

# Biodiesel

Small Scale On-farm  
Considerations

# Canola?

- Partial Budget analysis (available at the back of the room)
- 1.7t/ha crop with 44% oil
- on-farm canola price of \$317/t
- cold oil extraction process

# Results: Costs

- Total biodiesel production costs of **\$2.13/L**
- - Canola production costs: 70c/l
- - Biodiesel variable costs: \$1.18/L
  - Opportunity cost of sale to pool: 48c/L
  - Labour: 32c/L
  - Methanol: 28c/L
- Biodiesel fixed costs: 15c/L

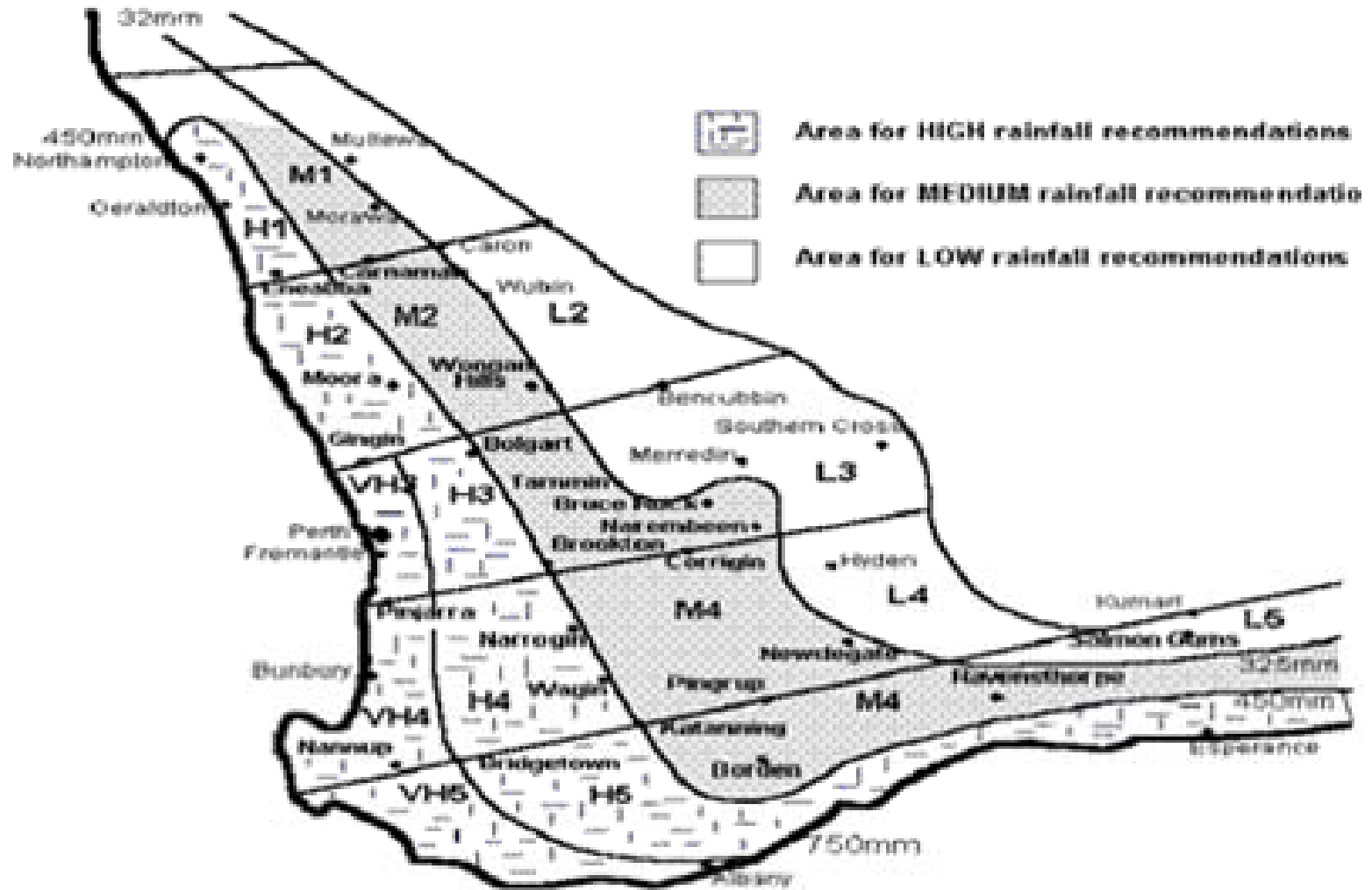
# Results: Revenue

- Total revenue: **\$1.42/L**
- Biodiesel: 77c/L (value of off road diesel at the time)
- Meal: 59c/L
- Glycerol: 15c/L
- Ignore Opportunity Cost of pool sales and labour, then economic
- BUT
- Implies difficulty to ensure supply if scaled up and labour will have to be included.

# *Comparison of Biodiesel and Canola Returns (Difference in net Return \$/ha) at Varying Diesel Prices*

		Diesel on-farm Value							
		\$ 0.55	\$ 0.66	\$ 0.77	\$ 0.88	\$ 0.99	\$ 1.10	\$ 1.21	\$ 1.31
Canola Farm Gate Price (\$/t)	\$257	-\$269	-\$215	-\$161	-\$107	-\$53	\$0	\$54	\$108
	\$277	-\$304	-\$250	-\$196	-\$142	-\$88	-\$34	\$20	\$74
	\$297	-\$338	-\$284	-\$230	-\$176	-\$123	-\$69	-\$15	\$39
	\$317	-\$373	-\$319	-\$265	-\$211	-\$157	-\$103	-\$49	\$4
	\$337	-\$407	-\$353	-\$299	-\$246	-\$192	-\$138	-\$84	-\$30
