PROJECT REPORT ON
Bitter Gourd under Greenhouse

SUBMITTED BY

Promoter Name:
Xxxxxxxxxxxxxxxxx

Project Location:
xxxxxxxxxxxxxxxxx

Prepared By:
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C O N T E N T S

CHAPTER - I

ABOUT THE PROMOTER

1. Name of Firm : xxxxxxxxxxxx
2. Name of Promoter : xxxxxxxxxxxx
3. Address(Residence) : xxxxxxxxxxxx
4. Contact Number : xxxxxxxxxxxx
5. Project Location (Addr.) : xxxxxxxxxxxx

CHAPTER – II

PROJECT DESCRIPTION

Varieties
Co 1, MDU 1, COBgoH 1 (Hybrid), Arka Harit, Priya and Preethi are mainly cultivated.

CO.1 :

Selection from local type from Thudiyalur. Fruits are medium long and dark green fruits weighing 100-120g. Yield potential is 14.0 tonnes/ha in a crop duration of 115 days

MDU 1:

nduced mutant with long green white fru
warts the fruit length 30-40cm with in yi
potential of 32-35 t/ha in 120-130 days

COBgoH.1 :

It is a hybrid between MC.84 x MDU.1 .Yield potential is 52.0 tonnes/ha in a crop duration of 115 -120 days.F
have high momordicin content (2.99mg/g).eruits are white in colour

Soil
Sandy loam soils rich in organic matter with good drainage and pH range of 6.5-7.5 is suited for bitter gourd cultivation. This crop requires a moderate warm temperature.

Season
Planting is done on July and January.

Seed rate
1.8 kg/ha

Preparation of field
Plough the field to fine tilth and dig pits of 30 cm x 30 cm x 30 cm size at 2 x 1.5 m spacing and form basins.

Sowing
Sow the seeds (5 seeds/pit) treated with *Trichoderma viride* 4 g or *Pseudomonas fluorescens* 10 g or Carbendazim 10 g/kg of seeds and thin the seedlings to two/ pit after 15 days.

Irrigation
Irrigate the basins before dibbling the seeds and thereafter once a week.

Application of fertilizers
Apply 10 kg of FYM per pit (20 t/ha) 100 g of NPK 6:12:12/pit as basal and 10 g of N/pit 30 days after sowing.Apply Azospirillum and Phosphobacteria 2 kg/ha and Pseudomonas @ 2.5 kg/ha along with FYM 50 kg and neem cake @ 100 kg before last ploughing.

Quality seedling production
Bitter gourd is a direct sown vegetable but polythene bag nursery is more advantageous to get early marketing and to avoid more gap filling. Use 200 gauge poly bags of 10 cm diameter x 10 cm height for sowing the seeds. Transplant about 15 days old seedlings to the main field.

Drip irrigation
Install drip system with main and sub-main pipes and place the inline lateral tubes at an interval of 1.5m. Place the drippers in lateral tubes at an interval of 60 cm and 50 cm spacing with 4LPH and 3.5 LPH capacities respectively.

Drip irrigation

Field preparation
Form the raised beds of 120cm width (120 cm) and spread the lateral tubes in the centre of each bed. Irrigation is done in the beds by operating the drip system continuously for 8-12 hrs. Spray pre emergence herbicide like Pendimethalin @ 1 Kg *a.i*/ha just before planting. Planting or sowing is done at the holes made at 2 m distance.

Fertigation
Apply a dose of 200:100:100 kg NPK/ha throughout the cropping period through split application.

Fertigation Schedule- Bitter gourd (Hybrid)
Recommended dose: 200:100:100 kg/ha

Stage	Crop stage	Duration in days	Fertilizer grade	Total Fertilizer (kg/ha)	Nutrient applied			% of requirement		
					N	P	K	N	P	K
1	Crop establishment stage	10	19:19:19 + MN 13-0-45 Urea	26.81 11.00 29.03	5.00 1.43 13.35	5.00 - -	5.00 4.95 -	10.00	5.00	10.00
				Subtotal	19.78	5.00	9.95			
2	Vegetative stage	30	12-61-0 13-0-45	12.28 66.00	1.47 8.58	7.49 -	- 29.70	30.00	7.50	30.00

			Urea	109.00	50.14	-				
				Subtotal	60.19	7.49	29.70			
3	Flower initiation to first picking	30	12-61-0 13-0-45 Urea	12.28 44.00 115.00	1.47 5.72 52.90	7.49 - -	- 19.80 -	30.00	7.50	20.00
				Subtotal	60.09	7.49	19.80			
4	Harvesting stage	45	19:19:19 + MN 13-0-45 Urea	26.31 78.00 97.52	5.00 10.14 44.86	5.00 - -	5.00 35.10 -	30.00	5.00	40.00
	Total duration	**115 days**		Subtotal	60.00	5.00	40.10			
Total					**200.06**	**24.98 (or) 25.00**	**99.35 (or) 100.00**	**100**	**25**	**100**

***75% RD of Phosphorus applied as superphosphate = 469 Kg/ha.**
1. 19:19:19 = 53 kg/ha
2. 13:0:45 = 199kg/ha
3. 12:61:0 = 25 kg/ha
4. Urea = 351 kg/ha

After cultivation
Hoeing is done thrice to control weeds. Provide stakes to reach the pandal (2 m). Spray Ethrel 100 ppm (1 ml dissolved in 10 lit of water) four times from 15th day after sowing at weekly intervals.

