

SUBMISSION

Agricultural Competitiveness White Paper

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Issue 2: Farmer decisions for improving farm gate returns

Focus: Learning from top performing farms

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What are the drivers and constraints to farmers adopting alternative business structures, innovations or practices that will assist them in improving farm-gate returns?

Drivers:

Production stability
Profitability of a niche product or service
Possibility of chemical free farming with no risk of harmful residue
Assurance that the property and business can remain in the family
Long term increase in land fertility
Confidence in the future

Constraints:

Fear of adopting a new idea, reluctance to change.
Mistrust of any concept advocating 'natural' systems
Intimidation and coercion by multinational companies selling conventional seed and fertilizer
Reluctance of educational institutions to adopt new practices or innovations
Reluctance of bureaucratic institutions to recognize new practices or innovations
Inability to access funds to finance new practices
Lack of market readiness for any new products
Inadequate market price for any new product

What tools, skills and advice do farmers need to effectively adapt and respond to the risks they face?

Permaculture* (or 'Permanent Agriculture') is a system, which, by definition is a permanent agricultural system. Within this system, therefore, there are strategies to deal with any eventuality a farmer may face. The strategies are sustainable, hence the system is permanent. See 'Learning from top performing farms' for more information.

Permaculture observes the environment in its natural state and applies these observations to the designing of the farm landscape and infrastructure.

The farming community of Australia needs to have access to a range of tools, skills and advice from permaculturalists to allow them to effectively adapt and respond to the risks they face.

What alternative actions or measures by governments, farmers or others would result in improved financial performance at the farm gate?

The funding and promotion of permaculture practice, would improve financial performance at the farm gate by providing a stable, sustainable form of production. Only sustainable agriculture can guarantee increased production, long term fertility and a stable farming society.

What approaches could be used to encourage improved drought preparedness?

The permaculture approach could be used to encourage drought preparedness by implementing infrastructure which not only caters for all extremes but *uses* the extremes of the Australian climate to the advantage of the farmer. No other agricultural practice does this.

For example, the use of the 'swale' or berm built on contour can prevent land being lost to

desertification. It can also act as a buffer against extreme dry periods. The swale acts as a barrier and gathers any moisture and wind blown natural debris to build a natural catchment. This catchment in turn retains moisture and builds fertility. This, then can be planted with windbreak and soil regenerating plants. The plants hold soil and shelter and shade land on the lee side to grow food crops or fodder for stock. These swales need not be large, a swale 10cms high can

retain moisture for up to one kilometer.** This means in a rain event, water is gathered, retained, pacified and allowed to soak beneath the soil. This means the implementation of plants in the soil is relatively easy. Swales can be created with earthmoving equipment, and in particularly drought prone areas (which tends to feature wide flat stretches of land) they are easy and quick to create, as they need not be high or require equipment to be on dangerous sloping land. The planting which follows could feature many hardy salt resistant plants which, once established retain moisture themselves and funnel water beneath the soil where it can permanently increase the fertility of the area.

In the case of areas of rocky terrain where rain is heavy, sudden and short lived, rock gabions can retain large down pours. They then pacify and redirect the water downwards to where the soil can be rejuvenated and plants grown to survive long periods of dry weather.

In both cases, any sudden rain is held and retained. No heavy rain is lost to swollen rivers and allowed to destroy the landscape and cause erosion.

The trees which are established also increase the likelihood of rain occurring in the area, and so the cycle repeats and fertility and drought hardiness increases.

Tree fodder is more sustainable than the grass equivalent, and fodder of this type if grown in situ prevents the need for feed to be bought in for livestock in times of hardship. It also doubles as shade for stock creating a better environment for them. Any watering points are also easily shaded and last longer. Infant animals are also less prone to attack by predatory birds when tree cover is available.

Permaculture techniques improve drought preparedness by retaining any rain events and channeling this water to grow an environment that can withstand times of extreme dry weather.

During drought, what measures are most effective in supporting long term resilience?

During drought, the measures which are most effective in supporting long term resilience, are to have previous to the drought, created permaculture infrastructure, as above.

In times of drought the farm assets, namely the livestock should be moved to a small temporary cell grazing system which involves a fast cycling of animals to prevent overgrazing of any particular paddock. This way resources can be contained and any suffering animals can be closely monitored. This system should be implemented on a larger scale when the threat of drought has passed.

Permaculture is a preventative rather than bandaid system. The crisis of drought can be prevented with sensible management before the advent of extreme dry weather.

