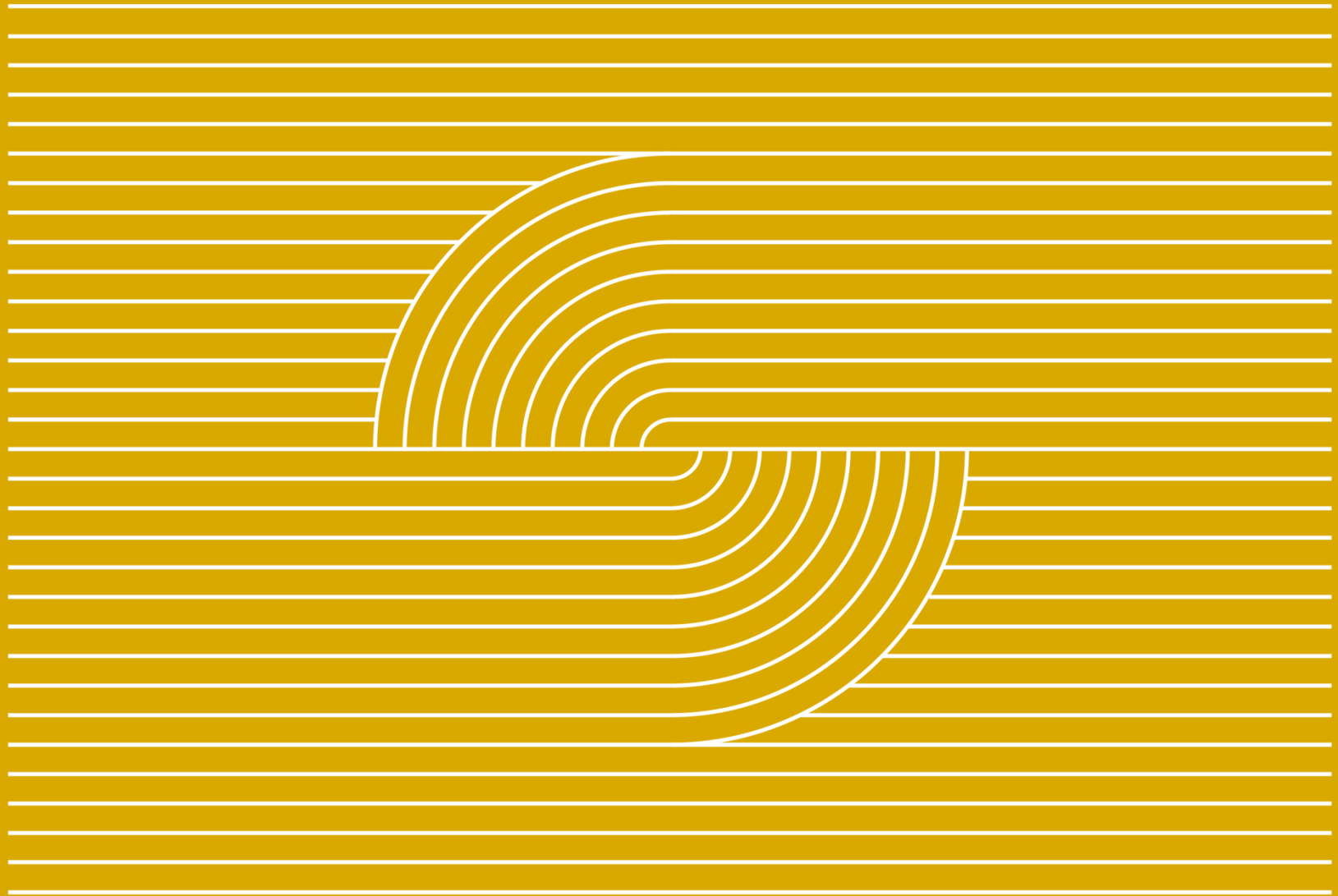


18 August 2026



Agvise

Power of the Pulse

Why Lupins & Lentils?



Lupins:

- Natural nitrogen source
- Reduce fertiliser requirements for following crops
- Nitrogen legacy effect after harvest from roots, fallen leaves & stubble
- Improved soil fertility
- Higher lupin yield equals greater benefit



Lentils:

- Valuable break crop benefits
- Improved weed control
- Stronger cereal performance
- Reduce nitrogen requirements for subsequent cereal crops
- Lower input costs

Lupin & Lentil Legacy

Key observations include:

- Lupins fix approximately 169kg N/ha to the total plant
 - 121 kg N/ha (72%) is contained in the above ground biomass
 - 48 kg N/ha (28%) is retained below ground in roots and nodules
- Lentils fix approximately 127kg N/ha to the total plant
 - 91 kg N/ha (67%) is contained in the above ground biomass
 - 36 kg N/ha (33%) is retained below ground in roots and nodules

TABLE 1 – BIOLOGICAL NITROGEN FIXATION BY AUSTRALIAN PULSE CROPS (KG/HA)			
Pulse crop	Number of sites/years data	Average amount of fixed nitrogen (kg fixed nitrogen/ha per crop)	
		In the shoot	In whole plant
Faba beans	115	130	182
Lupins	102	121	169
Lentils	30	91	127
Field peas	179	80	112
Vetch	25	82	115
Chickpeas	112	51	100
Mungbeans	78	41	57

Source: Mark Peoples, CSIRO

Following a Pulse Crop

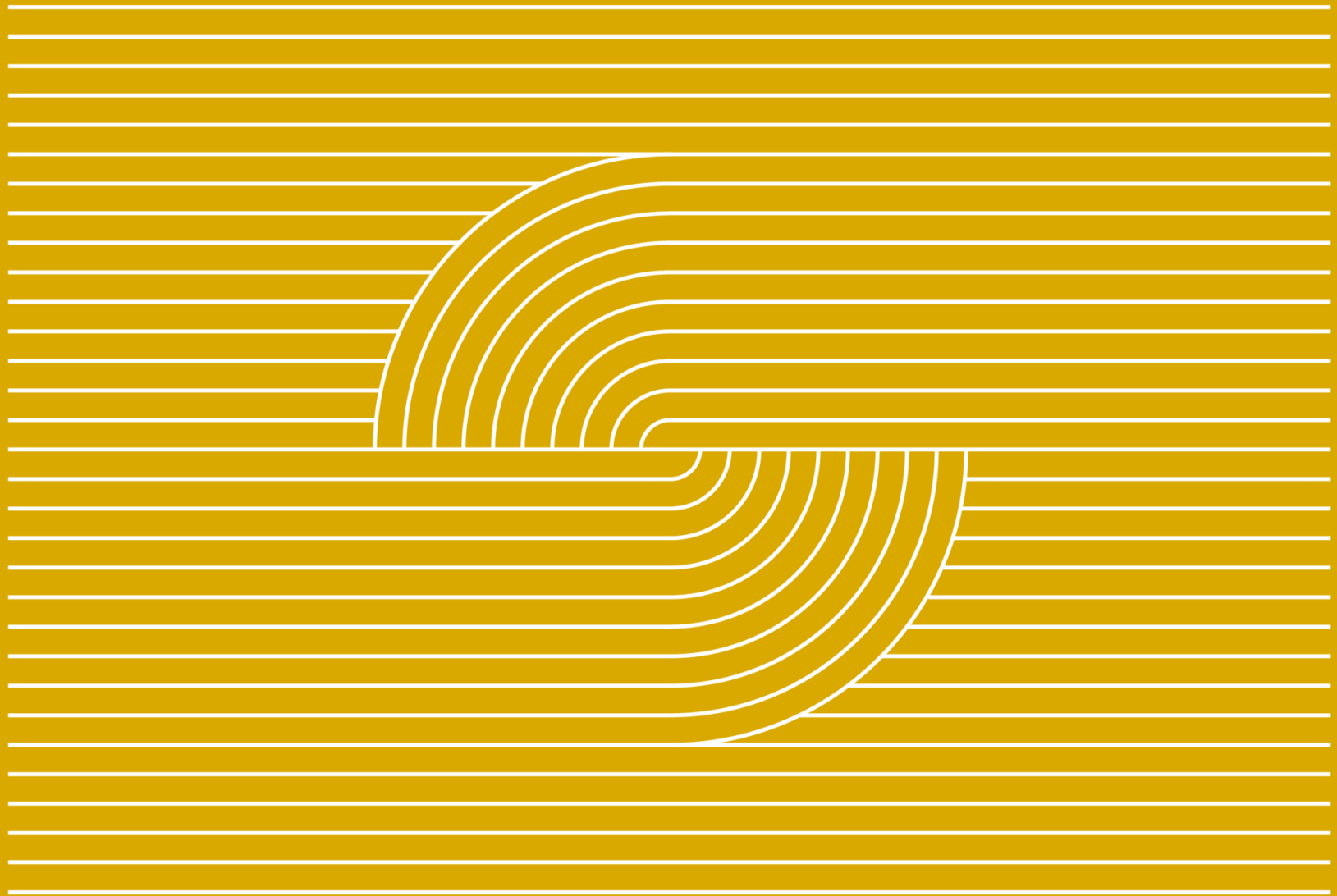
Key takeaways include:

