BIOGAS FERMENTATION RESIDUE'S EFFECT ON THE FORMATION TENDENCY OF THE SOIL AGGREGATES

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Introduction

The soil's organic and inorganic content have serious impact on the formation of the soil structure. The primary soil particles forms aggregates by the colloids and mechanical impacts. The artificial mechanical effects could improve or decrease this forming process. Mixing organic materials as adhesives into the soil can mend the soils' physical characteristics. Important to advantage the fluid and solid non-hazardous organic material wastes' use for this purpose. The surface roughness can be examined by the shadow effects. We examined the fermentation residues' improving effect on the soil structure under laboratory conditions. We redound the formation tendency with mechanical interference of the soil aggregates which evaluated by optical inquiry.

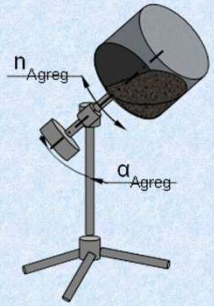
Materials and methods

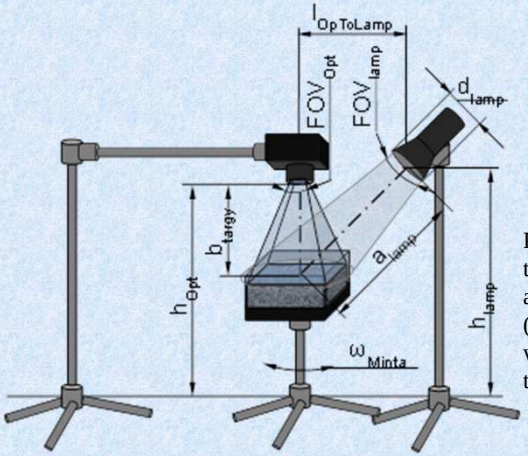
Sample	Soil type	KA	hy	humus%	CaCO3%
Gödöllő	Arenosol	25	0.8	0.5	0
Mosonmagyaróvár	Fluvisol	38	2.5	2.7	27.4

Treatments on the 50 g samples (DV: distilled water)

Sample	Control	Half dose of digestate	Full dose of digestate
Gödöllő	10 cm^3 DV	1.5 cm^3 digestate + 8.5 cm^3 DV	3 cm^3 digestate + 7 cm^3 DV
Mosonmagyaróvár	22 cm^3 DV	1.5 cm^3 digestate + 20.5 cm^3 DV	3 cm^3 digestate + 19 cm^3 DV

The granulation was made in a 5 dm^3 of capacity homemade rotating drum, started with 50 g of air-dry sample, after we add the liquid for each sample.



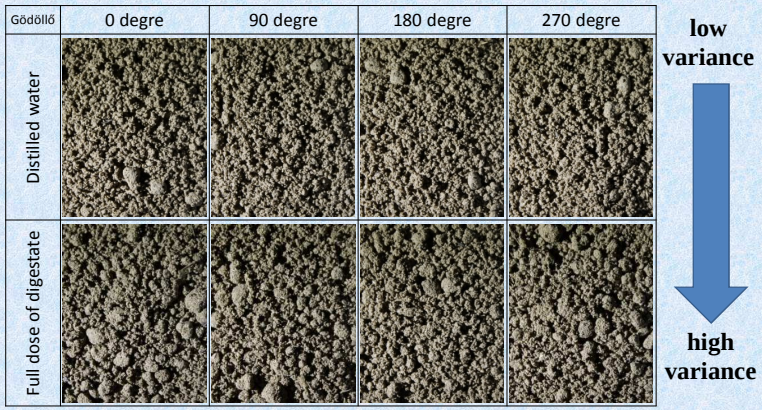


Photos were taken from the air-dried samples around the vertical axis (at 0°,90°, 180°, 270°) while we illuminated them in angel of 45°.

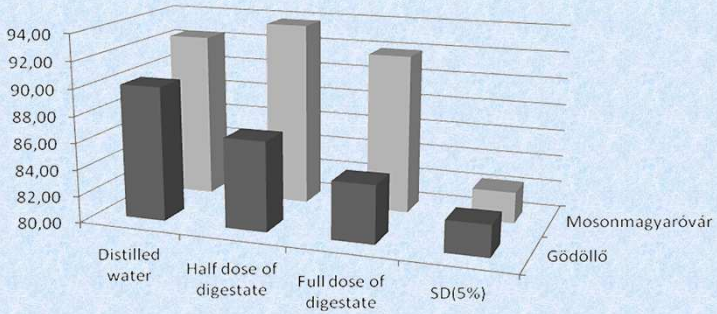
We determined the pictures average luminosity with histogram function of the IrfanView program. To determine the luminosity value (%) we made a brightness correction on the photo in which we changed the original picture's brightening until it wasn't totally a white picture.

Results and discussion

In case of the Arenosol from Gödöllő the higher organic matter (digestate) content increased the variance. The deviation between the 0.20 and 0.50 variance can be verify with Fisher F test with 7%



Observed average of the luminosity (%) for each treatment.



When the organic matter (digestate) content was higher in the samples from Gödöllő, the luminosity was decreased significantly ($SD_{5\%}$: 0.93). In case of the samples from Mosonmagyaróvár, the changes were not significant.

Conclusions

Illuminate the soil's surface from different angels cause different reflections. These reflections made diverse shadow effects because of the soil aggregates and these effects can be measured from the top. Based on the shadow effects can be infer the roughness of the soil surface. By improving this method, later the impact of the soil tillage can be evaluate by remote sensing.

Acknowledgements

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