

“Jangarri”: economics, environment, society

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A BRIEF description of my formative years and the location of my early development provides clues to my philosophy about life which influences my approach to farming. I was fortunate to have had the experience of an upbringing on the land during the 1940s, at Kukerin in the wheatbelt, and 1950s, in the Mount Barker region, in southwestern Australia. It was a period of rapid change when mechanization brought about development that far outstripped long-term planning. Huge areas of the Jarrah *Eucalyptus marginata* forest were cleared and burnt to make way for agriculture. The sandplains rich in flora and fauna were easily cleared for extensive agriculture. These changes left me with a feeling of regret and those who follow my generation will never know what we have lost. This period was a time when education taught the basics of life and when good “life” values were inculcated with sayings, morals and mottoes. Two of these I have never forgotten: “waste not, want not”; and “good, better, best, never let it rest, till your good is better, and your better best”. They have been guiding principles for me. I also hold to the sentiment that nature and experience are the best teachers and that nothing is more certain than change.

With this background, I have been driven to run “Jangarri” with three important objectives. The first is to manage the farm as an economic business, as efficiently as possible, with the long term in mind. The second is to protect, manage and rehabilitate those natural environmental features remaining on the property such as remnant vegetation, wetlands, waterways and native fauna. The third is to manage the farm in a socially acceptable way, that limits impacts off the farm both physically and visually, and at the same time providing personal satisfaction, enjoyment and a sense of pride.

REGIONAL HISTORY

“Jangarri” is about 30 km north of Esperance on the south coast of Western Australia (see Fig. 1, Hobbs 2003). Land in this region was released for agriculture by the Crown in the late 1950s on what was known as a conditional purchase basis. In the short term, after release of the land, the emphasis was to clear native vegetation as quickly as possible, firstly to comply with the terms of conditional purchase, and secondly, to cash in on what was akin to

winning a major lottery. In those early days it was merely necessary to clear native vegetation, apply seed and fertilizer and lush agricultural land followed.

Environmental and land degradation issues were either not recognized or simply lost in the “boom” mentality of the times. It was not until the late 1970s that a few people started to show unease with the degree of wind erosion and salinity occurring on agricultural land on the south coast. Loss of environmental stability was only accepted as an issue ten years later and by the 1990s remedial action on many properties was being carried out. However, in my opinion, these actions are too slow and too small to prevent further large losses of natural resources.

The Esperance sandplain, when cleared for agriculture, is susceptible to many forms of degradation. The flat, sandy surface and the windy nature of the region means it is prone to wind erosion. Naturally high levels of salt stored in the soil render it liable to soil salinity. Other forms of degradation include waterlogging, increasing acidity, increasing non-wetability, compaction, leaching of nutrients and loss of the buffering effect provided by natural systems. For example, riparian vegetation acted as bio-filters along waterways, native perennial vegetation had high water use, wetlands acted as storage sumps, and native birds controlled insects and pollinated plants.

PROPERTY DESCRIPTION

“Jangarri” is 2 500 ha and receives 450–500 mm of rainfall per year, of which about a third falls outside the winter growing season. Because the farm is on the northern edge of the sandplain merging into the mallee, the soils are transitional. They range from deep sand and the typical duplex soils of the sandplain, to the shallow sands over clay which are typical of the mallee. The original vegetation was low scrub of Chittick *Lambertia inermis*, banksia *Banksia* spp. and mallee (multi-stemmed eucalypts *Eucalyptus* spp.) with a dense heath understorey. Low lying and naturally saline areas supported paperbarks *Melaleuca* spp. and some eucalypts.

MANAGEMENT OF “JANGARRI”

Management of the property has concentrated on segregating the land management units; that is, recognizing soil types and areas at risk from

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the different forms of land degradation and fencing them accordingly. Where the risks of degradation are high or the returns from current enterprises are marginal, the land has been set aside and secured by fencing, revegetation and destocking. The cost to a management system of not treating the land this way is both short and long term. The short-term costs of inputs of fertilizer, chemicals and management on land producing low or often negative net returns reduces overall efficiency and average yields. The long-term effects are reduced future options as these soil types usually degrade easily, as well as contributing to on- and off-site salinity because of low water use. This can lead to economic pressure and loss of aesthetic values leading to lower property values. Due to high risk of land degradation these units generally create a major management problem.

OUR BREAD AND BUTTER COUNTRY

I believe pasture for wool growing is the most sustainable use on "Jangarri", although by 1996 higher than average prices for grain and decreased prices for wool were forcing a shift to more cropping. Continuous pasture of mixed legumes and grasses with different seed hardness, disease and insect resistance, as well as the ability to cope with differing climatic conditions, is employed on all the soils with a low degradation hazard. Superphosphate is the only input. The export of nutrients off-farm and the cost of transport for a wool-based management system are low.

The risk of carrying a fairly high stocking rate through the autumn period when there may be a shortage of feed has been covered by several management strategies. These involve reducing numbers of stock in exceptional cases. The spring "flush" of pasture is conserved as silage. This needs special equipment, but, if silage is made and stored correctly, it will not deteriorate and can provide high value feed.

In conjunction with silage, we lot feed weaners through until after the break of the season overcoming "weaner ill thrift". This allows close monitoring of these future producers of the enterprise; worm burdens, flystrike and shy feeders can be identified during the regular feeding routine. Lot feeding allows other stock to be spread at lower stocking rates over the rest of the property.

Grain is conserved for use with the natural dry pasture feed. Lupins, in particular, are conserved because of their ease of handling. In addition, perennial pastures, saltbush and Tagasaste *Chamaecytisus palmensis* are grazed on a rotational basis, particularly after summer rain which reduces the value of dry annual pasture feed.