	\$357	-\$442	-\$388	-\$334	-\$280	-\$226	-\$172	-\$119	-\$65
	\$377	-\$476	-\$423	-\$369	-\$315	-\$261	-\$207	-\$153	-\$99
	\$397	-\$511	-\$457	-\$403	-\$349	-\$295	-\$242	-\$188	-\$134
	\$417	-\$546	-\$492	-\$438	-\$384	-\$330	-\$276	-\$222	-\$168
	\$437	-\$580	-\$526	-\$472	-\$418	-\$365	-\$311	-\$257	-\$203

# Mustard?



# 2003 Merredin Research Station Trial Results

Selection	Sown 19 May		Harvested 19 Nov				
	Species	Mean Yld	Protein %	Oil %	Moisture %	Oil @8.5%	Oil Yield
Charlton	B. napus:	1583	23.6	43.6	6.6	42.7	676
BLN2298-00W 7	B. napus:	1572	25	41.9	6.9	41.2	647
DB62*2.01	B. napus:	1514	25.1	41.4	6.9	40.7	616
KHU4-99W 2	B. <b>juncea</b> :	<b>1394</b>	25.1	39.5	6.3	38.6	538
Surpass 501TT	B. napus:	1388	24.2	42.7	6.8	41.9	582
KHU2	B. <b>juncea</b> :	<b>1354</b>	25.5	36.2	7.3	35.7	484
ATC94011-01W 2	B. <b>juncea</b> :	<b>1297</b>	22.6	43.1	6.1	42	545
82N022-102	B. <b>juncea</b> :	<b>1293</b>	26.6	35.9	6.9	35.3	456
337110	Crambe:	1252	21.4	38	8.3	37.9	475
KHU2-99W 9	B. carinata:	1227	25	36.5	7.1	35.9	441
KHU4-99W 4	B. <b>juncea</b> :	<b>1151</b>	24.3	40.4	6.2	39.4	454
CMB94054-01W 2	Crambe:	1151	20.3	38.7	8.2	38.6	444
ATC94129-01W 1	B. carinata:	1127	26.7	34.2	7.9	34	383
ATC94043-01W 1	B. carinata:	1084	26.6	33.5	7.9	33.3	361
K10-01W 2	Crambe:	824	20.5	39.1	8.2	39	321
SAL94031-01W 4	S. alba:	318	32.1	28.5	7.3	28.1	89
SAL92880-01W 1	S. alba:	294	33.7	28.6	7.3	28.2	83

