stripe nor leaf rust occurred in this trial and as a result the initial input costs were not recouped. Under non-experimental cropping situations foliar fungicide sprays would not have been applied in the absence of disease, however in this trial the cost of foliar applications were not returned through improved yield.

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DISEASE MANAGEMENT IN WHEAT AND BARLEY

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Agronomy

AIM

To evaluate and determine the profitability of different strategies of disease management.

BACKGROUND

Leaf spot diseases, namely septoria nodorum *(Phaeosphaeria nodorum)* and yellow spot *(Pyrenophora tritici-repentis)* in wheat and net and spot type net blotch *(Pyrenophora teres sp.)* in barley, are often neglected and more importance is placed on other diseases, such as stripe rust. In wheat, yield gains of 30% have been demonstrated from controlling these diseases (Bhathal et. al., 2003) and they frequently occur together. Barley growers around the region are beginning to realise the benefits of controlling net blotch in barley.

This trial examines the benefits of applying two disease management regimes to Hamelin barley, Arrino & Bonnie Rock wheat. The two packages are **1)** Full protection (aiming at nil disease), **2)** Foliar sprays (depending on seasonal conditions) and **3)** A nil treatment.

TRIAL DETAILS

Property	Hyde Park Farms, Main Trial Site
Plot size & replication	1.8m x 20m x 6 reps
Soil type	Red Loam
Sowing date	13th May 2005
Seeding rate	Wheat at 100 kg/ha, Barley at 65 kg/ha
Fertiliser (kg/ha)	110 kg/ha Agstar Extra drilled, 100 kg/ha urea and 50 kg/ha Muriate of Potash topdressed.
Treatments	**1. Full** – Impact on fertiliser + 2 x fungicide sprays. **2. Foliar Spray** – 2 x fungicide sprays at Z31 (first node) and at full flag emergence. **3. UTC** – untreated control.
Herbicides	3 L/ha Sprayseed and 1.5 L/ha Treflan as knockdown, 7th July 2005: 750 mL/ha Jaguar + 300 mL/ha Lontrel
Growing Season Rainfall	258mm

TREATMENTS

	Wheat	**Barley**
Full treatment	400mL Impact on fertiliser 145mL Folicur at first node (Z31) 145mL Folicur at ear emergence (Z53)	400mL Impact on fertiliser 250mL Tilt Xtra at first node (Z31) 400mL Amistar Xtra at ear emergence (Z53)
Foliar Spray	145mL Folicur at Z31	250mL Tilt Xtra at Z31

	145mL Folicur at Z53	250mL Tilt Xtra at Z53
UTC	None	None

RESULTS

Net type net blotch was present in the barley and yellow spot and septoria nodorum present in the wheat. All diseases were not at high levels during the season. They were at moderate levels by the end of June but then the rain stopped and because of the lack of moisture the disease was not able to continue to infect. Therefore when it began to rain again in August, similar timing to when the second foliar spray was applied, there was very little disease to re-infect the top of the canopy. This is the main reason why we do not see any difference between the 2 foliar sprays and the untreated control (Table 1).

The full protection treatment, with Impact up-front and 2 fungicide foliar sprays had a significant yield response because earlier in the season the plants were fast growing but the canopy had plenty of moisture which allowed the disease to develop quickly, particularly the net blotch in barley.

This season lent itself to early treatment of these leaf diseases. The moist warm conditions at the start of the season were conducive to plant growth but also to fungi growth. When we would normally expect these diseases to start moving up the canopy and infecting leaves further up the plant, there was no rain and because of the lack of moisture the leaf diseases where not able infect up the plant.

Table 1: This table shows the average yields (t/ha) for the three different treatments in the trial. It also shows the means for each of the treatments as well as the average yield for the three varieties. The bolded means are significant.

Variety	Full protection	Foliar spray	UTC	Mean
Arrino	1.24	1.19	1.2	1.21
Bonnie Rock	1.39	1.32	1.27	**1.33**
Hamelin	1.32	1.16	1.2	1.22
Mean	**1.32**	1.22	1.22	

The full protection was slightly better yielding than the other treatments and there was no difference between the flag leaf spray and the untreated controls (Table 1). All results were analysed using the analysis of variance (ANOVA). The average yield for the full protection treatment was significantly higher than the other two treatments because the difference between the yields exceeded the lsd (lsd = 0.0743). It also showed that the higher yield of Bonnie Rock was also significantly higher than the other two varieties (lsd = 0.0743).

ECONOMIC ANALYSIS

Table 2: Economic Analysis ($/ha)

The variable costs only take into account the difference in treatment costs so the gross margin does not take into account fertiliser, application and other fixed costs. The full treatment is the leader in gross margins for all the two wheat varieties. The drop in gross margin for the barley reflects the high cost of the fungicides applied.

Variety	Treatment	Yield (t/ha)	Protein%	Gross Return	Fungicide Costs	Gross Margin
Arrino	Full	1.32	15.8	228	33	**195**
Arrino	Foliar	1.17	16.2	203	13	190
Arrino	UTC	1.11	16.3	193	-	193
Bonnie Rock	Full	1.45	14.6	322	33	**289**
Bonnie Rock	Foliar	1.26	14.8	281	13	268
Bonnie Rock	UTC	1.22	15.3	271	-	271
Hamelin	Full	1.32	16.9	224	67	**157**
Hamelin	Foliar	1.23	17.1	208	18	190
Hamelin	UTC	1.16	17.4	198	-	198

The high proteins of all three varieties favoured Bonnie Rock because it is classified as an AH. Arrino exceeded the noodle bracket so it is priced as ASW and Hamelin pricing is based on Feed.

COMMENTS

Seasonal conditions masked a lot of the effects of fungicide treatments. The very dry July period stopped the leaf diseases from continuing to grow and then after the rains in August the plants were able to grow away from the diseases. The leaf scorch caused by the lack of moisture meant that the diseases were unable to spread and it effectively stopped the disease in its tracks. There was also head frost throughout the trial which combined with the dry period during July resulted in the low yields. The improved yield of the full treatment over the foliar sprays shows that the impact was controlling early disease that had an effect on the yield before the first fungicide spray at first node. It also indicates that the impact may be controlling other diseases, such as take-all, that were present at sub-clinical levels in the plants.

In summary:

- The Full treatment was significantly better yielding than the other treatments.
- There was no significant effect on yield from the 2 foliar sprays full flag emergence, over the untreated control, a reflection of the season.
- Bonnie Rock was significantly better yielding than the other varieties.
- The high proteins gave Bonnie Rock as distinct advantage in $/ha income over the other varieties.
- The full treatment was more profitable than other treatments for wheat.

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