



Environmental gains anticipated for Northland BioChar research

Overseas research indicates that BioChar has the potential to mitigate climate change through storing carbon, along with multiple other benefits. The Ministry for Primary Industries (MPI) is co-investing with Parengarenga Incorporation to turn local forestry waste wood into BioChar and trial its use in Northland.

MPI has contributed \$100,000 through its Sustainable Food & Fibre Futures (SFF Futures) programme to an 11-month project that will identify a BioChar product best suited to Far North soil and report back on its level of effectiveness.

BioChar is a form of organic matter charred under controlled high-temperature conditions of between 400 and 450 degrees Celsius. It can be blended with natural organic matter and added to pasture.

Parengarenga Incorporation's project leader Jon Brough says the project was prompted by concern about the high level of sawdust waste in the Northland forestry industry, combined with the challenging sandy soils of the region.

"While the sawdust of *pinus radiata* on its own can't be applied to soil, we knew from overseas research that if it's turned to BioChar it has potential to hold the pH and soil nutrients way better than before," says Brough.

The concept of BioChar goes back hundreds of years – for example, Aztec Indians discovered their crops grew better in areas where they had flung the ashes from their fire pits.

The Northland project will conduct pasture trials, making use of the varying soil types across

Parengarenga station. This will involve spreading ground-up BioChar on test strips of pasture and comparing them with control sites to observe differences in the soil over time.

Brough says that adding BioChar to soil is expected to increase pasture growth, enrich topsoil and help to store carbon. Combined with a tailored drainage programme, this may also reduce and filter sediment run-off into waterways.

"After a couple of days in the rain, BioChar still feels dry but is three times the weight. It returns extra carbon to the soil, holding back the moisture so that the nutrients are more available to the soil."

While not in scope of the MPI-funded research, Parengarenga researchers are also interested in the potential benefits of BioChar for animal health. They have been undertaking a 90-day trial of feeding a BioChar supplement to a mob of heifers and comparing the results with a control herd. Preliminary results show the number of worm eggs in cattle faeces plummeting from an average of 130 per sample to zero after just 30 days of being fed a daily diet of BioChar.

"Cattle with worms can suffer from diarrhoea, emaciation, weight loss and/or blood loss," says Brough. "Feeding cattle BioChar could reduce the cost of animal health significantly and also tick the ecological box."

Previous research in Australia and the United States indicates that BioChar can act as a catalyst to increase weight gain. The researchers will be weighing the cattle at the end of the 90 days to see if the BioChar-fed cows have gained more weight than the control group.

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“If this stacks up and we see heavier stock we’d see considerable economic payback in year one,” says Brough.

The process of creating BioChar could have another side benefit – power generation. “Our carboniser machine is a baby – it just makes charcoal – but the next size up can trap and bottle all the gases that come from the pyrolysis of wood and turn this into electricity.

“Getting people thinking differently about farming methods could have multiple benefits for New Zealand.”

Steve Penno, Director Investment Programmes at MPI, says the concept behind this project is simple but could have wide-reaching impacts if successful. “The use of BioChar to improve soils is receiving a lot of attention. This project will provide valuable insights on its effects when used in New Zealand soils.”



Neil Butler (left) from Progressive Processors Ltd with workshop supervisor Murray Larsen, checking the quality of fresh BioChar.