



Click on images for larger view



Figure 1. Location of the Pauley's farm at Dudinin



Figure 2. Areas seeded with saltbush *Acacia saligna*, tall wheatgrass and puccinellia.



Figure 3. Young seedlings grown in a shade cloth covered stock crate.

Farmnote

Don't wait : revegetate

By Avril Baxter

"I would like to have an aerial survey flown of our whole catchment and produce a map showing where most of the salt is stored and the location of dykes. It would probably be quite daunting to realise how big a salinity problem we may have in 20 years time"

Des Pauley believes that such foresight would be wonderful, as five to ten years ago he did not believe that salinity would be such an issue on his farm. "Electromagnetic data gives you a couple of years grace. It allows you to stabilise area before the problem becomes apparent on the surface."

Background

The Pauley's [family farm at Dudinin](#) is in a 400 mm rainfall zone. The farm is a mixture of salmon gum and York gum flats, sand over clay on the slopes with gravels and sand pockets on the ridges.

Since taking over the farm 35 years ago, the family has cleared 150 ha of the lighter country.

Salinity through rising watertables on the extensive valley flats is the main constraint to productivity. The Pauleys are attempting to control the rising watertable by planting trees and shrubs in blocks on susceptible areas and by reducing the flow of water into these areas through planting deep sands, creeklines and belts of trees and shrubs at the change of slope.

Wind erosion control on the upper slopes, stock shelter, the protection of remnant vegetation and fencing to soil types are also part of the overall farm plan.

Saltland monitoring

Three major creeklines feed 100 to 150 ha of very flat land on the farm. Salinity first appeared in the creeks in 1978 and is now spreading along the valley flats.



Figure 4. River red gum (*Eucalyptus camaldulensis*) and golden wreath wattle (*Acacia saligna*) nine months after transplanting as bare rooted seedlings.



Figure 5. Eighteen month old *Acacia saligna* after its first grazing. It should have been grazed earlier to keep the feed at sheep height

When the Pauleys first started revegetating the area, they painstakingly fenced along the barley grass line. Some years later, the salt moved beyond the fenceline. Des now obtains data on watertable depths and salinity levels and treats a whole area, rather than fencing out small areas which will eventually succumb to salt.

Observation wells drilled throughout the flats in 1994 reached the watertable within a metre of the surface. In most cases it was very salty.

Des believes that the whole area will need to be alley farmed with single rows of trees approximately 30 m apart to allow cropping in between. "Most farmers find it hard to believe that productive land may not be so productive in three years time. But having found out the facts, it is better to rehabilitate the area with rows of trees or a forage system before the land becomes bare."

Establishing forage systems

When rehabilitating an area that is predominantly barley grass, the Pauleys sow a mixture of saltbush (*Atriplex sp*), blue bush (*Maireana brevifolia*), golden wreath wattle (*Acacia saligna*), tall wheatgrass (*Thinopyrum elongatum*) and puccinellia (*Puccinellia ciliata*). Rows of salt tolerant trees are planted approximately 10m apart in the slightly elevated areas where they are likely to survive.

When planting a large area with varying degrees of waterlogging and salinity, the Pauleys use a shot gun mix over the whole paddock and let the species sort themselves out. In one paddock of 32 ha, planted four years ago, 20 ha grew mainly saltbush and 12 ha mainly *A saligna*.

The forage systems are established by scarifying the area and broadcasting the seed from the back of the scarifier. There areas cannot be grazed for at least three years after establishment if trees are planted.

Grazing value of forage systems

Saltland forage areas are grazed from January until two months after the break of the season. This takes pressure off areas prone to wind erosion and allows other pastures to germinate and grow at the break of season. However, waterlogging in the middle of winter means the paddocks have to be destocked to stop the sheep pugging the ground.

Des is aware of recent research trials at Katanning which compared sheep grazing saltbush and understory grasses with sheep on unimproved saltland pasture. Results showed that apparent 'weight maintenance' in sheep grazing saltbush is actually water retention and the condition score of sheep fell at the same rate in both plots.

Des is the first to admit that sheep lose weight purely on saltbush and unimproved understory grasses, but says that sheep would lose weight anywhere on his farm at the end of summer without supplementary feeding.

Within this system, stock have access to a wide range of food including perennial pastures and stubbles with occasional supplementary feeds. He sees the 'bulk' in the perennial forage areas as a useful resource and notes that the sheep will graze the stubbles one day and the forage system the next. Access to good quality water is important when the sheep are grazing these areas.

Another advantage is that the plants are using water over summer, drying out the soil profile before the onset of winter rains. Salts are then flushed out of the topsoil by winter rains.

Bare rooted seedlings

The Pauleys are also planting between 10,000 and 15,000 bare rooted seedlings each year. Des grows these trees and shrubs for 0.8 cents each.

Seeds are sown in an old stock crate which is filled with 5 cm of sheep manure and covered with 10 cm of white sand as a friable potting mix. The stock crate is covered with shade cloth and the seedlings are watered every day and fertilised if necessary. Des has installed an automatic sprinkler system.

If necessary, the seedlings are pruned a few weeks before transplanting. At transplanting, they are separated in water and planted straight away. Des started using bare rooted seedlings in 1994, when he planted 6,000 seedlings on an area of deep gutless sand and on a waterlogged saline site with a salt watertable a metre below the surface in winter.

"I didn't know how successful it would be, so when I was on the back of the tree planter, I planted them as fast as I could which meant they were a metre apart. We had a 95 per cent success rate, so now I'll have to go back with a chain saw! However there is plenty of time for nature to thin them out." Success rates

were just as good in the 1996 planting season.

