

## MORLEY RESEARCH CENTRE

### Foliar fungicide programmes for triticale

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#### Summary

Fungicide treatments based on Folicur or Opus in mixture with Amistar or Corbel were evaluated largely as two-spray programmes, but also with a single three-spray programme on the triticale variety Binova, drilled on 24 November 2000 on the loamy sand soil at Colney, Norwich. All programmes received their first treatment on 10 May (GS 32), with the second treatment being applied on 23 May (GS 39-45) or delayed to 4 June (GS 55-59). The three-spray programme was treated on 10 May, 23 May and 12 June (GS 61-65). Disease pressure remained low all season and when assessed on 10 July (GS 77), *Septoria tritici* was recorded on only 1.9% of the area of leaf 2 on untreated crop. Treatments where Opus + Amistar was applied on 23 May or when Folicur + Amistar was applied on 4 June significantly reduced *Septoria tritici* infection and increased the amount of green leaf area remaining on leaf 2. Where no fungicide was applied, the crop produced a yield of 8.44 t/ha. Some of the treatments significantly increased yield, with responses ranging from 0.13 t/ha (two applications of Folicur + Corbel at 0.5 + 0.5 l/ha) to 0.64 t/ha (Folicur + Corbel at 0.5 + 0.5 l/ha on 10 May followed by Folicur + Amistar at 0.5 + 0.5 l/ha on 4 June). The inclusion of Amistar in the programme tended to produce the highest yields.

#### Object

To examine the effect of a range of foliar fungicide programmes on triticale

#### Method

<i>Site</i>	New Found Farm, Colney, Norwich
<i>Soil type and series</i>	Loamy sand
<i>Variety</i>	Binova
<i>Treatments</i>	Details of treatments are given in Tables 1 & 2
<i>Sowing date</i>	24 November 2000
<i>Husbandry</i>	The crop followed potatoes, all applications as farm crop except fungicide, field details as outlined in Appendix
<i>Trial design</i>	Randomised block with six replicates
<i>Analysis</i>	ANOVA with LSD's quoted at P = 0.05
<i>Plot size</i>	12 m x 2.1 m with buffers
<i>Application</i>	Treatments (see Tables 1 & 2) were applied on 10 May (GS 32), 23 May (GS 39-45), 4 June (GS 55-59) and 12 June (GS 61-65) in 200 l/ha water as a medium spray using F110-03 nozzles
<i>Experiment diary</i>	See Appendix
<i>Deviations from protocol</i>	<ul style="list-style-type: none"> <li>• First ear treatment timing delayed from GS 51 to GS 55-59</li> </ul>

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\*Not for publication without the consent of the Director of Morley Research Centre. This report deals primarily with only one year's work so any conclusions given are provisional

## Results

Table 1. Grain yield (t/ha at 85% dm)

GS 32 10 May	GS 39-45 23 May	Ear spray	Yield (t/ha)
1. Untreated	-	-	8.44
2. Folicur + Corbel (0.5 + 0.5)	Folicur + Amistar (0.5 + 0.5)	Opus + Amistar (0.25 + 0.3)*	9.03
3. Folicur + Corbel (0.5 + 0.5)	Folicur + Amistar (0.5 + 0.5)	-	8.79
4. Folicur + Amistar (0.5 + 0.5)	Folicur + Corbel (0.5 + 0.5)	-	8.68
5. Folicur + Corbel (0.5 + 0.5)	Folicur + Corbel (0.5 + 0.5)	-	8.57
6. Folicur + Corbel (0.5 + 0.5)	-	Folicur + Amistar (0.5 + 0.5) <sup>†</sup>	9.08
7. Opus + Corbel (0.25 + 0.5)	Opus + Amistar (0.25 + 0.5)	-	8.95
8. Opus + Corbel (0.25 + 0.5)	Opus + Corbel (0.25 + 0.5)	-	8.66
LSD			0.304

SE per plot (35 df) =  $\pm 0.258$  or 2.9 CV (%)

<sup>†</sup> applied on 4 June (GS 55-59)

\* applied on 12 June (GS 61-65)

Table 2. Active ingredients of commercial products used

Product	Active ingredients (ai)	g ai/l or % w/w	Formulation
Amistar	azoxystrobin	250	SC
Corbel	fenpropimorph	750	EC
Folicur	tebuconazole	250	EW
Opus	epoxiconazole	125	SC

- The crop followed potatoes and was drilled on 24 November 2000.
- Establishment was satisfactory, with 243 plants/m<sup>2</sup> recorded when counts were made on 25 January 2001
- Disease pressure remained low all season and when assessed on 10 July (GS 77), *Septoria tritici* was recorded on only 1.9% of the area of leaf 2 on untreated crop (Table A1). Treatments where Opus + Amistar was applied on 23 May or when Folicur + Amistar was applied on 4 June significantly reduced *Septoria tritici* infection and increased the amount of green leaf area remaining on leaf 2.
- Where no fungicide was applied, the crop produced a yield of 8.44 t/ha (Tables 1 and A2). Some of the treatments significantly increased yield, with responses ranging from 0.13 t/ha (two applications of Folicur + Corbel at 0.5 + 0.5 l/ha) to 0.64 t/ha (Folicur + Corbel at 0.5 + 0.5 l/ha on 10 May followed by Folicur + Amistar at 0.5 + 0.5 l/ha on 4 June). The inclusion of Amistar in the fungicide programme tended to produce the highest yields.
- Where no fungicide was applied, a specific weight of 71.9 kg/hl was recorded (Table A2). Specific weight was significantly improved by several of the treatments which had included Amistar in the programme.

