

Research to profit  
higher-rainfall  
temperate zone  
graingrowers

# Hi-Grain

UPDATE

## Plan to succeed with stubble retention

Attention to detail is the key to successful stubble retention in high-rainfall districts where crops produce large volumes of stubble.

Grower experience makes it clear that changing to a stubble retention system is a long-term exercise that involves farmers working through rotations and redesigning their seeding operation to maximise field efficiency.

Successfully developing a well-integrated stubble retention system brings financial and environmental benefits, particularly in the area of soil health and condition.

For best results planning needs to start several years before the farmer wants to implement the practice, which will vary from paddock to paddock because the speed at which stubbles break down is influenced by the characteristics and 'health' of the soil.

The first step is to determine the best rotation for stubble retention in your farming system.

Canola or pulse stubbles are easier to sow into than cereals, making them a good starting point for growers planning to start stubble retention or change to wider row spacings.

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## Key messages:

- Successful stubble retention requires careful planning and attention to detail
- Burning is not always the most profitable treatment
- Paddock conditions will dictate how best to achieve stubble retention objectives
- Wider row spacings may be beneficial but can impose yield or weed penalties
- Inter-row seeding with an autosteer is effective

## Sowing decisions

Shorter-strawed varieties tend to leave less residue after harvest.

Red wheats have stiffer straw than white wheats.

Barley straw is softer than wheat straw but can be too light and fluffy to pass between tines.

## Row spacings

Early indications from Southern Farming Systems (SFS) research suggest wider row spacings and inter-row seeding, which have proved to be of benefit in the drier conditions of the Wimmera and Mallee, are also options in the southern higher rainfall zone.

Inter-row sowing requires a high level of sowing accuracy best achieved with sub 2cm Autosteer GPS.

In 2005 there was some yield penalty for sowing wheat on wider row spacings in high-rainfall districts. However, this approach eliminates the need for burning, which can make it easier to sow but imposes other costs like loss of nutrients and organic matter.

When assessing the economics of such system changes it is important to look at the impact across the entire rotation, rather than focus on just one element of it.

Incorporation of stubbles requires additional energy (diesel) and labour.

Applying less nitrogen fertiliser at sowing and more in crop will result in less vegetation and more grain so there is less post-harvest residue left in the paddock.

## Harvest treatment

Cut crops moderately high and leave stubble standing. Leaving as much vegetation as possible standing as stubble limits the amount of trash on the surface, which minimises the risk of lumping and blockages during sowing. Standing stubble is less likely to cause problems with hair-pinning and blockages between seeder tines than stubble knocked down onto the soil surface.

Where straw has been knocked onto the ground by stock, morning dews will slow operations and increase the chance of blockages. Standing stubble can minimise this.

Efficient straw choppers with the capacity to break up and high stubble loads and spread the cut harvest residue evenly across the full header width minimise lumping and the potential for blockages at seeding. This in turn enables sowing machinery to operate efficiently and accurately, resulting in good depth control and even emergence.

Observations from SFS trials in 2005 suggest residues mulched soon after harvest are more likely to be blown away and lost than stubble that is incorporated or left standing.

Lack of autumn rainfall can limit the rate of stubble breakdown, particularly with residues of crops in excess of 3 t/ha.

## Burning

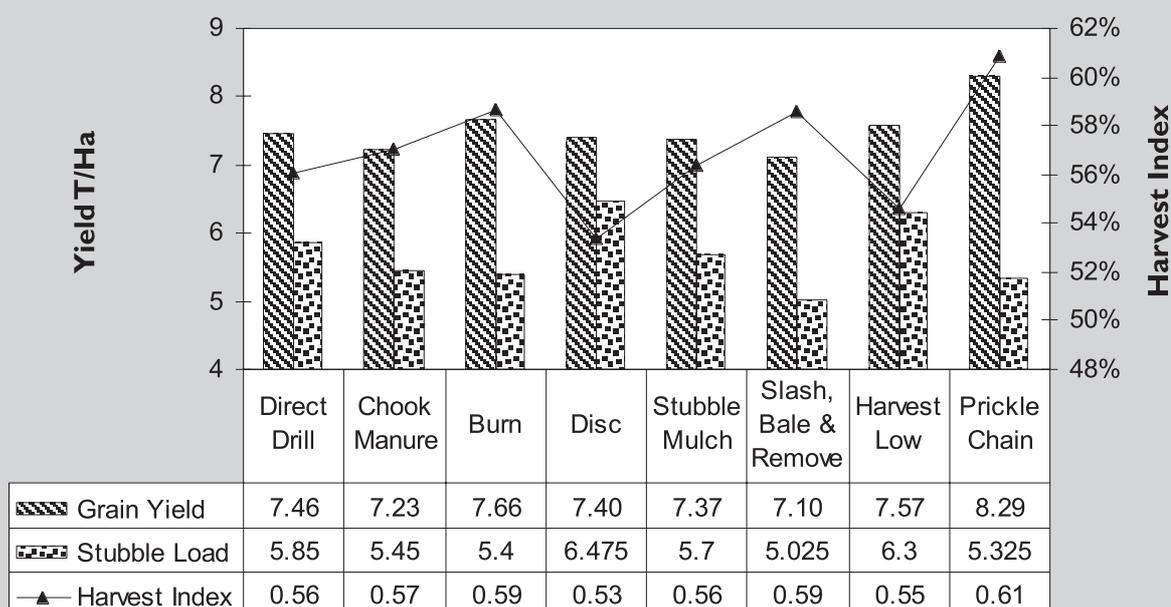
Trial results from sites across SW Victoria show that burning is **not** always the most profitable stubble treatment (**Figure 1**) for cereal stubbles in high rainfall areas.

