

Disease and Pest Control

Managing a continuous cereal on cereal rotation

SUMMARY

Barley can be successfully grown on retained wheat stubble, but it is advisable to burn wheat stubble when growing wheat on wheat. If stubble is retained then Yellow Leaf Spot can be a devastating disease in a wet winter. The most important management practices when growing a cereal on cereal are:

- Select paddocks with low numbers of grass weeds
- Retain wheat stubble for barley, burn the stubble for wheat
- Control summer weeds to ensure summer rainfall can be used by the crop
- Use varieties with good disease resistance such as Silverstar or Krichauff
- Disease - select paddocks with low disease pressure (monitor the previous crop) and DNA test the paddock prior to sowing
- Apply sufficient nitrogen for a good crop (soil test to know how much to apply)
- Barley on barley can lead to serious problems with leaf diseases such as net blotch

The aim of this trial work is to investigate management options which reduce the risk of failure when growing wheat on wheat, or barley on wheat stubble.

BACKGROUND

Many regard cereal on cereal as poor management. This may have been the case in the past but now that we have better disease resistant varieties, much better soil testing procedures for identifying potential disease problems and better in crop disease management strategies, it needs to be reviewed. Break crops such as pulses are not always successful and often fail because these crops are not as resilient as cereals. The production risk of pulses is much higher than for cereals. If we can learn to grow cereal on cereal successfully it may reduce the production risk associated with intensive cropping thereby reducing the financial risk.

Some farmers have been successful in growing wheat on wheat (Table 1).

Table 1. Examples of commercial crops of wheat on wheat.

	Charlton (avg GSR=310mm)			Rupanyup (avg GSR=310mm)			Birchip (avg GSR=310mm)		
	yld	GSR	WUE	yld	GSR	WUE	yld	GSR	WUE
1998	3.2	270	20						
1999	2.8	243	22	3.7	279	22	3.2	228	27
2000	3.0	274	18	3.9	304	20	2.4	256	17

There are still many cases where farmers are disappointed with the second or third cereal crop and the BCG have been working on trying to identify the main management practices which are essential to make cereal on cereal a success. Quite often the second or subsequent wheat crop yields less than the first - it is important to review the economic return over a number of years before deciding wheat on wheat is a good or bad idea.

METHOD

The trial work is now in its second year. At Charlton wheat and barley were sown on a barley stubble, whereas at Birchip wheat and barley were sown on a wheat stubble. Treatments included:

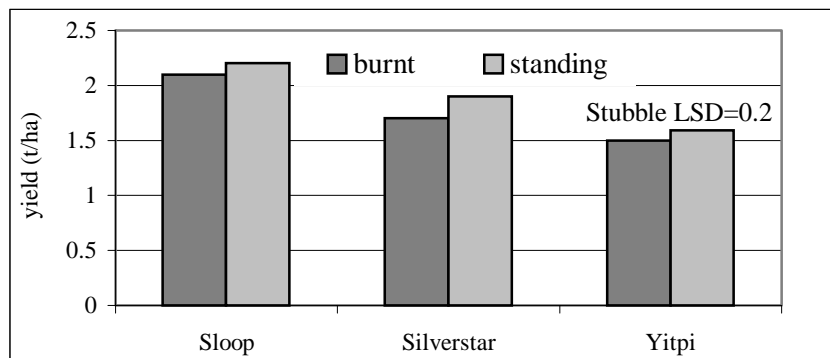
- three varieties (wheat - Yitpi and Silverstar; barley - Sloop)
- stubble burnt or stubble retained
- fungicide with the fertiliser (Impact in Furrow) or applied in crop as Folicur

At Charlton the crops were sown on May 10, where as at Birchip they were sown on May 23. At both sites the plots were predrilled with urea (100kg/ha) and the crop was sown with 80kg of MM1.

RESULTS

At the Birchip site there were yield differences between the varieties and between stubble burnt or retained. Yitpi performed poorly in relation to Silverstar at Birchip (1.56 vs 1.81 t/ha respectively), whilst barley had the highest yield (2.15 t/ha) (see Figure 1). The effect of stubble was also significant with the stubble retained plots yielding slightly more than the burnt. At Charlton the yields were similar for these two wheat varieties (average 1.83 t/ha) and barley (1.92 t/ha).

Figure 1. Birchip – yield of wheat and barley on wheat stubble (burnt or retained)



There was no beneficial effects of the fungicide treatments at either site.

Cereal yields at the Charlton site were low. Competition from ryegrass resulted in a reduced yield. It is suspected that the ryegrass was resistant to Group A herbicides because the plots were sprayed with a grass herbicide which had little or no effect in reducing the ryegrass population. Grass weed control is essential for the successful production of cereal on cereal.

INTERPRETATION

There was disease pressure at both sites from Yellow Leaf Spot during the early tillering stages which was most pronounced in Yitpi on the stubble retained plots. However, Silverstar was not immune to the disease. The early winter period was quite dry and the disease did not cause any long term problems.

In both 1999 and 2000 there was a beneficial effect on retaining stubble on yield. Both years were dry early in the season and the stubble may have provided a slightly more moist environment for the crop. If it had been a wet start to the season it is expected that the disease pressure from Yellow Leaf Spot would be too high in the stubble retained system to be able to grow wheat on wheat successfully. Because barley is less affected by wheat diseases it may be better to retain the wheat stubble when growing barley on wheat.

In 1999 and 2000 there was no benefit from using a fungicide (either at sowing as Impact in Furrow or in crop as Folicur).

BEST PRACTICE WHEN GROWING WHEAT OR BARLEY ON WHEAT STUBBLE

1. barley on wheat - retain stubble if possible; wheat on wheat - burn stubble, risk of Yellow Leaf Spot is too high in a wet start to the season
2. paddock selection with low grass weed pressure - herbicide resistant ryegrass and wild oats, and brome and barley grass are difficult to control in wheat and barley
3. control summer weeds - moisture retention is essential because paddocks are generally very dry after a cereal crop
4. disease management - observe root diseases in the first crop (in the previous year) to ensure take-all and eelworm levels are low.
5. DNA soil test - a DNA test will help identify any potential problems with root diseases
6. variety selection - Silverstar has some tolerance to Yellow Leaf Spot in the early growth stages (but probably not as much as first thought), Frame is resistant and tolerant to eelworm, Krichauff has good foliar leaf disease resistance and is tolerant to eelworm, Yitpi is susceptible to Yellow Leaf Spot. The best varieties are Krichauff or Silverstar.
7. seed treatment - treat seed with Armour or Baytan (do not use trifluralin)
8. soil test - test the soil for nitrate to ensure adequate supplies of N are provided