COMMONWEALTH OF AUSTRALIA

Official Committee Hansard

HOUSE OF REPRESENTATIVES

STANDING COMMITTEE ON PRIMARY INDUSTRIES AND RESOURCES

Reference: Assisting Australian farmers to adapt to climate change

WEDNESDAY, 24 JUNE 2009

CANBERRA

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HOUSE OF REPRESENTATIVES

STANDING COMMITTEE ON PRIMARY INDUSTRIES AND RESOURCES

Wednesday, 24 June 2009

Members: Mr Adams *(Chair)*, Mr Schultz *(Deputy Chair)*, Mr Bidgood, Mr Champion, Mr Forrest, Mr Haase, Ms Livermore, Mr Perrett, Mr Sidebottom and Mr Windsor

Members in attendance: Mr Adams, Mr Forrest, Mr Haase, Ms Livermore, Mr Schultz and Mr Windsor

Terms of reference for the inquiry:

To inquire into and report on:

- Current and prospective adaptations to the impacts of climate change on agriculture and the potential impacts on downstream processing.
- The role of government in:

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

  - promoting research, extension and training which assists the farm sector to better adapt to climate change.
- The role of rural research and development in assisting farmers to adapt to the impacts of climate change.

WITNESSES

Committee met at 5.13 pm

HANSARD, Mr Allan, Chief Executive Officer, National Association of Forest Industries

RAE, Mr Samuel Thomas, Policy Advisor, National Association of Forest Industries

CHAIR (Mr Adams)—I declare this public hearing of the House of Representatives Standing Committee on Primary Industries and Resources for its inquiry into Australian farmers and climate change. This is the third public hearing of this important inquiry. Today the committee will hear from the National Association of Forest Industries and Dr Christine Jones.

I call representatives of the National Association of Forest Industries to give evidence. Welcome. Although the committee does not require you to give evidence under oath, I advise you that this hearing is a formal proceeding of the parliament; therefore it warrants the same respect as proceedings of the House. The giving of false or misleading evidence is a serious matter and may be regarded as a contempt of the parliament.

The committee has received a submission from the National Association of Forest Industries. Are there any corrections or amendments you would like to make to that submission? Then, you might like to make a brief statement before there are some questions. I am sure my committee members would like to ask you some questions. Thanks very much for attending and thank you very much for your submission to our inquiry.

Mr Hansard—With the committee's leave, I would like to make a short statement that will supplement our submission to the committee. We can also provide a copy of the statement to the members of the committee. On behalf of the National Association of Forest Industries, NAFI, we welcome the opportunity to address the Standing Committee on Primary Industries and Resources inquiry into the role of government in assisting farmers to adapt to the impacts of climate change. It is perhaps timely that the Minister for Agriculture, Fisheries and Forestry delivered a statement on forestry this afternoon.

CHAIR—A very good one, too.

Mr Hansard—I commend the minister and the government on this statement. The statement was also relevant to NAFI's opening statement this afternoon. NAFI provided a detailed submission to the committee earlier this year, and this statement identifies key opportunities for the greater integration of trees and farm forestry activities as a means of helping farmers adapt and respond to the impacts of climate change. This is a case of Australia's only carbon positive industry—forestry—coexisting and complementing Australia's second largest emitting sector: agriculture. This is a logical approach as we share the same land base.

NAFI believes one of the most important ways government can help agriculture adapt to the impacts of climate change is in its support for forestry as a complementary land use at both regional and farm scales. However, this approach requires the presence of the correct regulatory and market signals to support forestry as a complementary land use.

NAFI believes that a key market mechanism to achieve this is the emissions trading scheme. NAFI supports the development of an emissions trading scheme as an appropriate mechanism to steer Australia's economy onto a long-term, low-emissions path. However, just as an emissions trading scheme should provide the correct market signals to reduce emissions, it should also provide the correct market signals to promote sequestration and abatement activities.

We see the government's proposed carbon pollution reduction scheme as a first step in developing a comprehensive recognition of forestry over time. The current CPRS construct—based on a narrow Kyoto protocol rule-set—does not fully recognise the benefits of forestry and only a small and select proportion of our industry are likely to opt into the scheme initially. We are hoping the development of international forestry rules for a post-Kyoto framework, including the recognition of carbon in wood products, will lead to a greater recognition of the carbon benefits from forestry in our domestic scheme.

Another key market signal is the full recognition of wood biomass for the generation of bioenergy. The current regulations under the National Renewable Energy Target Scheme, ENRET, only partially recognise wood biomass for the creation of renewable energy credits. The result is a significant lost opportunity to rural and regional Australia, in terms of jobs and investment, and a continued heavy reliance of Australia's economy on fossil-based energy.

If the government gets these signals right, NAFI estimates that it could abate around 20 per cent of Australia's emissions target by 2020, create around 2,300 jobs in rural and regional Australia and meet seven per cent of the government's renewable energy target. The key thing about this—particularly for this committee—is that it can be done through closer integration and coexistence with farming. In fact, getting the signals right for forestry will arm farmers with a far greater set of land-use options to adjust to the effects of climate change, while offering alternative sources of farm income. At a regional level, it will also help diversify regional economies to better adapt to climate variability.

Some of the options for farmers include the growing of a forest for carbon as an offset against emissions from farming activities or as a form of alternative income. The ability for farmers to grow forests for carbon offsets is likely to be important, given the government's intention to assess agriculture in 2013 for potential inclusion in the CPRS in 2015. In this context, it is important to acknowledge that agriculture and forestry are not necessarily mutually exclusive and that there exists a continuum of tree plantings and forestry activities across the landscape at a range of scales and tree densities. These activities are undertaken for a range of production and environmental purposes, from salinity and riparian plantings through to farm woodlots and plantations used primarily for wood production.

Forestry can also complement a range of agricultural activities which may be at greater risk from the effects of climate change. Trees used strategically in the landscape can enhance pasture and plant production and provide direct livestock production and calving benefits through provision of shade and shelter, particularly during periods of climatic stress. As a long-term perennial, trees are generally not as susceptible to seasonal and climatic variations as some other types of crop. Trees can be planted as woodlots and plantations or used in

specific configurations to provide shelter functions for some crops and pastures. This is not about forestry competing against Australia's food basket; it is about coexistence resulting in a potentially larger, healthier and sustainable food basket.

Consequently, the forestry sector's role as a complementary land use can help reduce farm reliance on drought assistance and provide alternative income sources in dealing with the longer term impacts of climate change—in the same way the full recognition of wood biomass provides farmers with a viable, alternative source of income. As part of a sustainable system, farmers could provide wood biomass to regional based generation facilities, reducing the reliance on fossil fuel energy and creating greater long-term energy security for regional Australia.

