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Lupins

Rothamsted Research

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98/R/LP/1

LUPINS

LUPIN GENOTYPES

Object: To assess the overwinter survival, crop structure, date of maturity and yield potential of new lines of winter lupins - Osier.

Sponsors: I.F. Shield, H.J. Stevenson.

Design: 3 blocks of 54 plots in an alpha design.

Whole plot dimensions: 2.0 x 4.5.

Treatments:

GENOTYPE

51	G151
52	G152
53	G153
54	G154
55	G155
56	G156
57	G157
58	G158
59	G159
60	G160
61	G161
62	G162
63	G163
64	G164
65	G165
66	G166
67	G167
68	G168
69	G169
70	G170
71	G171
72	G172
73	G173
74	G174
75	G175
76	G176
77	G177
78	G178
79	G179
80	G180
81	G181
82	G182
83	G183
84	G184
85	G185
86	G186

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GENOTYPE (continued)

87	G187
88	G188
89	G189
90	G190
91	G191
92	G192
93	G193
LU	Lucyane
AG	Agena
AR	Arthur

Experimental diary:

13-Aug-97 : B : Ploughed and furrow pressed.
04-Sep-97 : B : Spannit at 1.1 l in 200 l. Rotary harrowed.
: T : **GENOTYPE**: Genotypes drilled at 40 seeds per m².
: B : Rolled.
24-Sep-97 : B : Danadim Dimethoate 40 at 850 ml in 200 l.
27-Oct-97 : B : Checkmate at 1.75 l with Atlas Adjuvant Oil at 2.0 l in
200 l.
26-Nov-97 : B : Gesatop 500 SC at 2.5 l in 200 l.
18-Feb-98 : B : Folicur at 0.5 l in 200 l.
24-Feb-98 : B : Rovral Flo at 1.0 l in 200 l.
16-Mar-98 : B : Skirmish at 1.0 l in 200 l.
02-Apr-98 : B : Danadim Dimethoate 40 at 850 ml in 200 l.
20-May-98 : B : Folicur at 0.5 l in 200 l. Aphox at 280 g in 200 l.
12-Jun-98 : B : Alto 240 EC at 0.33 l with Bravo 500 at 1.5 l in 200 l.
20-Sep-98 : B : Combine harvested.

Previous crops: Industrial rape 1996, w. barley 1997.

- NOTES:**
- (1) Plant populations were assessed on five occasions. Apical dissections were made from October to March. Date of flowering and final main stem leaf numbers were noted. Plant heights were measured in February and August and in September the amount of lodging.
 - (2) Seed was severely infected with bean yellow mosaic virus which spread to most plants.
 - (3) The experiment was analysed as an alpha design and as a randomised block design. There was no appreciable difference and the randomised block design is presented.

98/R/LP/1

GRAIN TONNES/HECTARE

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

GENOTYPE

51	0.40
52	0.40
53	1.33
54	0.46
55	0.91
56	0.80
57	0.70
58	0.84
59	0.67
60	0.55
61	0.68
62	0.56
63	1.01
64	1.10
65	0.32
66	0.85
67	1.43
68	0.59
69	0.67
70	0.54
71	0.41
72	0.67
73	0.42
74	0.76
75	0.76
76	0.66
77	0.71
78	0.24
79	0.25
80	2.07
81	1.15
82	0.62
83	0.35
84	0.44
85	0.47
86	1.34
87	0.81
88	1.59
89	1.34
90	0.73
91	0.94
92	0.73
93	0.47
LU	1.10
AG	2.12
AR	1.30
Mean	0.85

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GRAIN TONNES/HECTARE

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

GENOTYPE

0.315 min.rep

0.235 max-min

GENOTYPE

min.rep

max-min

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

Stratum	d.f.	s.e.	cv%
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BLOCK.WP	114	0.385	45.2
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GRAIN MEAN DM% 72.5

PLOT AREA HARVESTED 0.00084

98/R/LP/2

LUPINS

LINES AND SOWING DATES

Object: To test the effect of sowing date on plant structure, light interception, dry matter accumulation and yield of seven lupin genotypes - Osier.

