DETAILED PROJECT REPORT ON

Hi-Tech Cultivation of LIME

SUBMITTED BY:

Principal Promoter:

xxxxxxxxxxxxxxxx

Project Location:

xxxxxxxxxxxxxxxxxxxx

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C O N T E N T S

A. ABOUT THE PROJECT

GENERAL INFORMATION

Citrus is an important fruit crop. Lemon is one of the important category of citrus. It is mainly known for its pulp and juice throughout the world. Different citrus fruits are used throughout the world as food or juice. In central India, Nagpur santra is grown on a large scale. Mandarin Production states are Assam, Dibrugarh and Brahmaputra valley. In India Citrus cultivation is done on an area of about 923 thousand hectare with annual production of 8608 thousand metric tons. In Punjab citrus is grown on 39.20 hectares of land.

CLIMATE

Temperature	Rainfall	Sowing Temperature	Harvesting Temperature
20°C - 25°C	75 cm-200 cm	20°C - 25°C	25°C - 30°C

SOIL :

Lemons can be grown in all types of soils. Light soils having good drainage are suitable for its cultivation. PH range of soil should be 5.5-7.5. They can also grow in slightly alkaline and acidic soils. Light loam well drained soils are best for lemon cultivation.

POPULAR VARIETIES WITH THEIR YIELD

Punjab Baramasi: Shoots dropping are usually ground touching. Lemon has yellow fruits, round shaped with tapering base. Seedless fruits and are juicy in nature. The average fruit yield is 84 kg per tree.

Eureka: Semi-vigorous tree. Lemon-yellow skin color, juice is strongly acidic having excellent flavor. Fruit ripens in the month of August.

Punjab Galgal: Vigorous trees with light green foliage color. Medium size, oval shaped fruit. Juice is very acidic with 8-10 seeds per fruit. Fruits mature in the months of November-December. The average fruit yield is 80-100 kg per tree.

PAU Baramasi: The right time of fruit maturing is first week of July. It contains very less amount of seeds. It gives an average yield of 84kg per tree.

PAU Baramasi-1: The right time of fruit maturing is last week of November month. The fruit is seedless. It gives an average yield of 80kg per tree.

Other States Varieties

Rasraj: Developed by IIHR. Yellow colored fruits content 70% juice and 12 seeds. Its acidity is 6% and TSS content is about 8 brix. It is resistant to bacterial blight and canker disease.

Lisbon lemon: It is resistant to frost and high wind velocity. Fruit are of medium size, having lemon yellow color with smooth surface.

Lucknow seedless: Fruits are of medium size with yellow color.

Pant Lemon: Dwarf variety having medium size juicy fruits. It is resistant to scab, canker and gummosis

Assam Lemon, Italian Lemon, Eureka lemon, Malta lemon.

LAND PREPARATION:

Land should be ploughed, cross ploughed and leveled properly. Planting is done on terraces against slopes in hilly areas. High density planting is also possible in such areas.

SOWING:

Time of sowing
The best season for planting is July-August.

Intercropping: Intercropping with cowpeas, vegetables, french beans can be done in initial two to three years.

Spacing
Spacing between plants should be kept between 4.5×4.5. Pits of size 60×60×60cm should be dug for planting seedlings. 10Kg of Farmyard Manure and 500g of single superphosphate should be applied to pits while planting.

Sowing Depth
Pits of size 60×60×60cm should be dug for planting seedlings.

Method of sowing
Propagation
Plants are propagated by budding or air layering.

SEED :

Seed Rate
Minimum plant density of 208/acre should be maintained.

PRUNING AND TRAINING:

For proper growth of trunk of plant, Shoots in 50-60cm near ground level should be removed. Centre of plant should remain open. Water suckers should be removed at early stages of growth.

