## 1.1 INTRODUCTION OF THE STUDY

Agricultural production has gained importance recently because of climate change and food security. The exponential increase in the world's population leads to an increased demand for food. Agricultural production and productivity are directly linked with nutrient availability. For sustained high crop yields, the application of nutrients is required. The term 'nutrient availability' has been used and defined in many ways. Hence, any use of the term needs to be accompanied by an appropriate definition.

The Soil Science Society of America has defined available nutrients: (1) the amounts of soil nutrients in chemical forms accessible to plant roots or compounds likely to be convertible to such forms during the growing season, and (2) The contents of legally designated available nutrients in fertilizers determined by specified laboratory procedures which in most states constitute the legal basis for guarantees.

Soil productivity and nutrient availability are interrelated. Soil productivity is the capacity of a soil to produce a certain yield of crops or other plants with a specified system of management. Management of nutrients is an important aspect of maintaining soil productivity. Quantity of nutrient present in the soil is defined in terms of soil fertility, and, generally, soil analysis is used as a criterion to make fertilizer recommendations for field crops. Nutrient availability is evaluated by observations and tests which are used to predict the response of plants and management of nutrients. The presence of sufficient total quantities of essential nutrients in a soil does not guarantee the availability of these nutrients to growing plants, because other factors such as soilmoisture content, soil temperature, pH, soil physical conditions, presence of toxic elements and/or salts may be limiting. Hence, adequate levels of nutrients alone do not guarantee soil productivity. A productive soil is one that has optimal total environmental conditions for plant growth. Since soil is a continuum, it is a matrix in constant change. It is very difficult under practical conditions to have all crop production factors at an optimal level; hence, most of the crop production factors are usually at a suboptimal level.

Farm management is the collective term for various management strategies and methods that are employed to keep a farm productive and profitable. The process of this type of management is often associated with large commercial farms, although many of the same methods can be used with equal success on a small family-owned farm. Depending on the size of the operation, the management process may require the service of a single

farm manager or a group of managers who oversee various aspects of the overall project. In many respects, effective farm management is similar to the management processes that are employed with any type of business. There are decisions that must be made on a daily basis, as well as operational guidelines that must be observed by everyone who is involved with the operation. Some participants are accountable to overseers or managers, who in turn are accountable to owners. What set the farm management apart from other moneymaking venture are the kinds of daily duties involved and the number of management layers found in the operation. Even among farms, the processes will vary depending on the type of farming business involved and the overall size of operation. Large commercial farms are more likely to rely on modern technology in order to maximize the efficiency of the management process. Agriculture Production Management helps to the farmer right from cultivation to harvesting and maintenance also helps enhance the productivity of farms of all sizes.

In modern agriculture, maximizing and sustaining crop yields are the main objectives. One of the major problems constraining the development of an economically successful agriculture is nutrient deficiency for crop production. As much as 50% of the increase in crop yields worldwide during the twentieth century was due to the adoption of chemical fertilizers. Soil infertility (natural element deficiencies or unavailability) is probably the single most important factor limiting crop yields worldwide.

The administrators and policy planners are the prime users of cost of cultivation data for policy formation. Many other organizations use this data for micro level decision making while the individuals use the data for research purpose. In view of the utility of this data it is desirable that the cost of cultivation survey is statistically well planned so that the required information can be obtained efficiently and precisely. It is appropriate to mentioned that due to the changes taking place at the global level the importance of cost of cultivation data has increased manifold. This is attributable to the phenomenon of global competitiveness which implies that those who are efficient and can produce at competitive prices will survive. In this changing scenario cross country comparisons are meaningful only if the system of data collection is based on uniform technology. This 19 particular aspect of cost of cultivation surveys is a problem area. Despite the fact that these surveys have been carried out for long across countries there is still no uniform methodology followed in carrying out these surveys.

Cost of cultivation surveys are an important mechanism for data generation on

cost structure of crops. These are very intensive surveys wherein data are collected on the various inputs which are used for the cultivation of crop. The data collection approach in these surveys is inquiry based which implies that the information on the input use is obtained by inquiry from the farmer. Use of input is a continuous process which goes on from beginning to end. In order that no information on input use is missed, data collection under these surveys is generally carried out in multiple rounds.

Thus, the farmer is visited repeatedly during the growth stage of the crop and during the time of harvest so that the information on input use is correctly and properly recorded.

As a result, a huge volume of data is generated through these surveys. The data so collected is generally used to work out cost per unit area or cost per unit weight.

Cost of cultivation surveys are an important data source for decision making at the macro as well as micro level. Accuracy of information generated out of these surveys is, therefore, of paramount importance. This can be ensured by proper planning of the survey, so that the sampling as well as non-sampling errors are minimized. Of equal importance is the question of how efficiently the cost of cultivation data can be collected. Proper designing of the survey by judiciously making use of the information available from other surveys and censuses will go a long way in collecting the data needed in an efficient manner.

Cost of production studies are undertaken with a view to get information for a class of cultivators belonging to a particular region or an area called as the population.

The number of such cultivators is expected to be very large. The cost and time involved in collecting information on every cultivator belonging to a region will be prohibitive.

At best, the information can be obtained from a sample of cultivators. This sample based information can be used to draw inferences about the population. The inferences about the population in the context of cost of cultivation surveys may be in the form of framing estimators of parameter of interest like cost of production per unit area or per unit weight.

In the present scenario, due to advancement in computer technology and IT sector, analysis of cost of production data is not a issue any more. The FAO has developed a computer software package called FARMAP which makes cost data validation and

subsequent analysis possible. More or less on same lines computer software, also named FARMAP, for cost data validation and analysis, has been developed in India with the assistance of FAO. Cropping pattern means the proportion of area under various crops at a point of time. The crop statistics published by the governments are used to denote the cropping patterns. Cropping pattern is however a dynamic concept as it changes over a space and time.

The cropping pattern of a region is closely influenced by the geo-climatic, socio- cultural, economic, historical and political factors. The physical environment (Physiographic, climate, soil and water) imposes limits on the growth and distribution of plants and animals. The role of man in the cultivation of certain crops in a region is also quite important. Man by his technological advancement, can ameliorate the physical limits.