Sponsors: H.J. Stevenson, I. Shield, J.E. Leach, T. Scott.

Design: 3 randomised blocks of 8 plots.

Whole plot dimensions: 8.0 x 9.0.

Treatments:

LINE	Line	Seed dressing	Seed rate seeds per m ²	Sowing date
12S	DETN 12	undressed	40	15-Sep-97
20S	DETN 20	undressed	40	15-Sep-97
LDS	Ludet	Germipro	40	15-Sep-97
LYS	Lucyane	Germipro	40	15-Sep-97
LDM	Ludet	Germipro	80	10-Mar-98
LWM	Wodjil	undressed	80	10-Mar-98
AMM	Merritt	undressed	80	31-Mar-98
ATM	Tallerack	undressed	80	31-Mar-98

Experimental diary:

12-Aug-97 : B : Ploughed and furrow pressed.
 15-Sep-97 : B : Flat rolled.
 : T : **LINE** LYS, LDS, 12S, 20S: Rotary harrowed. Cultivars drilled as treatment. Rolled.
 29-Sep-97 : T : **LINE** LDM, AMM, ATM, LWM: Rotary harrowed.
 02-Oct-97 : T : **LINE** LDM, AMM, ATM, LWM: Harrowed, rotary harrowed.
 03-Oct-97 : T : **LINE** LDM, AMM, ATM, LWM: Rotary harrowed, cultivars Lucyane, Ludet, DETN 12 and DETN 20 drilled as treatment.
 27-Oct-97 : B : Stomp 400 SC at 5.0 l in 200 l.
 26-Nov-97 : B : Gesatop 500 SC at 2.5 l in 200 l.
 18-Feb-98 : B : Folicur at 0.5 l in 200 l.
 24-Feb-98 : B : Rovral Flo at 1.0 l in 200 l.
 05-Mar-98 : T : **LINE** LDM, LWM: Heavy spring-tine cultivated twice.
 10-Mar-98 : T : **LINE** LDM, LWM: Rotary harrowed. Cultivars drilled as treatment.
 16-Mar-98 : T : **LINE** LYS, LDS, 12S, 20S: Skirmish at 1.0 l in 220 l.
 17-Mar-98 : T : **LINE** LWM, LDM: MSS Simazine 50 FL at 2.0 l in 220 l.
 30-Mar-98 : T : **LINE** AMM, ATM: Heavy spring-tine cultivated. Rotary harrowed.
 31-Mar-98 : T : **LINE** AMM, ATM: Cultivars drilled as treatment.
 01-Apr-98 : T : **LINE** AMM, ATM: MSS Simazine 50 FL at 2.0 l in 220 l.
 02-Apr-98 : B : Danadim Dimethoate 40 at 850 ml in 200 l.

98/R/LP/2

Experimental diary:

27-Apr-98 : T : **LINE** LYS, LDS, 12S, 20S: Laser at 1.25 l with Chiltern
Cropoil at 2.5 l in 220 l.
20-May-98 : B : Folicur at 0.5 l in 200 l. Aphox at 280 g in 200 l.
12-Jun-98 : B : Alto 240 EC at 0.33 l with Bravo 500 at 1.5 l in 200 l.
17-Sep-98 : T : **LINE** LYS, LDS, LWM: Combine harvested.
23-Sep-98 : T : **LINE** 12S, 20S: Combine harvested.

NOTES: (1) A sowing on the 02-Oct-97 failed to grow and was resown in spring.
(2) **LINE** LDM, AMM and ATM failed to produce a harvestable crop.
- **LINE** DETN 12 was severely infected by bean yellow mosaic.
- Apical dissections were made October to March (autumn sown) April to May (spring sown). Plant counts were taken on five (autumn) and three (spring) occasions. Dates of flowering and final main stem leaf numbers were noted. Branch and leaf numbers were counted, plant heights were measured. Degree of lodging was assessed and components of yield at harvest were measured.

