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Heartlands Field Trip

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General (relevant to all places visited)

Mediterranean climate – characterised by cold, wet winters and hot dry summers. Average annual rainfall is 800 mm.

Sustainable Agriculture Research Institute

Hosts: Jeff Nugent and Julia Boniface. *Location:* Nannup

The Sustainable Agriculture Research Institute, SARI, is home to two families. Jeff bought the 90 acre property in 1974 and has lived there for the past 20 years, 16 with his partner Jill. They and their two daughters live on one section of the property, Julia and Phil on another.

Only 20 acres of the property are used by the two families; the rest is bush land which was once logged for jarrah. Jeff believes the main threats now facing the natural bush land are dieback fungus and the controlled burns required by law to be carried out every 5 years.

The soil is variable, some areas are gravelly, others have a high clay content so a lot of work has been done to build them up. Julia said the main limit to expansion is water; quality, not quantity. The high salinity of the water is attributed by Jeff to agricultural practices carried out in neighbouring regions.

Solar energy is used to pump water from a bore on the lower section of the property up to the higher areas (a vertical distance of 42 m) during the summer months. The panels (a total of 21, each with a 60 Watt capacity) are fixed in a north facing position and pump approximately 2000 gallons of water per day. Solar panels are also fixed to the roofs of the houses to supply power for domestic consumption.

There are 6 dams on the property, each one supporting a different species of fish including carp, blackfish, black brim, redfin and also marron. The gardens grown by Jeff and Jill have taken on a life of their own over the years. They tumble in chaotic abundance over buildings and pathways. You never know what you will find around the next corner, an old red phone box, the solar passive home built by Jeff over the last 6 years.

The orchard is fenced off to keep emus away from the fruit. Pears, prunes, persimmons, hazelnuts and citrus are some of the fruits grown. A chicken tractor (4-5 chooks kept in a portable pen) is used in the orchard to keep grass down.

Both families use a system of rotating chooks with vegetable garden beds. Julia estimates that she and Phil grow about 80% of their own food. They breed rabbits and chooks for their own consumption. Julia uses a zoning system with salad greens such as Chinese cabbage, sorrel, New Zealand spinach, Japanese greens and herbs grown close to the house. Further out, broad beans, potatoes, peas, tomatoes and strawberries are grown. Fruits such as plums and apricots are bottled and made into wines.

The families have made a practise of collecting seeds from useful plants from Mediterranean, sub-tropical and temperate climates world-wide. Jeff said it has been a lot of work to find out which species will grow in the area. He has devised a simple and efficient way of germinating slow growing seed by planting it in barely damp coconut fibre in a plastic bag. He stores the bag in a warm place then pots the seedlings after sprouting. He uses yoghurt containers with lids on for small seed.

Small Tree Farm

Hosts: Andrew Thammo and Dr Christine Sharp. *Location:* Balingup.

Andrew and Chrissie opened their 100 acre (35 hectare) farm to the public in 1981 with the aim of providing farmers with trees that were both productive and able to be used for landcare. Over 100 different trees, exotic, rare, deciduous and native are available. Following is a small selection.

Poplars: Chrissie and Andrew promote the use of poplars on farming properties because some species are very salt tolerant and can help reverse the spread of soil salinity. Poplars are more dependent on ground water than rainfall and can make use of water courses in arid country that are often saline. They are sometimes sold as cuttings several metres tall.

Euphrates: Salt tolerant poplar with variable leaf form which can be used for erosion control and also provides suckers for livestock fodder. Sheep and cattle prefer the suckers to grass so these trees provide an economic incentive for farmers during the summer months when other feed is scarce. If unmanaged, the suckers do grow into thickets and concern was raised about the invasive nature of the species. Andrew believes this is a small risk, fairly easily avoided, and is outweighed by the great potential the species has as an economic means of controlling salinity.

Mahgreb: (native to Morocco, Tunisia, Algeria) An attractive, extremely fast growing and salt-tolerant poplar which provides good livestock fodder in the form of suckers. Andrew thinks the timber has potential as sawlogs.

Pryors: A semi-evergreen harvested for timber production at 15-16 years old; a bland hardwood used for internal mouldings and shelving.

Cottonwood: Elegant tree widely used for avenues.

New Zealand Willow: Used for erosion control.

Fat Eucalypts: The eucalypt is the most widely grown plantation tree in Australia but is very difficult to mill at a young age because it's wood holds a lot of tension. As the tree grows, the inner cells of the trunk are compressed and the outer ones are stretched so when the wood is cut the tension is released causing the cells to move and the wood to split. Rather than being used as a timber wood, eucalypts are used instead for energy production (fire and charcoal), as wood pulp and for the production of rayon.

Inspired by a New Zealand farmer who was milling 22 year old Sydney blue gum (the usual milling age is 70 years), Chrissie and Andrew set out to discover the secret of his success. The farmer believed the secret was to grow short and fat trees rather than tall and slim ones but didn't know if the size and height was controlled by genetics or environmental factors such as wide spacing between trees.

Chrissie and Andrew started trialing 'fat eucalypts' using seeds from 46 different families of eucalypt. They planted trees out on a widely spaced grid in May 1994 and are looking for species with a specific bark characteristic; rough with an interlocking grain.

Trees which don't have these characteristics are culled. So far half have been cut out and Andrew, who originally estimated that one in five trees would be left to grow to maturity, now thinks that figure will be one in ten. He wants to develop a superior line of trees to use as a seed orchard. The planting layout was designed to increase out-pollination.

