2007

Sugarcane the champion crop at carbon sequestration

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Publication details
Parr, JF & Sullivan, LA 2007, 'Sugarcane the champion crop at carbon sequestration', Australian Canegrower, 17 December, pp. 14-15. The abstract and pdf of the published article reproduced in ePublications@SCU with the permission of Australian Canegrowers.

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**Carbon trading**

**Sugarcane the champion crop at carbon sequestration**

Dr Jeff Parr and Professor Leigh Sullivan, both researchers from Southern Cross University and Plantstone Pty Ltd in Lismore NSW, have recently discovered that a process that occurs naturally in plants (especially grasses such as sugarcane), plays an important role in countering CO2 emissions and global warming.

This process is termed plantstone carbon and is also referred to as phytolith occluded carbon. Their research shows that plantstone carbon has been extracting 300 million tonnes of CO2 per year from the atmosphere and storing it securely in soil for thousands of years.

What are plantstones? Plantstones form as microscopic grains of silica in plant leaves, particularly grass-based pastures and crops such as sugarcane and wheat. During plant growth a small proportion of organic carbon becomes encapsulated within the microscopic silica grains.

Regardless of whether the plant dies, burns or is harvested, the carbon entrapped in the plantstone is highly resistant to decomposition. Therefore, unlike most plant matter, which readily decomposes and returns CO2 to the atmosphere, the carbon in plantstone effectively removes CO2 from the atmosphere. This process essentially suggests that crop choice decisions by farmers could be a major contributing factor in the reduction of CO2 from the atmosphere.

Parr and Sullivan’s research in crop plantstone yields has shown that different plant types produce greatly varying amounts of plantstone carbon. According to the research team, some crops have been identified as producing over 1,000 times more plantstone carbon than other crop types.

Moreover, varieties within a single crop type, such as sugarcane, have been found to produce widely differing quantities of plantstone carbon.

This indicates that a farmer’s decision of choice of crop type and/or cultivar has a considerable impact on the amount of CO2 extracted from the atmosphere and securely stored in their farm’s soil.

Some of the latest plantstone research shows that sugarcane is the clear champion crop at carbon sequestration. Sugarcane can sequestrate up to 0.66 tonnes of CO2 per ha per year in plantstones while many other crops (especially legumes) sequestrate comparatively little or no CO2 by this process.

Thus the benefits that farmers growing sugarcane provide to society is not just limited to the more obvious benefits such as the sugar they produce, but also to the environmental services that they provide by locking up enhanced amounts of carbon in the plantstones that are produced abundantly by their crop.

Increasing carbon sequestration by plantstones is by no means limited by a need to change the types of crops that a farmer grows. Indeed, it can be business-as-usual: by simply choosing to grow a high plantstone carbon yielding cultivar of a crop over a low plantstone carbon yielding cultivar of the same crop can greatly enhance carbon sequestration on the farm.

For a sugarcane farmer, the relatively simple decision to choose to grow one sugarcane variety instead of another can result in an extra 0.25 tonnes of CO2 per ha per year being securely sequestered in the soil inside plantstones.

Importantly, the research to date shows that there are no crop yield penalties involved in choosing to grow high plantstone carbon yielding cultivars over low plantstone carbon yielding cultivars.

For grain crops such as wheat and sorghum, (for which there are readily available data) some of the highest yielding cultivars are also those that produce the greatest amounts of plantstone carbon.

The implementation of an appropriate carbon trading systems, as are currently being proposed by governments, would provide an incentive to farmers to grow high plantstone carbon yielding crops and crop varieties.

Carbon trading systems will result in farmers having the potential to earn additional income without detracting from existing income streams.

The Australian Research Council Discovery Grant Program has recognised the importance of Parr and Sullivan’s plantstone carbon research providing means for further development during 2007-2009.

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Tweed cane grower Robert Quirk was recently featured on the ABC’s Landline program explaining acid sulphate soils. He will be on Landline again early in 2008 talking about the plantstone trials he has participated in on his farm.
Plantstone carbon research is developing powerful tools to counter global CO2 emissions providing land managers the opportunity to play an even greater role in the fight against global warming and climate change.

CANEGROWERS Senior Manager, Policy, Bernard Milford, said that the phytolith discovery was interesting and timely.

“In order for farmers to participate in emerging carbon markets, it will be necessary to demonstrate that carbon can be sequestered in the soil in a way that is permanent and measurable,” he said.

“The ongoing research announced into plantstone should prove whether these tiny particles could be turned into an income source. We will be watching the results carefully and working to ensure that innovations such as this can be recognised in any future carbon trading scheme.”

Case expands biodiesel farm use

Case IH has extended its recommendations on use of biofuels to include B100 – or pure biodiesel – on even more of its farm equipment models.

Farmers now can use B100 on nearly all Case IH medium to high horsepower tractors, combines, windrowers, and most self-propelled sprayers and cotton pickers - so long as proper protocols are followed for engine operation and maintenance.

Carbon emissions drop by 70%

Industrial ingredients and food processing giant Tate & Lyle announced it was implementing a $41.1 million (£20 million) biomass boiler project at its East London sugar refinery, which will slash the carbon emissions from energy use by 70% in less than two years and turn the factory into a net energy producer.

The carbon footprint of Tate & Lyle cane sugar will be reduced by 25% following the switch to renewable biomass. The factory in London is one of the largest cane refineries in the world, processing 1.1 million tonnes of sugar a year.

The new biomass boiler, which will power the combined heat and power (CHP) plant for the factory, will mean Tate & Lyle can switch to renewable biomass to supply 70% of the energy it needs.

Post 2009, with the boiler working at full capacity, the carbon footprint of cane sugar produced at the refinery will be reduced to 0.32 tonnes per 1 tonne of sugar. Raw cane sugar milling is almost carbon neutral.

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