I would like the committee to note a complementary activity to the use of wood biomass for energy—that is, the use of wood biomass for the production of biochar. The forest industries welcome the recognition by both sides of parliament about the potential benefits of biochar in storing carbon and improving the productivity of our agricultural soils. We note and commend the recent research funds that the Minister for Agricultural, Fisheries and Forestry has allocated to research on biochar, as was outlined in his media release of 21 May 2009. The forest industry is the largest source of biomass for the potential production of biochar. The win-win in this is that, while producing biochar, you can also generate heat for energy generation. But, as previously mentioned, we need the correct market signals.

NAFI notes the government initiatives relating to climate change adaptation and mitigation for agriculture. We commend the government's initiatives in this area including those under the Australia's Farming Future project, which incorporates elements of research, education and assistance to farming enterprises in the form of financial and strategic adjustment support. However, to effectively capture and promote these opportunities, it is imperative that government assistance and policies for farm adaptation effectively recognise and incorporate the forestry sector's significant capacity to offset emissions from agriculture and provide farm-level abatement as an adaptation strategy; the value of forestry to rural communities as a climatically resilient land use that is less reliant on external assistance from drought; and the need for greater research, development and capacity building to promote the synergies between forestry and agricultural activities, including renewable energy, carbon storage and agroforestry practices, that allow farmers and regions to better adapt to climate change.

NAFI is continuing to work proactively with the government and other rural stakeholders in pursuing these objectives. NAFI believes the opportunities for forestry to contribute further to agricultural activities will only become increasingly important given the range of climatic and other environmental production drivers.

CHAIR—Thank you very much for that detail; there were many important points there for us. There are other issues that we are constantly looking at. In relation to farm forestry's commerciality, is there a particular size or is that still emerging? What woodlots would be on a farm to make it commercially viable? Or is it the storing of carbon, for which we have not really got a price yet? Is that still emerging as a policy position?

Mr Hansard—What we have noticed over the development of the commercial plantation industry over the last 40 or 50 years in Australia is that farm forestry and agroforestry can benefit through proximity to commercial plantations. Where you have farmers that grow trees that are close to existing plantations, they can often piggy-back on a lot of the infrastructure and there are often economies of scale that come with a commercial-size plantation. Often, we have seen the development of commercial plantations in parallel with the development of farm forestry.

Mr WINDSOR—Has NAFI done any work, in terms of farm budgets, on the carbon savings that are obtained on various sized properties that are not agroforestry but farm woodlots? How much of the farm would need to be timbered to make a claim to offset the carbon emissions from the balance of the farm? Have you got any substantive information on that?

Mr Hansard—NAFI specifically has not done any work on that, but the CRC for Greenhouse Accounting did a substantial amount of work on that particular topic. They also developed some tools. One of the tools I have seen sets up a dairy farm and basically looks at the emissions from that. Through that tool, the farmer can grow up parts of the farm. You can have a look at the carbon offset from the trees that that would have on the emissions from the dairy farm. There has been some good work done on that, and we can give the committee those references.

CHAIR—We will also have opportunity to visit a couple in southern Victoria and probably in Tasmania. The figures would be good to have; thank you.

Mr SCHULTZ—I pick up the point you made with regard to your estimates that you could abate around 20 per cent of Australia's emissions target by 2020 and create around 2,300 jobs. How are you going to create those 2,300 jobs? I presume they are jobs over and above the current level of employment within the timber industry. Secondly, how much arable farming land will be consumed to meet the demand for that level of employment?

Mr Hansard—That is based on the assumption that, by 2020, we stay on track with the Vision 2020 Australia target that states we will have three million hectares of plantations in the ground. It is also based on the recognition that we can use the residues from our existing production associated with that resource base to create electricity from biomass.

Mr SCHULTZ—Three million hectares of land is a significant amount. From where is that land going to be acquired? Is it going to be acquired from current arable farming land? Let us take your example of a dairy farm. Dairy farms are normally on pretty significant arable agricultural land. One's imagination does not have to run riot too quickly to know that three million hectares is a very significant amount of land for timber. I am just talking on the basis of my experience with the softwood timber that is being grown in the Kosciusko area by the timber industry. There is no problem with the timber industry. People need to be made aware of where the land is coming from and what impact it is going to have on perfectly good arable land which can make a very significant contribution to the food chain.

Mr Hansard—Let me make a couple of points of clarification. In relation to the Vision 2020, Australia has just reached two million hectares. We have two million hectares in the ground there towards that target, and to meet that target we need an extra million hectares. Between now and 2020, we will need to probably put in 80,000 to 90,000 hectares a year.

That area will be largely based on where the plantations are growing now. There are some key plantation areas around Australia that have formed a good hub for the plantation industry. You would expect that a million hectares would probably be developed around those areas, as well as some new areas that are emerging. In the next 10 years, we will probably see some significant changes in where we put plantations. There are emerging, significant opportunities, for example, in northern Australia, and we are yet to fully assess that opportunity. One could imagine, though, that by 2020 we may have established a good plantation base in the northern part of Australia.

The market will largely determine where land is taken up. One thing that is coming out, though, from the studies—this is in relation to your issue on where forestry goes in relation to prime agricultural land—is that we do not necessarily compete with the top end of prime agricultural land. For example, the price of prime agricultural land is often too expensive for forestry. Additionally, the land does not often meet the requirements that our trees need, in relation to characteristics that we look for. We can look at the example of the prime agricultural land in Tasmania. The work done by the private forestry group down there showed that, so far, forestry only takes up probably five per cent of Tasmania's prime agricultural land.

Mr SCHULTZ—Is it for softwood production predominantly?

Mr Hansard—It is for a mixture of hardwood and softwood. We like to look at it as there is probably good potential for farmers to use their back paddocks and those sorts of areas to grow plantations—wood lots. This would then be a complementary use, rather than a situation where one is competing directly for agricultural land.

CHAIR—I suppose that economics is the other thing that Tasmania experiences, where the debate centred on whether wood was worth more than butterfat or wool or whatever, which is a market driven philosophy.

Mr FORREST—I am interested in the integration with existing agriculture. I have been seeing evidence of good plantation in alley farming, which you have reported in your first submission. That is being done for reasons other than anything to do with carbon: salinity management, crop protection, livestock shelter—all those sorts of things. In those figures you have been talking about—as per Mr Schultz's question—is that kind of plantation development included in that volume of hectares?

Mr Hansard—Do you mean the three million hectares of Vision 2020 plantations?

Mr FORREST—Yes.

