

*CONFIDENTIAL

MORLEY RESEARCH CENTRE**Winter oilseed rape****Management of double-low varieties***G M Palmer and D B Stevens***Summary**

The varieties Capricorn and Bristol gave similar yield responses to increasing nitrogen levels, each giving their highest yields at 220 kg/ha nitrogen (5.07 and 5.40 t/ha respectively), the highest rate tested. Disease levels were relatively low, with only moderate levels of phoma leaf spot developing in the spring on both varieties and later some light leaf spot on stems and alternaria on pods. Capricorn responded well to fungicide treatments which were not profitable on Bristol.

Object

To evaluate the effects of nitrogen rate and fungicides on the performance of new high yielding double-low varieties.

Method

A range of nitrogen and fungicide levels was imposed on plots of Capricorn and Bristol winter oilseed rape drilled on 8 September, 1992, at a heavy land site at Stonham, Suffolk. Details of the treatments are given in Table 1.

Table 1. *Treatments applied to rape varieties*

Variety	Spring nitrogen (kg/ha)	Fungicide programme**
Capricorn	60	Nil
Bristol	100	Low input
	140	Intensive
	180	
	220	

**Programmes applied (dose l/ha):

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<u>Timing</u>	<u>Low input</u>	<u>Intensive</u>
20 November 1992	-	Sportak alpha (1.1) (prochloraz + carbendazim, 267 + 100 g ai/l)
26 March 1993	Sportak 45 (0.7) (prochloraz, 450)	Sportak Alpha (0.75)
29 April	Compass (1.5) (iprodione + thiophanate methyl, 167 + 167)	Ronilan (2.0) (vinclozolin, 500)
8 June	-	Rovral (2.0) (iprodione, 255)

Nitrogen was applied as a split treatment, the first 60 kg/ha being applied as sulphate of ammonia by farm spreader overall on 10 and 16 February. The remainder was applied by hand to plots on 19 March. The fungicide treatments applied up to and including the mid-flower spray on 29 May were applied by knapsack sprayer using standard Morley procedures. The late Rovral treatment was applied to the appropriate plots using the farm sprayer. The treatment plot size was 6.75 x 12.0 m² of which 2.25 x 9.0 m² was harvested for yield estimation on 28 July. Treatments were arranged in randomised blocks.

Results and discussion

Disease levels were generally low through the season on both varieties. The early season phoma leaf spot (*Phoma lingam*) was the most significant disease but few stem canker lesions developed. Later there was some light leaf spot (*Pyrenopeziza brassica*) on the stems and alternaria (*Alternaria spp.*) on untreated pods and these infections were eliminated by the intensive fungicide programme which included a Rovral spray. The low input fungicide programme appeared to give some reductions in these late infections.

Table 2. *Light leaf spot on stems and alternaria on pods (% on 7 July)*

Fungicide programme	Capricorn	Bristol	Mean
Light leaf spot			
Nil	1.1	4.0	2.5
Low input	0.1	0.8	0.5
Intensive	0.0	0.0	0.0
LSD		1.03	0.73
Mean	0.4	1.6	
LSD		0.60	
SE per plot(58 df)		±1.42	
SE as % GM		140.9	
Alternaria			
Nil	6.0	4.9	5.5
Low input	1.9	2.6	2.2
Intensive	0.0	0.0	0.0
LSD		1.12	0.61
Mean	2.6	2.5	
LSD		NS	
SE per plot(58 df)		±1.19	
SE as % GM		46.1	

Yield

Overall there were significant yield responses to both fungicide programmes, this was especially obvious with Capricorn which was more responsive to fungicides than Bristol.

The responses to increasing N rates up to the maximum used were significant and economic in both varieties. These trends were similar at all levels of fungicides.

Table 3. Yield (t/ha at 91% dm)

	Capricorn	Bristol	Means
Total spring nitrogen (kg/ha)			
60	3.29	3.83	3.56
100	3.84	4.35	4.10
140	4.28	4.96	4.62
180	4.73	5.20	4.97
220	5.07	5.40	5.23
LSD	0.259		0.183
Fungicide programme (all nitrogen rates)			
Nil	3.84	4.61	4.22
Low input	4.23	4.76	4.49
Intensive	4.65	4.88	4.77
LSD	0.201		0.142
Mean	4.24	4.75	
LSD	0.116		
SE per plot(58 df)	±0.275		
SE as % GM	6.1		

These results indicate that the performance of Capricorn can be seriously affected even by relatively low disease levels so that a higher expenditure on fungicide is justified than the more recently introduced Bristol.

The response to increasing nitrogen level, which was profitable up to the highest rate tested, was an unexpected reaction on a site shown to have an estimated 92 kg/ha mineral N in the top 90 cm in the late winter and further experience is required to check that this result is typical for this soil and location.

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Appendix

The following information is presented as an appendix which is available on request:

Field details

Method

Experiment diary

Results

Table A1. Economic assessment

Method

These are an abbreviated version of the Standard Operating Procedures used at Morley Research Centre.

Plot layout

Plots were sown at 140 seeds/m² with an Oyjord drill. The drilled plots were 12 m long and 1.66 m wide from outside row to outside row (14 rows at 12.8 cm spacing). Plots were separated by a buffer of the same size with a 59 cm gap between successive plots and buffers. This gave an effective plot width of 2.25 m, which was used for harvest yield calculations. Trial treatments were applied to the plot and to part of the buffer at each side.

Common treatments such as fertiliser, insecticides, and herbicides were applied across all plots with farm machinery using wheelings, 12 m apart. For harvest purposes, plot length was reduced to 9.0 m.

Spraying details

Treatments were applied using a CO₂ powered backpack sprayer utilising 'Cornelius' vessels and 4 m boom (eight nozzles at 0.5 m spacings) with Lurmark F 110 - 03 nozzles at 2 bar pressure to give 200 l/ha spray volume at 1.6 m/s forward speed.

Agronomic factors

Overall plant population was determined by making 50 counts of 50 cm of row at random across the site.

Harvest details

Plots were harvested using a Claas Compact combine which was modified for plot work and used electronic weighing (Novatech M864 Loadmeter). Trials were harvested by replicate.

Post harvest determinations

Moisture content was determined by taking a 200 g subsample, oven drying for 40 hours at 100 -102° C and weighing at ambient temperature.

Experiment diary

Date	Operation
8 September 1992	Trial drilled
16 October	Rape population counts made
20 November	Early winter sprays applied. Crop GS 1,3
10-16 February 1993	Farm applied 60 kg/ha N (as amm.sulph.)
19 March	Applied differential N treatments
26 March	Green bud fungicides applied
29 April	Mid-flower fungicides applied
8 June	Post-flower fungicide applied
8 July	Desiccant (Roundup) applied
26 July	Trial harvested

Results

Table A1. *Economic assessments - margin over treatment cost (£/ha)*

	Capricorn	Bristol	Means
Total spring nitrogen (kg/ha)			
60	410	480	445
100	469	536	503
140	514	603	559
180	561	622	592
220	593	636	614
Fungicide programme			
Nil	499	599	549
Low input	520	589	554
Intensive	522	552	537

Assumes crop value £130/t

N cost £0.3/kg

Fungicide programmes cost: low input = £29.6/ha
intensive = £82.8/ha