

CORRECTED VERSION

ENVIRONMENT AND NATURAL RESOURCES COMMITTEE

Inquiry into impacts and trends in soil acidity

Melbourne – 5 August 2003

Members

Mrs A. Coote

Mr D. K. Drum

Ms J. T. Duncan

Mr J. G. Hilton

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Mr G. Seitz

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Research Assistant: Ms R. Ind

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Witnesses

Ms C. Forster, Chairperson; and

Mr D. Cummings, Executive Officer, Victorian Catchment Management Council; and

Mr C. McRae, Director, Land Management, Department of Sustainability and Environment.

The CHAIR — I declare open the hearings of the Environment and Natural Resources Committee into soil acidity. I welcome Christine Forster and David Cummings from the Victorian Catchment Management Council (VCMC) and Chris McRae from the Department of Sustainability and Environment.

All evidence taken by this committee is taken under the provisions of the Parliamentary Committees Act and is protected from judicial review. However, any comments made outside the precincts of the hearing are not protected by parliamentary privilege. All evidence today is being recorded by Hansard and witnesses will receive proof versions of the transcript next week.

Ms FORSTER — I will start the presentation by telling the committee about the Victorian Catchment Management Council and the catchment management framework, not in detail but simply to paint a picture of where we fit in. The VCMC was established under the Catchment and Land Protection Act in 1994 and has a role as an independent advisory body to basically the Minister for Environment, but as the act says, and ‘if requested by any other minister’.

The council was set up as an expertise-based council with 10 members from a broad range of interests in water and land management. The committee is probably familiar with the catchment management framework. It was established by the act in 1994 and started off with the then Catchment and Land Protection Council and from 1997 it became the VCMC. At the same time the CALP Boards became independent statutory authorities reporting to the minister in their own right.

I will quickly talk about how the whole institutional framework came to be. It became obvious some 15 or 20 years ago that the challenges facing Victoria and Australia in catchment and water management were quite large and required cooperation of private land-holders because much of the land we deal with is in private ownership. With the development of the Landcare movement and the community-based approach to dealing with local issues the idea of the catchment management framework was born. Firstly, Landcare groups got together and planned on a bigger scale than their own little patch of four or five farms, and gradually the planning framework came to embrace the whole of the catchments. It is important that people understand that the catchment management framework is there to engage local communities on catchment management issues.

The catchment management council itself has a few jobs to do, but probably the most important job is to report to Parliament every five years on the health of Victoria’s catchments. The last report was tabled in Parliament on 30 October last year. We have produced two reports in our time — one in 1997 called *Know your catchments*, with the second one produced in 2002.

It is a major body of work. We did not do any of the individual data collection work ourselves, but drew on a whole range of information that has been brought together by the national land and water resources audit data and that has been collected and analysed inside state government bodies. We reported on some 32 indicators of catchment health that went across the board from socioeconomic indicators, biodiversity, water indicators and land management indicators.

In doing the job a second time we were concerned that although things had improved greatly in the previous five years, we still have an issue in Victoria in actually dealing with, managing and publishing the information that is made available. We are a very data-rich community in Victoria, but we probably miss out on actually turning that information and data into knowledge that everyone can use. You will see that in our report. I refer you to that chapter in our report, and I have copies of it for the committee.

When we were making an assessment about whether things had improved or not in the last five years in this report, our basic response as to whether we are making a difference was yes, we are, but not enough. There are quite a lot of management strategies in place. They are all outlined in the report to deal with a whole range of catchment issues. There is a lot of work, and the government is investing heavily in a lot of these strategies, but we still have to find more innovative ways to make sure we are protecting our resources for the future.

That is by way of a bit of background because soil acidification was one of the indicators that we addressed at the time. If you want to have a look at the report, the actual indicator is on page 66 of the report. This is addressing probably the first question that you asked us about, and that is the social, economic and environmental impacts on a region and catchment scale. So I will not go through the detail of that, but I am tabling the report and that area for you to look at the information that has been collected together at that catchment scale — for instance, we have identified that 23 per cent of the state’s agriculture land is losing productivity. You have probably heard that figure before. More than half of the affected agricultural land at the moment is in north-east Victoria, and under the current land management practices and rates of acidification this area is expected to double within the next 50 years

unless we do something about it. The farmers have been applying a lot more lime to the soil, but the figure we have is approximately 12 per cent of the total lime that is required to maintain soil pH of 4.8 or higher.

The off-site impacts of soil acidification are significant — an increase in stream turbidity and a decline in pH, or an increase in acidity in Victoria's streams. We estimate that by 2050, if things go the way they are, that the losses will be in excess of \$1.2 billion in respect of soil acidity. It is a major issue for agricultural production and is the silent sleeper behind salinity, if you like, in terms of effect on agricultural production.

Perhaps I might get onto that a bit later. I want to go into some of the social and economic reasons for why it is not being addressed, but I will deal with that in respect to your third question.

Your second question asked us to talk about the management framework that is currently in place to address soil acidity in Victoria, the catchment management framework, but it is also important to note that one of the jobs of the catchment management authorities is to develop five-year regional catchment strategies where they identify right across the region and in consultation with a whole range of groups in the region — local government, farmers federation branches, Landcare groups, and a whole range of groups — and identify what needs to be done in that region to move the land management and water resources management towards sustainability.

Those regional catchment strategies are then the basis for regional catchment investment plans which are the means by which both the state and the federal governments invest in these strategies through programs such as the National Action Plan on water quality and salinity and the Natural Heritage Trust.

Many CMAs have individual soil health plans which are helping them to identify what might be done in their areas. Most of the CMAs in the areas where soil acidity is a problem, and those areas are the Glenelg-Hopkins catchment, the North Central catchment, Goulburn-Broken and the North-East. Most of the CMAs have identified the threats from soil acidity and say that research needs to be undertaken or remediation measures need to be adopted, but there is not at this stage really a clear way forward to deal with soil acidity.

David, I think that is probably the same as the strategy that the department put together last year on the impacts of acid soils in Victoria, which I think you might have heard about yesterday, anyway, from the department representatives. You came to the same findings?

Mr CUMMINGS — Yes, the same basic conclusions. The impacts of acid soils have been assessed by the Rutherglen people, which you may have already heard about from presentations to date. But certainly 'which way forward' is the issue that the catchment management framework is having some difficulty with, because individual soil health issues cannot be considered in isolation. It is possible to deal with the consequences of acidity, but if we are saying that the acidification of soils indicates we are not fully sustainable in our land-use practices, then it is an issue we are having trouble coming to terms with.

Ms FORSTER — We have identified three possible responses to acidification. One is change of land use — it could be that the land use that is in place in a particular area at the moment is not appropriate for those sorts of soils, given the economic situation; then there is change in the practices, the way the land is managed and the intensity of use, and the matching of land use to land capability; and the third way, of course, is using lime. I think we know how to ameliorate soil acidification, but it is the social and economic framework that probably gives us a problem.

Which brings me to the key challenges and barriers to the management of soil acidity. You have probably heard this as well, but one of the problems with soil acidification is that most of the time it is in the area of private good, so it has not lent itself to government grants or government subsidies for the application of lime to the acidified area. It really should be built into the overall framework management of the land. Unfortunately, if it goes on for too long, in the longer term the acidification can become irreversible. Perhaps it would be in different time frames, depending on what sorts of soils you are in, but in the long run it can become irreversible, and then it does become a public concern because of stream turbidity and acidity in the rivers as well as loss of productivity.

It has been around for a long time, and the way of ameliorating it by the application of lime has been known, but it has been very difficult for it to be actually dealt with in the public framework.

That is really one of the problems we face with soil acidity. On the one hand we know that if we let things go as they are we will have huge costs in both the private and public sectors; on the other hand it really is something that should be managed within overall farm management. The Catchment and Land Protection Act talks about a duty of care of land managers to manage the land so that the impact of their management practices does not flow on to

other people. In actual fact in many of these instances, where people are broadacre grazing, it is very difficult to pay the cost of liming in the management of the farm. I know that personally; I am a woolgrower in western Victoria, and there are only 2 years out of 10 that lime can come into your calculations in farm management.

So we have a situation where we know exactly what to do with it, that it is beyond the social and economic resources of the people who are managing the land, in many cases, to do it, and we also know that in the longer term there will be some major consequences.

We have not really got an answer about where we go from here. But we do see that there needs to be a concentration on it in the short to medium term before it becomes a long-term problem. From our point of view it is really basically to do with changed management practices of the land.

You had a fourth question? Yes; I have gone on to the potential solutions. I might leave it at that. Much of the technical information you should get from the experts rather than from us, but we are certainly willing to discuss it a bit further from our point of view.

Mr HILTON — Thanks, Christine. Could I clarify a point you made about the use of lime? I think you said that at the moment we are using only 12 per cent of the lime we would need to use.

Ms FORSTER — Yes, they are the figures that we have.

Mr HILTON — We have been advised by another witness that, given current lime use, we have 50 years supply in Victoria. If you are saying that at the moment we are using only 12 per cent of what we need to use, it would not appear to me that just using more lime is a long-term solution.

