PROJECT REPORT ON
Cabbage under Greenhouse

SUBMITTED BY

Promter Name:
xxxxxxxxxxxxxxx

Project Location:
xxxxxxxxxxxxxx

Prepared By:
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C O N T E N T S

CHAPTER - I

ABOUT THE PROMOTER

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

CHAPTER – II

PROJECT DESCRIPTION

Varieties

Hills

Quisto.

Plains

Golden Acre, Maha Rani.

Soil

It is commonly cultivated in cool moist climate. It is grown as a winter crop in plains. It is grown in varied types of soils ranging from sandy loam to clay. It requires a pH ranging from 5.5 to 6.5 for higher production.

Season of sowing

Hills

The crop can be planted during January – February, July – August and September – October.

Plains

August – November is suitable season.

Seed rate

650 g/ha of seeds is required.

Nursery

About 100 sq.m nursery area is required for raising plants for one hectare area. Apply FYM at 300 kg, and 10 kg of No.5 mixture (9:9:9) along with 50 g of Sodium molybdate and 100 g of Borax. Sow the seeds at 10 cm between rows in raised seed beds after drenching it with Copper oxychloride (2.5 g/lit). Transplant 40 - 45 days old seedlings at a spacing of 45 cm. Avoid land infected with 'club root disease'.

Protected nursery

Raise the seedlings in shade net house. A nursery area of 5 cents with a slanting slope of 2% is required for the production of seedlings for 1 ha. Cover the nursery area with 50 per cent shade net and the sides with 40/50 mesh insect proof nylon net. Form the raised beds of 1m width and convenient length inside the nursery and above the beds, the portrays are placed.

Protray
The Protrays of 98 cells are ideal for cabbage seedling production. Around 600 protrays are required for the production of 28.333 seedlings required for one hectare at spacing of 60x45x45 cm in three row planting

Growing medium
The sterilized cocopeat @ 720kg / ha is mixed with 10kg of neem cake and Azospirillum and Phosphobacteria each @ 1kg. About 1.25 kg of the cocopeat medium is required for each tray.

Seed treatment
C for 30 minutes. 25g of Azospirillum is required for the seed treatment of 250g cabbage seeds.° 250 g of hybrid cabbage seed is required for the production of seedlings for 1 ha. Treat the seeds in hot water @ 50

Sowing
Sow the seeds in protrays @ 1 seed per cell. Cover the seeds with cocopeat and keep the tray one over the other (8-10Nos) and covered with polythene sheet for 5 days or till germination starts. After 5 days when the seeds are germinated arrange the protrays on the raised beds inside the shade net nursery. Water the tray by rose can everyday (twice / day) upto seed germination. Drench with 19:19:19 + MN @ 0.5 % (5g/lit) solution using rose can or spray micro nutrient of 0.5 % at 18 days after sowing. The cabbage seedlings are ready for transplanting in 25 days

Preparation of field

Bring the soil to a fine tilth. Pits should be taken up at a spacing of 40 cm either way in Hills. Ridges and furrows are formed at 45 cm apart in plains.

Spacing

Hills : 40 x 40 cm
Plains : 45 x 30 cm
Hybrid : 60x 45x45cm in paired row system

Planting

30 – 40 days old seedlings are selected for planting. Hardening of seedlings is done by withholding irrigation 4 - 6 days prior to planting.

Irrigation

Provide continuous supply of moisture.

Drip irrigation

Install drip system with main and sub-main and place the inline laterals at the interval of 1.5. Place the drippers at the interval of 60 cm for 4 LPH or 50 cm for 3.5 LPH in the lateral system. Form the raised beds at 120 cm width at an interval of 30cm and place the laterals at the centre of each bed.

Application of fertilizers

Hills

Apply 30 t/ha FYM, 90 kg N, 90 kg P and 90 kg K as basal and 45:45:45 kg NPK/ha on 30 to 45 days after planting.

