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Secretary:	[Signature]

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The Submission from the Conservation Agriculture Alliance of Australia and New Zealand to the following 'Terms of Reference'

The Committee to inquire into and report upon:

Current and prospective adaptations to the impacts of climate change on agriculture and the potential impacts on downstream processing.

Australian farmers already live with considerable climate variation from an individual farm perspective and the top end of Australian broadacre growers relying on rain-fed farming systems are considerably skilled in production efficiency. The perspectives on long term climate forecast based on models are uncertain and regionally broad. The degree of severity and timeframe involved is probably the more contentious aspect. It is difficult from these models to determine an investment course of action. The flow on effects relating to investments in property, infrastructure and machinery is likely to be significant in some areas. It asks the question how reliable is our forecasts and can we make investment decisions from this?

Our farmer members have demonstrated continued adaptation, maintaining their bottom line with investment in technology and conservation agriculture techniques. In the end we are farming \$/millimetres of rainfall/hectare. With 3,500 farmer members from Western Australia to Central Queensland we see large variations in farming systems which leads us to conclude that adaptation must itself be variable and flexible to suit. A considerable gulf in the efficiency of practices between the top ten percent to the bottom 30 percent of farmers exists, and the broad messages such as minimum tillage, increased stubble retention and crop rotation need to be coupled with investments in farming systems extension to help farmers adapt. This means that all research efforts must be coupled with a significant extension base.

The current farming practice of No Tillage, including full stubble retention, has the ability to adapt to variable climate conditions (and is doing so now) due to it's seeding date flexibility, water harvesting capacity and improved water use efficiency that leads to massive yield benefits over conventional farming systems during periods of below average rainfall. The system also improves soil health leading to long term sustainability of the farm

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sector in Australia. To quote one of our farmer members "The No tillage farming system is climate change ready".

Summary: review the option to support the ongoing role of conservation agriculture in broadacre crop production as a 'climate change adaptive' process on farm.

The role of government in:

- augmenting the shift towards farming practices which promote resilience in the farm sector in the face of climate change;

One way government can better support the shift to conservation agriculture is to support not-for-profit organisations that growers themselves support financially through voluntary subscriptions and in-kind contributions of time, skills and resources.

To augment the shift towards adaptable farming practices, one has only to look at leading farmers who have clearly adopted the necessary practice changes for the present and continue to explore new boundaries. In areas where there is more variability in rainfall such as Northern NSW, farmers have adopted no-till practices resulting in greater infiltration and less evaporation and erosion. The result is that the best practitioners can effectively store more fallow moisture for longer periods of time and sow on time without relying on sowing rains. The result is less reliance on good winter rains to achieve profitable yields. While some individual farmers have realised these benefits for many years, there is still a considerable few that have not adopted this system. The real question is how we assist the larger majority of secondary adopters in making the required shifts given the lack of extension support.

The proposal by us is that new models of extension are required. They need to be current, relevant and flexible. They need to consider an integrated system with all the sciences and business management. They need to be led by farmers who are already at the forefront of practice change; recognising those that are doing the necessary adaptation is a key component.

Summary: Support voluntary conservation agriculture farmer organisation to augment the shift towards more farmers participating in climate change adaptation. Leading farmers can demonstrate the benefit in a practical way to other farmers.

- promoting research, extension and training which assists the farm sector to better adapt to climate change.

The need to support extension must consider how might such a model work and what might be the most significant process in helping farmers shift farming practices?

Farmer to farmer communication has been an exceptionally important contributor to the uptake of sustainable farm practices and this mechanism provides results for a number of reasons. First, farmers trust other farmers over any other source of information, including

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government advisories and commercial marketing. Leading farmers are able to demonstrate the specific technical considerations rather than just promoting a concept and for many secondary adopters, 'seeing is believing'. Leading Farmers are able to demonstrate specific technologies in the context of a wider systematic approach to sustainability and this is increasingly difficult for traditional research and demonstration activities.

The rate of innovation being set by leading farmers is outpacing traditional institutional research because innovative farmers operating on their own properties can more quickly adopt working solutions and then move on to new challenges whereas traditional research is fundamentally dedicated to several years of formal validation and development. There are risks and benefits in engaging 'active research' and traditional research still has a very strong role to play with respect to progressing Australian agriculture. However it is important to recognise that leading growers can engage modern technologies and communication mechanisms and have a marked impact on farm-based innovation and the widespread adoption of practices.

Leading farmers can demonstrate that adopting sustainable farm practices is economically viable under the variability of climate and market forces. Moreover, established conservation farmers are able to provide data for the development of cost benefit analysis. Models and practice change analysis tools are increasingly important for decision makers in farm businesses and this is particularly true for the increased uptake of sustainable farm practices by secondary adopters, who by definition are more risk adverse and require a high degree of confidence to adopt new technologies and practices.

Leading farmers have demonstrated a willingness to contribute to the greater good and recognise the advantages of collective value adding through organisations such as CAAANZ. The bottom line is that farmers trust other farmers and the opportunity to showcase leading growers provides confidence and working examples to the majority of farmers so they too can achieve sustainable farm practices that allow adaptation to changing climate.

One might conclude that conservation agriculture techniques (no-till) can be utilised in just about any agricultural cropping system. Funding the groups that conduct research in no-till and have the practical extension capacity would be regarded as a high value investment in supporting the long term viability of Australia's food capacity.

Summary: Reconsider extension model of using institutional experts and consider funding the people who know how to do it because they have been doing it for years.

The role of rural research and development in assisting farmers to adapt to the impacts of climate change.

It's concerning to our members that the expert assessment panels assembled to review the 'climate change Research Fund' had no farmers or their technical representatives involved. Farming systems groups existing outside statutory bodies and institutional research organisations, have significant technical expertise and innovative capacity. Their practical

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knowledge base can provide valuable insight into overall logistics and financial capability of farms in different regions.

Active research into farming systems adaptation with model scenarios can give better risk management options than simply handing out "Best Management Practices" that keep changing. The better farmers adopt new research directions by taking up risk positions. If this is done in steps, then it creates pathways for other farmers to follow. Regional leadership is important in this since farming areas vary considerably. Researchers on their own cannot ask the critical research question; only the farmer client can do that. At present research systems have poor consulting channels and research mostly within their capacity making the research topic fit the problem rather than the other way. This often ends up in capacity silos that don't communicate to each other and thus slow the pace of adaptation.

Summary: Consider involving farmers in developing the research questions and also consider them as having more than sufficient technical capacity to direct the research process.

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