

Multi Peril Crop Insurance

a proposal by

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As presented to the Liberal Party Policy Committee
for Agriculture

BASIC PRINCIPLES

To create an insurance product to allow growers to insure their cost of production at the beginning of each season

That a Government premium subsidy operated along the lines applicable to Private Health Insurance apply. This subsidy to replace EC assistance.

Premium costs would be risk rated taking into account both production and costs data.

As the name alludes, the product would cover all risk including hail and fire.

Why Multi Peril Crop Insurance (MPCI) instead of Exceptional Circumstance (EC)

EC is a Government grant and as such is complex and means tested which frequently excludes growers simply on the basis of property value or off farm investments

This product would be available to all who choose to use it and the subsidy would not be means tested.

Those who did not purchase the product would be deemed to self-insure and therefore be ineligible for Government assistance.

For the purpose of the initial estimate, the following data was used

That the average cost of production for grain crops is \$300 per hectare but translated to 1 tonne per hectare of production

Other detail

Average area planted to wheat = 12m hectares

Years when the national average production has been less than 1 tonne per hectare = during last 16 years = 2

By State average over 16 years

	NSW	QLD	VIC	WA	SA
1994/95	1.5m ha @ 0.4t =\$180m	400,000 ha @ 0.4t = \$48m			
2002/03	3.0m ha@ 0.17t =\$153m		1.2m ha @ 0.28t = \$100m	4.5m ha @ 0.9t = \$121.5m	
2006/07	3.6m ha @ 0.29t =\$313m		1.3m ha @ 0.35t = \$136m		2.2m ha @ 0.33t = \$217m
2007/08	4.0m ha @ 0.55t =\$660m				

Total Cost Over 16 years = Approximately \$2 bn

**POTENTIAL CLAIMS ON A STATE BY STATE BASIS BY MULTIPLYING THE AREA
PLANTED BY THE AMOUNT OF DEFICIENCY BELOW 1 TONNE PER HECTARE FOR
WHICH A CLAIM COULD BE LODGED**

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Total Cost over 16 years = Approximately \$2bn

Indicative calculation

(Hectares of wheat over 16 years)

12m Hectares (wheat) x 1.7 Tonne per Hectare = 20.4m Tonne pa

20.4m x 16 years = 326.4m Tonne

326.4m Tonne x \$300 = \$97.92b

Cost of claims for 16 years at \$300 per tonne / \$2b
\$2b is 2.04% of \$97.92b

Nett premium excluding loss ratio = 2.04%

Approximate Government expenditure for EC for 16 years = \$3bn

Some Actuarial Assessment as prepared for the WA
Government Task Force 2003

Final Report

MULTI PERIL CROP INSURANCE TASK FORCE

**REPORT TO THE MINISTER FOR AGRICULTURE,
FORESTRY AND FISHERIES**

Glossary of Terms from the Multi Peril Crop Insurance Task Force

9Actuarially Sound/Fair Premiums: Actuarially fair refers to premiums that are calculated using a known historical data set, with a specified level of cover, loss ratio and election percentage. Actuarial fairness does not guarantee that a scheme will be actuarially sound, however, as problems such as adverse selection, moral hazard and systemic risk have a large bearing on this.

Adverse Selection (commonly used insurance term): If individuals have different chances of incurring losses, and there is no observable means for the insurer to separate these individuals into separate risk classes, then any insurance offered is likely to be selected against, with only the high risk (those with a higher chance of a payout) taking out the cover. For example in agriculture if a wheat yield for a whole shire was insured at 65 per cent of the shire average of 2 tonnes per hectare, people in the shire who only average 1.5 tonnes per hectare would take out insurance and get a payout in most years.

Those who average 2.5 tonnes per hectare would be highly unlikely to take out insurance.

Asymmetry of information: Relates to the purchaser of the insurance and the insurance provider not having access to the same information regarding the probability of a loss occurring. For example a farmer has a far better idea of what his long-term yields are than any insurance company.

Basis Risk: Refers to how closely the cover you are taking out covers the risk you are trying to protect against.

For example if a farmers yield has a strong positive correlation with growing season rainfall at the local weather station, there is a small basis risk in utilising a weather derivative based on that weather station. If the correlation were poor, however, then this would lead to a large basis risk, and the farmer could suffer catastrophic yields and yet not receive a payout. Equally, the farmer could get high rainfall at the farm with much less at the recording weather station and as a result receive a payout when he or she may not have suffered a loss.

Coverage Level: Refers to the level where insurance payments are triggered. For a 65 per cent coverage level on the yield of a crop, for example, if your long-term average was 2 tonnes per hectare, insurance payments would begin to occur when yield dropped below 1.3 tonnes per hectare.

Election Percentage: Refers to the percentage of the insured loss that the insurer will pay out. For example if a payout is triggered and the loss is \$100,000 then if the election percentage is 70 per cent a payment of \$70,000 will be made on the claim.

Loss Ratio: This is the ratio of premiums collected to payouts made by the insurer. Most crop insurance is carried out at a long-term loss ratio of 60-70 per cent; i.e. 30-40 per cent of premiums collected are retained by the insurer to cover administration costs and profit. Of course, these are calculated on historical data, and an unusual sequence of events can result in actual Loss Ratios being significantly higher or lower. Subsidised MPCCI schemes overseas typically have loss ratios over 100 per cent.

