



TreeNote

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Farmer experiences in farm forestry

Garry and Jan English, 'Jangarri', Gibson, Esperance

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Garry and Jan English's 'Jangarri' farm near Gibson is a landmark example of how a poorly producing property with many examples of land degradation can be improved and made productive. This 1534 ha farm lies at the headwaters of Coramup Creek, which is part of the Lake Warden chain of lakes catchment.

After taking ownership of their Esperance sand plain/mallee property in 1976, Jan and Garry set about solving its problems. Their innovative practices in re-introducing trees into a degraded landscape were recognised when they won the Western Australian Land Manager of the Year Award in 1989 and the National Landcare award - Primary Producer category in 1990.

The problems

On purchasing the first block of their farm (1050 ha) in 1976, Garry and Jan took over a low producing property that could barely maintain 1600 sheep. Much of the primary salt land was degraded, more was becoming saline and there were few living trees. A large tank-dam built upslope had too small a catchment for adequate supply. This made the property very vulnerable to drought in this 450 mm rainfall area.

With the farm in a transitional area between sand plain and mallee country, there is a mosaic of soil types ranging from deep sand to non-wetting sand, to shallow duplex, samphire wetlands, a chain of hyper-saline lakes and even a few shallow granite outcrops.

In winter of 1979 much of the farm became waterlogged and two years later Garry and Jan lost a lot of topsoil through wind erosion.

Innovative planning

After fencing off saline wetlands and installing drains to ease waterlogging, the English's adopted minimum tillage practices to counter soil erosion, and set about planning a tree planting program. After adding an adjoining 484 ha block to their farm, Garry and Jan engaged a contractor to carry out their first tree plantings in the winter of 1982. These trees were radiata pine (*Pinus radiata*) and a mix of eucalypts. That same winter a regeneration program was begun in a bush area on 20 ha of white banksia sand. In following years, banksia flowers (*Banksia speciosa*) were commercially harvested to provide valuable extra income.



Garry and Jan English and a southward view of one of their 200 m wide alleys created by radiata pine belts. Planted in 1984, these three-row tree belts are one of the most important features of Garry and Jan's revegetation program.



Jan and Garry in their 20 ha grove of regenerated banksias which were commercially harvested in the 1980s.

Decisions were also made to fence off areas becoming degraded by salinity and to realign paddocks to soil types. This new regime recognised that the productive recharge areas lay upslope from the salt-scalded discharge areas. These salt-affected areas included a 200 ha saline watercourse which included a chain of small lakes.

In 1984 Garry and Jan embraced the 'alley farming' concept by planting eight 2 km-long tree belts 200 m apart (the alleys) on 250 ha of deep sand. These belts were planted in five days and comprised 15,000 radiata pines in triple rows, with 3 m spacings between the rows.

In 1985 a trial planting of 6000 radiata and maritime pine (*P. pinaster*) at a spacing of 3 x 1 m (3000 trees/ha) was undertaken by CALM. To overcome establishment problems on old pastured land the non-wetting topsoil was removed by 'scalping' to ensure moisture was retained exactly where needed. The site, adjacent to the shearing shed, was chosen as an off-shears refuge for sheep during inclement weather.

Four years later, part of a raised area in the middle of the Coramup creek was planted as an intended arboretum of salt tolerant eucalypts and acacias. Three double rows of trees were also direct-seeded on pasture land with a mixture of seed mostly procured on the property.

These plantings were the basis upon which Jangarri was judged for the English's winning landcare award.

Locust plague

Almost immediately after Garry and Jan received their award, Jangarri was hit by the 1990 locust plague. Most affected were the three belts of direct-seeded trees which were about 0.5 m high at the time. Fortunately, most of the Bald Island marlock (*Eucalyptus conferruminata*) in

one of the tree belts survived and these trees are an impressive feature on the farm today. The locust plague also coincided with severe damage to seedlings on the island in Coramup creek. There, kangaroos ate the acacias, and spring beetles (*Liparetrus sp.*) damaged the eucalypts but left some of swamp yate (*E. occidentalis*).

