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80/W/CS/99 Effects of Breaks on Take -all

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80/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 eight year, s. barley, s. beans, s. oats.

For previous years see 72/W/CS/99(t) and 73-79/W/CS/99.

Design: 2 randomised blocks of 9 plots, 4 of which are split into 2.

Whole plot dimensions: 5.34 x 15.2.

Treatments: All combinations of:-

Whole plots

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

	1968-71	72	73	74	75	76	77	78	79	80
B 7(S)	B	F	BE	B	B	B	B	B	B(S)	B
B 5	B	B	B	F	BE	B	B	B	B	B
B 4(SI)	B	B	B	B	F	BE	B	B	B(SI)	B
B 3(I)	B	B	B	B	B	F	BE	B	B(I)	B

Sub plots

2. INOCULUM Take-all inoculum:

0	None
I	Inoculated

plus five extra plots testing crop sequences alone:

EXTRA

	1968-71	72	73	74	75	76	77	78	79	80
	B	F	B	B	B	B	B	B	F	BE
B 13	B	B	B	B	B	B	B	B	B	B
B 6	B	B	F	BE	B	B	B	B	B	B
B 1	B	B	B	B	B	B	F	BE	0	B
	B	B	B	B	B	B	B	F	BE	0

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

80/W/CS/99

Standard applications:

All crops: Weedkillers: Glyphosate at 1.5 kg in 250 l.

S. barley and s. oats: Manures: (20:10:10) at 450 kg, combine drilled.
Weedkillers: Mecoprop with bromoxynil and ioxynil as ('Brittox' at 3.5 l) in 280 l with the fungicide. Fungicide: Tridemorph at 0.53 kg.

S. beans: Manures: (0:14:28) at 400 kg. Weedkiller: Simazine at 0.84 kg in 250 l.

Seed: S. barley: Georgie, dressed with ethirimol, sown at 160 kg.

S. oats: Panema, sown at 180 kg.

S. beans: Minden, sown at 200 kg.

Cultivations, etc.:-

All plots: Glyphosate applied: 13 Sept, 1979. Ploughed: 5 Nov.

Spring-tine cultivated with crumbler attached: 28 Feb, 1980.

S. barley: Spring-tine cultivated with crumbler attached: 7 Apr, 1980.

Seed with inoculum treatment applied, all plots rotary cultivated, seed sown: 9 Apr. 'Brittox' with fungicide applied: 13 May. Combine harvested: 21 Aug.

S. oats: Spring-tine cultivated with crumbler attached: 7 Apr, 1980.

Rotary cultivated, seed sown: 9 Apr. 'Brittox' with fungicide applied: 13 May. Combine harvested: 4 Sept.

S. beans: PK applied, seed sown: 28 Feb, 1980. Weedkiller applied: 29 Feb. Combine harvested: 19 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 7(S)	B 5	B 4(SI)	B 3(I)	MEAN
0	5.08	5.01	4.75	5.11	4.99
I	4.63	4.96	4.54	4.76	4.72
MEAN	4.85	4.99	4.65	4.94	4.86
EXTRA	B 13 5.11	B 6 5.37	B 1 5.51	MEAN 5.33	

GRAND MEAN 5.06

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

TABLE	EXTRA	INOCULUM	TREATMNT	INOCULUM TREATMNT
SED	0.274	0.185	0.274	0.378

EXCEPT WHEN COMPARING MEANS WITH THE SAME LEVEL(S) OF:
TREATMNT 0.369

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

STRATUM	DF	SE	CV%
BLOCK.WP	6	0.274	5.4
BLOCK.WP.SP	10	0.369	7.3

GRAIN MEAN DM% 82.9

SUB PLOT AREA HARVESTED 0.00199