Moral Hazard (commonly used insurance term): In an uncertain environment, if an insured person can take action that is difficult to observe and control that will affect the outcome and increase the possibility of a payout, then moral hazard is said to exist.

Reinsurance: Retail insurers arrange reinsurance contracts with reinsurance companies (usually multi-national) to protect their balance sheets against large losses. The protection may apply to individual losses on individual policies or to a series of losses that might occur from a single event such as a cyclone or earthquake that might affect many policies. In some cases the reinsurance protection might only apply when losses on a whole class of business has reached a predetermined level. The level of reinsurance protection sought by the retail insurer is dependent on the insurer's capital base and its own level of risk aversion. In any case, the company's reinsurance program must be approved by the Australian Prudential Regulatory Authority as adequate for the business written.

Risk Averse: This is a nebulous term that refers to farmers not wishing to be exposed to "excessive" risk. The notion of risk, aversion to risk, and how farmers perceive the risks they face and how to measure this aversion is a complex and not well understood area.

Systemic Risk: Occurs when a large number of people are likely to suffer a loss at the same time, and if insurance is involved, a large number of claims will result in the premiums that have been paid into the pool being insufficient to cover the losses incurred. The widespread nature of drought is a classic case of systemic risk.

Take-up level: Refers to the overall penetration of an insurance scheme. Hence a take-up level of 10 per cent for a MPCCI for wheat would mean that 10 per cent of the States crop had insurance cover.

Weather Derivative Markets: Markets that allow trading against an observable weather index. This would include such things as extremes in temperature and rainfall.

<http://www.agroinsurance.com/files//Austr%20-%20MPCITaskforceReport.pdf>

The most significant factor is “Take Up Level”

A low participation level means high premiums

Risk rating of premiums makes the product more attractive to low risk properties

As the product covers all risks, certain areas will take out cover for different reasons i.e. low rainfall or frost

Today's gross cost of production and areas sown represents a very high monetary risk which virtually prevents a follow up crop.

Finance providers would insist on insurance were an affordable product available (i.e. household mortgage insurance)

Assuming **no selection** (i.e. compulsory scheme or random take-up) the following ratings were calculated:

Premium Rates (percent of crop value) calculated for Task Force based on the Insurer's loss ratio				
Rating Model	70% loss ratio		60% loss ratio	
	65%	40%	65%	40%
	Coverage	Coverage	Coverage	Coverage
Individual Yield	2.1%	0.4%	2.5%	0.5%
Area	3.0%	0.7%	3.5%	0.8%
Revenue (price \$230/t)	2.4%	0.5%	2.8%	0.6%

Premium cost based upon Take Up or (or participation) level

Unless a scheme is compulsory, selection would occur and cause the scheme to fail.

Assuming **maximum selection** the following ratings were calculated:

Premium Rates (% of crop value) assuming 70% loss ratio								
Rating Model	65% coverage				40% coverage			
	Take-up level				Take-up level			
	10%	20%	30%	40%	10%	20%	30%	40%
Individual Yield	7.7%	5.9%	4.8%	4.2%	2.7%	1.9%	1.4%	1.1%
Area	17.0%	10.9%	8.2%	6.6%	5.3%	3.1%	2.2%	1.7%
Revenue	8.0%	6.3%	5.1%	4.5%	2.9%	2.0%	1.5%	1.2%

Premium Rates (% of crop value) assuming 60% loss ratio

Rating Model	65% coverage				40% coverage			
	Take-up level				Take-up level			
	10%	20%	30%	40%	10%	20%	30%	40%
Individual Yield	9.0%	7%	5.8%	4.7%	3.2%	2.2%	1.6%	1.3%
Area	19.9%	12.8%	9.5%	7.7%	6.2%	3.6%	2.6%	2.0%
Revenue	9.4%	7.3%	5.9%	5.2%	3.3%	2.3%	1.7%	1.4%

Selected Shires on Risk Rating basis

Shire	Random Take-up	Maximum selection take-up level			
		10%	20%	30%	40%
Katanning	2.20%	7.1	5.4	4	3.4
Jerramungup	4.10%	10.9	9.8	8.3	7.3
Kulin	2.50%	7.9	6.8	5.5	4.9
Merredin	2.30%	7.3	5.1	4.3	4.3
Dalwallinu	1.20%	5.1	3.8	3.1	2.7
Dandaragan	1.90%	9.2	6	4.8	4.1
Wongan-Ballidu	1.30%	7.6	5.6	4.1	3.1
Esperance	2.60%	9.4	7.1	5.8	4.9 ₁₅

SOME COMMENTS

The figures provided are indicative but based on different principles although 65% of estimated average crop value would equate to cost of production.

Moral hazard (the opportunity to cheat) has always been promoted as the principal objection of the insurance industry to MPCl.

I believe a “cost of production” policy could reduce this problem i.e. it would only relate to actual costs and income which could be audited. The policy could also list the PERIL events that must occur to trigger the policy i.e. a frost event or low or inconsistent rainfall, locusts and/or hail or fire.

MPCI
SO YOU CAN
SLEEP AT NIGHT