Pandhal System

Plant protection
Pests and diseases

Mites: Spray dicofol 18.5 % SC @ 2.5 ml per litre of water.

Aphid: Spray Imidachloprid @ 0.5 ml/lit along with sufficient quantity of stickers like Teepol, triton X100, apsa etc., for better adhesion and coverage.

Beetles, fruit flies and caterpillars
Beetles, fruit flies and caterpillars can be controlled by spraying Malathion 50 EC 1ml/lit or Dimethoate 30 EC 1ml/lit or Methyl demeton 25 EC 1ml/lit.
Do not use DDT, copper and sulphur dust, as these are phytotoxic.

Fruit fungus

Powdery mildew
Powdery mildew can be controlled by spraying Dinocap 1ml/lit or Carbendazim 0.5 g/lit.

Downy mildew
Downy mildew can be controlled by spraying Mancozeb or Chlorothalonil 2 g/lit twice at 10 days interval.

CHAPTER – III

MARKET POTENTIAL

Marketing of Bitter Gourd is the crucial factor for the success of the project. There is tremendous potential for cultivating Bitter Gourd through poly houses. In India, Bitter Gourd is grown for its mature fruits and is widely used as salad. It has attained a status of high value crop in India in the recent years and occupies a pride place among vegetables in Indian cuisine, because of its delicate taste and rich content of ascorbic acid and other vitamins and minerals.

Bitter Gourd consumption in India is increasing now-a-days due to increasing demand by urban consumers. There is a good demand for export too. The export market needs fruits with longer shelf life, medium size, tetra lobed fruits with an attractive dark colour, mild pungency and good taste. But, the supply is inadequate due to low productivity of the crop. But there is increased demand for Bitter Gourd by the consumers and lot of farmers are also showing interest in the cultivation of this crop under protected conditions, as this type is having definite qualitative and quantitative advantage over the traditional cultivation.

CHAPTER – IV

SWOT ANALYSIS

Strengths:

- Domestic market for Bitter Gourd is growing.
- The Governments have identified vegetables in polyhouse as a sunrise sector and are providing strong support through various policies and schemes.

WEAKNESS:

- High capital investment
- Demand fluctuate according to different seasons
- Unavailability of skilled manpower
- Incidence of pest and diseases many a times becomes unmanageable.
- Poor marketing linkage and poor market infrastructure.
- Non-availability of adequate quality planting material.
- Poor post-harvest management infrastructure. Due to the perishable nature of the products it's important to have enough transportation and good logistics facilities.
- Negligence to research relating to technical factors

OPPORTUNITY:

- There is tremendous demand for Bitter Gourd due to the growing popularity of western life style
- Access to metropolises like Kolkata, Chennai, Mumbai and Delhi etc. and other big cities enhances the possibilities for tapping market of these states.
- Growing consumer base with higher income is expected to add demand in new market
- Availability of new and unique varieties

THREATS:

- Uncertainty in weather conditions and frequent occurrence of natural calamities like cyclone and drought.
- Uncertainty about market stability
- Exploitation by middlemen in the market chain.
- High incidence of pest and diseases.

V. ECONOMICS OF THE PROJECT

A. PROJECT PROFILE (Financial)

Sr. No.	PARAMETERS	VALUE
1	Unit Size in sq.m.	20,000
2	Product	Bitter Gourd
3	Cost of the project	2,05,35,500
4	Bank loan	1,54,01,625
5	Margin money	51,33,875
6	Financial Indicators	
	BCR at 15% DF	1.86 :1
	NPW at 15% DF Rs.	1,73,06,230
	I R R %	55
7	Average DSCR	2.8
8	Interest Rate (% per annum)	12
9	Repayment	5 years

B. BASIS & PRESUMPTIONS

Sr. No.	Particular	Unit	Quantity
I.	**Techno-economic parameters**		
	Payback period		5 years
	Rate of interst	%	12
II.	**Expenditure norms**		
	Fertilizer per annum	Rs./ Sq.m.	5
	Pesticides per annum	Rs./ Sq.m.	5
	No of semiskilled workers	Nos.	2
	Cost of one semiskilled worker per annum	Rs.	72,000
II.	**Income norms**		
	Sale price of Bitter Gourd	Rs./Kg	40
	Yield per 4000 sqm per crop cycle	Tonn	15
	Crop cycles per pear		3