## 1.2 OBJECTIVES OF STUDY

1) To study the socio-economic status of the host farmer.
2) To study the input management and cost of cultivation of different crops of the host farmer
3) To study the marketing of crops grown by host farmer.

## METHODOLOGY OF THE STUDY

In any Research project the selection of most effective methodology for the data collection and its further analysis plays an important role. The information collected and its interpretation should be done in a systematic and scientific manner, in accordance with the research objectives. The research methodology adopted in this study is illustrated below.

### 2.1. Sample Design

### 2.1. 1.Selection of Study Area:

In the recent years, Ozar and nearby areas are rapidly developing village in Niphad Tahsil because of easy access to Nashik and Mumbai as a Metropolitan city. The farmers in this area are innovative and also followers of new technology. The climatic conditions prevailing in the areas and its surrounding are suitable to the prepared project. The purpose behind selecting this project was to study the agricultural production management. Ozar is a progressive farmer's village because of its technical and management skills and hence, it was selected purposively as the study area.

### 2.2. Data Collection Methods

The present research project was based on the primary as well as secondary data collected through various sources. The data were collected in accordance to progressive farmers and their management techniques. The details about the data collection are given below.

### 2.2.1.Primary Data-

Primary Data was collected by taking actual survey on the study plots. In survey as per Performa of university questionnaire all information were collected daily from host farmer. For studying production details data were collected from farmer located in the Ozar village.

The data was collected related to the cost of Production, labour, cost of irrigation system and other cost adopted in farm. The data were pertaining to year 20**21**-2**2**.

### 2.2. 2.Secondary Data-

The secondary data, such as area, production, market status, etc. were obtained from various sources like magazines, books, internet, etc.

### 2.3. Analytical framework

The collected were analyzed by keeping in view the objectives of the study. The data were arranged in suitable and cross tables.

#### 2.3.1.ANALYSIS OF DATA:

The costs are divided into the three categories viz; Cost 'A', Cost 'B' and Cost ‘C’ A. Cost ‘A’: These are the paid out costs consisting of the costs on following items.

1. Hired human labour
2. Attached labour
3. Bullock Labour
4. Machine labour
5. Seed
6. Manures
7. Fertilizers
8. Irrigation Charges
9. Insecticides and pesticides
10. Repairs of implements/machine/Farm buildings.
11. Land revenue and other taxes.
12. Incidental Charges
13. Interest on working capital
14. Depreciation of Hand tool implements, machinery and farm buildings.

i. **Cost 'B':** Cost 'A' + Rental value of owned land + interest on fixed capital. (Hand tools and farm implements, machinery and farm buildings, well, electric motor, pipe line, drip set, sprinkler set, tractor etc.)

ii. **Cost 'C':** Cost 'B' + Family labour Charges.

B. **Evaluation of farm assets**

1. Farm Land: To be evaluated at prevailing rates in the village.
2. Farm buildings, implements and machinery: The evaluation is done at the original value less the depreciation calculated from the year of Purchase of a machine or implement.
3. Livestock: Evaluated at market prices

C. **Evaluation of farm output**

1. Crops: Both main and bye product evaluated at Harvest prices prevailing in the market.

D. **Evaluation of farm inputs**

**1. Human labour**

a. Hired human labour: Actual amount paid both in cash and kind.
b. Attached labour: Actual amount paid both in cash and kind. Payment in kind including food, clothes and other supplies including prerequisites.
c. Family labour

**2. Bullock power**

a. Hired bullock power: Evaluated at prevailing hiring rates in the region,
b. Owned bullock power: Owned bullock power can also be evaluated by charging the hiring rated prevailing in the region.

**3. Machine power**

a. Hired machine Charges: Actual amount paid in case of a hired machine.
b. Owned machine Charges: Cost of maintenance of machine includes expenditure on fuel, electric bill, repairing Charges. This total expenditure is divided by productive working hours of that machine to obtain per hour maintenance cost.

4. **Seed**

Purchased seed at actual cost Farm produced seed is evaluated at the prevailing Market price.

5. **Depreciation**

The depreciation for farm building, irrigation structure, implements, machinery and Hand tools etc. are worked out by using straight-line method.

$$\text{depreciation} = \frac{\text{Present Value} - \text{Junk value}}{\text{Remaining Life Period}}$$

6. **Interest on fixed capital**

The interest rate of fixed investment on different farm assets may be calculated at 10 per cent per annum.

7. **Irrigation Charges**

a. Lift and canal irrigation: Actual Charges paid for irrigation are considered.

b. Well irrigation: Evaluated at the prevailing rates.

c. Irrigation Charges for owned irrigation structure is worked out by using following formula:

$$= \text{Machine Manintance} \times \text{Irrigation Hourse} + \frac{\text{Intrest on irrigation structure}}{\text{Gross Irrigated Area}} \times \text{Plot Area}$$

The machine maintenance cost is worked out as:

$$\text{Maintenance Charges} = \frac{\text{Electricity Bill} + \text{Lubricant} + \text{Repairing}}{\text{Total No. of Hours}}$$

(Well, electric motor /oil engine, pipeline, drip set, sprinkler etc.) **8.**

**Manures/ Fertilizers**

Farm produce manure evaluated at prevailing market prices. In case of Purchased manures and fertilizers actual cost of Purchase is accounted for.

9. **Land revenue:**

Special taxes on certain crops paid to Government. All those taxes are accounted.

10. **Rental value of land**

It is imputed at the rate of 1/6th of the gross value of produce less land revenue and other taxes.

**11. Incidental Charges**

The cost of acquisition of inputs, which includes all the activities of crop production.

**12. Amortization Cost in Case of Fruits Crop-**

$$\text{Amortization Cost (A)} = \frac{P.r\ (1+r)^n}{(1+r)^n - 1}$$

**13. Interest on working capital**

It is charged at the rate of 12% per annum of crop duration.

