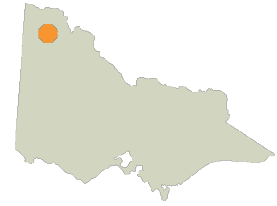


Stubble Management to Improve Crop Yield

Chris Korte, Mick Brady, Chris Davies, Dave Monks.
 Department of Economic Development, Jobs, Transport and Resources (DEDJTR)
 Peer Review: Garry O'Leary, DEDJTR



Why was the trial done?

Over recent seasons adoption of stubble retention has plateaued in the Mallee and some growers are reducing the area of stubble retained until the next growing season. An experiment was undertaken to identify potential improvements in stubble management so this trend could be reversed. The experiment examined how different amounts and types of stubble impact on subsequent water availability and crop yield.

How was the trial done?

The experiment was located at Ouyen using 4.8m by 15m plots, replicated in five blocks. In 2013 different stubbles were generated. In 2014 wheat and canola were grown on the range of stubble treatments. Growing season rainfall at the site was 147.8 mm in 2013 and 115.6 mm in 2014.

In 2013 plots were sown in either Mace wheat or Rasina vetch, each at two fertiliser rates – High input of fertiliser (20kg/ha of N & 6kg/ha of P followed by 20kg/ha of N top-dressed) and Low input of fertiliser (2.7 kg/ha of N & 6kg/ha of P). To further generate differences in stubble, the crops were harvested at two heights in 2013 (<15 cm and >30 cm above the ground). Measurements in 2013 included post-harvest stubbles.

In 2014 plots were sown in either Corack wheat or 43C80 Clearfield canola. In 2014 measurements included pre-sowing stubbles, soil moisture and grain yields.

Key Messages

- For different 2013 treatments, the amount of stubble ranged from 2.4-4.0 t DM/ha at harvest and from 1.6-3.0 t DM/ha at the subsequent sowing. The only statistically significant effect of 2013 treatments on 2014 pre sowing stubble was a difference between wheat and vetch stubble, 2.7 t DM/ha and 2.0 t DM/ha respectively, reflecting faster breakdown of vetch than wheat stubble.
- Despite significant differences in the amount and types of stubble generated in 2013, and remaining at sowing in 2014, there was no statistically significant effect of 2013 treatments on 2014 soil moisture at sowing or 2014 crop yields.
- There were significant differences between crop types in 2014. Significantly more wheat plants established than canola (49 and 15 plants per m² respectively) and wheat had a significantly higher grain yield than canola (1.2 and 0.3 t/ha respectively). Both wheat and canola were affected by the dry spring and associated frosts, plus canola had poor establishment.

- Research conducted previously at Walpeup in the 1980s¹ found that maintaining 2 t/ha stubble increased the amount of water stored in the soil at sowing, at depth 0-140 cm, by 16 mm in 1 year of 3. This increase in soil water availability was not reflected in increased crop yield.
- The recent experiment at Ouyen, together with the previous research at Walpeup, indicate that Mallee crop yields are unlikely to be increased by retaining higher levels of stubble, although there can be benefits of reduced soil erosion.

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Reference

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