

Finley Irrigated Research Centre NSW

Irrigated trials conducted at the Finley irrigated research centre 2021 were managed by FAR Australia, hosted by Southern Growers.

Trial 1. Influence of Soil Amelioration and Soil Amendments on Canola Yield and Profitability

Location: Finley IRC

FAR Code: FAR SA21-06a-1

Cultivar: Nuseed Condor TF

Sown: 17 May 2021

Seed rate: 3.75kg/ha (60 seeds/m²)

Harvested: 22nd December 2021

Rotation position: Faba Beans (2020), Fallow (2019), Faba beans (2018), Wheat (2017)

Soil Management: Cultivation with speed disc in autumn

Irrigation: Overhead irrigation, 5 applications totalling 82.5mm

GSR: April-October 192 mm. Total GSR water with irrigation 274.5mm (plus 30% fallow efficiency January – March 48mm) Total potential – 348mm

Key Messages:

- There were no significant differences between yield with just 0.11 t/ha separating the highest and lowest canola yield (4.27-4.38 t/ha) following soil amelioration treatments set up in March 2020 following faba beans in the 2020 season that did respond to amelioration.
- The soil amelioration treatments produced small significant effects (up to 1.3% oil content) on canola oil content with surface applied organic amendment (lucerne pellets applied in 2020) reducing by 0.9% oil content compared to deep ripped organic amendment (35-40cm depth).
- The un ameliorated control and deep ripped gypsum had significantly higher oil content than those treatments that utilised organic amendments, but differences were small.
- Deep applied gypsum had significantly lower dry matter at 60% flower (4.27 t/ha) compared to other treatments (5.48 – 6.34 t/ha), but this was not significant at harvest.
- There were no significant differences between dry matter at harvest ($p=0.054$).

Soil amelioration details (ripping and placement of ameliorants)

Soil amelioration involving ripping and placement of gypsum and organic ameliorants (lucerne pellets – 15t/ha) were conducted at the Finley Irrigated Research Centre on 16-18 March 2020. Ripping was achieved to a depth of 35-40cm. For reps 1 & 3, 3 passes were required to get to depth (2 passes pre-amendment plus 1 to apply amendment); and for reps 2 & 4, 2 passes were required (1 pass pre-amendment plus 1 to apply amendment). The deep applied organic amendment plus deep applied gypsum required an extra pass to deliver the second product as the machine used was not able to apply two products together.

The trial area was sown to faba beans in autumn 2020 sown 19 May cv PBA Samira and harvested on November 30th 2020. The following crop of canola cv Nuseed Condor XF was sown on 17 May 2021 and harvested on 22 December. The trial area will be sown to durum in autumn 2022.

Released: 27 Sept 2022

The GRDC Optimising Irrigated Grains Project is a collaborative project including the following project partners:



Table 1. Influence of soil amelioration and soil amendments on crop yield (t/ha) and grain protein (%).

Treatment Rate & Timing (Conducted 17-Mar 2020)		Grain yield and quality	
		Yield t/ha	Oil %
1.	Nil (Control)	4.33 -	45.7 a
2.	Deep rip (tillage control)	4.34 -	45.4 ab
3.	Surface applied organic amendment (15t/ha)	4.27 -	44.4 d
4.	Deep rip; Deep applied organic amendment	4.38 -	45.3 ab
5.	Deep rip; Deep applied organic amendment; Deep applied gypsum	4.35 -	45.1 bc
6.	Deep applied gypsum	4.33 -	45.7 a
Mean		4.35	45.1
LSD		ns	0.5
P val		0.493	0.001
CV		2.44	0.74

Organic amendment based on Lucerne pellets applied at 15t/ha, Gypsum applied at 5t/ha, Deep ripping conducted to a depth of 35-40cm after 3 passes.

