

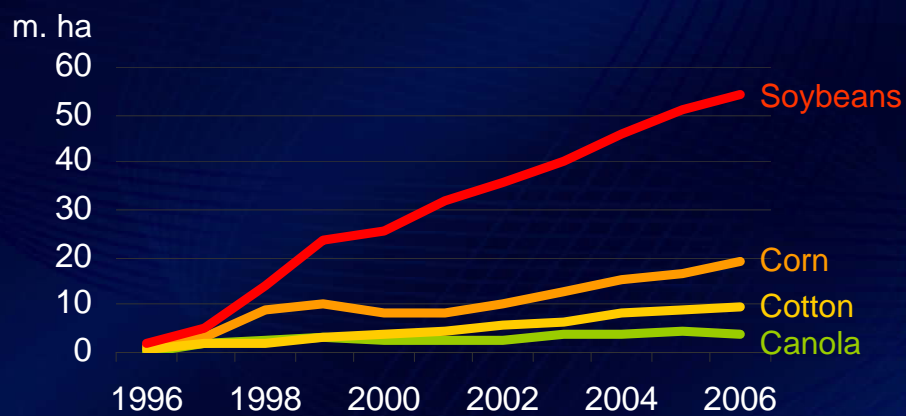
# *The economics of biotechnology adoption in Australian agriculture*

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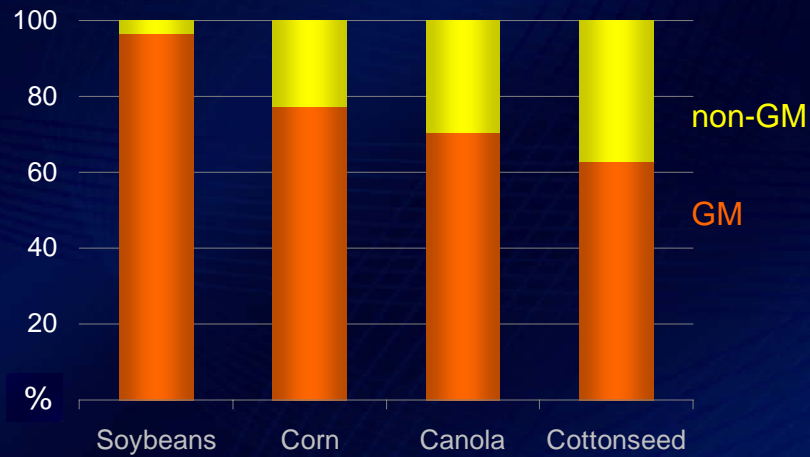
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## *Global GM crop area harvested*



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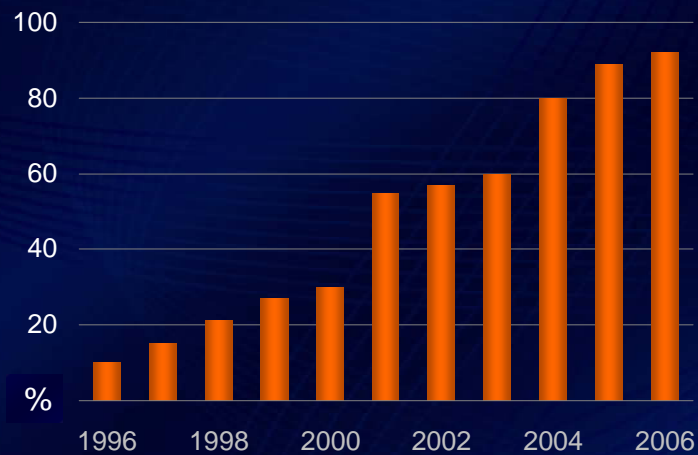
## World trade shares, GM producing countries \*



\* three years to 2005-06, excludes intra-EU trade

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## Uptake of GM cotton in Australia



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## Assessing the economic impact

- ▶ differences in yield
- ▶ reductions in insecticide / weed management costs
- ▶ differences in seed prices
- ▶ differences in prices received

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## Farm level impact of GM cotton in Australia

	conventional cotton	Bollgard II <sup>®</sup> cotton
Income (lint and seed)	\$3241	\$3241
Variable costs		
- cultivation and sowing	\$314	\$227
- fertiliser and irrigation	\$319	\$319
- herbicide and insecticide	\$640	\$313
- harvesting and ginning	\$930	\$930
- licence fee	–	\$300
- refuge crop	–	\$23
- other	\$130	\$130
	\$2333	\$2242
Gross margin (\$/ha)	\$908	\$999

source: NSW DPI summer crop gross margins 2005-06

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## Canola imports, Japan

Canadian & Australian import prices & volumes



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## Domestic canola prices



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## Canola price relationships



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## Price premiums

- ▶ EU import restrictions
- ▶ labelling requirements
  - food crops vs. other crops
- ▶ segregation costs
- ▶ 'second generation' GM crops

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## Modelling the welfare implications

### scenario 1

Australian states prohibit commercial plantings of GM grain and oilseed crops, while there is further GM crop adoption in other countries

vs.

### scenario 2

Australia adopts GM varieties of canola, wheat and barley over five years

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## Assumed productivity gains (\$1)

	Canola	Maize	Wheat
United States	–	–	5
Canada	–	–	5
Brazil	–	10	5
Argentina	–	–	5
China	–	10	5
India	–	10	5
Australia	–	–	–


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## Assumed productivity gains (s2)

	Canola	Maize	Wheat	Barley
United States	–	–	5	–
Canada	–	–	5	–
Brazil	–	10	5	–
Argentina	–	–	5	–
China	–	10	5	–
India	–	10	5	–
Australia	5	–	5	10


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## Modelling results

Productivity gains  \$2,952m

### Sensitivity analysis

- productivity gains halved  \$1,492m

- productivity gains doubled  \$5,770m

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*The way forward:  
managing the risks*

- ▶ environmental
- ▶ market acceptance
- ▶ agronomic

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