PROJECT REPORT ON

Green Chilli under Greenhouse

SUBMITTED BY

Promoter Name:
xxxxxxxxxxxxxx

Project Location:
xxxxxxxxxxxxxx

Prepared By:
Download Project Report.com
1187/67, Ground Floor, Gruhalaxmi,
J.M. Road, near Balgandharva Chowk,
Pune, Maharashtra 411005.

C O N T E N T S

CHAPTER - I

ABOUT THE PROMOTER

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

CHAPTER – II

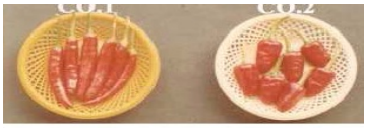
PROJECT DESCRIPTION

Varieties
K 1, K 2, CO 2, CO 4 (vegetable type), PKM 1, PMK 1 (for semi-dry conditions in Southern Districts), PLR1 (for coastal regions of North - East Tamil Nadu) and KKM (Ch) 1.

Hybrids
TNAU Chilli Hybrid CO 1

CO.1 (1979):

Reselection from Sattur samba.Eruits are long ,bright red in colour. Yields about 2.10tonnes/ha of dry pod in a crop duration of 210 days. Fruits have high capsaicin content (0.72mg/g).



CO.2 (1982):

Selection from Nambiyur local 'Gundu type'.Fruits are thick and red in colour with high seed content and pungency. Harvested for both green and red ripe pods Yields about 2.20tonnes/ha of dry pod in a crop duration of 210 days.

CO.3 (1991):

Selection from OP type introduced from Sri Lanka.Suitable for close planting (30 x 15 cm) and less affected by heavy wind. Yields about 3.00 – 3.50 tonnes/ha of dry pod and 15-18 t/ha of green chilli in a crop duration of 165 days. Fruits have high oleoresin content (13%)

CO.4 (2000):

It is a pureline selection made from an OP type introduced from Sri Lanka. Suitable for making chutney, curry and pickles, low pungency (0.29% Capsaicin
Yields about 23 tonnes/ha of green chilli in a crop duration of 165 days

TNAU HYBRID CHILLI CO 1:

Unripe fruits light green in colour, elongated, tapering towards the tip and 10.5 – 12.0 cm long.Capsaicin and oleoresin contents of 0.58 % and 14.0 % respectively. Moderately resistant to fruit rot disease. Yields about 6.74 t/ha of dry pod and 28.10 t/ha of green chilli in a crop duration of 195-205 days .

KI :

It is a pure line selection from an Assam type B 72 A. Plants are tall and spreading fruits are with pointed tip.Yields about 1.8 t of dry pods/ha in a crop duration of 210 days .Suitable for rainfed cultivation.

PMK 1 :

It is a hybrid derivative of the cross CO2 X Ramanad mundu.Suitable for rainfed cultivation. Yields about 2.3 tonnes/ha of dry pods under rainfed condition.Capsicin content is 0.36 percent

K2

It was a cross of K 1 and Sattur samba. Yields about 2.1 t of dry pods/ha in a crop duration of 210 days

KKM(Ch1):

High yield – 3.03 t/ha of dry fruits with high capsaicin content (0.54%).Early maturity - first harvest 92 days after planting. Suitable for export because of non shriveling nature even after drying

PLR 1:

It is a pureline selection from Kandangadu type**.** Yields about 18.40 tonnes/ha of green chilli in a crop duration of 210 days .Fruits are pendulous, medium in size with bulging base and blunt tip, glossy appearance.Suitable for pickling using buttermilk.

PMK 1:

It is a hybrid derivative of the cross CO2 X Ramanad mundu.Suitable for rainfed cultivation. Yields about 2.3 tonnes/ha of dry pods under rainfed condition.Capsicin content is 0.36 percent

Soil
Well drained loamy soils rich in organic matter with pH range 6.5-7.5.

