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Barley

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91/R/BW/1

WINTER BARLEY

CONTROL OF VOLUNTEERS

Object: To compare methods of volunteer control in winter barley after w. wheat - Great Harpenden II.

Sponsor: D.G. Christian.

Design: 3 replicates of 8 x 3 criss-cross.

Column plot dimensions: 6.0 x 20.0.

Treatments: All combinations of:-

Column plots

1. **PRIMCULT** Primary cultivations:

NONE	None until just before sowing
DYNDRIVE	'Bomford Dynadrive'
PLOUGH	Plough
TINE	Tine

2. **CULTDATE** Dates of cultivation:

EARLY	13 Aug, 1990
LATER	3 Sept

Row plots

3. **PRSOWCON** Pre-sowing volunteer control using weedkillers:

GLYPHOS	Glyphosate at 0.27 kg in 200 l on 8 Oct, 1990
PARAQUAT	Paraquat at 0.60 kg ion in 200 l on 8 Oct
NONE	None

NOTES: (1) The 'Bomford Dynadrive' has a frame similar to a rotary cultivator but it has two rotating shafts containing flat, slightly twisted, spade-shaped tines. The front shaft drives the rear, it is fitted with twice the number of blades and rotates at about one third the speed of the rear shaft.

(2) All plots were heavy spring-tine cultivated on 9 Oct, 1990 then rotary harrowed and the seed sown on 10 Oct.

Basal applications: Manure: 'Nitram' at 460 kg. Weedkillers: Isoproturon at 1.3 kg and pendimethalin at 1.3 kg in 200 l with the insecticide. Fungicides: Prochloraz at 0.40 kg with tridemorph at 0.26 kg in 200 l. Propiconazole at 0.12 kg in 200 l. Insecticide: Deltamethrin at 6.2 g.

Seed: Magie, sown at 150 kg.

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Cultivations, etc.:- Weedkillers with the insecticide applied: 15 Nov, 1990. N applied: 26 Mar, 1991. Prochloraz with tridemorph applied: 23 Apr. Propiconazole applied: 23 May. Combine harvested: 12 Aug. Previous crops: Potatoes 1989, w. wheat 1990.

NOTES: (1) Ears of volunteer plants were counted at anthesis of the sown crop.
(2) Percentage contamination of harvested grain by volunteer grain was measured.

GRAIN TONNES/HECTARE

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

CULTDATE	EARLY	LATER	Mean	
PRIMCULT				
NONE	6.52	6.71	6.61	
DYNDRIVE	6.83	7.15	6.99	
PLOUGH	6.81	6.90	6.86	
TINE	6.99	7.41	7.20	
Mean	6.79	7.04	6.92	
PRCULT				
PRCULT	GLYPHOS	PARAQUAT	NONE	Mean
NONE	7.04	6.28	6.53	6.61
DYNDRIVE	7.07	7.09	6.83	6.99
PLOUGH	7.28	6.33	6.96	6.86
TINE	7.25	7.19	7.17	7.20
Mean	7.16	6.72	6.87	6.92
PRCULT				
PRCULT	GLYPHOS	PARAQUAT	NONE	Mean
CULTDATE				
EARLY	7.05	6.67	6.65	6.79
LATER	7.27	6.78	7.09	7.04
Mean	7.16	6.72	6.87	6.92
PRCULT				
PRCULT	GLYPHOS	PARAQUAT	NONE	Mean
CULTDATE	EARLY	LATER		
NONE	7.03	6.28	6.25	7.04
DYNDRIVE	6.87	7.06	6.58	7.27
PLOUGH	7.30	6.12	7.01	7.26
TINE	6.99	7.22	6.77	7.50
				7.17
				7.56

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GRAIN TONNES/HECTARE

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

	PRIMCULT	CULTDATE	PRSOWCON	PRIMCULT CULTDATE
	0.262	0.186	0.187	0.371
	PRIMCULT PRSOWCON	CULTDATE PRSOWCON	PRIMCULT CULTDATE PRSOWCON	
	0.387	0.280	0.541	
Except when comparing means with the same level(s) of				
PRIMCULT	0.343			
CULTDATE		0.250		
PRSOWCON	0.378	0.267	0.534	
PRIMCULT.CULTDATE			0.478	

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP1	14	0.455	6.6
BLOCK.WP2	4	0.229	3.3
BLOCK.WP1.WP2	28	0.576	8.3

GRAIN MEAN DM% 84.4

SUB PLOT AREA HARVESTED 0.00094

91/R/BW/2

WINTER BARLEY

SOWING DATES, APHIDS AND BYDV

Object: To study the relationship of aphid numbers in suction trap samples to crop populations and the incidence of barley yellow dwarf virus (BYDV) on winter barley sown on a range of dates - Highfield IV.