Previous crops: Industrial rape 1996, w. barley and wheat 1997.

GRAIN TONNES/HECTARE

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

LINE	
12S	2.11
20S	2.72
LDS	3.04
LYS	2.48
LWM	1.65
Mean	2.40

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

LINE
0.357

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	8	0.438	18.2
GRAIN MEAN DM% 75.1			
PLOT AREA HARVESTED .00207			

98/R/LP/3

LUPINS

POD DEVELOPMENT AND YIELD

Object: To monitor the role of nitrogen in pod abortion, development and yield. To determine the relationship between leaves and pods in supplying carbohydrate to the seed - Fosters West.

Sponsors: J.E. Leach, I.F. Shield.

Design: 2 randomised blocks of 2 plots split into 5.

Whole plot dimensions: 6.0 x 9.0.

Treatments:

Whole plots

1. **IRRIGATN** Irrigation:

0 None

I Irrigated

Sub-plots

2. **T** Nitrogen or leaf removal:

- None

SN Spring nitrogen

FN Foliar nitrogen

HR Half leaves removed

AR All leaves removed

Experimental diary:

27-Aug-97 : B : Ploughed and furrow pressed.

12-Sep-97 : B : Rolled, rotary harrowed, DTN 20, undressed, drilled at 60 seeds per m². Rolled.

15-Sep-97 : B : Stomp 400 SC at 5.0 l in 200 l.

18-Sep-97 : B : Spannit at 1.1 l in 200 l.

05-Dec-97 : B : Gesatop 500 SC at 2.3 l in 200 l.

19-Feb-98 : B : Folicur at 0.5 l in 200 l.

24-Feb-98 : B : Rovral Flo at 1.0 l in 200 l.

16-Mar-98 : B : Skirmish at 1.0 l in 200 l.

02-Apr-98 : B : Danadim Dimethoate 40 at 850 ml in 200 l.

08-Apr-98 : T : T SN: 46% N at 217 kg.

30-Apr-98 : T : T SN: 46% N at 217 kg.

09-May-98 : B : Laser at 1.25 l with Chiltern Cropoil at 1.0 l in 200 l.

20-May-98 : B : Folicur at 0.5 l in 200 l. Aphox at 280 g in 200 l.

04-Jun-98 : T : **IRRIGATN** I: Irrigated 12 mm.

05-Jun-98 : T : **IRRIGATN** I: Irrigated 12 mm.

12-Jun-98 : B : Alto 240 EC at 0.33 l with Bravo 500 at 1.5 l in 200 l.

03-Jul-98 : T : T FN: 46% N at 32.6 kg in 220 l.

15-Jul-98 : T : T FN: 46% N at 32.6 kg in 220 l.

98/R/LP/3

Experimental diary:

22-Jul-98 : T : T HR, AR: Leaf removal started.
 23-Jul-98 : T : **IRRIGATN**: Irrigated 25 mm.
 24-Jul-98 : T : T FN: 46% N at 32.6 kg in 220 l.
 31-Jul-98 : T : T FN: 46% N at 32.6 kg in 220 l.
 07-Aug-98 : T : T HR, AR: Leaf removal finished.
 12-Aug-98 : T : **IRRIGATN**: Irrigated 20 mm.
 25-Sep-98 : B : Combine harvested.

Previous crops: W. rape 1996, w. wheat 1997.

NOTE: Plants were sampled regularly for biomass production and nitrogen content. Leaf and pod photosynthesis was measured regularly and light interception weekly. Flowering date was also noted.

