

## **Goa State Co-operative Milk Producers' Union Ltd.**

### **Rashtriya Krishi Vikas Yojna.**

#### **Success Story: MASS SCALE GREEN FODDER PRODUCTION IN GOA**

##### **Introduction**

The Green fodder has been the natural feed of Cattle and Buffaloes for growth, maintenance and production. In the early days the land was plenty that was used as rearing place by the cattle & buffalo population. The milk and meat was used by mankind to meet their nutritive needs. As the World changed from ancient to the present Modern status, the land availability became difficult. Presently the land in Goa has become not only costly but difficult to get for the use of Green Fodder Cultivation. Besides the size of the land holdings have become very small making it practically difficult to go for Mass Cultivation of any cash crop or say for green fodder cultivation.

Even in such circumstances our Milk Producers are trying to survive by continuing the milk production with the help of concentrate feeds manufactured by Goa Dairy. Ingredients required for manufacturing the concentrate feed is not available in Goa, and thus completely depends on outside purchase. This is also true in case of Dry Fodder (Kadaba Kutti). In such a conditions we cannot imagine the continuity of Milk Production in absence of the mass availability of green fodder in Goa. Ultimately the cost of Milk Production in Goa is very high as compared to that of our neighboring states. The feeding cost constitutes nearly 70% of the expenditure on Dairying. Therefore any effort to bring down the cost of feeding shall contribute directly in reducing the cost of milk production and increasing the profitability. Cow rearing is profitable if high cost of production is reduced, labour excess and availability of land. "Dry straw (hay) used to feed cattle has become scarce due to decline in area under rice cultivation. It becomes a dire necessity for dairy farmers to start growing green fodder

Geographical Topography of Goa does not provide many plain areas for taking up any crop cultivation on mass scale. This is also true for green fodder cultivation. Since Independence the Dairying is progressing though at a slow pace but at steady rate. This has been possible due to many developmental schemes from Dept. of Animal Husbandry & Veterinary Services as well as Goa Milk Union. However the urgent need is

to increase the local milk production at a drastic pace to meet the consumer demand for liquid milk and other milk products. For this to happen the State needs to have a specific policy to make available the feeds and fodders at optimum level with reasonable (affordable) rate to make dairying profit making venture.

### **Aims and objectives of Mass scale Green fodder Cultivation**

- 1) Availability of green fodder required by the milk producers can encourage them to take up dairying on a large scale.
- 2) The weakened Global Economy may be considered to be an opportunity to increase the participation of the rural youth as self-employment.
- 3) To minimize the cost of milk production at farmer level
- 4) To utilize barren lands round the year for fodder cultivation by utilizing irrigation facilities in the state.
- 5) To establish new variety of fodder, seed for further multiplication of fodder.

### **LIMITATIONS TO UNDERTAKE MASS SCALE GREEN FODDER CULTIVATION**

1. **Availability of Land:** Some of the agricultural as well as other land in Goa is not under any crop and remains barren. The land owners are reluctant to allow this land for green fodder cultivation due to fear of Mundkar Act. It is proposed that Govt. should come out with legislation that land allowed on lease for undertaking green fodder cultivation shall be excluded from "Mundkar Act"
2. **Irrigation Facility:** Goa has limited irrigation facilities exclusively for green fodder production. Available resources of water are usually utilized for other crops like horticulture, rice, coconut etc.
3. **Water pumps:** The availability of water pumps required for irrigation purpose needs to be taken care by the use of various schemes related to water pumping irrigation facility/agriculture/etc.
4. **Availability of Root slips of good Quality Grass fodder:** Presently in Goa we do not have the availability of root slips of quality green grass. Therefore it was proposed

to RKVY to provide funds to Goa Dairy to take up green fodder cultivation in an area of 100 Hectares of land during the 1<sup>st</sup> year. The root slips from this cultivation can be provided to the beneficiaries taking up green fodder cultivation during the subsequent years. Ultimately this 100 hectares of land needs to be maintained as "Fodder Seed Bank" to meet the "Root Slips" requirement of the state.

5. **Professional approach for scientific cultivation:** A special task force team to provide the technical/Educational information as well as training to the beneficiaries is not available who will be responsible for undertaking the programme to achieve desired the targets of fodder requirements.
6. The hurdle of stray cattle , wild animals , area under forest and wild life causing destruction of fodder plots.

#### **BENEFITS FROM GREEN FODDER CULTIVATION:**

1. Five Kg. of green fodder provides nutritive value equivalent to 1 Kg. of good quality concentrate feed.
2. Reduces the cost of Milk Production
3. The Cattle & Buffalo get natural feed
4. Animals remains healthy
5. Growth rate and production reaches to optimum level.
6. Helps in increasing fertility.
7. Early Maturity is achieved
8. Inter calving period reduced
9. Improves quality & taste of milk
10. Increased productivity
11. Higher profitability

#### **ESTABLISHMENT OF FODDER SEED BANK IN THE STATE.**

Goa State Co-operative Milk producers' Union took the lead role to undertake the pilot project of Fodder Bank with the help of Dept of Agriculture Govt. Of Goa and RKVY Govt. of India. Simultaneously actual cultivation of green fodder was initiated by bringing the 400 Ha. Of land every year during next 5 years. Thus

total land under green fodder cultivation would be 2000 hectares which is capable of providing round the year green fodder to 30000 cattle and buffaloes population including the calves, growing stock and the adults. This will indirectly help to reduce the cost of production by Rs 2 /- litre when the milch animals are fed with 20 kg of green fodder daily on regular basis. Thus the total direct benefits by reduced cost of production during the above five years would be in crores alone.