Sponsors: G.M. Tatchell, R.T. Plumb.

Design: 4 randomised blocks of 10 plots.

Whole plot dimensions: 3.0 x 21.0.

Treatments: All combinations of:-

1. **SOWDATE** Dates of sowing:

5 SEPT	5 September, 1990
14 SEPT	14 September
24 SEPT	24 September
4 OCT	4 October
17 OCT	17 October

2. **APHICIDE** Aphicide:

NONE	None
CYPERMET	Cypermethrin at 25 g in 300 l on 6 Nov, 1990

NOTES: (1) All **SOWDATE** treatments were rotary cultivated on 31 July, 1990, ploughed on 8 Aug and rotary harrowed on the day of sowing. **SOWDATE** 5 SEPT was rotary harrowed again on 5 Sept.

(2) The experiment was netted against birds during June and July.

Basal applications: Manure: 'Nitram' at 460 kg. Weedkillers: Paraquat at 0.40 kg ion with a wetting agent, 'Vassgro' at 0.06 l, in 200 l. Diflufenican at 0.10 kg and isoproturon at 1.0 kg in 300 l. Fungicides: Fenpropimorph at 0.75 kg in 300 l. Prochloraz at 0.40 kg with tridemorph at 0.26 kg in 200 l. Propiconazole at 0.12 kg in 200 l.

Seed: Magie, sown at 140 kg.

Cultivations, etc.:- Paraquat with wetting agent applied: 3 Sept, 1990. Fenpropimorph applied: 14 Nov. Diflufenican and isoproturon applied: 21 Nov. N applied: 26 Mar, 1991. Prochloraz with tridemorph applied: 23 Apr. Propiconazole applied: 23 May. Combine harvested: 5 Aug. Previous crops: W. wheat 1989, w. barley 1990.

NOTES: (1) Aphid numbers were sampled from September to May.
(2) BYDV was assessed by enzyme-linked immunosorbent assay from November to May and by visual symptoms during May.
(3) Components of yield were measured.

91/R/BW/2

GRAIN TONNES/HECTARE

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

APHICIDE	NONE	CYPERMET	Mean
SOWDATE			
5 SEPT	6.31	7.09	6.70
14 SEPT	7.73	8.09	7.91
24 SEPT	8.17	8.94	8.55
4 OCT	7.74	7.82	7.78
17 OCT	7.44	7.65	7.54
Mean	7.48	7.92	7.70

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

SOWDATE	APHICIDE	SOWDATE APHICIDE
0.202	0.128	0.286

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	27	0.404	5.2
GRAIN MEAN DM%	85.6		
PLOT AREA HARVESTED	0.00204		

91/R/BS/1

SPRING BARLEY

INSECTICIDES AND APHIDS

Object: To compare the effects of a range of insecticides on the control of aphids and barley yellow dwarf virus (BYDV) and on the yield of spring barley - Stackyard.

Sponsors: N. Carter, R.T. Plumb.

Design: 4 blocks of 5 plots, with external dummy plots and arranged to allow estimation of the effects of neighbouring plots.

Whole plot dimensions: 3.0 x 10.0.

Treatments:

INSCTCDE	Insecticides:
NONE	None
IMIDA SD	Imidacloprid seed dressing
DELTA SP	Deltamethrin spray applied at 5.0 g
DEMET SP	Demeton-S-methyl spray applied at 0.24 kg
PIRIM SP	Pirimicarb spray applied at 0.14 kg

- NOTES:** (1) Imidacloprid seed dressing applied as a 35% W/V formulation at 300 ml per 100 kg seed.
(2) Spray treatments were applied in 250 l on 21 May, 1991, and in 300 l on 17 June and 2 July.
(3) A NONE and a DELTA SP plot were inadvertently sprayed with pirimicarb on 2 July. Deltamethrin not subsequently applied to DELTA SP plot. Yields from these plots were treated as missing and estimated values were used in the analysis

Basal applications: Manures: Magnesian limestone at 2.0 t. 'Nitram' at 350 kg. Weedkillers: Paraquat at 0.60 kg ion in 200 l. Mecoprop at 1.2 kg with bromoxynil at 0.19 kg and ioxynil at 0.19 kg in 200 l. Fungicide: Tridemorph at 0.52 kg in 200 l.

Seed: Alexis, sown at 160 kg.

Cultivations, etc.:- Magnesian limestone applied: 31 July, 1990. Ploughed, furrow pressed: 3 Sept. Paraquat applied: 12 Mar, 1991. Heavy spring-tine cultivated: 15 Mar. Spring-tine cultivated: 22 Mar. N applied, spring-tine cultivated, rotary harrowed and seed sown: 16 Apr. Remaining weedkillers applied: 2 June. Fungicide applied: 4 June. Combine harvested: 29 Aug. Previous crops: W. wheat 1989, w. oats 1990.

