



Tropentag, September 20-22, 2017, Bonn

“Future Agriculture:  
Socio-ecological transitions and bio-cultural shifts”

## Application of Biogas Digestate as Biofertiliser for Paddy Rice Cultivation in Southern Vietnam

HOANG KHANH NGUYEN<sup>1</sup>, ANH HUNG LE<sup>1</sup>, MICHAEL BÖHME<sup>2</sup>

<sup>1</sup>*Industrial University of Ho Chi Minh City, Institut of Environmental Sciences, Vietnam*

<sup>2</sup>*Humboldt-Universität zu Berlin, Dept. Horticultural Plant Systems, Germany*

### Abstract

There are different trends in agriculture, one is related towards fertiliser supply of crops and another towards reuse of organic residues. For sustainable cultivation of crops the amount of mineral fertilisers should be reduced and partly replaced with organic fertilisers. A sustainable way is the use of biogas digestate as fertiliser for paddy rice cultivation. Therefore, an experiment was designed in the Mekong delta with four mineral and organic fertiliser treatments: 1<sup>st</sup> 100 % mineral nitrogen fertiliser, 2<sup>nd</sup> 100 % digestate as biofertiliser, 3<sup>rd</sup> 50 % mineral fertiliser and 50 % biofertiliser and 4<sup>th</sup> 75 % mineral fertiliser and 25 % biofertiliser. The results show that, the parameters characterising the growth of the rice plants were not significant different. The colour of the rice plant leaves was also measured and showed significant differences between treatment 1 and 4. The plants heights of the rice plants showed no treatment effect, and were for the four treatments  $78.5 \pm 2.06$  cm,  $75.0 \pm 3.00$  cm,  $73.5 \pm 4.09$  cm and  $72.5 \pm 3.04$  cm, respectively. After harvesting, the length of the paddy rice inflorescences were measured. The differences between the variants were small and not significant, e.g. the length of the inflorescence in the 4<sup>th</sup> variant was  $17.90 \pm 1.75$  cm and in the 1<sup>st</sup> variant (control)  $20.50 \pm 1.29$  cm. The most important parameter is the grain yield that means the weight of the seeds and their quality. The highest yield was found for treatment 3 in comparison to the other treatments. It can be conclude that it is possible to replace mineral fertiliser in rice cultivation to some extent with biofertiliser as for example with digestate from biogas plants. Further experiments regarding the exact amount of biofertiliser, and the frequency of application are necessary.

**Keywords:** Biofertiliser, biogas plant, digestate, mineral fertiliser, nitrogen supply