

## EFFECTS OF BIOCHAR GRANULOMETRY ON THE EMISSIONS OF GREENHOUSE GASES

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### INTRODUCTION

The group has been working with the effects of biochar addition on soil properties and GHG emissions under field and laboratory conditions.

Biochar is the carbon-rich product of biomass carbonization. Among the biomass used to produce biochar the most common are wood, manure or crop residues.

This study aimed to analyze biochar grain size effect on greenhouse gases emission.

### MATERIALS AND METHODS

*Miscanthus* pyrolyzed at 450°C.



*Miscanthus* biochar of different sizes were mixed with sandy and clay soils and incubated at 20°C for 60 days.

Biochar addition had a greater effect on N<sub>2</sub>O emission of sandy soil than clay soil. N<sub>2</sub>O emissions varied among the treatments in the sandy soil. N<sub>2</sub>O emission increased with the reduction of the biochar particle size. The smallest particle size (<0.149 mm) promoted an increase of 2.5 times more on N<sub>2</sub>O emission than the biggest particle size of the biochar (> 2 mm) particle (Figure 2).

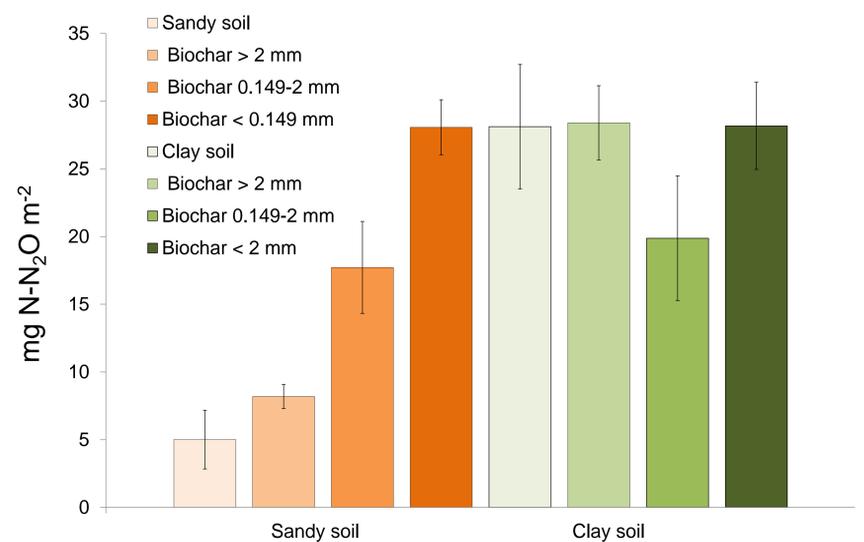


Figure 2. Total N<sub>2</sub>O-N efflux from 60-day laboratory incubations of sand and clay soil amended with different particle sizes of *Miscanthus* biochar. Vertical bars are standard deviations of means (n=4).

### RESULTS

Biochar addition did not have an effect on CH<sub>4</sub> emissions, while increased the CO<sub>2</sub> and N<sub>2</sub>O emissions in both soils. Clay soil presented the highest CO<sub>2</sub> emissions. However, the size of biochar did not affect the CO<sub>2</sub> emission.

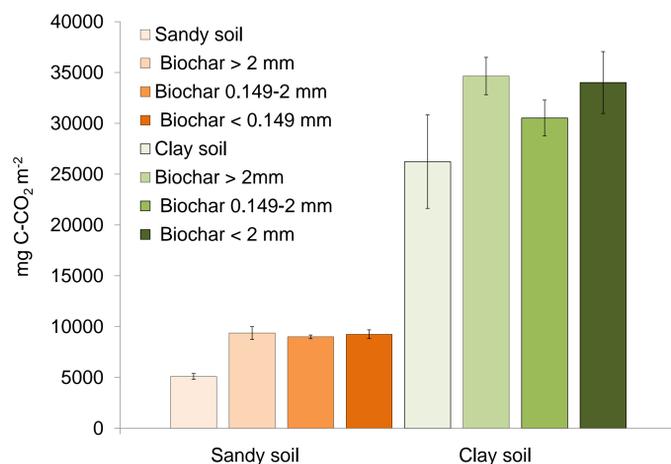


Figure 1. Total CO<sub>2</sub>-C efflux from 60-day laboratory incubations of sand and clay soil amended with different particle sizes of *Miscanthus* biochar. Vertical bars are standard deviations of means (n=4).

### CONCLUSIONS

- (i) Biochar addition did not promote change in CH<sub>4</sub> emissions;
- (ii) Biochar addition increased CO<sub>2</sub> emissions in both soils;
- (iii) Particle size of biochar had a effect on N<sub>2</sub>O emission in the sandy soil;
- (iv) The smallest particle size (<0.149 mm) of biochar showed the highest N<sub>2</sub>O emission in the sandy soil.

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### REFERENCES

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