

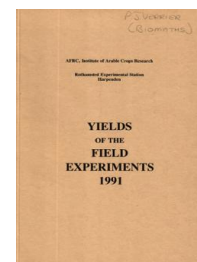
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### 91/R/CS/327 Control of Stem Nematode - Lucerne

#### Rothamsted Research

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91/R/CS/327

**CONTROL OF STEM NEMATODE**

**Object:** To study the effects of rates of carbofuran and row spacings on the incidence of stem nematode (*Ditylenchus dipsaci*) and yield of four varieties of lucerne - Long Hoos IV 3.

**Sponsor:** A.G. Whitehead.

The fourth year, lucerne.

For previous years see 88-90/R/CS/327.

**Design:** 2 randomised blocks of 20 plots.

**Whole plot dimensions:** 1.22 x 8.84.

**Treatments:** All combinations of:-

1. **VARIETY**                      Varieties:  
  
    EUROPE  
    EUVA  
    VELA  
    VERTUS
  
2. **CARBRATE**                    Residues of carbofuran (kg) applied in first year only:  
  
    (0.0)  
    (1.5)
  
3. **ROWSPACE**                   Spacings between rows (cm):  
  
    15                              15 (6 inches)  
    30                              30 (12 inches)

plus four extra treatments:

- CA3 R015**                      Varieties, given 3 kg carbofuran, on 15 cm row spacing, in first year only:
- EUROPE  
    EUVA  
    VELA  
    VERTUS

**NOTE:** Carbofuran was applied to lucerne on 7 Apr, 1988 at sowing.

**Basal applications:** Manures: (0:16:36) at 510 kg. Weedkillers: 2,4-DB at 1.3 kg in 220 l. Paraquat at 0.40 kg ion in 220 l. Fluazifop-P-butyl at 0.19 kg in 220 l.

**Cultivations, etc.:-** P and K applied: 16 Nov, 1990. 2,4-DB applied: 14 Dec. Paraquat applied: 7 Mar, 1991. Fluazifop-P-butyl applied: 10 Apr. Cut: 20 May, 9 July, 12 Aug and 3 Oct.

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1ST CUT (20/5/91) DRY MATTER TONNES/HECTARE

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

<b>CARBRATE</b>	(0.0)	(1.5)	Mean		
<b>VARIETY</b>					
EUROPE	2.67	1.88	2.28		
EUVA	4.48	3.59	4.04		
VELA	1.02	1.07	1.04		
VERTUS	5.80	5.11	5.45		
Mean	3.49	2.91	3.20		
<b>ROWSPACE</b>	15	30	Mean		
<b>VARIETY</b>					
EUROPE	2.62	1.94	2.28		
EUVA	4.34	3.73	4.04		
VELA	1.23	0.86	1.04		
VERTUS	5.92	4.99	5.45		
Mean	3.53	2.88	3.20		
<b>ROWSPACE</b>	15	30	Mean		
<b>CARBRATE</b>					
(0.0)	3.76	3.23	3.49		
(1.5)	3.30	2.53	2.91		
Mean	3.53	2.88	3.20		
<b>VARIETY</b>	<b>ROWSPACE</b>	15	30		
<b>CARBRATE</b>					
EUROPE	(0.0)	3.07	2.28		
	(1.5)	2.17	1.59		
EUVA	(0.0)	4.62	4.35		
	(1.5)	4.07	3.11		
VELA	(0.0)	1.19	0.86		
	(1.5)	1.27	0.86		
VERTUS	(0.0)	6.16	5.44		
	(1.5)	5.68	4.54		
<b>CA3 RO15</b>	EUROPE	EUVA	VELA	VERTUS	Mean
	2.10	3.88	1.32	4.56	2.96
GRAND MEAN	3.16				

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

<b>CA3 RO15</b>	<b>VARIETY</b>	<b>CARBRATE</b>	<b>ROWSPACE</b>
0.322	0.161	0.114	0.114
<b>VARIETY</b>	<b>VARIETY</b>	<b>CARBRATE</b>	<b>VARIETY</b>
<b>CARBRATE</b>	<b>ROWSPACE</b>	<b>ROWSPACE</b>	<b>CARBRATE</b>
			<b>ROWSPACE</b>
0.228	0.228	0.161	0.322

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**1ST CUT (20/5/91) DRY MATTER TONNES/HECTARE**