- Subsequent first- and second-year yield benefits
- Increased nitrogen uptake compared to cereal on cereal or canola rotations
- Value across the rotation
- Rule of thumb in WA – doubling a legume grain yield doubles the N benefit to the next crop



TABLE 2 – IMPROVEMENTS IN CROP PRODUCTIVITY & NITROGEN UPTAKE BY WHEAT IN THE ABSENCE OF FERTILISER			
	Wheat Yield (t/ha)	Yield Improvement (%)	Additional nitrogen uptake (kg N/ha)
Australian average 2018 - 2022	2.14	-	-
First year following pulse crop	2.81	+ 31%	+ 36
Second year following pulse crop	2.53	+ 18%	+ 24
Third year following pulse crop	2.14	-	-

Source: Mark Peoples, CSIRO



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Medium Rainfall Zone

Gross Margin No Response: Lupins – Canola – Wheat

TABLE 5: LUPINS – CANOLA – WHEAT GROSS MARGIN				
		Lupins	Canola	Wheat
Income:		LUP1	GM	APW1
Price – Free In Store (FIS)	\$/tonne	350	820	385
Less: Levies, Freight & Selling Costs	\$/tonne	59	74	60
Price – Net Farm Gate	\$/tonne	291	746	325
Yield	t/ha	2.20	2.40	4.00
Total Grain Income	\$/ha	640	1,791	1,300
Expenses:				
	\$/ha			
Fertiliser		92	320	263
Chemical		183	137	108
Operations		148	168	146
Fuel		44	44	44
Repairs		46	46	46
Seed & Treatment		55	63	29
Crop Insurance		10	27	19
Total Variable Expenses	\$/ha	578	805	655
GROSS MARGIN	\$/ha	63	986	644

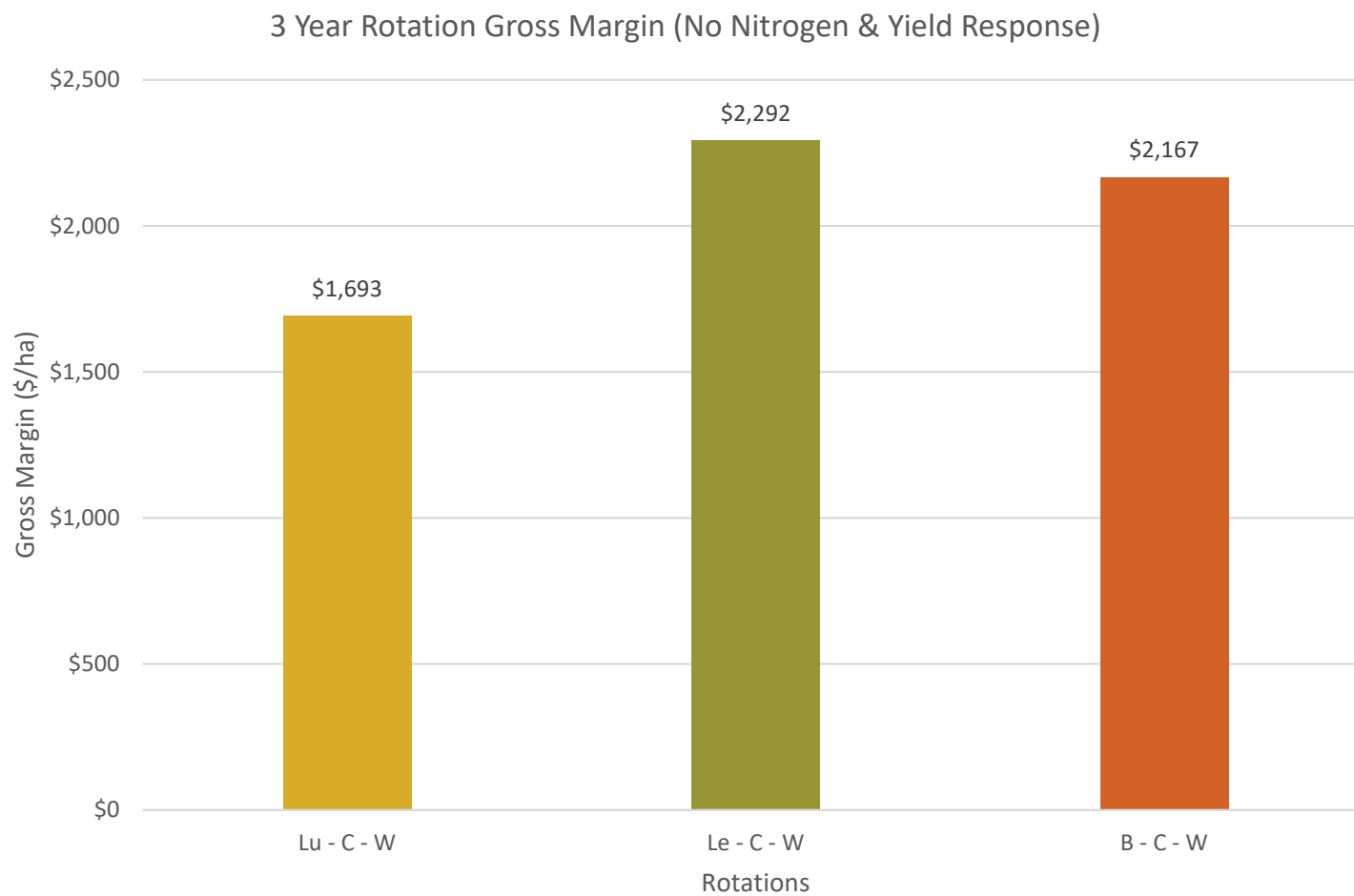
Gross Margin No Response: Lentil – Canola – Wheat

