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Ashalatha P
NTR College of Veterinary Science, Gannavaram, Sri Venkateswara Veterinary University, Tirupati, Andhra Pradesh, India

Subrahmanyeswari B
NTR College of Veterinary Science, Gannavaram, Sri Venkateswara Veterinary University, Tirupati, Andhra Pradesh, India

Sumukh CH
NTR College of Veterinary Science, Gannavaram, Sri Venkateswara Veterinary University, Tirupati, Andhra Pradesh, India

Ananda Rao K
NTR College of Veterinary Science, Gannavaram, Sri Venkateswara Veterinary University, Tirupati, Andhra Pradesh, India

Corresponding Author:
Ashalatha P
NTR College of Veterinary Science, Gannavaram, Sri Venkateswara Veterinary University, Tirupati, Andhra Pradesh, India

Study on biomass yield of different hydroponic fodders under low cost Hydroponic fodder production unit

Ashalatha P, Subrahmanyeswari B, Sumukh CH and Ananda Rao K

Abstract
Hydroponic Fodder is a significant alternative to fodder production for the farmers with minimal land availability, with scarce rainfall and with better productive performance compared to conventional fodder production. An endeavor was made to assess the physical performance of different Hydroponic Fodder under low cost Hydroponic Fodder Production system established in Tippanagunta village. he highest biomass yield on 8th day was shown by Cowpea(8.2 kg), followed by Pillipesara (7.92 kg), Lucerne (7.0 kg), Horsegram (6.76 kg), Bajra (6.44 kg), Maize (6.12 kg), Jowar (5.65 kg) and Barley(5.23 kg). The biomass yield of different Hydroponic Fodders on 8th day of growth was statistically significant (P<0.01). The biomass yield on 8th day from Cowpea and Pillipesara was not statistically significant at (P<0.01).

Keywords: Hydroponic, fodder, biomass yield

Introduction
Andhra Pradesh is an important livestock rearing state in India. It had a total livestock population of 34.05 million with 4.58 million cattle, 6.22 million, buffaloes, 17.63 million sheep, 5.52 million goats etc. (BAHS, 2019; Table 5). The estimated fodder shortage was estimated nearly at (-) 34.96 lakh tonnes (Bhatta et al., 2012) [2]. The animals require green, dry fodder and concentrate feed to exploit its genetic potential in order to yield more production.
However, there is 41% shortage in green fodder, and 20% shortage in dry fodder in the state. In this situation Hydroponic Fodder production technology is emerging as an alternative to grow fodder for animals. Due to the building shortage of green fodder, and rapid urbanization, hydroponic fodder production is considered as an alternative to grow fodder for farm animals. Therefore, an experiment was conducted to find out the biomass yield of different hydroponic fodder in an Indian setting.

Materials and Methods
Production of Hydroponic Fodder: A Hydroponic unit was fabricated using 100% shade net of 12.0 ft length × 8.0 ft width × 12 ft height; the net was used to cover steel racks of 10.0 × 7.0 × 10.0 ft length, width and height, with four shelves (1 ft distance each). Plastic trays 1.3 ft length × 1.0 ft width × 0.15 ft height were used to grow fodder. This green house was established using green shade net, foggers and a water motor and was planned to achieve controlled environment at least cost to allow good growth of Hydroponic Fodder. Clean seeds of locally available fodder seeds (Maize, Bajra, Barley, Pillipesara) were cleaned, soaked in tap water for 12 h and were then distributed in the gunny bags for germination for 36 hours, where the sprouted seeds were transferred in to hydroponic trays for growth. Inside the green house, the plants are allowed to grow for 7 days and then on eighth day, these are harvested and fed to the dairy animals.
Biomass Yield Measurement: Biomass yield was calculated every morning with the use of electronic weighing balance by measuring the weight of tray with Hydroponic Fodder and subtracting the weight of an empty Hydroponic tray.

Results and Discussion
The biomass yield of different hydroponic fodder is presented in Table number 1 The biomass yield (kg) of Hydroponic Maize Fodder on 0th day, 1st day, 2nd day, 3rd day, 4th day, 5th day, 6th day, 7th day, 8th day was 1.45, 1.81, 2.48, 2.85, 4.40, 4.76, 5.32, 5.51 and 6.12, respectively.