Subsidy receives @ 50% from N.H.B. treated as F.D. in bank @ 6%

This amount of subsidy is used for repayment of loan

C. TOTAL COST OF PROJECT

Sr. No.	Particular	Unit	Unit Rate in Rs.	Quantity	Amount in Rs.
I.	**Cost of Polyhouse**	Sq.m.	800	20,000	1,60,00,000
II.	**Initial Planting cost**				
	Bed material & preparation	Rs./sq.m.	50	20,000	10,00,000
	Fertilizers & mannures	Rs./sq.m.	5	20,000	1,00,000
	Manpower & supervision	Rs./sq.m.	50	20,000	10,00,000
	Irrigation system (with drip)	Rs./sq.m.	100	20,000	20,00,000
					41,00,000
III.	**Cost of grading/pack house**	Sq. ft.	650	670	4,35,500
			TOTAL		**2,05,35,500**

D. MEANS OF FINANCE

Sr. No.	Particular	Unit	Quantity	Amount in Rs.
1	Term loan	%	75	1,54,01,625
2	Own contribution	%	25	51,33,875
			TOTAL	**2,05,35,500**
3	Subsidy entitlement @ 50% from NHB			**1,02,67,750**

E. PROJECTION OF PERFORMANCE & PROFITABILITY

Sr. No.	Particular	Unit	Unit rate in Rs.	Quantity	I year	II year	III year	IV year	V year
I.	**Income**								
a.	Sale of Bottle Gourd								
	Yield per crop cycle	Tonn			75	75	75	75	75
	Total yield per annum (Crop	Tonn			225	225	225	225	225
	Selling price	Rs./kg			40	40	40	40	40
	Total Income	Rs.			90,00,000	90,00,000	90,00,000	90,00,000	90,00,000
b.	Interest on Subsidy @ 6%				6,16,065	6,16,065	6,16,065	6,16,065	6,16,065
c.	Subsidy				0	0	0	0	1,02,67,750
				TOTAL (B)	**96,16,065**	**96,16,065**	**96,16,065**	**96,16,065**	**1,98,83,815**
II.	**Expenditure**								
a.	Cost of Raw Materials								
	Planting material for 3 crop cycle	per sq.m.	10	20,000	2,00,000	2,00,000	2,00,000	2,00,000	2,00,000
	Fertilisers	per sq.m.	5	20,000	1,00,000	1,00,000	1,00,000	1,00,000	1,00,000
	Pesticides & fungicides	per sq.m.	5	20,000	1,00,000	1,00,000	1,00,000	1,00,000	1,00,000
b.	Cost of Consumbles								
	Packaging material	per kg	0.50	225	113	113	113	113	113
c.	Cost of Utilities								
	Electricity, Water	per month	2,500	12	30,000	30,000	30,000	30,000	30,000
d.	Cost of Manpower								
	Semiskilled workers	per annum	72,000	2	1,44,000	1,44,000	1,44,000	1,44,000	1,44,000
e.	Overhead Expenses								
	Transportation	per month	1000	12	12,000	12,000	12,000	12,000	12,000
	Marketing expenses 1% of sales				90,000	90,000	90,000	90,000	90,000
				TOTAL (A)	**6,76,113**	**6,76,113**	**6,76,113**	**6,76,113**	**6,76,113**
III	**Net Income**			**TOTAL (A+B)**	**89,39,953**	**89,39,953**	**89,39,953**	**89,39,953**	**1,92,07,703**

F. Financial Analysis

Particulars	I year	II year	III year	IV year	V year
Capital Costs	2,05,35,500				
Recurring cost	6,76,113	6,76,113	6,76,113	6,76,113	6,76,113
Total Cost	**2,12,11,613**	**6,76,113**	**6,76,113**	**6,76,113**	**6,76,113**
Benefit	96,16,065	96,16,065	96,16,065	96,16,065	1,98,83,815
Depreciated value of buildings @ 10%					2,54,985
Depreciated value of Machinery & equipments @ 15%					77,13,000
Total Benefit	**96,16,065**	**96,16,065**	**96,16,065**	**96,16,065**	**2,78,51,800**
Net Benefit	**-1,15,95,548**	**89,39,953**	**89,39,953**	**89,39,953**	**2,71,75,688**
Discounting Factor@ 15%	0.87	0.76	0.66	0.57	0.50
NPV cost at 15% DF	1,84,54,103	5,13,846	4,46,234	3,85,384	3,38,056
NPV benefits at 15% DF	83,65,977	73,08,209	63,46,603	54,81,157	99,41,908
NPW at 15% DF	**1,73,06,230**				
BCR at 15% DF	**1.86 :1**				
IRR %	**54.72**				

G. Term Loan Repayment

Rate of interst - % per annum **:** 12

Opening balance of term loan **:** 1,54,01,625

Year	Loan Outstanding	Gross Surplus	Principal	Interest	Total Repayment	Net Surplus	DSCR
1	1,54,01,625	89,39,953	3080325	1848195	4928520	40,11,433	1.8
2	1,23,21,300	89,39,953	3080325	1478556	4558881	43,81,072	2.0
3	92,40,975	89,39,953	3080325	1108917	4189242	47,50,711	2.1
4	61,60,650	89,39,953	3080325	739278	3819603	51,20,350	2.3
5	30,80,325	1,92,07,703	3080325	369639	3449964	1,57,57,739	5.6
						Avg. DSCR	**2.8**