GRAIN TONNES/HECTARE

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

T	-	SN	FN	Mean
IRRIGATN				
O	3.50	3.05	3.12	3.34
I	3.04	2.77	2.90	2.96
Mean	3.27	2.91	3.01	3.15

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

T	IRRIGATN*
	T
0.216	0.305 min.rep
0.176	0.249 max-min

* within the same level of **IRRIGATN** only

min.rep Any of the remainder
 max-min - v any of the remainder

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP.SP	12	0.305	9.7
GRAIN MEAN DM%	69.9		
SUB-PLOT AREA HARVESTED	0.00223		

98/R/LP/5

LUPINS

PESTS AND DISEASES

Object: To test methods of bean seed fly control, identify possible causes of plant blindness and identify the link between insect damage and fungal pathogens - Osier.

Sponsors: I.F. Shield, G.L. Bateman, H.J. Stevenson, J.V. Etheridge.

Design: 3 blocks of 12 plots.

Plot dimensions: 2.0 x 9.0.

Treatments:

PESTCONT

-	New seed undressed
2Y-	Two year old seed, undressed
-	One year old seed, undressed
YS	One year old seed, undressed, drilled into a stale seedbed
Y-C	One year old seed, undressed, plus chlorpyrifos at 1.0 l post drilling
Y-CI	One year old seed, undressed, plus chlorpyrifos at 1.0 l incorporated into seedbed
YCIF	One year old seed, undressed, plus chlorpyrifos at 1.0 l incorporated into seedbed then tebuconazole at 250 g in November
YG1	One year old seed dressed furathiocarb
YG2	One year old seed dressed imidacloprid
YX	One year old seed dressed bendiocarb
YD	One year old seed, dressed furathiocarb, then deltamethrin at 8.8 g at 2-4 leaf stage
YM	One year old seed, dressed furathiocarb, then dimethoate at 340 g at 2-4 leaf stage

Experimental diary:

12-Aug-97 : B : Ploughed and furrow pressed.
 : T : **PESTCONT** YS: Rotary harrowed.
26-Aug-97 : T : **PESTCONT** YS: Scythe LC at 2.0 l in 220 l.
01-Sep-97 : T : **PESTCONT** All except YS: Rotary harrowed.
02-Sep-97 : T : **PESTCONT** Y-CI, YCIF: Spannit at 1.5 l in 220 l.
 : B : Rotary harrowed. Lucyanne dressed as treatment, drilled at 40 seeds per m².
 : T : **PESTCONT** Y-C: Spannit at 1.5 l in 220 l.
05-Sep-97 : T : Stomp 400 SC at 5.0 l in 200 l.
29-Sep-97 : T : **PESTCONT** YD: Decis at 300 ml in 220 l.
 : T : **PESTCONT** YM: Atlas Dimethoate 40 at 850 ml in 220 l.
27-Oct-97 : B : Checkmate at 1.75 l with Atlas Adjuvant Oil at 2.0 l in 200 l.
12-Nov-97 : T : **PESTCONT** YCIF: Folicur at 1.0 l in 220 l.

98/R/LP/5

Experimental diary:

26-Nov-97 : B : Gesatop 500 SC at 2.5 l in 200 l.
 16-Mar-98 : B : Skirmish at 1.0 l in 200 l.
 02-Apr-98 : B : Danadim Dimethoate 40 at 850 ml in 200 l.
 20-May-98 : B : Folicur at 0.5 l in 200 l. Aphox at 280 g in 200 l.
 12-Jun-98 : B : Alto 240 EC at 0.33 l with Bravo 500 at 1.5 l in 200 l.
 17-Sep-98 : B : Combine harvested.

Previous crops: Set-aside and industrial rape 1996, w. wheat and w. barley 1997.

NOTE: Apical dissections were made in December and January. Plant populations were assessed on six occasions. Bean seed fly and slug damage was assessed in September 97 and lodging in September 98.

GRAIN TONNES/HECTARE

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

PESTCONT

-	0.76
2Y-	1.33
Y-	1.25
YS	1.78
Y-C	1.00
Y-CI	1.36
YCIF	1.44
YG1	1.30
YG2	1.72
YX	1.27
YD	1.20
YM	1.54
Mean	1.33

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

PESTCONT

0.355

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	22	0.435	32.7
GRAIN MEAN DM%	80.5		
PLOT AREA HARVESTED	0.00134		

98/R/LP/6

LUPINS

FOLIAR DISEASES AND FUNGICIDES

Object: To test fungicides to control foliar diseases on lupins - Fosters West.