Farms under threat from repossession or extreme salination or other impending disasters could also access free permaculture instruction of a more immediate and thorough form, together with the temporary use of a free equipment to create swales and free trees and plants to cover these swales. They could also have the interest removed from their farm debts in exchange for using this balance to immediately implement

infrastructure which makes their farm more sustainable.

Abandoned farms and those considered past being productive can be rejuvenated with the techniques outlined above. Those in receivership could be offered to new farmers who have a commitment to farming sustainably with a start up grant to cover initial costs. However, there is a minimum period of five years for these areas to become viable again.

A reduction in the viability of farming in Australia has created a large proportion of unemployed in these areas. These people could be in charge of collecting and distributing excess food from local supermarkets and food outlets to those families affected by drought. They could also be taught the concepts of permaculture to provide a local expert in the field in each area who is freely available to give advice to the community. Another scheme could be teams of these people to help implement swales and tree systems on farms in the local area. These community contributions could help with preventing the depression and suicide so prevalent in rural areas of Australia

How can new farmers be attracted to agriculture and how can they succeed?

New farmers can be attracted to farming by the advertisement of and access to a network of sustainable farmers already being successful in Australia.

A comprehensive education kit on the concepts of permaculture and how they apply directly to their situation should be available. In addition to this, a free day of advice at their new property from a qualified permaculturalist can ensure that resources are used to their best advantage to create a sustainable farm.

Existing farmers could have access to a website on how to overcome major problems on their farm with the use of permaculture. The network of sustainable farmers could have a representative in each area who could give free talks on the subject at a local venue.

Policies

Free information from a visiting permaculturalist to a farm could be established by creating a network of qualified volunteers. Australia produces at a minimum, 100 permaculturalists a month. Of these, a minimum of 25% go on to teach the concept, and would be available to contribute to this scheme, possibly on a rotation basis. Permaculture is a practical concept and skill is improved through practical application.

Permaculture is a concept which is easy to learn and easy to implement. The initial creation of infrastructure requires mechanical equipment. Specialised earthmoving equipment is best suited.

However, another initiative of this program could be research and development into the creation of a piece of swale creating equipment designed to be attached to and powered by the average farm tractor. This could be used in more remote, more arid areas where the threat of drought tends to be the highest. This would dramatically reduce the cost of implementing the system, and also create an additional small local industry.

Funding would be required to distribute an educational kit and to create a website. Volunteers could be accessed to collate the kit and to contribute to the site.

Collaboration with financial institutions would be required to offer the farmer short term interest free payment on debt in return for investing the balance in sustainable infrastructure.

Funding would be required for the start up grant to new farmers taking on abandoned farms.

Funding would be required to implement the network of sustainable farmers able to give a small amount of time to educating new farmers in their practice.

Funding would be required to implement the scheme for the unemployed people in rural areas.

All of the areas in need of funding, even collectively, do not amount to a large amount of investment compared to the finance required to help farmers badly affected by drought, the loss of productivity to the economy or the huge cost to the viable farming land in Australia for every farm which is not sustainable.

Focus Learning from top performing farms.

Permaculture can address the following features of successful farms

- Higher water use efficiency;
- High productivity—including higher herd and flock productivity;
- Lower enterprise and overhead costs
- Greater reliance on grain growing relative to livestock production.

Higher water use efficiency

Permaculture is unique in the fact that the technique uses short, medium and long term water infrastructure. The system goes beyond the use of water source irrigation, underground water and construction of dams. All of these conventional systems rely on river access, drawing of water from beneath the subsoil or keeping water in large open reserves.

Large scale irrigation from rivers and large creeks relies on consistent flow of these water courses. Reduction of these courses by irrigation can have deleterious effects on the wider environment. It also requires complex and controversial water trading agreements. These agreements must be mediated by government bodies.

Retrieving water from underground sources by way of pumping is a traditional method used in more arid areas. The long history of this technique has caused the water table to drop, and the salinity of both the surface soil and the water retrieved to become more saline. Large areas of land have in fact become too salty to be of any use in production. The Great Artesian basin which supplies this source is not unlimited.

Large stand alone dams are prone to evaporation in drier areas and often require replenishing by the two aforementioned sources. In more humid climates dams are prone to too high levels of nutrient which cause algal bloom and infestation by water weeds.

Permaculture accesses water from immediately outside and from that which falls on the property itself to irrigate the land. By means of networks of berms laid on contour (or 'swales'), water is pacified and allowed to soak beneath the surface. Ponds and dams are also filled by these networks. Water flowing past the property in the form of storm and road runoff is redirected to the property itself, and in turn pacified as well, for use within the property. Large water events in arid areas are captured by gabion walls and allowed to soak in to create long term arable land in times of dry. These are three examples of many systems used.

