Preventative Fungicide Applications on Wheat Crops

Background

Traditionally fungicides are applied to crops by foliar application after identification of rust on the plants, usually once the disease has become well established. However once disease has been noticed there has already been some reduction in yield potential. In varieties with low resistance and ideal conditions for the disease this can lead to considerable loss in production even to the most astute producers. By applying fungicide before any sign of rust, lower rates can be used, the fungicide provides longer protection and the potential yield loss is saved.

In this trial a preventative fungicide spray of Triad (Active Constituent Triadimefon) was applied at GS32. This was followed up with an application of Folicur (Active Constituent Tebuconazole) at GS39 to provide protection against Leaf and Stem Rust as well as other high rainfall diseases such as Septoria & Yellow Leaf Spot.

What was done?

A trial site was established on the property Caledonia, Timber Creek Road owned by Richard and Kate Stanton and Sons, in a paddock that was planted to Canola in 2005 and Wheat in 2004. Annuello Wheat (Moderately Susceptible to Stripe rust.) treated with Raxil was planted at 75kg/ha with 25cm row spacings on the 15th May.

The paddock was sprayed with 1.5L/Ha Roundup on the 23rd April followed by 1.6L/Ha TriflurX, 700ml/Ha Roundup, 200ml/Ha Dicamba (Herbicides), 100ml/Ha Dimethoate (Insecticide) and 75kg/ha DAP at planting. The plots were set up and treated as shown in Figure 1 with the Triad being applied at 500ml/Ha on the 13th August (GS32) and the Folicur at 150ml/Ha on the 14th September (GS39).

All plots were all harvested on the 12th December with each plot being separately bagged and weighed to determine yield.



Figure 1: Plots and their treatments.

At another site on the Stanton's Springy Waters property, Bark Hut Road, a Trace Element trial was established to investigate the effect of applying trace elements to a Chara Wheat crop. This crop was sown on the 24th May at 85kg/Ha with 25cm spacings and 75kg/Ha DAP. General weed, pest and fungicide control measures where undertaken as usual.

A plot was left untreated with Trace Elements and the rest of the paddock received:

- 20th July
- 2.5kg/Ha Zinc Sulphate
- 22nd August
- 20g/Ha Sodium Molybdate
- 200g/Ha Copper Oxide
- 150g/Ha Boron
- 1.25L/Ha Molasses.

The rates applied were based on a tissue test, which identified the above nutrients as being deficient or marginal.

Results

Plant Density counts of the Annuello on the 21/08/06 averaged 125plants/m² and was considered a good establishment given the planting rates and it was expected to see yields of >4t/ha. Final growing season rainfall of 232mm with a very early finish to the season gave a revised yield estimate

based on the French-Shultz model of 2.6t/Ha for the wheat crops on the Stanton property.

There was no sign of either Leaf or Stripe rust in any of the crops on the Stanton properties in 2006, although some Leaf Rust was noticed early in the season on Ryegrass and Phalaris plants around the sheds at Caledonia.

Although there was no rust recorded on the wheat plants there was an increased production from the additional applications of the fungicide across the different plots. The results in Table 1 illustrate an 11% increase in yield by applying Triad and Folicur at GS32 and GS39 respectively, compared with the control. Similarly there was a 10% yield increase relative to the control when just Triad was applied at GS32. However there was a 5% yield increase from applying only Triad at GS32 compared to Folicur at GS39.

The cost of using 500ml/Ha Triad was approximately \$3.35/Ha and \$6.38/Ha for the Folicur (150ml/Ha) excluding application costs. Therefore based on the results in this trial, if the fungicides are applied at the same time as other routine applications of insecticides, herbicides or Trace Elements the increased yield correlates to a \$74/Ha (Based on \$290/t wheat minus \$9.73 chemical cost.) Obviously profit decreases when application costs and yield loss from wheel tracks are considered.

Plot	Plot Treatment	Yield
Number		
Plot 1 -	Nothing post GS32	2.62t/Ha
Control		
Plot 2	Folicur @ GS39	2.75t/Ha
Plot 3	Triad @ GS32	2.88t/Ha
Everything	Triad @ GS32 &	2.91t/Ha
	Folicur @ GS39	

Table 1: Yields from trial plots.

Due to the poor seasonal rainfall and because there was no visual difference the trace elements plots where not harvested separately. Given KI soils are typically deficient in the trace elements Zinc, Copper, Molybdenum and Manganese, further work into their effects on cropping yields will be continued this year.

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Take Home Message:

- Most farmers apply fungicide as a curative rather than preventative measure.
- Foliar fungicides are more effective when applied before the onset of the disease
- Preventative applications can be applied at lower rates than curative applications thus reducing application costs and potential yield loss.
- Despite the dry spring finish, all plots treated with fungicide demonstrated an increase in yield compared to the control.
- There was a small yield deficit incurred from applying only Folicur at GS39 compared with only Triad at GS32.