# Whole Farm Model

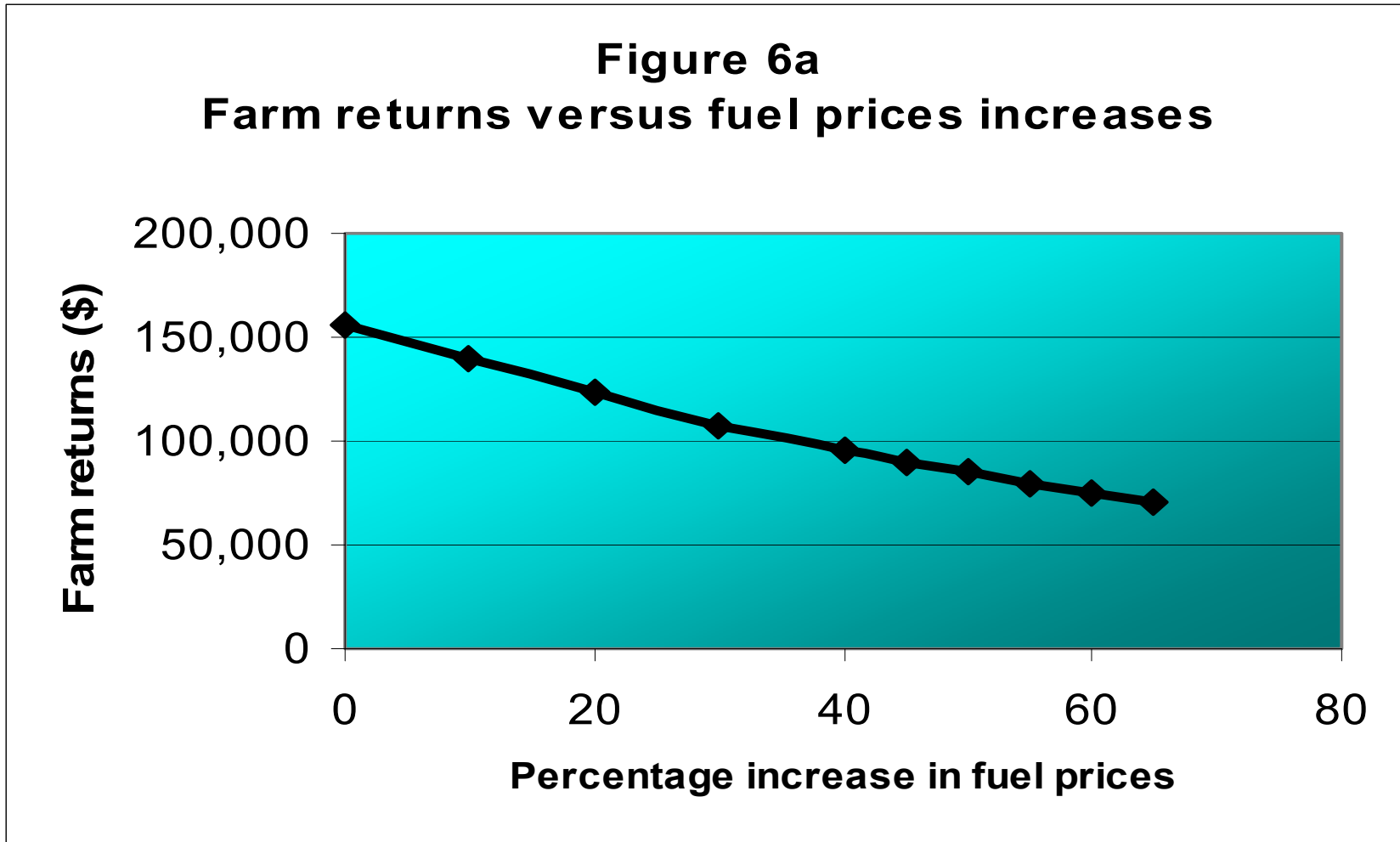
- Compared canola and mustard whole farm enterprise
- Less fertilizer and no swathing required: \$35/t saving over canola
- 1.3t/ha, with a 40% oil content
- Examined impact of rising energy costs: rise in diesel and fertilizer
- No switching costs between crops and livestock
- Factored in scale in biodiesel production
- To be updated as research data becomes available

