Ratio solid – air - water in mixtures of biosolid and carbonized rice husk for agricultural use as substrate

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INTRODUCTION

Sewage sludge is a residue generated in sewage treatment plants, after the composting process is called biosolids (BIO), and is rich in organic matter and minerals, however due to the large volume generated and with few destinations suitable for this residue, is currently an environmental problem. Another waste generated on a large scale in Brazil is carbonized rice hulls (CRH) which is used as raw material for preparation of substrates.

OBJECTIVE

The objective was to evaluate the relationship of solids - water - air in mixtures between BIO and CRH for use in agriculture.

MATERIAL AND METHODS

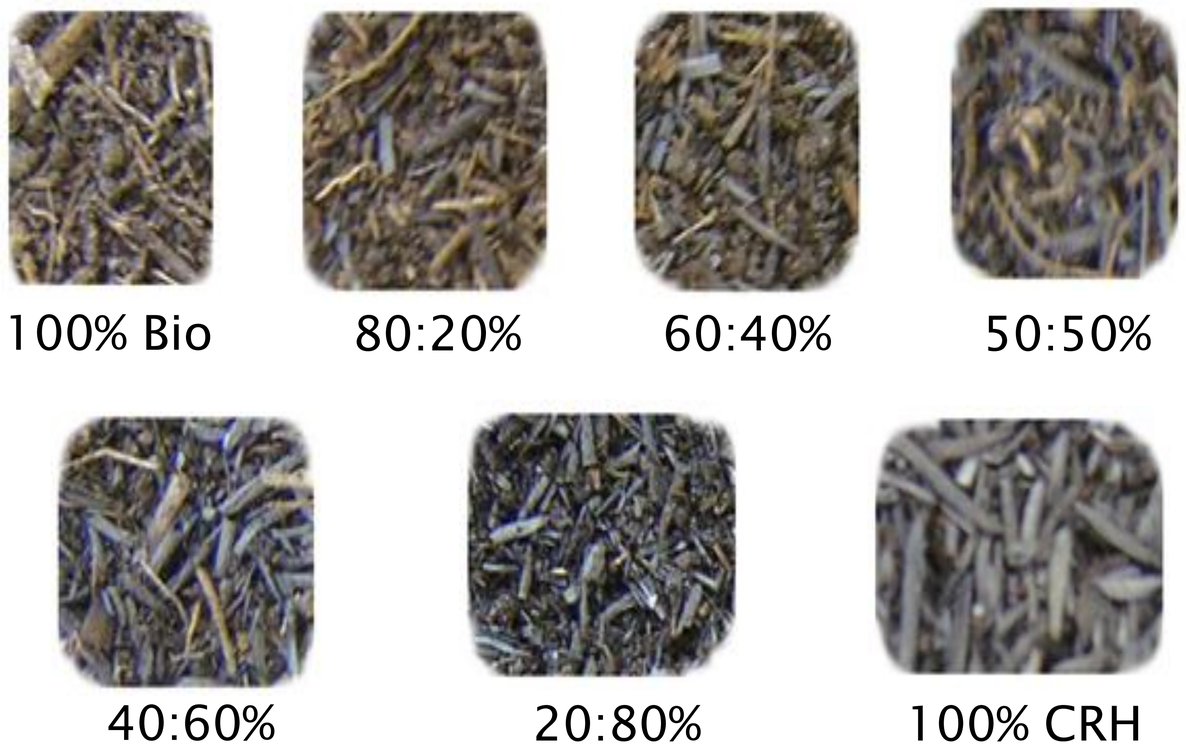
This study was conducted in the laboratory in the Department of Soil Science of the FCA/Univ. Estadual Paulista, Botucatu, Sao Paulo - Brazil.

The experimental design was randomized blocks with seven treatments, three blocks and three replicates. Treatments: 100% BIO, 80:20% BIO:CRH, 60:40%, 50:50%, 40:60%, 20:80% e 100% CRH.

The characteristics evaluated were: solid particles (SP), air space (AS), available water (AW), buffering water (BW) and remaining water (RW).

