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ABSTRACT COLLECTION BOOK



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ANAEROBIC DIGESTION PERFORMANCE IN THE ENERGY RECOVERY OF KIWI RESIDUES

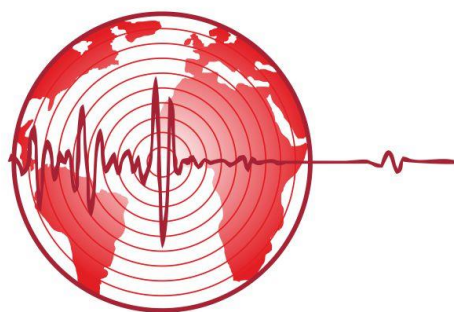
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ABSTRACT

World production and trade of fruits generate losses in the harvest, post-harvest, handling, distribution and consumption phases, corresponding to 6.8% of total production. These residues present high potential as a substrate for the anaerobic digestion process and biogas generation. Thus, the energy valuation of the agro-industrial residues of kiwifruit production was evaluated by anaerobic digestion, aiming at optimizing the biogas production and its quality. Ten assays were carried out in a batch reactor (500 mL) under mesophilic conditions and varying a number of operational factors: different substrate/inoculum ratios; four distinct values for C: N ratio; inoculum from different digesters; and inoculum collected at different times of the year. The following parameters were used to control and monitor the process: pH, alkalinity, volatile fatty acids (VFA), volatile solids (VS) and chemical oxygen demand (COD). Among the tests performed, the best result obtained for the biogas production corresponded to the use of 2 g of substrate and 98 mL of inoculum of the anaerobic digester of the Wastewater Treatment Plant (WWTP) of Bragança, with addition of 150 mg of bicarbonate leading to a production of 1628 L biogas.kg⁻¹ VS (57% methane). In relation to the biogas quality, the best result was obtained with 20 g of substrate and 380 mL of inoculum from the anaerobic digester sludge of Ave WWTP (plus 600 mg of sodium bicarbonate), presenting a value of 85% of CH₄, with a production of 464 L biogas.kg⁻¹ VS.



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