

POST-EM RIPPING

2021-2022



Project Summary

Soil amelioration is a key part of farming systems in Western Australia to overcome soil limitations to crop production. The removal of soil constraints such as compaction and water repellence through strategic tillage practices generally leads to increases in crop production in successive years. One of the limitations that threatens the longevity of these benefits is that the soil can re-compact over time following amelioration, often leading to levels higher than before amelioration. Currently, the solution is to repeat the deep ripping process every few years, with the period between deep ripping dependant on the soil type and amount of wheeled traffic on the paddock. This is a costly repetitive process that may become unsustainable in the long term as soils become compacted to greater depths with successive tillage treatments and larger/heavier machinery. While there is a good network of demonstration sites established across the port zones of WA, there are a number of soil types where the benefit and longevity of soil amelioration practices are unknown. The adoption of controlled traffic practices by growers is one tool that can potentially increase the longevity of soil ameliorative practices, by reducing soil compaction from wheel traffic by confining this to permanent wheel tracks across the paddock. However, the potential of controlled traffic practices to increase the longevity of amelioration treatments has only been evaluated on a narrow range of soil types. This project aims to evaluate and demonstrate the benefit of soil amelioration across a wider range of soil types that are common to the WA grain growing region. Demonstration sites will be established across the Kwinana East, Kwinana West, and Albany port zones that will fill the gaps in current knowledge of the grain yield and economic return from the amelioration of soil constraints.

Variation - November 2020

A variation to this project WMG1803-002SAX will set up four trial sites throughout the central and northern wheatbelt, particularly in regions recently hit by wind erosion events, to evaluate the impact of ripping after seeding on crop productivity. Various post seeding ripping timings (x3) and crop types will be evaluated in the trials against a control (nil rip) and a traditional pre-seeding ripping timing. Crop measurements and yield data will be collected to inform a gross margin analysis to aid growers in their decision making.





Trial Objectives

Four new farm scale trial sites will be established to evaluate different timings of post seeding deep ripping, against a non-ripped control and a traditional pre-seeding rip timing. Soil and crop measurements will be undertaken at each site to highlight the efficacy of each treatment undertaken and measure impact on crop production. At a minimum, these should include; MED testing, soil strength (at field capacity), soil moisture, plant counts, biomass and harvest yield.

RIPPER GAUGE VARIATION, DEMONSTRATING THE BENEFITS OF SOIL AMELIORATION POST EMERGENT APPLICATION

2021

Key Messages:

Grower standard practice was the highest performing treatment, performing 400kgs better than the unripped control and proved the site was responsive to deep ripping.

When ripping occurred at the later timing, crop was significantly set back (200kgs less than unripped) Despite a yield penalty, visually the later ripping timing recovered better than expected.

Aim:

Farmer scale trial sites will be established to evaluate different timings of post seeding deep ripping, against a non-ripped control and a traditional rip timing.

How was it done?

The ripping treatments in this trial were carried out by the host grower. Grower standard practice for the site is ripping 1 week post-sowing, however a control was left but an extra unripped section was not left so the second post-sowing rip was ripped twice (1 week post-sowing and 3 weeks). All other operations were carried out as per the rest of the paddock. Harvest data was collected using the MIG weigh trailer.

Location:	Depot Hill
Soil Type:	Sandplain
2021 Total:	335.2mm
2021 GSR (Apr-Oct):	283.2mm
Paddock History	
2018:	Lupin
2019:	Wheat
2020:	Canola
Sowing Date:	8th May 2021
Seeding Rate:	Havoc @ 50kg
Paddock Inputs	
Fertiliser:	50kg MAP Trace 06/05/21 30kg MOP 110kg NS51 27/05/21 May Variable Rate Urea (85kg in this area) 15/07/21
Chemical:	Pre-em 06/05/21 Sakura 118g Trifluralin @1.5L 10g Sulfosulfuron 1.8L Paraquat Post-em 17/06/21 Velocity 700ml LVE MCPA 500ml 5g Ally 300ml Atlantis

Soil Test Results

Site	Depth	Col P	Col k	KCl S	OC	EC	pH Ca Cl2	PBI	N
Cosgroves	0 - 10	20	72	9.9	0.68	0.070	6.4	7.1	14
Cosgroves	10 - 30	16	51	2.8	0.25	0.021	5.2	8.5	3
Cosgroves	30 - 50	11	52	4.1	0.14	0.015	4.7	10.7	2

Harvest Results

Treatment	Yield (t/ha)	Soil Test Results	Weight (kg/L)	Screenings (%)
Control - No Ripping	5.4	10.7	81.1	2.29
1 week after sowing rip (Ausplow) + 3 weeks post	5.2	10.6	80.21	1.97
Post-seeding (Ausplow) (Grower standard)	5.8	10.4	81.74	1.8



Day of application of 1+3 week ripping treatment (left), and the recovery of this treatment at flowering

RIPPER GAUGE VARIATION, DEMONSTRATING THE BENEFITS OF SOIL AMELIORATION POST EMERGENT APPLICATION

2022

Key Messages:

The grower standard treatment was again the highest yielding in this trial, producing 100kgs per hectare more than post emergent treatment after 3 weeks the year prior.

Aim:

Farmer scale trial sites will be established to evaluate different timings of post seeding deep ripping, against a non-ripped control and a traditional rip timing.

How was it done?

In 2021, ripping treatments in this trial were carried out by the host grower. All other operations were Harvest Results per the rest of the paddock. Harvest data was collected using header yield monitors.

Treatment	Yield (t/ha)
Control – No Ripping	2.19
1 week after sowing rip (Ausplow) + 3 weeks post	2.31
Post-seeding (Ausplow) (Grower standard)	2.41

Location:	Depot Hill
Soil Type:	Sandplain
2022 Total:	386 mm
2022 GSR (Apr-Oct):	347 mm
Paddock History	
2019	Wheat
2020	Canola
2021	Wheat
Sowing Date:	01/04/2022
Seeding Rate:	1.8kg/ha
Paddock Inputs	
Fertiliser:	100kg Ammonium Sulphate 30/03/22 55kg MAP Trace 01/04/22 80kg Urea 11/04/22 60kg Urea 16/6/22 66L UAN 6/7/22
Chemical:	Pre-em 30/3/22 Paraquat 250 @1.2L Mice Baiting 5/4/22 Mouseoff @ 1kg Roundup Ready App 1 27/5/22 Kenup Dry @1.2kg Alpha-cypermethrin @100ml Chlorpyrifos @250ml Fungicide 6/7/22 Prosaro @450ml

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