Ms FORSTER — No.

Mr HILTON — Because it will run out in probably 10 years time.

Ms FORSTER — Yes, I would agree with you there. From our point of view lime use would probably be suitable on highly intensive and highly and carefully managed operations that were actually generating enough income to support that. I am just trying to think of an example — a highly profitable dairy farm, Chris?

Mr McRAE — Yes, or horticulture.

Ms FORSTER — Horticulture, where the returns from the use of the land are so high that you can afford to add what is necessary to manage the land.

Mr HILTON — But if lime is not the solution, the solution presumably then is either different land management practices or different crops on various parts of the land?

Ms FORSTER — Yes.

Mr HILTON — Could you give me some specific examples of what you would recommend farmers do in these areas which are very badly affected?

Ms FORSTER — It is difficult, because it is the capability, it is the social and economic ability of the current land managers to actually implement what might be a good way of doing things.

Mr HILTON — But if we had an ideal world that did not have these socioeconomic constraints, what recommendations would you be giving to farmers to use their land in a more efficient way to ameliorate these issues?

Ms FORSTER — I guess what we would really need to do is actually get to grips with what the issue is in different regions. It is not the same across Victoria. There is not a formula. It has to be managed on a particular region's basis and in respect of the particular type of land use. But as a first instance you would really be wanting farmers to assess their resources through a whole-farm planning process to see how sustainable their current land management is and look individually in their own areas at what might be land use alternatives for the way they might manage that land.

In some areas it might be agroforestry; in some of the higher rainfall areas you might say that is the best thing to do. In other areas you might actually go the other way and go to much more broadacre grazing than is happening today.

We are all managing our land very intensively in Victoria; in some cases that is not good for the land. So it would be site specific and industry specific.

Mr SEITZ — Can you elaborate a bit on what the catchment authorities are actually doing on Crown land, because acidity is natural in some parts of Victoria?

Ms FORSTER — Yes.

Mr SEITZ — What is being done now to assist the private land-holders to understand the reality of acidity and our ability to sustain economic development in our rural industries for the future — whether it be harvesting on Crown land and whether it is affecting our forests and things like that, and our natural fauna? What is done by the authority in the private sector to assist the private land-holders?

Ms FORSTER — To answer the first point, the catchment management authorities work in partnership with the public landowners, but basically they have been concentrating on work with private landowners — the public landowners being forestry people and national parks. They are all part of a catchment and they all make a difference to what happens in a catchment, but they have been working in partnership on the actual management, setting long-term objectives together.

Mr SEITZ — Can you give some specifics?

Ms FORSTER — Not specific things that catchment management authorities are doing on public land.

Mr McRAE — They may pick up specific issues in terms of, say, the impact of forest roads on water quality, and so on, and raise that as an issue for consideration by the land manager, be it forests or parks. By and large they would deal with the public land managers as individual land managers within the area, but principally they would be dealing with the large number of private land managers who deal with catchment issues in their area.

Mr SEITZ — I am sure with Crown land there must be a lead agency that must be at least addressing or studying the issue of acidity. We are all blaming the farmer, which is the end product of our society really. As you indicated before, Christine, there are economic circumstances involved such as whether he or she survives and puts bread and butter on the table for his or her family. I would like to know who is the lead agency for Crown lands, who is accountable and responsible, and some examples of specific work that has been done?

Ms FORSTER — With soil acidification there is some natural acidity, but most of the concerns are on private land. Australia has naturally acid soils.

Mr SEITZ — Have there been any tests carried out on Crown lands?

Ms FORSTER — I am sure in the past there have been surveys in the forests.

Mr McRAE — Yes, and there is knowledge of the acidity levels on Crown land, but if you look at it from a management perspective, on Crown land there are very small amounts of disturbance, if you like, in forestry practices, in harvesting, in regeneration. In parks there is very little of that, whereas privately held land is largely modified and there is heavy production coming off that private land. Because of the management practices the impact on acidity is probably greater than what is the natural state on publicly held land.

Mr SEITZ — When you look at Victoria's resources online, you find the map goes back to 1994 — it covers 1974 to 1994. What are we doing at present in that field? I consider Victoria is my inheritance. What are we doing on the Crown land issues where we have the right to basically study and find out? There must be leaching even on Crown lands if we are clear felling, for example. We are changing the environment there as well.

Ms FORSTER — It is a very complex issue and do not take my word for some of the technical aspects, but it is a lot to do with the way we try to make our soils more productive by putting on nitrogen fertilisers to grow better grass. It is the reaction between the nitrogen and the formations of nitrates and the leaching of that that causes much of the acidity. That does not happen in a forestry operation; you are not putting on huge amounts of nitrogen.

Mr SEITZ — I hear Mr Howard talking about free trade and removing all tariffs so our farmers can compete with Europe where they are all subsidised, and with America. What are we doing in that field to assist our farming and agricultural communities? Australia was built on the agricultural industry until recently where we have gone into mining.

Ms FORSTER — I understand what you are saying. It relates to what I talked about earlier, and that is the balance between the public and the private benefit. The government does not give subsidies for lime to an enterprise because all the benefits of that in the medium term go to the farmer in increased productivity. Mitigation of acidification in a direct sense has never been part of a government program. The National Landcare Program would have supported some studies of the issue, but it came to the same conclusion that it is not a part of government to support the farmers. Farmers have a duty of care to manage their own land.

The CHAIR — If we look at how we manage acid soils, what would be your view of the best structure we can use? Is it in fact the whole of catchment or should it be smaller?

Ms FORSTER — One of the things we thought we might suggest to you is the use of the special area plans that are in the Catchment and Land Protection Act. They have not been used a lot. They were in the act when it was passed in 1994 and were carried forward, if you like, from a range of other acts in respect of protecting water supply catchments. Most of the special area plans that we have in Victoria now relate to those water supply catchments. It is a tool that could be used to manage a specific problem like this.

A catchment management authority — as has been done — could identify that acidification is a real issue in part of its catchment, and it could, together with the land-holders in that catchment, work to develop a special area plan, and that would be where you could bring the specifics of the local region and the local industry to bear. The committee might like to consider that suggestion of using that aspect of the Catchment and Land Protection Act.

The CHAIR — In some of the research documents there are comments about damage to local infrastructure, such as roads and bridges. Are you aware of any expertise that Vicroads has, or of any work it may have done with DPI, DSE or the catchment authorities at all?

Mr McRAE — I am not aware of any there. The main focus of expertise in Victoria is at the Rutherglen Research Institute, and they would be the ones who would know the answer to that question if you were needing it. I am not aware of any.

Mr HILTON — Christine, you mentioned the effects of fertilisers on increasing soil acidity. Yesterday the committee was told by another group that they had a negligible effect, which I found hard to believe. I would be interested in your comments on that.

Ms FORSTER — They are negligible if you put them together with lime and if you use them in the right sort of management framework, but that is not what happens. People have a limited budget, and they put on the ammonium fertiliser to get a quick response and they probably do not put on the lime that they should at the same time. It is different in different places, but from my experience the two major causes are the use of nitrogenous fertilisers and nitrogen-fixing pasture in environments, like clover environments, which is what acts in our area in western Victoria: we do not put out any nitrogen fertilisers, but we do have a heavily clover-based pasture, and the clover fixes the nitrogen and the nitrate leaches through.

Mr HILTON — It has been put to the committee by some that soil acidity is a bigger problem than salinity. The general public probably would not see it that way, and I wonder if you have any recommendations as to a way we could alert the public to the importance of this issue.

Ms FORSTER — I think the public alert does need to happen. When we tabled this report in Parliament in October last year I think the *Age* newspaper picked up the fact that we had said that if you put soil acidity and soil salinity together we are looking at something like lost productivity on 40 per cent of Victoria's agricultural land. That certainly grabbed the public's attention at the time. That is the difficulty with acidification: it is an insidious thing; it happens very slowly, perhaps over 50 years, and it is not easy to say at this point, 'This is what will happen in five years time if you keep doing it'.

I do not have any bright ideas about how you make soil acidity something that grabs the public's imagination. It has taken a long time. I have been in water resources management areas for probably 38 years, and it has taken a long time for salinity to reach the degree of recognition that it has, and I would say it would probably take as much time to get soil acidity to have that sort of profile. But I do not think we have that sort of time. I think we probably need to move towards getting our land-use practices matching the capability of the land.

Mr CUMMINGS — Acidification is incremental in nature, for sure, and with that there is a potential for thresholds — because we talked about it becoming irreversible at certain stages — and that becomes a real issue for soil health. There is potential also for acidification of streams, so we could do considerable damage to our stream

health, including biodiversity. The other concern is as the acidity level increases (or the pH drops), we start to lose potential for vegetative cover. Then the other issues of land protection and vegetation cover arise, so erosion increases and we have clay mobility and so on. The solution is not actually dealing with the one thing alone, but the integrated package. Some of the drivers of salinity are also the drivers of acidification, so it is a bit hard to individually pull out one of the issues like acidification — you cannot pull it away from salinity, they are tied together.