Off Road Diesel Price	Meal Price	Mustard Prod Cost	Bio diesel Prod Cost	Total Cost	Total Rev	Value Compared to Canola sold to Pool (25% Scale Econ BD Prod)
c/l	\$/t	\$/ha	\$/ha	\$/ha	\$/ha	\$/t
82	250	233	254	487	513	275
92		235	256	491	544	298
1.02		237	257	494	575	<b>321</b>
1.12		238	259	497	606	344
1.22		240	261	501	637	366
82	350	233	254	487	605	<b>346</b>
92		235	256	491	636	368

# A Couple of Implications

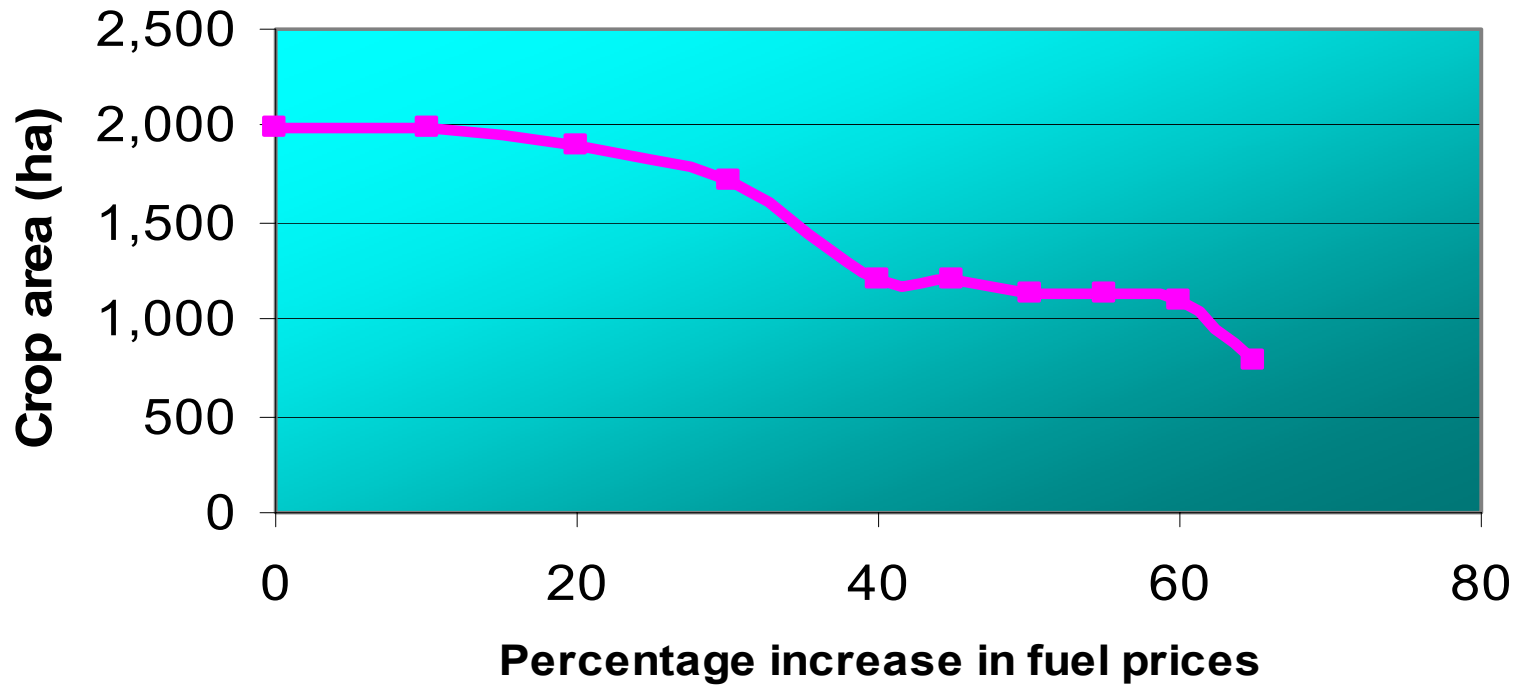
- Model most sensitive to
  - Scale Economies in Biodiesel Production and
  - Meal Value