TABLE 5: LENTIL – CANOLA – WHEAT GROSS MARGIN				
		Lentil	Canola	Wheat
Income:			GM	APW1
Price – Free In Store (FIS)	\$/tonne	625	820	385
Less: Levies, Freight & Selling Costs	\$/tonne	66	74	60
Price – Net Farm Gate	\$/tonne	559	746	325
Yield	t/ha	2.20	2.40	4.00
Total Grain Income	\$/ha	1,229	1,791	1,300
Expenses:				
	\$/ha			
Fertiliser		89	320	263
Chemical		189	137	108
Operations		160	168	146
Fuel		44	44	44
Repairs		46	46	46
Seed & Treatment		21	63	29
Crop Insurance		18	27	19
Total Variable Expenses	\$/ha	567	805	655
GROSS MARGIN	\$/ha	662	986	644

Gross Margin: Barley – Canola – Wheat

TABLE 5: BARLEY – CANOLA – WHEAT GROSS MARGIN				
		Barley	Canola	Wheat
Income:		BFED1	GM	APW1
Price – Free In Store (FIS)	\$/tonne	335	820	385
Less: Levies, Freight & Selling Costs	\$/tonne	62	74	60
Price – Net Farm Gate	\$/tonne	273	746	325
Yield	t/ha	4.60	2.40	4.00
Total Grain Income	\$/ha	1,257	1,791	1,300
Expenses:	\$/ha			
Fertiliser		283	320	263
Chemical		157	137	108
Operations		135	168	146
Fuel		44	44	44
Repairs		46	46	46
Seed & Treatment		36	63	29
Crop Insurance		19	27	19
Total Variable Expenses	\$/ha	720	805	655
GROSS MARGIN	\$/ha	537	986	644

Gross Margin



Gross Margin Response: Lupins – Canola – Wheat

TABLE 5: LUPINS – CANOLA – WHEAT GROSS MARGIN				
		Lupins	Canola	Wheat
Income:		LUP1	GM	APW1
Price – Free In Store (FIS)	\$/tonne	350	820	385
Less: Levies, Freight & Selling Costs	\$/tonne	59	74	60
Price – Net Farm Gate	\$/tonne	291	746	325
Yield	t/ha	2.20	3.14	4.72
Total Grain Income	\$/ha	640	2,346	1,534
Expenses:				
	\$/ha			
Fertiliser		92	265 (55)	235 (28)
Chemical		183	137	108
Operations		148	168	146
Fuel		44	44	44
Repairs		46	46	46
Seed & Treatment		55	63	29
Crop Insurance		10	35	23
Total Variable Expenses	\$/ha	578	758	631
GROSS MARGIN	\$/ha	63	1,588	902

Yield benefit: Yr 1 31%, Yr 2 18%

N provided: Yr1 30kg, Yr 2 15kg

Gross Margin Response: Lentil – Canola – Wheat

TABLE 5: LENTIL – CANOLA – WHEAT GROSS MARGIN				
		Lentil	Canola	Wheat
Income:			GM	APW1
Price – Free In Store (FIS)	\$/tonne	625	820	385
Less: Levies, Freight & Selling Costs	\$/tonne	66	74	60
Price – Net Farm Gate	\$/tonne	559	746	325
Yield	t/ha	2.20	3.14	4.72
Total Grain Income	\$/ha	1,229	2,346	1,534
Expenses:				
	\$/ha			
Fertiliser		89	265 (55)	235 (28)
Chemical		189	137	108
Operations		160	168	146
Fuel		44	44	44
Repairs		46	46	46
Seed & Treatment		21	63	29
Crop Insurance		18	35	23
Total Variable Expenses	\$/ha	567	758	631
GROSS MARGIN	\$/ha	662	1,588	902

