



## Post-planting

- Rolling lentil improves harvest efficiency and minimises soil contamination at delivery.
- Rolling lentil can help protect the crop from post-sowing herbicide damage.
- A flat, firm soil surface at harvest becomes even more essential when crops are short in height at maturity due to low rainfall.
- The optimum timing for post-emergent rolling is when most of the crop is close to the top of the furrow, 3–5-leaf growth stage.

## 5.1 Rolling lentils

### 5.1.1 Why roll lentils?

The practice of rolling lentil, or to be precise, rolling the soil surface of paddocks sown to lentil, is done to improve harvest efficiency and to protect the crop from post-sowing herbicide damage.

Leaving a flat, firm soil surface is essential when growing lentil because this enables a successful and trouble-free harvest with minimal harvest loss or damage to the harvester. The specific aim of rolling is to flatten any ridges and clods caused by seeding, pressing any rocks or sticks into the soil. This allows flexi and draper fronts to 'sit' on the soil surface when harvesting, for both greater efficiency and a better quality grain sample.

A flat, firm soil surface at harvest becomes even more essential when crops are short in height at maturity due to low rainfall.

Rolling lentil also prevents post-seeding herbicides from accumulating in furrows after heavy rain which may result in herbicide damage to the lentil plant.<sup>1</sup>

### 5.1.2 When to roll

Rolling is possible from pre-emergence of the lentil crop, ideally 3–4-leaf stage, and possible up to 4–5-leaf stage.<sup>2</sup>

In the past, rolling of paddocks sown to lentil has generally occurred before crop emergence. Rolling before emergence, and ideally before germination, can:

- delay emergence by creating greater soil cover for the seed. This presents a wider window to apply post sowing pre-emergent herbicides, by delaying emergence; and
- reduce the risk of heavy rainfall washing herbicides into the bottom of the furrow.

However, in recent years many growers have taken to post-emergent rolling of lentil at the 3–5-leaf stage. Reasons for this change include:

- shoot damage occurring in crops rolled as the plant is about to emerge;
- soils prone to hard-setting or crusting can lead to emergence problems if rolled pre-emergence;
- greater wind and water erosion risk where soils are rolled and plants have not established, particularly on sloping soils; and
- with some heavy rollers on sandy soils, pre-emergent rolling can push herbicides into the row, resulting in possible damage to the crop.

### 5.1.3 Rolling post-emergence

Rolling post emergence provides the grower with a greater window to choose the right soil moisture conditions to achieve maximum burial of stones and clumps and improved levelling of the soil surface.

The optimum timing for post-emergent rolling is when most of the crop is close to the top of the furrow: 3–5-leaf growth stage. Trials on lentil in Australia and Canada have shown there is no yield loss if rolling occurs up to the 8th branching node stage.<sup>3</sup> This allows some flexibility with timing rolling to fit in with weed control priorities.

When rolling post-emergent lentil, the following should be considered:

- avoid rolling during the period when plants are just starting to emerge;

<sup>1</sup> R Rundell-Gordon (2016) Growing lentils: lessons learnt from growing lentils in central and north west Victoria. Grains Research and Development Corporation Update, 17 Mar 2016. <https://grdc.com.au/Research-and-Development/GRDC-Update-Papers/2016/03/Growing-lentils-lessons-learnt-from-growing-lentils-in-central-and-north-west-Victoria>

<sup>2</sup> Grains Research and Development Corporation (2016) Lentil: The Ute Guide. Grains Research and Development Corporation, <https://grdc.com.au/resources-and-publications/all-publications/publications/2008/11/lentils-the-ute-guide>

<sup>3</sup> J Lamb, A Poddar (2008) Grain Legume Handbook for the Pulse Industry. Grain Legume Hand Book Committee, <https://grdc.com.au/grainlegumehandbook>

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- do not roll for 14 days after herbicide application and, conversely, do not apply herbicides until 14 days after rolling;
- do not roll stressed or diseased plants;
- the least amount of damage occurs to the plant when it is limp such as mid-afternoon; and
- avoid rolling straight after rain in heavier soil types.<sup>4</sup>

## IN FOCUS

- Rolling post-emergence can increase the risk of foliar diseases later.
- Damaged plant tissue can become the site for Botrytis grey mould or other common diseases to develop later, particularly if cold and wet conditions follow.
- Frosty conditions and wet foliage must be avoided when rolling.

### 5.1.4 Choice of roller

Both rubber-tyred and steel rollers can be used to roll lentils although a lighter roller is preferred when rolling post-emergence.<sup>5</sup>

The choice of roller is largely dictated by soil conditions and the type of material being rolled. The heavier the roller the better the result of levelling heavy soil types and pushing rocks and sticks below the soil surface. Lighter rollers work well on sandier soils.



**Photo 1:** Rubber-tyre roller.

Photo: M. Raynes, formerly Pulse Australia

The large barrelled roller, using truck tyres, in [Photo 1](#) allows water to be added as ballast to provide more weight for improved performance on heavy textured soil types. This can be advantageous if rolling where the soil has 'settled', or where significant surface debris needs to be pushed into the soil surface, requiring more weight in the roller.

<sup>4</sup> J Lamb, A Poddar (2008) Grain Legume Handbook for the Pulse Industry. Grain Legume Hand Book Committee, <https://grdc.com.au/grainlegumehandbook>

<sup>5</sup> Pulse Australia (2016) Southern Lentil: Best Management Practices Training Course. Pulse Australia

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Rolling is not usually necessary with disc tillage systems as these systems generally provide a flat harvesting surface.



**Photo 2:** *Lentil ridges rolled after seeding.*

(Photo: M. Raynes formerly Pulse Australia)



**Photo 3:** *Rubber-tyre roller.*

Photo: G. Reithmuller

### 5.1.5 Benefits

The ideal outcome of rolling lentils is that the resulting flat soil surface will allow the harvester to operate at near-ground level, picking up the short crop and harvesting pods close to the ground. A flat surface reduces harvest losses, harvester wear and contamination in the grain sample.

Rolling may not necessarily flatten all the standing stubble present. However, after summer or harvest rains, cereal stubble, in particular barley stubble, tends to be more brittle and does not stand as well after rolling. Some of the lentil crop growth and erectness benefits of standing stubble may therefore be lost. The use of some disc drills at seeding, sown into paddocks with standing stubble, may eliminate the need to roll lentil crops.<sup>6</sup>

Extra consideration is required for narrow-point and press-wheel tillage systems as standard rolling may result in the soil ridges only being levelled by the roller, as the roller will tend to ride on the ridges and put less pressure on the plant rows.

### 5.1.6 When not to roll

Rolling is not usually necessary with disc tillage systems as these systems generally provide a flat harvesting surface. On some soil types the clods or ridges naturally flatten with rainfall during the season.

<sup>6</sup> Pulse Australia (2015) Best Management Guide – Lentil Production: Southern Region. Pulse Australia, <http://www.pulseaus.com.au/growing-pulses/bmp/lentil/southern-guide>