# And another ...

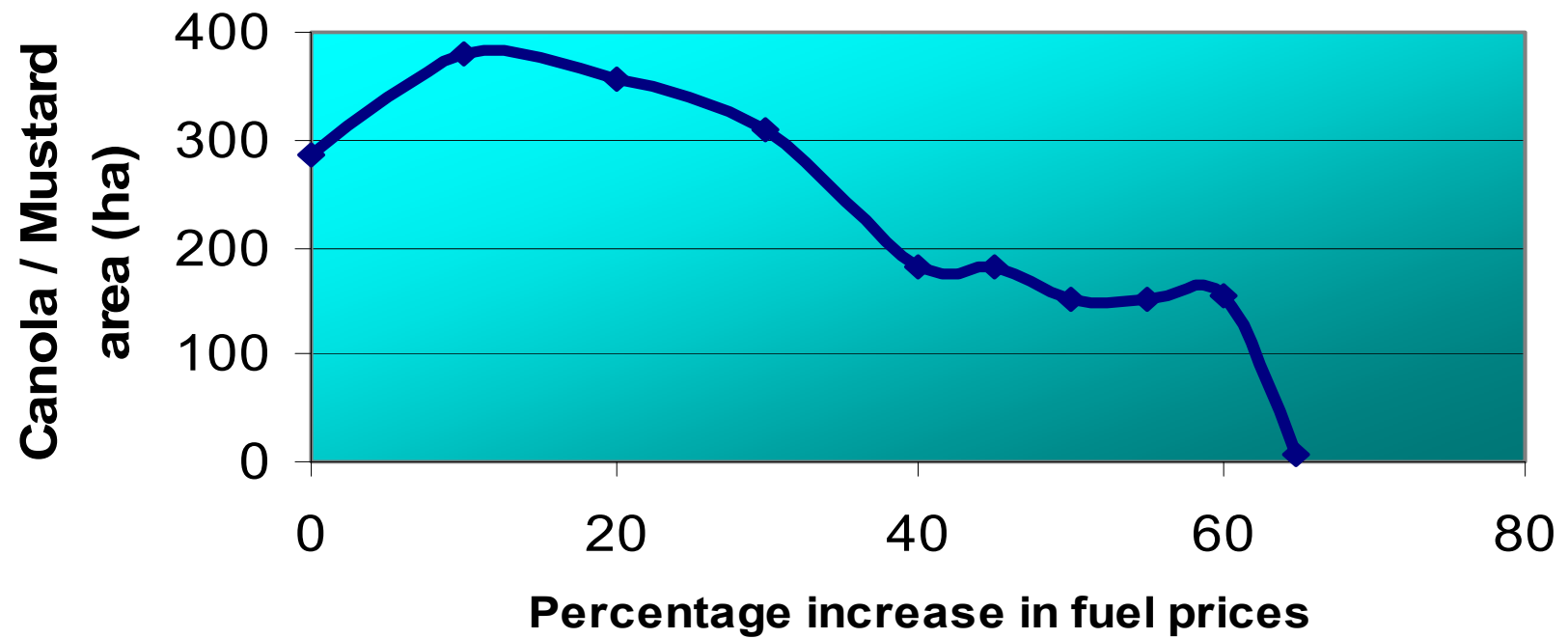


# Implying substitution from cropping to livestock