Mr Hansard—No, they were specifically commercial plantation developments. I think you are talking about the environmental plantings that are starting to appear in the wheat belt of WA, for example—those sorts of places. They are additional plantings that were not actually accounted for in the Vision 2020 target.

Mr FORREST—They tend to be mallee trees, too, with not much harvesting potential. Have I got that wrong?

Mr Hansard—You are right, in as far as they are probably not that much good for what we could call traditional wood products, like swan timber or pulpwood. A few reasons for that are, basically, the nature of the trees that are growing and the proximity to markets. One of the exciting things that we are starting to find now, in relation to this sort of integration of forestry with agriculture, is that that sort of planting could lend itself to other commercial uses, such as the production of biomass for electricity generation or the production of wood pellets. In this way, you are not necessarily confined to the traditional forestry industry structure. You can have quite a mobile and different setup to access those areas for that product.

Mr FORREST—I have the interests of irrigators in the Murray Valley, which I am also worried about, and they are impacted by the same issue. There is going to have to be some balance in here, because the more trees you plant the less runoff there is; that is, one benefit creates a disbenefit. Is your industry conscious of that and done any work to be able to tell the rest of the world how much the runoff reduces?

Mr Hansard—We are very conscious of that. It is quite interesting because we have been working on that issue to a large degree of detail in the south-east of South Australia, where they are developing policy for water use there now. As the science has evolved, we have found that scientists are saying that trees do not necessarily use as much water as was originally thought; nor do they have the impact on the water table, on groundwater, as was originally thought. When we start to get into the actual specific science of this, we are finding that the use of water by trees is not as significant as originally proclaimed.

In relation to water, we are quite happy to be involved in appropriate water policy that recognises the equity of uses. Also, any policy needs to be sustainable. One example is found in the Green Triangle, where we are being asked to move into the licensing market. We have around 140,000 hectares of trees in the Green Triangle. If you believe some of the science, trees do not use double the amount of water per hectare that, say, deep-rooted lucerne would use. If you have a look at the figures for deep-rooted lucerne in the Green Triangle area, you are looking at 1.2 million hectares. So, in relation to the actual magnitude of water use, forestry is quite small. We understand that there are regional issues there, in that forestry tends to be far more concentrated, but these are the issues that we would like to see fleshed out in the development of an equitable water policy.

Mr FORREST—Is any of that work in a form that could be forwarded to the committee yet?

Mr Hansard—Certainly. We can definitely provide the committee with some reports that we have had done, as well as with appropriate references to work that is being done. There is work being done, obviously, in South Australia, but in Victoria, as well.

CHAIR—Looking at the issue of using trees for salinity control, I take it we can harvest those trees and reuse them. Are we still doing work in that area?

Mr Hansard—I think it has been proven that you can sustainably set up a system where you can harvest and replant trees, whilst still getting the benefits of water quality and salinity through them. That has been largely worked out.

CHAIR—The environmental gains.

Mr Hansard—Yes, environmental gains are still there, as long as it is done on a sustainable basis.

CHAIR—The man from Kalgoorlie over here might have a question.

Mr HAASE—Thanks, Chair. I have a great deal of difficulty with forestry and agriculture. You have made the point today about locating your copper saw—whatever you like to call it—in relation to existing processing facilities. You also mentioned that there was opportunity for biochar and biomass production in Western Australia. I am very conscious that you need rainfall to grow trees, just as you need rainfall to grow broadacre crops. Collectively, as we address this preparedness for climate change, we need to consider the areas that are currently growing broadacre crops, and will continue to do so unless there is no rainfall and they have to do something else. I wonder in that scenario whether you will have the ability to plant even mallee trees for biomass for energy production.

To get to the point: I wonder if you have done any work to establish what the net result is of growing mallee for biomass. My understanding is that you would strip-plant it on remnant patches and so on. How far can you cart a tonne of mallee biomass to produce energy at a central point and still have a net gain, as far as energy production and greenhouse gas reduction is concerned?

CHAIR—That is a great question but it might be a bit hard to answer.

Mr Hansard—No, that is a fair question to ask, and that is really what we would like to know. To be truthful, these opportunities for our industry and for agriculture are just evolving now. We do not have all the answers as to the commercial side of this, and this is where we really need help from the government in order to put some good research into this sort of thing and look at the economic viability of these sorts of systems. We know that it can be done, because it is done overseas. In relation to the recognition and use of wood biomass, we are behind a lot of the other Western countries. We know it can be done; what we need is some good research into how it fits in to Australia and how we can actually do it so that it is commercially viable.

Mr HAASE—Can you give me any information that would help me address critics in relation to their oft-used statement concerning the sequestering of carbon in growing trees—that we all accept is the case and is self-evident on a daily basis. What do you say to those people that ask, 'What happens to the trees eventually? Do you burn them? Or do they rot? Or are they discarded to the tip? Or do they go into a fire and, therefore, create the same amount of carbon dioxide in the atmosphere as that which you have already captured?'

Mr Hansard—When you chop a tree down, yes, you are right: the carbon does not dissipate into the air. Though a number of environmental groups might like us to think it does, it does not. We have a number of options, and this is what I am talking about today—the options in relation to the use of wood. We can put it into products like tables, pulp and paper, that then goes into a lifecycle for those products. Or we can use the wood to create electricity or biofuels. The thing about that is that because we grow the trees back—and that is the key thing about this—it is renewable. So we are offsetting fossil fuels in that way; it is an environmental benefit.

The wood that goes into products, like this table, or even paper, will have a life. It could be there for 50 or 100 years—who knows. House framing is the same; there is a large use of timber in house framing and it is there for the life of the house. Eventually houses get knocked down; this table will be thrown out in the tip or something. We have an option again. If we burn this, again, it is an offset against fossil fuels, as long as we do the right thing with it. As long as we create bioenergy or biochar or electricity, then it is offsetting fossil fuels. The same thing can be said of paper. If it does find its way into landfill, normally it gets covered up and it is sealed. We have had some research done that shows that, once that has happened—even for timber products, even for paper—the carbon is locked there for a very long time. The Forests New South Wales has done some good work, which I will send to the committee, that shows that 50 years after newspapers have been put into landfill you can dig them up and still read them. So it is locking the carbon in for a long time after that.

Again, it comes back to those opportunities. If we recognise those opportunities and we have the signals right in relation to what we do with wood, and we recognise that using wood is a good thing, then we are setting ourselves up in a very good, positive carbon approach. This is an approach that should be available to a farmer, as well, which is what we are saying.

Mr SCHULTZ—The char side of timber is also a good substitute for current fertilisers that are being used, at considerable cost to agriculture. We saw a machine operating the other day that produces friendly gases that drive plants to generate electricity et cetera. Some of these pieces of equipment are actually transportable; you can drive them from farm to farm.