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	19	0.322	10.2
IST CUT MEAN DM%	15.7		

**2ND CUT (9/7/91) DRY MATTER TONNES/HECTARE**

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

	(0.0)	(1.5)	Mean		
<b>CARBRATE</b>					
<b>VARIETY</b>					
EUROPE	3.68	3.79	3.74		
EUVA	4.89	4.40	4.65		
VELA	3.34	3.67	3.51		
VERTUS	5.42	5.16	5.29		
Mean	4.34	4.26	4.30		
<b>ROWSPACE</b>	15	30	Mean		
<b>VARIETY</b>					
EUROPE	4.00	3.48	3.74		
EUVA	4.93	4.37	4.65		
VELA	3.88	3.13	3.51		
VERTUS	5.48	5.10	5.29		
Mean	4.57	4.02	4.30		
<b>ROWSPACE</b>	15	30	Mean		
<b>CARBRATE</b>					
(0.0)	4.58	4.09	4.34		
(1.5)	4.56	3.95	4.26		
Mean	4.57	4.02	4.30		
<b>VARIETY</b>	<b>ROWSPACE</b>	15	30		
EUROPE	(0.0)	3.89	3.48		
	(1.5)	4.11	3.47		
EUVA	(0.0)	5.11	4.68		
	(1.5)	4.76	4.05		
VELA	(0.0)	3.66	3.01		
	(1.5)	4.09	3.25		
VERTUS	(0.0)	5.67	5.18		
	(1.5)	5.30	5.03		
<b>CA3 RO15</b>	EUROPE	EUVA	VELA	VERTUS	Mean
	3.61	4.53	3.49	4.93	4.14
GRAND MEAN	4.27				

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2ND CUT (9/7/91) DRY MATTER TONNES/HECTARE

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

<b>CA3 RO15</b>	<b>VARIETY</b>	<b>CARBRATE</b>	<b>ROWSPACE</b>
0.311	0.155	0.110	0.110
<b>VARIETY</b>	<b>VARIETY</b>	<b>CARBRATE</b>	<b>VARIETY</b>
<b>CARBRATE</b>	<b>ROWSPACE</b>	<b>ROWSPACE</b>	<b>CARBRATE</b>
			<b>ROWSPACE</b>
0.220	0.220	0.155	0.311

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	19	0.311	7.3

2ND CUT MEAN DM% 17.4

3RD CUT (12/8/91) DRY MATTER TONNES/HECTARE

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

<b>CARBRATE</b>	(0.0)	(1.5)	Mean
<b>VARIETY</b>			
EUROPE	3.16	2.93	3.04
EUVA	3.79	3.56	3.67
VELA	2.34	2.59	2.46
VERTUS	4.14	4.03	4.08
Mean	3.36	3.28	3.32
<b>ROWSPACE</b>	15	30	Mean
<b>VARIETY</b>			
EUROPE	3.26	2.83	3.04
EUVA	3.66	3.69	3.67
VELA	2.72	2.20	2.46
VERTUS	4.25	3.92	4.08
Mean	3.47	3.16	3.32
<b>ROWSPACE</b>	15	30	Mean
<b>CARBRATE</b>			
(0.0)	3.48	3.24	3.36
(1.5)	3.47	3.08	3.28
Mean	3.47	3.16	3.32

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3RD CUT (12/8/91) DRY MATTER TONNES/HECTARE

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

VARIETY	ROWSPACE	15	30		
	CARBRATE				
EUROPE	(0.0)	3.42	2.90		
	(1.5)	3.09	2.76		
EUVA	(0.0)	3.63	3.95		
	(1.5)	3.69	3.44		
VELA	(0.0)	2.54	2.14		
	(1.5)	2.91	2.27		
VERTUS	(0.0)	4.31	3.97		
	(1.5)	4.19	3.87		
CA3 RO15	EUROPE	EUVA	VELA	VERTUS	Mean
	2.87	3.66	2.50	3.56	3.15
GRAND MEAN	3.28				

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

CA3 RO15	VARIETY	CARBRATE	ROWSPACE
0.387	0.194	0.137	0.137
VARIETY	VARIETY	CARBRATE	VARIETY
CARBRATE	ROWSPACE	ROWSPACE	CARBRATE
			ROWSPACE
0.274	0.274	0.194	0.387

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	19	0.387	11.8
3RD CUT MEAN DM%	16.3		