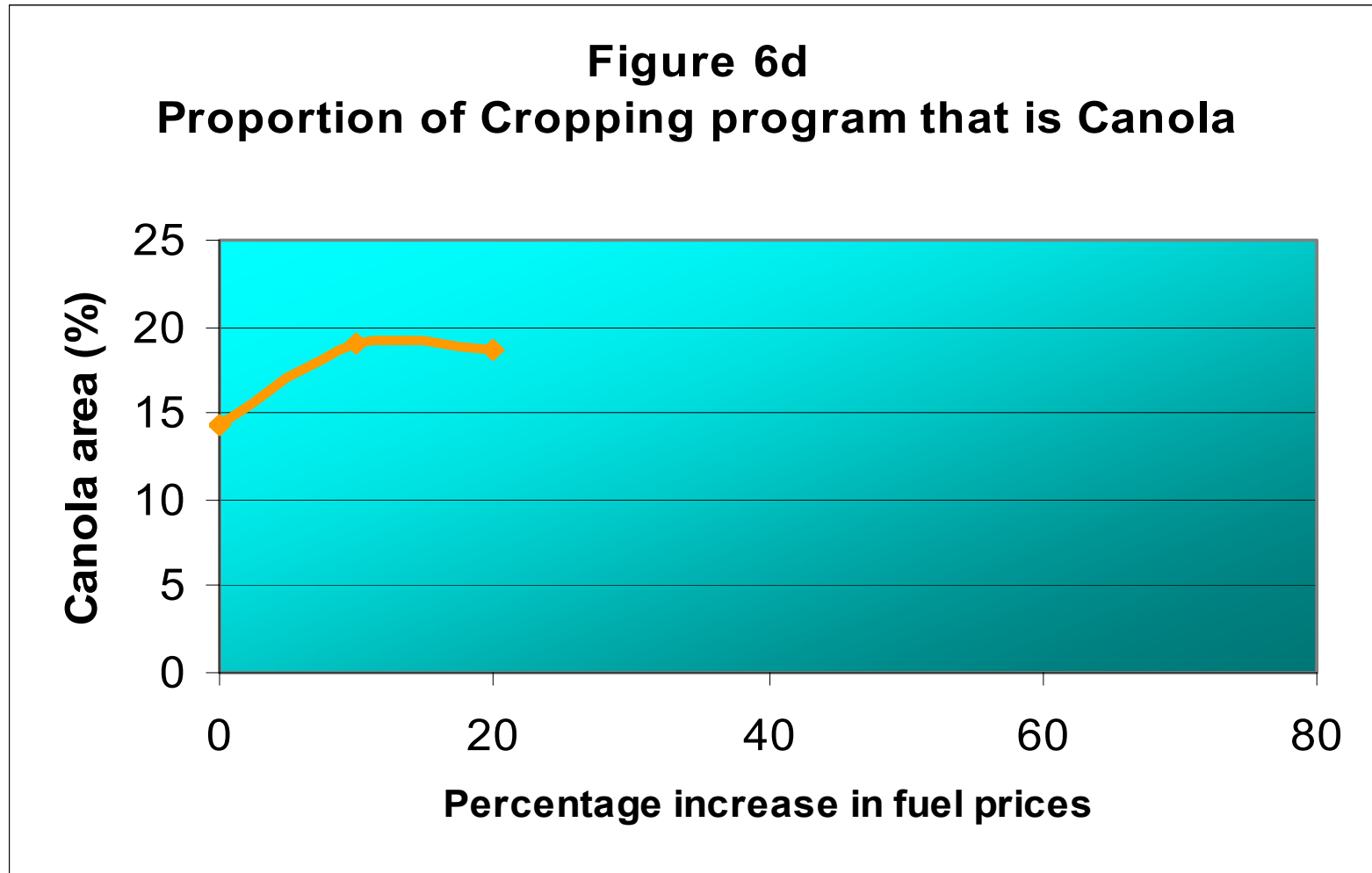
**Figure 6b**  
**Area of crop versus fuel prices increases**



