

## Scientists uncover key to boosting carbon capture

by Matt Peacock via rialator - ABC 7.30 report *Tuesday, Sep 2 2008, 6:58am*

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Buried under a giant stand of bamboo in northern New South Wales, two Australian soil scientists have made a discovery they believe will help save the planet.

Leigh Sullivan, from Southern Cross University, explains the significance of the find.

"This is a really old growth of bamboo here, it's been here at least 50 years according to the aerial photographs," he told The 7.30 Report.

"So it's been here a long time shedding leaves onto the ground and when you actually look at the accumulation of the organic matter what we can see is a really thick spongy layer.

"It is full of organic matter in various states of decay. Now when you dig into the soil layer, you can see we've got fresh leaves on top that are being decomposed into this thick mulch material beneath it."

Amongst the decay are thousands of tiny capsules of carbon known as plant stones, invisible to the naked eye and virtually indestructible.

"Plant stone is just like a glass jar that has the carbon inside it and that gets deposited into the soil when the plant dies and, basically, it's very stable, it's there for thousands of years," said Jeffrey Parr, also of Southern Cross University.

"The carbon is actually enclosed by a silica coating. The silica coating protects it from being decomposed in soils."

He says the phytoliths from sugar cane are even plumper, and hold even more carbon.

Some plants make more plant stones than others and with the warming world now desperate to capture and store carbon, these scientists believe they've hit on something big.

"What we've found is that all this organic matter is accumulated within seven years, which means that the organic carbon's been accumulating at a gold medal rate - one tonne, per hectare, per year," Dr Parr said.

Dr Parr was measuring the plant stones to carbon date some ancient soil when he suddenly realised the significance for global warming.

"I got a little bit sidetracked as some crazy scientists do, and I started to ask the question, well, if these things have got carbon in them and they're being deposited in the soil, what contribution are they making to the soil carbon? How much? And, ah, not only that, but what plants are contributing to that carbon fraction?" he said.

In the Tweed River Valley, Robert Quirk wants farmers to be part of the solution to global warming.

"I'm one of those who believe this is all happening. We've got to do what we can as soon as we can," he said.

Mr Quirk grows sugar cane. While not as fast as bamboo, it's still locking carbon into plant substance at a rapid rate.

"With sugar, for every tonne of carbon we put into the atmosphere, we take 2.6 out," he said.

Professor Sullivan is the key is choosing the right type of sugar cane.

"One of the cultivars he's growing is actually securely sequestering in the soil half a tonne more carbon dioxide per year than another cultivar of the sugar cane, so what that means is if that that farmer went and grew all of that cultivar, that high carbon sequestering cultivar, that he would be - for every hectare he's got, he'd be putting another half a tonne into the ground for the next 5,000 years," he said.

Australia's emissions trading scheme, to start in two years, won't initially include agriculture. That's because its emissions from things like cattle burping and its carbon capture from things like forests breathing in carbon are both too hard to measure. But it's a gap the Government's adviser Professor Ross Garnaut thinks needs urgent attention.

"This is tremendously important for Australia, firstly because there's a lot of opportunity for sequestering carbon in reforestation and different agricultural practices in Australia," he said.

"Secondly, Australia lives in a region in which these possibilities are very important.

"Our neighbours, Indonesia, Papua New Guinea, Solomon Islands, New Zealand, for all of these forestry and agriculture are right at the centre of the emissions problem.

"So, if we can solve these problems for ourselves, we help them solve their problems and that's a very big contribution to the global problem."

Until now, forests have grabbed the most attention as carbon capturers, but hardly any tree types make plant stones and they give off carbon when they're cut down.

By contrast, plant stones made by crops and grasses are secured for thousands of years, and if the crop's harvested and regrown, more new plant stones are created, and they're easy to measure.

Professor Sullivan says you can grow a forest pretty quickly and lock up large amounts of carbon.

"The problem is that that carbon is quite volatile," he said. "If you have a fire, a disease, or you want to change the forest back to a paddock, you lose the stored carbon.

"With plant stone carbon we can actually get the carbon in the crop and estimate it quite easily before it hits the soil."

Dr Parr says it doesn't matter what crop you have, as long as you choose the variety of that crop that works best in terms of plant stones.

Already, China's showing great interest in the bamboo plant stones and if the technique is applied globally say the scientists, it could make a major difference.

"This is a bit of a stretch, but if all the arable land on the globe was growing vegetation that had the same plant stone carbon sequestration rates as our best sugar cane, that would actually sequester nearly three billion tonnes of CO2 annually in the globe, which is about 20 per cent of our current rate of atmospheric CO2 increase," Professor Sullivan said.

For farmers like Robert Quirk, there's no time to waste.

"I think a lot of us can make a real benefit and I don't think we need to sit on our hands for another six or eight years before we start to trade carbon," he said.

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