HYDROPONICS GREEN FODDER FEEDING TECHNOLOGY

KRISHIMATE AGRO AND DAIRY PVT LTD

NO.1176, 1ST CROSS, 12TH B MAIN,
H A L 2ND STAGE, INDIRANAGAR
BANGALORE-560008, INDIA
Email: sales@srisaiagro.com
Www.srisaiagro.com

INTRODUCTION:

Hydroponics fodder can be grown in low cost greenhouses with locally available grains. Production of hydroponics fodder in low cost greenhouses is an effective solution for fodder scarcity and is a very promising technology for sustainable livestock production in different regions of India.

Green fodders are staple feed for dairy animals. Dairy animals producing up to 5-7 litters' milk per day can be maintained exclusively by feeding green fodders. Hydroponic farming is the art of growing plants without the use of soil. This technology is old as history. Hydroponic fodder production involves supplying cereal grain with necessary moisture and nutrients, to enable germination and plant growth in the absence of a solid growing medium. For economical and sustainable dairy farming, fodder production round the year is highly essential.

Objective

- To document feasibility of use of "Pabal dome" (Geodesic dome) structure as potential hydroponics fodder cultivation unit.
- To document steps involved in production of Hydroponics fodder.

Scope of Experiment:

- Cost of hydroponic system is high it can be reduced by using Pabal dome (geodesic dome structure) as low cost structure.
- To achieve maximum biomass production as green fodder in per unit area

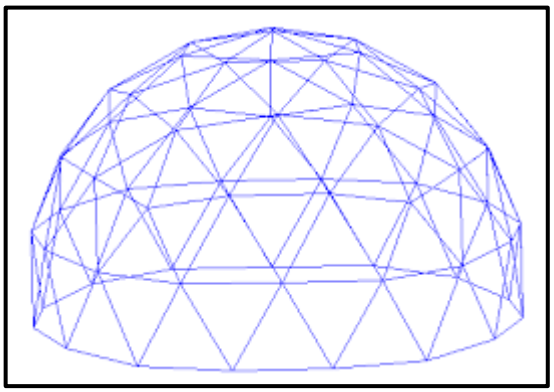
HYDROPONIC GREEN FODDER PRODUCTIONS

The experimental work was carried out in Agriculture department of the Vigyan ashram, Pabal, Pune.

Components used

4 m diameter Pabal dome ,Shed-net of 90%**,** 1 hp Motor**,** Lateral pipe 2cm (diameter)**,** Bamboo**,** Foggers**,** Plastic tray**,** Maize-(procure from local market).

Hydroponic green fodder in geodesic dome :



The choice of structure or device generally termed as mini greenhouse come geodesic dome here on is an important factor as it provides an ideal climate for the proper growth or sprouting of the fodder plant. A geodesic dome or the mini greenhouse is a framed or inflated structure covered with a transparent or translucent material in which the crops can be grown under the conditions at least partially controlled environment. The requirement for water, light, temperature and humidity is maintained by water fogging.

Structural dimensions :

- The size of geodesic dome is 12 ft*12 ft*12ft ,with production potential of 20 to 30 kg green fodder in one batch in 7-8 days was approximately.
- Inside the dome horizontally and vertically bamboos are placed, by using that bamboos racks are prepared they are in 8 numbers.
- On which 4 trays were rest, each trays containing soaked seeds. Distance between the two trays are 2ft.
- Length of lateral 161 ft, is each placed for water supply.
- Laterals containing micro-foggers 54in number were fitted just above the trays for water fogging 1 hp water lifting motor was used to lift the water from tank to the laterals
- Structure was totally covered to maintain the controlled condition with the help of 90% of shed net.

- Plastic tray of 56 cm (length) x 40 cm (width) x 7 cm (height) was used during experimentation.
- This tray was drill by 171 holes (If they don't have holes, make some)for the drainage because excess water may leads to fungal growth in green fodder.
- To produce one kg of fresh hydroponics maize fodder (8-d) about 1 litre (if water is reused). During experiments 400 ml of water was apply for 21 sec of duration for single tray.
- Total cost of Pabal geodesic dome kit (Geodeic MS fabricated structure) is 10,000/-

Procedure for hydroponic green fodder production

Green fodder was grown up by maize seed during experimentation. And this seeds should be pesticide and impurity free and are of best quality.

The following steps are carried out for green fodder production:

i. Soaking of seed
ii. Germination of seed
iii. Transfer the seed in greenhouse
iv. Irrigation
v. Complete growth of green fodder

Soaking of seed :

Weigh the correct amount of 1 kg of seed and wash it with clean water. Add the appropriate amount of water in seed so that it is thoroughly wet. Allow it to soak for 12 hr.