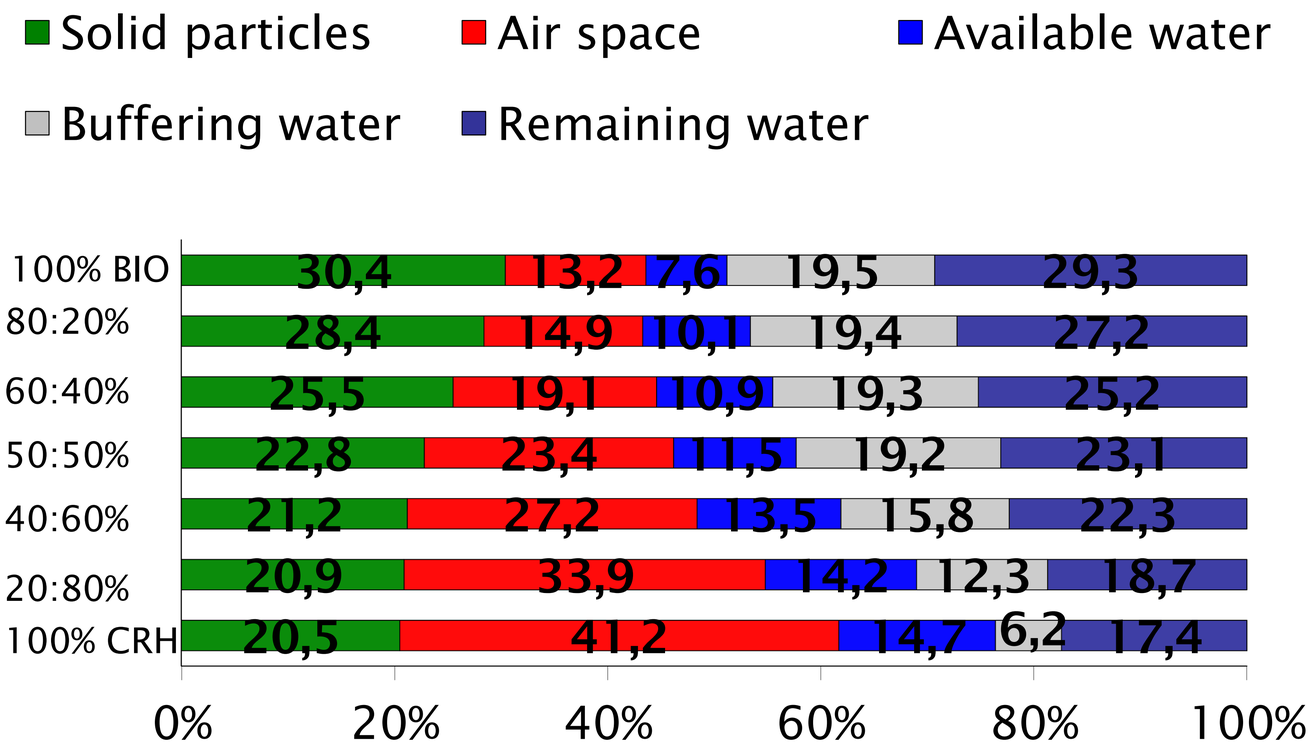
The materials were placed into rings with a volume of 90,478 cm³ and allowed to saturate for 24 hours, after this period, the rings were placed in the tension table under tensions 0,1, 0,6 and 1,0 kPa, remaining for 48 hours each tension and measuring the weight in each time interval. Upon reaching constant weight the rings were dried with forced air circulation at a temperature of 65 ºC.

The results were statistically analyzed using the Tukey test.



RESULTS

Ratio solid – air - water in mixtures of biosolid and carbonized rice husk



CONCLUSIONS

There were significant differences when making mixtures with CRH, with gradual reduction in the volume of SP (30,4% BIO; 20,5% CRH), BW (19,5% BIO; 6,2% CRH) e RW (29,3% BIO; 17,4% CRH), and an increase in S AS (13,2% BIO; 41,2% CRH) e AW (7,6% BIO; 14,7% CRH). The mixtures evaluated have parameters suitable for agricultural use.