Some areas of land with the potential to be productive, but also a high risk of degradation

have been modified to reduce the risk to an acceptable level. Such areas are some of the deep sands that are ideal for producing lupins. By installing an extensive series of windbreaks over this soil type we have developed a stable cropping system on land that had low productivity and water use, as well as high risk of wind erosion under pasture. Wheat, lupins, barley, oats and canola are planted using no tillage and stubble retention. The wind breaks also offer commercial potential as they are planted with Radiata (Monterey) Pine *Pinus radiata*.

Areas of non-wetting sand have proved difficult to handle, and as much of the farm is affected to some degree, large scale retirement from agriculture is not an option. Some form of vegetative cover is essential to use water from these sites which generally have low production. The most severe areas are sown to perennial pastures. Tagasaste planted in alleys and undersown with perennial pasture is another option used on the farm. Both options reduce the choice of management to grazing only, but in relatively small areas the value of feed produced out of season is high. Under conditions of good prices for livestock, this choice is reasonable and the system is very stable from a land degradation point of view. Trials of spreading dispersive clays on these non-wetting soils are also proving very positive.

WATER SUPPLIES AND MANAGEMENT OF WATER

Water for household and spraying requirements is more than adequate with all sheds being equipped with water tanks. A perched, fresh supply of ground water is used for all other purposes and is reticulated throughout the farm. Location of dams is difficult due to unsuitable soils or shallow, saline water tables. Unusual rainfall events and periods of high rainfall are managed by a range of methods. A series of shallow contour and "w" drains has been developed to manage surface flows and reduce ponding and inundation. Vegetation, including perennial pasture and fodder shrubs chosen for high water use, has been planted to lower water tables allowing soils to take on more water during periods of above average flow. Wetlands are preserved as natural buffers and sumps. In addition, pasture and cropping systems are managed to be as productive as possible to increase water use, reducing recharge as well as producing a higher economic result.

SALT SCALDS AND WATER LOGGED AREAS

These areas have been sown to puccinellia, wheat grass and salt bush to gain some productivity, reduce erosion and use water. The economics of

this are questionable, but the intangible benefits for landcare and aesthetics are high.

WETLANDS

These natural buffers for management of surface water have been fenced. Some that were badly degraded by livestock have been reclaimed by planting species which are tolerant of waterlogging and salinity. Other wetlands have regenerated naturally, particularly by native paperbark, sedges and rushes. These areas have become prolific breeding sites and refuges for an increasing number and variety of birds and other animals. Populations of birds are the main form of insect control on "Jangarri" with pesticide sprays only used twice during the past fifteen years.

REMNANT VEGETATION

Remnant vegetation has been left on low lying, stony or other ground generally unsuitable for agriculture. Protection of the extremely diverse flora, much of which is unique to this part of Australia, is a high priority. The fact that the flora is most prolific and diverse on what are regarded as wastelands justifies its protection by fencing to prevent its loss and the degradation of the land.

NATIVE WILDFLOWERS ENTERPRISES

In 1982, 20 ha of deep white banksia sand which had been cleared in 1981 was left out of the farming operations because of its inability to support pasture or crop. It was also at risk from land degradation. This area regenerated with native species and became a wildflower garden. In 1986 we participated in a feasibility study of wildflower production in the Esperance region. As a result, this piece of ground became a no risk, low cost, wildflower plantation. *Banksia speciosa* flowers were harvested each year from October to December with the returns being very acceptable and the diversification fitting into the farm programme. The vegetation has since become unmanageable for wildflower picking, although the option to regenerate a new stand by burning the old stand exists should we so desire. The area is large enough that we could do this and protect the resident fauna by rotational burning of selected areas within the stand.

REVEGETATION

Revegetating a high percentage of "Jangarri" has always been a goal to mimic natural protection of the land from wind and excess water. In addition, provision of conservation habitats, economic timber products, fodder and visually attractive areas are seen as important in balancing the effects of broad scale agriculture. The species planted are very diverse, from local and regional species through to the exotic.

Methods of establishment vary from use of seedlings, to direct seeding and natural regeneration. More than a third of the farm has been removed from conventional agriculture, most of which is now covered with deep rooted perennial vegetation.

MONITORING

Since 1988, eighteen bore holes have been monitored. This has yielded both good and bad news:

- On the deep sands protected by wind breaks which are part of our agroforestry operations, the water table has declined markedly. On areas of shallow duplex soils, water tables are stable or rising and are within the danger zone of two metres from the surface.
- Observation, rather than monitoring, of wind erosion has shown it to be of no consequence on the most fragile soils because of modification and protective measures. On the more stable soils under crops or pastures, occasional severe climatic events cause some wind erosion and will require more effort to protect them.
- Average crop yields on the farm are increasing. Fuel inputs have decreased due to a shift to minimum tillage and, finally, to no tillage. The amount of time spent in farming operations compared to the area planted is decreasing, showing increased efficiency.
- The condition of the remnant vegetation and the nature conservation areas on the property improves each year with the appearance of more fauna, both in variety and abundance.

CONCLUSIONS

To many people, the economic bottom line is paramount. I believe there are other bottom lines. We have been well rewarded over the years we have been farming "Jangarri" with the ability to withstand the natural stresses of drought, occasional crop failures, fluctuations in commodity prices and "crashes", as happened to the wool industry after removal of the Reserve Price Plan. At the same time, we have provided for the long-term economic and ecological stability of the farm. To me, this is the most interesting, if at times challenging, all-consuming occupation with rewards of a sense of purpose, pleasure of working with the natural environment, and an income that has provided for the needs of our families.

REFERENCES

- Hobbs, R. J., 2003. The wheatbelt of Western Australia. *Pac. Cons. Biol.* 9: 9–11.