Germination of seed :

Keep the soaked seed in wet gunny bag and allowed to germinate (sprout) for 48 hr.at temperature 17 to 19ºC.

Transfer the seed in dome :

Dimension of plastic tray of 56 cm (length) x 40 cm (width) x 7 cm (height).The seed was scattered uniformly within the tray. This tray must keep in controlled temperature, light, irrigation and humidity because successful growth was observed in controlled environment.

Irrigation :

Sprouted seed irrigated by sprinklers or fogging. Water must be provided at interval of 1hr for 21sec.During experiments 400 ml of water was given for single tray with the help of foggers for 21 sec duration. Excess water leads to the fungal diseases to the fodder.

Harvesting green fodder :

The sprout allowed germinating in greenhouse for period of 8 days. Height of green fodder is 13 cm, color is Flush/dark green, and without fungus and odor .This fully grown fodder is then given to the Cattles as whole feed. Yield - from 1kg of dry seed around 7 to 8 kg green fodder can be made hydroponicall

Step 1: Seeds are kept in gunny bag after 12 hrs. of socking

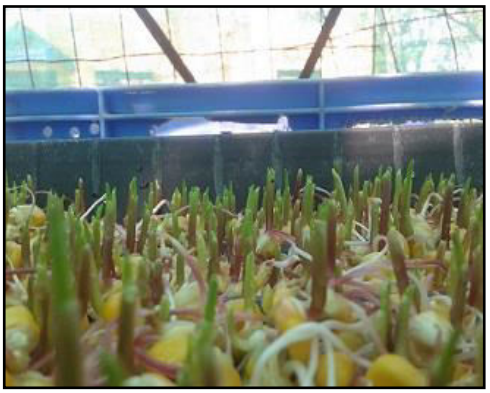
Step 2: After 48 hrs. white sprouting were seen

Step 3 :Seeds are kept in tray after

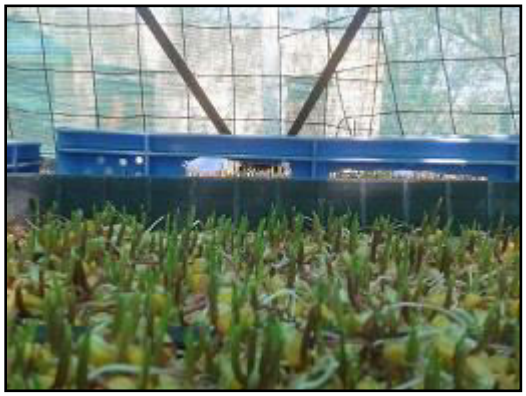
Sr. no.	Day	Growth Stage	Height cm)		Weight (kg)
			9.00AM	5.00 PM	
1.	Day 1	Overnight soaked seeds	0	0	1.460
2.	Day 2	White Sprout are seen	0.8	1	1.820
3.	Day 3	Light green sprouting is seen	2	2.5	2.89
4.	Day 4	Leaf formation	3.5	4.2	3.21
5.	Day 5	Leaf formation and	6	6.8	4.67
6.	Day 6	Well-developed leaf with light red stem.	9	9.5	5.190
7.	Day 7	Well-developed leaf with dark red stem.	11	11.5	6.55
8.	Day 8	Flush/dark green with well-developed roots	12.5	13	7.94

Production cycle:

Day 1



Day 2



Day 3

Day 4

Day 5

Day 6

Day 7

Day 8

a. Problems :

- Due excess amount of water fungal attack may happened so that tray should have number of holes so that water get drained.
- And due to fungal attack weight of fodder not increased.

6. Costing :

A. Fixed cost of structure (Excluding Dome structure) -

Sr. No.	Particulars	No./weight of materials	Rate	Prize
1	1 HP Motor	1	3500	3500
2	PVC Pipe	32 ft	9.50	304
3	Angle	121 m	48 kg/angle	3480
4	Laterals pipe	161 ft	1.60 ft	257.60
5	Plate	61	20	1220
6	Green shed net	392 sq.ft	2.5	980
7	Welding mesh	392 sq.ft	3 sq.ft	1176
8	Bamboo	389 ft	5ft	1945
9	Fogger	8	40	40
10	End cap	6	2	12
			Total Cost : 12,914	

B. Production cost / Batch –

Sr.No.	Particulars	No./weight of materials	Rate	Prize
1.	Maize (1 kg)	2 kg	30	30
2.	Water cost(Per day)	9600 ml	1/lit	9.6
3.	Labour	1	10 / hr	10
			Total cost :49.6	

Conclusion

- It is low cost system which can be used round year for green fodder production.
- Pabal dome structure has low maintains and easy operations.
- Nutritional value of milk is not checked because we are doing it as the experiment.