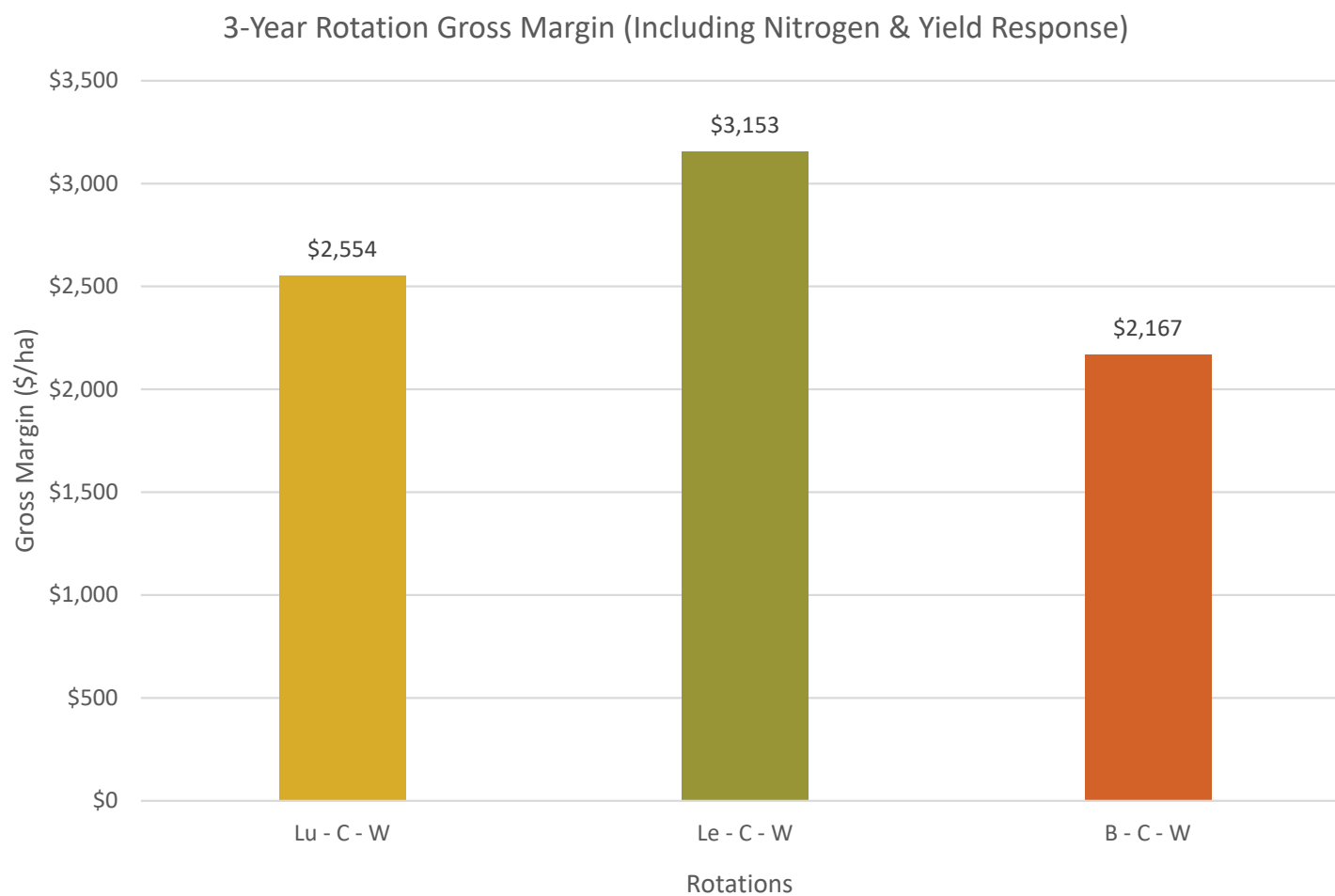
Yield benefit: Yr 1 31%, Yr 2 18%

N provided: Yr1 30kg, Yr 2 15kg

Gross Margin: Barley – Canola – Wheat

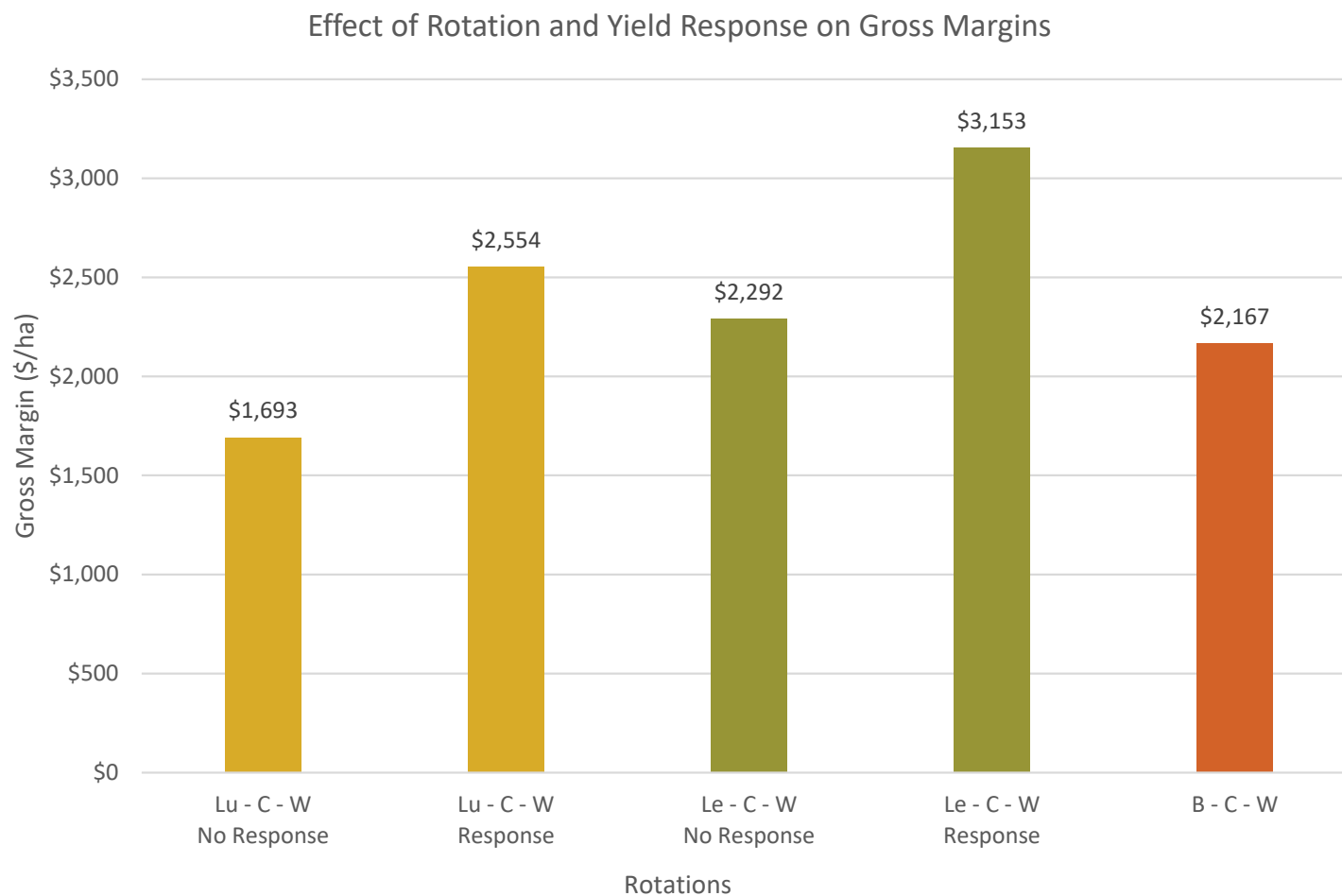
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		Barley	Canola	Wheat
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Operations		135	168	146
Fuel		44	44	44
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GROSS MARGIN	\$/ha	537	986	644

Gross Margin



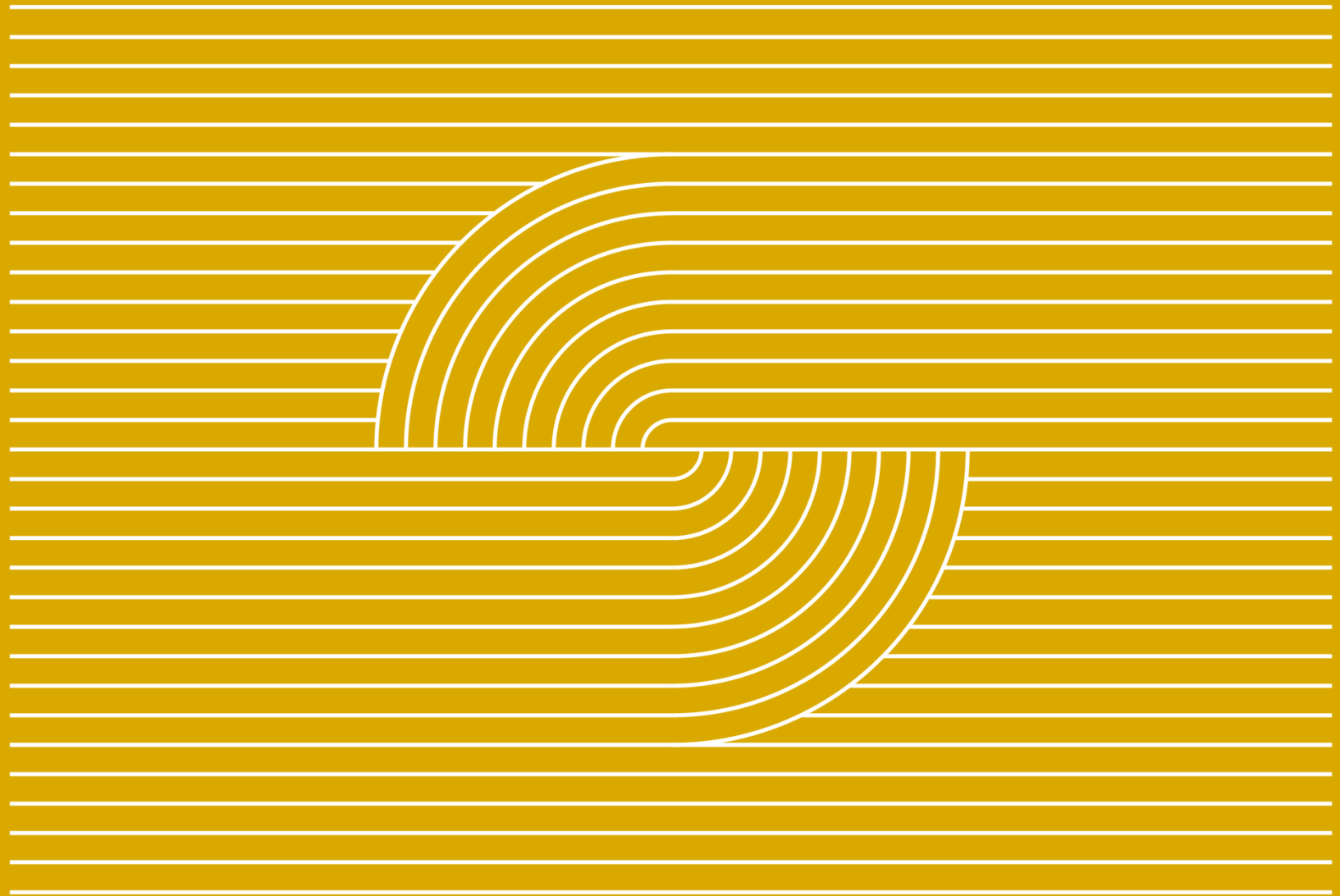
Yield benefit: Yr 1 31%, Yr 2 18%
N provided: Yr1 30kg, Yr 2 15kg