### **SELECTION OF SEED MATERIAL**

Majority of green fodder cultivators were cultivating Napier variety ( Coimbatore ) CO1, CO2, & Yeshwant . It was observed that yield was considerably low compared to CO3 variety. Yeshwant variety had high estrogenic effects thus by the milk producers observed that feeding of large quantity of yeshwant would cause pre-parturient prolepses in few milch cows . Hence to overcome this issues an alternative solution of selecting other varieties like CO3 and CO4 was explored. Few farmers had CO3 variety and had better performance as compared to other varieties already grown by them. After due consultation with Agricultural Universities at Dharwad , Coimbatore , ICAR Goa , it was suggested for CO4 variety Napier X Bajra hybrid ( Pennisetum Glaucum X Pennisetum Purpureum) variety was considered for Fodder Seed bank .

CO-4 variety of the fodder was procured from Tamil Nadu Agricultural University in Coimbatore.

### **CO-4 Grass**

CO-4 grass is a hybrid developed by TamilNadu Agricultural University in coimbatore. This is a cross between Napier grass and Bajra cereal( Pennisetum Glaucum X Pennisetum Purpureum). This is a very high yielding grass variety. With proper care, it would harvest around 180 tones per year per hectore. This has average protein content ranging from 8% to 11%. The cultivation of CO-4 grass is similar to sugarcane requiring around 17000 slips per acre. This grass can be grown in most soil types, except in heavy

clay, highly alkaline and water logged areas. CO-4 grass used as fodder increases milk yield considerably Co4 is a perennial grass which can be retained on field for 2-3 years. It has larger leaves, softer and less persistent hairs of leaf blades and sheaths and "less sharp leaf edges". Tall growing (250 cm to 350 cm Height) erect, stout deep rooted perennial hybrid grass. Hybrid is a triploid and hence sterile. They spread by short, stout rhizome to form a large clumps or stools up to one meter and propagated by two noded stem cuttings or by division of rootstock. One rooted slip or stem cutting is planted at a depth of 5- 7 cm on one side of the ridge at 75 x 30 cm spacing at the rate of 35000 – 40000 rooted slips or stem cuttings /Ha. In the month of June and July. In irrigated situation it can be planted round the year. A basal dose of Farm Yard Manure/ compost @ 5 ton/Ha , 50 kg Nitrogen / ha. Phosphorus @ 50 kg / Ha. Potassium @ 40 kg / Ha. Should be applied followed by top dressing of 50 kg N/ Ha after each cutting. Basal dose of the fertilizers should be repeated every year for sustainable high yield. Irrigation should be given on third day of planting and repeated as and when required thereafter. First cut should be taken 60-75 days after planting and subsequent cut should be 55- 65 days after first cut. In Goan conditions it was observed by farmers that average yield was 200 – 220 MT yield / Ha.



**CO4 Green Fodder Plot**

## PLANTING PATTERNS

Traditional method of planting was ridge type one rooted slip or stem cutting is planted at a depth of 5- 7 cm on one side of the ridge at 75 x 30 cm spacing



Ridge method of planting .

In pit method of planting one ft x one ft x one ft pit is dug and one stem sapling / root sapling is placed. Distance between two pit is 0.75 mts.



**Pit method of planting (1ft x 1ft )**



**Pit method of planting**



**Inter cultivation of fodder in cashew plants.**

#### **Advantages of Pith method of plantation of Co4 variety**

- 1) Pit method provides more area for propagation of the fodder
- 2) Pit helps in providing more nutrients for growth
- 3) Early root formation in pith and fodder grows straight appxt 2.25 to 2.5 mts height.
- 4) Water and fertilizer conservation due to depth of the pith
- 5) No of tillers / saplings per pith are appxt . 40- 65 as compared to ridge method in 30 -40 / basal stem.
- 6) Easy to cut the grass and free movement of the person cutting the grass.
- 7) Due to more no of saplings per pith yield of the fodder is more
- 8) Pith method requires less water as pith maintains lot of humus with moisture.
- 9) Easy to clean the area in between two piths.

10) This method is much suitable for inter cultivation of fodder in coconut, mango and cashew plantation.



