

ABSTRACT

Greenhouses are a common plant research tool with the advantage of achieving optimal plant growth in an easily accessible environment. However, because the intrinsic climate characteristics in the greenhouse are heterogeneous and the quality of plant growth is not uniform. In this research, a pre-simulation study of the greenhouse system will be made to determine the distribution pattern of air temperature and humidity with *nozzle* spray. The form of distribution pattern that can be used is to vary the height and number of *nozzles* in the greenhouse. The method used is Computational Fluid Dynamics (CFD). With CFD, the effect of variations in height and number of *nozzles* can be modeled and computed to obtain even distribution results. The simulation results show that the coefficient of variation in greenhouse temperature with 4 *nozzles* with a height of 1.7 m is 0.073%. Meanwhile, the variation in humidity coefficient for the greenhouse is 4 *nozzles* with a height of 1.7 m, amounting to 1.308%. Therefore, this research shows that the developed CFD model can be a tool for designing and transmitting *nozzle* watering systems in greenhouses with various variations in the number and height of *nozzles*.

Keywords: greenhouse, computational fluid dynamic, temperature, humidity, height, number of *nozzles*