MAIBIL HORTICULTURAL SERVICES

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INVESTOR INSIGHTS

Most of the farmers or the investors don't have an adequate knowledge about the HDAP. For their brief insights to make their calibrated decisions for their investment in this sector, we hereby provide a model project for their informed decision making. This information is purely based to the personal experience of the MAIBIL and the front-end costs for the installation of the HDAP by acquiring the services from our enterprise.

High-Density Apple Plantation (HDAP) on 10 Kanals of Land

Project Summary

This project report outlines the establishment of a high-density apple plantation (HDAP) on an acre plot of land. The objective is to maximize the utility of the piece of land. Analyzing the various agricultural related projects including establishment of bio-fertilizer unit and HDAP, we found HDAP more efficient and productive in comparison to the former. In this report, we analyzed the project empirically after thorough investigation about the market conditions, land fertility, environmental conditions & the pros and cons, the imputed costs associated to reduce the impact of certain natural disasters, the front-end costs for the extension of the existing unit. The report covers the costs involved in land preparation, development of the trellis and drip irrigation system, additional costs incurred for increasing the water storage and effective drip irrigation for the additional one acre of the land parcel.

Project Basics

Title: High-Density Apple Plantation (HDAP)

Location: _____

Land Area: 1.25 Acre / 10 Kanals / 43520 Sq. ft.

Planting System: High-Density system with a tree density of 150 trees per kanal of land

Varieties: Mixture of the early harvesting varieties of Gala having best economic potential as per the demand of the market

Rootstocks: Dwarfing rootstock- M9, the most suitable one for HD plantation.

Project Duration: 20 years- the least expected life span of the trees (Establishment period: 3 years, Full production: Year 5-6)

Objectives of the Project

I. To establish a high-density apple orchard on one and a quarter acre for maximizing productivity.

II. To reduce the gestation period by using dwarfing rootstocks, which lead to early fruiting (within 2-3 years).

III. To increase yield per acre and ensure high-quality apple production.

IV. To employ sustainable agricultural practices with efficient resource use.

V. To provide high returns on investment (ROI) through optimized use of land and resources.

Land and Soil Preparation

Soil Preparation

The land is flat or gently sloped having expectedly a pH relevant for the establishment of HDAP. The soil is loamy having reasonably good fertility. The land is reasonably suitable without any doubt. However, at the time of land preparation for the establishment of the unit some of the soil tests will be done to correct the aberrations from the empirical requirements which otherwise may become a permanent liability and may incur additional costs to the working capital on yearly basis. The tests include, pH, the percentage of the sand, silt and clay in the loamy soil, early detection of the deficiency of nutrients if any (including the micro nutrients), soil pathogenicity tests etc.

Selection of Varieties

Choose varieties based on market demand, climate, and disease resistance. Popular varieties include Gala, King rot, Fuji, Golden and Granny Smith.

Spacing and Planting System

- **Tree Density**: 1200–1400 trees per acre.
- **Row Spacing**: 10–12 feet between rows.
- **Plant Spacing**: 2.5–3.5 feet between plants within a row.

Irrigation and Water Management

Water Requirements

Apple trees require consistent moisture, especially in the initial years and during the fruiting season. Drip irrigation is the most suitable method for HD apple orchards as it provides precise water and nutrient delivery.

Irrigation Infrastructure

Drip Irrigation System: Install drip lines with emitters spaced along the rows to ensure uniform water distribution.

Water Source: Ensure the availability of a reliable water source such as a borewell, river, or rainwater harvesting system. We have readily available water source from the nearby stream.

Nutrient Management and Fertilization

Organic Fertilization

Incorporate well-decomposed organic manure (cow dung, compost) during planting to improve soil fertility.

Fertilization Schedule

Year 1-2: Apply balanced fertilizers (NPK) to support vegetative growth.

Year 3 and onwards: Use specific fertilizers based on the crop's nutrient demand, applying nitrogen, phosphorus, and potassium at regular intervals. Calcium and Magnesium is provided as per the soil testing.

Micronutrients: Supplement with micronutrients (zinc, iron, boron) as needed based on soil tests.