Another question I will ask you is a little bit tongue in cheek. Will the benefits of tree plantations on agricultural land offset the gases that come from flatulence of ruminants, which some scientists say are so bad that we need to remove all ruminants from agriculture and replace them with kangaroos? You haven't done the figures on that yet?

Mr Hansard—I will go back to your previous question about work that has been done in relation to farms and growing trees. I spoke about some of the tools that the CRC for Greenhouse Accounting produced, and this is one of them. If you have a farm with so many head of cattle on it—you could even go through and determine whether the cows were dairy or beef—you could work out what area of trees you would need to offset the emissions from flatulence. We would certainly recommend further research into methanogens. There was a big spurt on methanogens a few years ago—CSIRO was doing a lot of work on them—but we have not heard too much more as to whether they are successful or not. Your point is quite interesting, though, and I will leave the committee with this. In the green paper, the government actually listed the emissions associated with activities. Beef cattle were No. 3 and dairy cattle were No. 6 in emissions intensiveness.

Mr SCHULTZ—I have looked into how much kangaroo meat and how many kangaroos we would need to replace the meat and other by-products produced from cattle and sheep.

Mr Hansard—How does it stack up?

Mr SCHULTZ—It is very significant.

Mr Hansard—Is it?

CHAIR—It is a bit like replacing forestry fibre with hemp fibre—and we have done some of those figures as well. The whole of Tasmania could be covered in hemp and we still would not make a decent pulp mill. Working with those averages that we have been discussing, maybe there would be world averages on whether some of that wood was kept or went into landfill or wooden tables or whatever so that we could get some agreement on those things as far as storage of carbon from wood based products.

Mr Hansard—As an industry, we would support any research that can assist us in identifying the opportunities of using wood through the chain. We know about the carbon stored in the trees; the next stage will be to identify those opportunities—from harvesting the wood right through to the end of its life, whether that be in electricity generation or in landfill.

CHAIR—The objective would be, say, in a dairy farm—as Alby said—being able to offset some of the carbon footprint by having a whole-farm plan which would take in some tree production and being able to use some of its water runoff to help assist in tree growth. There is a whole process where we need more research, although some people are already into this in a pretty big way.

Mr Hansard—We will leave the committee with this example of agroforestry at Linfield Park. Sam, would you like to say a little about that?

Mr Rae—This is a local example in the Canberra region. It is a project that has been going on for quite some time now. The farmer identified in a drought—in the 1980s, I think it was—his soil loss and degradation. He put in place a long-term approach to reforesting his property without losing any agricultural production. He came up with some really ingenious ways to plant his paddocks and to use windbreaks and things like that. He was using trees for fodder crops. If he had an issue with his pastures, sometimes the trees held up his animals through seed pods dropping and whatever else. As Mr Hansard mentioned earlier, when rainfall is scant, the trees manage to survive a little better than some of the other edibles around the place and you can continue to maintain your livestock.

Mr SCHULTZ—You guys could probably make a significant contribution to the lowering of greenhouse emissions by getting rid of the feral greens out of your industry, couldn't you?

Mr Hansard—I may not answer that.

Mr HAASE—Mr Rae, do you know any of the varieties that have been planted as perennial fodder crops?

Mr Rae—I could not tell you off the top of my head, I am afraid.

Mr HAASE—I was going to ask if you knew if Tagasaste was used over here.

Mr Rae—I am not sure.

Mr Hansard—They do, depending where you are in Australia. There are also examples of using Palonia in Queensland. Palonia is a Chinese—

CHAIR—As a fodder crop?

Mr Hansard—They basically prune the tree and use it for fodder.

Mr SCHULTZ—There was an article on that the other day.

CHAIR—These are the interesting things that we as a committee are coming across. There are lots of adaptation strategies. I think the beef industry was talking about $60 or $80 extra cost per beast when trying to deal with the carbon footprint, but that is without any adaptation or mitigation strategies. All those strategies are going to emerge as we go along. Our inquiry, hopefully, will throw some light on some of those things, as your evidence is very much helping us to.

Mr Rae—This particular example shows very well that, while at first he had to make some fairly significant changes in the way he ran his enterprise, the result has been that he has a great asset now in his trees, in the forest that he maintains on the property. He has also raised his carrying capacity and production on the property. So he is seeing a greater return from it.

CHAIR—His bank is probably very happy.

Mr Rae—I would say so.

CHAIR—Thank you very much. We really appreciate your evidence. If we need any further information as we go on, we would love to be able to contact you for that.

Mr Hansard—Thank you, Mr Chair and the committee.

Proceedings suspended from 5.57 pm to 6.10 pm

JONES, Dr Christine, Founder, Australian Soil Carbon Accreditation Scheme

CHAIR—Welcome. Although the committee does not require you to give evidence under oath, I advise you that this hearing is a formal proceeding of the parliament and therefore warrants the same respect as the proceedings of the House. It is customary to remind witnesses that giving false or misleading evidence is a serious matter and may be regarded as contempt of the parliament. The committee has received a submission from you. If there are any corrections or amendments you would like to make to that, please feel free. I am sure you would like to make a brief opening statement on your submission. I am sure the committee has some questions.

Dr Jones—I would like to make several simple statements as an introduction to some photographs that I would like to show you. All living things are made of carbon and the carbon cycle is the basis of all life on Earth. We need to learn how to properly complete that cycle—how to draw down excess CO2 from the atmosphere and sequester it in a stable, life-supporting form in the soil. This process is very simple. Mother Nature was building topsoil for millions of years before people got in the way. The sequestration of CO2 requires a green plant. The conversion of the liquid carbon in the plant to stable soil carbon requires a microbial bridge. Life in the soil cannot flourish in the absence of green plants, nor can it tolerate a constant barrage of toxic chemicals.

In our never-ending quest for technological quick fixes we frequently overlook the obvious, the simplest and the most effective solutions. Without doubt, increasing the level of carbon in agricultural soils is the most obvious, simple and effective solution to climate change. But we cannot increase soil carbon unless we change farming methods. As this committee is aware, I have submitted a proposal for a green agricultural stewardship scheme that would provide financial incentive to landholders for the biosequestration of atmospheric carbon in farm soils. With the committee's indulgence I will briefly show some photographs illustrating how the resilience of agricultural land can be dramatically and very simply improved.

CHAIR—We would certainly welcome that. I did not thank you for your very good submission at the start, so thank you.

Dr Jones—Thank you.

A PowerPoint presentation was then given—

Dr Jones—These introductory photographs are from a recent visit to Western Australia. We have 12 soil carbon measuring sites in WA. If some of the committee were to visit our sites, this is the sort of thing they would see at the end of summer—lots of sand with no groundcover.

