

Establishing pasture into stubble at Mount Cooper

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RESEARCH

Searching for answers



Location:

Mt Cooper
Ian, Robyn and Angus Gunn

Rainfall

Av. Annual: 435 mm
Av. GSR: 325 mm
2015 Total: 268 mm
2015 GSR: 234 mm

Yield

Potential: 7.3 t/ha (pasture)
Actual: 3.2 t/ha

Paddock history

2015: Medic pasture
2014: Wheat
2013: Medic pasture

Soil Type

Red loam

Plot Size

20 m x 4 m x 3 reps

stubble in farming systems on upper Eyre Peninsula (EP).

One issue upper EP farmers identified as a problem was sowing into retained pasture residue with pasture vines causing issues with blockages at sowing and uneven germination. Also establishing legume pastures into heavy stubble residues has also an issue in this region. The trial at Mount Cooper was designed to compare plant establishment and production, and weed and pest control effectiveness in the presence and absence of previous crop or legume pasture residues.

How was it done?

On 7 April 2014, four residue treatments were imposed on a pasture from 2013 at Mount Cooper (1.6 t/ha of vine and leaf material). The treatments were: (i) Harrowed, (ii) Mowed to the ground (residue removal), (iii) Cultivated with offset disc and (iv) Untreated control.

In 2014 the trial was sown on 21 May with Mace wheat @ 65 kg/ha and base fertiliser of DAP @ 75 kg/ha into the residue treatments. There were no differences in wheat establishment, yield or grain quality due to different pasture residue treatments imposed before seeding (Table 2). At the end of the 2014 season the stubbles were harvested at two heights of 15 cm (low) and 30 cm (high).

In 2015 the wheat stubble cut at different heights were either left standing or rolled with a rubber pea roller on 7 April to determine the impact of wheat stubble management on medic regeneration and establishment in

the following season.

The measurements taken in 2015 were soil moisture, plant emergence counts, early and late dry matter. Data were analysed using Analysis of Variance in GENSTAT version 16.

What happened?

The initial soil data taken at the site (April 2014) showed at soil pH (CaCl₂) of 7.9, a Colwell P of 10, phosphorus buffering index of 128, and soil N level of 84 kg N/ha in the 0-60 cm depth.

The initial wheat stubble levels in April 2015 were variable but showed no consistent differences from the 2014 tillage and harvest treatments imposed (Table 1).

The 2015 season was initially very dry in most regions including Mount Cooper. The medics germinated in mid-April with the first rains, however struggled early in the season due to very little follow up rainfall events. Spring rainfall allowed the medic pasture to grow some bulk.

There were no differences in the medic plant establishment, early or late dry matter of the regenerating medic pasture between the different stubble management treatments imposed at harvest the year before (Table 2).

Key message

There were no differences in medic regeneration in wheat stubbles either harvested at two heights, left standing or rolled.

Why do the trial?

The GRDC project 'Maintaining profitable farming systems with retained stubble - upper Eyre Peninsula' aims to produce sustainable management guidelines to control pests, weeds and diseases while retaining stubble to maintain or improve soil health, and reduce exposure to wind erosion. The major outcome to be achieved is increased knowledge and skills allowing farmers and advisers to improve farm profitability while retaining

Table 1 Wheat stubble residues after 2014 tillage and harvest treatments.

2014 pasture residue treatment 7 April 2014	2014 harvest wheat stubble treatment 21 Nov 2014	Wheat stubble residue April 2015 (t/ha)	Wheat yield 2014 (t/ha)
Residue harrowed	Cut high	5.2	3.6
	Cut low	5.0	
Residue mown	Cut high	4.1	3.6
	Cut low	4.7	
Residue cultivated	Cut high	5.8	3.6
	Cut low	6.8	
Untreated control	Cut high	4.4	3.5
	Cut low	5.5	
<i>LSD (P=0.05)</i>		<i>ns</i>	<i>ns</i>

Table 2 Pasture measurements following wheat stubble treatments at Mount Cooper in 2015.

Wheat stubble treatment 7 April 2015	Medic establishment (plants/m ²)	Early dry matter 25 May (t/ha)	Late dry matter 19 August (t/ha)
Cut high rolled	119	0.95	3.34
Cut high standing	124	1.05	3.35
Cut low rolled	104	1.06	3.26
Cut low standing	121	0.90	2.98
<i>LSD (P=0.05)</i>		<i>ns</i>	<i>ns</i>

What does this mean?

In the 2015 with a dry start to the season at Mount Cooper there were no differences in medic pasture regeneration and production given different harvest stubble heights and management with rolling the stubble.

In 2014 the 1.6 t/ha medic pasture residue did not cause problems at sowing in drier sowing conditions

and there were no differences in wheat establishment, yield or grain quality due to different pasture residue treatments imposed before seeding.

The results from this research over three seasons have showed no differences in crop or pasture establishment or production however a different sowing system or different sowing conditions may have changed plant establishment

and yield outcomes. There were no major weed or pest issues at this site in either season.

Acknowledgements

Thank you to the Gunn family for having the trial on their property. Trial funded by GRDC Maintaining profitable farming systems with retained stubble - upper Eyre Peninsula (EPF00001).