Sponsors: G.L. Bateman, J.V. Etheridge.

Design: 3 randomised blocks of (3 x 7) + 3.

Plot dimensions: 3.0 x 9.0.

Treatments: All combinations of:-

1. FUNGICIDE	Fungicide:
C	Iprodione and thiophanate-methyl (Compass at 3.0 l in 220 l)
F	Tebuconazole (Folicur at 1.0 L in 220 l)
S	Prochloraz (Sportak 45 HF at 1.0 l in 220 l)

2. **TIMING**

1	07-Apr-98
2	05-May-98
3	01-Jun-98
12	1 + 2 as above
13	1 + 3 as above
23	2 + 3 as above
123	1 + 2 + 3 as above

Plus extra plots

EXTRA

-	None (triplicated)
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Experimental diary:

27-Aug-97 : B : Ploughed and furrow pressed.
12-Sep-97 : B : Rolled. DTN 20 undressed, drilled at 60 seeds per m².
Rolled.
15-Sep-97 : B : Stomp 400 SC at 5.0 l in 200 l.
18-Sep-97 : B : Spannit at 1.1 l in 200 l.
05-Dec-97 : B : Gesatop 500 SC at 2.3 l in 200 l.
16-Mar-98 : B : *Pleiochaeta setosa* inoculum applied. Skirmish at 1.0 l in 200 l.
02-Apr-98 : B : Danadim Dimethoate 40 at 850 ml in 200 l.
07-Apr-98 : T : **TIMING** 1, 12, 13, 123: Fungicides applied.
05-May-98 : T : **TIMING** 2, 12, 23, 123: Fungicides applied.
09-May-98 : B : Laser at 1.25 l with Chiltern Cropoil at 1.0 l in 200 l.
20-May-98 : B : Aphox at 280 g in 200 l.

98/R/LP/6

Experimental diary:

01-Jun-98 : T : **TIMING** 3, 13, 23, 123: Fungicides applied.
24-Sep-98 : B : Combine harvested.

Previous crops: W. rape 1996, w. wheat 1997.

NOTES: (1) *Pleiochaeta* inoculum was on sterile oat grain applied at 200 kg.
(3) Assessments of brown rot were made in April, May and June. Rust was assessed in June and July. Harvested seed was examined for fungal infection.

GRAIN TONNES/HECTARE

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

TIMING	1	2	3	12	13	23	123	Mean
FUNGICIDE								
C	1.45	1.36	1.60	1.44	1.62	1.53	1.65	1.52
F	1.51	1.39	2.97	1.54	2.84	2.97	2.70	2.27
S	1.38	1.30	1.66	1.44	1.47	1.50	1.64	1.48
Mean	1.45	1.35	2.08	1.47	1.98	2.00	2.00	1.76

EXTRA 1.46

Grand mean 1.72

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

FUNGICIDE	TIMING	FUNGICIDE
		TIMING
0.052	0.080	0.138

SED for comparing - with any item in **TIMING.FUNGICIDE** table is 0.112

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	48	0.169	9.8

GRAIN MEAN DM% 77.2

AVERAGE PLOT AREA HARVESTED 0.00219

98/R/LP/7

LUPINS

GENOTYPE, ROW SPACING AND SEED RATE

Object: To test seed rates and row spacings on the structure and yield of standard and new dwarf-determinate genotypes of lupins - Osier.

Sponsors: I.F. Shield, J.E. Leach.

Design: 3 blocks of (4 x 2 x 2) + 2 extra plots.

Whole plot dimensions: 8.0 x 9.0.