Permaculture techniques can avoid the reliance on water courses and any deleterious

effect on these courses. Water trading agreements need not apply. Water does not need to be retrieved from below the surface, preventing long term loss of the water table and salination of the land. Any dams used are filled by way of surface water collected within the property. Other mediation techniques are used to prevent the evaporation or excessive nutrient build up in any water holding areas.

Higher productivity

Permaculture design can improve productivity due to the fact that it follows natural patterns. The natural world creates productivity from diversity, interdependence of systems and ability to rejuvenate after crisis.

Permaculture contains a stipulation that every aspect of a design must perform a diversity of functions. This means that each aspect of the property is continually producing at least three benefits. From the outset this means that an average farm could increase productivity by at least 50%, if not up to 300% merely by adopting this basic stipulation.

An average farm contains at least one producing element. An example is the dairy farm producing milk from a herd of cows. A secondary product could be the selling of the animals past milking age to an abattoir for use for lower grade meat products. This means revenue is reliant on milk production. This commodity in turn is reliant on a good price from the market place. Fodder needs to be bought in, and fertilizers used to improve pasture. Disease spreading through the herd, drought or flood may severely impinge on the farm's viability. A permaculture design may include the growing of forage trees and a range of diverse grasses to replace the need for buying in feed and fertiliser. Cow manure can be used to further fertilise the pasture. The manure can also be collected for methane capture energy systems to reduce the need for energy to be bought to run the farm. Manure can also be used in 'cob' an economical building material. Milk can be simply and easily made into value added dairy products or ecological paint products on the farm. Tours and education of local people and school groups can be another form of income. In this way, by making one single element (the cow) perform various functions, productivity is increased.

Animal herds and flocks benefit from access to a broad range of fodder plants and mixed grasses which can be provided by the cell grazing cycle system used in permaculture. Monocultural food sources leave the stock lacking in nutrients and prone to attack from pests and disease. Dousing of animals with chemicals alters the end product from the animal and itself opens up the possibility for further problems through a range of side effects to the animal and the environment. Permaculture practices increase productivity by increasing the health of the individual animal.

Permaculture recognizes the interdependence of systems. A farm can benefit from the products of neighbouring properties, be it the clean creek flowing into the property or the cheap local fruit it can purchase to add to its own value added produce. All aspects of the farm can benefit from sensible networks of water use (see above) and waste from one area (eg chicken manure) can be used elsewhere as a resource (eg vegetable crops). In hot summers the forage crops hold the soil together and provide shade and food for hungry animals while being fertilized by those same animals. Carefully managed cell grazing cycle systems acknowledge the need for pastures to rejuvenate from grazing and to provide flowering grasses for insects and cover for small native animals to maintain natural diversity.

In times of crisis some aspects will survive and others fail. If design includes diversity, one aspect which survives can allow a system to survive to rebuild in future. Interdependence of systems means that each aspect has many means of support and can exist when some support mechanisms are missing.

Permaculture provides a stable, healthier more productive farm able to better cope in times of crisis.

Lower enterprise and overhead costs

Permaculture promotes an integrated system where each aspect of the farm has to provide many benefits. This in turn provides less overhead costs because where possible the requirements of one aspect are provided by another, eg animal manure providing fertiliser.

Greater reliance on grain growing relative to livestock production

Permaculture stipulates that a system be based on diversity. In this way, a mixed farm is preferred over a single product one. Grains grown together with animals provides greater variety and stronger base for possible profit.

Grain production requires one set of nutrients, while stock requires another. Through cycling of crops with animals the nutrients lost to the harvested crop can be replaced by the manure from animals, and the animals can graze on the remnants of a harvested crop.

The nutrient profile as assessed relative to the nutrient input is greater for that of a grain than an animal product on the same area of land. For example, the amount of protein contained in a crop of wheat is more than double the same amount of protein from the amount of cows that could be fed from the same amount of ground.*** Growing grain to feed beef cows actually creates a reduction in the final amount of usable protein produced. It is therefore more efficient and more environmental to grow the grain crop.

Grain production is more flexible a crop in relation to possible products that can be created from it, as compared to beef.

Livestock with hard hooves damages the fragile top soil in Australia, causing it to compact and therefore be less able to absorb water and take up nutrients.

Grain therefore requires less nutrient input and yields higher nutrients than cattle grown from beef on the same ground, so a greater reliance on grain relative to livestock makes good farming sense in the future.

*Permaculture concept originated by David Holmgren and Bill Mollison

** Geoff Lawton Director of Permaculture Research Institute

***John Lobell (1981); *The Little Green Book: A Guide to Self-Reliant Living in the 80's*.