- NOTES:** (1) Aphids were sampled from early May to the end of July.
(2) Shoot samples for borers were taken in early July from NONE plots.
(3) BYDV was assessed visually at weekly intervals from mid-June to the end of July.
(4) Plant emergence and components of yield were measured.

91/R/BS/1

GRAIN TONNES/HECTARE

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

INSCTCDE	
NONE	6.40
IMIDA SD	6.33
DELTA SP	6.78
DEMET SP	6.44
PIRIM SP	6.47
Mean	6.48

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

INSCTCDE
0.087

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	10	0.123	1.9
GRAIN MEAN DM%	86.3		
PLOT AREA HARVESTED	0.00230		

91/R/BS/2

SPRING BARLEY

SPRAY TIMINGS AND BYDV

Object: To investigate the optimum strategy for controlling barley yellow dwarf virus (BYDV) in spring barley in relation to sowing date, aphid immigration and subsequent population development - Stackyard.

Sponsors: N. Carter, R.T. Plumb.

Design: 3 randomised blocks of 16 plots with external dummy plots and arranged to allow estimation of the effects of neighbouring plots.

Whole plot dimensions: 3.0 x 10.0.

Treatments:

S P DATE Dates of sowing and of applying pirimicarb, at 0.14 kg in 300 l on the first, fifth and sixth occasions and in 250 l on the remainder:

E 0	Sown 25 March, 1991 no pirimicarb
E D1	" " " pirimicarb applied 23 Apr
E D2	" " " " " 7 May
E D3	" " " " " 21 May
E D1 D2	" " " " " 23 Apr and 7 May
E D1 D3	" " " " " 23 Apr and 21 May
E D2 D3	" " " " " 7 May and 21 May
E D1D2D3	" " " " " 23 Apr, 7 May and 21 May
L 0	Sown 23 April, no pirimicarb
L D3	" " " pirimicarb applied 21 May
L D4	" " " " " 5 June
L D5	" " " " " 17 July
L D3 D4	" " " " " 21 May and 5 June
L D3 D5	" " " " " 21 May and 17 July
L D4 D5	" " " " " 5 June and 17 July
L D3D4D5	" " " " " 21 May, 5 June and 17 July

Basal applications: Manures: Magnesian limestone at 2.0 t. 'Nitram' at 350 kg. Weedkillers: Paraquat at 0.60 kg ion in 200 l. Mecoprop at 1.2 kg with bromoxynil at 0.19 kg and ioxynil at 0.19 kg in 200 l. Fungicide: Tridemorph at 0.52 kg in 200 l.

Seed: Alexis, sown at 160 kg.

Cultivations, etc.:- Magnesian limestone applied: 31 July, 1990. Ploughed, furrow pressed: 3 Sept. Paraquat applied: 12 Mar, 1991. Heavy spring-tine cultivated: 15 Mar. Spring-tine cultivated: 22 Mar. Early-sown plots rotary harrowed, seed sown: 25 Mar. N applied: 16 Apr. Late-sown plots spring-tine cultivated, rotary harrowed, seed sown: 23 Apr. Remaining weedkillers applied: 2 June. Fungicide applied: 4 June. Combine harvested 29 Aug. Previous crops: W. wheat 1989, w. oats 1990.

91/R/BS/2

- NOTES:** (1) Aphids were sampled from mid-April until late July.
 (2) Shoot samples for borers were taken in late June.
 (3) BYDV was assessed visually at weekly intervals from mid-June until the end of July. Leaves from infected plants were tested using enzyme-linked immunosorbent assays to determine virus strains present.
 (4) Plant emergence and components of yield were measured.
 (5) The special features of this experiments design are not used in this report.

GRAIN TONNES/HECTARE

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

S P DATE	
E 0	6.13
E D1	6.37
E D2	6.45
E D3	6.48
E D1 D2	6.37
E D1 D3	6.26
E D2 D3	6.35
E D1D2D3	6.27
L 0	5.99
L D3	5.72
L D4	5.94
L D5	5.98
L D3 D4	6.05
L D3 D5	5.72
L D4 D5	5.79
L D3D4D5	5.99
Mean	6.12

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

S P DATE
0.209

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	30	0.255	4.2
GRAIN MEAN DM%	86.4		
PLOT AREA HARVESTED	0.00230		

91/R/BS/3

SPRING BARLEY

VARIETIES AND HARVEST DATES

Object: To study the effects of harvest dates on the yield and malting quality of three varieties differing in their quality and dormancy characteristics - Stackyard.

