

Early post emergent (EPE) deep ripping

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Key Messages

- There was no yield benefit to early post emergent ripping at 1, 3, or 6 weeks following seeding
- Plant establishment and grain yield was reduced when ripped 1 week after sowing.

Aim

To demonstrate and quantify the plant establishment penalty of seeding canola into deep ripped soil, the loss of plants by deep ripping early post emergent (EPE), and to check if delaying deep ripping until EPE still produces a yield boost compared to ripping in typical summer conditions.

Background

The Hirsch's have always seen canola and deep ripping as a package, because of canolas' ability to use subsoil moisture and produce a reliable yield response, and the tillage effect of stimulating weeds where they can be controlled with glyphosate or selective herbicides. However, it has been risky, with plant establishment sometimes compromised by poor depth control in softer sands. Reduced plant establishment can undo the yield response of canola in this system. Ripping post seeding, when there is adequate subsoil moisture available is considered an option to alleviate this however this comes with significant logistical issues ie machinery and labour availability as well as the risk of seedling mortality.

After seeing the effects of EPE deep ripping trial strips on previous canola crops, Dylan implemented this trial (as well as others across the property) to better assess the effects of different timings of post emergent deep ripping. The soil was previously deep ripped in 2017 and is a yellow sandy loam, which is considered easy to rip when there is moisture in the soil.

Trial Details

Trial location	Hirsch Property, Latham
Plot size & replication	18.3m x 200m x 2 replications
Soil type	Sandy loam
Paddock rotation	2020 wheat, 2019 wheat, 2018: Canola
Sowing date	20/04/2021
Sowing rate	1.4 kg/ha 4022P Canola
Fertiliser	15/03/2021 - 80 kg/ha MOP, 80 kg/ha Superphosphate 14/05/2021 - 45 L/ha UAN 05/06/2021 - 65 L/ha UAN
Herbicides, Insecticides & Fungicides	14/05/2021 - 1.2 L/ha Glyphosate 450 05/07/2021 - 1.2 L/ha Glyphosate 450 18/09/2021 - 1.5 L/ha Glyphosate 450
Harvest date	04/11/2021

Treatments

	Treatment
1	Unripped
2	Ripping 1 week post seeding
3	Ripping 3 weeks after seeding
4	Ripping 6 weeks after seeding

Soil Composition

Depth (cm)	pH (CaCl ₂)	Col P (mg/kg)	Col K (mg/kg)	KCl S (mg/kg)	N (NO ₃) (mg/kg)	N (NH ₄) (mg/kg)	EC (ds/m)	OC (%)
0-10	6.9	39	95	3.6	6	1	0.056	0.66
10-30	5.2	20	63	12.8	3	< 1	0.038	0.45

Results

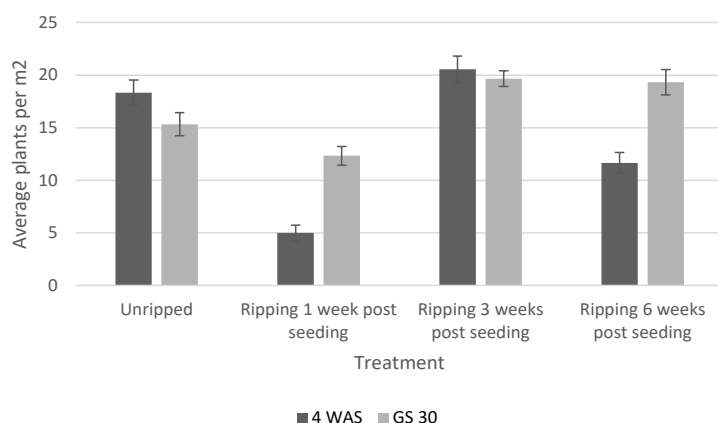


Figure 1: Average plants per m² 4 weeks after sowing (WAS) and at Growth Stage 30 when ripped at different time intervals after seeding in the Ripper Gauge trial at Latham 2021. Error bars are ± 1 S.E.