FERTILIZER:

Fertilizer requirement

Age of crop (Year)	Well decomposed cow dung (kg/tree)	Urea (gm/tree)
First to three year	5-20	100-300
Seven to Nine	25-50	400-500
Four to Six	60-90	600-800
Ten and above	100	800-1600

Nutrient requirement

Age of crop (Year)	Well decomposed cow dung (kg/tree)	Nitrogen (gm/tree)
First to three year	5-20	50-150
Seven to Nine	25-50	200-250
Four to Six	60-90	300-400
Ten and above	100	400-800

When age of crop is 1-3year, apply well decomposed cow dung@5-20kg per Tree and Urea@100-300gm per Tree. For 4-6year old crop, apply well decomposed cowdung@25-50kg and Urea@100-300gm per Tree. For 7-9year old crop, apply Urea@600-800gm per tree and well decomposed cow dung@60-90kg per Tree. When crop is 10year old or above, apply cowdung@100kg or Urea@800-1600gm per tree.

Apply whole amount of cow dung during December month whereas apply Urea in two parts; apply first of Urea in February, and second dose in April-May month. At time of applying first dose of Urea, apply whole dose of SSP fertilizer.

If fruit drop is observed, to control excessive fruit drop, take spray of 2,4-D@10gm in 500Ltr of water. Take first spray in March end, then in April end. Repeat the spray in August and September end. If cotton is planted in nearby field of citrus, avoid spraying of 2,4-D, instead take spray of GA3.

WEED CONTROL :

Weed can be controlled by hand-hoeing and also controlled by chemically, use glyphosate@1.6litre per 150 litre of water. Use glyphosate only on weeds not on crop plants.

IRRIGATION :

Lemon requires irrigation at regular intervals. Lifesaving irrigation should be given in winters and summers. Irrigation is necessary for Flowering, Fruiting and proper plant growth. Over irrigation may also leads to diseases like Root rot and collar rot. High frequency irrigation is beneficial. Salty water is injurious for crop plants. Partial drying out of soil in spring may not affect plants.

PLANT PROTECTION :

Citrus Psylla: These are juice sucking pests. Damage is mainly caused by nymphs. It injects a plant toxin liquid which burns foliage and skin of fruit. Leaves curl and fall off prematurely. It can be controlled by pruning of diseased plants, burning them. Spraying of Monocrotophos-0.025% or carbaryl- 0.1% can also be helpful.

Leaf miner: Larvae inside the upper or lower surface of young and newly emerged leaves are curled and look distorted. Young trees show a reduction in growth due to leaf miner. Best management for leaf miner is to leave it alone and let the natural enemies to feed upon them and parasitize their larvae. It can also be controlled by spraying Phosphomidon @1ml or Monocrotophos @1.5ml per 3-4 times fortnightly. Pheromone traps are also available for detecting leaf miner moths.

Scale Insects: Citrus scale insects are small insects that suck sap from the citrus trees and fruits. Honeydew is produced which is feasted upon by ants. They do not have much mouth parts. Male citrus scale has a short life span. There are mainly two types of scale on citrus plants armored scale and soft scales. Armored scale insects insert their mouth parts in the plant and never move again, eating and reproducing in the same spot. Soft scale bugs on citrus form a protective coating, which in turns cover citrus leaves and prevents photosynthesis. Once dead, soft scale will fall from tree instead of remaining stuck. They can be controlled with the introduction of indigenous parasitic wasps. Neem oil is also effective against them. Spraying of Parathion (0.03%) emulsion, dimethoate 150ml or malathion @0.1% are effective against scale control.

Aphids & Mealy Bugs: They are small sap sucking pests. Bugs are present on the underside of leaves. Synthetic pyritheriods or pest oil can be used to control aphids and bugs.

Citrus Canker: Plants have lesions on stems, leaves and fruits with brown, water-soaked margins. Citrus canker bacteria can enter through plant's stomata into the leaves. Younger leaves are highly susceptible. Lesions oozes bacterial cells which can be dispersed by blowing wind to healthy plants in area.

