'Managing the Carbon Cycle'

KINGAROY 25-26 October 2006

http://www.amazingcarbon.com/

PAPER SUMMARIES

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Importance of Soil Carbon

This paper reviews the historic loss of 50-60% of soil carbon, and its effects on crop yields, the physical, chemical and biological aspects of soil health and the health and wellbeing of the farming family. Farming practices that influence soil carbon dynamics and the methods and principles of increasing the carbon sink in the soil are discussed.

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Ray O'Grady and Rod Rush
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The Terra Preta phenomenon

The greatest legacy the Amazonians left to the World was not the famed 'City of Gold' but the Terra Preta. These man-made 'Indian black earths' in the Amazon Basin cover an area the size of France. They hold a secret to carbon sequestration that could reduce carbon dioxide emissions and global warming. We require only 10% of our productive, degraded lands to absorb the estimated 6.1 gigatons of carbon dioxide emissions to make a carbon negative world possible in our life-time. The question must then be asked 'Do we need nuclear power to reduce Global Warming?

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Understanding mycorrhizal fungi

Mycorrhizal fungi form symbiotic associations with the roots of many plant species. Mycorrhizae supply their hosts with mineral nutrients (notably phosphorus) in exchange for energy compounds. However, there are many land management practices that can severely deplete and sometimes extinguish mycorrhizal populations. This paper focuses on a discussion of these management practices and their consequences for ecosystem health and farm productivity.

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Carbon, air and water - is that all we need?

Soil carbon is the one single, measurable factor that underpins the solution to multiple natural resource management problems. '**Managing the Carbon Cycle' is about turning carbon loss into carbon gain.** With appropriate changes to land management, agricultural soils have the capacity to sequester and store large volumes of carbon, thus improving microbial content, biological activity, fertility, structure, stability, resistance to erosion and ultimately biodiversity, productivity and profitability. Increasing soil carbon can significantly reduce the impact of dryland salinity, reduce sedimentation rates in rivers and streams, improve water quality, improve air quality and decrease the impact of the Greenhouse Effect, global warming and climate change.

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Carbon sequestration: a case study from the South Burnett

Deforestation and clearing of lands in the South Burnett region for pasture and cropping has substantially reduced carbon stocks from above-ground biomass through vegetation removal or burning and below-ground from soil organic matter. Planting forests onto marginal ex-agricultural land can increase soil carbon stocks, as well as improve soil fertility. Planted forests can remove carbon dioxide (CO_2) from the atmosphere and store it as carbon in the plants and soil. Planting forests may provide a relatively cost-effective way of creating a carbon sink while simultaneously improving soil organic matter and fertility; also creating a potential for carbon credits in the future. Carbon stocks in spotted gum plantations planted onto ex-pasture sites in the Kingaroy district were compared with the adjoining cropping, pasture and native vine scrub land uses. Soil carbon stocks were greater under the 4-year-old plantation than both the adjacent grazed pasture and peanut cropping areas, but not yet as high as the original native vine scrub. Carbon credits from planting forests may be an important source of future income for landholders in the degraded agricultural lands of the South Burnett region of south-east Queensland.

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Coalition campaigns for carbon credits from soil

The Carbon Coalition Against Global Warming was launched to promote carbon in agricultural soils as a natural carbon sink for the purpose of trading on the global emission credits market. Global Warming presents farmers and graziers with an opportunity to sell carbon credits worth thousands of dollars per hectare. Soil carbon levels can be increased by replacing soil management practices such as stubble burning, ploughing and inappropriate grazing with minimum tillage, regenerative grazing and revegetation with perennial grasses. Base-lining is essential for registration in possible future trading programs. Landholders need to take action now to be ready for the anticipated first day of trading.

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David Marsh
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A different decision-making process can produce profits, increase carbon sequestration in soils and regenerate landscapes

With a change to holistic grazing management, there is huge potential for carbon sequestration in soil. The effect of higher soil carbon levels on landscape function and possible solutions to other land degradation issues are discussed. Drought performance on a farm where decisions are made using the Holistic Management model are examined.

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Carbon farming through Pasture Cropping

Concerns about declining profitability, poor soil structure, dryland salinity, soil acidification and increasing numbers of herbicide resistant weeds have prompted over 1000 farmers throughout eastern, southern and western Australia to trial Pasture Cropping. The year-round ground-cover results in reduced wind and water erosion, improved tilth, reduced weed numbers, increased nutrient availability and increased levels of soil organic carbon. Numerous soil health benefits accrue from plant root exudates derived from a mix of shallow rooted crops and deep-rooted perennial pastures. At a time when dryland salinity, soil acidification and loss of soil carbon are having increasing impacts on the productivity and profitability of farming enterprises, Pasture Cropping may provide one option for addressing these issues.

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Hamish Mackay
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Biodynamics – the practical alternative

We live in the world we create as growers and consumers, with or without scientific sanction, as we inhabit an increasingly global environment. The environment, global warming, biological farming and increased farm costs are receiving wider consideration and media coverage. Biodynamics is proving to be an extremely cost-effective tool to achieve improved agricultural, environmental, health and social outcomes within the constraints of our contemporary economy. These outcomes can assist farmers around the world solve the agricultural and environmental issues of our time, including Climate Change.

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From bulldozers to broadcasters

In this presentation we track a 30+ year journey from 'conventional' agricultural 'wisdom' (the use of heavy machinery, introduced species, pasture renovation, timber remnant and regrowth clearing, chemical fertilisers, herbicides and pesticides, fire and continuous grazing) to the current use of Biodynamic Field Broadcasters in managing the landscape for long term optimum health and productivity. The change has been based on insights gained from studying 'alternative' agricultural systems, all of which have had as a common thread - **the building and maintenance of optimum soil structure.** There is no one single contributing factor. A combination of many actions have led to some interesting results on the Joyce's property 'Dukes Plain', Theodore, Queensland.

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Tom Nicholas
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We are the leaders we've been waiting for

Natural resource management problems nearly all come from diminishing carbon in the system through poor management. Australia spends billions of dollars on NRM catchment issues – some real – some imagined. If farmers were paid to increase carbon in soil – and we need to do this anyway – the potential benefits would be huge. Farmers can increase their productivity while improving soil health and becoming sustainable. We have to alter our mindset to achieve the right set of circumstances to follow this path, but there is nothing like a carrot to move the donkey!

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Copies of the Kingaroy Proceedings are available from
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or visit

www.amazingcarbon.com

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Horsham (VIC), National (Canberra) and Katanning (WA) events
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