Fabrication of Low Cost Hydroponic Device for Sustainable Fodder Production

P. Tensingh Gnanaraj*, S. Meenakshi Sundaram, T. Muthuramalingam, E. Rachel Jemimah, R. Venkataramanan and K. Rajkumar

Livestock Farm Complex, Tamil Nadu Veterinary and Animal Sciences University (TANUVAS) MMC, Chennai, Tamil Nadu, India

Abstract

Availability of green fodder is the basis for any livestock enterprise and with the decline in area under pasture and non-availability of land for fodder cultivation, alternate techniques such as hydroponic fodder production is gaining importance. Objective of the study was to design a low cost hydroponic device with a production capacity of 20 kg / day that is suitable for small scale farmers having 2 – 4 dairy cattle. The materials required for the fabrication of the device like mild steel pipe, mild steel angle and agro shade net were procured from the local market. An exhaust fan was fitted at the rear end, to maintain optimal humidity and to remove the unwanted gas produced during germination. The machine was fabricated with 2 columns and 8 rows, holding 3 trays each. Each row was designed with 3 foggers on either side at the rate of one mister / tray for misting water over the fodder. The hydroponic tray was planned with buds for root grip and holes at the sides for draining excess water sprinkled over the fodder. The device was provided with a water tank of 120 liters capacity and a ½ HP motor to pump water from the water tank into the machine. Different seeds such as yellow maize, horse gram, sun hemp, jowar, ragi, cowpea, foxtail millet and bajra were selected to test the efficiency of the fabricated device. The device requires only 12 sq. ft. of land to produce 20 kg of hydroponic maize green fodder. With one kg of un-sprouted maize seeds, 4 - 6 kg of green forage was obtained in 7-8 days. The total cost for fabrication of low cost hydroponic device was 17,000 Indian Rupees ($235). Hence, it is concluded that this hydroponic fodder device can be used as alleviate fodder shortage problem of small scale farmers during forage scarcity period at a low cost.

Keywords: Biomass Yield, Economics, Growth Rate, Hydroponic fodder

Corresponding Author: tensinghgnanaraj@gmail.com