Using the Chatfield tree planter, the Pauleys are able to plant up to 1000 bare rooted seedlings per hour.

Des knew from the work of Dean Melvin of Dowerin that tagasaste (*Chamaecytisus proliferus*) and golden wreath wattle (*Acacia saligna*) would perform well as bare rooted seedlings and experimented with river red gums (*Eucalyptus camaldulensis*) which worked well. In 1995 he tried growing flat topped yates (*E. occidentalis*) and swamp sheoak (*Casuarina obesa*). Although they have grown well since transplanting, Des thinks that their root systems are not so well developed.

Des buys some seedlings in pots to increase the variety of species planted. He does not think that all species can be successfully grown in a bare rooted nursery. Des stresses that the nursery is still very much an experiment and that great care is needed in transplanting the seedlings.

Wind erosion on upper slopes

Wind erosion is being controlled by a system of windbreaks and planting on deep sands.

The Pauleys rely on soaks for water in the upper catchments and are careful not to plant on the slopes directly above them, preferring to protect these areas with windbreaks.

Tagasaste

A 16 ha patch of deep sand was direct seeded with tagasaste in single rows, 5 m apart, and was unfortunately devastated by grasshoppers. The following year the Pauleys reseeded the area in between the rows and later found that enough of the hard seeded tagasaste had survived from the previous year to germinate, making tagasaste rows 2.5 m apart!

Most of the tagasaste is now above sheep height as the rows are only 2.5 m apart which does not allow access for machinery to slash the plants. However, the Pauleys shear in February and use the area for stock shelter. The deep sand was also a major recharge area which is no longer contributing to the rising watertable on the valley flats. The Pauleys are thinking of buying cattle to get the tagasaste under control.

Golden wreath wattle (Acacia saligna)

Golden wreath wattle (*Acacia saligna*) was also planted as a forage shrub on small sections of gutless sands which were a

source of sandblasting on the emerging crops around them. *A. saligna* needs to be grazed within eight months of planting and slashed if necessary to keep the feed within sheep height.

Benefits obtained

Wind erosion has been greatly reduced. Des notes that the stock camp in areas that are protected by trees and shrubs and believes that due to this shade, the sheep are drinking less water in summer. Lambing percentages have also improved.

The Pauleys have not recorded a drop in the watertable over the last two years. Nor do they know whether they have slowed down salt encroachment as "...it might take off again in two years time with a particularly wet spring".

Controlled grazing has allowed samphire and some saltbushes to colonise previously bare areas and the 'bulk' provided in the perennial grazing systems is a useful summer resource.

As Des says, "The whole farm is now much more pleasant to drive around".

Future plans

As part of the overall conservation plan, every paddock will have some protected vegetation to prevent wind erosion, provide stock shelter and forage and use water. Small areas of remnant bush left within paddocks are also being protected and enlarged.

The Pauleys will continue to rehabilitate valley flats, now on a large scale. They will increase the variety of species used to hedge their bets. "Six years ago we only knew to plant saltbush. Now we plant a whole mixture of things and let them sort themselves out."

"We aim to halt the degradation on our farm. In 10 years time it will be a better farm than it was 10 years ago. We may not get it just right, but salinity will be a big problem in this area and if we don't do anything about it while we can, it could be an enormous problem."

Acknowledgement

Des Pauley can be contracted at "Brialee", Dudinin, 6363.

This account was produced with funding from the National Landcare Program projects 'Revegetation strategies for Land Conservation Districts of the Western Australian wheatbelt' and

'Upper Great Southern Key Farmers Sustainable Systems Promotion'. The author would like to thank David Bicknell, Agriculture Western Australia, Narrogin, for his assistance.

Further reading


- Bulletin 4262 'Tagasaste and *Acacia saligna* establishment using bare rooted seedlings' (Agdex 125/22)
- Farmnote No. 12/96 '[Tagasaste at East Toolibin](#)' (Agdex 125/21).
- Farmnote No. 13/96 '[Productive conservation - wildflowers, seeds and tourism](#)' (Agdex 282/20).
- Farmnote No. 26/96 '[Revegetation - clothing the landscape](#)' (Agdex 300/570).
- Farmnote No. 49/96 '[The importance of being sheltered](#)' (Agdex 300/570).
- Farmnote No. 59/96 '[Green feed in summer](#)' (Agdex 131/513).
- Farmnote No. 63/96 '[Farming with environmental benefits](#)' (Agdex 300/570).

Disclaimer: This material has been written for Western Australian conditions. Its availability does not imply suitability to other areas, and any interpretation or use is the responsibility of the user. Mention of product or trade names does not imply recommendation, and any omissions are unintentional. Recommendations were current at the time of preparation of the original publication.

This file: F06296.HTM **Date converted:** 8 Oct. 1998

© Copyright Chief Executive Officer, Agriculture Western Australia, 1996

Prime Notes
Index

A rectangular button with a gradient from light orange to dark orange, containing the word "Search" in bold black text.

Search



Figure 1. Location of the Pauley's farm at Dudinin





*Figure 2. Areas seeded with saltbush *Acacia saligna*, tall wheatgrass and puccinellia.*





Figure 3. Young seedlings grown in a shade cloth covered stock crate.





Figure 4. River red gum (Eucalyptus camaldulensis) and golden wreath wattle (Acacia saligna) nine months after transplanting as bare rooted seedlings.





Figure 5. Eighteen month old Acacia saligna after its first grazing. It should have been grazed earlier to keep the feed at sheep height

