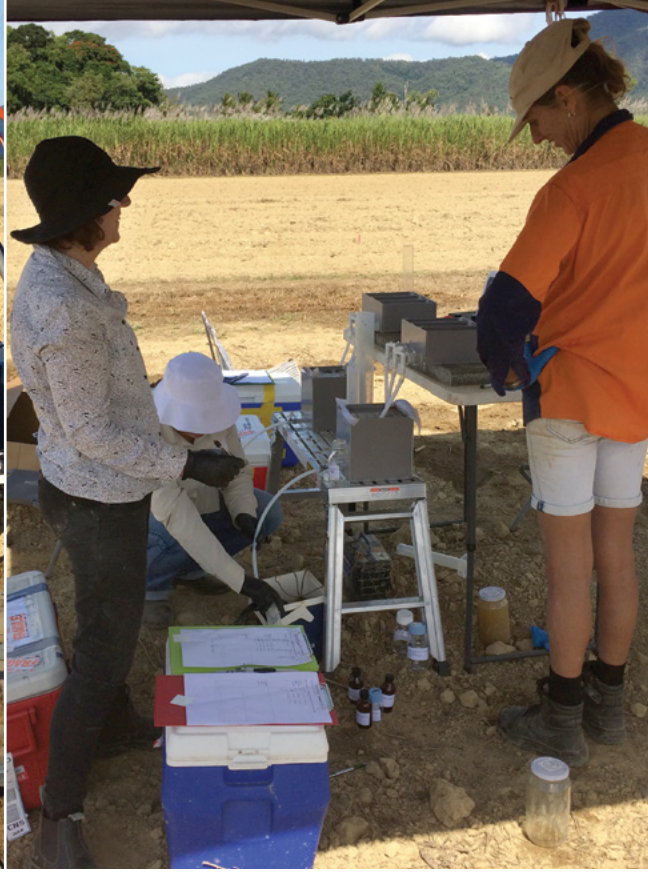

Can "biochar" help meet water quality targets?

TRIALS HAVE BEEN UNDERWAY TO ASSESS WHETHER A BIOCHAR FILTER CAN HELP REDUCE HERBICIDE LOADS IN RUN-OFF WATER.

Mitigating water quality impacts from farming remains a priority for the cane industry. Much effort is being directed into modifying agronomic practices to minimise the surface movement of nitrogen and pesticides from farm land into waterways and eventually the Great Barrier Reef lagoon. For herbicides, much of the focus is around reducing the amount of pre-emergent herbicides applied.

But what if a simple filtering system could remove herbicides from run-off water?

A proof-of-concept biochar filter trial by CSIRO shows promising results to decrease herbicide load in surface run-off. Recently, CSIRO joined forces with SRA's weed agronomy team to test the sorbent filter material at SRA's Meringa Research Station. The work is part of the SRA-funded project *Keeping our chemicals in their place – in the field.*

As a proof-of-concept, the trials were small scale using rainfall simulation to create herbicide-loaded run-off. The contaminated run-off was then filtered through the proprietary biochar medium, with herbicide concentrations measured before and after the filtering process.

This initial trial looked at how well the sorbent material decreased the concentrations of five herbicides: hexazinone, diuron, imazapic, metribuzin and atrazine, as the run-off passed through the sorbent bed.

Promisingly, the filter was able to remove approximately 70 percent of the diuron load and 50 percent of the atrazine, metribuzin and hexazinone load, from the first run-off event. The filter was less successful in capturing imazapic, due to the fact that, as an acidic herbicide, it has a negative charge which is the same charge as the sorbent material, and thus was not captured.

Filtration of a second run-off event achieved a further 50 percent reduction of the diuron load, and a 20 percent reduction in the loads of metribuzin, atrazine and hexazinone.

The filter also successfully decreased the amount of sediment in the runoff by approximately 80 percent and 40 percent for the first and second run-off events, respectively.

These promising results will hopefully be followed by further work to test additional herbicides, developing a system to encase the biochar medium and upscale to a paddock and farm level.

The current project funding only allows for the initial proof-of-concept trial, and taking this research to the next stage is dependent on additional funding.

Coupled with improved in-field management, technology such as this has the potential to accelerate the achievement of Great Barrier Reef water quality targets.

"This strategy for improving water quality may be able to be incorporated into other research activity in the Burdekin and Wet Tropics. However, further studies would be required to take this initial work to the next stage," said Danni Oliver, CSIRO. ■

For more information contact:

Danni Oliver, CSIRO
T 08 8303 8434

Emilie Fillols, SRA
T 0438 711 613

(Above left) *The rainfall simulator at work at SRA Meringa as part of the trials.* ***(Above right)*** *CSIRO and SRA have been assessing biochar filters for helping to reduce water quality impacts.*