Treatments: All combinations of:-

1. GENOTYPE

LY	Lucyane dressed Germipro
LB	Ludet dressed Germipro
12	DTN 12 undressed
20	DTN 20 undressed

2. ROW SPAC

Row spacing (cm):

R1	12.5
R2	37.5

3. SEED RAT

Seed rate seeds per m²:

S1	40
S2	80

Plus extra

EXTRA

X1	Ludet at 50 cm and 40 seeds per m ²
X2	DTN 20 at 50 cm and 40 seeds per m ²

Experimental diary:

12-Aug-97 : B : Ploughed and furrow pressed.
15-Sep-97 : B : Rolled. Rotary harrowed.
16-Sep-97 : T : Genotypes drilled as treatment.
18-Sep-97 : B : Rolled. Stomp 400 SC at 5.0 l with Spannit at 1.1 l in 200 l.
27-Oct-97 : B : Checkmate at 1.75 l with Atlas Adjuvant Oil at 2.0 l in 200 l.
26-Nov-97 : B : Gesatop 500 SC at 2.5 l in 200 l.
18-Feb-98 : B : Folicur at 0.5 l in 200 l.
24-Feb-98 : B : Rovral Flo at 1.0 l in 200 l.
16-Mar-98 : B : Skirmish at 1.0 l in 200 l.
02-Apr-98 : B : Danadim Dimethoate 40 at 850 ml in 200 l.
20-May-98 : B : Folicur at 0.5 l in 200 l. Aphox at 280 g in 200 l.

98/R/LP/7

Experimental diary:

12-Jun-98 : B : Alto 240 EC at 0.33 l with Bravo 500 at 1.5 l in 200 l.
 17-Sep-98 : T : **GENOTYPE** LY, LB: Combine harvested.
 23-Sep-98 : T : **GENOTYPE** 12, 20: Combine harvested.

Previous crops: Set-aside and industrial rape 1996, w. wheat and w. barley 1997.

NOTE: Plant populations were counted after establishment and in April. Light interception was measured, plants were sampled to measure dry matter accumulation. Lodging was assessed before harvest and at harvest components of yield were measured.

GRAIN TONNES/HECTARE

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

ROW SPAC GENOTYPE	R1	R2	Mean
LY	1.91	2.22	2.07
LD	3.04	2.72	2.88
12	1.56	1.53	1.54
20	2.08	2.42	2.25
Mean	2.15	2.22	2.19

SEED RAT GENOTYPE	S1	S2	Mean
LY	1.99	2.14	2.07
LD	2.81	2.96	2.88
12	1.59	1.50	1.54
20	2.44	2.05	2.25
Mean	2.21	2.17	2.19

SEED RAT ROW SPAC	S1	S2	Mean
R1	2.23	2.06	2.15
R2	2.18	2.27	2.22
Mean	2.21	2.17	2.19

ROW SPAC SEED RAT GENOTYPE	R1 S1	R2 S2	R2 S1	S2
LY	1.84	1.99	2.14	2.30
LD	3.10	2.98	2.52	2.93
12	1.57	1.56	1.60	1.45
20	2.43	1.72	2.45	2.39

EXTRA	X1	X2	Mean
	1.93	0.66	1.30

Grand mean 2.09

98/R/LP/7

GRAIN TONNES/HECTARE

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

GENOTYPE	ROW SPAC	SEED RAT	GENOTYPE
			ROW SPAC
0.173	0.122	0.122	0.244
GENOTYPE	ROW SPAC	GENOTYPE	
SEED RAT	SEED RAT	ROW SPAC	
		SEED RAT	
		& EXTRA	
0.224	0.173	0.345	

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	34	0.423	20.3

GRAIN MEAN DM% 75.1

PLOT AREA HARVESTED	ROW SPAC R1	0.00207
PLOT AREA HARVESTED	ROW SPAC R2	0.00202
PLOT AREA HARVESTED	EXTRA PLOTS	0.00225

98/R/LP/8

LUPINS

HERBICIDE STUDY

Object: To assess the effects of herbicides on winter lupins - Osier.

Sponsors: H.J. Stevenson, I.F. Shield.

Design: 3 randomised blocks of 8 plots.