E. **Allocation of different costs on crop**

**a) Depreciation:**

1. Farm building: In proportion to the gross cropped area and calculated by using the formula.

$$\text{Depreciation} = \frac{(\ Depration\ On\ Building)}{(Gross\ \ Cropped\ Area)} \times \text{Area under Crop}$$

2. Implements and machinery: Depreciation is apportioned on the basis of gross cropped area and calculated as below

$$\text{Depreciation} = \frac{(\ Depration\ of\ implements\ and\ machinary)}{(Gross\ \ Cropped\ Area)} \times 100$$

**b) Irrigation structure:** Depreciation is apportioned on the basis of gross irrigated area and calculated as below.

$$= \frac{(\ Total\ Depriciation\ on\ irrigation\ system)}{(Gross\ \ Cropped\ Area)} \times \text{Plot Area}$$

**c) Land revenue:** It is apportioned on the basis of gross cropped area and calculated as below.

$$= \frac{Total\ Land\ Rvenue}{Gross\ Cropped\ Area} \times 100$$

**d) Interest on fixed capital:** It is apportioned in case of general farm implements, machinery, farm building etc. on the basis of gross cropped area and calculated as below.

$$= \frac{\text{Intrest on fixed Capital}}{\text{Gross Cropped Area}} \times \text{Plot Area}$$

**e) Incidental Charges:** The incidental Charges are apportioned on the basis of gross cropped area and calculated as below

$$= \frac{Total\ Incidental\ Charges}{Gross\ Cropped\ Area} \times \text{Plot Area}$$

**F. Measures of Farm Income**

a. Farm Business Income = Value of gross produce – Cost 'B'
b. Family labour Income = Value of gross produce- Cost 'B'
c. Farm Investment Income= Farm Income - Imputed value of family labour
d. Net Income = Value of gross product - cost 'C'
e. B: C ratio (Benefit cost ratio) = Gross returns / Cost 'C'
f. Net returns per Rupee spent = Net Income/ Cost

### 3.1.1 GENERAL INFORMATION OF THE VILLAGE

1. Name of Gram panchayat: Ozar Grampalika
2. Year of Establishment: 1935. Members of Village Council: 17

### 3.1.2 Members of Village Council.

Table 3.1 Members of Village Council.

| Sr. No | Name of the Member | Designation |
|---|---|---|
| 1 | Mrs. Janhvi Yatin Kadam | Sarpanch |
| 2 | Mr.Mulla Rajak Shekhji | Upasarpanch |
| 3 | Mr. Sagar Vishnupant Shejwal | Member |
| 4 | Mr. Girijakant Devram Valave | Member |
| 5 | Mr. Hemraj Vijay Jadhav | Member |
| 6 | Mr. Sanjay Shivaji Pagar | Member |
| 7 | Mr. Prakash Shivaji Mahale | Member |
| 8 | Mr. Kishor Bajirao Satale | Member |
| 9 | Mr. Pradip Sahebrao Kadam | Member |
| 10 | Mrs. Shubhangi Raosaheb Bhadke | Member |
| 11 | Mrs. Madhura Tushar Kadam | Member |
| 12 | Mrs. Chanda Anil Gawali | Member |
| 13 | Mrs. Vidya Dinanath Shinde | Member |
| 14 | Mrs. Aasha Vinod Thete | Member |
| 15 | Mrs. Dipali Ghanasham Jadhav | Member |
| 16 | Mrs. Jayashree Dharmendra Jadhav | Member |
| 17 | Mrs. Shila Pandurang Kadam | Member |

**Village General Information**

**3.1.3 Population of Village**

Table 3.2. Population of Village

| Sr. No | Gender | Total Population |
|---|---|---|
| 1 | Male | 27,609 |
| 2 | Female | 26,460 |
| **Total Population** | | **54,069** |

**3.1.4 Demography of the Village** Table 3.3 Demography of Village

| Sr. No | Family category | Total No. |
|---|---|---|
| 1 | APL Families | 1749 |
| 2 | BPL Families | 640 |
| **Total No. of Families** | | **2389** |

**3.1.5 Total house in the village**

Table 3.4 Total house in the village

| Sr. No | Particular | Numbers |
|---|---|---|
| 1 | No. of Houses | 7065 |
| 2 | Kutcha Houses | 1755 |
| 3 | Pakka Houses | 5310 |
| 4 | No. of Wadi / Vasti | 05 |

**3.1.6 Geography of the village**

Table 3.5. Geography of the village

| Sr. No | Particulars | Hector |
|---|---|---|
| 1 | Total Area of Village | 4137.42 |
| 2 | Agriculture Area | 1989.25 |
| | a) Irrigated Area | 1984.25 |
| 3 | Gavthan Area | 30.00 |

### 3.1.7 Community Building

Table 3.6. Community Building

| Sr. No | Particulars | Numbers |
|---|---|---|
| 1 | Village Panchayat | 0 |
| 2 | Anganwadi | 36 |
| 3 | Z. P. Primary School | 03 |
| 4 | Govt. Hospital | 01 |
| 5 | Private Human Clinics | 28 |
| 6 | Veterinary clinic | 01 |
| 7 | Secondary Schools and Colleges | 07 |

### 3.1.9 Major Crops Grown in the Village

Table 3.7. Major Crops Grown in the Village

| Sr. No | Types of Crop | Name of Crop |
|---|---|---|
| 1 | Cereals | Maize , Wheat |
| 2 | Pulses | Greengram |
| 3 | Oil seeds | Soyabean |
| 4 | Flowers | Rose, Marigold |
| 5 | Vegetables | Tomato, Onion, Bitter Gourd |
| 6 | Fruits | Grapes |
| 7 | Spices | Chilli |
| 8 | Cash Crops | Sugarcane |

### 3.1.10 Infrastructure of the village

Table 3.8. Infrastructure of the village

| Sr. No | Particulars | Numbers |
|---|---|---|
| 1 | No. of Roads | 50 |
| | Kutcha | 40 |
| | Pakka | 10 |
| 2 | Markets | 01 |
| 3 | Financial Institutes | 16 |
| 4 | Temples | 35 |
| 5 | Post Office | 01 |
| 6 | Biogas Plant | 01 |
| 7 | Cooperative Society | 02 |