The biomass yield of Hydroponic Maize Fodder (6.12kg) was in accordance with the findings of Naik and Singh (2013) [9] and Morgan *et al.* (1992) [7] and the biomass yield of Hydroponic Maize Fodder was slightly higher than the findings of Jolad *et al.* (2018) [5], Lamnganbi *et al.* (2017) [6], who reported that the biomass yield was 5.48kg and 5.37kg, respectively. The biomass yield (kg) of Hydroponic Bajra Fodder on 0th day, 1st day, 2nd day, 3rd day, 4th day, 5th day, 6th day, 7th day, 8th day was 2, 2.72, 3.48, 4.35, 4.97, 5.85, 6.78, 6.49 and 6.44, respectively. The biomass yield of Hydroponic Bajra Fodder (6.44kg) was higher than the reports of Lamnganbi*et al.*, (2017) [6], who reported that the biomass yield of Hydroponic Bajra Fodder was 4.69kg and slightly lower than the findings of Murthy *et al* (2017) [8], who reported that the biomass yield was 7.9kg after 5 days.

The biomass yield (kg) of Hydroponic Barley Fodder on 0th day, 1st day, 2nd day, 3rd day, 4th day, 5th day, 6th day, 7th day, 8th day was 1.61, 2.3, 3.04, 3.62, 4.11, 4.62, 4.76, 4.83 and 5.23, respectively. The biomass yield of Barley Hydroponic Fodder (5.23kg) was lower than the reports of Sneath and Mc Intosh (2003) who reported that the biomass yield of 10kg and the biomass yield was lower than the findings of Gebremehdin *et al.* (2015) [3], who reported that the biomass yield of Hydroponic Barley was 9kg.

The biomass yield (kg) of Hydroponic Jowar Fodder on 0th day, 1st day, 2nd day, 3rd day, 4th day, 5th day, 6th day, 7th day, 8th day was 1.86, 2.62, 3.32, 4.18, 4.87, 4.95, 5.11, 5.38 and 5.65, respectively. The biomass yield of Hydroponic Jowar Fodder (5.65kg) was lower than the reports of Murthy *et al.* (2017) [8], who reported that the biomass yield was 6.1kg after 5 days. This can be attributed to the seed quality, climate condition.

The biomass yield (kg) of Hydroponic Lucerne Fodder on 0th day, 1st day, 2nd day, 3rd day, 4th day, 5th day, 6th day, 7th day, 8th day was 3.33, 4.47, 5.21, 5.52, 6.03, 6.54, 7.02, 7.12 and 7.08, respectively. The biomass yield of Hydroponic Lucerne Fodder (6.03kg) was lower than the findings of Murthy *et al.* (2017) [8], who reported that the biomass yield of 7.08kg after 5 days.

The biomass yield (kg) of Hydroponic Pillipesara Fodder on 0th day, 1st day, 2nd day, 3rd day, 4th day, 5th day, 6th day, 7th day, 8th day was 2.72, .3.57, 4.21, 5.37, 6.23, 7.16, 7.65, 7.71 and 7.92, respectively. The biomass yield of Hydroponic Pillipesara fodder (6.23) was lower than the findings of Murthy *et al.* (2017) [8], who reported that the biomass yield of 7.58kg after 5 days. This lower value can be attributed to changing environment, microbial load and effect of the seed rate per tray.

The biomass yield (kg) of Hydroponic Cowpea Fodder on 0th day, 1st day, 2nd day, 3rd day, 4thday, 5th day, 6th day, 7th day, 8th day was 3.56, 4.41, 4.91, 5.81, 6.47, 7.23, 7.55, 7.82 and 8.2, respectively. The biomass yield of Hydroponic Cowpea Fodder (8.2kg) was higher than the findings of Jolad *et al.* (2018) [5], who reported that the biomass yield of 5.29kg. The biomass yield was in accordance with findings of Naik *et al.* (2016) [10], who reported a biomass yield of 8.2kg.

The biomass yield (kg) of Hydroponic Horsegram Fodder on 0th day, 1st day, 2nd day, 3rd day, 4th day, 5th day, 6th day, 7th day, 8th day was 2.71, 3.58, 4.40, 5.03, 5.51, 6.47, 6.79, 6.65 and 6.76, respectively. The biomass yield of Hydroponic Horsegram fodder (6.76kg) was slightly higher than the reports of Jolad *et al.* (2018) [5] and Murthy *et al.* (2017) [8], who reported that the biomass yield was 5.44kg and 5.88kg, respectively.

Table 1: Biomass Yield of different Hydroponic fodder.