Mr WINDSOR—Whereabouts is this?

Dr Jones—This is just near Geraldton. We are in sand country. White sand and yellow sand are the two soil types there.

CHAIR—Are all the sites around that area?

Dr Jones—We have got 12 sites in that area, yes.

Mr HAASE—Could you name the local areas? I am familiar with the area—

CHAIR—Barry is the representative from that area.

Mr HAASE—List them later, if you could.

Dr Jones—It has been a long day today. The farmers in that region are planting perennial grasses into the sand. You can see the section up on the back left is an area of sand-plain that has not been planted and this in the right has been planted. That photograph was taken at the end of March this year. Those grasses were planted in November last year. There has not been any rain on them from November to March, when that photograph was taken. It is a bit hard to see on the screen but they are green and they have been grazed twice. There was not any rain until two or three weeks ago, so they have had their longest number of consecutive days with no rain and yet these perennial grasses have survived. If they were not there, that would be bare sand. These grasses have been planted with the specific purpose of increasing soil carbon and also to form the base for annual cropping. So there will be a grain crop in winter time sown into these summer active grasses. So there will be something green all summer and then something green all winter. We are talking about yearlong green, because the only way to get carbon into soil is with a green plant. If you have the bare sand, you are going to be losing carbon, losing soil water holding capacity and losing nutrient status. This was the sort of thing that the committee would see if you go to the Geraldton region. They have got 40 sites like that. Twelve of them are in my Australians Soil Carbon Accreditation Scheme and we have already got some very dramatic results from these in a very short span of time. If you look closely at those plants, you can kind of see that the leaves are green. I apologise that the colour has not come up very well. It is just sitting in bare sand.

When you dig it out, it is rather hard to see at the moment because colours have not come out very well, but all around the roots of that plant the soil has gone from either a white or yellowish sand colour to grey. All of that darker colour that you can see around the roots is carbon that comes out of plant roots in liquid form. The reason that plants put that carbon into the soil is to feed microbes which live around the plant roots. The only way you can get life in the soil is to have a green plant that is basically taking in gas, turning it into a liquid in the leaves in the form of sap and then it comes out of the roots into the soil. This is the main way that stable carbon forms, because those microbes around the roots turn it into humus, which means it is stable for between 50 and 1,000 years. If you just have the breakdown of organic matter like leaves or roots breaking down, they form what is called labile carbon, which is very short-lived in soil. If all that happens in that sand is that it grows a winter crop like wheat and then the stubble breaks down over summer, you just go back to sand-plain again. You are never going to increase carbon unless you have plants there all year round. That is the sort of thing you will see from our WA sites.

This is one of the farmers, Craig Forsyth. He is at Mingenew, which is south of Geraldton, so he is on the extreme of our sites. But he has got a sign on the back of his ute saying, 'This vehicle's emissions have been offset by perennial grasses.' In fact, the amount of carbon that he

is sequestering in his soil is many hundred times what he is emitting from his vehicle. But if you take all farm emissions into account, he is running cattle, so if you look at his methane emissions, his tractors, his vehicle, fertilisers and all the inputs that emit carbon, he is sequestering something like 25 tonnes of CO2 for every tonne of product that he produces. So he is very much on the right side of the ledger, a long way on the right side of it.

Mr FORREST—Does that include his livestock?

Dr Jones—Yes, and multiplying that by 21 for methane, I think it is.

Just a bit of data from Victoria. It is hard to pick something up straight away looking at a slide, but this is in the submission. It is just to show that, irrespective of whether you are looking in low rainfall country, less than 500 millimetres, or high rainfall, more than 500, and whether it is low fertility or high fertility soil, if you compare crop with pasture in the same rainfall zone and in the same kind of soil you find that pasture nearly always has about double the amount of carbon that is under crop. That is not rocket science. Any soil scientist would tell you that. You are going from 0.9 to 1.7 when you go from crop to pasture, or 1.45 to 2.6 or something. Obviously the amount of carbon there will depend on the rainfall and the natural fertility of the soil, but everywhere we go in Australia we are finding the same relationship. We are getting the same data from our Queensland sites and the same data from our WA sites. In fact, in WA we are now finding much bigger differences than just multiplying it by two. So whatever carbon level you have, you can safely say that if you go to pasture you will double it, which ends up being hundreds and hundreds of tonnes per hectare. What we are talking about is going to pasture but then cropping, putting an annual grain crop into that pasture.

One of the other benefits of going from bare ground to having it covered is that it dramatically increases the water holding capacity of the soil. This photograph was taken in western New South Wales after a heavy downpour of rain. You can see that there is nowhere for the water to go because carbon is what gives the soil structure, which makes spaces in the soil for water to infiltrate. You get rapid infiltration and water holding, which means that there is water in there for plants to grow and for microbes to live and for life. What will happen to that water is that it will evaporate as soon as the sun comes out. It cannot get into that soil because the soil has lost its carbon and therefore lost its structure. On sloping land the water will run off into creeks and rivers but it will take sediment with it.

This photograph is close to home, Tony. It is Rocky River at Uralla. We have very good evidence of how Rocky River appeared. Even as late as the early 1900s it was a beautiful river of clear water running over great big rocks with very deep pools. It runs over the rocks and then runs into a very deep pool and then runs over rocks again and runs into a deep pool. I am sure you have seen those sorts of rivers and streams. People who are in their 80s and 90s who were little kids when it was a rocky river with deep pools said that when they were kids and they dived into the deep pools they used to say that they were bottomless. For a kid you could not actually dive and touch the bottom of the pool. Now there are no pools in that river because it is all filled with sand, and that sand has come as sediment off people's farms. We have got this huge slug of sediment moving through a lot of our rivers and streams in Australia. Another classic is the Castlereagh River. If you cross the river at Gilgandra and look down you see all sand all through that river bed, and there are still people alive who can remember when the river at Gilgandra did not have any sand in it. So we have many rivers and streams in Australia

choked with sediment which was good topsoil at one point. All the fine material has gone off as mud and been carried out to sea and probably deposited on eel grass beds, or if you are up north on the Barrier Reef, and just left the coarse particles behind, which is the sand. A hundred years ago you could quite happily drink the water but it is now just algal slime. You would never drink that water. And of course there are no deep pools with fish anymore. If you want to know how much our landscapes have changed and you ask people what has happened to the fishing, anyone who is a keen fisherman and can remember what fishing was like 50 years ago will tell you now that a lot of the deep pools have been filled in and a lot of our wetlands have been filled in. It is symptomatic of how much soil has moved from our farmland, and we are losing that soil because we do not have groundcover.