Season of sowing
1. January - February
2. June - July
3. September- October

Seed rate
Varieties: 1.0 kg / ha.
Hybrids: 200 - 250 g / ha.
Nursery area: 100 sq.m / ha.

Seed treatment
Treat the seeds with *Trichoderma viride* @ 4 g / kg or *Pseudomonas fluorescens* @ 10 g/ kg and sow in lines spaced at 10 cm in raised nursery beds and cover with sand. Watering with rose can has to be done daily. Drench the nursery with Copper oxychloride @ 2.5 g/l of water at 15 days interval against damping off disease. Apply Carbofuran 3 G at 10 g/sq.m. at sowing.

Protected nursery

- Prepare the nursery area of 3 cents with slanting slope of 2 % for the seedling production to cover 1 ha.
- Cover the nursery area with 50 % shade net and cover the sides using 40 / 50 mesh insect proof nylon net.
- Form raised beds of 1 m width and convenient length and place HDPV pipes at 2m interval for further protection with polythene sheets during rainy months.
- Mix sterilized cocopeat @ 300 kg with 5 kg neem cake along with Azospirillum and phosphobacteria each @ 1 kg. Approximately 1.2 kg of cocopeat is required for filling one protay. 300 protrays (98 cells) are required for the production of 29,000 seedlings, which are required for one hectare adopting a spacing of 90 x 60 x 45 cm in a paired row system.
- Sow the treated seed in protrays @ 1 seed per cell.
- Cover the seed with cocopeat and keep the trays one above the other and cover with a polythene sheet till germination starts.
- After 6 days place the protrays with germinated seedlings individually on the raised beds inside the shade net.
- Water with rose can everyday upto seed germination. Drench with 19:19:19 @ 0.5% (5g/l) at 18 days after sowing.

Field preparation
Thoroughly prepare the field with the addition of FYM @ 25 t/ ha and form ridges and furrows at a spacing of 60 cm. Apply 2 kg/ha of Azospirillum and 2 kg / ha of Phosphobacteria by mixing with 20 kg of FYM. Irrigate the furrows and transplant 40-45 days old seedlings, with the ball of earth on the ridges.

Spacing
Varieties : 60 x 45 cm
Hybrids : 75 x 60 cm

Weed control
Apply Pendimethalin 1.0 kg *a.i.* / ha or Fluchloralin 1.0 kg *a.i.* / ha as pre-emergece herbicide followed by hand weeding once 30 days after planting.

Irrigation
Irrigate is done at weekly intervals.

Layout and planting for drip irrigation and fertigation

- Apply FYM @ 25 t / ha as basal before last ploughing.
- Apply 2 kg / ha of Azospirillum and 2 kg/ha Phosphobacteria by mixing with 20 kg of FYM.
- Apply 75 % total recommended dose of superphosphate i.e. 375 kg / ha as basal.
- Install the drip irrigation with main and sub main pipes and place lateral tubes at an interval of 1.5 m.
- Place the drippers in lateral tubes at an interval of 60 cm and 50 cm spacing with 4 LPH and 3.5 LPH capacities respectively.
- Form raised beds of 120 cm width at an interval of 30 cm and place the laterals at the centre of the each bed.
- Before planting wet the beds using drip system for 8-12 hrs.
- Planting to be done at a spacing of 90 x 60 x 45 cm in the paired row system, using ropes marked at 60 cm spacing.
- Spray Pendimethalin 1.0 kg *a.i.* / ha or Fluchloralin 1.0 kg *a.i* / ha as pre-emergence herbicide at 3rd day after planting.
- Gap filling to be done at 7th day after transplanting.

Manuring
Varieties
Basal dose : FYM 25 t/ha, NPK 30:60:30 kg/ ha.
Potassium as K2SO4 for quality improvement. Application of potassium in the form of potassium sulphate will increase quality of chilli.
Top dressing : 30 kg N/ha in equal splits on 30, 60 and 90 days after planting.