### 3.1.11 Schemes and program implemented by village

Table 3.9. Schemes and program implemented by village

| Sr. No | Particulars |
|---|---|
| 1 | Mazi Vsundara Abhiyan |
| 2 | Gram Swachata Abhiyan |
| 3 | Ramai Gharkul Awas Yojana |
| 4 | MANREGA |
| 5 | Pradhan Mantri Gharkul Awas Yojana |
| 6 | Corona Mukt Gaav Yojana |
| 7 | Tree Plantation |
| 8 | Tanta Mukti Abhiyan |

**Socio-economic Survey of Farmer**

Table 3.10. Student information

| | |
|---|---|
| Name of the student | : Bairagio Ganesh Sanjay |
| Registration No. | : ABMN-2019/01 |
| Name of the College | : K.K.Wagh College Of Agri-Buisness Management |
| Name of the Village | : Ozar |

### 3.2.1 Name of the host farmer: <u>Sathbhai Vilas Laxuman</u>

Table 3.11. Host Farmer information

| | | | |
|---|---|---|---|
| a) Sex - Male / Female | | Male | |
| b) Age - (years) | : | 52 | |
| c) Education | : | M.pharm | |
| d) Category of the host farmer | : | Small:bellow 2 Ha (**Yes 2.70ha)** | |
| e) Address | : | Village- Ozar | Post- Ozar |
| | : | Taluka- Niphad | District- Nashik |
| | : | Phone No :- 7066511226 | |

### 3.2.2 Information of the family members including attached labourers:

Table 3.12. Information of the family members.

| Sr. No. | Name | Gender | Relation with head of family | Age | Education | Occupation |
|---|---|---|---|---|---|---|
| 1. | Mr. Vilas Laxuman Sathbhai | Male | - | 52 | -M.Pharm | Farmer |
| 2. | Miss. Shobha Sathbhai | Female | Wife | 46 | 10 | - |
| | Mr. Mangesh Sathbhai | Male | Son | 20 | MBBS | - |
| 4 | Miss. Pooja Sathbhai | Female | Daughter | 24 | BE Electric | - |

### 3.2.3 Assets:

**I. Land:**

Table No. 3.13. Information of Land

| Sr. No. | Plot / -Survey No. | Area (ha.) | | Soil Type | Present Value (Rs.) | Land Revenue and other taxes (Rs.) |
|---|---|---|---|---|---|---|
| | | Irrigated | Un-Cultivable | | | |
| 1 | 460 | 1.60 ha | 0.10 | Black Soil | 1,20,00,000 | 320 |
| | 404 | 1.00 | - | Black Soil | 75,00,000 | 250 |

**II. Source of Irrigation and Area Irrigated:**

Table No.3.14.Irrigation and Area Irrigated

| Sr. No. | Source | Number | Area Irrigated (ha.) | | |
|---|---|---|---|---|---|
| | | | 4 months | 8 months | Perennial |
| 1 | Wells | 2 | - | - | 2.80 |
| 2 | Borewells | 1 | - | 0.80 | 0.80 |

**III. Buildings:**

Table No.3.15. Information about Building

| Sr. No. | Category | Type of Construction | Year of construction | Present value (Rs.) |
|---|---|---|---|---|
| 1 | Residential House | Pakka | 2005 | 25,00,00 |
| **2** | Store | Pakka | 2007 | 80,000 |
| 3 | Mandir | Pakka | 2013 | 6,00,000 |

**IV. Implements and Machinery:**

Table No.3.16. Information about Implements and Machinery

| Sr. No | Category | Number | Present value (Rs.) |
|---|---|---|---|
| A | **Implements:** | | |
| | a) Iron plough | 01 | 25,000 |
| | d) Harrow | 01 | 20,000 |
| | e) Bed preprator | 01 | 15,000 |
| | f) Clod crusher | 1 | 30,000 |
| | g) Others Trolly) | 01 | 20,000 |
| B | **Equipments:** | | |
| | b) Duster | 01 | 15,000 |
| | c) Knapsack Sprayer | 01 | 5,000 |
| C | **Machinery:** | | |
| | a) Electric Motor | 03 | 45,000 |
| | c) Tractor ( 24 HP ) | 02 | 7,20,000 |
| | e) power spreyer | 1 | 20,000 |
| D | **Hand tools:** | | |
| | a)Spades | 06 | 1500 |
| | b)Weeding Hook | 05 | 1000 |
| | c)Sickle | 08 | 800 |
| | d)kudali | 04 | 600 |
| | e)grapes hoe | 02 | 600 |

**V. Household Assets:**

Table N.3.17. Information about Household Assets

| Sr. No. | Particulars | Number | Value (Rs.) |
|---|---|---|---|
| 1 | Two Wheeler- | 01 | 220,000 |
| 2 | Four Wheeler | 02 | 9,50,000 |
| 3 | Television | 01 | 15,000 |
| 4 | Music System | 1 | 7,000 |

### 3.3 Cropping Pattern:

Table No.3.18. Cropping Pattern

| Season | Plot No. | Crop | Variety | Irrigated | | | |
|---|---|---|---|---|---|---|---|
| | | | | Area (ha) | Yield Qt/ha | | Gross Value |
| | | | | | Main | By | |
| Kharif | 1. | Tomato | Australian keshar | 0.40 | 180 | | 360000 |
| | 2. | Soyabean | JS-335 | 0.60 | 16.5 | 4 | 103000 |
| Rabi | 1. | Onion | Bhima Shweata | 0.40 | 150 | | 225000 |
| | 2. | Wheat | Aditya (HD2781) | 0.60 | 32.5 | 3 | 108100 |
| Perennial | 1 | Grapes | Thompson Seedless | 1.60 | 400 | | 1600000 |