Gross Margin Comparison



Lentil Sensitivity Analysis

Lentil Price \$/t FIS								
Lentil Yield t/ha		475	525	575	625	675	725	775
	1.40	17	85	153	222	290	358	426
	1.60	98	176	254	332	410	488	566
	1.80	179	266	354	442	530	617	705
	2.00	259	357	454	552	649	747	844
	2.20	340	447	555	662	769	876	984
	2.40	421	538	655	772	889	1,006	1,123
	2.60	502	629	755	882	1,009	1,136	1,262
	2.80	583	719	856	992	1,129	1,265	1,402
	3.00	664	810	956	1,102	1,249	1,395	1,541



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Low Rainfall Zone

Gross Margin No Response: Lupins – Canola – Wheat

TABLE 5: LUPINS – CANOLA – WHEAT GROSS MARGIN				
		Lupins	Canola	Wheat
Income:		LUP1	GM	APW1
Price – Free In Store (FIS)	\$/tonne	350	820	385
Less: Levies, Freight & Selling Costs	\$/tonne	64	79	65
Price – Net Farm Gate	\$/tonne	286	741	320
Yield	t/ha	1.37	1.19	1.74
Total Grain Income	\$/ha	392	882	557
Expenses:				
	\$/ha			
Fertiliser		55	170	110
Chemical		90	90	70
Operations		138	148	126
Fuel		38	38	38
Repairs		41	41	41
Seed & Treatment		31	107	22
Crop Insurance		6	13	8
Total Variable Expenses	\$/ha	399	607	415
GROSS MARGIN	\$/ha	-7	275	141

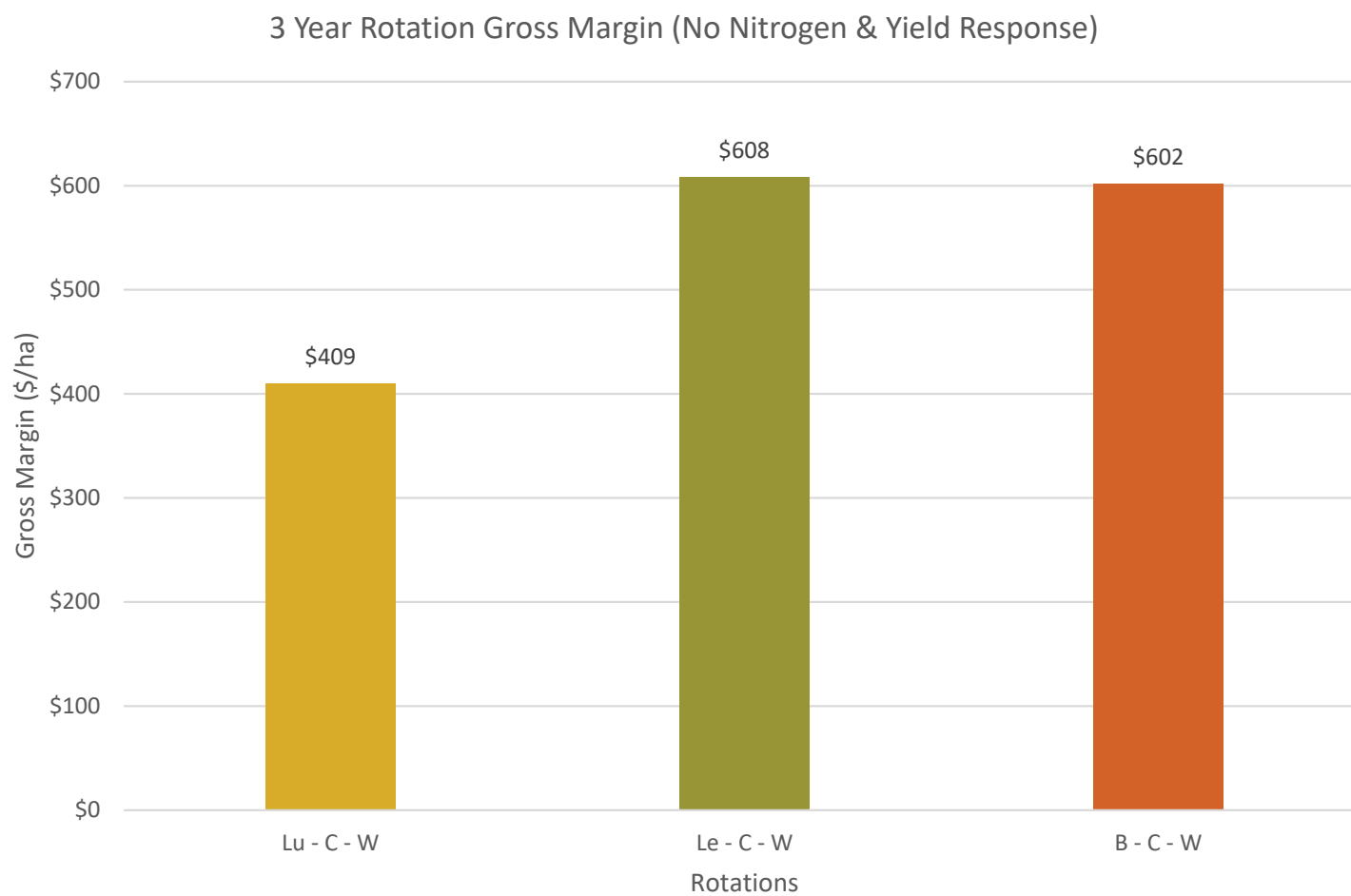
Gross Margin No Response: Lentil – Canola – Wheat

TABLE 5: LENTIL – CANOLA – WHEAT GROSS MARGIN				
		Lentil	Canola	Wheat
Income:			GM	APW1
Price – Free In Store (FIS)	\$/tonne	625	820	385
Less: Levies, Freight & Selling Costs	\$/tonne	66	74	60
Price – Net Farm Gate	\$/tonne	559	746	325
Yield	t/ha	1.09	1.19	1.74
Total Grain Income	\$/ha	609	888	565
Expenses:				
	\$/ha			
Fertiliser		65	170	110
Chemical		90	90	70
Operations		150	148	126
Fuel		38	38	38
Repairs		41	41	41
Seed & Treatment		19	107	22
Crop Insurance		9	13	8
Total Variable Expenses	\$/ha	412	607	415
GROSS MARGIN	\$/ha	197	281	150

Gross Margin: Barley – Canola – Wheat

TABLE 5: BARLEY – CANOLA – WHEAT GROSS MARGIN				
		Barley	Canola	Wheat
Income:		BFED1	GM	APW1
Price – Free In Store (FIS)	\$/tonne	335	820	385
Less: Levies, Freight & Selling Costs	\$/tonne	67	79	65
Price – Net Farm Gate	\$/tonne	268	741	320
Yield	t/ha	2.32	1.19	1.74
Total Grain Income	\$/ha	622	882	557
Expenses:	\$/ha			
Fertiliser		115	170	110
Chemical		80	90	70
Operations		136	148	126
Fuel		38	38	38
Repairs		41	41	41
Seed & Treatment		17	107	22
Crop Insurance		9	13	8
Total Variable Expenses	\$/ha	436	607	415
GROSS MARGIN	\$/ha	186	275	141

