

23 October 2003

Mr Jerome Brown
Inquiry Secretary
Science and Innovation Committee
R1 Suite 116
Parliament House
CANBERRA ACT 2600

Dear Jerome

RE: Science to combat salinity

NSW Farmers' Association is the largest farm lobbying organisation in Australia, representing approximately 13,000 farmers in NSW.

Importantly, these members manage a significant area of productive farmland in NSW – some of which may be experiencing or susceptible to salinity problems. In addition, many of the Associations members are irrigators who rely on good water quality to sustain their farming enterprises and the environment they live in.

Therefore, Association members have an inherent interest in how science can be best coordinated to combat soil and water salinisation.

Listed below are a series of concerns and general comments that farmers regularly express to the Association in relation to scientific research into salinity problems.

Where does the best scientific information reside?

An issue that has emerged over the last 10 to 20 years is the sheer volume of salinity research and extension that is being undertaken by numerous research institutes, CRCs, regional and metropolitan universities, and Federal and State government departmental agencies – often in the same region or catchment. Some of these organisations maintain strong links, while others rarely collaborate on scientific methods and results.

This level of commitment to salinity research should be commended and most likely promotes healthy competition amongst research bodies and government agencies, but communication problems can emerge when so many different organisations are involved in the same issue.

For example, a cotton grower in the Liverpool Plains of northwestern NSW who is concerned about the development of salinisation on his/her property may find it a difficult exercise to source the best available scientific information.

To access salinity information, does he/she contact the (1) CRC for Sustainable Cotton Production at Narrabri, (2) NSW Department of Infrastructure, Planning and Natural Resources at Gunnedah, (3) NSW Agriculture at Gunnedah, (4) CSIRO at Canberra, (5) CRC for Plant-Based Management of Dryland, (5) CRC for Catchment Hydrology – just to name a few!

Chances are that all these groups have at some stage carried out research (e.g. soil and water sampling, remote sensing mapping, data analysis etc) in the Liverpool Plains area.

Basically, the local communities need a 'one-stop shop' to access accurate, up-to-date and well presented salinity information.

It begs the question, what mechanisms are in place at the Commonwealth or State level to facilitate the communication and exchange of ideas, methods and results between the different research organisations and government agencies?

For instance, do salinity researchers at the NSW Department of Infrastructure, Planning and Natural Resources at Gunnedah collaborate regularly with researchers at the CRC for Sustainable Cotton Production at Narrabri? Do they use similar methods to measure, monitor and map soil and water salinity?

In short, is salinity research at the regional scale coordinated between organisations and agencies?

Similarly, is there a single organisation – at the Commonwealth or State level – that collates salinity information for the regions/catchments? A National or State audit of existing and proposed salinity research may be advisable. Basically, who's doing what, and where?

It may be feasible for the Commonwealth or individual States to create a central repository that contains salinity information that can be accessed via the internet? Once institutes and agencies have completed their research, their results can be forwarded and posted on this registry. Hence, for example, all the salinity information available on the Liverpool Plains can be assessed quickly. This system may also help to prevent duplication of research.

Furthermore, is there a single organisation that monitors on-going salinity research to prevent duplication and encourage the adoption of new and improved salinity assessment techniques?

In the United States, salinity research and assessment have largely been consolidated under the 'one roof' at a Federal facility located in Riverside, California. From 1947 to 2000, this facility was known as the U.S. Salinity Laboratory. It is now known as the George E. Brown, Jr., Salinity Laboratory – A National Research Laboratory looking at the Biology, Chemistry and Physics of Salt-Affected Soil-Plant-Water Systems. Importantly, leading salinity researchers and extension officers are based at this facility.

What farmers need to prevent, halt or reverse salinity

Farmers attempting to prevent, control or reverse salinity require two essential things.

1. Accurate, up-to-date and well presented salinity information that is based on sound science – preferably at the field-scale.

Maps of salinity at the catchment scale are suitable for broad based strategies, but to **successfully** combat salinity at the farm scale landholders require good information at the field-scale. It stands to reason that if you encourage farmers to change their practices at the field-scale the result of this change will eventually extrapolate to the broader catchment scale (i.e. from the bottom-up approach).

Farmers live and work on farm – not in a 'catchment'. They need access to field-scale modelling and monitoring tools that assist their decision making, and inform them of the salinity related implications of those decisions. Having these 'tools' readily available will do more to reduce the threat of salinity than will a large collection of catchment-scale plans.

2. Information that is readily accessible and easy to comprehend.

The majority of farmers are not academics, nor do they have the time to analysis complex scientific data. Additionally, like the rest of the population they do not have the time (or inclination) to speak with countless agency staff or researchers.

A farmer needs to be able to make a minimum number of phone calls to access the right information. Furthermore, salinity information should be presented in an easy to understand format – preferably a map indicating areas of salinity risk etc.

Local extension officers can then provide the farmer with **targeted** strategies and tools (i.e. re-vegetation, irrigation scheduling, lining leaky channels, drainage systems, salt tolerant pastures etc) to prevent or halt salinity at the field-scale.

What is the best methodology to measure, monitor and map soil salinity?

Farmers are often recommended a wide range of high-tech remote sensing techniques for measuring and mapping soil salinity (i.e. radiometrics, magnetics, airborne and ground electromagnetic induction etc). Often, researchers and agencies will argue about the merits and validity of different mapping techniques. This can be very confusing (and expensive) when it comes time for the farmer to decide on which method or data set to use for his/her salinity problem.

Are some methods better than others? If so, this information should be made available to the farming community.

There may be the need for an expert panel of salinity researchers to recommend the best techniques to assess salinity.

The jargon of salinity science

A system that standardises the measurement units of soil and water salinity is needed for the farming community to become comfortable with the complexities of salinity science.

For example, in relation to water salinity the following units are commonly used in the research literature/maps etc:

Total Dissolved Salts (TDS)

Total Soluble Salts (TSS)

EC units (siemens, deci-siemens, milli-siemens etc)

This varying terminology can be very confusing – since, these units can have different levels of magnitude.

In short, can a standard measurement unit for soil and water salinity be adopted by all Australian research agencies?

Recommendations

- A National or State audit to uncover the volume of existing or proposed salinity research activities (catchment by catchment).

- National or State body to collate and present available salinity information and research activities – a central repository of information that can be easily accessed by farmers (one-stop shop).
- Structure established to ensure that research institutions and government agencies in catchment areas are actively collaborating on existing and proposed research activities.
- More focus placed on field-scale studies and extension (i.e. at the farm level).
- Standardisation of measurement units (i.e. uniform approach to reporting soil and water salinity).

Regards

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