

CHAPTER 11

USING ADAPTIVE NEURO-FUZZY INFERENCE SYSTEMS (ANFIS) TECHNIQUE TO ESTIMATING THE DENSITY IN PEPPER (*CAPSICUM ANNUUM L.*) SEED

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1. INTRODUCTION

Pepper is one of the widely produced vegetables in the world and in Türkiye that are consumed its immature and ripe fruits in fresh or processed (tomato paste, spice or pickle) (Güvenç, 2020). According to the data of the United Nations Food and Agriculture Organization (FAO), China is the world's leading pepper producer with 16.65 million kilos, followed by Mexico with 2,818.44 million kilos, Indonesia with 2,772.59 million kilos, Türkiye with 2,636.9 million kilos and Spain with 1,472.85 kilos (Anonymous, 2022). In plant production, one of the most important factors that increase the yield per unit area and obtain quality products is the seed and the seeds must be healthy as well as have a good performance in the cultivation of cultivated vegetables (Özkan Sivritepe and Şentürk, 2011).

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architecture presented a better result than the ANFIS_4 model the inputs of which are W, L, T and S that obtained a maximum accuracy of R^2 , RMSE and MAE in 0.95 and 0.99, 30.09 and 3.952, 18.87 and 2.367 for true density and bulk density prediction, respectively.

This study results demonstrated that it is possible to identify using adaptive neuro-fuzzy system that is estimated the true density and bulk density the pepper seed. Overall, this study shows that ANFIS technique can be used effectively to accurate estimation of true and bulk density and therefore as an alternative approach.

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