Sponsor: J.F. Jenkyn.

Design: 3 randomised blocks of 15 plots.

Whole plot dimensions: 3.0 x 10.0.

Treatments: All combinations of:-

1. **VARIETY** Varieties:

BLLENHEIM
REGATTA
TRIUMPH

2. **HARVDATE** Dates of harvest:

1	15 Aug, 1991
2	21 Aug
3	27 Aug
4	2 Sept
5	10 Sept

NOTE: An additional replicate was sown to provide material to flush the combine harvester of extraneous grain before each treatment combination.

Basal applications: Manures: Magnesian limestone at 5.0 t. 'Nitram' at 290 kg. Weedkillers: Paraquat at 0.60 kg ion in 200 l. Metsulfuron-methyl at 6.0 g in 200 l. Fungicides: Tridemorph at 0.52 kg in 200 l. Fenpropimorph at 0.75 kg with the insecticide in 200 l. Insecticide: Pirimicarb at 0.14 kg.

Seed: Varieties, dressed ethirimol, flutriafol and thiabendazole, sown at 350 seeds per square metre.

Cultivations, etc.:- Magnesian limestone applied: 31 July, 1990.
Ploughed, furrow pressed: 3 Sept. Paraquat applied: 12 Mar, 1991.
Heavy spring-tine cultivated: 15 Mar. Spring-tine cultivated:
22 Mar. N applied, rotary harrowed, seed sown: 25 Mar. Tridemorph
applied: 4 June. Metsulfuron-methyl applied: 11 June. Fenpropimorph
with pirimicarb applied: 10 July. Previous crops: W. wheat 1989,
w. oats 1990.

91/R/BS/3

GRAIN TONNES/HECTARE

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

HARVDATE VARIETY	1	2	3	4	5	Mean
BLENHEIM	6.69	6.76	6.61	6.69	6.51	6.65
REGATTA	6.88	6.73	6.77	6.73	6.65	6.75
TRIUMPH	6.56	6.52	6.10	6.19	6.32	6.34
Mean	6.71	6.67	6.49	6.54	6.49	6.58

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

VARIETY	HARVDATE	VARIETY HARVDATE
0.073	0.095	0.164

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	28	0.201	3.1
GRAIN MEAN DM%	84.4		
PLOT AREA HARVESTED	0.00150		

91/R/BS/5

SPRING BARLEY

SUMMER INSECTICIDES AND POLYPHAGOUS PREDATORS

Object: To study the effects of summer applied insecticides on non-target polyphagous predators - Appletree.

Sponsors: N. Carter, K.F.A. Walters (M.A.F.F)

Design: 3 randomised blocks of 4 plots.

Whole plot dimensions: 8.0 x 15.0.

Treatments:

INSCTCDE	Insecticides:
NONE	None
ALPHAC 1	Alpha-cypermethrin at 7.5 g in 200 l on 11 July, 1991
ALPHAC 2	" " 15.0 g in 200 l on 11 July
DIMETHOA	Dimethoate at 0.34 kg in 520 l on 11 July

NOTE: Polythene barriers were erected around the plots from May until harvest to prevent movement of ground insects.

Basal applications: Manures: Magnesian limestone at 5.0 t. (0:16:36) at 980 kg. 'Nitram' at 360 kg. Weedkillers: Glyphosate at 0.27 kg in 200 l. Mecoprop at 1.2 kg with bromoxynil at 0.19 kg and ioxynil at 0.19 kg in 200 l. Fungicide: Tridemorph at 0.52 kg in 200 l.

Seed: Alexis, sown at 120 kg.

Cultivations, etc.:- Magnesian limestone applied: 13 Aug, 1990. PK applied: 22 Aug. Glyphosate applied: 12 Sept. Ploughed: 18 Oct. N applied: 12 Apr, 1991. Spring-tine cultivated: 15 Apr. Rotary harrowed, seed sown: 16 Apr. Mecoprop, bromoxynil and ioxynil applied: 2 June. Fungicide applied: 4 June. Combine harvested: 29 Aug. Previous crops: W. oilseed rape 1989, w. wheat 1990.

NOTES: (1) Aphids were sampled during July.
(2) Polyphagous predators were monitored, using pitfall traps, from early July to August.
(3) Components of yield were measured.

91/R/BS/5

GRAIN TONNES/HECTARE

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

INSCTCDE	
NONE	5.89
ALPHAC 1	6.25
ALPHAC 2	5.72
DIMETHOA	5.96
Mean	5.96

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

INSCTCDE
0.385

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	6	0.471	7.9
GRAIN MEAN DM%	86.6		
PLOT AREA HARVESTED	0.00345		