Macro and microporosity of mixtures of biosolid and carbonized rice husk for use as agricultural substrate

Luiz Vitor Crepaldi SANCHES, Maria Júlia Carreiro Lima FERREIRA, Roberto Lyra VILLAS BÔAS and Thomas Fiore de ANDRADE

Unesp – Univ Estadual Paulista, José Barbosa de Barros street, n. 1780, zip code 18610-307, Botucatu city, São Paulo State, Brazil, e-mail: **luizvitorsanches@fca.unesp.br**

INTRODUCTION

The recycling of biosolids and any discarded material in urban centers may be able to add economic value and generate income through the products generated. There are several studies on the use of biosolids (BIO) in agriculture that prove its benefits, the most important being the supply of organic matter and water retention in the formulations of substrates.

OBJECTIVE

The objective was to evaluate the volume (%) of the total porosity, macro and microporosity in mixtures between BIO and carbonized rice husk (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.

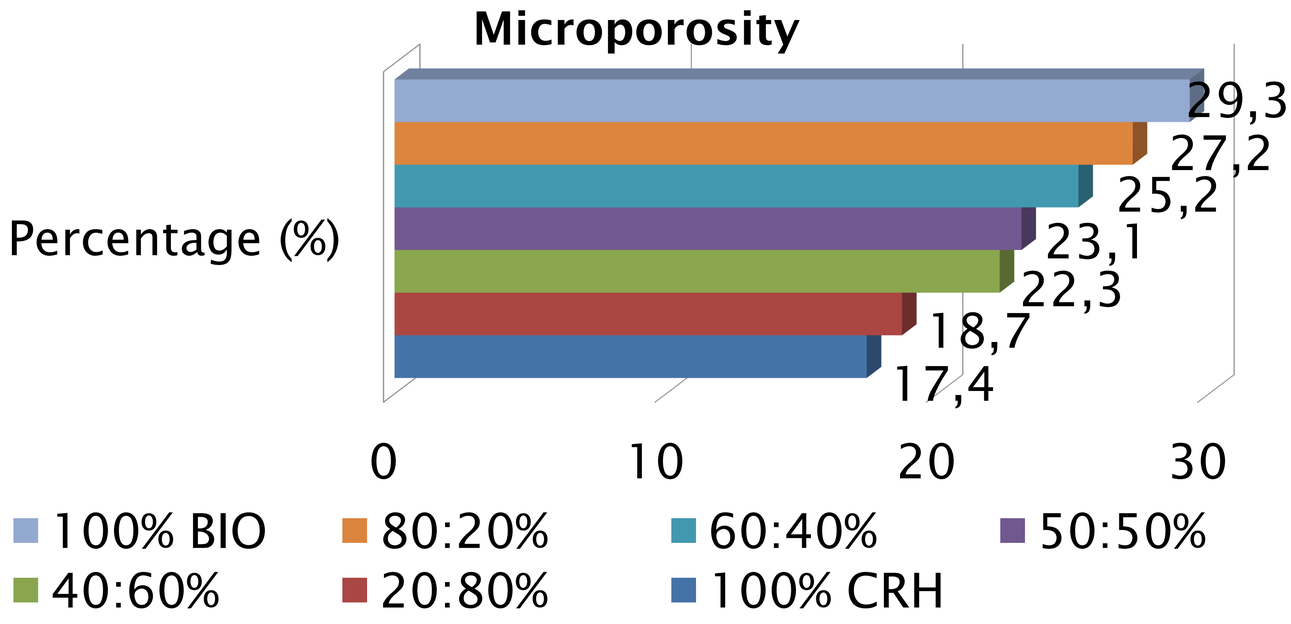
The experimental design was randomized blocks with seven treatments, three blocks and three replicates. Treatments: 100% BIO, 80:20% BIO:CRH, 60:40%, 50:50%, 440:60%, 20:80% e 100% CRH.