Pest and Disease Management

Common Pests: Codling Moth, Apple Maggot, Aphids

Common Diseases: Apple Scab, Powdery Mildew, Fire Blight

Integrated Pest Management (IPM)

Implement IPM practices by using biological control agents, pheromone traps, and timely applications of organic or chemical pesticides.

Infrastructure and Capital Requirements

Fencing and Protection

Fencing: Erect fencing around the plantation to prevent animal intrusion. Little more is expected to improve it if the budget allows for it.

Trellising: Install trellising or support systems to train the trees and prevent them from breaking under the weight of fruit. We have to improve our trellis system in the existing ochard. The trellis system is to be properly developed for effective support of the trees.

Storage and Transportation

Establish a small storage facility on-site to store apples before transportation to markets or cold storage facilities. We have a proper store for short storage, no additional investment is required for this purpose.

Financial Projections

Initial Investment:

Land Preparation: Plowing, leveling, and nutrient management: the costs involved are outside the projected cost for orchard development on the given area of land.

Planting Material: Apple saplings on dwarf rootstocks: to be provided by the enterprise, the responsibility of the enterprise shall remain to the true to type and mortality (if any above 10% in the first offshoot in spring.

Irrigation System: Drip irrigation setup, pumps, and water storage (In this, the drip irrigation system shall be developed by the enterprise while as the pumps and water storage has to be developed independently, if required.

Infrastructure: Fencing, trellising, storage facility.

Operational Costs

Labor: Regular maintenance, pruning, and training of trees.

Fertilizers and Pesticides: Ongoing inputs for optimal growth and pest control.

Irrigation Costs: Watering during dry months and energy costs for running pumps and other miscellaneous activities.

Expected Yield and Returns

Yield: Approximately 15–25 tons per acre by the 4th or 5th year (An average of 17 kg per tree having a density of 150 plants per kanal of land)

Price: Average market price of Rs 70 -170 per kg (can vary).

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Timeline and Work Plan

Activity	Year 1	Year 2	Year 3	Year 4	Year 5
Land Preparation	√				
Planting	√				
Drip Irrigation Setup	√				
Fertilization	√	√	√	√	√
Pruning & Training	√	√	√	√	√
Pest Management	√	√	√	√	√
Harvesting			√	√	√

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Economics of High-Density Apple Plantation (HDAP) on 1.25 Acre/ 10 Kanals of Land.

This report presents the economic feasibility of setting up a high-density apple plantation (HDAP) on a 1-acre plot of land in India. The analysis will include the initial investment, operational costs, and revenue projections, based on the latest agricultural practices and pricing trends in India.

Note: The Currency is in INR. (Indian Rupees)

PROJECT SUMMARY	
Particulars	**Details**
AREA OF THE LAND (In Kanals) for establishing HDAP	**10**
Cost incurred (per Kanal) for the services offered by the enterprise	**168825**
Total cost incurred for the services offered by the enterprise	**1688250**
Additional investment besides cost incurred by the enterprise	**115,000.00**
Total Initial Investment for the establishment of the unit (Year 1):	**1,803,250.00**
Average Annual operational cost/ working capital per kanal of land	**19491.02**
Average revenue from the sale of fruits on yearly basis at base price (Base Year 2024)	**311040**
Break even Point (Year)	**4th Year**
Break even Point Year Surplus	**458,917.50**
Average Net Profits per kanal in a year	**268762.73**
Average Net Profits in a Year	**2687627.28**
Total Net Profits over a period of 20 years	**53,752,545.52**
Average returns on investment (fixed cost & working Capital)	**9.67**
Average returns on Capital investment	**29.81**

PLANT ESTABLISHMENT COST ANALYSIS	
high density apple plantaion project	
No. of Kanals	10
land preparation	100000
Soil Testing & Amendments	10,500.00
Planting Material (Saplings)	900000
Drip Irrigation Setup	290000
Trellising/Support System	390000
Fencing	
water storage, motor, Generator, tubewell development or water carrying expenditure	
Storage Infrastructure	
Labor (Initial Planting)	15,000.00
Total investment for Soil testing and amendments, saplings, trellis system and Drip irrigation system	1,590,500.00
Transportational charges for carrying trellis and drip irrigation raw materials at the site	42500.00
Professional charges	12750
Entrepreneur	42500
Total cost incurred through the enterprise	1,688,250.00
Additional costs incurred by the proprietor	115,000.00
Total Initial Investment for the establishment of the unit (Year 1):	1,803,250.00