Contaminated equipment tends to spread disease to healthy plants. Bacteria can stay viable in old lesions for several months. It can be detected by appearance of lesions. It can be controlled by cutting of effected branches, twigs. Spraying of Bordeaux mixture

@1%. Aqueous solution of 550ppm, Streptomycin Sulphate is also helpful in controlling citrus canker.

Gummosis: Exudation of gum from bark of tree is the characteristic symptom of gummosis disease. Affected plant leaves turns to pale yellow in color. Hardness masses of gum are common on stem and leaf surfaces. In severe cases, bark may be destroyed by rotting and tree may dies. Plant dies before the fruit matures. This disease is also called foot rot. This disease can be managed through proper selection of site with proper drainage, use of resistant varieties etc. Plant injuries should be avoided. Drench the soil with 0.2% metalaxyl MZ-72 + 0.5% trichodermaviride, which helps to control this disease. Bordeaux mixture should be applied to plant upto 50-75 cm height from ground level at least once in a year.

Powdery mildew: White cottony powdery growth is noticed on all aerial plant parts. Leaves tend to become pale yellow and crinkle. Distorted margins are also seen. Upper surface of leaves are more affected. Young fruits drop off prematurely. Yield is reduced significantly. To control powdery mildew, affected plant parts should be removed and destroyed completely. Carbendazim, three times at 20-22 days of interval helps to control this disease.

Black Spot: Black spot is a fungal disease. Circular, dark spots on fruits are seen. Copper spray in early spring should be sprayed on foliage helps to cure plants from black spots. It should be repeated in 6 weeks again.

Lemon Scab: It affects some of the mandarin varieties and lemon fruits. Raised grey corky scabs on tree branches, fruits and leaves are seen causing distortions of the fruit. Fruits fall of at very early stages of growth. It is caused due to fungus. Copper spray mixed with white oil should be sprayed on the foliage to prevent lemon scab. 2 Table spoons of white oil to two liter of water should be added into 5 litre or copper spray mixture.

Collar Rot: Collar rot is also caused due to fungus. This disease mainly affects the bark on tree trunk. Bark begins to rot and forms a band just above ground surface, this band decay gradually and covers the whole trunk. It is very severe in some cases that even the trees may die. This is caused due to incorrect mulching, injury due to weeding, mowing etc. Tree may lose its vigor. To protect trees from collar rot, cut and scrape away the soft, infected bark to clean the trunk of tree. Mixture of copper spray or Bordeaux mixture should be painted on the affected part of the tree. Remove all the weak, diseased and congested tree branches to ensure proper air circulation.

Zinc Deficiency: It is very common in citrus trees. It is notified as yellow areas between main lateral veins and midrib of the leaves. Twigs may die back, dense shoots having stunted bushy appearance is commonly seen. Fruits tend to become pale, elongated and small in size. Proper fertilizer application should be given to the citrus tree to prevent zinc deficiency. Zinc sulphate should be provided by dissolving 2 table spoons

in 10 litres of water. This should be sprayed thoroughly on all the tree branches and foliage. It can also be cured by providing cow or sheep manure.

Iron deficiency: Color of new leaves changes to yellowish green. Iron chelates should be provided to the plants. Cow or Sheep manure is also helpful to cure plants from iron deficiency. This deficiency mostly occurs in case of alkaline soils.

HARVESTING :

On attaining proper size, shape along with attractive color having TSS to Acid ratio of 12:1, kinnow fruits is ready for harvest. Depending upon variety fruits are generally ready for harvesting in Mid- January to Mid- February. Do harvesting at proper time as too early or too late harvesting will give poor quality.