Hybrids
Basal dose : FYM 30 t / ha, NPK 30:80:80 kg / ha.
Top dressing : 30 kg N / ha in equal splits on 30, 60 and 90 days after planting.

Fertigation schedule
CHILLI F1 HYBRID
Recommended Dose: 120:80:80 kg / ha

Stage	Crop stage	Duration in days	Fertilizer grade	Total Fertilizer (kg/ha)	Nutrient supplied			% requirement		
					N	P	K	N	P	K
1	Transplanting to plant establishment stage	10	19:19:19 MN 13:0:45 Urea	21.05 8.88 14.86	4.00 1.15 6.83	4.00 - -	4.00 3.98 -	10.00	5.00	10.00
				Subtotal	11.98	4.00	7.98			
2	Flower initiation to	30	12:61:0 13:0:45	13.11 71.04	1.57 9.24	8.00 -	- 31.97	30.00	10.00	20.00

	flowering		Urea	80.72	37.13	-	-			
				Subtotal	47.94	8.00	31.97			
3	Flowering set to fruit picking	30	19:19:19 13.0:45 Urea	21.05 44.40 56.91	4.00 5.77 26.18	4.00 - -	4.00 19.98	30.00	5.00	20.00
				Subtotal	35.95	4.00	23.98			
4	Alternate day from picking	8	12:61:0 13:0:45 Urea	6.52 35.52 40.38	0.75 4.62 18.57	3.81 - -	- 15.98 -	30.00	5.00	50.00
				Subtotal	23.94	3.81	15.98			
					119.81 (or) 120.00	19.81 (or) 20.00	79.91 (or) 80.00	100.00	25.00	100.00

75% RD of Phosporous applied as superphosphate = 375 kg / ha
1. 19:19:19 = 42 kg/ha
2. 13:0:45 = 160 kg/ha
3. 12:61:0 = 20 kg/ha
4. Urea = 193 kg/ha

Effect of Endo root soluble and Mycorrhizae on Chilli
Apply 250g of Endo Roots Soluble in two splits doses at 15 DAT and 45 DAT along with 100 % N and K and 50% P for higher yield and saving of Phosphorous.
Apply 250g of Mycorrhiza in two splits at transplanting and 30 DAT along with 100% N and K and 50% P for higher yield and saving of Phosphorous.

Growth regulators
Spray Triacontanol @ 1.25 ml/l on 20, 40, 60 and 80th day of planting. Spray NAA 10 ppm (10 mg/l of water) on 60 and 90 days after planting to increase fruit set.

Micronutrient spray
Foliar spray of Zn SO4 @ 0.5 per cent thrice at 10 days interval from 40 days after planting.
Spray 19:19:19 + Mn @ 1 % at 60 days after planting.

Weed control
Spray Fluchloralin @ 1 lit a.i/ha or Pendimethalin @ 1 kg a.i/ ha. or Oxyflourfen @ 0.15 kg *a.i.*/ha as pre-emergence herbicide and may be combined with hand weeding once and earthing up 45 days after planting. Raise intercrop of onion in paired row system to get additional income.

Intercropping
The intercrops like onion and Green Chilli can be grown for getting additional income. It can also help to control the weed population.

Intercropping with onion

Plant protection
Pests
Fruit borer
Integrated pest management of fruit borer:

- Set up pheromone traps for *Helicoverpa armigera or Spodoptera litura* at 12 Nos./ha.
- Collection and destruction of damaged fruits and grown up caterpillars.
- Spray *Bacillus thuringiensis* at 2 g/lit.
- Provide poison bait with carbaryl 1.25 kg, rice bran 12.5 kg, jaggery 1.25 kg and water 7.5 lit/ha or spray any one of the following insecticide

Insecticide	Dose
Emamectin benzoate 5 % SG	4 g/10 lit.
Fipronil 5 % SC	2.0 ml /lit.
Flubendiamide 20 WDG	6.0 g /10 lit.
Flubendiamide 480 SC	2.5 ml /lit
Indoxacarb 14.5 % SC	6.5 ml/10 lit.
Novaluron 10 % EC	7.5 ml/10 lit.
Spinosad 45 % SC	3.2 ml/10 lit.
Thiodicarb 75 % WP	2.0 g/lit.

