



Hillslope erosion trial results December 2020

There are various ways to reduce erosion, including reducing how much water runs off and the speed of that flow.

A trial was conducted at Forthside Vegetable Research Station, Forth, in north western Tasmania, to compare three treatments to reduce the amount of water moving down a hillslope with a control (no treatment) - see Table 1 for treatment descriptions.

Contour lines were mapped using GIS and were loaded into the guidance system of the tractor.

Lines were ripped along the contour at every 5 m drop in elevation, i.e. every 30 to 40 metres down the slope (see Figure 1).



Paddock details:

- 5.8 ha of red Ferrosol soil
- 13 to 17° slope
- slope length: 265 – 280 m
- commercial cropping – beans

Figure 1 Paddock description and aerial view including 5 m contours lines

	Treatment	Tyne(s)	Swath (approx.)	Treatment width	Comment
1	Agro plough (see Figure 2)	7 offset tynes following wheels	2.2 m	30 m	
2	Single tyne	1	0.5 m	30 m	
3	Single tyne with straw drain (Ripper Mulcher, see Figure 3)	1	0.5 m	130 m	Approx. 15 square bales/ha
4	Untreated (control)	n/a	n/a	30 m	

Table 1 Hillslope erosion treatment descriptions

	Treatment	No. rills uphill from contour line (per ha)	No. rills downhill from contour line (per ha)	% change - rill numbers	Rill volume above contour line (m ³)	Rill volume below contour line (m ³)	% change - rill volume	Estimated value of soil loss (\$/ha)	Cost to implement treatment (\$/ha)
1	Agro plough	13	7	50% ↓	10.6	2.55	76% ↓	-\$127	\$50
2	Single tyne	13	13	no change	12.0	9.26	23% ↓	-\$463	\$50
3	Single tyne with straw drain (Ripper Mulcher)	13	7	50% ↓	38.5	3.23	92% ↓	-\$161	\$175
4	Untreated (control)	20	53	167% ↑	55.3	41.0	25% ↓	-\$2,050	\$0

Table 2 Treatments and effect on rills with estimation of value of soil loss and cost to implement

Two months after installation of the treatments, rills above and below a contour line were recorded and their volumes estimated (see Table 2).

The treatment was on the contour line. **It is important to adhere to the contour line**, otherwise the water will find a way to continue downhill.

It should be noted that rill formation varies across any given paddock and this should be borne in mind when looking at these results (particularly those of the control treatment).

If you intend to use straw, ensure it is seed free and that you use it with precision.

An arbitrary value of \$50/m³ has been used to estimate the value of soil and nutrients lost due to soil erosion in each treatment. However, this value will not be the same in all cases and the soil is assumed to be 'lost' from the paddock.

Whatever the constraints and assumptions in this trial, it still demonstrates that

1. riplines, or
2. addition of straw to riplines

reduce hillslope erosion.

While there is outlay associated with these treatments, that cost outweighs the potential losses when compared to no treatment at all.



Figure 2 Agro plough (treatment 1)



Figure 3 Ripper mulcher (treatment 3)

Further resources

[LISTmap](#) - you can download contour details.
 Note some areas of the state have 5 m contours, some only go to 10 m
 Check the [CCNRM portal](#) for more on protecting productive soils

More information on the ripper mulcher can be found [here](#) (factsheet) and [here](#) (podcast)
 The [Soil Wealth and Integrated Crop Protection](#) website also has a lot of useful information

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