

# Deciding row spacing for wheat in central Queensland

**W**heat is a profitable crop in central Queensland. It also provides valuable stubble and other rotation benefits including weed and disease management.

The recent use of wide rows to improve yield reliability in sorghum has led to wider row spacing in wheat. Wider rows enable

- Better matching of row spacing with other crops
- Better stubble handling
- The ability to moisture seek and fertilise between the rows at planting
- Reduced cost of buying or modifying a planter.

The disadvantages of wide rows include

- Lower yield potential under high yield conditions
- Reduced crop establishment when applying nitrogen fertiliser with the seed
- Reduced crop competition from weeds
- Lower establishment percentage.





What is the effect of row spacing on wheat yields and farm profitability?  
There are two main issues to consider:

1. The long term wheat yield potential for your farm
2. The relative importance of wheat to the profitability of your farm compared to other crops grown.

## 1. Yield potential

DPI&F's CQ Sustainable Farming Systems Project in conjunction with the CQ wheat breeding team, conducted 24 research trials to investigate the interaction between row spacing and yield potential. The study compared 25, 37.5 and 50 cm rows and concluded the impact of row spacing on wheat yield varied with crop yield potential.

At yields up to 2 t/ha (four trials), there was no effect of row spacing on yield for row spacing up to 50 cm.

At average yields between 2 t/ha and 4 t/ha, both 37.5 and 50 cm rows resulted in a yield reduction compared to 25 cm rows. 50 cm rows incurred a slightly higher yield loss than 37.5 cm rows.

*Table 1. Results from trials yielding between 2.0 and 4.0 t/ha*

Average yield level 2.0 – 4.0 t/ha	Widening row width from...	
	25 to 37.5 cm	25 to 50 cm
No. trials	3	9
No. trials with significant loss (% of total no. trials)	2 (66%)	7 (78%)
Av. yield loss in trials where losses were significant	0.2 t/ha	0.3 t/ha

At average yields above 4 t/ha, yield losses from 37.5 cm and 50 cm rows compared to 25 cm rows were greatest. A greater number of trials incurred a yield loss with 50 cm rows compared to 37.5 cm rows.

*Table 2. Results from trials yielding above 4.0 t/ha*

Average yield level > 4.0 t/ha	Widening row width from...	
	25 to 37.5 cm	25 to 50 cm
No. trials	6	9
No. trials with significant loss (% of total no. trials)	2 (33%)	7 (78%)
Av. yield loss in trials where losses were significant	0.6 t/ha	0.5 t/ha

Because the yield reduction from wider rows varies with crop yield, the long term yield potential for your farm will influence which row spacing is best suited to your farming system. Generally the degree of yield reduction under wide rows (>25 cm) increases as yield potential rises, with the greatest reduction occurring at yields above 4 t/ha. Ideally, this suggests that row spacing should be varied with crop yield potential, with narrower rows being used in high yield potential situations.

In reality however, the difficulty of changing row spacing on some planters every year and accurately predicting yield potential prior to planting means that a fixed row spacing that is compatible with other crops grown is a practical approach. In this case, the row spacing selected should be determined according to the relative importance of wheat compared to other crops grown. Crop prices may also influence this decision, with yield losses from wide rows resulting in greater economic losses when crop prices are high.

## 2. How important is wheat in the farming system?

Yield losses from wide rows will affect profitability greatest on farms where wheat makes up a large proportion of the total annual crop area and yield expectations are often high. In these situations 25 cm rows are recommended, however 37.5 cm should be preferred to 50 cm if a spacing wider than 25 cm is required. These enterprises are more likely to justify having a planter where row spacing can be adjusted from year to year according to crop yield potential.

On the other hand, farms where wheat makes up a small proportion of the total annual crop area and yield expectations are low to moderate, either 37.5 cm or 50 cm row spacings are suitable, particularly if moisture seeking is commonly used to sow wheat. These enterprises are most likely to use the compromise approach described above with a row spacing that fits with other crops grown.

Before changing row spacing, individual farmers need to weigh up the potential yield impacts with the importance of wheat in their farming system. This decision should be reviewed when planting equipment is updated or the area of wheat sown changes.

Further information can be obtained from:

- CQ Sustainable Farming Systems Project. [www.dpi.qld.gov.au/cqsfs](http://www.dpi.qld.gov.au/cqsfs)
- DPI&F web site. [www.dpi.qld.gov.au](http://www.dpi.qld.gov.au)
- Telephone DPI&F on 13 25 23







## Farmers' experience

### Mifsud family 'Wandina' Kilcummin

Wheat is important because:

- it provides valuable stubble cover, protecting soil against erosion
- of rotation benefits to address weed control issues and herbicide resistance
- provides better use of stored soil moisture (less evapo-transpiration than summer crops)
- less insect problems.



Approximately 1500 ha of wheat is grown each year, which is about 33% of the total farm area. Yield expectation is 2.5 t/ha, with 2.3 t/ha average yield obtained. Moisture seeking to plant wheat without rain is not practiced, as prefer to leave stubble undisturbed and wait for a summer crop.

Row spacing was widened from 30 to 50 cm 7 years ago and have found this spacing suits because:

- less ground units made a cheaper conversion
- summer crops are planted on 1.5 m rows and fertilizer is placed 50 cm either side of the planted row, which maximizes yield across a range of seasons
- majority of cropping area is sown to summer crop, so wheat sown on 50 cm rows fits in to the overall farming system.

### Durkin family 'Silverton' Theodore

Wheat is important because of:

- rotation benefits – wheat stubble minimises erosion and is important for soil moisture accumulation
- marketability - feedlot industry starting to use more wheat in rations
- profitability – high returns are possible in a good year.



Approximately 1000 ha of wheat is grown each year, which is about 50% of the total farm area. Average yield expectation is 3 t/ha and in some years (2 in 6) wheat is sown by moisture seeking due to lack of planting rain.

Planters consist of a tyne opener (Multiplanter) on 37.5 cm and a disc opener (Barton) on 50 cm. These planters are suitable for wheat and pulses, which can be easily changed to 1.5 m spacing for sorghum and fertilise between the planted row.