ANNUAL OPERATIONAL COSTS/ WORKING CAPITAL AT BASE PRICES (In Inr) (BASE YEAR 2024)								
Components/ Year	Fertilizers and Nutrients	Pesticides & Pest Management	Irrigation & Water Costs	Labor (Maintenance)	Pruning and Tree Training	Harvesting Costs	Renovation and replacement	Total
Year 1	50000.00	15000.00	1500.00	30000.00	9000.00	10000.00	27540.00	143040
Year 2	50000.00	18750.00	1500.00	36000.00	11700.00	10000.00	27540.00	155490.00
Year 3	50000.00	23437.50	1501.00	40320.00	14040.00	10000.00	27540.00	166838.50
Year 4	50000.00	28125.00	1501.00	44352.00	16146.00	10000.00	27540.00	177664.00
Year 5	50000.00	32906.25	1502.00	48787.20	17760.60	10000.00	27540.00	188496.05
Year 6	50000.00	37513.13	1502.00	52690.18	17760.60	10000.00	27540.00	197005.91
Year 7	50000.00	41264.44	1503.00	56905.39	17760.60	10000.00	27540.00	204973.43
Year 8	50000.00	41264.44	1503.00	56905.39	17760.60	10000.00	27540.00	204973.43
Year 9	50000.00	41264.44	1504.00	56905.39	17760.60	10000.00	27540.00	204974.43
Year 10	50000.00	41264.44	1504.00	56905.39	17760.60	10000.00	27540.00	204974.43
Year 11	50000.00	41264.44	1505.00	56905.39	17760.60	10000.00	27540.00	204975.43
Year 12	50000.00	41264.44	1505.00	56905.39	17760.60	10000.00	27540.00	204975.43
Year 13	50000.00	41264.44	1506.00	56905.39	17760.60	10000.00	27540.00	204976.43
Year 14	50000.00	41264.44	1506.00	56905.39	17760.60	10000.00	27540.00	204976.43
Year 15	50000.00	41264.44	1507.00	56905.39	17760.60	10000.00	27540.00	204977.43
Year 16	50000.00	41264.44	1507.00	56905.39	17760.60	10000.00	27540.00	204977.43
Year 17	50000.00	41264.44	1508.00	56905.39	17760.60	10000.00	27540.00	204978.43
Year 18	50000.00	41264.44	1508.00	56905.39	17760.60	10000.00	27540.00	204978.43
Year 19	50000.00	41264.44	1509.00	56905.39	17760.60	10000.00	27540.00	204979.43
Year 20	50000.00	41264.44	1509.00	56905.39	17760.60	10000.00	27540.00	204979.43
Total	1000000.00	733434.04	30090.00	1048824.84	335055.60	200000.00	550800.00	3898204.48

Revenue from the sale of fruits on yearly basis at base price (In Inr.) (Base Year 2024)			
Parameter/Year	Production (In Kgs)	Price	Total revenue
1	0	120	0
2	3200	120	384000
3	9600	120	1152000
4	16000	120	1920000
5	19200	120	2304000
6	25600	120	3072000
7	28800	120	3456000
8	32000	120	3840000
9	32000	120	3840000
10	32000	120	3840000
11	32000	120	3840000
12	32000	120	3840000
13	32000	120	3840000
14	32000	120	3840000
15	32000	120	3840000
16	32000	120	3840000
17	32000	120	3840000
18	32000	120	3840000
19	32000	120	3840000
20	32000	120	3840000
Total	518400	0	62208000

Depreciation analysis (VALUE AT BASE PRICE, BASE YEAR 2024)

The depreciation analysis takes in account of the depreciating value of money @4% on a yearly basis in addition to the depreciating value of the fixed assets at constant price