### VI. Annual gross income (Previous year)

Table No.3.19. Annual Gross Income

| Sr. No. | Source | Amount (Rs.) |
|---|---|---|
| 1 | Crops | 23,47,500 |
| | **Total** | 23,47,500 |

### VII. Cropping Intensity

Table No.3.20. Cropping Intensity

| Sr. No | Category | Area(ha) |
|---|---|---|
| 1 | Total Land | 2.70 |
| 2 | Net cultivable Land | 2.60 |
| 3 | Gross cropped area | 3.60 |
| 4 | Un-cultivable Land | 0.10 |

**Cropping intensity =** (Gross Cropped Area/ Net Cultivated Area) x 100

= (3.60/2.60) x 100 = **138.46 %**

**Result**

Table show total land holding 2.70Ha ,net cultivable area 2.60Ha, gross crop area 3.60 Ha. Calculated cropping intensity is greater than 100% which shows that land is well utilized by farmer

# Crop Wise Overhead Cost

**Crop Wise Depreciation Charges**

Table No. 3.21 Depreciation on Implement & Hand Tools

| Sr. No. | **Category** | Present Value ( RS.) | Useful Life (year) | **Junk Value (Rs.)** | Depreciation (Rs.) |
|---|---|---|---|---|---|
| **A** | **Implements:** | | | | |
| | a) Iron plough | 25,000 | 10 | 2,500 | 2470 |
| | b) Harrow | 20,000 | 10 | 2,000 | 1,800 |
| | c) Others (Trolly) | 20,000 | 10 | 2,000 | 1,800 |
| | d) cloud crusher | 30,000 | 8 | 3,750 | 3281.25 |
| | e) Bed Prep. | 15,000 | 10 | 1,500 | 1350 |
| **B** | **Equipments:** | | | | |
| | a) Sprayer | 5000 | 5 | 1000 | 800 |
| | b) Duster | 15,000 | 10 | 1500 | 1350 |
| **C** | **Machinery:** | | | | |
| | a) Electric Motor | 45,000 | 25 | 1,800 | 1,728 |
| | b) 24 HP Tractor | 7,20,000 | 25 | 28,800 | 27,648 |
| **D** | **Hand tools:** | | | | |
| | a)Spades | 1500 | 5 | 300 | 240 |
| | b)Weed hook | 1000 | 5 | 200 | 160 |
| | c)Sickle | 800 | 5 | 160 | 128 |
| | d)Kuladi | 600 | 5 | 120 | 96 |
| | e) Grapes hoe | 600 | 5 | 120 | 96 |
| | Total | 919,500 | | **47,750** | **44,747** |
| **E** | **Building & Construction** | | | | |
| | a) well | 4,00,000 | 50 | 8,000 | 7,840 |
| | b) Borewell | 75,000 | 25 | 3,000 | 2,880 |
| | c) drip | 1,80,000 | 25 | 7,200 | 6,912 |
| | **Total** | **655000** | | **18,200** | **17,632** |
| | **Total** | **1574500** | | ***65950*** | ***62379*** |

## Crop Wise Depreciation Charges

Total Depreciation- 62379
Gross cropped area (Ha)- 3.60

$$Allocation\ of\ Depreciation\ Charges\ Per\ Ha = \frac{(Total\ Depration\ Charge)}{(Gross\ \ Cropped\ Area)} \times Area\ under\ Crop$$

Table No.3.22 Crops wise depreciation Charges

| Sr. No. | Crop | Plot area(Ha) | Crop wise Depreciation (Rs) |
|---|---|---|---|
| **1** | Tomato | 0.40 | 6931 |
| **2** | Soybean | 0.60 | 10396 .5 |
| **3** | Onion | 0.60 | 10396.5 |
| **4** | Wheat | 0.40 | 6931 |
| **5** | Grapes | 1.60 | 27724 |
| | **Total** | **3.60** | **62379** |

## Crop wise Depreciation excluding building

Total Depreciation- Rs. 44,746.9

Gross cropped area(Ha)- 3.60

$$\text{Allocation of Depreciation Charges Per Ha} = \frac{(\text{Total Depration Charge})}{(\text{Gross Cropped Area})} \times \text{Area under Crop}$$

Table No.3.23 Crop wise depreciation charges excluding building

| **Sr. No.** | **Crop** | **Plot area(Ha)** | **Crop wise Depreciation (Rs) Ex. Building** |
|---|---|---|---|
| 1 | Tomato | 0.40 | 4971.9 |
| 2 | Soybean | 0.60 | 7,457.8 |
| 3 | Onion | 0.60 | 7,457.8 |
| 4 | Wheat | 0.40 | 4971.9 |
| 5 | Grapes | 1.60 | 19,887.5 |
| | **Total** | **3.60** | **44,746.9** |

## Crop wise Interest on Fixed Capital

Total Fixed Capital = 15,57,450.
Interest on Fixed Capital @10% = 157,450
Gross Cropped Area = 2.40

Table No. 3.24 Crop wise interest on fixed capital

| **Sr. No.** | **Crop** | **Plot area(Ha)** | **Crop wise interest on fixed capital** |
|---|---|---|---|
| 1 | Tomato | 0.40 | 17,494.4 |
| 2 | Soybean | 0.60 | 26,241.7 |
| 3 | Onion | 0.60 | 26,241.7 |
| 4 | Wheat | 0.40 | 17,494.4 |
| 5 | Grapes | 1.60 | 69,977.8 |
| | **Total** | **3.60** | **1,57,499.8** |

## Crop wise Incidental Charges

Total Incidental charges(Rs)- 10,000
Gross cropped area (Ha) – 3.60

$$\text{Crop Wise Incidental charges} = \frac{(\text{Total Incidental charges})}{(\text{Gross Cropped Area})} \times \text{Area under Crop}$$

Table No.3.25 Crop wise incidental Charges

| **Sr. No.** | **Crop** | **Plot area(Ha)** | **Crop wise incidental charges** |
|---|---|---|---|
| 1 | Tomato | 0.40 | 1111.1 |
| 2 | Soybean | 0.60 | 1666.7 |
| 3 | Onion | 0.60 | 1666.7 |
| 4 | Wheat | 0.40 | 1111.1 |
| 5 | Grapes | 1.60 | 4444.4 |
| | **Total** | **3.60** | **10,000** |

