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PRODUCTIVE SOLUTIONS FOR SALINE LAND

Yates

22 October 2003

The Committee Secretary
House of Representatives
Standing Committee on Science and Innovation
R1 Suite 116, Parliament House
Canberra ACT 2600

Re: Inquiry into the Coordination of the Science to Combat the Nation's Salinity Problem

SUMMARY

The catchment-based approach to salinity management provides an appropriate framework for management decisions on the basis that it integrates the causes and effects at a river system scale. However, the ability of this objective process to overcome the subjective human element that may resist adoption of new ideas and new Science must be seriously questioned. The capacity of catchment planning alone to deliver optimal environmental *and* economic benefits together must also be questioned.

Real and sustainable land use change at the scale required to significantly impact on salinity and deliver new, sustainable land-use industries will require a radical shift from our current land use practices. Under an open ended catchment planning system, changes of the type and magnitude required are likely to meet resistance, or be met with token "tweaking" of existing land use practices to deliver a modicum of salinity benefit or to meet modest salinity targets that serve to deliver a false sense of achievement but effectively perpetuate the status quo, without delivering a truly sustainable outcome for future generations.

The widespread adoption into routine practice of scientific advances and land-use options that can deliver real and sustainable salinity benefits will require a proactive effort by catchment boards, which in turn may require a more structured and holistic approach to NRM investment strategies. NRM plans that aim to deliver on the triple bottom line cannot achieve this objective if they focus solely on environmental outcomes without introducing economic considerations into planning options.

In this context, it is recommended that catchment management agencies introduce resource or industry development planning into their NRM planning and funding prioritisation process in order to establish the necessary frameworks to facilitate, promote and bring about the co-ordinated adoption into mainstream practice of revolutionary, science based industries with the potential to make significant contributions to salinity management and sustainability.

Yours sincerely

G. T. Dale

Dr Glenn Dale
Technical Director
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PREFACE

The following submission primarily addresses Part (a) of the terms of reference: use of the salinity science base and research data in the management, coordination and implementation of salinity programs.

Further, the submission is made principally in relation to the category of scientific research aimed at developing technologies and applications for various on-ground works and interventions, variously referred to as "applicable knowledge".

INTRODUCTION

A central criticism of the Federal Government's current approach to salinity management is that by default, it largely promotes a continuum of the status-quo with tinkering around the edges to achieve a modicum of salinity benefit, and fails to foster and stimulate the "Revolution in Land Use" widely promoted by the science community and which is obvious to the informed and independent observer. The current approach fails to put in place the structures necessary to ensure catchment boards make the hard decisions necessary to promote and foster radical change that is required to reach long-term sustainability.

It is now widely accepted, and herein acknowledged, that no single land-use option will halt the spread of salinity. It is further widely accepted and acknowledged that land use changes to address salinity must deliver leakage rates past the rootzone that approach those of natural vegetation, or land use systems must establish a net water balance that approaches that of the pre-clearing environment. This may involve balancing increased recharge under crops with increased discharge from fast growing trees, drains, pumps etc.

As stated by Stirzaler *et al.* (2000)[1], this will require a "revolution in land use" involving widespread change to profitable, commercially driven perennial vegetation and reduced leakage farming systems. By virtue of the nature of the required revolution, it will require taking many existing landowners outside their comfort zone of knowledge and current land use practices. Human nature of comfort within existing knowledge is likely to dictate that such a revolution is unlikely to happen and, even despite altruistic intentions, is more unlikely where existing landholders are the principle drivers behind catchment management boards unless the transition to new, currently foreign land-uses and land-use systems is (a) driven by functions and structures within catchment boards based on due process and objective science, and (b) is fostered and supported through Federal and State Salinity Management programs until new and sustainable land use systems are established and proven to the stage where they become widely accepted and commercially viable in their own right.

The change to perennial land use systems is about more than the change of land-use practices on individual farms. It is about the development of new industries and resources that may not be viable until they reach a critical mass of adoption, and hence produce a critical mass of

[1] Stirzaker, R., Lefroy, T., Keating, B., and Williams, J. (2000) A Revolution in Land Use: Emerging Land Use Systems for Managing Dryland Salinity. CSIRO Land and Water. 23pp.

produce. As an example, if our farming systems were based primarily on perennial crops, then successful demonstration of, say, wheat growing on a single farm or a number of farms would not constitute a new industry. It would only become such once a sufficient number of farms adopted wheat growing and produced an adequate quantity of product that they could justify handling facilities and could aggregate sufficient produce to develop a marketing presence to enter national and world markets. While individual farms operating in isolation could identify niche markets for their products, they will not deliver the scale of land use change required to address salinity comprehensively, and so are ignored in this discussion. Conversely, at the scale of land use change required, very large volumes of product will be generated, hence the focus in this discussion on achieving a sufficient scale of adoption to sustain handling facilities, processing infrastructure and to form marketing blocks that are typical of any world competitive scale agricultural industry whose produce can compete efficiently on world markets.

