ROTHAMSTED RESEARCH

Yields of the Field Experiments 1991

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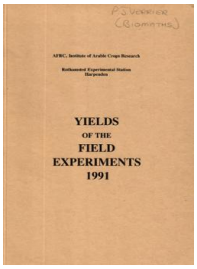

Winter Oilseed Rape

Rothamsted Research

Rothamsted Research (1992) *Winter Oilseed Rape ;* Yields Of The Field Experiments 1991, pp 138 - 152 **- DOI: https://doi.org/10.23637/ERADOC-1-46**

91/R/RAW/1

WINTER OILSEED RAPE

TIMES OF APPLYING FUNGICIDES

Object: To study the single and combined effects of prochloraz applied in autumn, spring and summer on the seed quality and yield of two varieties - Black Horse I N.

Sponsors: L. Figueroa, V.J. Church, B.D.L. Fitt.

Design: 2 randomised blocks of 8 plots split into 2 sub plots.

Whole plots dimensions: 9.0 x 22.5.

Treatments: All combinations of:-

Whole plots

1. **AUTSPRAY** Autumn spray:

NONE	None
PROCHLOR	Prochloraz at 0.50 kg on 3 Dec, 1990

2. **SPRSPRAY** Spring spray:

NONE	None
PROCHLOR	Prochloraz at 0.50 kg on 8 Apr, 1991

3. **SUMSPRAY** Summer spray:

NONE	None
PROCHLOR	Prochloraz at 0.50 kg on 17 June

Sub plots

4. **VARIETY** Varieties:

CAPRCORN	Capricorn
FALCON	Falcon

Basal applications: Manure: 'Nitram' at 320 kg on two occasions. Weedkillers: Paraquat at 0.40 kg ion with a wetting agent, 'Vassgro' at 0.06 l, in 200 l. Metazachlor at 0.75 kg in 200 l. Insecticides: Deltamethrin at 6.2 g in 200 l. Alpha-cypermethrin at 0.02 kg in 200 l. Desiccant: Diquat at 0.60 kg ion with a wetting agent, 'Vassgro' at 0.52 l, in 520 l.

Seed: Varieties, seed dressed gamma-HCH, thiram and fenpropimorph sown at 120 seeds per square metre.

Cultivations, etc.:- Burnt straw, heavy spring-tine cultivated: 31 July, 1990. Paraquat with wetting agent applied: 3 Sept. Cultivated by rotary grubber, rotary harrowed, seed sown: 4 Sept. Metazachlor applied: 2 Oct. Deltamethrin applied: 22 Oct. First N applied: 26 Feb, 1991. Second N applied: 22 Mar. Alphacypermethrin applied: 24 Apr. Desiccant with wetting agent applied: 1 Aug. Combine harvested: 6 Aug. Previous crops: W. wheat 1989, w. barley 1990.

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NOTE: Incidence of light leaf spot and other diseases were assessed monthly during the season. Airborne inoculum was monitored from January to March 1991 and plant numbers, before and after spray treatments, were recorded. Oil and glucosinolate content of harvested seed and components of yield were measured.

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

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

SPRSPRAY	NONE	PROCHLOR	Mean
AUTSPRAY			
NONE	3.42	3.64	3.53
PROCHLOR	3.66	3.93	3.79
Mean	3.54	3.78	3.66

SUMSPRAY	NONE	PROCHLOR	Mean
AUTSPRAY			
NONE	3.48	3.58	3.53
PROCHLOR	3.78	3.80	3.79
Mean	3.63	3.69	3.66

SUMSPRAY	NONE	PROCHLOR	Mean
SPRSPRAY			
NONE	3.53	3.55	3.54
PROCHLOR	3.73	3.83	3.78
Mean	3.63	3.69	3.66

VARIETY	CAPRCORN	FALCON	Mean
AUTSPRAY			
NONE	3.26	3.80	3.53
PROCHLOR	3.74	3.84	3.79
Mean	3.50	3.82	3.66

VARIETY	CAPRCORN	FALCON	Mean
SPRSPRAY			
NONE	3.36	3.71	3.54
PROCHLOR	3.64	3.93	3.78
Mean	3.50	3.82	3.66

VARIETY	CAPRCORN	FALCON	Mean
SUMSPRAY			
NONE	3.49	3.77	3.63
PROCHLOR	3.51	3.87	3.69
Mean	3.50	3.82	3.66

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GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