Plains

Apply 20 t/ha of FYM, 50 kg N, 125 kg P and 25 kg K/ha along with 2 kg *Azospirillum* as basal and 50 kg N after one month of planting and earth up.

Fertigation

Fertigation requirement for F1 hybrid: 200: 125:150 kg of NPK / ha. Apply once in three days throughout the cropping period.

Fertigation schedule

Recommended Dose: 200:125:150 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	10	19:19:19 + MN 13-0-45 Urea	32.87 19.42 24.36	6.25 2.52 11.21	6.25 - -	6.25 8.74 -	10.00	5.00	10.00
				Subtotal	19.98	6.25	14.99			
2	Head initiation stage	30	12-61-0 13-0-45 Urea	20.37 133.20 130.74	2.44 17.32 60.14	12.50 - -	- 59.94 -	30.00	10.00	30.00
				Subtotal	79.90	12.50	59.54			
3	Head initiation to development stage	30	19:19:19+ MN 13-0.45 Urea	32.87 86.02 92.37	6.25 11.18 42.49	6.25 - -	6.25 38.71 -	20.00	5.00	20.00
				Subtotal	59.92	6.25	44.96			
4	Harvesting stage	35	12-61-0 13-0-45 Urea	10.18 66.60 65.38	1.22 8.66 30.07	6.25 - -	- 29.97 -	40.00	5.00	40.00
	Total duration	105		Subtotal	39.95	6.25	29.97			
Total					**199.75 (or) 200.00**	**31.25**	**149.85 (or) 150.00**	**100**	**25**	**100**

75% RD of Phosphorus applied as superphosphate in plains and rock phosphate in hills (589 kg/ha)

1. 19:19:19 = 66 kg / ha
2. 13:0:45 = 305 kg / ha
3. 12:61:0 = 31 kg / ha
4. Urea = 313 kg / ha

After cultivation

Deep hoeing should be avoided, as the Cabbage roots are surface feeders.

Plant protection

Pests

Cut worms

Apply Chlorpyriphos 2 ml/lit in the collar region during evening hours for the control of common cutworm - *Agrotis segetum*.

Aphids

- Install yellow sticky trap @12 no/ha to monitor “macropterous” adults (winged adult).
- Spray neem oil 3 % with 0.5 ml Teepol/lit or any one of the following insecticide.

Insecticide	Dose
Azadirachtin 0.03% WSP (300 ppm)	5.0 g/lit.
Dimethoate 30 % EC	6.0 ml/10 lit.
Malathion 50 % EC	1.5 ml/lit.
Phosalone 35 % EC	1.5 ml/lit.
Quinalphos 25 % EC	1.0 ml/lit.

Diamond backmoth

1. Grow mustard as intercrop as 20:1 ratio to attract diamond back moths for oviposition. Periodically spray the mustard crop with insecticide to avoid the dispersal of the larvae.
2. Install pheromone traps at 12 Nos/ha.
3. Spray Cartap hydrochloride 1 g/lit or *Bacillus thuringiensis* 2 g/lit at primordial stage (ETL 2 larvae/plant)
4. Spray NSKE 5 % after primordial stage.
5. Release parasite *Diadegma semiclausum* at 50,000/ha, 60 days after planting.

Insecticide	Dose
Azadirachtin 0.03% WSP (300 ppm)	5.0 g/lit.
Bacillus thuringiensis var *kurstaki* 5 % WP	1.0 g/lit.
Chlorantraniliprole 18.5 % SC	1.0 ml/10 lit.
Chlorfenapyr 10 % SC	1.5 ml/lit.
Chlorpyrifos 20 % EC	2.0 ml/lit.
Diafenthiuron 50 % WP	8.0 g/10 lit.
Emamectin benzoate 5 % SG	4 g/10 lit.
Fipronil 5 % SC	1.6 ml/lit.
Flubendiamide 20 WDG	2.5 g/10 lit.
Flufenoxuron 10 % DC	4 ml/10 lit.
Indoxacarb 14.5 % SC	3.5 ml/10 lit.
Indoxacarb 15.8 % SC	2.7 ml/10 lit.
Lufenuron 5.4 % EC	1.2 ml/ lit.
Metaflumizone 22 % SC	1.5 ml/lit.
Novaluron 10 % EC	7.5 ml/10 lit.