In one trial last season the establishment of canola direct-drilled without press wheels after wheat stubble was burnt was much lower than in most stubble retention treatments and considerably below commercially acceptable levels.

Emergence was also low where the soil was 'scratch tilled' ahead of sowing; apparently due to moisture loss as a result of the cultivation.

Plant density was good in un-burnt treatments grazed by sheep prior to sowing.

## Hamilton NLP Stubble Management Trial 2005 (Barley)



**Figure 1:** Biomass comparison for grain and residue yield with resultant Harvest Index – Hamilton 2005.

## Grazing

Grazing makes a huge difference to the management plan.

In a trial at Hamilton, paddocks in which stubble was grazed by stock had significantly higher weed densities at early post-emergence (**Figure 2**) than paddocks that were not grazed.

Researchers have found that leaving weed seed on the soil surface can increase the efficacy of residual herbicides on those weeds.

This can result in improved control of weed populations resistant to Group A chemicals and lessen growers' reliance on these selective chemicals.

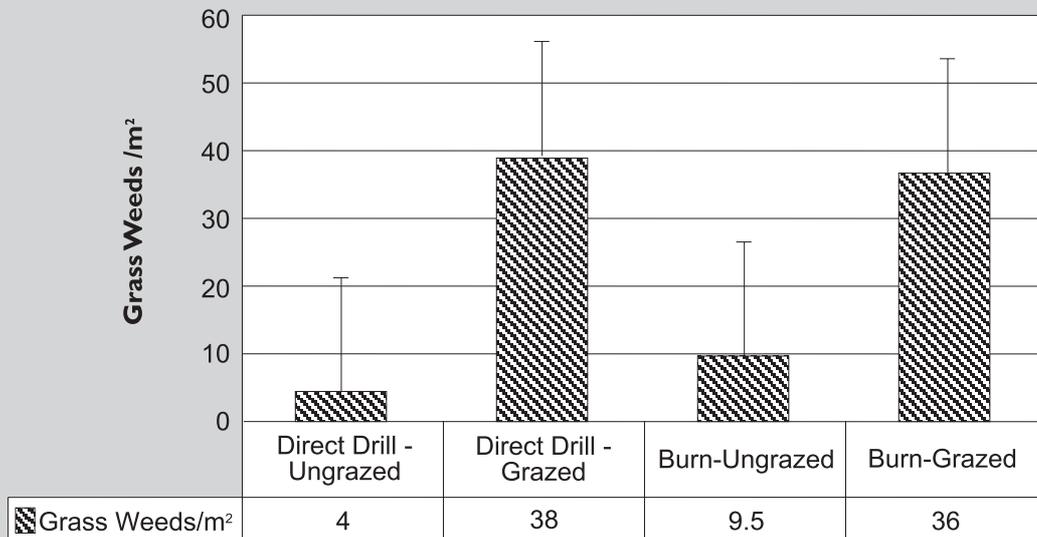
## Other treatment options

- 'Scratch tillage' using a purpose built disc travelling at pace. This has shown promise in some situations, but with high stubble loads it depends on summer rainfall to enhance stubble breakdown ahead of sowing.
- Incorporation of poultry manure in autumn to accelerate stubble breakdown.
- 'Residue managers' fitted to seeding equipment to push aside fallen stubble, minimising blockages and optimising crop establishment.

**For further information:**

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## Hamilton NLP Stubble Management Trial 2005 (Barley) Grazed vs Ungrazed (Direct Drill & Burnt Treatments)



**Figure 2:** Grass weed presence post emergence – Grazed vs Ungrazed - Hamilton 2005 (confidence bars indicate significant differences,  $P < 0.05$ ).

### IMPORTANT

For farmers... without fear or favour.

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