***Helicoverpa armigera* infested pods**

***Spodoptera litura* infestaion**

Thrips

1. Grow Agathi as Intercrop
2. Treat seeds with imidacloprid 70% WS @ 12 g /kg of seed
3. Apply carbofuran 3% G @ 33 kg /ha or phorate 10 % G @ 10 kg/ha or spray any one of the following insecticide

Insecticide	Dose
Imidacloprid 17.8 % SL	3.0 ml/10 lit.
Dimethoate 30 % EC	1.0 ml/lit.
Emamectin benzoate 5 % SG	4 g/10 lit.
Ethion 50 % EC	2.0 ml/lit.
Fipronil 5 % SC	1.5 ml/lit.
Oxydemeton –Methyl 25 % EC	1.0 ml/lit.
Phosalone 35 % EC	2.0 ml/lit.
Spinosad 45 % SC	3.2 ml/10 lit.
Thiacloprid 21.7 % SC	6.0 ml/10 lit.

Aphids

Treat seeds with imidacloprid 70% WS @12 g /kg of seed. Apply phorate 10 % G @ 10 kg/ha or spray any one of the following insecticide

Insecticide	Dose
Carbosulfan 25 % EC	1.0 ml/lit.
Fipronil 5 % SC	1.0 ml/lit.
Imidacloprid 17.8 % SL	3.5 ml/10 lit.
Oxydemeton –Methyl 25% EC	1.6 ml/lit.
Phosalone 35 % EC	2.0 ml/lit.
Quinalphos 25 % Gel	1.0 ml/lit.
Quinalphos 25 % EC	1.0 ml/lit.

Yellow Muranai mite

Apply phorate 10 % G @ 10 kg/ha or spray any one of the following insecticide

Insecticide	Dose

Buprofezin 25 % SC	8.0 ml/10 lit.
Diafenthiuron 50 % WP	8.0 g/10 lit.
Dimethoate 30 % EC	1.0 ml/lit.
Ethion 50 % EC	2.0 ml/lit.
Fenazaquin 10 % EC	2.0 ml/lit.
Fenpyroximate 5 % EC	1.0 ml/lit.
Hexythiazox 5.45 % EC	8.0 ml/10 lit.
Milbemectin 1 % EC	6.5 ml/10 lit.
Oxydemeton –Methyl 25 % EC	2.0 ml/lit.
Phosalone 35 % EC	1.3 ml/lit.
Propargite 57 % EC	2.5 ml/lit.
Quinalphos 25 % EC	1.5 ml/lit.
Spiromesifen 22.9 % SC	5.0 ml/10 lit.

Root knot nematode
Apply TNAU formulation of VAM (containing 1 spore/g) to control root knot nematode in nursery.

Diseases
Damping off
Treat the seeds with *Trichoderma viride* 4 g/kg or *Pseudomonas fluorescens* 10 g/kg of seed 24 hours before sowing. Apply *Pseudomonas fluorescens* as soil application @ 2.5 kg/ha mixed with 50 kg of FYM. Water stagnation should be avoided and drench with Copper oxychloride at 2.5 g/lit at 4 lit/sq.m

Leaf spot
Leaf spot can be controlled by spraying Mancozeb 2 g/lit or Copper oxychloride 2.5 g/lit.

Cercospora leafspot in chilli

Powdery mildew
Powdery mildew can be spraying Wettable sulphur 3 g/lit or Carbendazim 1 g/lit. Totally 3 sprays are required at 15 days interval from the first appearance of symptom.