Particulars / Year	Planting Material (Saplings)	Drip Irrigation Setup	Trellisig /Support System	Fencing	water storage, motor, Generator, tubewell development or water carrying expenditure	Storage Infrastructure	Grand Total
1	63000	43500	31200	0	0	0	137700
2	63000	43500	31200	0	0	0	137700
3	63000	43500	31200	0	0	0	137700
4	63000	43500	31200	0	0	0	137700
5	63000	43500	31200	0	0	0	137700
6	63000	43500	31200	0	0	0	137700
7	63000	43500	31200	0	0	0	137700
8	63000	43500	31200	0	0	0	137700
9	63000	43500	31200	0	0	0	137700
10	63000	43500	31200	0	0	0	137700
11	63000	43500	31200	0	0	0	137700
12	63000	43500	31200	0	0	0	137700
13	63000	43500	31200	0	0	0	137700
14	63000	43500	31200	0	0	0	137700
15	63000	43500	31200	0	0	0	137700
16	63000	43500	31200	0	0	0	137700
17	63000	43500	31200	0	0	0	137700
18	63000	43500	31200	0	0	0	137700
19	63000	43500	31200	0	0	0	137700
20	63000	43500	31200	0	0	0	137700
Total	1260000	870000	624000	0	0	0	2754000

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Profit and Loss Analysis (At Base price- Base Year: 2024)

Particulars/ Year	Total initial investment for the establishment of the unit	Annual operational cost/ working capital at Base price	Depreciation of Assets	Sale of the Produce	Gross Profits	Tax	Net Profit (At Base Price)	Cummulative Surplus at the end of year (at base price)	Break even point (BEP)	Return on Investment (RoI) (In %)
1	1803250	143040	137700	0	-2083990	0	-2083990	-2083990	N.D.	-107.07
2	0	155490	137700	384000	90810	0	90810	-1993180	7.89	58.4
3	0	166838.5	137700	1152000	847461.5	0	847461.5	-1145719	1.83	507.95
4	0	177664	137700	1920000	1604636	0	1604636	458917.5	1.26	903.19
5	0	188496.1	137700	2304000	1977804	0	1977804	2436721	1.01	1049.25
6	0	197005.9	137700	3072000	2737294	0	2737294	5174016	0.71	1389.45
7	0	204973.4	137700	3456000	3113327	0	3113327	8287342	0.62	1518.89
8	0	204973.4	137700	3840000	3497327	0	3497327	11784669	0.55	1706.23
9	0	204974.4	137700	3840000	3497326	0	3497326	15281994	0.55	1706.23
10	0	204974.4	137700	3840000	3497326	0	3497326	18779320	0.55	1706.23
11	0	204975.4	137700	3840000	3497325	0	3497325	22276644	0.55	1706.22
12	0	204975.4	137700	3840000	3497325	0	3497325	25773969	0.55	1706.22
13	0	204976.4	137700	3840000	3497324	0	3497324	29271293	0.55	1706.21
14	0	204976.4	137700	3840000	3497324	0	3497324	32768616	0.55	1706.21
15	0	204977.4	137700	3840000	3497323	0	3497323	36265939	0.55	1706.2
16	0	204977.4	137700	3840000	3497323	0	3497323	39763261	0.55	1706.2
17	0	204978.4	137700	3840000	3497322	0	3497322	43260583	0.55	1706.19
18	0	204978.4	137700	3840000	3497322	0	3497322	46757904	0.55	1706.19
19	0	204979.4	137700	3840000	3497321	0	3497321	50255225	0.55	1706.18
20	0	204979.4	137700	3840000	3497321	0	3497321	53752546	0.55	1706.18

Key Abbrevations:

1.	HDAP	High density Apple Plantation
2.	Inr.	Currency in Indian Rupees
3.	NPK	Nitrogen, Phosphorus and Potassium
4.	RoI	Return on investment

Disclaimer

This project is based on the empirical findings as observed by the team of MAIBIL HORTICULTURAL SERVICES. The projections are based on the average prices of different apple varieties for the Year 2024. The projections for the subsequent years is prepared while keeping the real value of the produce and profits, eliminating the depreciation due to the average inflation and other factors. Accordingly, we have made the projection while fixing the Base Year for the realistic projections. Considering the returns on investment, we highly recommend for an entrepreneur's investment in the high density apple plantation sector which is emerging in India and the expectations of the demand of the apple varieties is expected to remain intact for atleast next few decades.

For any query, regarding this project, kindly contact the Project Manager,

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