With our Australian Soil Carbon Accreditation Scheme we use a hydraulic mounted soil coring device. We can take cores to 110 centimetres, just over a metre. We can look to see what is under the soil surface. The cores come out, the coring tubes are in the bottom of this photograph and are laid into a wooden tray, as you can see. There are four soil cores in that tray, like long pieces of brown plasticine or something. That is good quality soil that has come out from our Queensland sites. You can see that there are some little notches in the wooden tray and a metal device near that blue bucket, like a cheese slicer. You can put it down into those notches and we can cut the soil into sections to see how much carbon is in the top and all the way down.

Where we have lost a lot of groundcover is in the site here. This is one of our measuring sites in Queensland. When we take the cores we find we have only got about 45 centimetres of soil, maximum. A lot of places in that paddock we could only get 10 centimetres before we get to bedrock. People say we naturally had shallow, infertile soils in Australia, and it is really not true. That soil is what has ended up in our creeks and rivers.

If we go to the next paddock on the same property, the milker paddock—in other words, it was kept for just the house cow—there is good ground cover. There is easily 110 centimetres of soil under there. That is only 50 metres away.

CHAIR—That is dramatic, isn't it?

Dr Jones—So the paddock that was bare has lost over 100,000 tonnes of soil per hectare. This is a very typical story across Australia. We have lost a metre of soil in many parts of Australia. Even on the Liverpool Plains they have lost a metre. I have no idea where that has gone on that flat landscape, except for the fact that if you drive through after very heavy rain sometimes you cannot get through because there is mud all over the road and you have to wait for a bulldozer to come and clear it off. If you go down through Quirindi people will tell you that when it rains whole paddocks basically move across the road. We are losing massive amounts of soil. Agriculture cannot continue farming the way it does.

I will just show you what this landholder did. They had no money, no equipment, no nothing. They borrowed a chisel plough and planted millet. They very roughly put it in. They did not have a seed box. They made the drill lines. The husband drove this old chisel plough across the paddock and his wife came across behind with a superspreader and spread out seeds. They fell onto the top of the ground and rolled down into the drill lines somehow. These sorts of things I am talking about can be done very quickly just to get green in there. If you get something green in there it pumps carbon into the soil, it activates soil microbes and then we find that we have

grasses establishing all along those drill lines. This is all about having year-long green as cheaply as possible.

What we want to see for our green agriculture stewardship scheme is people planting native grasses. These are native grasses that are green over summer. They naturally go dormant in winter. This photograph taken at Warren in June last year shows sowing in western New South Wales. The warm season grasses are dormant and this fellow sowed 5,000 hectares like this into grass. There is a crop coming up. It comes up the same as it would whether or not it was sown into grass. It makes no difference. In fact, it comes up heaps better. By the time you get canopy closure, apart from a few bits of native grass you cannot really tell. So it is not impeded by the grass at; in fact it grows much better where the grass is. That was the 2008 Farmer of the Year—Nigel Kerin at Yeoval. It is very hard to see in that photograph but between his hands are some wheat plants. There is actually a line of wheat running under his body and then another line running down beside one hand. He is lying in his crop, showing a crop sown into grass. Once a crop gets up, you cannot really tell that it was sown into grass.

What we are talking about is warm season native grasses cropped to cool season crops. What happens with this disturbance of having the crop in there and all of the green that pumps carbon into the soil over winter and feeds the soil microbes is that the native grasses grow much more vigorously in summer. So we see huge improvements in pasture quality over summer from having something feeding the soil. Plants actually feed the soil. We have been taught that plants take from the soil but the only way you can build soil is with green plants. It is the only way you can build soil.

Mr SCHULTZ—So you drill and sow into existing pasture?

Dr Jones—Yes, but we also have lots of people now planting pasture to drill into. In the photos I showed you of the WA sand-plain they were planting grasses in wide rows for animal production over summer when there would not be anything green anyway. Of course, green is important for vitamins and minerals for the animals as well. They are much healthier if they are getting vitamin E and vitamin A from the green leaves. But then in winter time when those grasses are not so actively growing, because they are active in summer and dormant in winter, then you sow your crop in between the rows but you get a better crop. In 2007 there was no grain harvested in the Geraldton region. They normally have a crop of around two million tonnes. There was not a single grain harvested in 2007 apart from the crops that were sown into pasture by the department of agriculture there. They yielded over a tonne per hectare when everyone else's plants died. It was because pasture improved the soil and put that carbon out from the roots, which means it holds moisture.

There always is some rain. People say rainfall has declined, but there is always some. But what happens is that it falls onto that soil that is like a table and the water cannot get in; it will just evaporate. If it falls onto soil that is like this and it is sloping land, it is just going to run off. There is recent rain that you have had in this district. I have just come from Wagga today. In the Wagga district there was rain in April this year—quite good rain; some people got an inch or two inches. In fact, unfortunately a lady was drowned at Cootamundra in a flash flood because the water just hit and ran; it did not soak in. Even where people had had two inches of rain, we went and dug holes in their paddocks and the water had only gone that far. It is not getting in, because the soil is not porous, and it will not be porous until we do something to manage it in such a way.

Mr SCHULTZ—Is the message getting through?

Dr Jones—Yes, it is getting through.

CHAIR—As the plants take down the carbon from their leaves into the fluid to make that come out, that gets the microbes going even more—

Dr Jones—Absolutely, yes.

CHAIR—We have been putting on more phosphorus or fertiliser.

Dr Jones—Nitrogen and so on.

CHAIR—Yes, nitration—and that does not those microbes much good.

Dr Jones—No.

CHAIR—So, when you have taken your metre of core, that is showing the microbes. How far do the microbes go? Are they right through?

Dr Jones—What we are finding with our one-metre cores is that, if we now have a perennial system, in those WA sands we are finding perennial grass roots down to six metres.

CHAIR—Wow!

Dr Jones—That is as far as we have measured, so we do not even know how far they go. But certainly, in our 110-centimetre cores, we are finding roots right at the bottom of perennial plants. Wheat is an annual, so it is very short. Most of the roots of wheat will be in the top 30 centimetres; that is where 90 per cent of the roots will be. With our perennial grasses, we are finding good root systems all the way down to a metre, and we are finding that grey, dark colour around. It is really exciting to find that change. It is almost like a dendritic pattern of all this dark stuff around roots, and you can see it really clearly in white sand. You can also see it in lighter soils like yellow soils, orange soils and brown soils. Once we get into some of our black soils, of course, we cannot see it. But what we notice in the black soil is that, when we go to take the cores, in a paddock that is low in carbon it is like black cement or black concrete. It is almost impossible. The coring tubes just bust and you lift the back of the truck off the ground. As you are pushing the core down, you are just lifting the truck off the ground like that. We just cannot take cores unless people have been pasture cropping, in which case it just goes down as if through butter. So, even though we cannot see a change in soil colour, we can certainly see a change in the physical properties of the soil. The effects are quite dramatic.