## Irrigation charges

Table No. 3.26 Crop wise Irrigation charges

| Sr. No. | Crop | Plot area (Ha) | Number of hours | Irrigation charges |
|---|---|---|---|---|
| 1 | Tomato | 0.40 | 25 | 9232.77 |
| 2 | Soybean | 0.60 | 20 | 12486.66 |
| 3 | Onion | 0.60 | 75 | 16804.16 |
| 4 | Wheat | 0.40 | 60 | 11987.77 |
| 5 | Grapes | 1.60 | 350 | 56586.11 |
| | **Total** | **3.60** | **530** | **101197.47** |

Electricity Bill :- 31,500
Repairing Charges :-1100
Lubricants :- 600

$$Maintenance\ Charges = \frac{Electricity\ Bill\ +\ Lubricant\ +\ Repairing}{Total\ No.\ of\ Hours}$$

$$= \frac{31500 +\ 600\ +\ 1100}{363}$$

= 78.5 Rs

$$\text{IC} = \text{Machine Manintance}\ \times \text{Irrigation Hourse} + \frac{\text{Intrest on irrigation structure}}{\text{Gross Irrigated Area}} \times \text{Plot Area}$$

## Crop wise Land Revenue

Total Land Revenue: 570

Gross Crop Area: 3.60

$$\text{Crop Wise Land revenue} = \frac{(Total\ Land\ Revenue)}{(Gross\ \ Cropped\ Area)} \times Area\ under\ Crop$$

Table No. 3.27 Crop Wise Land Revenue

| **Sr. No.** | **Crop** | **Plot area(Ha)** | **Crop wise land revenue** |
|---|---|---|---|
| 1 | Tomato | 0.40 | 63.4 |
| 2 | Soybean | 0.60 | 95 |
| 3 | Onion | 0.60 | 95 |
| 4 | Wheat | 0.40 | 63.3 |
| 5 | Grapes | 1.60 | 253.3 |
| | **Total** | **3.60** | **570** |

## 3.4 Crop wise Overhead Cost

Table No. 3.28 Cropwise overhead cost

| Crop | Plot Area (Ha) | Crop wise Depreciation (Rs) | Crop wise Depreciation (Rs) Ex.building | Cropwise interest on fixed capital | Cropwise incidental charges | Irrigation charges | Crop wise land revenue |
|---|---|---|---|---|---|---|---|
| **Tomato** | 0.40 | 6931 | 4971.9 | 17,494.4 | 1111.1 | 9232.77 | 63.4 |
| **Soybean** | 0.60 | 10396 .5 | 7,457.8 | 26,241.7 | 1666.7 | 12486.66 | 95 |
| **Onion** | 0.60 | 10396.5 | 7,457.8 | 26,241.7 | 1666.7 | 16804.16 | 95 |
| **Wheat** | 0.40 | 6931 | 4971.9 | 17,494.4 | 1111.1 | 11987.77 | 63.3 |
| **Grapes** | 1.60 | 27724 | 19,887.5 | 69,977.8 | 4444.4 | 56586.11 | 253.3 |
| **Total** | **3.60** | **62379** | **44,746.9** | **1,57,499.8** | **10,000** | **101197.47** | **570** |

## TOMATO

Photo 3.1

### 3.5 Input Utilization & Cost of Cultivation of Different Crops Inputs Used in Tomato

Table No.3.29 Inputs used in Tomato

| **Crop: Tomato** | | **Variety: Austrelian Keshar** | | | **Season: Kharif** | | | **Area: 0.40** |
|---|---|---|---|---|---|---|---|---|
| **Sr. No** | **Item of Cost** | **Unit** | **Per Plot** | | | **Per Hectare** | | |
| | | | **Qty.** | **Rate** | **Value (Rs.)** | **Qty.** | **Rate** | **Value (Rs.)** |
| 1. i. | Hired Human Labour | | | | | | | |
| a. | Male | Days | 10 | 250 | 2500 | 25 | 250 | 6500 |
| b. | Female | Days | 195 | 200 | 39000 | 487.5 | 200 | 97500 |
| 2. i. | Hired Machinery Used | Hour | 1 | 2200 | 2200 | 2.5 | 2200 | 5500 |
| ii. | Owned Machinery Used | Hour | 8 | 240 | 1920 | 20 | 240 | 4800 |
| 3. | Seedling Purchased | No. | 3800 | 1.5 | 5700 | 950 0 | 1.5 | 14250 |
| 4. | Manure | Tons | 3 | 2200 | 6600 | 7.5 | 2200 | 16500 |
| 5. | Fertilizers | | | | | | | |
| i) | Straight a)10:26:26(N:P:K) | Kg. | 30 | 25 | 750 | 75 | 25 | 1875 |
| | b) 12:32:16 | Kg. | 30 | 27 | 810 | 75 | 27 | 2025 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| ii) | **ii)Straight** | | | | | | | |
| | a )Boron | Gm | 350 | 0.40 | 140 | 875 | 0.40 | 350 |
| | **iii) Compound** | | | | | | | |
| | a CalciumNitrate | Kg | 16 | 20 | 320 | 40 | 20 | 800 |
| | b .SilicateNitrate | kg | 1 | 300 | 300 | | 2.5 | 300 |
| | **Water Soluble** | | | | | | | |
| | a).00:00:50(SOP) | kg | 16 | 125 | 2000 | 40 | 40 | 125 |
| | b) .Micronutrient | kg | 3 | 250 | 750 | 7.5 | 7.5 | 250 |
| | c) 19:19:19 | kg | 16 | 76 | 1,216 | 40 | 76 | 3,040 |
| | d) 12:61:00 | kg | 16 | 90 | 1,440 | 40 | 90 | 3600 |
| | e) 13:40:13 | kg | 18 | 100 | 1800 | 45 | 100 | 4500 |
| | f) 00:52:34 | kg | 16 | 130 | 2,080 | 40 | 130 | 5,200 |
| | **B)Insecticides** | | | | | | | |
| | a) Benevia | ml. | 320 | 10 | 3,200 | 800 | 10 | **8,000** |
| | b) Proclaim | Gm. | 100 | 10 | 1,000 | 250 | 10 | **2,500** |
| | **C)Fungicides** | | | | | | | |
| | a) Xelora | ml. | 400 | 4.7 | 1880 | 1000 | 4.7 | **4700** |
| | b) M-45 | Gm. | 250 | 6.4 | 160 | 625 | 6.4 | **400** |
| | c) Antrocoll | Gm | 500 | 3.4 | 170 | 1250 | 3.4 | **425** |
| | **D) PGR** | | | | | | | |
| | b) Humic acid | Gm. | 1600 | 0.70 | 1120 | 4000 | 0.70 | 2800 |
| | Irrigationcharges | Rs | | | **9232.77** | | | **23081.94** |
| | Incidentalcharges | Rs | | | **1111.1** | | | **2777.8** |

