



## Development and performance evaluation of evaporative cool hydroponic fodder production chamber

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### Abstract

An evaporative cool hydroponic chamber (EHC) consisting of a double wall (inner and outer wall), a filler inside the double-wall, fogging system inside the chamber, drip system on the wall and a shading curtain was developed and evaluated for its cooling and humidifying performance and qualitative characteristics of hydroponic maize produced under EHC. The combined effect of evaporative cooling and misting system maintained the daily average temperature and relative humidity (RH) in the range of 28.6-30.2 °C and 65.2-75.1%, respectively under EHC as compared to temperature and RH variations of ambient in the range of 28.5-41.4 °C and 37-77% respectively. The minimum-maximum temperature and RH range of 25.4-34.3 °C and 52-88%, respectively were also observed under EHC. The cooling efficiency of EHC varied from 57.61 to 83.33% with an average value of 74.06%. Fresh biomass yield of seven days hydroponic fodder maize was observed as 4.00 kg/kg of seed. High crude protein (13.10%) and low crude fiber (15.30%) contents on dry matter basis of hydroponic maize fodder made it more nutritious for livestock.

**Keywords:** Evaporative, Fodder, Humidity, Hydroponic, Maize, Temperature