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

	SPRSPRAY	NONE		PROCHLOR	
AUTSPRAY	SUMSPRAY	NONE	PROCHLOR	NONE	PROCHLOR
NONE		3.39	3.45	3.57	3.71
PROCHLOR		3.66	3.65	3.90	3.96

	SPRSPRAY	NONE		PROCHLOR	
AUTSPRAY	VARIETY	CAPRCORN	FALCON	CAPRCORN	FALCON
NONE		3.11	3.73	3.40	3.88
PROCHLOR		3.62	3.70	3.87	3.99

	SUMSPRAY	NONE		PROCHLOR	
AUTSPRAY	VARIETY	CAPRCORN	FALCON	CAPRCORN	FALCON
NONE		3.22	3.74	3.30	3.86
PROCHLOR		3.76	3.80	3.72	3.88

	SUMSPRAY	NONE		PROCHLOR	
SPRSPRAY	VARIETY	CAPRCORN	FALCON	CAPRCORN	FALCON
NONE		3.39	3.66	3.34	3.76
PROCHLOR		3.59	3.88	3.68	3.98

		SUMSPRAY	NONE		PROCHLOR	
AUTSPRAY	SPRSPRAY	VARIETY	CAPRCORN	FALCON	CAPRCORN	FALCON
NONE	NONE		3.11	3.67	3.11	3.78
	PROCHLOR		3.33	3.81	3.48	3.95
PROCHLOR	NONE		3.68	3.65	3.56	3.75
	PROCHLOR		3.85	3.95	3.89	4.02

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GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

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

AUTSPRAY	SPRSPRAY	SUMSPRAY	VARIETY
0.071	0.071	0.071	0.042

AUTSPRAY SPRSPRAY	AUTSPRAY SUMSPRAY	SPRSPRAY SUMSPRAY	AUTSPRAY VARIETY
0.100	0.100	0.100	0.082

Except when comparing means with the same level(s) of

AUTSPRAY	0.059

SPRSPRAY VARIETY	SUMSPRAY VARIETY	AUTSPRAY SPRSPRAY SUMSPRAY	AUTSPRAY SPRSPRAY VARIETY
0.082	0.082	0.141	0.116

Except when comparing means with the same level(s) of

SPRSPRAY	0.059	
SUMSPRAY		0.059
AUTSPRAY.SPRSPRAY		0.083

AUTSPRAY SUMSPRAY VARIETY	SPRSPRAY SUMSPRAY VARIETY	AUTSPRAY SPRSPRAY SUMSPRAY VARIETY
0.116	0.116	0.164

Except when comparing means with the same level(s) of

AUTSPRAY.SUMSPRAY	0.083	
SPRSPRAY.SUMSPRAY		0.083
AUTSPRAY.SPRSPRAY.SUMSPRAY		0.118

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	7	0.141	3.9
BLOCK.WP.SP	8	0.118	3.2

GRAIN MEAN DM% 79.4

SUB PLOT AREA HARVESTED (VARIES BETWEEN BLOCKS) 0.00518 or 0.00483

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91/R/RAW/2

WINTER OILSEED RAPE

VARIETIES AND FUNGICIDES

Object: To investigate the effects of fungicides on a range of low glucosinolate varieties - Black Horse I N.

Sponsors: V.J. Church, B.D.L. Fitt.

Design: 4 randomised blocks of 12 plots.

Whole plot dimensions: 3.0 x 21.0.

Treatments: All combinations of:-

1. **VARIETY**	Varieties:	
	CAPRCORN	Capricorn
	COBRA	Cobra
	ENVOL	Envol
	FALCON	Falcon
	LIBRAVO	Libravo
	SAMOURAI	Samourai
2. **FUNGCIDE**	Fungicides:	
	NONE	None
	PR+CA+IP	Prochloraz at 0.45 kg and carbendazim at 0.17 kg in 200 l on 3 Dec, 1990 and 8 Apr, 1991. Iprodione at 0.50 kg in 200 l on 17 June.

Basal applications: Manure: 'Nitram' at 320 kg on two occasions. Weedkillers: Paraquat at 0.40 kg ion with a wetting agent, 'Vassgro' at 0.06 l, in 200 l. Metazachlor at 0.75 kg in 200 l. Insecticide: Deltamethrin at 6.2 g and on a second occasion at 12.5 g both in 200 l. Desiccant: Diquat at 0.60 kg ion with a wetting agent, 'Vassgro' at 0.52 l, in 520 l.