This can be seen in the regional catchment strategies. They talk about soil health, but they do not have a total package. The farming system or land management system needs to make sure that we do not actually leak excessive water through to the water tables and contribute to salinity nor that they mobilise nutrients out of the system — this is where we are getting acidification of the soil profiles. It is something that our researchers are still coming to terms with. They have individual solutions but reliable and economic packages are elusive.

Ms Forster is quite right: we have a whole series of different land capabilities, with slightly different processes in each one — some are buffered, some are unbuffered; some are more susceptible to leaching than others — there is a lot of work to be done in understanding and cataloguing these. You can see that clearly in the regional catchment strategies. The soil health strategies that sit underneath them do not provide a good idea of precisely what to say then to individual managers of land. There are some good ideas around, but we have not actually tested them all through. We still need to treat much of our approach as experimental.

Dr WILLIAMS — Could you tell the committee a bit more about the socioeconomic constraints of managing acid soils? I notice in the report that you put together you look at a whole lot of indicators, and they must have an impact on management of acid soils. The committee has been told the profitability of a farm is a major constraint, obviously, on how it is managed. Can you talk about some of the other factors that impact on that?

Ms FORSTER — I am happy to do that — or unhappy, because especially in broadacre grazing and to a certain extent cropping, our farming enterprises are not profitable in the broader sense. Certainly there are areas — there is a corridor up the Hume Highway, for example — where the amenity value of the land is far higher than the profit you are able to generate from that land. It really does make it difficult there. The older, traditional way of becoming a more profitable farmer was to get bigger and bigger. Even where I live in western Victoria, because the land has value other than farming values — it has amenity value for hobby farms and for people who want a rural lifestyle — it actually drives the cost of the land up very high, so it is very difficult to then get bigger and therefore generate enough profit to service the needs of the land. I think in many cases acidification, soil acidification, comes into that category.

As we say in our report, this situation is partly geography and partly some of our soldier settlement policies after the first and second world wars. We probably have very closely settled land; our climate helped too, because until the past few years it rained fairly regularly. So it is not easy for today's farmer to actually work his way through this problem, for a variety of reasons. But I would refer you to the section in the report on the overall statistics of the size and profitability of broadacre farming.

Mr SEITZ — Given that 25 per cent of Victoria is affected with the acidity problem, where would you rate it on a scale from 1 to 10 compared with salinity?

Ms FORSTER — I think it is probably going to be as important as salinity in a few years time. It is not as obvious as salinity, but — I would hate to come up with a figure and defend it — in terms of the area covered it will be as important as salinity. So it depends on what your measurement is.

Mr SEITZ — I was looking for a figure from 1 to 10, comparing it with salinity, for the extent of it.

Ms FORSTER — In terms of the amount of the state's land affected, it is equivalent to salinity.

Mr SEITZ — So that is the soil degradation that is taking place?

Ms FORSTER — Yes.

The CHAIR — Thank you very much.

Witnesses withdrew.

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Witnesses

Mr P. Sutherland, Victorian Deputy Commissioner, Murray–Darling Basin Commission; and
Mr C. McRae, Director, Land Management, Department of Sustainability and Environment.

The CHAIR — I welcome Mr Sutherland and Mr McRae. All evidence taken by this committee is taken under the provisions of the Parliamentary Committees Act and is protected from judicial review. However, any comments made outside the precincts of the hearing are not protected by parliamentary privilege. All evidence given is being recorded by Hansard and witnesses will be provided with a proof version of the transcript next week. Would you like to make a presentation, Mr Sutherland?

Mr SUTHERLAND — I will basically focus on the issue of soil acidity in the context of the Murray–Darling Basin and the arrangements for managing natural resources within the basin. Briefly in terms of background, in the mid-1980s the governments of Victoria, South Australia, New South Wales and the Commonwealth agreed to establish a broader Ministerial Council to oversee the management of natural resources in the Murray–Darling Basin, building on the work of the former River Murray Commission which had a primary focus on the water sharing and water quality in the River Murray itself. That Ministerial Council oversees the work of the Murray–Darling Basin Commission which coordinates activities across the basin in the interests of improved land and water management.

The Commission has undertaken a number of surveys of natural resource management issues in the basin, most recently in relation to salinity. Those assessments indicate there are significant land degradation problems throughout the basin and that many of those land degradation problems have similar causes — land clearing, replacing native deep-rooted vegetation with annual pastures and introduced species, the introduction of pests et cetera.

In relation to soil acidification, as you have no doubt heard, the basic causes result from leeching of water through introduced agricultural systems, particularly annual pastures with legumes resulting in increased acidification in soils. In many areas that becomes a problem in terms of deep subsurface soil acidification which is difficult to treat even with the application of lime. In other cases it is confined to the soil surface and shallower areas and can be treated effectively with the use of lime.

However, that is expensive and in many of the marginal agricultural areas the costs of liming probably do not achieve the return in terms of increased production. Like salinity, there is a problem in terms of farmers not having sufficient disposable income to address the costs of application of lime dosing.

In terms of the management arrangements for the Murray–Darling Basin, they are very much based on an integrated catchment framework with a recognition that the best decisions are going to be made in terms of land and water management if communities close to those problems have a strong involvement in those decisions. That has given rise to the catchment management frameworks that now exists in Victoria and other States. Victoria's model of catchment management based on catchment boards having a coordinating role in developing regional catchment strategies is fundamentally at the core of the approach across the Murray–Darling Basin.

Each of the catchments across the basin is assessing the land degradation problems both in terms of the water environment and the land environment, and prioritising those for addressing by joint investment by State, Commonwealth and regional communities.

Soil acidification has, it is fair to say, been a problem that has not received as much attention publicly as soil salinity and other water quality problems. However, the recent report of the National Land and Water Resources Audit last year identified that soil acidification in terms of its economic impacts is certainly as significant a problem as dryland soil salinity. That is true for the Murray–Darling Basin as it is for other parts of Australia.

The other issue that has distinguished the approach to soil acidity compared with salinity is the fact that in the past it has generally been seen to have been in the interests of farmers to address soil acidity — in other words, through the application of lime to improve their productivity and the yield of their pastures and crops — and that the benefit of that investment is achieved by the individual farmer and land-holder, which is somewhat different to salinity in many cases where often land-holders further up in the catchment are being required to plant trees or take action in terms of salinity mitigation, which benefits land-holders downstream in the catchment.

So in those circumstances it is seen that more assistance is required, in a sense, to achieve the solutions on a catchment scale because the beneficiaries of control measures often may be different from those that have to undertake the works. However, there are concerns that there are externalities or off-site impacts of soil acidification, potentially in relation to water quality of streams, and I think it is fair to say that there is a need for more research to look at the relationship between soil acidification in catchments and the pH status of streams. As yet the research is not clear about that relationship, but it is certainly one that I think needs to be looked at in the future.

The other issues in terms of soil acidification relate to reduced yield and cover in terms of vegetation, particularly in grazing areas, which in turn can result in both increased soil erosion and, for that matter, also increased salinity through reduced cover and therefore reduced use of water and water seeping into the ground water system. So there is a complex interaction between the range of land degradation issues.

I think in terms of the Murray-Darling Basin Commission's activity, as I said, there has not been a specific program in terms of soil acidification but a range of initiatives directed at integrated catchment management which have been funded through a range of mechanisms, including specific Murray-Darling Basin programs such as the Murray-Darling 2001 initiative, which was jointly funded by the Commonwealth and States, and more recently funding through programs such as the National Action Plan on Water Quality and Salinity and the Natural Heritage Trust has involved or is involving expenditure by the state and commonwealth governments in addressing a wide range of catchment management issues. Some of those will certainly be beneficial in terms of addressing soil acidity, particularly the move to perennial pastures and the use of deep-rooted perennial species, both crops and tree crops.

In terms of the overarching arrangements in terms of priorities for the Murray-Darling Basin Commission, the Commission two years ago released an integrated catchment management framework or policy which sets out, if you like, the priorities for catchment management within the basin. I think it is fair to say that in that document soil acidity was not seen as one of the highest priorities, but was certainly identified as one of the issues that needed to be addressed along with a suite of other issues, including environmental flows, salinity, and soil erosion in general.

I might leave it there in terms of just an overview and answer any specific questions you might have.

Mr HILTON — I was interested in your comment that you do not feel the connection has been made between what I understand is to be the decline in water pH of the Murray-Darling Basin and increased soil acidity, particularly in that north-east catchment area. I am just wondering what further research you feel needs to be done to prove or disprove that connection?

Mr SUTHERLAND — I might ask Chris McRae to comment in a minute. I think at the moment there are such a complex of factors that influence the pH of streams that it is very difficult to necessarily disentangle the cause and effect relationships between, say, soil acidity in the catchment and a raft of other issues. So I think it is probably fair to say that whilst there are concerns that there may be a link between pH levels in streams within the Murray-Darling Basin and soil acidification, the definitive research work has not been done to effectively establish that as opposed to other factors that may be involved. I might get Chris to comment.

