Project Catalyst Trial Report

Recycled Carbon Materials for Capturing Nutrients and Pesticides

Grower Information	
Grower Name:	Michael Waring
Entity Name:	Waring MJ & AM
Trial Farm No/Name:	F# 94 B# 6-5 Capturing nutrient and pesticides with locally sourced biochar
Mill Area:	Victoria. Herbert Region
Total Farm Area ha:	140
No. Years Farming: (Grower Experience)	21 years farming experience.
Trial Subdistrict:	Upper Stone
Area under Cane ha:	133.86

Trial Status

Completed / Continuing

Background Information

Aim: To develop a low-cost effective method to remove agricultural pesticides from cane farm runoff.

Background: (Rationale for why this might work)

Processed used car tyres become a near pure carbon source, when mixed with a product that has been proved by the Griffith University to adsorb pesticides, heavy metals, and some nutrients in lab-based studies. The product is at the stage now to be field tested and Griffith University staff are prepared to work with a grower group to assess the products usefulness in the commercial world.

Due to Covid-19 shutdown and restrictions in early March 2020 some of the details to the trial had to be modified. The product that was to be used in the trial was getting sourced from China and due to the world pandemic unfortunately HCPSL and Griffith were not able to obtain the original material. Instead, a local biochar product called Terix was source with the understanding that biochar products are good at filtering pesticides and nutrients. The product was put into stockings and reinforced with shade cloth to be able to lay the sausage across the rows and inter-rows or before the entrance of the farm drain, in hope that a proof-of-concept result could be reached.

Potential Water Quality Benefit:

The biochar sausage will be placed in farm drain(s) to test its ability to remove agriculture pesticides from cane farm runoff.

If the product works as the lab studies have suggested, then we can capture pesticides and some nutrients before every reaching the waterway, which in turn will improve overall water quality coming off the farm.

Expected Outcome of Trial:

To capture pesticides and some nutrients before every leaving the trial block.

Service provider contact: Megan Zahmel: 0447 317 102

Where did this idea come from: Griffith University/ HCPSL

Plan - Project Activities	Date : (mth/year to be undertaken)	Activities :(breakdown of each activity for each stage)
Stage 1	Establish Trial	- 13th July 2019 - Planted Cane variety Q208. - 13th July 2019 – Applied Imidacloprid at the top registered rate. - 13th Dec 2019 – Inspected site and installed rain gauge. - 20th Dec 2019 – Installed water catching points x 3reps.
Stage 2	Sampling 2019	- 27th Dec 2019 – 8ml of rain recorded, site checked for water runoff, still not enough rain to get a water sample.
Stage 3	Sampling 2020	- 8th Jan 2020 – Rainfall of 75ml. Collected samples from water catching points. Sent samples to Griffith Uni for testing. - 17th Jan 2020 – Rainfall 24ml. Collected samples from water catching points. Sent samples to Griffith Uni for testing. - 21st Jan 2020 – Rainfall 11ml. Collected samples from water catching sites. Sent samples to Griffith Uni for testing.
Stage 4	Sampling 2020	- 10th March 2020 - Covid-19 pandemic. - 11th August 2020 - discussions with Griffith university and project leader. Concluded that Griffith Uni was being badly affected by the pandemic and that the original material designed to be used in the trial was not going to be feasible. After discussion with Professor Chen (leading expert in biochar at Griffith) the decision was made to purchase a local source of biochar from Toowoomba call Terix - 22nd Oct 2020 – 100kg of Terix (biochar) arrived in Ingham - 4th Dec 2020 – Carbon sausages were made. - 7th Dec 2020 – Carbon sausages were installed in the cane block across two rows and inter-rows x 2 at the lower elevation end of the block with water catching point installed behind the carbon sausage to capture filtered water sample. - 29th Dec 2020 – Water sample collected. Rainfall 75ml. Water samples stored in the freezer due to lab closure over the Christmas/New Year period.
Stage 5	Sampling 2021	- 12th Jan 2021 – Water sample collected. Rainfall 128ml. Water samples stored in the freezer due to lab closure over the Christmas/New Year period. - 7th Feb 2021 - Samples sent to the TropWater Labs in Townsville for testing. - 10th Feb 2021 – Sausage collected from field and Terix biochar sample collected for Griffith Uni to test for pesticide absorption.
Stage 6		
Stage 7		