Seed: Varieties sown at 120 seeds per square metre. Seed dressed with gamma-HCH, thiram and fenpropimorph except for **VARIETY** ENVOL, which was untreated.

Cultivations, etc.:- Heavy spring-tine cultivated: 31 July, 1990. Paraquat with wetting agent applied, cultivated with rotary grubber: 3 Sept. Rotary harrowed, seed sown: 4 Sept. Metazachlor applied: 2 Oct. First deltamethrin applied: 23 Oct. First N applied: 26 Feb, 1991. Second N applied: 22 Mar. Second deltamethrin applied: 12 Apr. Desiccant with wetting agent applied: 7 Aug. Combine harvested: 13 Aug. Previous crops: W. wheat 1989, w. barley 1990. to post-harvest.

NOTE: Disease assessments were made from November to post-harvest. Plots were assessed for cabbage stem flea beetle damage in October and pollen beetle damage in April. Glucosinolate levels and oil content were measured.

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91/R/RAW/2

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

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

FUNGCIDE VARIETY	NONE	PR+CA+IP	Mean
CAPRCORN	2.13	2.78	2.46
COBRA	1.70	2.52	2.11
ENVOL	1.93	2.68	2.30
FALCON	2.28	2.73	2.50
LIBRAVO	2.64	2.99	2.81
SAMOURAI	1.78	2.67	2.22
Mean	2.08	2.73	2.40

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

VARIETY	FUNGCIDE	VARIETY FUNGCIDE
0.159	0.092	0.225

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	33	0.319	13.3

GRAIN MEAN DM% 88.5

PLOT AREA HARVESTED 0.00483

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91/R/RAW/4

WINTER OILSEED RAPE

N, S AND GLUCOSINOLATES

Object: To study the separate and combined effects of rates of nitrogen and sulphur on the quality and yield of three varieties of w. oilseed rape - Pastures.

Sponsors: J.E. Fieldsend, J. Spink, J.E. Leach, H. Stevenson.

Design: 4 replicates of 3 x 3 x 3 in blocks of 9 plots.

Whole plot dimensions: 3.0 x 21.0.

Treatments: All combinations of:

1. **VARIETY** Varieties:

   ARIANA Ariana
   FALCON Falcon
   LIBRAVO Libravo

2. **N** Nitrogen fertilizer (kg N) as 'Nitram' on 12 Mar, 1991:

   0
   150
   250

3. **S** Sulphur (kg S) as calcium sulphate on 13 Mar:

   0
   50
   100

NOTE: Sulphur was applied as gypsum (17.5% S).

Basal applications: Manure: Magnesian limestone at 5.0 t. Weedkiller: Metazachlor at 0.75 kg in 200 l. Fungicide: Prochloraz at 0.40 kg in 300 l. Insecticide: Deltamethrin at 6.2 g in 200 l. Irrigation: 25 mm applied on two occasions.

Seed: Varieties, dressed fenpropimorph, gamma-HCH and thiram, sown at 120 seeds per square metre.

Cultivations, etc.:- Magnesian limestone applied: 31 July, 1990. Ploughed: 3 Aug. Rotary harrowed: 28 Aug. Rotary harrowed, seed sown: 29 Aug. Weedkiller applied: 30 Aug. Irrigation applied: 13 and 27 Sept. Deltamethrin applied: 15 Oct. Fungicide applied: 23 Apr, 1991. Combine harvested: 8 Aug. Previous crops: W. wheat 1989, w. barley 1990.

NOTE: Crop samples were taken on five occasions throughout the season and a further five during seed development, to measure nitrogen, sulphur and glucosinolate content.