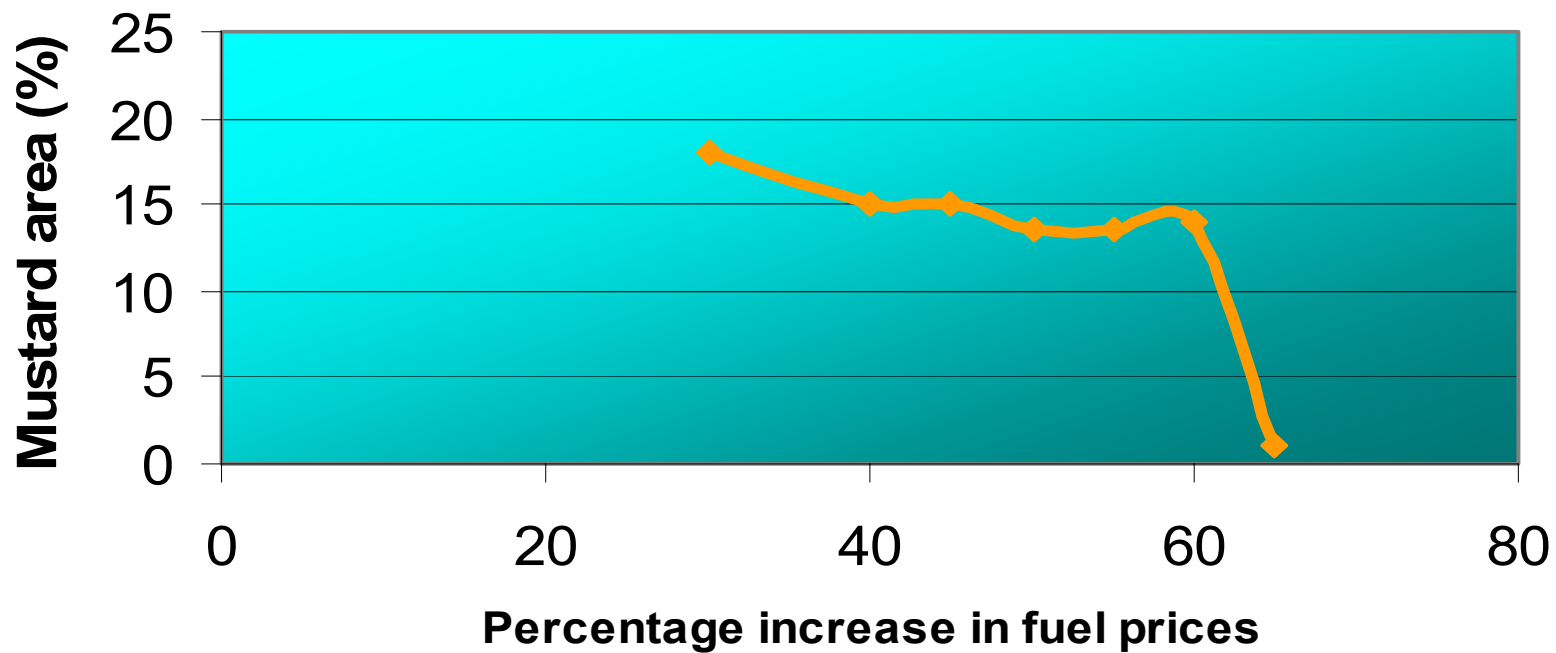
**Figure 6c**  
**Area of Canola / Mustard versus fuel prices**  
**increases**



# As well as substitution of mustard for Canola



**Figure 6e**  
**Proportion of Cropping program that is Mustard**



# Some Regulatory Considerations

- Rebate at manufacturer level
- Full rebate until 2011, then phased out over five years
- ‘Poor cousin’ to ethanol?
  - Tariff barrier (imported ethanol tariff = excise)
  - Max. excise of 12.5c/l from 2016
- No dedicated body of feedstock producers?!?

# Some Wider Market Considerations

Rebated diesel market around 3.5BL / non rebated market around 1.8BL BUT

Only one dedicated known retail outlet (SAFF Fuels)

Around 300ML+ capacity over the next two years

Feedstock largest cost: limiting factor

150ML Darwin plant: imported palm oil

Landed for estimated 45c/L.

**Implies a ceiling on domestic feedstock returns**