Mr McRAE — From what I can understand of the research, there is a general understanding that there is a reduction in water pH, that in fact that is occurring both in disturbed and undisturbed areas, and so being able to draw a link between, say, the agricultural or production practices in general versus something that is happening basically in the environment as a whole has been where the issue has been. That is not my particular area of expertise, but that is the issue in terms of being able to draw a distinct link between what appears to be a decline in pH and the actual cause of it. So that is where the disconnect is.

Mr HILTON — What would be the effect of a continuing decline in pH in the river if it was not addressed?

Mr SUTHERLAND — The pH is an important parameter in terms of the biota in fresh water ecosystems. Native species would be sensitive to adapt to a certain range of pH, so that if the pH were to fall outside that range, it would certainly affect fish and other aquatic biota. However, again I think the biological monitoring and water quality monitoring that has been done in Victoria and within the Murray-Darling Basin has not, in a sense, led to any particular conclusions that soil acidity has been a technical factor in decline in fish or aquatic biota compared to other factors such as flow, the nature of the inflows of carbon from streamside vegetation and a whole range of other factors. So I think it is fair to say that the evidence is not adequate and has not been adequately analysed to establish what impact, if any, soil acidification is actually having on stream biota.

Mr HILTON — Peter, is that because the research has not been done, or the research has been done but has not been conclusive?

Mr SUTHERLAND — It is largely that the definitive research has not been done. I am aware that some recent research has been going on through organisations such as the CRC for Freshwater Ecology, but I think a lot of that research is still in its early stages.

Mr HILTON — Thank you.

Mr SEITZ — The committee is given to understand that in the higher rainfall areas, particularly, there is a problem with acidity, like the southern margin and the eastern part of the basin. Does the commission have detailed information on the geographical distribution of acid soil and subsoil, and what are the projected rates of the progression of soil acidity? With salinity it seems to be growing.

Mr SUTHERLAND — The commission itself has not undertaken that work. But the most, I think, recent definitive analysis of soil acidification within the basin comes from the work of the Land and Water Audit Advisory Council. The land and water audit report and atlas certainly analyses and presents, in some detail, the information on the current state of soil acidification and trends, and it also documents the economic impacts of soil acidification. Certainly that is done on a river basin basis so that you can actually identify the implications for the Murray–Darling Basin. That work, I might add, is drawn on principally the data that is collected and held by the various state and territory jurisdictions. That information indicates that soil acidity is a significant problem in terms of the area involved and also in terms of a spreading problem.

Mr SEITZ — I will follow that up. As you mentioned, the basin covers a number of jurisdictions, states and territories. Where are they addressing soil acidity better? Which framework — in your area of the commission, where the commission has a say in it — or which jurisdiction is most progressive in managing it?

Mr SUTHERLAND — I think it is difficult to draw direct comparisons because the nature of the environments can differ quite dramatically through the basin, as you would realise — from almost tropical and subtropical in Queensland, right through to the cooler climates in the Victorian part of the basin. There has been a lot of good work done within Victoria — certainly in north-east Victoria — by the Rutherglen Research Institute. There has also been work done at Hamilton and in Gippsland through both the Department of Agriculture and the Department of Natural Resources and Environment, and more recently DSE and DPI.

There is certainly active work going on in New South Wales in terms of soil acidification, although I think a lot of its emphasis has been more recently on the issue of acid sulphate soils, which is a different problem in some of its coastal and estuarine environments.

As an indication of the priority under the Natural Resource Management Ministerial Council — which involves not only the Murray Darling Basin Commission ministers, but also ministers from other Australian jurisdictions — recently work has been initiated to look at a number of case studies in terms of priority natural resource management issues. One of those case studies is looking at soil acidity in particular, and Victoria, New South Wales and Queensland are actively involved in developing that case study, which will not only explore what is currently happening in terms of those jurisdictions to tackle soil acidity but look at more innovative possible approaches in terms of addressing the problem. So I think it is fair to say that the states involved in the Murray–Darling Basin are actively pursuing new policy options in terms of soil acidity.

Mr SEITZ — I will follow up on that. Most of these reports and things like that are written for other academics to read. They are written by one academic for other academics to present papers at conferences and things like that. As laymen, where would you recommend the committee should visit to physically see the land and where work has been carried out to see what effect it has and so forth? A farm? Crown land? And in which district? In New South Wales, or somewhere else, is anybody saying, ‘Well, we have taken certain actions to reverse it.’?

Just recently I had a look in Western Australia where Harry Whittington of WISALTS, the Whittington Interceptor Salt Affected Land Treatment Society, invented the interceptor banks for salinity to keep the water up on the slopes instead of going down the valley and onto the farm below. Is anything like that happening here in the field of acidity, and where would you recommend we should go to see it?

Mr SUTHERLAND — Yes, most definitely. In terms of Victoria I think some very practical, not only research, but also extension work has been done in north-east Victoria, and there are excellent extension products that are used with farmers in terms of assisting them to change their practices. I am sure that a very useful tour could be undertaken by the committee in north-east Victoria, in particular, with the research institutes that have been providing that support to land-holders in that part of the region. I am not familiar with the details for New South Wales, in terms of specific sites, but there would be many opportunities in New South Wales to look at similar activities. We would be happy to get some detailed information for you on the most prospective areas to go to. Chris McRae would —

Mr McRAE — I cannot give you the exact dates, but there has been a major national program on acidity, in which obviously Victoria, New South Wales and Western Australia have been major players. In fact, while dealing specifically with the issue in Victoria, the Victorian researchers have been in very close connection with particularly New South Wales and Western Australia. That program has had both a research component and an extension farm advisory component. It is the latter component that Victoria, through Rutherglen, has actually been a national leader in. So that would be the key point to go to in terms of how this technical information is being put into a means that is being conveyed to practitioners, if you like, to make best use of.

There are programs that have been running there for a number of years that I am sure the people at Rutherglen would be very pleased to show you. The point I am making is that it is not just drawing on Victorian experience; it has drawn across the national experience as part of this national program.

Mr SEITZ — My last question is: you mentioned research and the heritage trust. Should the research be a state or a federal responsibility? Should it be done by universities? And where should the funding for that research come from?

Mr SUTHERLAND — I think all of those. There are a range of centres of excellence, CRCs for research that have been funded through both commonwealth contributions and also membership from State organisations, and Victoria is involved in a number of them. In the case of the Murray-Darling Basin there is a specific program called the Strategic Investigations and Education program which invests significant resources in research within the basin. Some of that research has focused on issues such as soil acidification. That is funded through equal contributions from the member States and the Commonwealth.

A range of both funding formulas and research organisation arrangements have to date had a hand in soil acidity research, and they will continue to be the sorts of mechanisms that will need to be used as well as the research that has actually been done through the State agencies — for example, the research institutes within the Department of Primary Industries undertake a range of research related to soil acidity and farming practices.

Mr SEITZ — If you were to rate the importance of funding between salinity and acidity, where would you put acidity in the rating for funding say from 1 to 10?

Mr SUTHERLAND — I would like to preface my remarks by saying that the reason I think salinity should probably attract more attention from governments is the fact that it is clearly an issue that involves significant market failure, in that the solutions often require actions by individual land-holders from which they are not going to derive the benefits themselves, but someone else will derive the benefits. In terms of the types of cause and effect, salinity is an issue that demands investment by governments in terms of the public good outcomes.

In relation to soil acidity, to a certain extent the benefits of controlling soil acidity fall to the individual farmers who can take those actions, so there is much more of a direct link in terms of private benefit from the control measures involved. However, notwithstanding that, there is a case for better information to farmers to enable them to improve their practices, and governments have an important role in that in terms of providing information and advice about new technologies which will generally improve the sustainability of the resource, even though in a sense it will contribute to the private benefits.

On balance, in the past there has been a stronger argument for investment of government in salinity research than soil acidity, but that may change with the issues emerging in terms of the off-site effects of soil acidification.

Mr McRAE — I wanted to expand a little on the source of funding, because there is another institutional arrangement in Australia for actually collecting funds from individual farmers that then come back into research corporations, and they fund research as well. That is a mixture of private individuals and commonwealth government funding. Some of those, particularly the Grains Research and Development Corporation, have been players in funding these research programs. Funding through that mechanism is the way in which private individuals — they do not have any choice in it — pay levies, and the corporations are set up and they invest those research funds on their behalf. As well as the public state and commonwealth issues Peter has mentioned, that is another private individual's mechanism for funding this research.

Mr SEITZ — Where do you put it on a scale from 1 to 10?

Mr McRAE — If you are looking at salinity as 10, I think I would put acidity a little below that. I would probably put it at 7 or 8.

Dr WILLIAMS — Can you tell us a little bit about the landmark project the commission has done on soil acidity in the Upper Goulburn? What have been its findings? Is there a report the committee can get hold of on that project?

Mr McRAE — That is a program that is obviously set up and funded through the commission, but the actual delivery of it has been managed outside the commission. Again we come back to a player at Rutherglen who is actually managing it from the Victorian perspective, and I can give you the name for that.

