOW METH DYNADRIV**: Rotary cultivated with Bomford Dynadrive.
: T : **SOW DATE HARV+2, SOW METH DISC, DYNADRIV**: Puffin, dressed Cerevax Extra, sown at 180 kg, Ember, undressed, sown at 30 kg.
: T : **SOW DATE HARV+2, SOW METH DR DRILL**: Puffin, dressed Cerevax Extra, direct drilled at 180 kg, Ember, undressed, direct drilled at 30 kg.
30-Sep-92 : T : **SOW DATE END SEPT, SOW METH DR DRILL**: Puffin, dressed Cerevax Extra, drilled at 180 kg, Ember, undressed, drilled at 30 kg.
01-Oct-92 : T : **SOW DATE END SEPT, SOW METH DISC**: Disced, harrowed.
: T : **SOW DATE END SEPT, SOW METH DYNADRIV**: Rotary cultivated with Bomford Dynadrive, harrowed.
: T : **SOW DATE END SEPT, SOW METH DISC, DYNADRIV**: Puffin, dressed Cerevax Extra, broadcast at 180 kg, Ember, undressed, broadcast at 30 kg. Harrowed.
23-Apr-93 : B : Ploughed.
05-May-93 : B : Rotary harrowed, Antares, dressed Prelude 20LF, drilled at 650 seeds per square metre.
07-May-93 : T : **SPRING N 75, SPR N BC 75, SPR N ST 75**: 27% N applied at 278 kg.
15-Jun-93 : B : Ally at 30 g in 200 l.
02-Sep-93 : B : Barclay Desiquat at 3.0 l with Vassgro Spreader at 0.30 l in 300 l.
18-Oct-93 : B : Combine harvested.

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NOTE: Plant populations, nitrogen content and dry weights were measured in October, December, April and at harvest. Capsules were counted and thousand-grain weights were measured at harvest.

GRAIN TONNES/HECTARE

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

SOW METH	DISC	DYNADRIV	DR DRILL	Mean
CROP				
W BARLEY	1.05	0.99	1.10	1.05
F RAPE	1.07	1.03	0.98	1.03
Mean	1.06	1.01	1.04	1.04
SOW DATE	HARV+2	END SEPT	Mean	
CROP				
W BARLEY	1.08	1.01	1.05	
F RAPE	0.95	1.10	1.03	
Mean	1.02	1.05	1.04	
SOW DATE	HARV+2	END SEPT	Mean	
SOW METH				
DISC	1.11	1.01	1.06	
DYNADRIV	0.94	1.08	1.01	
DR DRILL	1.00	1.08	1.04	
Mean	1.02	1.05	1.04	
SPRING N	0	75	Mean	
CROP				
W BARLEY	0.83	1.26	1.05	
F RAPE	0.86	1.20	1.03	
Mean	0.85	1.23	1.04	
SPRING N	0	75	Mean	
SOW METH				
DISC	0.80	1.32	1.06	
DYNADRIV	0.91	1.11	1.01	
DR DRILL	0.83	1.25	1.04	
Mean	0.85	1.23	1.04	
SPRING N	0	75	Mean	
SOW DATE				
HARV+2	0.82	1.22	1.02	
END SEPT	0.87	1.24	1.05	
Mean	0.85	1.23	1.04	

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GRAIN TONNES/HECTARE

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

CROP	SOW METH	DISC		DYNADRIV		DR DRILL	
		HARV+2	END SEPT	HARV+2	END SEPT	HARV+2	END SEPT
W BARLEY		1.21	0.89	0.94	1.04	1.10	1.10
F RAPE		1.02	1.12	0.95	1.11	0.89	1.06

CROP	SOW METH	DISC		DYNADRIV		DR DRILL	
		HARV+2	END SEPT	HARV+2	END SEPT	HARV+2	END SEPT
W BARLEY	SPRING N	0	75	0	75	0	75
F RAPE		0.75	1.35	0.90	1.07	0.86	1.35
		0.85	1.29	0.91	1.15	0.80	1.15

CROP	SOW DATE	HARV+2		END SEPT	
		HARV+2	END SEPT	HARV+2	END SEPT
W BARLEY	SPRING N	0	75	0	75
F RAPE		0.85	1.32	0.82	1.20
		0.79	1.12	0.92	1.28

SOW METH	SOW DATE	HARV+2		END SEPT	
		HARV+2	END SEPT	HARV+2	END SEPT
DISC	SPRING N	0	75	0	75
DYNADRIV		0.82	1.41	0.77	1.24
DR DRILL		0.82	1.07	1.00	1.15
		0.82	1.18	0.84	1.32

CROP	SOW METH	SOW DATE	HARV+2		END SEPT	
			HARV+2	END SEPT	HARV+2	END SEPT
W BARLEY	DISC	SPRING N	0	75	0	75
	DYNADRIV		0.84	1.58	0.65	1.12
	DR DRILL		0.87	1.01	0.93	1.14
F RAPE	DISC		0.84	1.36	0.87	1.33
	DYNADRIV		0.80	1.23	0.90	1.35
	DR DRILL		0.77	1.13	1.06	1.17
			0.80	0.99	0.81	1.31

SPR N BC	0	75	Mean
CROP BC			
W BARLEY	0.75	0.96	0.85
F RAPE	0.87	1.17	1.02
Mean	0.81	1.06	0.94

SPR N ST	0	75	Mean
	0.62	1.06	0.84

GRAND MEAN 1.01

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GRAIN TONNES/HECTARE

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

	CROP	CROP BC	SPR N BC	SPR N ST
	0.064	0.157	0.052	0.129
	SOW METH	SOW DATE	SPRING N	CROP BC SPR N BC
	0.078	0.064	0.037	0.181
Except when comparing means with the same level(s) of				0.129
CROP BC				

	CROP	CROP	SOW METH	CROP
	SOW METH	SOW DATE	SOW DATE	SPRING N
	0.111	0.091	0.111	0.074
Except when comparing means with the same level(s) of				0.053
CROP				

	SOW METH	SOW DATE	CROP	CROP
	SPRING N	SPRING N	SOW METH	SOW METH
			SOW DATE	SPRING N
	0.091	0.074	0.157	0.128
Except when comparing means with the same level(s) of				
SOW METH	0.065			
SOW DATE		0.053		
CROP.SOW METH				0.091

	CROP	SOW METH	CROP
	SOW DATE	SOW DATE	SOW METH
	SPRING N	SPRING N	SOW DATE
			SPRING N
	0.105	0.128	0.181
Except when comparing means with the same level(s) of			
CROP.SOW DATE	0.074		
SOW METH.SOW DATE		0.091	
CROP.SOW METH.SOW DATE			0.129

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	28	0.192	19.0
BLOCK.WP.SP	30	0.158	15.7

MEAN DM% 85.2

SUB PLOT AREA HARVESTED 0.00099