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*Animal Production Science*

### Supplementary Material

#### **Integrating dual-purpose crops mitigates feedbase risk and facilitates improved lamb production systems across environments: a whole-farm modelling analysis**

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**Supplementary Table S1. Stocking densities applied for the different feedbase utilisation rates, and feedbase parameters for the four locations spanning northern and southern NSW.**

<sup>1</sup> Average sowing date simulated by APSIM based on the sowing rules being met at each location.

	Armidale	Gulargambone	Goulburn	Temora
<i>Livestock parameters</i>				
Stocking density (ewes/ha)				
30% utilisation	5.5	5.3	3.8	4.7
40% utilisation	7.4	7.1	5.1	6.3
50% utilisation	9.2	8.9	6.4	7.9
<i>Feedbase parameters</i>				
Pastures				
Pasture 1	Phalaris	Winter-active lucerne	Phalaris	Winter-active lucerne
Pasture 2	Phalaris	<i>Austrostipa</i> spp.	<i>Microlaena</i>	Phalaris
Dual-purpose crops				
<i>Wheat</i>				
Cultivar 1	Revenue	Wedgetail	Revenue	Wedgetail
Cultivar 2	Wedgetail	Gregory	Wedgetail	Gregory
Cultivar 1 sowing window	1-Mar – 3-May	1-Mar – 3-May	1-Feb – 22-Mar	22-Mar – 26-Apr
Cultivar 2 sowing window	3-May – 17-May	3-May – 17-May	22-Mar – 17-May	26-Apr – 31-May
Median sowing date (APSIM) <sup>1</sup>	30-Mar	29-Mar	23-Feb	6-May
Grazing end date	22-Aug	11-Aug	25-Aug	31-Aug
<i>Canola</i>				
Cultivar 1	Taurus	CBI406	Taurus	CBI406
Cultivar 2	CBI406	46Y78	CBI406	46Y78
Cultivar 1 sowing window	1-Mar – 22-Mar	1-Mar – 5-Apr	1-Feb – 29-Mar	1-Mar – 5-Apr
Cultivar 2 sowing window	22-Mar – 19-Apr	5-Apr – 3-May	29-Mar – 19-Apr	5-Apr – 19-Apr
Median sowing date (APSIM) <sup>1</sup>	30-Mar	29-Mar	24-Feb	5-Apr
Grazing end date	1-Aug	30-Jun	18-Jul	10-Jul

**Supplementary Table S2. Dates for the livestock management activities for the autumn and spring lambing systems.**

Livestock event	Autumn	Spring
Purchase ewes	01-Nov	15-Feb
Cull ewes	31-Oct	14-Feb
Ewes joined	16-Nov	01-Mar
Lambs born (average)	27-Apr	11-Aug
Lambs weaned (average)	03-Aug	17-Nov
Start selling lambs	04-Aug	18-Nov
End selling lambs	04-Jan	20-Apr
Shearing	10-Apr	25-Jul
Crutching	01-Nov	15-Feb

**Supplementary Table S3. Output and input values from livestock and grain production used for gross margin estimates.**

Variable		Value
	<i>Output</i>	
Lamb meat (18-22 kg CWT; c/kg)		587
Lamb meat (12-18 kg CWT; c/kg)		560
Sheep meat (c/kg CWT)		371
Skin price (\$/head)		5
Wool price (21-22 micron wool; c/kg clean)		1424
Wheat grain sale (\$/t)		255
Canola grain sale (\$/t)		520
	<i>Input</i>	
Replacement ewes (\$/head)		79
Livestock transport (\$/head)		4
Crutching rate (\$/breeding ewe)		0.90
Shearing rate (\$/breeding ewe)		3.12
Livestock variable cost (\$/breeding ewe)		25
Pasture and livestock infrastructure cost (\$/pasture ha)		300
Wheat supplement (\$/t consumed)		255
Wheat variable cost (\$/wheat crop ha)		640
Canola variable cost (\$/canola crop ha)		750