Mr SUTHERLAND — The contact there is the project manager, David Clark; he is running that project. As I understand it there will be further reports to come from that project.

Mr McRAE — Angela Avery at Rutherglen is dealing with a component of that as well, so she would be the contact there.

Mr HILTON — Following Caroline's point about this project, are there any findings that have come to light about which you can talk to the committee?

Mr McRAE — No, I am not familiar enough with the detail of it to chance my arm there.

Mr HILTON — Peter, can you comment on it?

Mr SUTHERLAND — There has not been a report to the Commission on the outcomes of the project as yet, but I am happy to follow up on that in terms of what documentation reports are available.

Mr HILTON — To follow up on George's point in terms of the relative importance of salinity and acidity, what do you believe the role of the commission should be in alerting the public to these increasing problems? If salinity is 10 and you said acidity is 7, 8 or 9, it is obviously a big issue. Where do you believe the commission should be going to inform people that this is something of which they should be aware?

Mr SUTHERLAND — The Commission's focus is very much on sustainable land and water management. To the extent that soil acidification is or could lead to a broader problem within the environment, the Commission certainly has an interest and an obligation to provide both research and better information to land-holders and catchment organisations to enable them to make better land-use and land-management decisions. As Chris said, there is also clearly a role for industry organisations to the extent that this is an issue that affects industries and the economic performance of individual farms. While the Commission certainly would see that as important in raising broad awareness about those issues, its focus would be on the management of the environmental and broader sustainability issues within the basin, particularly in the context of how soil acidification can be tackled in an integrated way with other natural resource problems on a catchment scale.

The CHAIR — Chris, do you want to take the opportunity to make some comments?

Mr McRAE — I think I have made those on the way through, thank you.

The CHAIR — Thank you both very much for attending.

Witnesses withdrew.

CORRECTED VERSION

ENVIRONMENT AND NATURAL RESOURCES COMMITTEE

Inquiry into impacts and trends in soil acidity

Melbourne – 5 August 2003

Members

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Mr D. K. Drum

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Chair: Ms J. M. Lindell

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Staff

Executive Officer: Dr C. Williams

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Office Manager: Ms. M. Pilley

Witnesses

Mr G. Gibson, Chairman;

Mr J. Crowe, Secretary; and

Mr T. Tovey, Treasurer, Victorian Limestone Producers Association.

The CHAIR — I declare open the hearing on soil acidity. I welcome Trevor Tovey, the treasurer, Joe Crowe, the secretary, and Gavin Gibson, the chairman, from the Victorian Limestone Producers Association. All the evidence taken by the committee is taken under the provisions of the Parliamentary Committees Act and is protected from judicial review. However, any comments made outside the precincts of this hearing are not protected by parliamentary privilege.

Hansard is taking a record of all the evidence given today. You will receive a proof version of the transcript next week for your correction and return to the committee, and then a final version will be sent out to you. I invite you to make your presentation, and then we will take some time for questions.

Mr GIBSON — I will take the opportunity to allow the other two members to give a background on the companies they represent.

Mr CROWE — My name is a Joe Crowe. I am from a little place called Codrington in the Western District about halfway between Portland and Warrnambool. I am basically a farmer. We have a beef farm on about 1100 acres, and we also have a lime quarry.

Mr TOVEY — My name is Trevor Tovey. I am working with David Mitchell Ltd, a lime manufacturer, which has 18 lime plants down the eastern seaboard of Australia. It has just been taken over by a company called Unimin Australia Ltd. I have been with the company for 25 years and for probably 15 to 20 of those have been involved with development of soil acidity awareness and promotion from within the Victorian operation, which has four limestone operations.

Mr GIBSON — I am Gavin Gibson and I am from East Gippsland. My main background is that I have a fertiliser business, which the family has had for 35 years. We also bought a lime pit three years ago because of the need for our market to have a reliable supply of good limestone.

We are just going to share the job of reading through our presentation. We have tried to structure it the best way we think we can, so we have probably given you some of the answers relevant to your terms of reference, but you might not want to use them, or you might like to write your own answers!

The Victorian Limestone Producers Association was initially formed in the mid-1980s to represent limestone manufacturers within Victoria as a peak body. It has 16 members. It represents about 90 per cent of the limestone that is sold in Victoria. So I guess the small membership reflects the nature of the industry.

The peak bodies that we represent our members to are the Victorian State Chemistry Laboratory, which does a lime test every two years, and the state chemical standards branch with regard to Victorian fertiliser regulation — that is the body that sets the minimum standards that our lime has to meet. We liaise with the Australian Fertiliser Services Association as required, and we participate in joint venture activities, because it is important that our lime actually has someone to spread it onto the ground. Not all of the lime producers have trucks, and the spreaders association helps to provide that service to get it onto the ground. We represent the Victorian limestone manufacturers with research institutes from Victoria, and we provide industry representation to the minerals and energy department, as required by our members. That department inspects quarries every year, and there can be problems with rehabilitation or getting new deposits open, so if we need to help them there, we do.

One of the committee's terms of reference is to review the projected social, economic and environmental impacts of soil acidity at a regional and catchment scale. The media, politicians and the public would no doubt, in general, be aware of the salinity problems that are being encountered in many parts of Victoria. Myriad government bodies, environmental and land-care groups have responded to the challenge at hand in an attempt to tackle the ever-increasing economic and environmental problems that salinity produces.

If, however, one were to ask about the effect of severe soil acidity, which affects a similar land area, the answers would be muted. The symptoms of salinity and acidity, or acid soils, are very similar, except that acidity is insidious, less visual, and can be confused with poor seasons or inadequate fertiliser programs. In many situations the seriousness of the problem can become fully apparent only over a long period of time.

Therefore the impacts of soil acidity are enormous. They include increasing dryland salinity; a reduction in vegetative ground cover leading to an increase in run-off and erosion; an increasing nitrate pollution of ground water and therefore a reduction in water quality; a decrease in the pH of waterways and wetland environments; more pressure on water plants and aquatic life to survive in a more acidic environment; a reduction in the choice of crops and land use in affected areas; marked drops in agricultural yields and therefore farm income as well as

domestic and national income; a drop in land values; and as with salinity, acidic soils can also impact on infrastructure such as concrete.

It is estimated that around 3 million hectares of Victoria are affected to some degree or another by soil acidity. This equates to 23 per cent of the state, and like salinity it is gradually growing. To put a dollar figure on this is nearly impossible, but it would be in the order of tens of millions. By contrast, only 120 000 hectares are thought to have salinity problems.

The next heading of our submission refers to identifying areas for potential partnerships with industry and the community as well as developing recommendations to reduce the projected impact of soil acidity. One solution would be an education program to address various stakeholders such as farmers, agronomists, fertiliser companies, the agriculture department, the Department of Primary Industries, water catchment authorities and the general public. A second solution would be a discount on soil tests by approved laboratories for people in areas with acid soils. As only 20 per cent of farmers conduct regular soil tests this could be used to alert the farmers as well as to monitor and map acidic areas.

As the application of lime can be expensive a tax rebates similar to that available for Landcare tree plantings could be appropriate. The development of low-interest, long-term loans to help offset the initial application through relevant institutions such as the Rural Finance Corporation could be considered. The Victorian Limestone Producers Association would like to facilitate farmer information and meeting nights to offer research and technical information where it is most needed. As such, we would be prepared to put a budget on the costs involved in a program of this nature.

Mr CROWE — I will talk briefly about some thoughts we have on identifying future research and development priorities. We think research is needed on the current trend of high-input farming. The irony is that good farming techniques — higher phosphate and nitrogen applications — lead to more soil acidity. While the benefits are easy to see and are often promoted, little time is given to the invisible damage this is causing. Also, a lot of research has been done in the past into the effects of application rates and types of nitrogen on soil acidity, but with the loss of or cutbacks in the number of extension officers this research is languishing on the shelves, with the current generation of farmers struggling to get access to this information.

The employment of facilitators is vital to assist the researching, recommending and making available to farmers of solutions in our acid soil regions. Has any research being done on subsoil acidity and the impact of water run-off and quality in catchment areas? This could be a new area for research on plant species et cetera to stabilise water quality decline. The next step would then be to undertake research to identify future acidic regions and to forewarn about developing problems.

The next heading of our submission refers to the management framework currently in place to address soil acidity in Victoria, including the role of limestone producers. Currently some farmers are becoming more aware of soil acidity due to various economic pressures. For example, canola is now a widely grown crop. It gives good gross margins provided the soil acidity is not a limiting factor. This has brought about a shift in thinking involving regular consultation in the field with agronomists, and to a lesser extent fertiliser companies.

Victorian limestone producers are actively involved in making liming materials readily available; helping to educate farmers in the correct usage of the product; getting information out to the farmers where it counts by putting representatives on the road to meet with fertiliser distributors, lime agents and farmers. Some companies also make representatives and/or stands available at various agricultural field days.

