

EMERGING ISSUES AND THE ROLE FOR PASTURES:

TACKLING SALINITY ON THE FARM

Bill Barber

Farmer & Grazier
"Silverdean"
BALDRY NSW 2867

Abstract: Salinity problems can present management problems to farmers through loss of productivity and degradation of their property. To redress the problem, each landholder must first acknowledge that the problem exists and then make a commitment to carry out the works on his farm according to a well-developed farm and community-based plan. Activities centre around discharge and recharge areas should be planned and co-ordinated with adjoining landholders and government agencies.

INTRODUCTION

Salinity is the most serious problem facing this country today. It is severely limiting crop and pasture production on some of the best soils (those alluvial soils associated with depressions and flowline) and can render some land totally unusable for agricultural activities. The slow onset, followed by rapid degradation (salinization) is a serious problem for property management. Most people are now conscious of Landcare, and help available today via the Soil Conservation Service and other Departments to redress salinity problems.

"Silverdean" (320 ha) is run in conjunction with "Castle Hill" (380 ha) and is situated between Parkes and Wellington in a 650 mm rainfall area. Topography is gently undulating with drainage towards Little River and then to the Macquarie River. Soils which are derived from granites (fine grained), basalts and conglomerates are predominantly Euchrozems and non-calcic brown soils.

The property had been cropped continuously for many years prior to our purchase in 1960. To prevent the tremendous runoff which was evident at this time, we chisel ploughed to a depth of 25 cm and sowed the property to clover and rye based pastures. The chisel ploughing proved effective in stopping the runoff, but may have added to the rising water table problems. Attempts were made to sow kikuyu in wet areas, but it quickly died due to salinity levels. Little water erosion occurs on the property as most water "soaks into the soil".

Salinity first appeared at "Silverdean" in 1956/1957 with two small outbreaks, about the size of an average room. Over a number of years the affected areas increased slowly, but over the last 5 years the problem has intensified and now about 100 ha of "Silverdean" is affected to various degrees of salinization. This has not only reduced productivity of pastures, but has also affected livestock production. For example, we had pigs die when watered from a dam which collects water from a affected area below the house. At

present, the water quality in this dam is equivalent to approximately 1/2 seawater.

PROBLEMS FACED

The first step to solving the problem is to accept that salinity is a problem on your property and then make a commitment to tackle the problem. Your future, your children's future, and your country's future depends on your efforts to control salinity on your farm. It is not a problem which will go away naturally without intervention.

Problems faced on "Silverdean" as a result of salinity include:

- Waterlogged and boggy areas.
- Bare white patches and areas of reduced pasture growth.
- Stock water resource diminished.
- Tree death.
- Erosion of bare wet patches.
- Rapid increases in size of salty areas with wet years.

As the first stage in the control program at "Silverdean", a farm plan was drawn up by the Soil Conservation Service in consultation with myself. Although this was time consuming, it was well worth while as you must frequently refer to this blue-print to properly implement the program.

SOLUTIONS ATTEMPTED

A group consisting of myself and four neighbours approached the Soil Conservation Service in 1988 to conduct studies into ways to arrest and reduce the effects of salinity. An NSCP project application was made and approved to carry out practical treatments and survey methods in "salted" catchments. Various programs were carried out on a demonstration area of 3,000 ha spread over five properties.

The geology and soil of a small catchment (269 ha) on a neighbouring property was extensively surveyed at the surface and by drilling. Electro Magnetic Induction surveys were undertaken, and modelling procedures used to collate the data. This base information from this catchment was used to develop a property plan for "Silverdean".

The property plan had various levels of information such as infrastructure, soils, and geology, contour banks and fencing changes, trees for salinity control and windbreaks, land capability and recommendations for problem areas.

The "Silverdean" plan was integrated with the plans formulated for the four other properties in an overall strategy for salinity control.

ACTIVITIES CARRIED OUT

The following activities were initiated under the plan:

- Saltbush planted in a salt patch for grazing.
- Trees planted in discharge areas to "sop up some water" and limit erosion.
- Lucerne established on mid-slope areas.
- Large tree lots established on rocky hill tops.
- Windbreak areas sown by direct seeding, speedling and tubestock methods.

All the work carried out on "Silverdean" was monitored closely by Allan Nicholson of the Soil Conservation Service, Wellington. In the first stage, it was difficult to convince myself to do large enough areas in the salt patches. The areas that were fenced off initially were not large enough as the salinity has expanded past the fences in some areas. Electric fencing is now being used as the traditional type of fence is too expensive to enclose such large areas.

Tubestock, speedlings and direct seeding have been used. Deep ripping some months prior to planting then mounding to a height of 30 cm followed by a rotary hoe, leaves an excellent seedbed for trees. Mounding of discharge sites has greatly increased the survival of trees in wet, boggy and salty areas. Also, mounding significantly increased growth of plants in windbreak plantings.

Spraying for weed control around trees has been carried out using 1.2 L/ha Roundup® and 75 ml Goal®. A maintenance over-spray of Goal® has been used as well as shielded sprays of Roundup®.

Some tubestocks have been hand planted in some areas, but this was slow and time consuming. Hand planting has been carried out by myself, contract labourers under the NSCP program and by volunteers from the Australian Trust for Conservation Volunteers. The use of a mechanical planter (shelter belter) speeds up the process considerably. Speedling stock was planted with a cabbage planter, and after 12 months there is very little difference in growth patterns between the two type of stock.

Direct seeding offers the most exciting development. Three 500 m windbreaks were seeded last August with

generally excellent results. The areas were 4 or 5 rows wide with the operation taking approximately 4 hours. The saving in time is of great importance as far as cost and speeding up the process of planting trees goes. The cost saving is approximately 10% of cost of tubestock.

The selection of tree and pasture species to plant was determined by the planting location. Native trees such as *Casuarina cunninghamiana*, *Casuarina glauca*, *Eucalyptus camadulensis*, *E. sargentii*, *E. occidentalis*, *Melaluca hal-maturourum*, *Melaluca bracteata*, *Acacia saliga* and *Acacia stenopylla* are being planted on ridges and in windbreaks. Lucerne has been planted on soil types that will carry its growth where it is used to increase water use in the catchment to reduce salinity effects.

RESULTS TO DATE

Salinity treatment will take a long-term commitment. It is difficult to fix in 3 or 4 years something that has taken 50-100 years to develop.

Immediate results to date include:

1. Improved value of property resulting from use of trees for shade and shelter;
2. Simply by fencing and de-stocking affected areas, growth on most bare areas will reduce visual effects and erosion hazard of salinity;
3. Old man saltbush has been hand planted into a small area of wet ground and is doing extremely well. Larger areas will be planted in the next year. The ground is now much drier after 18 months and is ready to be grazed in autumn next year.
4. Property plans allow activities to be carried out as time and funds allow.

Treatment measures have been carried out over approximately 60% of the property to date. Total program costs are in the vicinity of \$90,000 of which I have contributed approximately 60% of funds.

SUMMARY

The main points:

1. Decide that you need to do something.
2. Form a Landcare Group. Encourage members to work closely together.
3. Consult with your local Salinity Control Officer.
4. Form a plan of attack.
5. Plant larger areas than you think they should be, and use the plant species that does the best job in specific location:
 - Lucerne and deep rooted pastures on mid-slope areas.
 - Native trees on hilltop ridges and windbreaks.
 - Salt tolerant species that have some productive use *ie*: Saltbush, *Casuarina*'s.