Powdery mildew in chilli

Die-back and fruit rot
Spray Mancozeb 2 g/lit or Copper oxychloride 2.5 g/lit. thrice at 15 days interval starting from noticing the die-back symptoms.

Anthracnose
Use of disease-free seeds
Treat the seeds with *T. viride* 4 g/kg or *P. fluorescens* 10 g / kg of seed 24 hours before sowing
Spray Mancozeb 2 g/lit or Copper oxychloride 2.5 g/lit thrice at 15 days interval starting from noticing the die-back symptoms

Anthracnose in chilli

Chilli mosaic
Raise 2 rows of maize or sorghum for every 5 rows of chilli crop against wind direction. Recommendations given for aphids may be adopted for controlling the vector.

Chilli mosaic

Harvest

Harvesting can be done 75 days after transplanting. First two picking yield green chilli and subsequently yield red ripe fruits.

CHAPTER – III

MARKET POTENTIAL

Marketing of Green Chilli is the crucial factor for the success of the project. There is tremendous potential for cultivating Green Chilli through poly houses. In India, Green Chilli 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.

Green Chilli 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 Green Chilli 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 Green Chilli 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 Green Chilli 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	Green Chilli
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	1.24 :1
	NPW at 15% DF Rs.	48,32,356
	I R R %	38
7	Average DSCR	1.9
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 Green Chilli	Rs./Kg	35
	Yield per 4000 sqm per crop cycle	Tonn	10
	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 Green Chilli								
	Yield per crop cycle	Tonn			50	50	50	50	50
	Total yield per annum (Crop cycles per anuum- 3)	Tonn			150	150	150	150	150
	Selling price	Rs./kg			35	35	35	35	35
	Total Income	Rs.			52,50,000	52,50,000	52,50,000	52,50,000	52,50,000
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)	**58,66,065**	**58,66,065**	**58,66,065**	**58,66,065**	**1,61,33,815**
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	150	75	75	75	75	75
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				52,500	52,500	52,500	52,500	52,500
				TOTAL (A)	**6,38,575**	**6,38,575**	**6,38,575**	**6,38,575**	**6,38,575**
III	**Net Income**			**TOTAL (A+B)**	**52,27,490**	**52,27,490**	**52,27,490**	**52,27,490**	**1,54,95,240**

F. Financial Analysis

Particulars	I year	II year	III year	IV year	V year
Capital Costs	2,05,35,500				
Recurring cost	6,38,575	6,38,575	6,38,575	6,38,575	6,38,575
Total Cost	**2,11,74,075**	**6,38,575**	**6,38,575**	**6,38,575**	**6,38,575**
Benefit	58,66,065	58,66,065	58,66,065	58,66,065	1,61,33,815
Depreciated value of buildings @ 10%					2,54,985
Depreciated value of Machinery & equipments @ 15%					77,13,000
Total Benefit	**58,66,065**	**58,66,065**	**58,66,065**	**58,66,065**	**2,41,01,800**
Net Benefit	**-1,53,08,010**	**52,27,490**	**52,27,490**	**52,27,490**	**2,34,63,225**
Discounting Factor@ 15%	0.87	0.76	0.66	0.57	0.50
NPV cost at 15% DF	1,84,21,445	4,85,317	4,21,460	3,63,988	3,19,288
NPV benefits at 15% DF	51,03,477	44,58,209	38,71,603	33,43,657	80,66,908
NPW at 15% DF	**48,32,356**				
BCR at 15% DF	**1.24 :1**				
IRR %	**38.05**				

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	52,27,490	3080325	1848195	4928520	2,98,970	1.1
2	1,23,21,300	52,27,490	3080325	1478556	4558881	6,68,609	1.1
3	92,40,975	52,27,490	3080325	1108917	4189242	10,38,248	1.2
4	61,60,650	52,27,490	3080325	739278	3819603	14,07,887	1.4
5	30,80,325	1,54,95,240	3080325	369639	3449964	1,20,45,276	4.5
						Avg. DSCR	**1.9**