POST-HARVEST :

After harvesting, wash fruits with clean water then dip fruits in Chlorinated water@2.5ml per Liter water and then partially dried them. To improve appearance along with to maintain good quality, do Citrashine wax coating along with foam. Then these fruits are dried under shade and then packing is done. Fruits are packed in boxes

II. ECONOMICS OF THE PROJECT

A. PROJECT PROFILE (Financial)

Sr. No.	PARAMETERS	VALUE
1	Product	Lime
2	Area in Hector	2.43
3	Cost of the project	6,66,666
4	Bank loan	5,00,000
5	Own Contribution	1,66,667
6	Financial Indicators	
	BC R	1.57 :1
	N P W 15% (Rs.)	7,00,310
	I R R %	36.19
	Average DSCR	5.1
7	Interest Rate (% per annum)	10.45
8	Repayment Period	10 years including first Three years as a moratorium perod

B. BASIS & PRESUMPTIONS

1 Payback period 10 years including first three years as a moratorium perod

2 Tax on income ignored.

3 Promoters share includes self-contribution plus loan from friends and relatives.

4 There is no change in Government policies and interest rates in next 8 years.

C. TOTAL COST OF PROJECT

SR.NO.	PARTICULAR	UNIT	UNIT RATE IN RS.	QUANTITY	AMOUNT IN RS.
1.	**Land Development**				
i)	Land Leveling & pit digging	Hector	80,000	2.43	1,94,248
ii)	Fencing	Mtr	150	300	45,000
iii)	Farm Road	Mtr	150	300	45,000
			SUB TOTAL – 1		**2,84,248**
2.	**Irrigation**				
i)	Cost of Open/ Tube Well	No	80000	1	80,000
			SUB TOTAL – 2		**80,000**
3.	**Drip Irrigation etc. :-**				
i)	Drip Irrigation	Hector	40,000	2.43	97,124
			SUB TOTAL – 3		**97,124**
4.	**Cost of Cultivation**				
a.	Cost of Planting Material ('@ No. of saplings per acre -70)	Saplings	70	300	21,000
b.	Initial cost of inputs	Hector	20,000	2.43	48,562
c.	Labour Charges	Hector	20,000	2.43	48,562
			SUB TOTAL – 4		**97,124**
5.	**Infrastructure**				
i)	Grading & Packing House (10'x20')	Sq. ft.	250	200	50,000
			SUB TOTAL – 5		**50,000**
6.	**Mechanization**				
i)	Cost of Sprayer & other farm equipments	Ls			58,170
			SUB TOTAL – 6		**58,170**
	TOTAL				**6,66,666**

D. MEANS OF FINANCE

Sr. No.	Particular	Unit	Quantity	Amount in Rs.
1	Bank/FI Term loan	%	75	5,00,000
2	Promoter's Share	%	25	1,66,667
			TOTAL	**6,66,666**

E. PROJECTED PROFITABILITY

Sr. No.	Particular	Unit	Unit rate in Rs.	Quantity	I year	II year	III year	IV year	Vyear	VI year	VII year	VIII year	IX year	X year
I.	**Income**													
	Sales of Lime													
a.	Yield of Lime fruits per Tree	Kg	0	0	-	-	-	25	30	40	50	100	150	200
b.	Total Yield of 400 Trees	Kg						10,000	12,000	16,000	20,000	40,000	60,000	80,000
c.	Income	Rs.	0	0	0	0	0	2,50,000	3,00,000	4,00,000	5,00,000	10,00,000	15,00,000	20,00,000
	(@ Selling Price Rs. 25 per kg.)													
			TOTAL (A)		**0**	**0**	**0**	**2,50,000**	**3,00,030**	**4,00,040**	**5,00,050**	**10,00,100**	**15,00,150**	**20,00,200**
II.	**Expenditure**													
a.	Mannures & Fertilisers	Hector	15,000	2.43	36,422	36,422	36,422	36,422	36,422	36,422	36,422	36,422	36,422	36,422
b.	Insectisides & Pesticides	Hector	15,000	2.43	36,422	36,422	36,422	36,422	36,422	36,422	36,422	36,422	36,422	36,422
c.	Manpower (For land preparation, planting, Inter - cultural operation etc.	Hector	20,000	2.43	48,562	48,562	48,562	48,562	48,562	48,562	48,562	48,562	48,562	48,562
d.	Packaging, Transportation etc.	Hector	10,000	2.43	24,281	24,281	24,281	24,281	24,281	24,281	24,281	24,281	24,281	24,281
e.	Overhead (Electricity, Water etc.)	Hector	2,000	2.43	4,856	4,856	4,856	4,856	4,856	4,856	4,856	4,856	4,856	4,856
f.	Contengencies	Hector	5,000	2.43	12,141	12,141	12,141	12,141	12,141	12,141	12,141	12,141	12,141	12,141
			TOTAL (B)		**1,62,683**	**1,62,683**	**1,62,683**	**1,62,683**	**1,62,683**	**1,62,683**	**1,62,683**	**1,62,683**	**1,62,683**	**1,62,683**
III.	**Net Income**		**TOTAL (A-B)**		**-1,62,683**	**-1,62,683**	**-1,62,683**	**87,317**	**1,37,347**	**2,37,357**	**3,37,367**	**8,37,417**	**13,37,467**	**18,37,517**