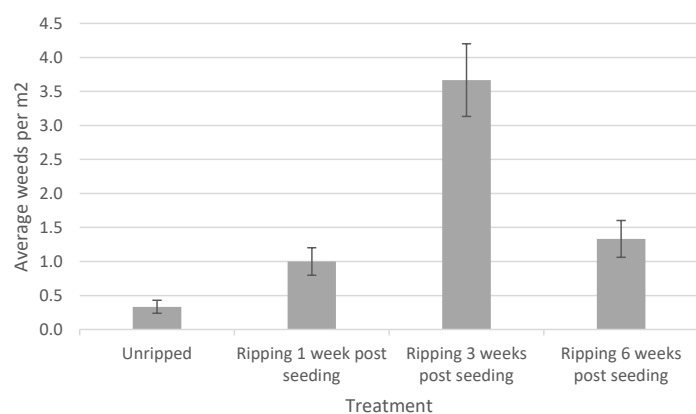


Figure 2: Average weeds per m² when unripped and ripped at different time intervals after seeding in the Ripper gauge trial at Latham 2021. Error bars are ± 1 S.E.

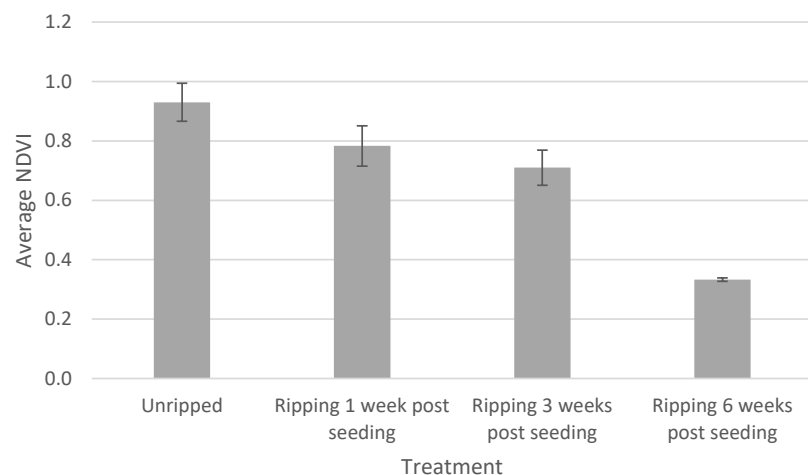


Figure 3: Average NDVI at GS30 for unripped and ripped treatments in the Ripper gauge trial at Latham in 2021. Error bars are ± 1 S.E.

Table 1: Grain yield of ripping treatments versus the control (unripped) at the Ripper Gauge site at Latham in 2021.

Treatment		Yield (t/ha)	Oil %
3	Ripping 3 weeks after seeding	0.89	45.2
1	Control - Unripped	0.85	44.8
4	Ripping 6 weeks after seeding	0.75	44.9
2	Ripping 1 week post seeding	0.61	44.6

Comments

Plant establishment and grain yield was greatly reduced where canola was ripped at 1 week post seeding (Figure 1, Table 1). Plant numbers were slightly increased with ripping at 3 and 6 weeks and this may have been due to a change in soil conditions at the soil surface; a change clay content from subsoil clay being lifted to the surface.

It was observed that in some parts of the plots there was better plant numbers. This was attributed to the ripper position relative to the crop row, as gaps in crop rows were evident where the ripper tine aligned with the crop row.

Ripping 3 weeks after sowing showed some areas that responded to the deep ripping, but this was offset by some areas where plant death was quite high which limited yield. Higher weed numbers were also noted in the 3 weeks after seeding treatment (Figure 3).

Ripping 6 weeks after sowing showed higher plant numbers at GS30 however did not show a yield response. This result is likely due to the variability of establishment across the paddock. NDVI was measured at the end of the ripping window for all treatments (start of flowering) and declined with each ripping treatment which likely indicates the different stages of recovery after ripping.

Acknowledgements

This project (WMG1803-002SAX) is a GRDC investment that is led by the West Midlands Group and this site is managed by the Liebe Group. This site is one of four trial sites across the Wheatbelt that has investigated the use of early post emergent (EPE) deep ripping on grain yield. Thank you to the Hirsch family for hosting the trial site.

Peer review

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Contact

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