FarmFLOW
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Monitoring sediment loss in horticulture

Photo 1: Lablab cover crop. Source: Julie O'Halloran, DEEDI.

At a glance

This monitoring site was set up to look at how much soil might move off a bare fallowed horticulture field with summer rainfall and how a living cover crop (lablab) might reduce the erosion risk. In this trial we found:

- Significant amounts of soil were lost from bare fallow over summer with rainfall events.
- The amount of soil loss varied with the amount and intensity of rainfall.
- The lablab cover crop significantly reduced the erosion risk on horticultural fields.

What did we do?

Cropping fields often show signs of washing after rainfall events.

- But has any soil moved off field?
- How much soil has moved?
- How effective is a cover crop in reducing erosion?

A monitoring site was set up in the Lockyer Valley on a commercial vegetable farm to answer some of these questions.

- A horticulture cropping field was split into two with different fallow management:
  - lablab
  - bare fallow with beds formed.
- Sediment collection troughs were set up at the end of the field (see photo 2 7).
- Field was monitored for sediment loss from December 2009 to March 2010.
- Field slope was approximately 5%.

What did we find?

Soil loss

- Less than 0.1 tonne/ha of soil was lost from the lablab block over the summer.
- Up to 11 tonnes/ha were lost from the bare fallow block over the summer.

There were several rainfall events over the summer that varied in amount and intensity.

- The amount of soil lost varied with these differences in rainfall.
- In each event the bare fallow lost much more soil than the lablab.
- The lablab was very effective in reducing soil loss even when only just established at 18 days after sowing (DAS) (see event 28 Dec 2009).

Lablab (or any cover) protects soil from raindrop impact and also stabilises soil through its root system. It also reduces runoff from the field (see photos 4–7) with greater infiltration.

In this case, the grower co-operator has in place infrastructure such as a sediment trap, grassed drains and grassed buffer strips to filter sediment and reduce any off farm loss from the bare fallow.

Nutrient analysis

The sediment collected was also analysed for nutrients.

- Very little nitrogen was found in the sediment as it is likely to have been leached or solubilised in runoff.
- Bare fallow lost 1.5 kg/ha of phosphorus and 6.5 kg/ha of potassium over the monitoring period in sediment.
- Lablab lost less than 0.05 kg/ha of phosphorus and potassium lost over the monitoring period. This is likely to be due to reduced sediment loss rather than a difference in the concentration of nutrient in the sediment.

FF10-010

For more information

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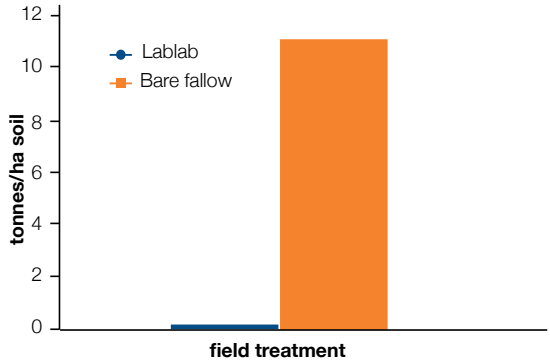

Figure 1: Sediment loss over summer from the lablab cover block and the bare fallow block.

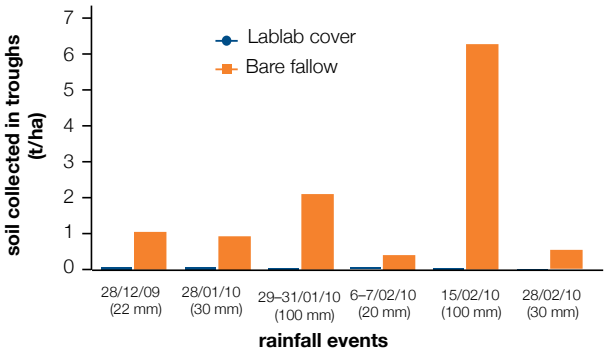

Figure 2: Soil loss from the lablab cover block and the bare fallow block with each rainfall event.

Cover at what cost?

A cost benefit analysis of the cost of the lablab cover crop was also undertaken. The cost of the lablab cover crop was approximately $256.44/ha. This seems a minimal cost given the protection provided to topsoil and nutrients.

Table 1: Cost of including lablab cover crop.

Farm operation	Cost ($/ha)
Lablab seed	$158.40 #
Sowing (FORM+labour)	$24.38/ha
Spray out (FORM+labour)*	$8/ha
Seedbed preparation 2 operations x $32.83 /ha (FORM+labour)	$65.66/ha
TOTAL (FORM+labour) + chemical	$256.44/ha

The recommended rate of sowing for lablab as a fodder crop in high rainfall areas is 30 kg/ha.
* Chemical costs for the spray out need to be added to the total cost.

Other costs to be considered include:

- loss of P and K may have to be replaced in the future,
- cost of moving and spreading soil that builds in drains and sediment traps.

Photo 2: Lablab plot 29-31 Jan, 100 mm event.

Photo 3: Bare fallow plot 29-31 Jan, 100 mm event.

Photo 4 5: Runoff from the bare fallow block during the 29–31 January 2010, 100 mm event. Source: Julie O'Halloran, DEEDI.

Photo 6 7: Runoff from the lablab block during the 29–31 January 2010, 100 mm event. Source: Julie O'Halloran, DEEDI.

On farm options to reduce erosion losses

To reduce erosion risk growers should consider the following:

- Protecting soil through cover cropping and inter-row cover. This is the most effective way to reduce erosion risk and add organic matter to your soil.
- Controlled traffic farming and minimised tillage systems will reduce erosion risk.
- Farm infrastructure such as sediment traps, grassed drains and filter strips will reduce soil loss off farm. These should be regularly maintained.

While you may put in place farm infrastructure to reduce soil loss off farm, the loss of soil off your field is a loss of the most productive part of your soil: nutrients and organic matter too. Preventing it from moving off your field in the first place is the best management practice.

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For further information contact:
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