Gross Margin



Gross Margin Response: Lupins – Canola – Wheat

TABLE 5: LUPINS – CANOLA – WHEAT GROSS MARGIN				
		Lupins	Canola	Wheat
Income:		LUP1	GM	APW1
Price – Free In Store (FIS)	\$/tonne	350	820	385
Less: Levies, Freight & Selling Costs	\$/tonne	64	79	65
Price – Net Farm Gate	\$/tonne	286	741	320
Yield	t/ha	1.37	1.56	2.05
Total Grain Income	\$/ha	392	1,156	657
Expenses:				
	\$/ha			
Fertiliser		55	140 (30)	97 (13)
Chemical		90	90	70
Operations		138	148	126
Fuel		38	38	38
Repairs		41	41	41
Seed & Treatment		31	107	22
Crop Insurance		6	17	10
Total Variable Expenses	\$/ha	399	582	404
GROSS MARGIN	\$/ha	-7	574	253

Yield benefit: Yr 1 31%, Yr 2 18%

N provided: Yr1 16kg, Yr 2 7kg

Gross Margin Response: Lentil – Canola – Wheat

TABLE 5: LENTIL – CANOLA – WHEAT GROSS MARGIN				
		Lentil	Canola	Wheat
Income:			GM	APW1
Price – Free In Store (FIS)	\$/tonne	625	820	385
Less: Levies, Freight & Selling Costs	\$/tonne	66	79	60
Price – Net Farm Gate	\$/tonne	559	741	325
Yield	t/ha	1.09	1.56	2.05
Total Grain Income	\$/ha	609	1,156	667
Expenses:				
	\$/ha			
Fertiliser		65	140 (30)	97 (13)
Chemical		90	90	70
Operations		150	148	126
Fuel		38	38	38
Repairs		41	41	41
Seed & Treatment		19	107	22
Crop Insurance		9	17	10
Total Variable Expenses	\$/ha	412	582	404
GROSS MARGIN	\$/ha	197	574	263

