

Abstract: This paper presents an alternative method for predicting biochar yields from biomass thermochemical processes. The obtained results were compared to those of other methods, such as ANFIS using gradient descent, practical swarm optimization, genetic algorithm, whale optimization algorithm, sine-cosine algorithm, and LS-SVM. Therefore, this paper avoids this limitation by using a hybrid method between the adaptive neuro-fuzzy inference system (ANFIS) and gray wolf optimization (GWO) algorithm. The aim of the second experiment was to evaluate the performance of the proposed ANFIS-GWO method to predict biochar yield from manure pyrolysis. **Keywords:** Gray wolf optimization (GWO), adaptive neuro-fuzzy inference system (ANFIS), renewable energy production, biochar prediction. Several methods have been presented to predict biochar, such as neural network (NN) and least square support vector machine (LS-SVM). The proposed method is called ANFIS-GWO, which consists of two stages.