The association is also actively involved with providing technical assistance to farmers, distributors and agronomists about, for example, the recommended rates of lime for different soil types, pH levels and farmer budget restraints. Farmers are mainly production driven and not so much environmentally driven. If their operations can be made more profitable they will spend more money on their environment. The former DNRE, now the Department of Sustainability and Environment, has two good publications — that is, *Acid Soil Management* and *The Impact of Acid Soils*. There are also some relevant web sites.

Mr TOVEY — Just to go a bit further on Victoria before I get on to the other jurisdictions, which we assumed were the states of Australia, there is a publication which we have passed out to you now which came out some years ago. It is an excellent vehicle for the farmer to have a look at where he is and how to solve his problems, but again I cannot say that I have actually seen that at any farmers and/or distributors network. It just seems to have got lost in the system.

The second one, which I think you may have seen, is the impact on acid soils in Victoria. That is the only publication we have. Again, it was originally initiated by a group of about six or eight of us who met about four or five years ago in the Benalla region. There was a representative from QBE Insurance, an Elders agronomist, local catchment management authority personnel, the VFF, a local farmer, Rutherglen Research Institute, the Victorian Limestone Producers Association, represented by myself, also representing David Mitchell Ltd. At that meeting QBE Insurance, the VLPA and David Mitchell Ltd agreed to put funding in so we could have a professional meeting and have a professional facilitator to eventually get this publication to where it is. It just showed me that the government and private enterprise can work together. The only downside there is that in all the covers I still cannot see any mention of the contribution we made, which is probably a little bit disappointing.

Further on from that — and I will pass them around later on — we as a company produce a publication called ‘Limelink’. We have put 30 000 of those into the marketplace each year. We tried to get the awareness going. One headline there which I like is, ‘For every dollar I spend on Aglime, I get in excess of \$5 in return’. That was in a given set of circumstances, I will take it for granted, but farmers still are not necessarily applying lime. So we have been trying to get the message out, as Joe said. We do put out TV promotions as well, so we are trying our best to fill the gap or the void as one company because of the cutback in extension personnel.

Just finishing off on Victoria, there may be a perception that acid soil awareness and/or liming might be under control, but it has now developed into basically a statewide problem. Initially people were talking about the north-east of Victoria, but both Joe and Gavin, representing East Gippsland and South Gippsland, and me from the Western District, can reassure you that there is a lot of lime being sold in those areas as well, but a lot of awareness has still to go out there.

The other point there is that we were running farmer nights some 10 years ago in conjunction again with the Department of Agriculture representatives coming down and talking about the acid soil problem, but as the representation from the department dried up, these nights dried up also.

Having a look at the other states, New South Wales started an acid soil action program some years ago, and the request there was from the government. They got basically \$7.5 million over a three-year period to fund research. That research also funded 18 full-time research scientists and extension personnel just on acid soil involvement. They have since then had another \$4 million, which is finishing up at the end of June, but again, as a body called Acid Soil Action New South Wales, they have produced leaflets called ‘Understanding Soil pH’, ‘Are my soils acid?’, ‘Planning on liming?’ and ‘Pastures and acid soils’. So the New South Wales department was very proactive in trying to get the message out there to farmers that there is a possible problem.

The acid soil program aims to correct or reduce the effects of acidity and involves the agricultural sector, the lime producers association in New South Wales and the government agencies. It has also involved the employment of extension officers for overseas training, research and education. Added to that 18 people under the acid soil action funding there are in the southern part of New South Wales, stationed at the major country towns, another 56 extension personnel, so they are very active in New South Wales.

In South Australia I have not got the details I was wanting. I could not quite get it in the time allowed, but I know that the government there went through the producers association in getting brochures and farmer nights and field days promoted, and I will endeavour to get that to you as soon as I can.

In Western Australia they were not using much lime over there some five to seven years ago. Again, I only have one of each of these, but the department had a promotion called ‘Time to Lime’, and it had T-shirts, jumpers and caps, plus a sticker for the fridge, ‘Time to Lime. Contact Agriculture Western Australia’, and the department people were out there promoting this. They have turned the market awareness around from about 30 000 to 40 000 tonnes a year to about 450 000 tonnes a year; again all because people have been out there making the farmer aware.

In Queensland the Department of Primary Industries is very active there. They have a lot of different crops up there which are very intensive, and they have very good research and awareness going on in Queensland.

The next point is the key challenges and barriers to the management of soil acidity.

The largest problem at the moment is a lack of awareness of the problem. This really covers all sections of the community. A lot of farmers have probably noticed the declining yields and all the other signs that indicate rising soil acidity, but due to a lack of education and good farming practice — such as regular soil testing — as a consequence have yet to identify the cause. Larger bodies — for example, private plantation companies, water

catchment authorities and other government bodies — with large land holdings are not likely to have a budgeted approach to maintain or rectify soil acidity, hence declining water quality et cetera.

The availability of Department of Primary Industry extension officers has been in gradual decline over the last decade and has reached the stage where they are extremely thin on the ground. It should be a priority to make funds available to put these people back in the Department of Primary Industries system. From there they can identify worst areas, research, recommend, educate and facilitate solutions to this statewide problem.

Other barriers or perceptions: depending on the situation, agricultural lime can be a high volume input — for example, from 500 kilograms to 5000 kilograms per hectare. In comparison to other rural inputs, agricultural lime is cheap. However, transportation — in many cases over long distances — and spreading costs can make the solution appear prohibitively expensive. This is not helped by the fact that agricultural lime deposits are generally spread around the coast of Victoria.

While initial results can seem a little slow on the uptake after applying lime, depending on the acidity of the soil, compared to traditional fertilisers, they can conversely be effective for a long period of time — up to maybe eight years or even more. Therefore, with some planning, it is possible to gradually get the whole farm covered over a period of years, avoiding a blow-out in the farm budget.

Share-farming and/or leased farms with a limited tenure can also foster the perception of lack of return on capital input, as they might not get their full return back over a short period of time.

Mr GIBSON — Future research and development priorities: the main priority here should be the education of the community. If the general public is not aware of the problem, no attempt can be made to rectify the acid soils. As previously stated, salinity has been well publicised, and the damage acid soils are doing to the environment needs the same focus.

Employ or reinstate Department of Primary Industries extension officers. These people are vital to the facilitating of education programs. They can also monitor acidic soil growth, thereby targeting hot spots, as well as put into practice quickly and effectively the latest results from R and D. With the Department of Primary Industries behind them, they can provide practical solutions to help landowners abate or rectify their problems.

There is probably research to be done. However, there has been considerable research already done which should be re-examined and made more readily available. It would be a waste of money and resources to replicate research.

The VLPA is willing to facilitate farmer nights through member and industry connections and would be prepared to do a budget on this if required.

Development priorities: identify new and existing acid soils; a trigger point for pH for the introduction of solutions; continuing meetings; six-monthly updates, so as to keep our members informed as to where this is going; farmer education; and on-farm trial plots.

In summary, it needs to be acknowledged by government that this state has up to a quarter of its total land area affected to some degree or other by acid soil. Due to the nature of the problem, like salinity, this area is increasing. Acid soil has economic and environmental impacts beyond agricultural enterprises.

Money needs to be directed towards education programs aimed at the community, farmers and government agencies, along with the deployment of Department of Primary Industries extension officers.

Prior research needs to be made available. The two publications mentioned in this paper would only be a small sample of other people's work lying forgotten on shelves, but nonetheless important, if only to prevent duplication of expense.

As to the appointment of a chairperson as a coordinator, this person would need to have experience in the field — i.e. from DPI Rutherglen — in order to be able to disseminate the information.

There is a footnote. We estimate that our members have approximately 70 million to 90 million tonne earmarked for extraction in the lime pits. There are greater amounts of lime than that, but with the way work authorities are structured you nominate how much you want to extract over a 10, 20 or 30-year period, and that impacts on the amount of rehabilitation bond you put up to rectify any damage that you might do. If there were a large increase in lime use it would be nice to have some of the applications fast-tracked or have it kept in mind that people would

have to change their current extraction rates with the department. Joe took three years to get his work authority approved, and there was no problem, was there, Joe? There was no reason to stop it?

Mr CROWE — No; I am only a relative newcomer to the lime mining side of things. That is basically it. It took three years to get our work authority. There were really no problems. They were bureaucratic things, really. I ended up with a file about an inch thick and a lot of it — well it did not seem to have a lot of relevance, but it is just the way the system works. So I am now in a situation of having to extend the work authority, and I am probably dreading it to some extent. Obviously there have to be checks and balances in any particular system, but some of these things could be streamlined a little bit better than what they are at present.

The CHAIR — Thank you.

Mr GIBSON — I am not sure who got them, but there are three company presentations at the back of this folder, which is basically just a Powerpoint presentation. There are some interesting highlights there and some visuals on the effects of lime. You can be looking at an acid soil that is still growing vigorously, and it can be pushed along by the fertiliser inputs of nitrogen and phosphorus. One of the things about lime is that it is a natural product. It is clean and green, and we have got reasonable amounts of deposits around. So it is a bonus. It is not like it is a chemical. That is basically the end of that.