	Day Wise Biomass Yield(kg)								
	Sprout Seeds (0 day)	**1st day**	**2nd day**	**3rd day**	**4th day**	**5th day**	**6th day**	**7th day**	**8th day**
Maize	1.45^{d}±0.13	1.81^{e}±0.157	2.48^{f}±0.079	2.85^{e}±0.058	4.40^{e}±0.111	4.76^{d}±0.063	5.32^{c}±0.103	5.51^{d}±0.07	6.12^{e}±0.111
Jowar	1.86^{c}±0.069	2.62^{c}±0.124	3.32^{d}±0.105	4.18^{d}±0.094	4.87^{d}±0.081	4.95^{d}±0.097	5.11^{c}±0.076	5.38^{d}±0.111	5.65^{f}±0.124
Bajra	2.00^{c}±0.056	2.72^{c}±0.087	3.48^{d}±0.094	4.35^{d}±0.114	4.97^{d}±0.081	5.85^{c}±0.065	6.78^{b}±0.08	6.49^{c}±0.111	6.44^{d}±0.082
Barley	1.61^{d}±0.093	2.3^{d}±0.076	3.04^{e}±0.083	3.62^{e}±0.104	4.11^{f}±0.055	4.62^{e}±0.087	4.76^{d}±0.068	4.83^{e}±0.104	5.23^{g}±0.137
Lucerne	3.33^{a}±0.072	4.47^{a}±0.069	5.21^{a}±0.095	5.52^{b}±0.07	6.03^{b}±0.087	6.54^{b}±0.114	7.02^{b}±0.064	7.12^{b}±0.066	7.0^{b}±0.101
Horsegram	2.71^{b}±0.054	3.58^{b}±0.153	4.40^{c}±0.078	5.03^{c}±0.092	5.51^{c}±0.089	6.47^{b}±0.117	6.79^{b}±0.061	6.65^{c}±0.108	6.76^{c}±0.083
Pillipesara	2.72^{b}±0.093	3.57^{b}±0.105	4.21^{c}±0.071	5.37^{b}±0.109	6.23^{a}±0.122	7.16^{a}±0.103	7.65^{a}±0.097	7.71^{a}±0.106	7.92^{a}±0.086
Cowpea	3.56^{a}±0.065	4.41^{a}±0.076	4.91^{b}±0.112	5.81^{a}±0.088	6.47^{a}±0.077	7.23^{a}±0.11	7.55^{a}±0.123	7.82^{a}±0.156	8.2^{a}±0.09
SEM	0.13559	0.16779	0.16260	0.17465	0.15044	0.18137	0.19315	0.18929	.17741
n	4	4	4	4	4	4	4	4	4
F Value	92.566**	77.525**	110.719**	121.796**	95.596**	121.841**	174.366**	106.734**	100.875**

Means bearing different superscript in the same column differ significantly at (p<0.01)

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References

1. BAHS Basic Animal Husbandry and Fisheries Statistics Department of Animal Husbandry, Dairying & Fisheries Ministry of Agriculture, Govt. of India 20th livestock census (2012-2019) Ministry of Agriculture Department of Animal Husbandry, Dairying and Fisheries, Krishi Bhawan, New Delhi-110001; c2019.
2. Bhatta R, Jash S, Corbon GD. National Institute of Animal Nutrition and Physiology-annual report 2011-2012 National Institute of Animal Nutrition and Physiology-annual report; c2011-2012.
3. Gebremedhin WK. Nutritional benefit and economic value of feeding hydroponically grown Maize and Barley fodder for Konkan Kanyal goats. IOSR Journal of Agriculture and Veterinary Science. 2015;8:24-30.
4. Jemimah ER, Gnanaraj PT, Muthuramalingam T, Devi T, Vennila C. Productivity, nutritive value, growth rate, biomass yield and economics of different Hydroponic green fodders for livestock. International Journal of Livestock Research. 2018;8(9):261-270.
5. Jolad R, Sivakumar SD, Babu C, Sritharan N. Performance of Different Crops under Hydroponics Fodder Production System. Madras Agricultural Journal.

2018;105(march (1-3)):1.
6. Lamnganbi M, Surve US. Biomass yield and water productivity of different Hydroponic Fodder crops. Journal of Pharmacognosy and Phytochemistry. 2017;6(5):1297-1300.
7. Morgan JV, Hunter RR, O'Haire R. January Limiting factors in Hydroponic Barley grass production. In Proceedings of the 8th international congress on soilless culture, Hunter's Rest, South Africa; c1992. p. 241-261.
8. Murthy AK, Dhanalakshmi G, Chakravarthy K. Study on Performance of Different Fodder Crops under Low Cost Green House Hydroponic Fodder Production System. International Journal of Environment, Agriculture and Biotechnology. 2017;2(2):238752.
9. Naik PK, Dhawaskar BD, Fatarpekar DD, Chakurkar EB, Swain BK, Singh NP. Nutrient changes with the growth of hydroponics cowpea (*Vigna unguiculata*) sprouts. Indian Journal of Animal Nutrition. 2016;33(3):357-359.
10. Naik PK, Singh NP. Hydroponics fodder production: an alternative technology for sustainable livestock production against impeding climate change Compendium of model training course Management strategies for sustainable livestock production against impending climate changes Adugodi Bengaluru, India; c2013. p. 70-75.