## PER HECTARE COST OF CULTIVATION

Table No.3.30 Cost of Cultivation per hectare

| Sr. No | Item of Cost | Unit | Per Plot | | | Per Hectare Value Rs. |
|---|---|---|---|---|---|---|
| | | | Qty. | Rate | Value (Rs.) | |
| 1. i. | Hired Human Labour | | | | | |
| a. | Male | Days | 10 | 250 | 2500 | 6500 |
| b. | Female | Days | 195 | 200 | 39000 | 97500 |
| 2. i. | Hired Machinery Used | Hour | 1 | 2200 | 2200 | 4800 |
| ii. | Owned Machinery Used | Hour | 8 | 240 | 1920 | 5500 |
| 3. | Seedling Purchased | No. | 3800 | 1.5 | 5700 | 16875 |
| 4. | Manure | Tons | 3 | 2200 | 6600 | 16500 |
| 5. | Fertilizers | | | | | |
| i) | Straight | | | | | |
| | a)10:26:26(N:P:K) | Kg. | 30 | 25 | 750 | 1875 |
| | b) 12:32:16 | Kg. | 30 | 27 | 810 | 2025 |
| ii) | **ii)Straight** | | | | | |
| | a )Boron | Gm | 350 | 0.40 | 140 | 350 |
| | **iii) Compound** | | | | | |
| | a Calcium Nitrate | Kg | 16 | 20 | 320 | 800 |
| | b .SilicateNitrate | kg | 1 | 300 | 300 | 750 |
| | **Water Soluble** | | | | | |
| | a).00:00:50(SOP) | kg | 16 | 125 | 2000 | 5000 |
| | b) .Micronutrient | kg | 3 | 250 | 750 | 1750 |
| | c) 19:19:19 | Kg. | 16 | 76 | 1,216 | 3,040 |
| | d) 12:61:00 | kg | 16 | 90 | 1,440 | 3600 |
| | e) 13:40:13 | kg | 18 | 100 | 1800 | 4500 |
| | f) 00:52:34 | kg | 16 | 130 | 2,080 | 5,200 |
| | **B)Insecticides** | | | | | |
| | a) Benevia | ml. | 320 | 10 | 3,200 | 8,000 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | b) Proclaim | Gm. | 100 | 10 | 1,000 | 2,500 |
| | **C)Fungicides** | | | | | |
| | a) Xelora | ml. | 400 | 4.7 | 1880 | 4700 |
| | b) M-45 | Gm. | 250 | 6.4 | 160 | 400 |
| | c) Antrocoll | Gm | 500 | 3.4 | 170 | 425 |
| | **D) PGR** | | | | | |
| | b) Humic acid | Gm. | 1600 | 0.70 | 1120 | 2800 |
| 8 | Irrigation charges | Rs | | | **9232.77** | **23081.94** |
| 9 | Incidental charges | Rs | | | **1111.1** | **2777.8** |
| 10 | Total Working Capital (Total of 1to9) | Rs. | | | **89057.1** | **203074.1** |
| 11 | Interest on Working Capital @ prevailing bank rate for full Crop Period | Rs | | | 5343.42 | 13358.56 |
| 12 | **Total Operational Cost(10+11)** | Rs. | | | **94400.52** | **236001.3** |
| 13 | Land Revenue & Other cesses | | | | 63.4 | 158.5 |
| 14 | Depreciation on Implements, Machinery & Building | | | | 6931 | 17327.5 |
| 15. | Interest on Fixed Capital | | | | 17494.4 | 43736 |
| **16.** | **Total Fixed Cost** | | | | **84488.8** | **211222** |
| **17.** | **Total Cost (11+16)** | | | | **178889.3** | **447223.25** |
| **COST CON CEPT** | | | | | | |
| 18. | Total Operational Cost | | | | **94400.52** | **236001.3** |
| 19. | Land Revenue & Other cesses | | | | 63.4 | 158.5 |
| 20. | Depreciation on Implements & Machinery | | | | 4971.9 | 12429.75 |
| **21.** | **Cost A 1(18+19+20)** | | | | **94400.52** | **236001.3** |
| 22. | Rent Paid for Leased in Land | | | | - | - |

| | | | | | | |
|---|---|---|---|---|---|---|
| **23.** | **Cost A 2 (21+22)** | | | | **94400.52** | **236001.3** |
| 24. | Interest on Fixed Capital Excluding land (10% on Fixed Investment) | | | | 17494.4 | 43736 |
| 25. | Rental Value of Owned land ($1/6^{th}$ of gross Return) | | | | 59936.6 | 149841.5 |
| **27.** | **Cost B1 (21+24+25+26)** | | | | **176930.22** | **442325.55** |
| 28. | Rental Value of Owned land - Land Revenue & Other cesses (25-19) | | | | 59936.6 | 149841.5 |
| **29.** | **Cost B2 (27+28+22)** | | | | **236866.82** | **592167.05** |
| 30. | Imputed Value of Family Labour. | Male | 10 | 200 | 2000 | 5000 |
| | | Female | 80 | 150 | 12000 | 30000 |
| 31. | Supervision Charges (10% of Cost A | | | | 9943.5 | 24858.75 |
| **32.** | **Cost C1 (27+30+31)** | | | | **200873.72** | **502184.3** |
| **33.** | **Cost C2(29+30+31)** | | | | **260810.12** | **652025.3** |