Mr HILTON — The committee has been advised that with current usage there is about 50 years supply of lime left. I am not sure if that is in Victoria or Australia; I think it is in Victoria. The committee was also advised this morning that the amount of lime that is currently being used is only 12 per cent of what needs to be used to counter the acid problem. If you take those two figures together, it would not appear that the use of lime is a particularly long-term solution to soil acidity. I would like your comments on that.

Mr TOVEY — Sorry, what was the question again, about comparing the two?

Mr HILTON — We have been advised that there is 50 years supply of lime left in Victoria based on current usage. We have also been advised that the amount of lime which is currently being used is only 12 per cent of what should be used to counter the effects of soil acidity. The extrapolation, I suppose, of those figures is that the amount of lime will run out very quickly if we start using it to the extent it should be used. If that is the case, do we need to be looking at other solutions to the soil acidity problem?

Mr TOVEY — I think there is enough, as I said, untapped. I do not know where some of those figures might have come from, but the coastal areas, both the western districts and Gippsland, have a lot of untapped limestone where no-one is actively extracting those deposits. We know that as a lime company looking for new deposits. The figures we gave before are basically from the active extraction manufacturers at the moment. I would hazard a guess that it would probably go at least 50 years or more, I would think. But I do not know about the 12 per cent. Did that figure come from the Department of Agriculture? Can I ask where the 12 per cent of usage came from? Is that possible?

Dr WILLIAMS — It is in the Victorian Catchment Management Council report.

Mr GIBSON — I think the point we were trying to make there is that under the work authorities that we operate under most people have earmarked 10, 20 or 30 years. There is a 10, 20 or 30-year extraction, and ours is on 10 per cent growth per year. We can take out 20 acres of land or 30 acres of land. Of the deposit that we are in, that 30 years would only take out 10 per cent of the area of limestone on the farm where we operate. So I mean there are enormous deposits of limestone there; it is just that they are not earmarked in someone's work authority. That is why we say that long term there may be a need to fast-track or be aware that, if lime is important, some of the areas are on farmers' lands. That may be, 'Yes, we will facilitate' or 'We will speed up your capacity to have a work authority over a greater area'. We believe about 600 000 tonnes of limestone a year goes out to agriculture.

Mr TOVEY — That is in a good year and not a drought year.

Mr SEITZ — Are farmers sourcing lime from interstate or is it all Victorian lime that farmers are using in Victoria?

Mr TOVEY — You look at the New South Wales–Victorian border, and it is possibly 300 kilometres north or south to the nearest lime deposit. Hence we mentioned the cost of transport. So the border area would be serviced a little bit from New South Wales and over the border into Victoria as well. Unfortunately if you are at

Corowa it is 300-odd kilometres to the nearest lime deposit, so we go into the border a bit — Victoria into New South Wales and New South Wales just over the northern part of Victoria.

Mr GIBSON — Freight is a big issue with lime. You could pretty well say at least 95 per cent of the lime used in Victoria would be mined in Victoria. It tends to have to move inland from the coast, and that is often done with grain trucks. As they move grain down to Geelong and Gippsland into the dairy industry for stock feed, they tend to reload lime back into those other areas as well.

Mr SEITZ — What is the difference between the agricultural use of lime and the industrial and chemical use of lime?

Mr TOVEY — It is called calcining limestone. You put limestone into kilns and calcine it to make it a chemical lime. It is a different market altogether. Once you calcine — burn — limestone it becomes a chemical. That basically does not then become usable in the agricultural market. Probably 95 per cent of lime for acid correction is limestone.

Mr SEITZ — Is that raw limestone, the granules?

Mr TOVEY — You crush it to about 1, 2 or 3 millimetres, minus the dust.

Mr GIBSON — It is the consistency of sugar, and most of the lime millers are small business people. It is a bit like a gravel pit; you dig it out, put it through some roller mills and some crushing, and then you sieve it very finely, and that is what we call agricultural lime. It is reasonably cheap to produce, whereas the company that Trevor represents tends to do a lot of the manufacturing that goes into industrial use.

Mr SEITZ — So it has to go through a kiln?

Mr GIBSON — Yes, it gets burnt. The stuff they use for road stabilisation and things like that is a different type of lime; it is the same lime but is manufactured differently. It is often from a higher grade.

Mr SEITZ — How many people would the industry employ?

Mr GIBSON — Most blokes would have four or five fellows at the average pit; maybe 200.

Mr TOVEY — From 150 to 200.

Mr SEITZ — This is for agricultural lime?

Mr TOVEY — Yes. Do not forget that you are looking at plants that may be going 24 hours a day.

Mr GIBSON — It is a seasonal operation that tends to go up and down. A lot of people do not lime in the winter because it is hard to handle and difficult to transport. It tends to be seasonal because it has to be dug out of the ground, kept dry and crushed. You cannot dig it out when it is wet and the track is all muddy and the product is wet.

Mr SEITZ — How is it dug out? Is it by mining, explosion or just by bulldozers?

Mr GIBSON — Often it is dug out with face shovels; some is bulldozed; some of it is scraped or graded. It depends on the nature of the deposit.

The CHAIR — The works approval side of things is to take the lime out. Are there other regulatory controls on the quality of the lime?

Mr GIBSON — Yes. The state chemistry laboratory tests it every two years.

Mr CROWE — That is mentioned on page 1 of our submission.

Mr GIBSON — There is a state chemical standards branch, and every second year it goes out to each lime deposit and takes a random sample. It is sent off to the state chemical laboratory, which tests it, and it has to meet labelling standards and fall within the Victorian fertiliser regulations, which are regulations that dictate how your labelling is done and whether it is heavy metals et cetera.

Dr WILLIAMS — Can you tell the committee whether the agricultural demand for lime has grown over time? Have farmers become more aware of acid soils and so are liming more?

Mr TOVEY — There may be two answers to the question. Yes, when I first got involved say 15 or 20 years ago the tonnage was very small, but so was the awareness. As we mentioned in our presentation, we have gone out to field days and have done other different things, and it has gone up slowly each year over that period. It has definitely grown from maybe 10 000 tonnes a year to 600 000.

Dr WILLIAMS — Do you have actual figures for that?

Mr TOVEY — Only on my own company.

Dr WILLIAMS — Not for the whole industry?

Mr TOVEY — No. You could get that by going to the minerals and energy department.

Mr GIBSON — We tend to find that people who use lime use lime annually. If they find that lime works, they tend to buy it every year or every second year and it becomes part of their farming practice. They can use more; they will accelerate their use. It takes a bit to get other people who are not liming started, to get a soil test, or they have to have an animal health problem or something to trigger them starting liming. The cost per hectare, because it is a 8 or 10-year full return on investment against fertilisers, against which you might get a return in 12 months, a lot of farmers have not got that income to make a 10-year investment. They are flat out making a 12-month investment. So if they are using it and they are farming to good practices, they tend to keep using it. There is a slow growth.

Mr TOVEY — We did not answer the other part of the question about the supply of lime and the alternative. There is an alternative of acid-tolerant species, but if the soil is in an acid situation it will become more acid. That is only a short-term solution.

The other part of that question I would like to comment on is that farming practices have changed significantly over the past 20, 30 and 40 years. They are more intensive; they are cropping and stocking heavier. The whole return on investment has become such a critical issue now that this farming change or shift is part of the problem as well.

There are two issues about making acid-tolerant species, which I think is a short-term solution, and the farming practices being more intensive. As they are putting more demand on the soil, they are taking more product out the gate, and out the gate does not matter whether it is wool, beef, lamb, wheat or milk, it is all going out the gate, and out the gate are going the nutrients, albeit calcium and magnesium, out of the soil as well.

Mr GIBSON — An additional problem is that as the country becomes more acidic, the clay is turned to sand. It breaks the particles down, and they end up with what they call acid sands. It does not matter how much lime you use, you will not turn a sand back to a clay. You can say we will plant something different, but if the clay is turned to sand it does not matter what you plant there, it will never revert it back to its original soil structure, and then it blows away and the process just keeps happening. That is the added side to not doing anything with lime. Letting it get more acid and finding species to grow will not help the soil structure.

Mr SEITZ — In your document you say it gives a quick result, it is ratified within 12 months. Everything else indicates, as you mentioned, it is long term and really up to 10 years before you see a result. Would you care to comment on that?

Mr TOVEY — I think when Gavin said that he was saying that it will last for up to 8 to 10 years but you have to pay for it now. Depending on the degree of acidity, you might not see a result for a year or two, but more importantly you have to pay for the 8 years or 10 years now. You have to pay for it up front for 8 to 10 years, whereas people might look at the short-term benefit of putting fertiliser or phosphorus on today, and they know they will get some response out of that in this year, the coming season, when they have put it on, and therefore the income comes in, whereas it might take a year or two for some lime to work in that environment. It gets back to — without getting too technical — the soil type. With the heavier types of soils it takes a bit longer for the lime to work; in the lighter soils it works a bit quicker. But I think where Mr Gibson was coming from was that he has to pay up front this year for an 8 to 10-year return or benefit.

