

Why the difference between Wheat and Barley in the level of Screenings?

Wheat and malting barley should be managed differently. The crops are quite different in their growth characteristics and what influences one crop in a particular quality characteristics can do the opposite in the other crop. For example high sowing rates in Silverstar wheat tends to reduce the level of screenings however in malting barley high sowing rates can result in an increase in screenings - why is this the case?.

1. PLANT ESTABLISHMENT

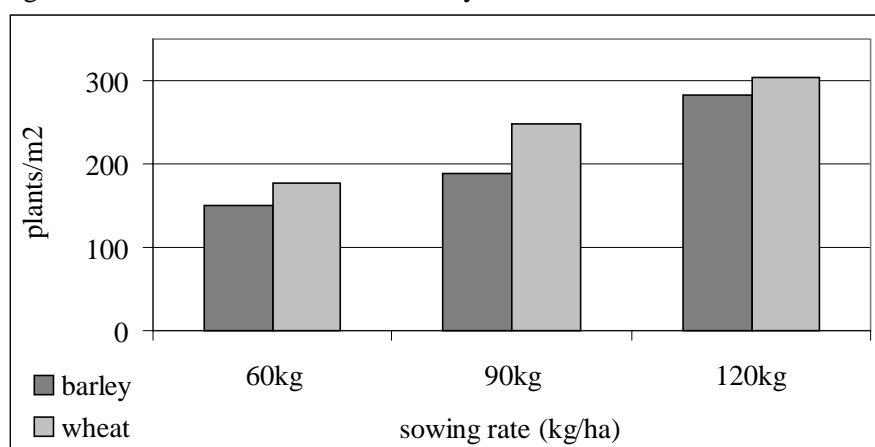
Sloop barley and Silverstar wheat have different grain weights and seed number per unit area will vary between the two crop types quite markedly for the same sowing rate (Table 1).

Table 1. Seed sown per square metre for Sloop barley and Silverstar wheat in the 2000 season trial.

Sowing rate (kg/ha)	Seed sown per square metre	
	Sloop barley (36mg/grain)	Silverstar wheat (30mg/grain)
60	166	200
90	249	300
120	332	400

Sloop barley and Silverstar wheat sown at 18cm (7") at 60, 90 and 120kg/ha increased in plant establishment in direct relation to the sowing rate (Figure 7).

Figure 7. Plant establishment for barley and wheat sown at three rates.

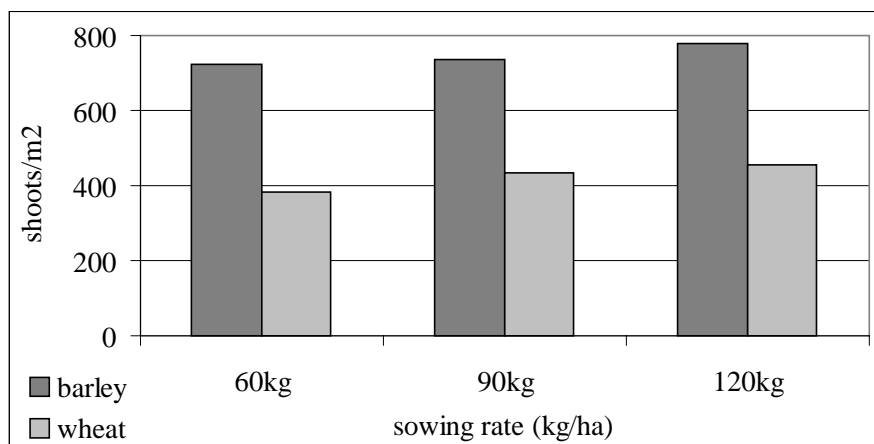


Average germination (plants established in relation to grain sown) was 84% for barley and 82% for wheat. At wider row spacings the average germination decreased to 70% for both crops.