**Further details**

Other experiment details and results are presented in the appendix.

Field details

Applications to crop

*Experiment diary*

Method

Results

Table A1 Disease and green leaf area (% leaf area)

Table A2 Grain yield (t/ha) and specific weight (kg/hl)

**Field details**

<b>Site</b>	New Found Farm, Colney, Norwich			
<b>Field reference</b>	Block 2			
<b>Crop</b>	Triticale			
<b>Variety</b>	Binova			
<b>Previous crop</b>	2000 Potatoes 1999 Winter barley			
<b>Soil type and series</b>	Loamy sand			
<b>Soil analysis</b>	pH	P	K	Mg
July 2001	7.7	2+	0-	0+
<b>Seed rate</b>	450 seeds/m <sup>2</sup>			
<b>Date sown</b>	24 November 2000			
<b>Cultivations</b>	23 November 2000	Ploughed and pressed		

**Applications to crop**

Precise treatments remain confidential but they are held on file. Appropriate treatments were applied to give a good commercial level of control of weeds, pests and crop growth and of crop nutrition.

**Experiment diary**

<b>Date</b>	<b>GS</b>	<b>Treatments applied or action</b>
24 November 2000	-	Trial drilled using Oyjord plot drill
25 January 2001	11-12	Plant count (243/m <sup>2</sup> )
10 May	32	1 <sup>st</sup> fungicide application as per treatment list. Weather conditions sunny and hot (24°C)
23 May	39-45	2 <sup>nd</sup> fungicide application as per treatment list. Weather conditions sunny and hot (24°C)
4 June	55-59	3 <sup>rd</sup> fungicide application as per treatment list. Weather conditions cloudy and cool (11°C)
12 June	61-65	4 <sup>th</sup> fungicide application as per treatment list. Weather conditions cloudy and warm (21°C)
14 June	65	Assessment of disease and green leaf area
10 July	77	Assessment of disease and green leaf area
14 August	92	Trial harvested using Sampo 2010 "W " plot combine

## Spray and assessment methods for cereal trials

This is an abbreviated version of the standard operating procedures used at Morley Research Centre.

### Plot layout

Plots were sown at 450 seeds/m<sup>2</sup> with an Oyjord drill. The drilled plots were 12 m long and 1.56 m wide from outside row to outside row (14 rows at 12.0 cm spacing). Plots were separated by a buffer of the same size with a 54 cm gap between successive plots and buffers. This gave an effective plot width of 2.10 m, which was used for harvest yield calculations. Treatments were applied to the plot and to half of the buffer at each side. For harvest purposes, plot length was reduced to 9.0 m.

### Overall treatments

Overall treatments such as fertiliser, insecticides, herbicides and growth regulators were applied across all plots with farm machinery using wheelings which were 24 m apart.

### Spraying details

Treatments were applied using a CO<sub>2</sub> powered backpack sprayer, utilising 'Cornelius' vessels and a 4 m boom (eight nozzles at 0.5 m spacings) with Lurmark F110-03 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 a 30.5 x 30.5 cm quadrat at random across the site.

### Foliar disease and green leaf area

Foliar disease of a particular leaf or leaf layer was determined by the following method. A standard (based on the appropriate key from the ADAS manual of disease assessment keys, 1976) was agreed between two experienced assessors and plots were assessed by walking along the gap between the harvest area and the buffer, examining the plot from both sides. The crop was examined at intervals and an appropriate disease level was agreed at the end of each plot.

The green area of a particular leaf or leaf layer was determined by two experienced assessors walking along the gap between the harvest area and the buffer, examining the plot from both sides. The crop was examined at intervals and an appropriate green leaf area was agreed at the end of each plot.

### Harvest details

Plots were harvested using a Sampo 2010 combine which was modified for plot work and used electronic weighing and specific weight determination (Harvest Master HM-400 with Grain Gauge). 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.

## Tables of results

Table A1 *Disease and green leaf area (% leaf area)*

Treatment	Septoria	Septoria	GLA	Septoria	GLA	GLA
-	Leaf 3	Leaf 4	Leaf 4	Leaf 2	Leaf 2	Leaf 3
Unit	%	%	%	%	%	%
Date	14/06/2001	14/06/2001	14/06/2001	10/07/2001	10/07/2001	10/07/2001
1	0.13	1.9	68.3	1.9	63.8	13.3
2	0.53	3.8	57.5	1.9	65.8	15.8
3	0.27	2.9	60.5	1.5	67.0	17.5
4	0.42	4.0	58.7	1.4	66.0	17.7
5	0.30	3.2	59.7	2.0	66.7	16.2
6	0.20	2.2	67.8	1.0	72.2	24.3
7	0.15	2.1	68.7	1.3	70.3	22.7
8	0.12	1.7	70.0	1.5	64.0	13.8
LSD (P=0.05)	0.217	1.10	7.18	0.56	4.27	NS
SE per plot (35 df)±	0.184	0.93	6.09	0.47	3.63	7.60
CV (%)	69.6	34.3	9.5	30.7	5.4	43.0

Table A2 *Grain yield (t/ha at 85% dm) and specific weight (kg/hl at 85% dm)*

Treatment	Grain yield	Specific weight
-	at 85% dm	at 85% dm
Unit	t/ha	kg/hl
Date	14/08/2001	
1	8.44	71.9
2	9.03	73.0
3	8.79	72.3
4	8.68	72.0
5	8.57	72.0
6	9.08	72.9
7	8.95	72.9
8	8.66	71.8
LSD (P=0.05)	0.304	0.50
SE per plot (35 df)±	0.258	0.42
CV (%)	2.9	0.6