**Pit method of Co4 cultivation in Mango Plot.**



**Pit method of plantation in coconut & cashew plot**



**GROWTH PATTERN OF THE CO4 VARRIETY (2,25 TO 2.5 MTS HEIGHT)**

### CO4 variety and other variety comparison

Sl no	Particulars	CO3 Variety	CO4 variety
1	Root slip growth	Sluggish	Active with many root slips
2	Stem with two nodes growth	Sluggish	Fairly good
3	Cultivation practices -Ridge method	More saplings required	More saplings required
4	Pit method	Less saplings	Less saplings
5	Quality of fodder Leaves	Narrow with spikes	Broad smooth to touch
6	Stem	Sturdy thin more fibrous	Thick , soft in nature with more leaves
7	Height of the fodder	1.75 -2 mt.	2.25 to 2.5 mt
8	Yield of seed saplings No / annum	2.8-3 lakh / Ha.	3.5- 4 lakh / Ha.
9	No of shoot saplings / ridge /mt	25- 35 No	30 -45 No
10	No of shoot saplings / Pit	30-40 No	45-60 No
11	Fodder Yield / Year / Ha.	180 – 190 MT	210 -220 MT
12	Sustainability in Goan soil	Requires more water to achieve maximum yield	Less water requirement and propagation is faster.
13	Fodder palatability by animals	Requires chaffing	Animals consumes with ought chaffing

#### ECONOMICS OF GREEN FODDER FEEDING:

The cost of production of Green fodder works out to Rupee. 2.5-3 /- per kg Generally 5 KG of good quality green fodder provides nutrients equivalent to 1 kg of concentrate

feed of quality standard. Therefore when the animal is subjected to Green fodder feeding up to 20 kg per day farmer can easily reduce 4 kg of concentrate feed. "Feeding one bundle 15 – 20 Kg of CO4 grass has been found to increase milk yield by almost 1.5 - 2 lts / cow/ day. By seeing this superior growth characteristic, farmers are replanting CO4 variety today and it has almost replaced the previous CO3 variety," as expressed by many milk producers in the dairy co-cooperative societies.

The present rate of concentrate feed in the market has reached to almost Rs. 20/- per KG. This means that the farmer will directly benefit by Rs. 80/- per day per animal by replacing 4 kg of concentrate feed in addition to other benefits listed above. Thus increase in 2 lts of milk will also support by Rs 40 / day along with better fertility rate and health of the animal.

Farmers are selling surplus fodder @ Rs 2.5- 3 a kg and are able to harvest 4-6 cuttings a year (the cuttings may vary with the availability of water). Many are able to get an average yield of 220 tones per hectare per year and earn the income routinely. It is observed that 76 dairy co-operatives have participated in this scheme of mass scale green fodder Cultivation 512 beneficiaries have cultivated the fodder in 400 Ha. of land produced fodder has routinely fed to their milch animals .This cultivation has indirectly benefited for generation of employment to the local laborers. 425.08 Ha. of Cultivated land under green fodder shall provide  $(425 \times 6 \times 30)$  76500 labour days employment which means that direct round the year regular employment to nearly 400 males and females from villages in Goa annually. The benefits from reduced cost of Milk production by utilizing the mass cultivated green fodder is Rs. 2/lit/day.

#### **FUTURE EXPECTATIONS OF FODDER CULTIVATORS:**

- 1) Timely availability of farm tools like tractors and irrigation facilities from the govt. So cultivators did not depend on rainy season, traditional systems of cultivation.
- 2) Availability of large lands for fodder cultivation to reduce the cost on irrigation fencing etc

- 3) Facility to prevent flooding, decaying of root slips due to heavy showers.
- 4) Amount proposed as incentive @ Rs 30000 /- Ha. Was too less to undertake cultivation in one hector land due to non availability of labor. Hence enhance incentives to at least Rs . 125000 /Ha.
- 5) Fodder plots were destroyed by wild animals; stray cattles put hardship and economic loss to the cultivators. Hence compensate the losses for strengthening the fodder cultivation.
- 6) Farmers suggested for additional financial support for infrastructure (irrigation, fencing, plot development) in addition to existing incentives.
- 7) Facility to convert excess available green fodder to enriched fodder there by utilizing the same during drought conditions.
- 8) Green fodder cultivation activity should be treated as important activity amongst other crop production, so as to meet the shortages of green fodder in the state.
- 9) Long term concrete policy by various agencies involved in dairy sector to overcome fodder deficiency.
- 10) Definite policy to convert barren lands and forest lands for fodder production and its conservation.

### **Success of Scheme:**

Mass scale Green fodder cultivation scheme has been successful in achievements of following facts.

- 1) Propagation of CO4 high yielding variety of fodder in state of Goa.
  - 2) Establishment of "fodder Seed Bank" to provide fodder planting material round the year.
  - 3) Scientific method of fodder cultivation amongst farmers.
  - 4) New method of pit planting has shown more fodder yield / Area.
  - 5) Reduction in milk production cost and cost saving on concentrate feeding.
  - 6) Quality grass feeding practices in dairy farm animals.
  - 7) Enhanced conception rate and better fertility management in milch animals.
  - 8) Better health conditions in milch animals.
  - 9) Due to green fodder lower feeding cost hence higher profits in dairy business.
  - 10) Provision of Green fodder for next five years as planted fodder will sustain for minimum of five years with available resources.
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