2. TILLERING ABILITY

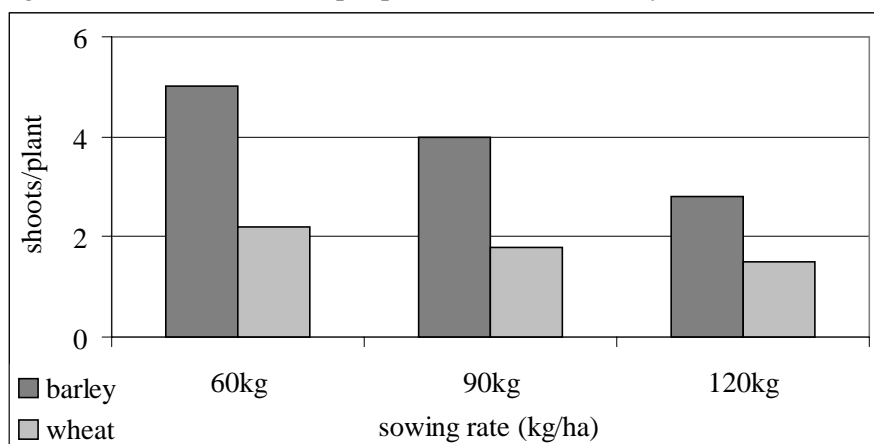
There were large differences in shoot number between the two crop types at the end of tillering Z30 (Figure 8).

Figure 8. Number of shoots per square metre (at Z30) for barley and wheat.



The differences in shoot number for the two crop types is directly attributed to differences in tillering ability. Wheat produces fewer shoots than barley (Figure 9).

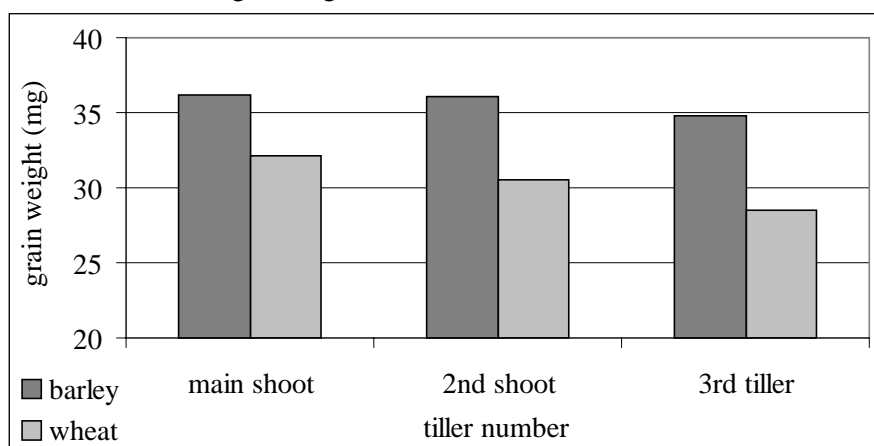
Figure 9. Number of shoots per plant (at Z30) for barley and wheat.



3. GRAIN WEIGHT

Individual shoot grain weights showed clearly that for each shoot the weight of grain decreased (Figure 10).

Figure 10. Grain weights for grain in the main shoot and 1st and 2nd shoots. The decrease in weight is significant ($P < 0.01$).



4. END RESULT

The reasons why barley at high sowing rate has the potential for high screenings are:

- Barley produces significantly more shoots per plant than wheat
- Grain weight decreases for each shoot

Hence because barley has many more shoots than wheat, and these extra shoots have smaller grain, the screening level in barley is often higher than in wheat

In both crops it is possible to reduce the amount of tillering by increasing the sowing rate. For Silverstar wheat 2.2 shoots formed at a sowing rate of 60 kg/ha, at 120 kg/ha only 1.5 shoots formed. For Sloop barley the number of shoots also decreased but nowhere near as much (at 60 kg/ha - 5 shoots; and at 120 kg/ha - 2.8 shoots).

Hence even at the high sowing rate of 120 kg/ha barley still produced too many shoots and the contribution of the small grain in the third and subsequent shoots is too large a percentage of the whole sample which results in an overall reduced grain weight for the sample.