F. Financial Analysis

Particulars		I year	II year	III year	IV year	V year	VI year	VII year	VIII year	IX year	X year
Capital Costs		6,66,666									
Recurring cost		1,62,683	43,047	43,047	1,62,683	1,62,683	1,62,683	1,62,683	1,62,683	1,62,683	1,62,683
Total Cost		**8,29,349**	**43,047**	**43,047**	**1,62,683**	**1,62,683**	**1,62,683**	**1,62,683**	**1,62,683**	**1,62,683**	**1,62,683**
Benefit		0	0	0	2,50,000	3,00,030	4,00,040	5,00,050	10,00,100	15,00,150	20,00,200
Depreciated value of buildings, fencing etc. @ 10%											50,365
Depreciated value of Machinery & equipments @ 15%											35,969
Closing stock value											21,000
Total Benefit		**0**	**0**	**0**	**2,50,000**	**3,00,030**	**4,00,040**	**5,00,050**	**10,00,100**	**15,00,150**	**21,07,533**
Net Benefit		**-8,29,349**	**-43,047**	**-43,047**	**87,317**	**1,37,347**	**2,37,357**	**3,37,367**	**8,37,417**	**13,37,467**	**19,44,851**
Discounting Factor@ 15%	**15%**	0.87	0.76	0.66	0.57	0.50	0.43	0.38	0.33	0.28	0.25
NPV cost at 15% DF		7,21,173	32,550	28,304	93,014	80,882	70,332	61,158	53,181	46,245	40,213
NPV benefits at 15% DF		0	0	0	1,42,938	1,49,168	1,72,948	1,87,987	3,26,934	4,26,436	5,20,950
NPW at 15% DF	**7,00,310**										
BCR at 15% DF	**1.57 :1**										
IRR %	**36.19**										

G. Term Loan Repayment

Rate of interst - % per annum **:** 10.45

Opening balance of term loan **:** 5,00,000

Year	Loan Outstanding	Net Income	Principal	Interest	Total Repayment	Net Surplus	DSCR
1	5,00,000	-1,62,683	0	52,250	52,250	0	0
2	5,00,000	-1,62,683	0	52,250	52,250	0	0
3	5,00,000	-1,62,683	0	52,250	52,250	0	0
4	5,00,000	87,317	71,429	52,250	1,23,678	-36,361	0.7
5	4,28,571	1,37,347	71,429	44,786	1,16,214	21,133	1.2
6	3,57,143	1,37,347	71,429	37,321	1,08,750	28,597	1.3
7	2,85,714	3,37,367	71,429	29,857	1,01,286	2,36,082	3.3
8	2,14,286	8,37,417	71,429	22,393	93,821	7,43,596	8.9
9	1,42,857	8,37,417	71,429	14,929	86,357	7,51,060	9.7
10	71,429	8,37,417	71,429	7,464	78,893	7,58,525	10.6
						Avg. DSCR	**5.1**