

AGRICULTURAL SOILS

The only viable short term solution to
Climate Change Mitigation

Only soils can remove enough CO₂ from the atmosphere in the next 30 years to avoid the worst effects of Global Warming.

Michael Kiely* has just returned from interviewing the world's experts on Climate Change action. Their verdict: only soils can remove enough CO₂ from the atmosphere in the next 30 years to avoid the worst effects of Global Warming.

**Convenor, Carbon Coalition Against Global Warming, a farmers' movement seeking to have soil carbon credits traded on the world greenhouse emissions abatement markets. Spent 3 weeks in USA with US Government working parties and other experts.*

The potential power of soils: A 1% increase in soil carbon in just 10% of Australia's farmland could remove 10 years worth of Australia's CO₂ emissions. A 4% increase in soil carbon could remove 40 years worth.**

***A 1% increase in soil carbon in 30cm topsoil @ 1.2 bulk density (132 t/ha CO₂ equivalent) over 45m ha. Soil carbon increase estimate by agronomist and botanist Dr Christine Jones. Total Australian farmland 455m ha, ABS.)*

What the experts say:

“It buys us time...” “C Sequestration in soil and vegetation is a bridge to the future. It buys us time while alternatives to fossil fuel take effect.”

- *Dr Rattan Lal, Director, Carbon Management and Sequestration Center, Professor of Soil Science, School of Natural Resources Ohio State University*

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Blog <http://carboncoalitionoz.blogspot.com>

“Unlike others... it is immediate...”

"Unlike many other technologies to offset fossil fuel emissions, land management for soil C sequestration can be implemented immediately.... An immediate offset of CO₂ emissions provides a significant delay in the rise of atmospheric CO₂ concentration. By the time that we saturate the soil's capacity to store additional C, other methods of reducing emissions or sequestering carbon may be available or already in use."

- Professor Bruce McCarl, Agricultural Economist and Economist, Climate Change, Texas A&M University; Member of the Intergovernmental Panel on Climate Change

“Available... low cost...” "Terrestrial C sequestration has immediate application in climate change mitigation due to its availability and relatively low cost."

- Professor Charles Rice, Department of Agricultural Economics, Kansas State University, Director of the Consortium for Agricultural Soils Mitigation of Greenhouse Gases. Dr. Rice is recognized as one of the leading soil microbiologists in the United States.

“It's here... now...” “Terrestrial sequestration is here and now. It's user friendly. It's easy to do. It can play a critical role in the early stages of our response, ahead of other methods [forestry, geologic burial].”

- Dr. John Antle, Professor of Agricultural Economics and Economics at Montana State University, Technical Leader, Economics, BigSky Carbon Sequestration Partnership

“Forests are limited...”

“Soil represents the largest carbon sink over which we have control. Improvements in soil carbon levels could be made in all rural areas, whereas the regions suited to carbon sequestration in plantation timber are limited.”

Dr Christine Jones, director, Carbon For Life Inc.

“Increases in soil carbon already achieved...”

“These levels of increase in soil carbon are achievable, and have already been achieved, by landholders practicing regenerative cropping and grazing practices.”

Dr Christine Jones, Australian soil carbon specialist, director, Carbon For Life inc.

Why the next 10-30 years is critical

- President George Bush's top climate modeller, Jim Hansen, director of the NASA Goddard Institute for Space Studies, says the world has a 10-year window of opportunity to take decisive action on global warming and avert catastrophe.
- A satellite study of the Greenland ice cap shows that it is melting far faster than scientists had feared - twice as much ice is going into the sea as it was five years ago.
- Britain's Institute of Public Policy Research says that, to minimise the risk of a 2C rise - seen as the threshold for dangerous climate change - global carbon dioxide emissions would need to peak between 2010 and 2013.
- Sir David King, the British government's chief scientific adviser, said that it was looking increasingly unlikely that the world would be able to stay below the 2C threshold.

Why other solutions are ineffective

Forests

- Not enough forests could be grown in the world to sequester enough CO₂ in the next 30 years.

- Forests are net emitters of CO₂ during the first years after planting.
- Only 10%-20% of available land is suitable for forestry.
- Forests are an expensive option compared to soil enrichment.

Clean Coal

- Clean Coal means burning coal and ‘scrubbing’ the CO₂ out of the emissions before they reach the atmosphere.
- Scrubbing intercepts only new CO₂ emissions. This makes no impact on existing CO₂ loads in the atmosphere which must be ‘sequestered’ quickly to prevent the global temperature rising above the 2°C level already predicted to result from CO₂ emitted years ago.

Geo-sequestration

- Geologic sequestration means the burial of liquid CO₂ (obtained from scrubbing) deep underneath rock formations underground, including exhausted oil wells and coal seams.
- As with Clean Coal, Geo-sequestration can only deal with new emissions, not the existing atmospheric load that is driving the global temperatures up.
- The public acceptability of trillions of tones of liquid CO₂ being pumped under the earth when scientists are not sure what the long term security of these caches is doubtful, given that any leakage can have deadly results for life above ground.

Deep ocean burial

- The US Government is planning to pump trillions of tones of CO₂ into deep ocean trenches.
- As with Clean Coal and Geologic Sequestration, this solution addresses only new emissions, not the existing atmospheric load.

Solar energy

- Alternative and renewable energy sources cannot impact the amount of CO₂ already in the atmosphere.
- They can provide non-polluting alternatives to reduce future CO₂ emissions.

Wind turbines

- As with Solar energy, wind generation of electricity does not sequester CO₂ already in the atmosphere.
- They can provide non-polluting alternatives to reduce future CO₂ emissions.

Long life light bulbs

- Long life light bulbs can only reduce demand for power. Power generation is responsible for 50% of CO₂ emissions. Low power light bulbs can reduce emissions in future.
- They cannot impact on existing CO₂ loads in the atmosphere.

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FACTS ABOUT CARBON SEQUESTRATION AND SOILS

- FACT: All “advanced technology solutions” are untried and have unknown capacity
- FACT: “Carbon scrubbing” at source (interception of CO₂ at point of emission) does not reduce the existing CO₂ burden in the atmosphere
- FACT: “Geosequestration” (burial beneath deep cap rock formations and in exhausted oil wells) does not reduce the existing CO₂ burden and researchers say it will take 100 years to determine if it is effective
- FACT: Forests can be net emitters in their early stages and take many years to reach their sequestration potential
- FACT: The terrestrial biosphere currently sequesters 2 billion metric tons of carbon annually. (US Department of Agriculture)
- FACT: Soils contain 82% of terrestrial carbon. (US Department of Agriculture)
- FACT: "Enhancing the natural processes that remove CO₂ from the atmosphere is thought to be the most cost-effective means of reducing atmospheric levels of CO₂." (US Department of Energy)
- FACT: "Soil organic carbon is the largest reservoir in interaction with the atmosphere." (United Nations Food & Agriculture Organisation) - Vegetation 650 gigatons, atmosphere 750 gigatons, soil 1500 gigatons
- FACT: The carbon sink capacity of the world's agricultural and degraded soils is 50% to 66% of the historic carbon loss of 42 to 78 gigatons of carbon. (US Department of Energy)
- FACT: Grazing land comprises half the land surface of the world.
- FACT: An acre of pasture can sequester more carbon than an acre of forest. (DR Christine Jones)