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## **Permaculture in Semi-Arid Areas and Patterns**

*Julie Firth (Australia)*

*[Presentation Report]*

Julie Firth manages a small dryland farm on the coastal sands of Western Australia just outside Geraldton. In this talk she described the development of her farm and the patterns she has begun to observe in nature. It is important to observe the patterns in nature and to apply them. This is particularly important, from a management aspect, to make a project viable.

Julie began to recognise plant communities by their colour, and the natural patterns around them. For example, the way that *Melaueca* species were distinctive from the surrounding species and were a different, lighter green when the seed was ready for collecting.

To bring an income into the system initially, Julie picked seeds and sold them. The northern side of the hills had a better seed set. She chose plants which tended to grow on the northern side of the hill, as these plants matured more quickly and were more established than on the southern side. An example is the seed/flowers along roads. She never took more than 40% of the seeds and found they came back stronger after a few years. Pest resistance, seed tolerance are true to form.

Julie has concentrated her systems more towards efficient cells. These are rectangular areas with compatible or related species of plants. For example, all of the crucifera family are planted together, all brassicas together and so on. Companion plantings of marigolds and sunflowers are included to help with the pollination attractors and pest deterrents. Julie uses decoy crops such as sunflowers for the grey and red Galahs so that they are not attracted to her crops. All of the gardens are used for seed collecting.

She uses shade cloth to stop cross pollination of companion plants. There is also a system of multi-layered plantings where crops can grow up other crops and provide nutrients in the soil. Seeds are kept from healthy crops that show good survival ability in the environment and also are pest resistant and true to form.

Using the knowledge Julie observed on hillside ecosystems, she built a mound out of car tyres, where she could harden off her seedlings on the side of the hillside that

she had collected the seeds from. She placed seedlings, out of the greenhouse, here in order to harden them up. The species are suitable for farm plantings to provide shade and be able to handle the harsh conditions in the desert. She offers contract growing to supplement her income.

A fruit garden was planted using the spiral technique but by inverting it. The spiral needed to work downwards in the hotter climate to provide shade and be more efficient in water use. She excavated all the white sand in a circle and replaced it with healthy composted soil. The trees were planted into the centre and then companion plants around them.

She found that as her size of production increased, her priorities changed accordingly. The layout of the gardens changed to accommodate the most efficient way of working. This happened to be a herringbone pattern so that plant produce was easily accessible.

The area has prolific wildflowers throughout the season, of many colours to suit pollinators. Julie learned to fine-tune varieties to come into flower at the right time to attract the main insect pollinators. Julie noticed that the colours of the wildflowers varied according to their pollinators and the temperature. For example, the acacias were the first to flower in the cooler, earlier winter months and the next colour was the pink and blue-pinks, following that was the blues and then the oranges.

## **Mulching systems**

Thick mulch was used to provide protection and moisture through the hotter months. This was in the form of compost and sawdust and straw.

Insect activity in deep mulch adds water to an area that was not normally wet. Slaters can be controlled using chickens in the area affected. Plants with a white milky sap also control insect populations. Collars on the seedlings also deter slaters – use milk cartons. Another mulch was made of three sheets of newspaper and collected seaweed and sea grass to protect the soil. This combination was 60 cm thick. In summer the micro-organisms were not around to break down the newspaper.

## **Notes**

Julie:

- Doesn't plant in the hot areas but waits until the first rains of the season.
- Uses living mulches, such as creeping saltbush and a lawn substitute.
- Raised the drippers to control an ant problem. It is a centralised system wired up at a height of 20 cm.
- Used an orientation of: tetragonias, carpobrutus, sweet potato.
- Planted peanuts around the eggplant.

- Planted succulents and cactus as a living mulch to hold the moisture in the soil. The cactus is a water holding body with an internal thermal mass.
- Plans to possibly create a living wall.

*Julie Firth, author of Permaculture Guidelines and Species List for Hot Semi Arid Coastal Regions, manages a small dryland farm on coastal sands in Western Australia, designs parks, school grounds, and farms, has a local acclimatised Seed Bank, and manages a wholesale Permaculture nursery.*

*Requests for her to teach mine site rehabilitation has led to her publishing a field manual: Rehabilitation of Arid Shrublands. Julie also conducts courses which introduce permaculture practices in arid landscapes to remote aboriginal communities aimed at setting up food gardens and seed picking enterprises, and facilitating aboriginal employment in the mining industry.*