Pyridalyl 10 % EC	1.0 ml/lit.
Spinosad 2.5 % SC	1.2 ml/lit.
Thiodicarb 75 % WP	1.5 g/lit.
Trichlorofon 50 % EC	1.0 ml/ lit.

Diseases

Club root

Biological control

Seed treatment with Pseudomonas fluorescens at 10 g/ kg of seeds, followed by seedling dip @ 5g/ l and soil application @ 2.5 kg/ha along with 50 kg FYM before planting

Chemical control

Dip the seedlings in Carbendazim solution 2 g/l for 20 minutes. Drench the soil around the seedlings in the main field with Carbendazim @ 1 g/l of water. Follow crop rotation. Crucifers should be avoided for three years.

Leaf spots

Leaf spot can be controlled by spraying Mancozeb at 2 g/lit or Carbendazim 1 g/lit.

Leaf Blight

Leaf blight can be controlled by spraying Mancozeb @ 2.5 g/ litre.

Ring spot

Ring spot can be controlled by spraying Mancozeb 2 g/lit or Carbendzim 1 g/lit or Copper oxychloride 2.5 g/lit.

Downy mildew

Downy mildew can be controlled by combined spraying of (Metalaxyl + Mancozeb) 2 g/lit 3 sprays at 10 days interval.

Black rot

Black rot can be controlled by dipping the seeds in 100 ppm Streptocycline for 30 minutes. Two sprays with 2 g/lit Copper oxychloride + Streptomycin 100 ppm after planting and head formation.

CHAPTER – III

MARKET POTENTIAL

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

Cabbage 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 Cabbage 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 Cabbage 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 fluctuates 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 Cabbage 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	Cabbage
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.	1,73,06,104
	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 Cabbage	Rs./Kg	30
	Yield per 4000 sqm per crop cycle	Tonn	20
	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 Cabbage								
	Yield per crop cycle	Tonn			100	100	100	100	100
	Total yield per annum (Crop cycles per anuum- 3)	Tonn			300	300	300	300	300
	Selling price	Rs./kg			30	30	30	30	30
	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	300	150	150	150	150	150
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)	**6,76,150**	**6,76,150**	**6,76,150**	**6,76,150**	**6,76,150**
III	**Net Income**			**TOTAL (A+B)**	**89,39,915**	**89,39,915**	**89,39,915**	**89,39,915**	**1,92,07,665**

F. Financial Analysis

Particulars	I year	II year	III year	IV year	V year
Capital Costs	2,05,35,500				
Recurring cost	6,76,150	6,76,150	6,76,150	6,76,150	6,76,150
Total Cost	**2,12,11,650**	**6,76,150**	**6,76,150**	**6,76,150**	**6,76,150**
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	**-1,15,95,585**	**89,39,915**	**89,39,915**	**89,39,915**	**2,71,75,650**
Discounting Factor@ 15%	0.87	0.76	0.66	0.57	0.50
NPV cost at 15% DF	1,84,54,136	5,13,874	4,46,259	3,85,406	3,38,075
NPV benefits at 15% DF	83,65,977	73,08,209	63,46,603	54,81,157	99,41,908
NPW at 15% DF	**1,73,06,104**				
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	89,39,915	3080325	1848195	4928520	40,11,395	1.8
2	1,23,21,300	89,39,915	3080325	1478556	4558881	43,81,034	2.0
3	92,40,975	89,39,915	3080325	1108917	4189242	47,50,673	2.1
4	61,60,650	89,39,915	3080325	739278	3819603	51,20,312	2.3
5	30,80,325	1,92,07,665	3080325	369639	3449964	1,57,57,701	5.6
						Avg. DSCR	**2.8**