Hillslope Erosion Trial – Jetsonville 2021

Demonstrating the cost-effectiveness of soil protection methods

Key Findings

- *Leaving soil bare through an intense rainfall period is an expensive option.*
- *Utilising any of the erosion control techniques was more beneficial than leaving the seedbed bare.*
- *Sowing a cover crop gave an 8:1 return on the investment.*

Objective

The Hillslope Erosion Sub-Project focuses establishing trial sites in areas of Northern Tasmania with intensive cropping enterprises and high susceptibility to hillslope erosion such as Deloraine and Scottsdale.

Trial sites were established to investigate the cost-benefit ratio of different hillslope erosion control methods and build awareness of hillslope erosion. Using these results, NRM North aims to demonstrate the cost-effectiveness of protecting soil from erosion.

Method

Five 250m^2 plots were prepared for the demonstration site at Moore's Vegetables, Jetsonville in June 2021.

Treatments were:

1. Bare fallow (smooth bed);
2. Tama ryegrass cover crop on smooth bed;
3. Contour-ripped bare fallow;
4. Contour-ripped with Tama ryegrass cover crop; and,
5. Contour-ripped with Tama ryegrass cover crop (early terminated).

Notched bamboo monitoring pegs (190) were inserted into each plot, with the soil level to the notch.

The difference between the notch and soil level was measured on each peg, by hand on 17 November.

Figure 1. The cover crops on the trial site were clearly visible to motorists on the Scottdale-Bridport Road.

Australian Government | National Landcare Program

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Results

Table 1. Average soil height changes from the five trial plots.

TREATMENT	SOIL HEIGHT
Bare fallow (smooth bed)	-8.6mm
Cover crop (smooth bed)	-4.9mm
Contour-ripped bare fallow	-7.6mm
Contour-ripped cover crop	-4.7mm
Contour-ripped cover crop early terminated	-8.4mm*

This in an excerpt from the full report. *This high level of erosion is likely due to early cover crop termination, followed by bare soil for weeks through Sept/Oct/Nov rainfall. Compared to the bare fallow plot which grew a cover of weeds over the same period.

Table 2. Cost:benefit for each treatment.

TREATMENT	COST/HA**
Bare fallow (smooth bed)	$4,501
Cover crop (smooth bed)	$2,778
Contour-ripped bare fallow	$4,102
Contour-ripped cover crop	$2,790
Contour-ripped cover crop early terminated	$4,698

This in an excerpt from the full report. **These costs were produced using v1.1 of the Tasmanian Erosion Economic Calculator and include the cost of lost topsoil carbon, lime and major nutrients and the relevant costs of tillage, seeding and spraying for each treatment.

Figure 2. The fertile soil and high rainfall resulted in vigorous growth in the cover crops.

Conclusion

The findings from the trial reveal that all plots experienced erosion, but the extent was reduced when soil protection methods, such as cover crops, were used (Table 1).

These results indicate that on a moderate slope on Scottsdale ferrosols in a wet year and late sowing of cover crop, erosion will occur despite treatments. However, sowing a basic ryegrass cover crop reduced the costs of erosion by $1,723/ha, including the cost of a cover crop.

Therefore, spending money on cover crops or tillage to reduce erosion risk through winter and early spring is usually a cost-effective investment in Tasmania's higher-rainfall agricultural zones.

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