Mr GIBSON — If they are using fertiliser, they will fertilise every four or five weeks and they will get a return over that four or five weeks on the nitrogen that they are using at this time of the year. So when you start

talking about something that is returned in five weeks and we are talking about something that will take eight years to get the full benefit of the cost, it is a big difference. One is a long-term approach.

A lot of it is not to do with whether or not it is financially viable to lime. It is the farmers' mindset that lime is expensive. So they decide to just put some fertiliser on. They do not look past that. They do not have the education and there is not a big enough ground swell of information and not enough happening at the moment to keep them thinking that they had better put a bit on and get going with this. Ten years ago there was a lot more awareness, and it has dropped off a bit; the people researching and promoting it have dropped off, so we are in a bit of a drop at the moment and the awareness needs driving up again.

Mr SEITZ — Let me be devil's advocate. Let us compare lime versus the other chemicals that are spread on properties. You just said they get fast growth, and after all we turn grass into fat, milk, hay or whatever else. How does one compare against the other, and should there be some government interference or regulation in that? If I have a block of land and want to build a house on it, I cannot do what I like — there are regulations and controls. The farmer may own the land, but that does not mean he can do what he likes; it does not mean he can then go and poison that land, where the poison then leaches out and washes off and runs into the rivers. Should there be some sort of department or government regulation to say what should happen? I have heard that those involved in viticulture are heavily into lime because they can afford it, whereas in grazing and the beef industry they cannot afford it. I would just like to have your comments on that.

Mr GIBSON — I think there is a note in our presentation document which probably sums up the matter. It says if you kept a monitor on the soil testing and you had people in certain areas that we would call hotspots, you would look at places of acid soils and say, 'Right, once you get to measurement X in this catchment or in this area, you cannot continue to keep buying the amount of fertiliser you are buying and worsen the problem unless you fix this or do that'. I think in the next few years you will start to see some standards coming into the fertiliser industry that will ensure that, just as you cannot go and buy a chemical and spray it around your farm to kill capeweed or something like that if you do not have a chemical users ticket, regulations will be brought that say, 'You cannot use fertiliser unless you have some proof from an agronomist or a department to say that your levels justify that amount of application'. I think you are right in what you are saying, Mr Seitz: it needs measurement, and I think it will come down to that and people will dictate as to what is available to go into that area if it is affecting everybody.

Mr TOVEY — To take that a step further, with regard to canola and lucerne, the message is out there basically to say you should not plant lucerne, for example, unless your soil pH is X level and you do it below X. I think you are really touching on something that could be coming into catchment management areas et cetera, where, if the soil pH drops below X you must apply lime to start correcting the problem because it has gone too far. One thing we have not touched on a lot today is that you are basically talking about surface pH — the top 100 millimetres. Lime is a very slow mover through the soil profile. It needs earthworms et cetera to generate movement, and if it goes down into the subsoil it will be one heck of a problem in years to come for the farmer to correct. I think it has just been the case that farmers have not known a lot of these problems.

To give you an example, one farmer got involved with off-farm income and he set up a fertiliser distributorship in Gippsland. It was not until he put some lime on his own farm that he said, 'That is the sort of pasture that my father grew 50 years ago'. The decline had been going on for 50 years, but it was that slow that he had not actually realised what had happened. When he applied lime the pasture just shot up, the clover came back and everything went up. He said, 'I just totally overlooked it. I have been walking over it for 40 years'. So it is a very hidden giant. It just keeps coming up; it comes up slowly over the years, and they just have not realised what was happening.

Mr SEITZ — We hear a lot about the expense. I am sure superphosphate and other fertilisers and weedkillers are not cheap either. Is the problem with lime the huge bulk that has to be shifted, the contract spreaders, or the distance it has to be shifted? How much does it cost to buy the actual material at source and get it to the farm, and how much extra money is needed in between?

Mr GIBSON — To put it in proportion, lime around main quarries is getting \$25 to \$30 a tonne from the pit. Close to our pit you will not drive very far and you are up to \$10 freight, and then you are looking at maybe \$15 for spreading. But in some of the other areas it could be \$30 freight. But you need to put 2.5 tonnes to the hectare basically as a minimum, or a tonne to the acre, so you are probably looking at in the vicinity of \$50 to \$80 a acre, just depending on where you are. So 100 tonnes does only 100 acres — many people probably need 500 acres to be viable in a lot of industries. Their fertiliser costs would run maybe at \$30 an acre, but they do that annually. That is why I say they have to try to get a program to work their way around, and they need to get started.

They have to buy their fertiliser because it is a yearly thing — they have to keep putting that on — and then they have to start a liming program. Once they get their liming program in place they can drop off a certain percentage of their fertiliser application and not affect production, because the acid soils will have dropped and the grasses will have started to grow, so they do not need as much fertiliser. But to get started you get the double whammy: you get the need to fertilise and the need to lime. That is why I thought it might be possible to get some kind of loan facility that says, ‘We will lend you X amount now, and you can pay it off over five years’, or something. By the time they start paying it off, they have the extra production and they can afford to keep doing it.

Mr TOVEY — It is worth while noting, too, that over this period of time, as the soils have become acidic, the produce has gone out the gate and the revenue has come into the farm. I do not know where that revenue has gone, but if you have slowly had an acid problem build up over 30 or 40 years, you have put a lot of whatever you have been growing out the gate as a saleable product and have generated quite a bit of revenue. Has it all gone into fertiliser or home improvements or new dairies or new cars? I do not know, but they have been paid for what went out, for what they have grown.

Mr SEITZ — Is that not like re-establishing a quarry after you finish quarrying?

Mr TOVEY — I wish we could.

Mr GIBSON — That is why we have to put the money up front, because if we walk away from it, the government keeps our money to rehabilitate. If it said, ‘You’ve all got to put up \$50 000 like the quarries do, so that when you leave your farm we can measure whether it is in the same condition as when you started’, that would be an interesting approach.

Mr CROWE — Farming is an awkward enterprise, and particularly on the economic side of things it can hardly be termed ‘reliable’. I think there is an urban perception that farmers are uncaring towards their environment, but to some degree it is a matter of education. Overall I have not met a farmer who would not try to improve his soils and environment in general. At the end of the day a lot of the problems are to do with economics.

Mr TOVEY — It would seem that Landcare has had severe cutbacks. Maybe there are issues there where finances could be considered, particularly with what you mentioned before about a cut-off point. I have here from Hifert a soil-testing kit which was sent out by the fertiliser company, and every fertiliser company does it.

The opportunity is there for the farmers to find out what is going on. On the back of the kit it says, ‘Contents: three sample bags; sampling instructions; sample information forms; sample bags; sample postage bags, prepaid; reply paid envelope’. If the farmer gets this all he has to do is take the soil test and send it back, and probably pay about \$100 for whatever is in the bag that he sends back. All instructions are there, including having postage either way paid, yet only 20 per cent of farmers do soil testing. That is still a major issue.

Soil acidity is only one part of the story. We look at the whole equation. We want the farmer to be successful, we do not want him just to buy lime — we want him to know what he is putting in and to get the benefit of the input, to make money so that the whole farming fraternity, country towns and so on benefit. But if only 20 per cent of them know whether what they are putting in is correct and addresses the problem, we have a long way to go. That might tie in: ‘Know your pH; know your cut-off period; do a soil test’.

Mr SEITZ — Are you in your industry GST exempt?

Mr GIBSON — No, we are an input like anything else.

Mr SEITZ — All the normal taxes apply?

Mr GIBSON — As a lime industry or to the farmer?

Mr SEITZ — As a lime industry?

Mr GIBSON — As a lime industry we get some assistance for fuel rebates for the quarries, for the digging-out part of our operations.

Mr CROWE — We are entitled to the diesel fuel rebate, but only on agricultural lime sold, not for lime sold for industrial purposes or road base and things like that.

Mr SEITZ — It is really that second leg — to get it onto the farm — where the big costs come in?

Mr GIBSON — Yes. In New Zealand, which has had big liming programs, they had subsidies on freight to move product around. They do that with hay sometimes; they will subsidise the freight on hay to get it from one end of the state to the other. It does not really matter if there is going to be assistance, whether it is at the quarry end or the transport end, although probably at the spreading end it is a bit different because a lot of farmers can apply their own lime. They can spread it themselves. Because it is a big, bulky product, they can buy a little spreader and do 100 acres or something if they want to.

A subsidy on freight would help move it. If you had hotspot areas and said, 'That is a designated bad acidity problem, it has dropped below a certain level and we need to fix it' and you can get a subsidy on freight, that would be one way to help fix some problems once they are recognised as being in a real problem area and impacting on some part of the environment that you do not want to happen.

The CHAIR — To follow up on the reference to New Zealand about the liming program, was that as a result of acid soils there?

Mr TOVEY — Yes. Over there they have a lot of small deposits spread throughout the country. They wanted to get things going and they gave a subsidy on freight. That was another initiative. It is a little like the New South Wales model, where they put the money into extensions and freight, but at the moment we believe there is so much more that needs to be done here if we can.

The CHAIR — Thank you. Your evidence has been very useful.

Committee adjourned.