4TH CUT (3/10/91) DRY MATTER TONNES/HECTARE

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

CARBRATE	(0.0)	(1.5)	Mean
VARIETY			
EUROPE	1.79	1.62	1.70
EUVA	2.19	2.15	2.17
VELA	1.12	1.21	1.16
VERTUS	2.53	2.44	2.48
Mean	1.91	1.85	1.88

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4TH CUT (3/10/91) DRY MATTER TONNES/HECTARE

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

ROWSPACE	15	30	Mean
<b>VARIETY</b>			
EUROPE	1.91	1.49	1.70
EUVA	2.23	2.11	2.17
VELA	1.29	1.04	1.16
VERTUS	2.59	2.37	2.48
Mean	2.01	1.75	1.88

ROWSPACE	15	30	Mean
<b>CARBRATE</b>			
(0.0)	1.99	1.82	1.91
(1.5)	2.02	1.69	1.85
Mean	2.01	1.75	1.88

	ROWSPACE	15	30
<b>VARIETY</b>	<b>CARBRATE</b>		
EUROPE	(0.0)	2.06	1.51
	(1.5)	1.77	1.46
EUVA	(0.0)	2.13	2.26
	(1.5)	2.34	1.96
VELA	(0.0)	1.20	1.03
	(1.5)	1.37	1.05
VERTUS	(0.0)	2.59	2.47
	(1.5)	2.60	2.28

CA3 RO15	EUROPE	EUVA	VELA	VERTUS	Mean
	1.58	2.23	1.29	2.38	1.87

GRAND MEAN 1.88

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

CA3 RO15	VARIETY	CARBRATE	ROWSPACE
0.174	0.087	0.062	0.062
VARIETY	VARIETY	CARBRATE	VARIETY
CARBRATE	ROWSPACE	ROWSPACE	CARBRATE
0.123	0.123	0.087	0.174

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	19	0.174	9.3
4TH CUT MEAN DM%	20.8		

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**TOTAL OF 4 CUTS DRY MATTER TONNES/HECTARE**

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

<b>CARBRATE</b>	(0.0)	(1.5)		Mean	
<b>VARIETY</b>					
EUROPE	11.31	10.22		10.76	
EUVA	15.35	13.71		14.53	
VELA	7.81	8.54		8.18	
VERTUS	17.89	16.74		17.32	
Mean	13.09	12.30		12.70	
<b>ROWSPACE</b>	15	30		Mean	
<b>VARIETY</b>					
EUROPE	11.79	9.73		10.76	
EUVA	15.17	13.90		14.53	
VELA	9.12	7.24		8.18	
VERTUS	18.24	16.39		17.32	
Mean	13.58	11.81		12.70	
<b>ROWSPACE</b>	15	30		Mean	
<b>CARBRATE</b>					
(0.0)	13.81	12.38		13.09	
(1.5)	13.35	11.25		12.30	
Mean	13.58	11.81		12.70	
<b>VARIETY</b>	<b>ROWSPACE</b>	15	30		
<b>CARBRATE</b>					
EUROPE	(0.0)	12.44	10.18		
	(1.5)	11.14	9.29		
EUVA	(0.0)	15.47	15.24		
	(1.5)	14.86	12.56		
VELA	(0.0)	8.59	7.04		
	(1.5)	9.65	7.44		
VERTUS	(0.0)	18.73	17.05		
	(1.5)	17.76	15.72		
<b>CA3 RO15</b>	EUROPE	EUVA	VELA	VERTUS	Mean
	10.16	14.30	8.60	15.42	12.12
<b>GRAND MEAN</b>	12.58				

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

<b>CA3 RO15</b>	<b>VARIETY</b>	<b>CARBRATE</b>	<b>ROWSPACE</b>
0.929	0.465	0.329	0.329
<b>VARIETY</b>	<b>VARIETY</b>	<b>CARBRATE</b>	<b>VARIETY</b>
<b>CARBRATE</b>	<b>ROWSPACE</b>	<b>ROWSPACE</b>	<b>CARBRATE</b>
			<b>ROWSPACE</b>
0.657	0.657	0.465	0.929



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TOTAL OF 4 CUTS DRY MATTER TONNES/HECTARE

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	19	0.929	7.4
TOTAL OF 4 CUTS MEAN DM%	17.5		
PLOT AREA HARVESTED	0.00045		