Trial and error

Jan and Garry learnt from these experiences. After preparing the ground for 12 months, and spraying weeds several times, in 1990 they succeeded in establishing 20,000 trees on the island by direct seeding. Eight hectares were seeded in just two hours using their 28-run combine. Later in the 1990s they planted more belts of trees, which included mixtures of eucalypts, acacias, maritime pines and other exotic species. Meanwhile, on the salt scald areas and areas verging the lake, the fenced-off melaleucas had regenerated to replace what Garry had previously described as being a 'paperbark graveyard'. In some areas of old pasture there was also regeneration of Christmas trees (*Nuytsia floribunda*). Protecting them from stock for several years has allowed them to grow to mature trees.

Shearing shed pines

Fifteen years after planting, the radiata pines in the plantation near the shearing shed are tall and straight, though only of about 20 cm at breast height over bark (DBHOB). At 13.5 years of age these pines had an



A harvested area of closely-planted radiata pine (*Pinus radiata*) in non-wetting sands near the shearing shed at Jangarri. These trees provided poles for vineyard trellising in the south-west and fence posts for use on the English's farm. These trees are pruned to improve their market value.

average DBHOB of 13.6 cm and height of 16.4 m (stocking of 2599 trees/ha). Some of the *P. radiata* were sun-scorched on the northern side of the trees which rendered them as low quality for a range of products. There has been limited harvesting of these pines for vineyard poles and fencing posts. Adjacent to them is a similar-sized plantation of maritime pine. At 13.5 years these had an average DBHOB of 12.4 cm and were 11.3 m high (stocking of 2900 trees/ha). These pines are well short of the height of the 16 m-high radiata pines nearby but Garry says from this point on they will begin to outgrow the radiata pines.

Pine alleys

The radiata pines in alleys (three-row belts) at age 14 had an average DBHOB of 30 cm and height of 19.4 m. Trees in the two outside rows were mostly outgrowing trees in the centre row. There has been recent harvesting of some of these pines for large strainer posts, poles and fence posts. The contract cutters preferred to harvest the centre-row trees as they were generally straighter and had less branching owing to the restricted growing environment imposed by the two outside rows.



These newly shorn sheep in the alley are benefiting from shelter provided by the pine belts.

In the 200 ha of alleys between the eight radiata pine belts (planted in 1984), grain production has improved markedly over the years. These north-south tree belts provide excellent protection from wind to the extent that Garry says erosion is now a thing of the past. He is currently experimenting with claying the non-wetting sands in the alleys to enhance pasture and crop growth, using nearby clay. In claying, the very fine clay particles present a massive surface area that is not water repellent, allowing the water to disperse through the soil profile.

Lowered watertables

Observation wells have been used to monitor watertables on the farm for the past 11 years. Of



Garry and Jan at one of their several clay pits from which claying has been done to aid water penetration in non-wetting sands.

particular interest are five bores in the deep sands of an alley between the pines. Two are positioned within the tree line on either side of the alley, another two are 10 m from each tree line and the fifth bore is in the centre of the 200 m alley.

Apart from fluctuations in water levels in years of high rainfall, the watertable has gradually fallen. In Bore 8, between the two tree belts, the watertable was only 0.5 m from the surface in the very wet July of 1989. By July 1996, the watertable had dropped to 5 m, with fluctuations according to episodic rainfall events (see graph overleaf).