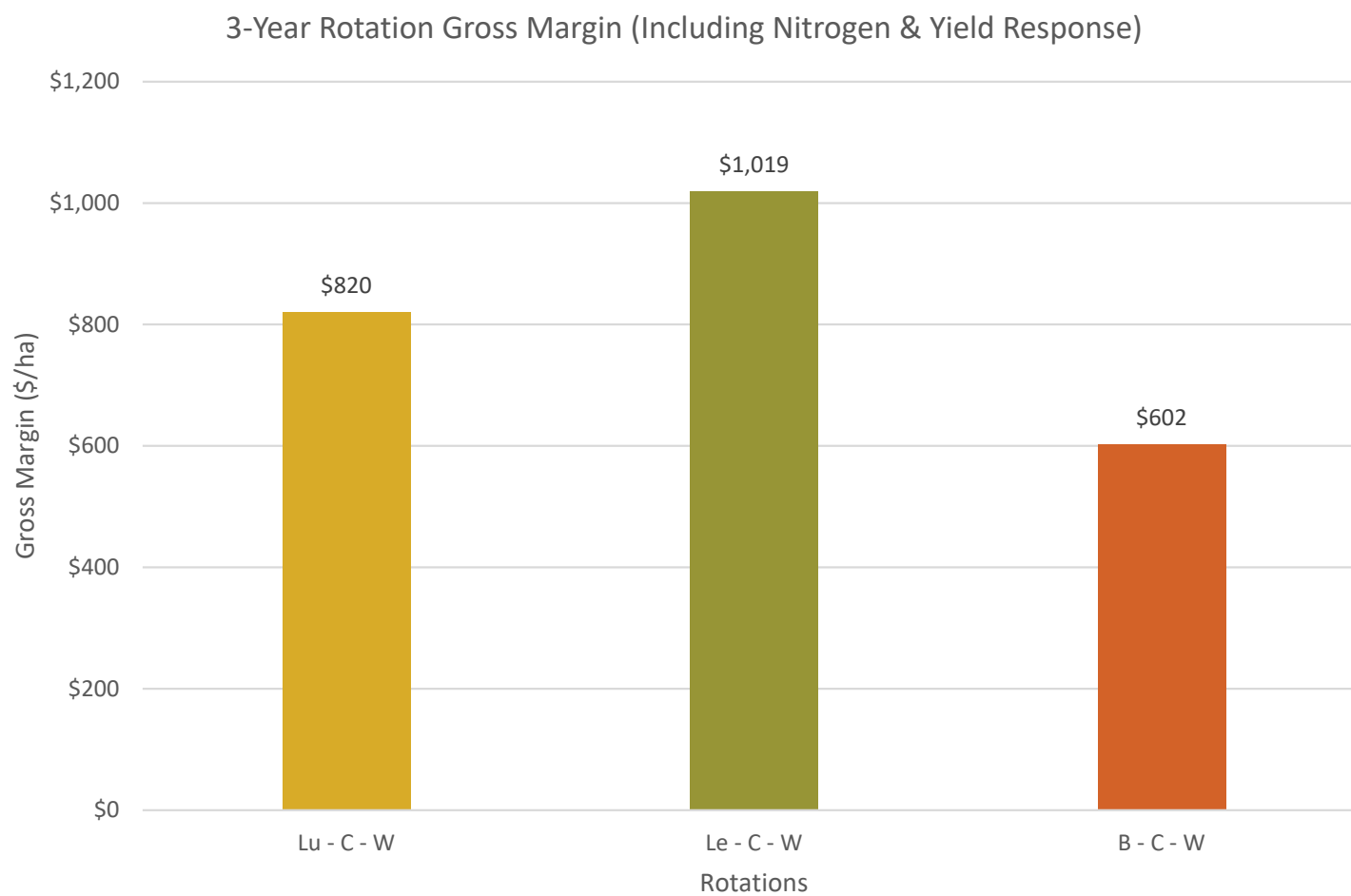
Yield benefit: Yr 1 31%, Yr 2 18%

N provided: Yr1 16kg, Yr 2 7kg

Gross Margin: Barley – Canola – Wheat

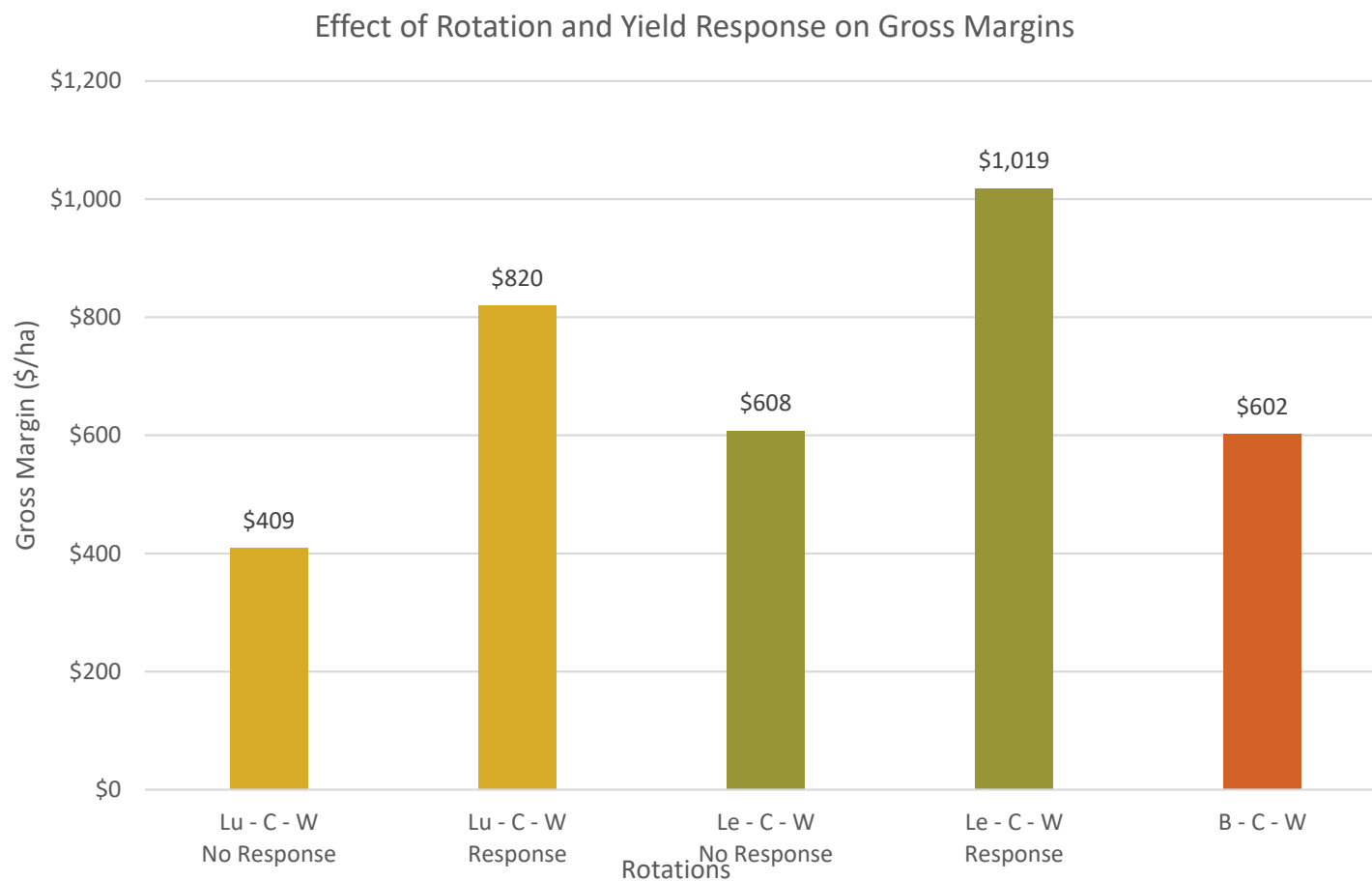
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Total Variable Expenses	\$/ha	436	607	415
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Gross Margin