In answer to your question, if the system is working well then we are getting the increases in carbon all the way down, so we are still seeing the same increase at a metre as we are seeing near the surface, which means it is a long way from the atmosphere. It is likely to be turned into humus and it is liquid carbon that is being humified through the soil food web, through all of these microbes that live around plant roots. If we have very shallow root systems, as we have under an annual crop, the rest of the soil under that is dead. One of the big things that departments of agriculture like DPI in Queensland and DPI in New South Wales do is to run

workshops for farmers all the time on what they call 'subsoil constraints'. Basically, that soil has died and become dysfunctional, so it then has problems like excess aluminium, iron and those sorts of things or sodicity—it has salts. Plant roots cannot even get in there now because it is not a living soil.

What you see in that photograph there is a very good-quality wheat crop which will pump lots of carbon into the soil in winter, but then you will have a much better quality of pasture in summer and carbon being sequestered all the way down the profile. The further it is sequestered from the atmosphere, the better. The form that it is sequestered in is very important; it must be humus to be stable.

Mr SCHULTZ—What about traditional weeds?

Dr Jones—If you have ground cover, they will not come up. You may remember a photograph I just showed you of a paddock that was all covered in grasses, and then the farmer was out on his planter planting into that. There is no space there for weeds to come up.

Mr SCHULTZ—Okay.

Dr Jones—But the other issue that you raised was that if you apply phosphorus and nitrogen, what actually happens is that you knock the microbes that you need to form humus out of the system. In our traditional cropping we have destroyed the microbial life that is there. We are adding masses of soluble phosphorus and nitrogen which, as you know, when the soil is wet forms nitrous oxide which we do not want. That basically inhibits the formation of microbes around the plant roots so that it is not possible for the carbon to turn into humus. We have done just about everything we could do wrong. Wrong is probably not a very good word. We have been inappropriate in the way we have gone about it. Inappropriate is a better word.

CHAIR—We are learning from now.

Dr Jones—From now on, yes. This shows another example of taking cores. This is one of the soils where the coring tube went in just like going into butter. You will see that you cannot see any bare ground between the rows. You will also notice, if you are a farmer, that the colour of the straw, which does not show very well on the photograph, is a lovely rich honey brown. That wheat crop was very high in protein. It means that you are getting a very high-protein, high-mineral content grain that is going to be good for human health because it has minerals. We cannot get minerals into the plant unless we have microbes in the soil. Under our traditional cropping again we have dysfunctional soils. We do not have microbes around the plant roots. We have satisfied P and N, but plants need about 66 different minerals to be healthy so that the grain that we get is low in things like selenium, which we need for human health. Again it is very well known now that our foods over the last 50 years or so have declined about 40 per cent in nutritional value.

CHAIR—When you start looking at health issues maybe some of the diseases and some of the things that we are suffering from come from some of these factors. People are talking about them now, so hopefully research will show that.

Dr Jones—We have low mineral density and low nutrient density in our foods. We have propped plants up. We have just used the soil as a medium to grow plants in without realising that soil needs to be a living thing. This slide shows a Senate committee visit to Warren last year—you will recognise some of the people in that photograph. The crop that we saw was grown into native grasses. It was just starting. There was about 50 per cent ground cover and 50 per cent not and we dug holes where the bare ground was and then dug holes under where the grasses were between the rows. Already in a very short amount of time that red soil had turned to black underneath the grasses. It is all about getting the word out.

This is a *Landline* program that was filmed on one of our sites in central Queensland. I am right in the middle of the photograph with an Akubra looking at the guy who is at this end. We have just taken a soil core and we are breaking it up to look at it. In the soil core we found roots all of the way down. A wheat crop was planted into this paddock into these grasses. This is *Landline* filming it. That is what the coring rig looks like. This was a Landcare visit to the site—300 farmers came. They are actually all looking at a wedge-tailed eagle which was just past that bottle tree there.

One of the things that we are seeing and one of the things that will be very important to monitor in this is a huge increases in biodiversity not only of the plants that form the ground cover but of all of the things that those plans support in turn. If we have a diverse perennial pasture over summer underpinning our cereal crop in winter, we find we have lots of little lizards, lots of snakes—I have got very used to snakes. In fact there was a huge carpet snake crawling across the road here just as the bus was leaving. The bus had to wait. It was a big fellow. It was about that round and as long as the width of the road. Then you get all the birds that prey on those things, so we see lots of birds of prey, lots of hawks.

CHAIR—There would be little marsupials too.

Dr Jones—Yes, we get lots of little *Antechinus* and those sorts of things. We start to get native animals rather than rats and mice. It is very strange in that you would think that you would get heaps of mice but, for some reason, they must just be a sign of something that is out of balance. So when we get it in balance again we start to see all the little native mice. Also, on this property we have seen bettongs, which are a little rabbit sized marsupial that does not eat grass but lives on fungi and earthworms. It digs in the ground, and if there are not fungi, which are really important for soil health, in the ground then the bettongs will not be there. We thought their absence was due to cats, foxes and that sort of thing, but it was due to lack of food supply and lack of habitat. Now we actually have the grasses there, although there are still plenty of foxes around, I am seeing more and more bettongs all the time. I still get blown away every time I see one. They are nocturnal, so you only see them at night.

CHAIR—And fertiliser kills a lot of the worms as well.

Dr Jones—That is right. We had a big issue with fertilisers knocking things out of the system. They really do knock the microbes out and, of course, fungi are a kind of microbe. We know that bettongs are a keystone species for a lot of plant communities. We think that a lot of the decline in our grasslands and the health of our soil is due to loss of these little marsupials. We have plagues of the bigger marsupials, which, again, are completely out of balance. The early explorers hardly ever saw kangaroos, but they would stop Aboriginal people as they were

walking around and ask them what they were carrying in their bags. They had string bags made out of grass fibre, and they would open the bags and they would be full of lots of little marsupials—the ones that we have lost. Unfortunately, we have these bigger ones now that have taken their place. Again, we have people looking at the grasses and looking at the health of the soil. This is a picture of a crop which was sown into the grass that you saw a few photos back, so you can grow a perfectly good crop in very thick grass.

Mr HAASE—The photograph that I think you are referring to showed the dry perennial grasses. Would that have been coming into winter? At what time of year is that sort of pasture dormant?