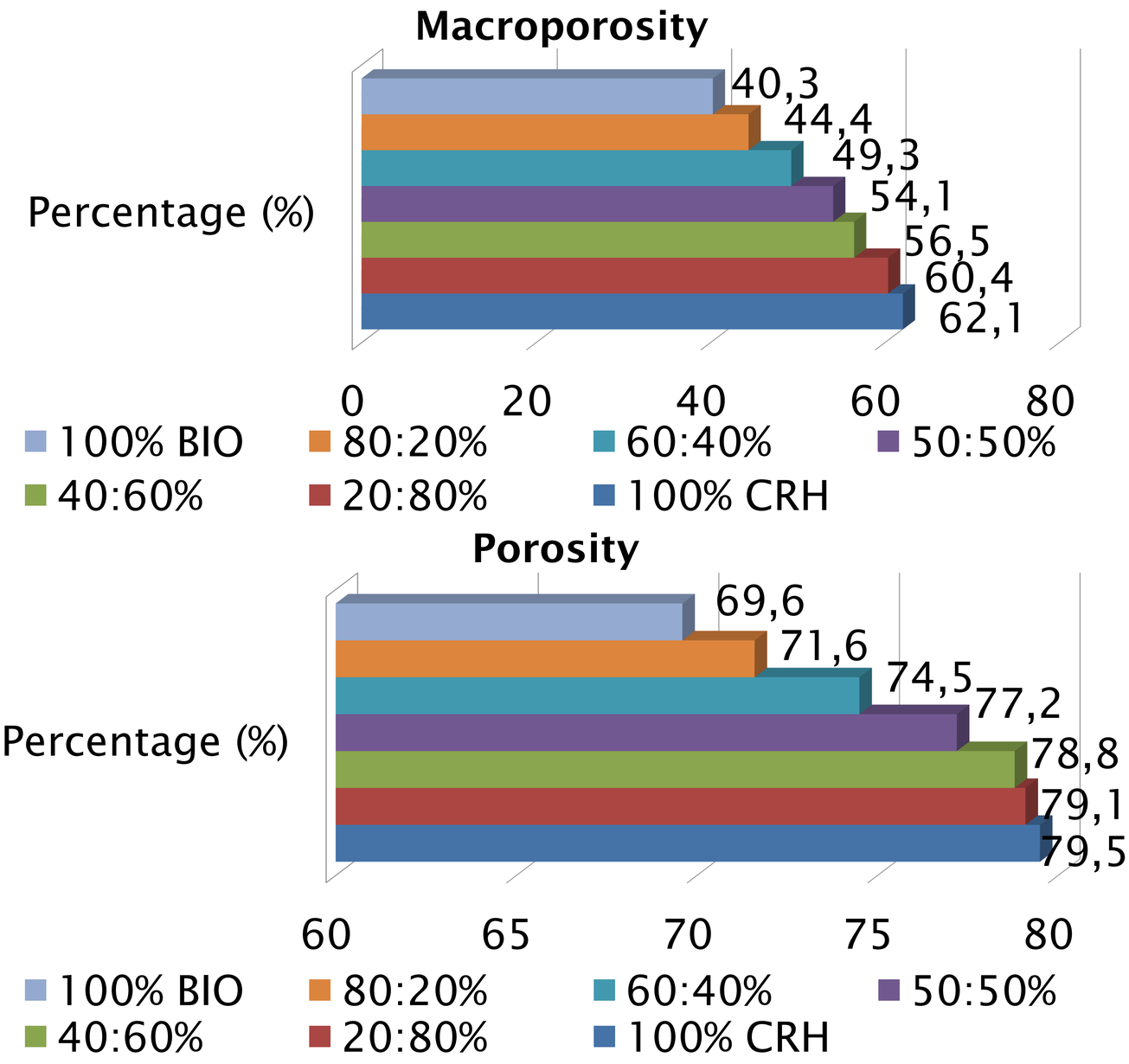
The materials were placed into rings with a volume of 90,478 cm³ and allowed to saturate for 24 hours, after this period, the rings were placed in the tension table under tensions 0,1, 0,6 and 1,0 kPa, remaining for 48 hours each tension and measuring the weight in each time interval. Upon reaching constant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

Formulas: Percentage saturation = (saturated weight - dry weight) x 100/ring volume; microporosity = (0,6 kPa weight - dry weight) x 100/ring volume; macroporosity = Percent saturation - microporosity; Porosity = microporosity + macroporosity.

The results were statistically analyzed using the Tukey test.

RESULTS





CONCLUSIONS

With the increase of CRH an increase in porosity (69,6% BIO; 71,6%; 74,5%; 77,2%; 78,8%; 79,1% e 79,5% CRH respectively), and macroporosity (40,3% BIO; 44,4%; 49,3%; 54,1%; 56,5%; 60,4% e 62,1% CRH) and reduction in microporosity (29,3% BIO; 27,2%; 25,2%; 23,1%; 22,3%; 18,7% e 17,4% CRH).