Whole plot dimensions: 4.0 x 9.0.

Treatments:

HERBICIDE	Herbicide and timing:		
	<u>Pre-emergence</u>	<u>Autumn</u>	<u>Spring</u>
-	None	None	None
SFP	Pendimethalin	Carbetamide and simazine	Isoxaben and terbuthylazine
S3	Pendimethalin	Carbetamide and simazine	Triasulfuron
S4	Pendimethalin	Carbetamide and simazine	Rimsulfuron
S5	Pendimethalin	Sethoxydim and simazine	Isoxaben and terbuthylazine
S6	Pendimethalin	Carbetamide, with diflufenican and simazine	Isoxaben and terbuthylazine
S7	Pendimethalin	Carbetamide, metazachlor with quinmerac and simazine	Isoxaben and terbuthylazine
S8	Pendimethalin	Carbetamide, carfentrazone-ethyl with flupyr-sulfuron- methyl and simazine	Isoxaben and terbuthylazine

Experimental diary:

- 12-Aug-97 : B : Ploughed and furrow pressed.
- 15-Sep-97 : B : Rolled. Rotary harrowed. DTN 20, undressed, drilled at 40 seeds per m². Rolled.
- 16-Sep-97 : T : **HERBICIDE** SFP, S3, S4, S5, S6, S7, S8: Stomp 400 SC at 5.0 l in 220 l.
- 18-Sep-97 : B : Spannit at 1.1 l in 200 l.
- 12-Nov-97 : T : **HERBICIDE** SFP, S3, S4: Carbetamex at 3.0 kg with MSS Simazine 50 FL at 2.3 l in 220 l.
- : T : **HERBICIDE** S5: MSS Simazine 50 FL at 2.3 l with Checkmate at 1.75 l and Atlas Adjuvant Oil at 0.10 l in 220 l.
- : T : **HERBICIDE** S6: Diflufenican at 0.10 l as Amazon TP with Carbetamex at 3.0 kg and MSS Simazine 50 FL at 2.3 l in 220 l.
- : T : **HERBICIDE** S7: Carbetamex at 3.0 kg with Katamaran at 2.0 l and MSS Simazine 50 FL at 2.3 l in 220 l.

98/R/LP/8

Experimental diary:

12-Nov-97 : T : **HERBCIDE** S8: Carbetamex at 3.0 l with Lexus Class WSB
at 60 g and MSS Simazine 50 FL at 2.3 l in 220 l.
18-Feb-98 : B : Folicur at 0.5 l in 200 l.
24-Feb-98 : B : Rovral Flo at 1.0 l in 200 l.
16-Mar-98 : T : **HERBCIDE** SFP, S5, S6, S7, S8: Skirmish at 1.0 l in
220 l.
02-Apr-98 : B : Danadim Dimethoate 40 at 850 ml in 200 l.
27-Apr-98 : T : **HERBCIDE** S3: Logran 20 WG at 19 g in 220 l.
: T : **HERBCIDE** S4: Titus at 50 g with Luxon Non-Ionic Wetter
at 0.3 l in 220 l.
20-May-98 : B : Folicur at 0.5 l in 200 l. Aphox at 280 g in 200 l.
12-Jun-98 : B : Alto 240 EC at 0.33 l with Bravo 500 at 1.5 l in 200 l.
23-Sep-98 : B : Combine harvested.

Previous crops: Industrial rape 1996, w. barley 1997.

NOTE: Plant populations were assessed on four occasions. Biomass was
measured on three occasions. Lodging was assessed in September.

GRAIN TONNES/HECTARE

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

HERBCIDE

-	2.34
SFP	2.86
S3	2.64
S4	1.38
S5	2.86
S6	2.57
S7	2.79
S8	2.28
Mean	2.46

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

HERBCIDE

0.442

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

Stratum	d.f.	s.e.	cv%
BLOCK.WP	14	0.541	22.0
GRAIN MEAN DM%	70.8		
PLOT AREA HARVESTED	0.00207		