Dr Jones—In autumn—the end of summer, coming into winter.

Mr HAASE—What does that grass do in wintertime?

Dr Jones—Nothing.

Mr HAASE—It stays dormant.

Dr Jones—Yes, absolutely nothing.

Mr HAASE—What if you get winter rains?

Dr Jones—It does not grow in winter, even with winter rains.

Mr HAASE—So it needs a heat trigger.

Dr Jones—Yes.

Mr HAASE—You put a wheat crop over the top of that perennial grass laying dormant, and the winter grains that you do get germinate and produce a harvest of your wheat but do not motivate the perennial grasses.

Dr Jones—No. Our grasses grow either in summer or in winter.

Mr HAASE—That is where the clever stuff comes in.

Dr Jones—Yes. So you have one growing like this and one growing like that.

Mr HAASE—Understood, and I can understand all that follows from carbon sequestration and so forth in soil. When you were talking about how you went to the west coast and that Geraldton-Mingenew sand-plain country, I think you said ‘perennial plants’, not ‘perennial grasses’. Do you know what the species was?

Dr Jones—The grasses?

Mr HAASE—Yes.

Dr Jones—That one is gatton panic.

Mr HAASE—I do not know it.

Dr Jones—It was called *Panicum maximum* up till two months ago. They have just changed it to an incredibly long name that even I cannot pronounce.

Mr HAASE—Is it endemic to the west?

Dr Jones—No. It is not even native. What is happening here in the northern agricultural region is that they do not have access to native grasses, because the seed bank has been completely depleted. This work is being done in conjunction with Tim Wiley of the department of agriculture in Geraldton. They brought probably about 20 different warm season grasses from Queensland and trialled them to see which ones grew most effectively, and this one has been a standout. It is also fortunately the one that is highest in digestibility, protein and metabolisable energy and all of those things for animal production, and it is a warm season grass.

Mr HAASE—Is that a picture of it?

Dr Jones—Yes, and that has been grazed twice after this planting.

Mr HAASE—I was going to say it looks like it has a round leaf on it, but it does not.

CHAIR—I want to ask about the significant factors to get innovation in Australia. Do we need more money for research? Do we need political will? What do we need to keep moving forward with some of the knowledge that you are telling us about?

Dr Jones—I would see the key factor is to support the landholders who are making these changes because they are highly respected or more believable—to put it that way—to fellow landholders and if it comes from within farming communities the change will be supported and they already have established social networks. We are finding that it is the most innovative, leading-edge farmers who are making these changes because they have been doing it another way for 30 or 50 years and they realise that it is just not working because their costs are increasing and their soils are declining. Intuitively landholders know that what they are doing is not the right thing. They do want to change. I cannot tell you how many people at recent workshops and things we have had have almost been in tears saying: 'We know we need to change. We just desperately need the information.' They are ripe for change.

CHAIR—So extension assistance and continuation of the research. We have had some experience that we are doing research but historically getting that down to the farm has had some difficulties as well.

Dr Jones—Unfortunately, the research at the moment is not into these techniques. There is not any research into pasture cropping, other than what we are doing and what landholders themselves are privately funding. There has not been any government research into pasture cropping. The technique of growing a crop into pasture is what we call pasture cropping. As I outlined in my submission, the thing I feel would bring about the biggest change would be to

support what landholders are doing across Australia so that we have everything from sand-plain in WA, black downs soils in Queensland to Victorian gravels.

CHAIR—We call it GAIN—

Dr Jones—GAIN sites—green agricultural innovation. Also to have a large number of those in the Murray-Darling because it is so important for perennial stream flow to have water go into the soil and be filtered through the soil. We need to replenish aquifers because rivers naturally run from groundwater running into the river; they do not run from overland flow.

CHAIR—That is $3½ million I think over five years. That would be a research project over five years or four years?

Dr Jones—Was it $3.7 million?

CHAIR—Something like that.

Dr Jones—I must admit that I have not looked at it myself for a while.

CHAIR—Yes, $3.7 million for a five-year program.

Dr Jones—That was based on establishing 20 sites this year, adding another 30 next year and adding another 50 in the third year. In the last two years the whole 100 sites would be—and finding those sites will not be difficult—

Mr WINDSOR—I want to support what Christine is saying and add a little bit if I could. Last year I met with the Prime Minister on these sorts of issues. I think Dr Jones would probably support this. There are critics of what Dr Jones is saying. I suggested to the Prime Minister that we need to go out to where these farmers are applying these techniques and prove them wrong. If what they are saying is wrong, it will show up very quickly. The reverse of the coin is: if what they are saying is right, we can circumvent probably decades of science with the major institutions.

Mr SCHULTZ—That leads me to the point I was going to make. We have had a very significant resource in this committee with the in-house movie team. They made a film on the issues for the bee inquiry. It was a classic example. You could do what Tony is saying if we could get the funds and the unit could come with the committee—and I do not know if the unit is still operating—and film and interview people on the ground when we are taking evidence. That could be put on a DVD, and we could do with that DVD what they did with the bee inquiry—put it into the system commercially on national television and promote it.

I make that suggestion because I am overwhelmed with what I have seen here and the potential that that has for Australia not only from the point of view of turning non-arable land back to arable land but from the biodiversity aspect which complements it, which complements the work we did on feral animals killing off biodiversity. It has so much going for it.

CHAIR—I have already spoken to the film people.

Mr SCHULTZ—That is wonderful. It is a cheap way of doing it and a wonderful way of getting it to a wide cross-section of the community.

CHAIR—Did you ask a question to do this research? What was the question?

Dr Jones—No, I did not. We have just observed over the years that there have been people being very creative and innovative in their approach. They have received a lot of criticism and ridicule, and they have been marginalised by conventional thinking. I have been very supportive of the things that they have done. I have gone to their properties and seen that their soils have been improving. My PhD is in soil biochemistry. I understand about the microbial bridge and about what we need to do to support life. I know we need to have green leaves—and when I am talking about 'green leaves', I am talking about green grasses, green crops and green groundcover.

Now it is just starting. It has taken a long time. Some people have been practising these techniques now for 15 years and have received nothing but criticism. All of a sudden it is exploding. People have realised as they have hit a brick wall. Last year with the hike in fertiliser prices and the drought everything has combined to make conventional agriculture completely unworkable. Nobody is making money in conventional agriculture. If they break even, they think they are doing well.

CHAIR—Thank you for your evidence and your submission. We may want to contact you again as we go on with our report. Thank you very much.

Resolved:

That this committee authorises publication, including publication on the parliamentary database, of the transcript of the evidence given before it at public hearing this day.

Committee adjourned at 6.53 pm