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# Yields of the Field Experiments 1981

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## 81/W/CS/99 Effects of Breaks on Take-all - S. Barley, S. Wheat, S. Oats

### Rothamsted Research

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81/W/CS/99

EFFECTS OF BREAKS ON TAKE-ALL

Object: To study factors affecting the incidence of take-all (*Gaeumannomyces graminis*) and their effects on yields of s. barley - Woburn, Butt Furlong.

Sponsor: D. Hornby.

The tenth year, s. barley, s. wheat, s. oats.

For previous years see 72/W/CS/99(t) and 73-80/W/CS/99.

Design: 2 randomised blocks of 9 plots, 5 of which are split into 2.

Whole plot dimensions: 5.34 x 15.2.

Treatments: All combinations of:-

Whole plots

1. TREATMENT Crop sequences; soil sterilant and inoculum in 1979:

	1968-71	72	73	74	75	76	77	78	79	80	81
B 8(S)	B	F	BE	B	B	B	B	B	B(S)	B	B
B 6	B	B	B	F	BE	B	B	B	B	B	B
B 5(SI)	B	B	B	B	F	BE	B	B	B(SI)	B	B
B 4(I)	B	B	B	B	B	F	BE	B	B(I)	B	B
W 7	B	B	F	BE	B	B	B	B	B	B	W

Sub plots

2. INOCULUM Take-all inoculum:

0	None
I	Inoculated (in 1980 to s. barley, in 1981 to s. wheat)

plus four extra plots testing crop sequences alone:

EXTRA

	1968-71	72	73	74	75	76	77	78	79	80	81
B 14	B	F	B	B	B	B	B	B	F	BE	0
B 2	B	B	B	B	B	B	F	BE	0	B	B
B 1	B	B	B	B	B	B	B	F	BE	0	B

B = S. barley, W = S. wheat, BE = S. beans, 0 = S. oats, F = Fallow  
 S = Soil sterilant (1979), formalin.  
 (I) & I = Inoculum of take-all applied on colonised autoclaved oats, in the ratio of three oats to one s. barley or s. wheat seed, broadcast at 310 kg on the surface and rotary harrowed in 1981 & 1980, combine drilled in 1979.

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Standard applications:

All crops: Manures: (20:10:10) at 500 kg. N at 30 kg as 'Nitro-Chalk'.  
Weedkillers: Dicamba with mecoprop and MCPA (as 'Banlene Plus' at 4.9 l) in 280 l with the fungicide. Fungicide: Tridemorph at 0.53 kg.

Seed: S. barley: Triumph, dressed with ethirimol, sown at 160 kg.  
S. oats: Panema, sown at 180 kg.  
S. wheat: Timmo, sown at 190 kg.

Cultivations, etc.:-

All crops: Ploughed: 21 Nov, 1980. NPK applied: 26 Feb, 1981.  
Spring-tine cultivated with crumbler attached: 27 Feb, 6 Apr. Rotary harrowed s. barley plots only: 6 Apr. S. barley and s. oats, seed sown: 6 Apr. Seed with inoculum treatment applied, rotary harrowed, and seed sown, s. wheat plots only: 7 Apr. Weedkillers with fungicide applied: 30 May. N applied: 1 June. Combine harvested, s. barley: 29 Aug, s. wheat: 2 Sept, s. oats: 3 Sept.

NOTES: (1) Soil samples were taken before treatments were applied for estimates of *Heterodera avenae* cysts and eggs and incidence of microflora.  
(2) Plant samples were taken in July for incidence of take-all.

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GRAIN TONNES/HECTARE

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

TREATMNT INOCULUM	B 8(S)	B 6	B 5(SI)	B 4(I)	W 7	MEAN
0	3.13	3.71	2.47	3.67	2.19	3.03
I	2.67	4.04	2.75	2.86	1.44	2.75
MEAN	2.90	3.87	2.61	3.26	1.81	2.89
EXTRA	B 14 2.78	B 2 4.75	B 1 4.33	MEAN 3.96		

GRAND MEAN 3.29

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

TABLE	EXTRA	INOCULUM	TREATMNT	INOCULUM TREATMNT
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SED	0.675	0.232	0.675	0.769

EXCEPT WHEN COMPARING MEANS WITHIN THE SAME LEVEL(S) OF:  
TREATMNT 0.519

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

STRATUM	DF	SE	CV%
BLOCK.WP	7	0.675	20.5
BLOCK.WP.SP	11	0.519	15.8

GRAIN MEAN DM% 83.6

SUB PLOT AREA HARVESTED 0.00193