Yield benefit: Yr 1 31%, Yr 2 18%
N provided: Yr1 16kg, Yr 2 7kg

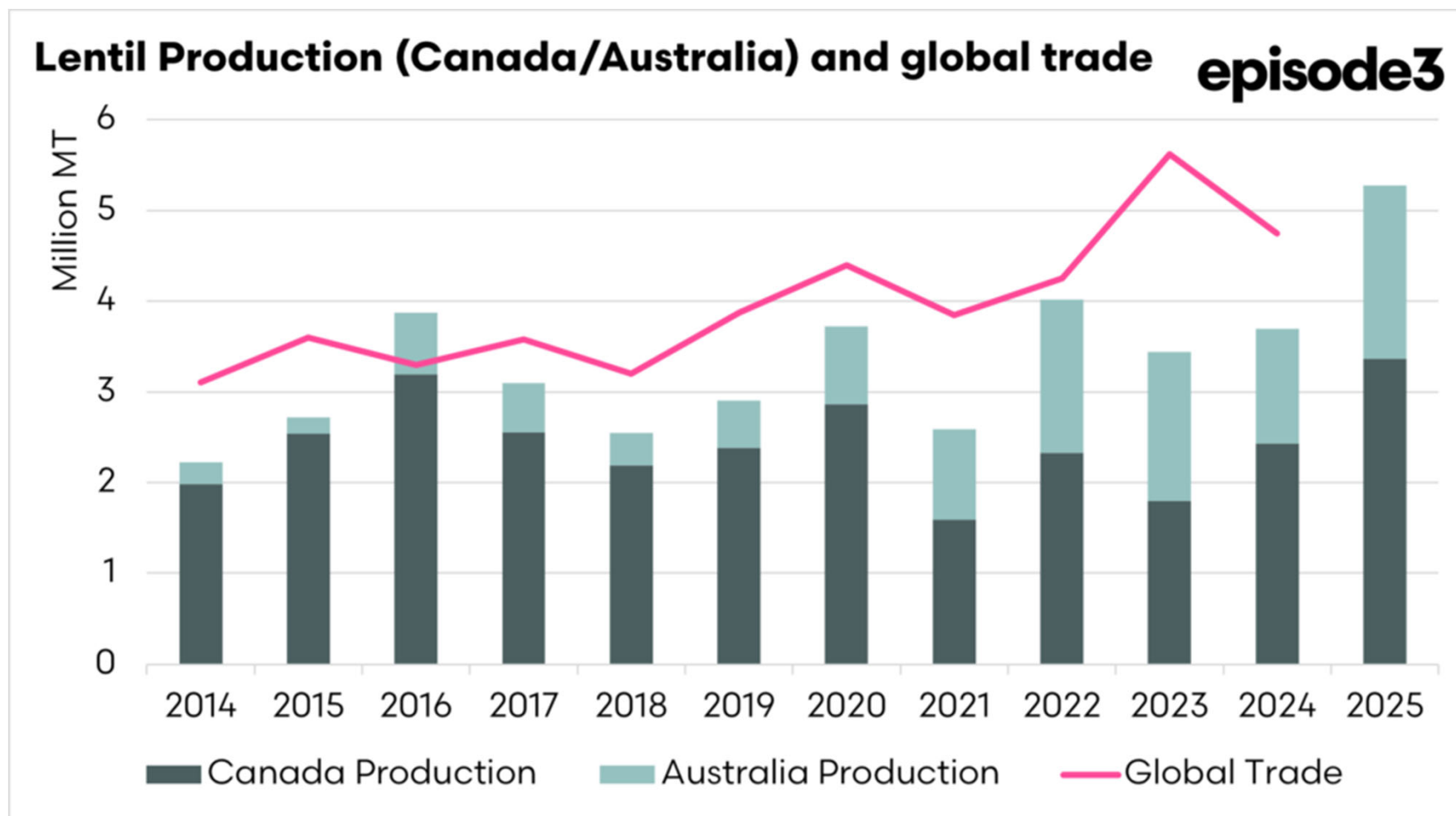
Gross Margin Comparison



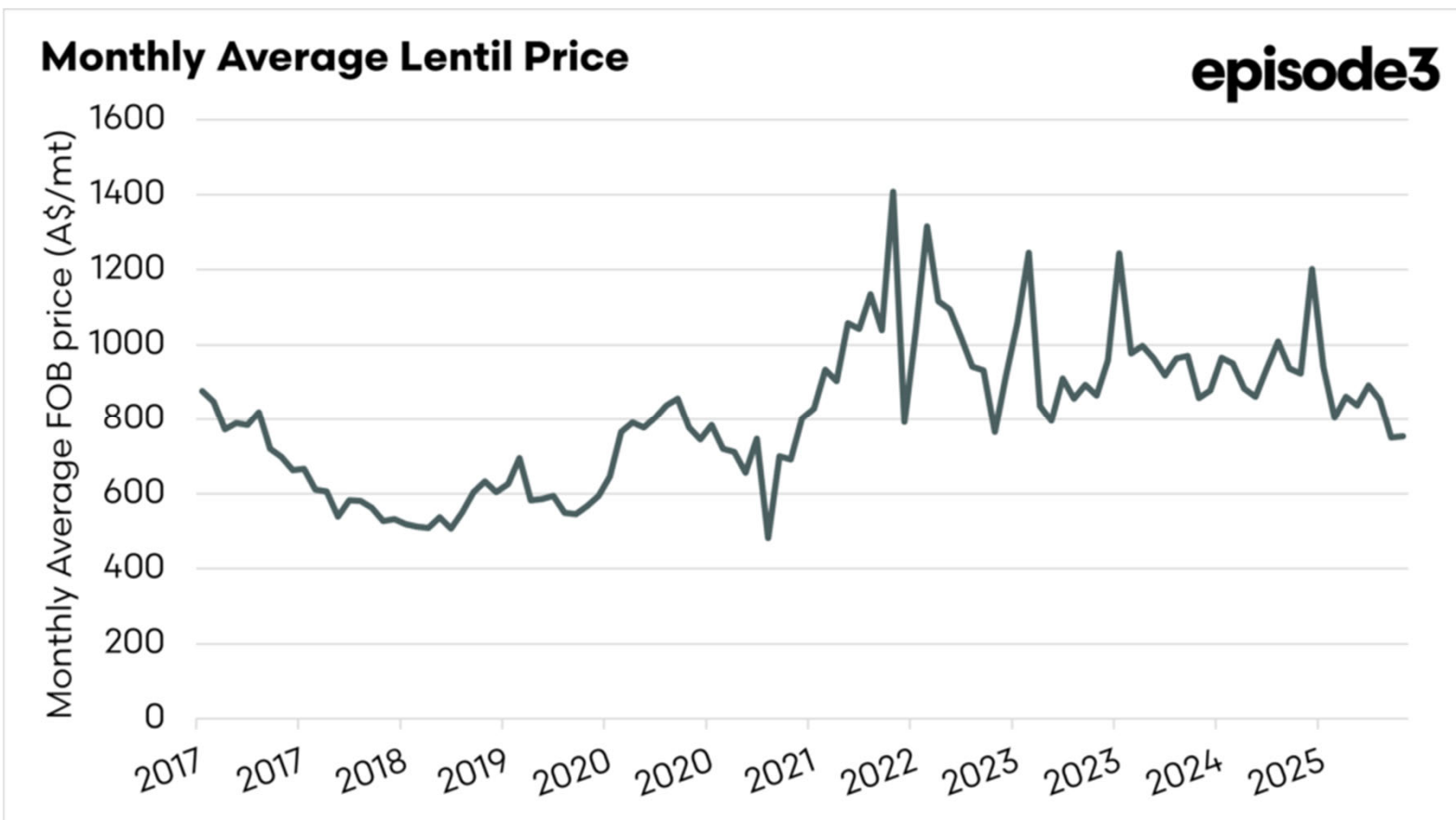
Lentil Sensitivity Analysis

		Lentil Price \$/t FIS						
Lentil Yield t/ha		475	525	575	625	675	725	775
	0.70	-124	-89	-55	-21	13	47	81
	0.80	-84	-45	-6	33	72	111	150
	0.90	-44	0	44	88	132	176	220
	1.00	-4	45	94	143	191	240	289
	1.10	36	90	143	197	251	304	358
	1.20	76	135	193	252	310	369	427
	1.30	116	179	243	306	370	433	496
	1.40	156	224	292	361	429	497	565
	1.50	196	269	342	415	488	562	635

Canada & Australia Lentil Production

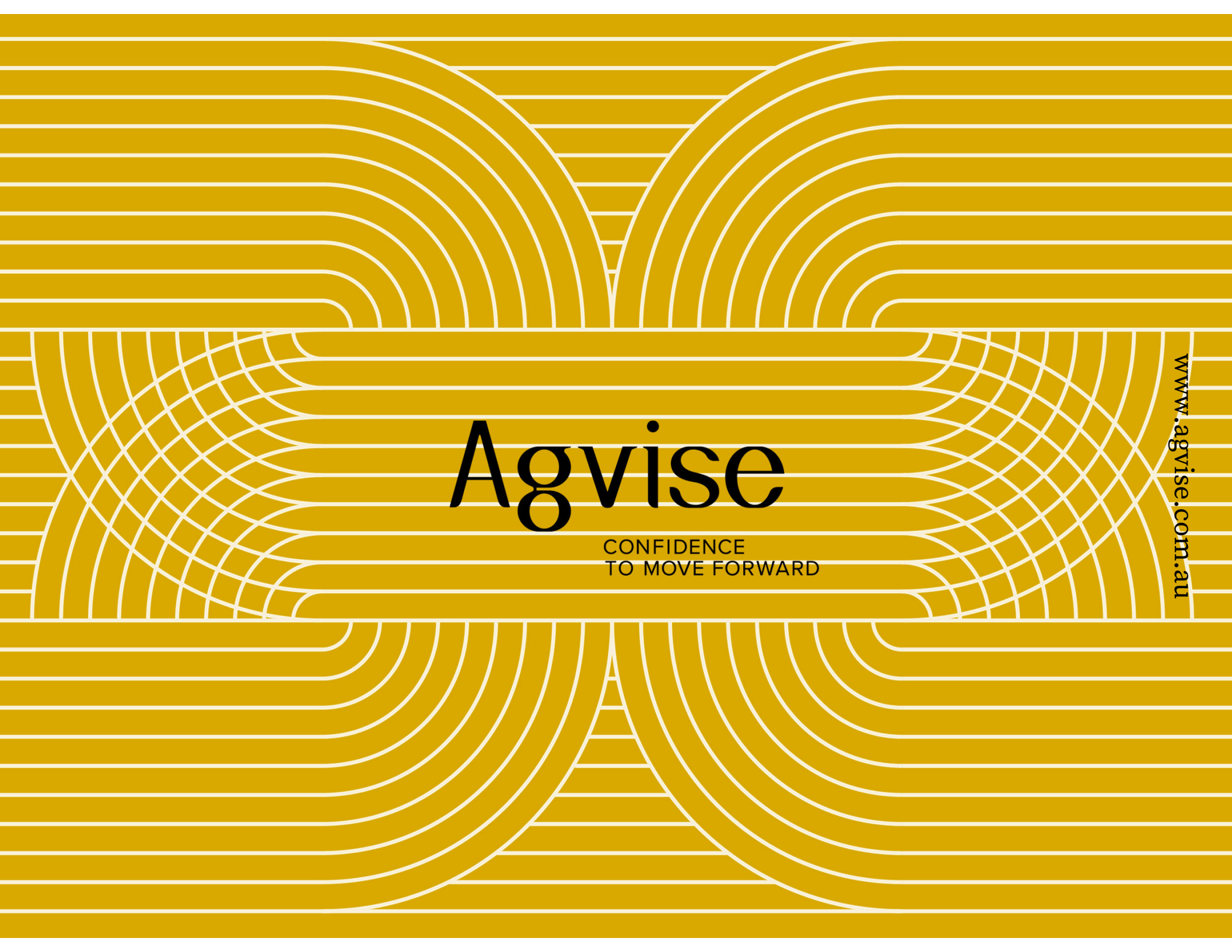


Historical Lentil Price



Bottom line

- pulses look marginal on their own crop gross margin, but once the nitrogen and yield legacy is counted across the rotation, they beat a barley-based system in both rainfall zones — with lentils the stronger performer
- all research indicates positive rotational benefits of improved fertility and other benefits – WA Farming Systems Trial
- economics dictate that canola follows the pulse phase to maximise the rotational value
- lentil rotation as a higher value crop provide a superior result in both rainfall zones
- pricing outlook under increased global and Australian production?

The background of the entire image is a solid mustard yellow. It is decorated with a complex pattern of white lines. These lines form a series of concentric, semi-circular arcs that are mirrored across the center. The arcs are of varying radii, creating a sense of depth and movement. In the center, where the arcs intersect, they form a grid-like pattern. The overall effect is a modern, geometric, and organic design.

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