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91/R/RAW/4

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

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

N	0	150	250	Mean
VARIETY				
ARIANA	2.94	3.80	3.67	3.47
FALCON	2.87	3.53	3.85	3.42
LIBRAVO	2.88	3.52	3.06	3.15
Mean	2.90	3.61	3.53	3.35

S	0	50	100	Mean
VARIETY				
ARIANA	3.53	3.39	3.49	3.47
FALCON	3.34	3.48	3.43	3.42
LIBRAVO	3.04	3.27	3.15	3.15
Mean	3.30	3.38	3.35	3.35

S	0	50	100	Mean
N				
0	2.99	2.82	2.88	2.90
150	3.47	3.69	3.68	3.61
250	3.44	3.64	3.50	3.53
Mean	3.30	3.38	3.35	3.35

	S	0	50	100
VARIETY	**N**			
ARIANA	0	3.11	2.81	2.90
	150	3.73	3.71	3.94
	250	3.73	3.66	3.61
FALCON	0	3.00	2.74	2.88
	150	3.06	3.76	3.76
	250	3.97	3.94	3.63
LIBRAVO	0	2.86	2.91	2.85
	150	3.63	3.58	3.35
	250	2.63	3.31	3.25

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

VARIETY	**N**	**S**	**VARIETY N**
0.067	0.067	0.067	0.116

VARIETY S	**N S**	**VARIETY N S**
0.116	0.116	0.211

Except when comparing means with the same level(s) of

VARIETY	0.207
N	0.207
S	0.207
VARIETY.N	0.214
VARIETY.S	0.214
N.S	0.214

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91/R/RAW/4

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

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

Stratum	d.f.	s.e.	cv%
REP.BLOCK.WP	70	0.283	8.5

GRAIN MEAN DM% 82.8

SUB PLOT AREA HARVESTED 0.00345

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91/R/RAW/6

WINTER OILSEED RAPE

FUNGICIDES AND LIGHT LEAF SPOT

Object: To study the effects of three dates of applying prochloraz on light leaf spot (Pyrenopeziza brassicae) and yield of winter oilseed rape - Great Field I.

Sponsors: L. Figueroa, B.D.L. Fitt.

Design: 4 randomised blocks of 4 plots.

Whole plot dimensions: 3.0 x 25.0.

Treatments:

PROCHLOR	Date of applying prochloraz at 0.5 kg in 200 l:
NEVER	Never
WINTER	3 Dec, 1990
SPRING	8 Apr, 1991
SUMMER	17 June

Basal applications: Manure: 'Nitram' at 320 kg on two separate occasions. Weedkillers: Glyphosate at 0.54 kg in 200 l. Metazachlor at 0.75 kg in 200 l. Insecticide: Alphacypermethrin at 0.02 kg in 200 l. Desiccant: Diquat at 0.60 kg ion with a wetting agent, 'Vassgro' at 0.52 l, in 520 l. Irrigation: 25 mm.

Seed: Cobra, seed not dressed, sown at 6.0 kg.

Cultivations, etc.:- Rotary cultivated: 21 July, 1990. Glyphosate applied: 24 Aug. Cultivated by rotary grubber: 28 Aug. Seed sown: 30 Aug. Metazachlor applied: 31 Aug. Irrigated: 14 Sept. N applied: 26 Feb, 1991, and 21 Mar. Insecticide applied: 24 Apr. Desiccant with wetting agent applied: 29 July. Combine harvested: 5 Aug. Previous crops: S. barley 1989, w. oilseed rape 1990.

NOTE: Incidence and severity of light leaf spot and other diseases were assessed monthly. Airborne inoculum was monitored from sowing to March. Oil, glucosinolate content and components of yield were measured and meteorological data recorded.

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91/R/RAW/6

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

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

PROCHLOR	
NEVER	2.66
WINTER	2.66
SPRING	2.77
SUMMER	2.64
Mean	2.68

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

PROCHLOR
0.105

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	9	0.148	5.5

GRAIN MEAN DM% 87.7

PLOT AREA HARVESTED 0.00253

https://doi.org/10.23637/ERADOC-1-46

91/R/RAW/9

WINTER OILSEED RAPE

WEED COMPETITION

Object: To study the effects of a range of densities of two weed species on the growth and yield of w. oilseed rape - Pastures.

Sponsor: P.J.W. Lutman.

Design: 4 randomised blocks of 12 plots.

Whole plot dimensions: 3.0 x 6.0.

Treatments: All combinations of:-

1. **WEED SPC** Weed species:

S MEDIA	Stellaria media
V PERSIC	Veronica persica

2. **SOW DENS** Sowing density of weed seeds (seeds per square metre):

1	300
2	600
3	1200
4	2400
5	4800

plus one extra treatment without sown weed seeds:

EXTRA	
NONE	None (duplicated)

Basal applications: Manures: Magnesian limestone at 5.0 t. 'Nitram' at 320 kg on two occasions. Weedkiller: Quizalofop-ethyl at 0.12 kg with a wetting agent, 'Actipron at 2.0 l, in 200 l. Fungicide: Prochloraz at 0.40 kg in 200 l. Insecticide: Deltamethrin at 6.2 g in 200 l and later at 12.5 g in 200 l. Irrigation: 25 mm applied on two occasions

Seed: Libravo, dressed fenpropimorph, gamma-HCH and thiram, sown at 6.0 kg.

