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# Yields of the Field Experiments 1980

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## 80/R/CS/203 Species Mixtures and Phialophora

### Rothamsted Research

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80/R/CS/203

SPECIES MIXTURES AND PHIALOPHORA

Object: To study the effects of lucerne, grass and clover, singly and in mixtures, and of soil inoculation on populations of *Phialophora radicola* *graminicola* (Prg) and on take-all (*Gaeumannomyces graminis*) and yield of following w. wheat crops - Stubbings.

Sponsors: E. Lester, D.B. Slope, R.J. Gutteridge.

The fourth year, w. wheat.

Design: 4 randomised blocks of 9 plots, split into 4.

Whole plot dimensions: 4.27 x 27.1.

Treatments: All combinations of:-

1. Whole plots

CRP INOC	Crops in 1977 and 1978 (all w. wheat 1979 & 1980) and inoculation:-	
	1977	1978
C C	White clover	White clover
G G	Ryegrass	Ryegrass
GC GC	Ryegrass/white clover mixture	Ryegrass/white clover
LU LU	Lucerne	Lucerne
LU LU I	Lucerne	Lucerne + Prg inoculum to 1979 wheat
GLU GLU	Ryegrass/lucerne in alternate rows	Ryegrass/lucerne
W G	Spring wheat	Ryegrass, sown into spring wheat stubble
WG G	Spring wheat undersown with ryegrass	Ryegrass
WGI G	Spring wheat, inoculated Prg, undersown with ryegrass	Ryegrass

2. Sub plots

N	Nitrogen fertiliser (kg N) in 1979 & 1980, cumulative:
0	
50	
100	
150	

NOTE: The inoculum used for the I treatments was an agar culture of Prg mixed with sand. It was broadcast and power harrowed into the soil before sowing.

Basal applications: Manures: (0:20:20) at 250 kg, combine drilled.  
Weedkiller: Methabenzthiazuron at 3.1 kg in 220 l.

Seed: Flanders, sown at 200 kg.

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Cultivations, etc.:- Ploughed: 12 Sept, 1979. Rotary harrowed: 4 Oct.  
Seed sown: 5 Oct. Methabenzthiazuron applied: 8 Oct. N applied: 14  
Apr, 1980. Combine harvested: 20 Aug.

NOTE: Estimates of take-all and Phialophora were made in April and  
early July. Bio-assays of soils for take-all and Phialophora were  
made after harvest, before ploughing.

GRAIN TONNES/HECTARE

\*\*\*\*\* TABLES OF MEANS \*\*\*\*\*

	N	0	50	100	150	MEAN
CRP INOC						
C C		3.57	5.83	7.75	7.70	6.21
G G		4.80	5.94	7.33	7.79	6.47
GC GC		3.93	6.40	7.03	7.97	6.33
LU LU		3.86	6.43	7.23	7.88	6.35
LU LU I		3.92	5.53	7.29	7.88	6.15
GLU GLU		3.80	5.49	7.30	7.93	6.13
W G		3.75	5.63	6.84	7.54	5.94
WG G		4.13	6.57	6.86	7.67	6.31
WGI G		4.02	6.46	7.39	7.75	6.41
MEAN		3.98	6.03	7.22	7.79	6.26

\*\*\*\*\* STANDARD ERRORS OF DIFFERENCES OF MEANS \*\*\*\*\*

TABLE	CRP INOC	N	CRP INOC
			N
SED	0.180	0.141	0.408
EXCEPT WHEN COMPARING MEANS WITH SAME LEVEL(S) OF:			
CRP INOC			0.423

\*\*\*\*\* STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION \*\*\*\*\*

STRATUM	DF	SE	CV%
BLOCK.WP	24	0.254	4.1
BLOCK.WP.SP	81	0.599	9.6

GRAIN MEAN DM% 83.3

SUB PLOT AREA HARVESTED 0.00128

80/R/CS/211

FACTORS AFFECTING EYESPOT

Object: To study the effects of a range of treatments on the incidence of eyespot (*Pseudocercosporella herpotrichoides*) and on the yield of w. wheat - Meadow.

Sponsors: R.D. Prew, A. Bainbridge.

The third year, w. wheat.

For previous years see 78-79/R/CS/211.

Design: 2 randomised blocks of 2 whole plots split into 6 sub plots split into 3 sub sub plots.

Whole plot dimensions: 94.0 x 9.14.

Treatments: All combinations of:-

Whole plots

- |          |                               |
|----------|-------------------------------|
| 1. STRAW | Treatment of straw in autumn: |
| BURNT    | Burnt on site after spreading |
| CARTED   | Baled and carted off          |

Sub plots

- |             |                                       |
|-------------|---------------------------------------|
| 2. DRILLING | Cultivations and drilling in autumn:  |
| CNVNTIAL    | Cultivated and conventionally drilled |
| DIRECT      | Uncultivated, direct drilled          |
- 
- |             |                    |
|-------------|--------------------|
| 3. SOW DATE | Dates of sowing:   |
| 17 SEPT     | 17 September, 1979 |
| 15 OCT      | 15 October         |
| 9 NOV       | 9 November         |

Sub sub plots

- |             |                  |
|-------------|------------------|
| 4. SEEDRATE | Seed rates (kg): |
| 100         |                  |
| 150         |                  |
| 200         |                  |

NOTE: All treatments were cumulative.