The same scenario applies to the adoption of agroforestry or farm forestry as a credible and serious enterprise despite the obvious benefits it has to offer agricultural production.

AGROFORESTRY AS AN EXAMPLE OF THE NEED FOR SALINITY MANAGEMENT AND IMPLEMENTATION TO BE MORE SUPPORTIVE OF LAND-USE OPTIONS INVOLVING SUBSTANTIAL CHANGE FROM CURRENT PRACTICE

In "A Revolution in Land Use", Stirzaker *et al.* identify "Commercially driven tree production systems and/or new tree species" as being one of three key land-use changes necessary to save the Murray-Darling basin.

Yet the adoption of agro-forestry in the 400 to 800m rainfall belt, the principle region affected by salinity, is staggeringly low. This region typifies the stark separation of forest tree cropping from agriculture in Australia, and highlights the Nation's failure to capture the many benefits of integrated agricultural and forestry systems, in addition to the benefits that trees may provide to water balance and salinity.

The failure of the catchment management planning process to embrace and seriously promote the adoption of commercially driven agroforestry despite extensive rhetoric of its benefits, and advances made in profitability through research such as that carried out by the XylonovA R&D Program and Saltgrow, is highlighted by a recent Expression of Interest document put out by the NSW Department of Infrastructure, Planning and Natural Resources for the Murray Region. The expression of Interest (Contract No MY100.03) called for on-ground works for a range of activities including 12 to 13 ha of plantation and agroforestry for salinity benefit across three regions – a total of 37ha. An area of 37 ha of plantation forestry in isolation can be considered as nothing more than a hobby, when a viable industry capable of achieving world competitive costs of timber production requires a resource base of 20 to 50,000 ha (requiring a minimum planting rate in the order of 1000 ha/year) within an economic transport distance (approx 150km) of a timber processing facility.

The serious adoption of commercial forestry by farmers will only occur if they can view forestry in the way they view any other crop – the availability of genetically improved material together with production systems that will provide an economic return, and a ready market for the final crop. As any individual farmer will be unable to establish sufficient plantation area to achieve a minimum critical mass of resource, an industry can only develop if the resource is developed across many properties. This then creates a chicken and egg scenario of who takes the first steps in establishing commercial plantations toward the development of a viable regional mass – farmers will not plant commercial trees if they cannot see their plantation being part of a viable local resource; and a viable local resource will not develop if individual farmers do not begin to put in place the numerous, small individual plantation parcels that will eventually create a critical resource mass.

For this deadlock to be broken in order to achieve the establishment of trees into the landscape on a sufficient scale to deliver salinity benefits and to create a viable timber commercial timber resource requires development and promotion of a broad, overarching planning framework that:

- Identifies zones across the landscape where trees can provide salinity and other environmental benefits;
- Identifies a logical location where central timber processing facilities may be established;
- Identifies a "Resource Catchment within an economic transport distance surrounding the logical processing location. This resource Catchment will overlie the biophysical catchment in which environmental benefits are targeted.
- Allocates an adequate proportion of catchment funding to help achieve the critical mass necessary for agroforestry development to become self-sustaining.

Importunately, any such plan will set targets for rate of plantation establishment, and will provide support to ensure the achievement of targets until such time that the "kinetic hump" resisting adoption is surmounted and resource the development program takes on it is own momentum.

It is clear that any such plan that promotes the development of a new industry such as agroforestry will require a long-term perspective in both policy and funding. A twenty year resource development plan with a five year policy horizon and a one year budget will fail to instil the confidence necessary to achieve serious adoption.

An example of the type of resource-development planning necessary to provide new industries with a context which can provide confidence to support their development is provided in the following two attachment:

- Attachment One: Wagga Framework Proposal, presents such a proposal developed and promoted by Saltgrow to foster investment in and development of a new forest plantation industry in the Wagga region.