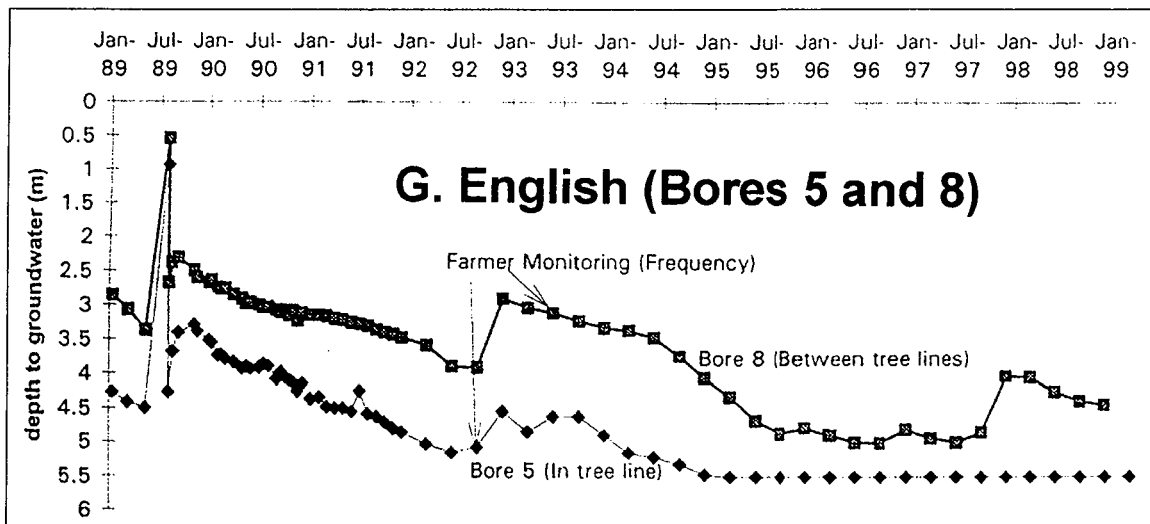
Meanwhile in Bore 5, within one of the tree lines, the watertable has fallen from 1 m below the surface in July 1989 to more than 5 m by mid 1992. By January 1995, the watertable was down to 5.5 m.

In another part of the farm a well in shallow duplex soil under annual pasture with no trees has recorded water levels that have varied from about 1.4 m below ground level, to the ground surface. These examples highlight the role of trees in keeping watertables down.

Marketing

While the trees on Jangarri have achieved their landcare objectives it has been more difficult to achieve the wood production objectives. This is because of a lack of markets for pine at Esperance coupled with the lack of tree management, such as pruning. Garry says trading timber rights should assist a farm forestry industry because the long term nature of timber production is a disincentive to many farmers who become involved. He supports the concept of a local cooperative that would buy timber rights for agroforestry on local farmlands.

Continued overleaf...



▲ Hydrograph showing groundwater response to the English's alley farming system. Note the effect of higher than average rainfall years from episodic events in 1989, 1992 and 1997.

◀ Garry at a monitoring bore within one of the 200 m alleys where satisfactory lowering of the watertable has been achieved.



populated by many birds where large flocks of swans, ducks and stilts come to feed seasonally. Where once the farm was extremely vulnerable to drought, Garry and Jan have restored and even expanded two freshwater soaks that are now vital, drought-proofing features of Jangarri.

The 8 ha island surrounded by the largest salt lake is now a 'showplace forest' comprising the planted mixed eucalypts (they have now grown to an average height of about 4 m), and acacias and other eucalypts that have regenerated naturally.

Today

Working with nature

Driving into Jangarri today is a far cry from the early 1980s when photographs of that time show bare paddocks and degraded, low scrub in the distance. On entry to the farm today, one sees a 600 m-row of mixed eucalypts 20 m high and a large pine plantation near the homestead. The radiata and maritime pines make an impressive sight. The introduced trees have transformed the farm landscape, enhancing its visual appeal while at the same time providing shelter from wind, control of soil erosion and they are valuable allies in the fight against salinity. The resulting more balanced landscape appeals to Garry whose family have farmed in Victoria for 150 years.

As landcare and agroforestry pioneers on the Esperance sand plains, Garry and Jan English have learnt lessons from nature through a determined process of trial and error. An underlying principle has been to treat causes rather than symptoms.

Other TreeNote titles

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