Cultivations, etc.:- Magnesian limestone applied: 31 July, 1990. Ploughed and rolled: 3 Aug. Rotary harrowed twice, cultivated by rotary grubber, seed sown: 5 Sept. Irrigated: 13 and 27 Sept. First deltamethrin applied: 15 Oct. Weedkiller with wetting agent applied: 23 Oct. First N applied: 27 Feb, 1991. Second N applied: 21 Mar. Second deltamethrin applied: 12 Apr. Fungicide applied: 23 Apr. Harvested by hand: 30 July. Previous crops: W. wheat 1989, w. barley 1990.

NOTE: Samples of crop and weed were taken in December, March, May and July for assessment of the effects of weeds on the growth of the rape. Components of yield were measured.

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91/R/RAW/9

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

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

SOW DENS	1	2	3	4	5	Mean
WEED SPC						
S MEDIA	3.94	3.75	3.24	3.73	3.35	3.60
V PERSIC	3.72	3.82	4.21	3.30	3.16	3.64
Mean	3.83	3.78	3.73	3.52	3.26	3.62
NONE	3.77					
GRAND MEAN	3.65					

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

WEED SPC	**SOW DENS**	**WEED SPC SOW DENS**
0.207	0.327	0.462

SED of **NONE** v any item in the **WEED SPC.SOW DENS** table is 0.400

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	34	0.654	17.9

MEAN DM% *

PLOT AREA HARVESTED 0.00020

https://doi.org/10.23637/ERADOC-1-46

91/R/RAW/10

WINTER OILSEED RAPE

DWARF STRAINS

Object: To compare the growth and yield of w. oilseed rape strains containing a dwarfing gene with standard strains - Long Hoos IV 5.

Sponsors: T. Scott, J.E. Leach.

Design: 2 randomised blocks of 13 plots.

Whole plot dimensions: 2.0 x 10.0.

Treatments: All combinations of:-

1. **ISO LINE** Isogenic lines:

   1
   2
   3
   4

2. **ISO TYPE** Types within lines:

DWARF	Dwarf
INTER	Intermediate
TALL	Tall

plus one extra treatment:

LIBRAVO	Standard tall variety Libravo

Basal applications: Manures: (0:16:36) at 1.1 t. Magnesian limestone at 2.9 t. 'Nitram' at 640 kg. Weedkiller: Metazachlor at 0.75 kg in 200 l. Insecticide: Alpha-cypermethrin at 20 g in 220 l. Irrigation: 25 mm on two occasions.

Seed: Various, sown at 8.0 kg.

Cultivations, etc.:- P and K applied: 3 Sept, 1990. Magnesian limestone applied, ploughed: 4 Sept. Rolled: 5 Sept. Rotary harrowed: 7 Sept. Cultivated with rotary grubber and rotary harrowed, seed sown, rolled, weedkiller applied: 10 Sept. Irrigated: 18 and 26 Sept. N applied: 14 Mar, 1991. Insecticide applied: 7 May. Hand harvested: 1 Aug.

NOTES: (1) The plots were netted against birds from late autumn to summer.
(2) Measurements were made of light penetration, total dry matter and nitrogen content at 50% flowering, maximum crop size and at harvest. After harvest components of yield were assessed.

https://doi.org/10.23637/ERADOC-1-46

91/R/RAW/10

GRAIN (AT 90% DRY MATTER) TONNES/HECTARE

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

ISO LINE / ISO TYPE	1	2	3	4	Mean
DWARF	1.31	0.84	1.01	0.89	1.01
INTER	1.26	2.86	2.01	2.57	2.18
TALL	3.14	2.25	3.45	3.52	3.09
Mean	1.90	1.99	2.16	2.33	2.09

LIBRAVO 4.82

GRAND MEAN 2.30

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

ISO TYPE	ISO LINE	ISO TYPE ISO LINE & LIBRAVO
0.602	0.696	1.205

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	12	1.204	52.4

MEAN DM% 94.4

PLOT AREA HARVESTED 0.00010

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