

Farmers can help reduce global warming

The clearing of farming land over the last four hundred years has released large quantities of carbon dioxide into the atmosphere. Around two thirds of the rise in atmospheric carbon dioxide is due to the clearing and the subsequent decline in organic matter on farming land, which is almost twice the carbon released from fossil fuel use since 1850.

Agriculture has a role in reducing the output of carbon dioxide emissions. The carbon pool in the soil worldwide is around 3 times the atmospheric pool and there is potential to offset fossil fuel emissions by reversing some of the losses of carbon and storing more organic matter in soils.

At the same time this will help to improve crop yields, which is required to feed the world in the future.

Farming in Australia has a lot to gain if we can slow down global warming. While food production in many countries may benefit from rising temperatures and higher carbon dioxide levels, this is not likely in Australia. The Intergovernmental Panel for Climate Change projections are for production from agriculture and forestry to decline over much of southern and eastern Australia, due to reduced precipitation, increased drought and fire.

Soil organic matter has declined on Queensland farms by around 50% over the last 100 years, where traditional farming methods have been used. New and more productive farming practices can reverse the decline of soil organic matter - storing carbon and at the same time improving soil productivity.

These practices improve water storage, produce better crop yields and also result in energy savings on farms more profitable while reducing greenhouse emissions.

The most important feature is to grow high yielding crops which produce good soil cover and have a high carbon return. The most important practices which conserve this carbon in the soil include eliminating tillage, avoiding long fallows, using animal manures and rotations with pastures.

No tillage is a vital change in sub-tropical farming. In long-term studies of no-tillage, soil organic matter increases, compared to a decline in organic matter where cultivation is used. At the same time, no-tillage reduces use and extends the life of tractors and machinery, both of which reduce greenhouse gas output from farming.

While many farmers have switched to no tillage, there are still around 50% of farms yet to make the change. A program of incentives for these farms to switch their production to zero-tillage would not only reduce greenhouse gas emissions, it would improve production and help improve farm viability.

Some people are concerned with the increase in herbicide inputs required to make the change to zero-tillage. Exhaustive testing has shown the herbicides leave no harmful residue in foods and monitoring of soils shows soil biota unaffected, with populations of earthworms and other organisms increasing under zero-tillage.

The level of organic matter in the soil is a balance between the amount of carbon being added and the rate of decline. In sub-tropical Australia, the rainfall can produce a high biomass (carbon) input, but the carbon has a rapid rate of decline in soils and it is difficult to maintain organic matter levels in soils above 2 percent.

In contrast, some desert soils have almost no organic matter, while in cold, wet areas of Ireland and Russia, some (peat) soils are over 90% organic matter and they are being ripped up and burnt in fires and power stations.

Farmers are interested in whether increasing soil carbon might provide future income from carbon credit schemes. However the gain of carbon per ha per year is likely to be small. When put together in a package of energy savings, a best practice program becomes more significant, but the price of carbon needs to rise for payments to be more than the cost of running a carbon credit program.

There is however plenty of incentive for farmers to build soil carbon if it results in better moisture storage, better nutrient reserves and higher crop yields. Farming carbon can provide a win-win outcome with improved farm profitability *and* a reduction in greenhouse gases.