The eucalypts will undergo a rigorous pruning regime beginning at 3 years of age and continuing until they are 8. By then Andrew believes a superior log size will have been set up for milling. At 25 years of age the timber yield of the fat eucalypts should far exceed their thin counterparts.

Fat eucalypt seedlings (Sydney blue gum, spotted gum, lemon scented gum, sugar gum and red ironbark) are now available for sale at the Small Tree Farm.

Oaks: Slow growing trees which live for hundreds of years.

Cork: grown for cork production.

Willow: grows to 50m, horizontal habitat, ornamental with good autumn colour.

Californian: grows to 50m, white oak with spreading habitat and edible acorns.

Portuguese: grows very well in the South West.

Paulownia: An extremely fast growing deciduous tree from China with large flowers which come out before leaves. A very attractive tree grown for it's timber.

Fire breaks

Fire retardant species include port oaks, chestnuts, *Acacia alarta* and the Mexican pepper tree.

Nanutarra

Host: John McGann. *Location:* Balingup.

John McGann bought this 33ha property in 1986 when it was a treeless, waterless, overgrazed, sandy block, “waste-deep in bracken fern”. The gully running through the centre was overgrown with blackberry bushes.



*Koppula Narasiah, Tony Jansen & Adam
Tiller at Nanutarra. (Photo: Leonie McMahon.)*

John said his driving force was to restore the land and to make it a model for others to follow. He has succeeded on both counts. The small valley is now covered in well established trees. A series of dams which support marron and silver perch and water the orchard and vegetable gardens have replaced the gully.

John said he hasn't used any one single regime to develop the property. He has borrowed from organic farming, biodynamics and permaculture.

Early on, the rectangular shaped property was divided into three: the middle section is the house block and the sections on either side of it are woodlots. The first trees were planted in 1987, including tuarts and acacias as a wind break from the easterly wind but most have been grown since 1990 when John first came to live on the property with partner, Lisa.

Trees grown include Sydney blue gum, sugar gum, wandoo (grown close for good timber production), marri, tagasaste (a support species and fantastic mulch), sheoak, plus English, Mediterranean and cork oak and chestnut.

John believes good preparation of the ground is critical. The trees were planted (up to 1000 a day) along contour lines made by a bulldozer. They weren't mulched or watered. In a good season he has a high survival rate but rabbits can do enormous damage, eating up to 200 trees a week in a bad season. The major expense in tree growing becomes the cost of fencing to keep them out.

John does some alley cropping. He is trying to introduce native grasses but has not yet been successful. He has developed a love-hate relationship with the bracken fern; a phosphorous accumulator and very good humus mulch. He rips it in summer to expose the roots and uses it as a mulch, of which he said he can never have too much.

The orchard, situated on a slope, is made up of pears, nashi fruit, nectarines, apples, pistachios, macadamias, avocados, plums and citrus fruits. John said he found terracing invaluable for growing fruit trees on sloping ground. A line of fig trees was grown along the eastern side of the orchard to act as a windbreak from hot summer easterlies. Because the figs are deciduous, they allow the winter sun in.

The orchard will eventually be fenced around it's perimeter and across the top to keep geese ducks and pigeons penned in and rabbits and parrots out.

John has grown 5 species of banksia on a 0.6ha plot, pruning them to produce masses of flowers which he sells for dry flower arranging. The flowers can't be taken from the wild, only from plantation grown trees.

The vegetable and herb garden runs across the slope on either side of the chicken pen. It has artichokes, asparagus, potatoes, broad beans and blueberries, lavender, rosemary and marigolds. The beds are rotated up and down the bank and mulched using nettles and arrow-root or cereal rye and bracken fern as green manure crops.

Yarri Springs

Hosts: Peter Hicks and Wendy Wilkins. *Location:* Balingup.

Wendy and Peter bought this 3.6ha property, formerly cattle grazing country, in 1980. At the time it was infested with weed grasses including couch, kikuyu grass, blackberry and bracken fern and the creek water was too saline for stock to drink. Sixteen years later, you can't see the weeds for the trees – or the bamboo.

The couple are permaculture consultants and run permaculture tours of their property. They have established a bamboo nursery and Pete also designs waterway systems using chinampas. They are also certified Level A organic growers and members of the Biological Farmers Association. They grow stone fruit and nuts for sale.

Pete in particular has a strong interest in bamboo. He believes it is the most versatile plant on the planet but extremely under-rated. It is flexible, light and strong making it a very useful construction material. At Yarri Springs it is used as verandah railings, the framework for a large pigeon dome, an enclosure in the creek for rainbow trout, handles for tools and stakes. It has other uses as an erosion control plant, for food and shade (both human and animal) and as a windbreak. Twenty five species are available for sale from the nursery but more than 60 species are grown on the property.

Mixed in with the bamboo that flourishes along the creek at Yarri Springs are Tasmanian blackwood, walnut, kangaroo apple, rosegum, redgum and bull banksia. To stabilise the steep slope behind the house tagasaste, acacia, cork oak, chestnuts and stone pines were planted.

The couple built their passive solar designed house of rammed earth, rock, jarrah and pine on a steep southern slope overlooking the creek. There is a glass house on the northern side and verandahs the rest of the way round. Most of the windows are in the northern and eastern walls, with a few on the west and south, which is well shaded by bamboo. In summer the west and south facing windows are opened to draw cool air into the house. The 5 year old paulownias are also good air conditioners, deciduous with big summer leaves to keep the house cool.