- Attachment Two: Dubbo Farm Forestry Paper, discusses the potential for developing new perennial based cropping industries based principally on high value solid-wood production and improved forest tree genetics more generally.

OTHER COMMERCIALLY-DRIVEN DRIVEN TREE PRODUCTION SYSTEMS

Agroforestry is used above to illustrate the planning framework necessary to bring about adoption of the sort of commercially-driven tree production systems that are identified by Stirzaker *et al.* as a key pillar of arresting salinity and achieving long term sustainability. The same principles would apply to say, nut crops, biomass crops etc, although the critical scale of resource may vary. Without a dedicated industry development planning framework supported by adequate, long term funding to foster the establishment of such industries until they reach a critical mass to become self supporting and generate their own internal confidence, then the aim of commercially-driven driven tree production systems on the scale necessary to deliver real salinity impacts will remain rhetoric, and the goal of sustainability will remain unattainable.

REVIEW

In review, the following points and recommendations are made:

- Sustainability of agricultural production will require radical land use change to involving integration of extensive areas of perennial production systems throughout the 400 to 800mm rainfall belt.
- Current science, including work carried out in our own program, has addressed the technical limitations to breeding commercially viable forest tree germplasm capable of supporting a commercial forest plantation industry integrated into the agricultural production systems of the drought and salinity affected 400mm to 800mm rainfall belt.
- Integrated forestry and agricultural production systems offer water-balance and in turn, salinity benefits, but also provide numerous other benefits including structural diversity in plant cropping systems; providing habitat and corridors for birds and wildlife; buffering and protection of remnant native vegetation; shade and shelter for stock; windbreaks for crops; enhanced aesthetics of the rural landscape; and habitat for natural predators of insects that attack crops and pastures allowing reduced use of insecticides.
- There is a growing awareness among farmers themselves (independent of the scientific community), who have practiced tree planting to date that they can ***enhance*** or at least maintain farm profitability when they have planted up to 20% of their property to tree and shrub species, and that this improvement results from the benefits outlined above of having trees on their farm. This experience directly contradicts the once held "common wisdom" that areas planted to trees took land out of production and had a direct negative impact on farm revenue.
- Given the benefits (both at the farm and catchment level) of integrating trees into the rural landscape, farm profitabilities could be further increased where commercial trees are planted.
- Australia currently has a critically low level of integration of forestry into agricultural production, despite the obvious and wide ranging benefits.
- In 2001, the Murray-Darling Basin Commission estimated that 4% or 1.5 million ha of the Murray-Darling Basin would need to be converted to new plantation forests to restore water balance to the Murray-Darling Basin. The investment to achieve this

target was estimated at $17 billion over 50 years. It is clear that a nation the size of Australia will require commercially-driven tree production systems to achieve this critical target.

- The isolated adoption of agroforestry by leading landholders, or by third party investors on leased agricultural land does not constitute an industry, will not provide adequate produce to justify modern processing facilities, will not produce product competitive on world markets, and will not achieve the scale of adoption required to deliver significant salinity and environmental benefits.
- Promotion and development of radical new industries such as forestry in the 400 to 800 mm rainfall belt is not limited by Science, but by the level of support and nurturing required to incubate an embryonic industry.
- To foster adoption of new industries that involve radical land-use change from current farming practices, and to truly be able to deliver on the triple bottom line, catchment and natural resource management agencies need to introduce resource or industry development planning into the NRM planning and funding prioritisation process.

KEY RECOMMENDATIONS

Based on the above considerations, and in order to overcome the barrier to adoption of new land use practices with significant potential contribution to salinity management, the following key recommendations are made with respect to enhancing the management, co-ordination and implementation of salinity programs:

> It is recommended that catchment management agencies introduce resource or industry development planning into their NRM planning and funding prioritisation process in order to establish the necessary frameworks to facilitate, promote and bring about the co-ordinated adoption into mainstream practice of revolutionary, science based industries with the potential to make significant contributions to salinity management and sustainability.
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> To facilitate this approach, it is further recommended that catchment authorities be required to establish a broad framework for expenditure between different categories of land-use options in order to give new enterprises within each option some level of funding scope and security in order to provide the confidence necessary to encourage investment in new, science based land-use industries.

The importance of these innovations in NRM planning to the future prosperity of Australia cannot be over-emphasised.

ATTACHMENTS

Attachment One: Wagga Framework Proposal
Attachment Two: Dubbo Farm Forestry Paper

Hewson Council
7/11/03