



## **Does stubble height influence subsequent crops?**

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**GRDC project CWF00018 – Maintaining profitable farming systems with retained stubble in Central West, NSW**

### **Key Points**

- Stubble height did not affect fallow efficiency at Weethallee following the 2013 or 2014 harvests.
- Stubble height during the 2014 fallow did not impact on 2015 crop yields.
- Leaving higher stubbles may reduce harvest cost but may also cause issues during fallow sprays and sowing. Individual producers need to target a stubble height that best suits their equipment and techniques.

### **Background**

At CWFS field days and grower events any discussion about stubble management usually results in the question “Does stubble height matter?” The answer to this question depends on the perceived benefit of stubble height at both harvest and within the next crop. Most producers agree that during harvest there is extra operational costs and lower header efficiencies in harvesting consistently lower to allow for harvest weed seed management options. Producers of peas, vetch and other prostrate crops will claim benefits of leaving higher cereal stubbles to support for these crops. At the 2013/14 CWFS windrow burning trial at Wyalong, it was observed that traditional knee high stubbles required an earlier and potentially extra fallow spray due to quicker weed emergence than beer can height stubble treatments used for windrow burning treatments.

During the 2013 and 2014 harvests, replicated stubble height trials using commercial equipment in commercial cereal crops were established by Mr Ian Luelf, Iona, Weethallee. CWFS used these sites to investigate any possible impact on subsequent management operations such as spraying or crop performance.

### **Agronomic Issues**

Stubble height will have an impact on future paddock management.

Generally higher stubble results in cheaper harvest costs. Higher stubble may slow the surface evaporation rate which, in certain fallow seasons depending on rainfall distribution, may potentially improve fallow efficiencies. Higher stubble may slow surface evaporation which may extend the sowing window in marginal establishment years.

Higher stubble may hinder herbicide applications during the fallow and at crop establishment. Higher stubble may slow sowing once the root system decomposes. Higher stubble may result in extra weed germinations in fallow.

### 2013 Trial

At the 2013 harvest with the aim of documenting and quantifying any agronomic fallow impacts of different stubble heights, a replicated trial was established using a New Holland CR9070 with a honeybee front, whilst a wheat crop was being stripped. The trial consisted of 3 replicates and 4 target stubble height treatments, 15cm, 25cm, 30cm and 40cm. Plots were 12m (a header width wide) and 100m long.

#### Results:

Targeted stubble height (cm)	Standing Stubble load (kg/ha)
40	1300-1655
30	1015-1235
25	605-1000
15	605-735

Table1. Average standing stubble loadings.

Month	Rainfall (mm)
December	0
January	16
February	17
March	60

Table 2. 2013 summer rainfall

Soil cores were collected from each plot during December and March and gravimetric soil water determined. As expected no differences were observed between plots in December. No differences were observed in March. There were no significant rainfall events during the summer that would potentially store any soil water, as a result there was no agronomical change in soil water between December and March. Although a zero tolerance to summer weeds was practiced, no fallow weed control was required until early April as result of the March rain.

#### Discussion:

During the dry 2013/2014 (refer Table 2) summer stubble height had no impact on fallow efficiency or management. Observations at a CWFS windrow trial at Wyalong concluded that earlier and, potentially, an extra summer spray was required where stubble heights were higher, but this was not seen at Weethallee.

### 2014 Trial

At the 2014 harvest, another replicated trial was established using a New Holland CR9070 with a honeybee front whilst a wheat crop was being stripped with the aim of again documenting and quantifying any agronomic fallow impacts of different stubble heights. The subsequent Scope barley crop was also monitored. The trial consisted of 4 replicates and

target stubble height treatments, 15cm, 25cm and 40cm. Plots were 12m (a header width wide) and 100m long.

**Results:**

Month	Rainfall (mm)
December	24
January	101
February	32
March	0

Table 3: 2014 summer rainfall

No data on standing stubble loads is available due to the loss of stubble samples collected immediately following harvest. Soil cores were collected from each plot during December and March and gravimetric soil water determined. As expected, no differences were observed between plots in December. No differences were observed in March.

Fallow weed control was required during December, January and March but no difference in weed emergence rates were observed between plots.

A commercial crop of Scope barley was sown 18 May into good conditions. Crop emergence, growth and final yield data for each plot was collected over the season. No difference was observed between plot performance at emergence or yield. During early tillering it was observed that plots with 15cm and 25cm high standing stubbles were generally 1 to 2 tillers in front of the 40cm high plots. By stem elongation no difference could be observed. The crop suffered a very tight finish and all plots yielded approximately 2.6 t/ha, this was determined by hand cut quads prior to the commercial harvest.

**Discussion:**

Similar to the 2013 trial, no differences were observed in fallow efficiency or management required. This was despite a more favourable summer rainfall. Timing of summer weed control sprays was not affected as observed at Wyalong during 2013. Ryegrass was not a major weed at this site and this may have contributing factor to spray timing.

It cannot be determined whether the tight finish to the season limited any potential yield differences between treatments. Although as final tiller numbers were similar between treatments the impact was most likely similar for all plots.

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