

The Gen Y Paddock Challenge – Optimising Tilling, Grain Fill and Yield Through Deep Ripping

Brendon Manuel, RD Manuel & Co, and Judith Storer, Research and Development Coordinator, Liebe Group

Take Home Messages

- Cultivation treatments trended toward an increase in yield and profit at the site.
- Decreased plant numbers appeared to be a more significant factor than increased tillering in the double ripped treatment, leading it to achieve a lower yield and profit than the single ripped treatment. Although, it still outperformed the uncultivated treatment.

Aim

To increase tillering and grain fill through the implementation of soil cultivation to boost yield and increase profitability.

Background

Farmers are very good at trialling best practice soil management in the isolation of their own environment, however do not always effectively capture and analyse trial information beyond visual or yield assessments. Furthermore they don't always have the opportunity to share the information they are gathering publicly, limiting their opportunities to gain valuable feedback from peers. By building the capacity of farmers to actively trial, capture and share their on-farm trials, with input from their peers and in a trusted environment, we aim to increase engagement and foster the adoption of best practice soil management methods.

The trial presented has been conducted by Brendon Manuel. He is seeking to validate his own evidence that more aerated soil increases early production of tillers in wheat. He had noted that wheat grown on soil that had been deep ripped then rolled was producing fewer tillers than when on soil that had only been deep ripped. Brendon has theorized that one of the key differences could be the higher levels of O₂ and CO₂ in the soil which could be influencing the mineralization process and leaving more plant available Nitrogen (N) come sowing. Brendon is seeking to confirm his hypothesis by increasing soil aeration through double pass deep ripping.

Trial Details

Trial location	Brendon Manuel's property, Marchagee
Plot size & replication	12m x 200m x 1 replication
Soil type	Gravel loam duplex
Paddock rotation	2017 Lupin, 2018 Wheat, 2019 Wheat
Sowing date	20/05/2020
Sowing rate	70 kg/ha Zen Wheat
Fertiliser	20/05/2020: 18 kg/ha N, 10 kg/ha P, 10 kg/ha K 10/06/2020: 32 kg/ha N, 5 kg/ha K 15/08/2020: 21 kg/ha N
Herbicides, Insecticides & Fungicides	20/05/2020: 2 L/ha treflan, 2L/ha prosulfocarb 10/06/2020: 750 g/ha Jaguar 15/08/2020: 450 g/ha Jaguar, 100 g/ha Hammer

Treatments

Treatment	
1	Nil control (no cultivation)
2	Single pass deep ripping
3	Dual pass deep ripping with 15° offset

Soil Health

Results

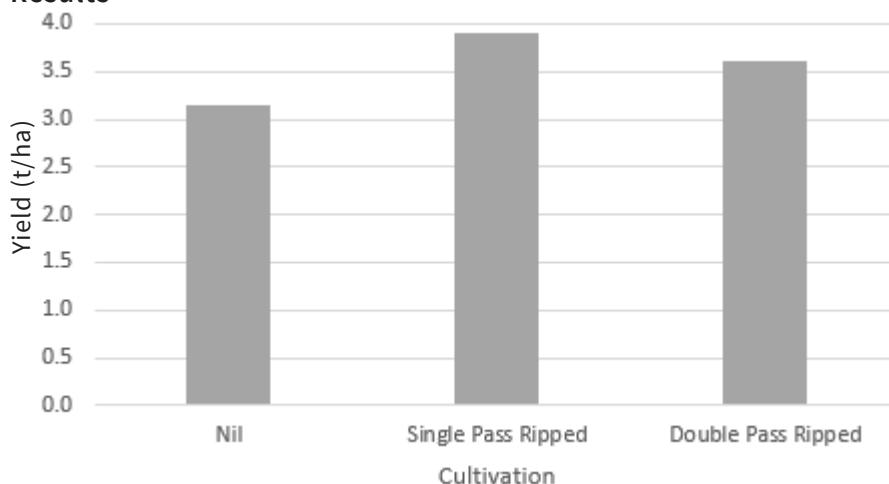


Figure 1: Average yield (t/ha) as harvested on the 22/10/2020, relative to each cultivation treatment.

There seems to be a positive yield response from the cultivation treatments (Figure 1). There was a high uneven weed burden at the site and a slightly uneven soil type that seems to have negatively impacted the double ripped plot, and there was a set of tram lines running through it. However, loss from the tram line was calculated at approximately 2.5% and has been allowed for in the graphed results.

Comments

There was a strong positive trend between yield and cultivation at the site, and the increased yield did correlate with increased profit at the site (Table 1) with the single cultivation treatment providing the highest EBT.

Table 1: Economic analysis of cultivation techniques in Marchagee

Cultivation		Nil	Single	Double
Yield	t/ha	3.15	3.9	3.61
Grade		ASW1	ASW1	ASW1
Average Grain Price	\$/t	300	300	300
Income	\$/ha	945	1170	1083
Variable Operating Costs	\$/ha	\$	\$	\$
Seed, Treatment & EPR's		12	12	12
Grain Freight		16	20	18
Grain Handling Charges		28	34	32
Crop Contract		35	35	35
Other Crop Costs & Crop Ins		22	22	22
Wages Gross		28	28	28
R&M Mach./Plant/Vehicle		42	42	42
Fuel & Oil		27	27	27
Fertiliser		66	66	66
Cultivation		0	40	80
Variable Operating Costs	\$/ha	275	326	362
Operating Gross Margin	\$/ha	670	844	721
Fixed Operating Costs	\$/ha	73	73	73
Total Operating Costs	\$/ha	348	399	435
Operating Profit (BIT)	\$/ha	597	771	648
Finance Costs	\$/ha	24	24	24
Earnings Before Tax (EBT)	\$/ha	573	747	624

However despite this positive increase in EBT from the single ripped treatment there was not a clear yield response to the second pass of deep ripping. There was a visual increase in tillering between the single and double deep ripping treatments however establishment was poorer on the double deep ripped treatment which limited overall yield. This decreased establishment on the double deep ripped treatment seems to be due to weed pressure and uneven soil type. Brendon also noted that tillering was good across the board this year, and all the effects on tillering observed at the trial were less pronounced than previously.

Note this is an un-replicated farmer demonstration and results should be interpreted with caution.

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Peer review

Chris O'Callaghan, Liebe Group

Contact

Brendon Manuel, RD Manuel & Co
acacia.rd@bigpond.com
0429 642 053

Judith Storer, Liebe Group
research@liebegroup.org.au
08 9661 1907



Scan the QR code to view a video interview with Brendon.