Basal applications: Manures: (10:23:23) at 250 kg, combine drilled. 'Nitro-Chalk' at 500 kg. Weedkillers: Paraquat at 0.84 kg ion in 220 l (to DIRECT only). Metoxuron at 4.4 kg in 220 l. Mecoprop at 2.5 l in 250 l. Insecticide: Demeton-s-methyl at 0.24 kg in 250 l.

Seed: Armada.



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Cultivations, etc.:— Straw treatments applied: 7 Sept, 1979. CNVNTIAL treatments ploughed, paraquat applied to DIRECT treatments only: 13 Sept. CNVNTIAL 17 SEPT treatments harrowed. DIRECT 17 SEPT disc harrowed three times. Seed sown on all 17 SEPT plots: 17 Sept. CNVNTIAL 15 OCT treatments rotary harrowed, DIRECT 15 OCT treatments disc harrowed twice, seed sown on all 15 OCT plots: 15 Oct. CNVNTIAL 9 NOV treatments rotary harrowed. DIRECT 9 NOV treatments disc harrowed twice, seed sown on all 9 NOV plots: 9 Nov. Metoxuron applied: 29 Feb, 1980. N applied: 10 Apr. Mecoprop applied: 24 Apr. Insecticide applied: 25 June. Combine harvested: 22 Aug.

NOTE: Plants were assessed for infection with eyespot and the incidence of eyespot spores was measured throughout the year. Take-all (*Gaeumannomyces graminis*) was assessed at harvest.

GRAIN TONNES/HECTARE

\*\*\*\*\* TABLES OF MEANS \*\*\*\*\*

DRILLING	CNVNTIAL	DIRECT	MEAN	
STRAW				
BURNT	5.00	4.98	4.99	
CARTED	5.06	5.76	5.41	
MEAN	5.03	5.37	5.20	
SOW DATE	17 SEPT	15 OCT	9 NOV	MEAN
STRAW				
BURNT	4.70	5.66	4.62	4.99
CARTED	4.55	5.84	5.84	5.41
MEAN	4.63	5.75	5.23	5.20
SOW DATE	17 SEPT	15 OCT	9 NOV	MEAN
DRILLING				
CNVNTIAL	4.20	5.65	5.25	5.03
DIRECT	5.05	5.85	5.21	5.37
MEAN	4.63	5.75	5.23	5.20
SEEDRATE	100	150	200	MEAN
STRAW				
BURNT	4.82	5.00	5.16	4.99
CARTED	5.25	5.39	5.59	5.41
MEAN	5.03	5.19	5.38	5.20
SEEDRATE	100	150	200	MEAN
DRILLING				
CNVNTIAL	4.84	5.09	5.17	5.03
DIRECT	5.23	5.30	5.58	5.37
MEAN	5.03	5.19	5.38	5.20

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GRAIN TONNES/HECTARE

\*\*\*\*\* TABLES OF MEANS \*\*\*\*\*

SEEDRATE	100	150	200	MEAN
SOW DATE				
17 SEPT	4.67	4.46	4.74	4.63
15 OCT	5.57	5.88	5.80	5.75
9 NOV	4.86	5.24	5.60	5.23
MEAN	5.03	5.19	5.38	5.20

	SOW DATE	17 SEPT	15 OCT	9 NOV
STRAW BURNT	DRILLING			
	CNVNTIAL	4.98	5.62	4.41
CARTED	DIRECT	4.42	5.69	4.84
	CNVNTIAL	3.42	5.68	6.09
	DIRECT	5.69	6.01	5.59

	SEEDRATE	100	150	200
STRAW BURNT	DRILLING			
	CNVNTIAL	4.68	5.21	5.12
CARTED	DIRECT	4.96	4.80	5.20
	CNVNTIAL	4.99	4.97	5.22
	DIRECT	5.51	5.80	5.97

	SEEDRATE	100	150	200
STRAW BURNT	SOW DATE			
	17 SEPT	4.71	4.57	4.81
	15 OCT	5.48	5.79	5.70
CARTED	9 NOV	4.26	4.65	4.96
	17 SEPT	4.64	4.36	4.66
	15 OCT	5.67	5.97	5.89
	9 NOV	5.45	5.83	6.23

	SEEDRATE	100	150	200
DRILLING CNVNTIAL	SOW DATE			
	17 SEPT	4.43	4.15	4.01
	15 OCT	5.26	5.83	5.85
DIRECT	9 NOV	4.82	5.29	5.65
	17 SEPT	4.92	4.78	5.46
	15 OCT	5.88	5.93	5.74
	9 NOV	4.90	5.20	5.54

	SEEDRATE	100	150	200	
STRAW BURNT	DRILLING				
	SOW DATE				
	CNVNTIAL	17 SEPT	5.07	4.86	5.00
		15 OCT	5.41	5.85	5.60
		9 NOV	3.55	4.92	4.76
	DIRECT	17 SEPT	4.35	4.28	4.63
CARTED		15 OCT	5.55	5.73	5.80
		9 NOV	4.96	4.39	5.16
	CNVNTIAL	17 SEPT	3.78	3.44	3.02
		15 OCT	5.12	5.81	6.10
		9 NOV	6.08	5.65	6.54
	DIRECT	17 SEPT	5.49	5.28	6.30
	15 OCT	6.21	6.13	5.68	
	9 NOV	4.83	6.00	5.92	