Project Trial site details

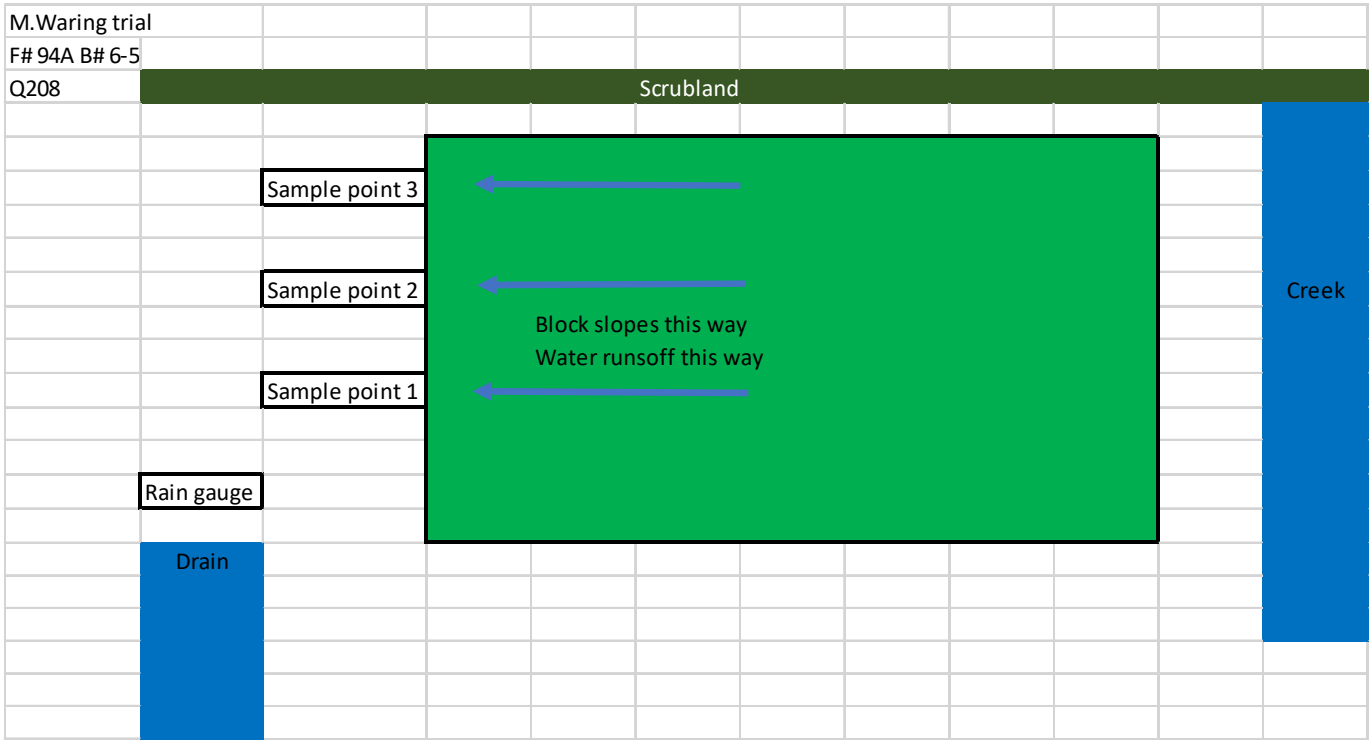
Trial Crop:	Sugar cane
Variety: **Rat/Plt:**	Q208 Planted July 2019
Trial Block No/Name:	B#6-5
Trial Block Size Ha:	1.15ha
Trial Block Position (GPS):	Refer to Google maps
Soil Type:	Sandy loam

Block History, Trial Design:

Block History:

- Mixed species fallow crop planted in Dec 2018
- Block is close to scrubland and typically has canegrub damage unless treated with Imidacloprid.
- Sandy loam soils which are prone to leaching and erosion

Trial Design:



Treatments:

N/A

Water samples are collected at the three points from a block that has Confidor applied at top register rate.

Results:

Sample Description	Sample Date	IMIDACLOPRID µg/L
Standard Confidor before carbon sausage	29/12/2020	0.04
Carbon Sausage #1	29/12/2020	0.05
Carbon Sausage #2	29/12/2020	0.02
Standard Confidor before carbon sausage	12/01/2021	1.02
Carbon Sausage #1	12/01/2021	1.05
Carbon Sausage #2	12/01/2021	3.33

The trial work done is very primitive and more technical equipment to capture samples should be used in future trial work.
The biochar from the carbon sausages has been collected and sent for analysis of absorption of pesticides. These results are still pending.

Conclusions and comments

Imidacloprid is the industry's only effective way of controlling cane grub, but studies show the imidacloprid in our water ways is exceeding critical levels. If the industry cannot reduce the imidacloprid level in water quality sampling it could be taken off the market

Advantages of this Practice Change:

If the carbon sausages can successfully filter out imidacloprid from entering waterways. The pesticide could be reduced from entering waterways and improve overall water quality to the GBR

Disadvantages of this Practice Change:

What do the growers do with the carbon sausage once it is filled?

Will you be using this practice in the future:

Due Covid-19 pandemic there should be more trial work done to fully understand the concept of such a practice

% of farm you would be confident to use this practice:

Not at this stage