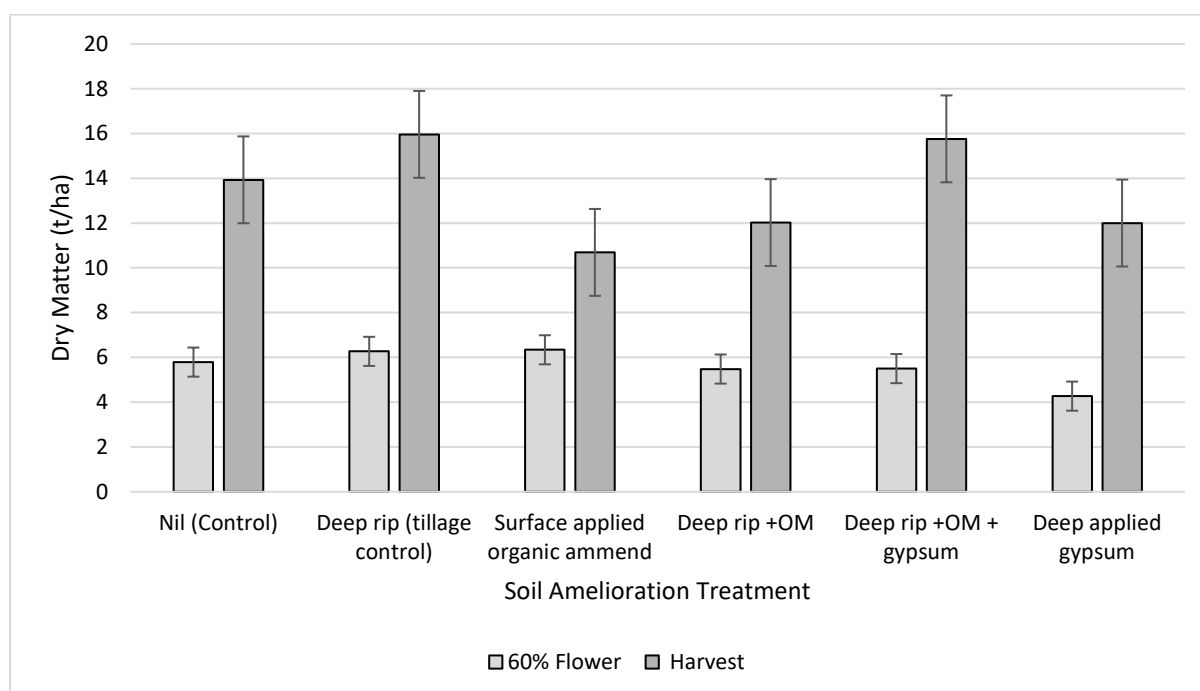


Figure 1. Influence of soil amelioration treatment on dry matter production at 60% flower (13 Sep) and harvest (29 Nov). (p value = 0.047 - 60% flower and 0.054 – harvest)

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Table 2. Influence of soil amelioration and soil amendments on crop yield (t/ha) and grain protein (%) in 2020 in faba beans – cv PBA Samira.

		Grain yield	
		Yield	
Treatment (Rate) (Conducted 17-Mar 2020)		t/ha	
1.	Nil (Control)	4.85	c
2.	Deep rip (tillage control)	5.87	ab
3.	Surface applied organic amendment (15t/ha)	5.51	b
4.	Deep rip; Deep applied organic amendment	6.03	ab
5.	Deep rip; Deep applied organic amendment; Deep applied gypsum	6.17	a
6.	Deep applied gypsum	5.68	ab
Mean		5.65	
LSD		0.54	
P val		0.002	

SAGI statistical analysis (Predicted values for Yield, Harvest dry matter, test weight and oil content)

The following statistical analysis of key harvest assessments has been carried out by SAGI. This analysis uses spatial statistical analysis to refine predicted values for key assessment values.

Table 1: Harvest Traits for the Treatments

Treatment	Grain Yield (t/ha)	Test Weight (kg/hL)	Harvest DM (t/ha)	Oil (%)
1	4.34 ± 0.05 -	64.58 ± 0.12 -	14.35 ± 1.08 -	45.62 ± 0.2 - b
2	4.31 ± 0.05 -	64.43 ± 0.12 -	14.85 ± 1.04 -	45.22 ± 0.2 - b
3	4.25 ± 0.05 -	64.53 ± 0.12 -	11.89 ± 1.06 -	44.26 ± 0.2 - a
4	4.38 ± 0.05 -	64.66 ± 0.12 -	11.78 ± 1.11 -	45.38 ± 0.2 - b
5	4.44 ± 0.05 -	64.48 ± 0.12 -	15.86 ± 1.12 -	44.95 ± 0.21 - ab
6	4.35 ± 0.05 -	64.49 ± 0.12 -	11.58 ± 1.09 -	45.02 ± 0.21 - b

Note: values expressed as mean ± standard error of prediction
- no subscripts relevant for this response

A summary of the experiment statistics is below:

Table 2: Key statistics for each response analysed

Statistic	Grain Yield (t/ha)	Test Weight (kg/hL)	Harvest DM (t/ha)	Oil (%)
LSD	0.139	0.239	3.134	0.429
Mean	4.300	64.500	13.400	45.100
Treatment_p-value	0.210	0.405	0.132	0.000
CV	2.414	0.355	22.085	1.245

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