**YIELD:**

Table No.3.31. Yield of Tomato

| Sr. No. | Item | Unit | Per Plot | | | Per Hectare |
|---|---|---|---|---|---|---|
| | | | Qty. | Rate | Value (Rs.) | |
| 1. | Main Product | Qt | **180** | **200** | **360000** | **900000** |
| 2. | By Product | Qt | | | | |
| | **Gross Income** | | | | **360000** | **900000** |

**Analytical Tools or Estimated Income Measures Used**

Table No.3.32. Estimated income measured used

| Sr. No. | Particulars | Formula | Solution |
|---|---|---|---|
| 1 | Gross Income | Total Production X (Price/Quintal) | **360000** |
| 2 | Farm business Income | Gross Income – Cost A1 or Cost A2 | **260564.18** |
| 3 | Family labour Income | Gross Income – Cost B1 or Cost B2 | **1,08,177.11** |
| 4 | Farm investment Income | FBI - Imputed Value of Family labour | **183069.78** |
| 5 | **Net income** | Gross Income - Cost C1 or CostC2 | **159126.28** |
| 6 | **B.C .Ratio** | Gross Income/Cost C1 or Cost C2 | **1.79** |
| 7 | Per Quintal cost of Production | Cost C1 or Cost C2 - Value of by Product/Yield in (qtl.) | **1104.85** |
| 8 | Per hectare cost of Production | Cost C1 or Cost C2 /Area (ha) | **497184.3** |

## SOYABEAN

Photo .3.2

**Input Utilization & Cost of Cultivation of Different Crops Inputs Used in Soyabean**

Table No.3.33. Inputs used in Soybean

| **Crop:** Soyabean | | **Variety:** JS-335 | | | **Season:** Kharif | | | **Area:0.60 ha** |
|---|---|---|---|---|---|---|---|---|
| **Sr. No** | **Item of Cost** | **Unit** | **Per Plot** | | | **Per Hectare** | | |
| | | | **Qty.** | **Rate** | **Value (Rs.)** | **Qty.** | **Rate** | **Value (Rs.)** |
| 1. | i) Hired Human Labour | | | | | | | |
| | a) Male | Days | 7 | 200 | 1400 | 11.66 | 200 | 2333.3 |
| | b) Female | Days | 13 | 200 | 2600 | 21.6 | 200 | 4320 |
| 2. | a) Hired Machinery Used | Hour | 3 | 750 | 2250 | 5 | 750 | 3750 |
| | b) Owned Machinery Used | Hour | 6 | 66 | 396 | 10 | 66 | 660 |
| 3. | Seed Purchased | Kg. | 50 | 50 | 2500 | 83.33 | 50 | 4166.66 |
| 4. | Fertilizers | | | | | | | |
| | Straight | | | | | | | |
| | A. Urea(46 % N) | Kg. | 100 | 7 | 700 | 166.66 | 7 | 1166.62 |
| | B. 10:26:26(N.P.K) | Kg. | 50 | 25 | 1250 | 83.33 | 25 | 2083 |
| 5. | Insecticides Rogor (Dimethoate 30% EC ) | Ml. | 500 | 48/100 | 240 | 833.33 | 48/100 | 400 |
| | b) Desis 100 | Ml | 250 | 160/100 | 400 | 416.66 | 160/100 | 666.66 |
| 6. | Weedicide | Ml | 150 | 150/100 | 225 | 250 | 150/100 | 375 |
| 8. | Irrigation Charges | Rs. | | | **12486.6** | | | **20811.11** |
| 9. | Incidental | Rs. | | | **1666.7** | | | **2777.83** |

## PER HECTARE COST OF CULTIVATION

Table No.3.34. Cost of Cultivation per hectare

| Sr. No | Item of Cost | Unit | Per Plot | | | Per Hectare Value Rs. |
|---|---|---|---|---|---|---|
| | | | Qty. | Rate | Value (Rs.) | |
| 1. | Hired Human Labour | | | | | |
| a. | Male | Days | 7 | 200 | 1400 | 2333.3 |
| b. | Female | Days | 13 | 200 | 2600 | 4320 |
| 2. | i) Hired Machinery Used | Hour | 3 | 750 | 2250 | 3750 |
| | ii) Owned Machinery Used | Hour | 6 | 66 | 396 | 660 |
| 3. | Seed Purchased | Kg. | 50 | 50 | 2500 | 4166.66 |
| 4. | Fertilizers | | | | | |
| a. | Straight<br>Urea ( 46%) | Kg | 100 | 7 | 700 | 1166.62 |
| b. | 10:26:26 ( N.P.K ) | Kg. | 50 | 25 | 1250 | 2083 |
| 5. | Complex<br>Insecticides<br>Rogor (Dimethoate 30% EC ) | Ml. | 500 | 48/100 | 240 | 400 |
| | b) Desis 100 | Ml | 250 | 160/100 | 400 | 666.66 |
| · | Weedicide | Ml | 150 | 150/100 | 225 | 375 |
| 6 | Irrigation Charges | | | | **12486.6** | **20811.11** |
| 7. | Incidental Charges | Rs. | | | **1666.7** | **2777.83** |
| 8. | Total Working Capital (Total of 1to7) | Rs. | | | **26863.66** | **44772.76** |
| 9. | Interest on Working Capital @ prevailing bank rate for full Crop Period | Rs. | | | 1074.54 | 1790.91 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **10.** | **Total Operational Cost (8+9)** | | | | **27938.2** | **46563.66** |
| 11. | Land Revenue & Other cesses | Rs. | | | 95 | 158.3 |
| 12. | Depreciation on Implements, Machinery & Building | Rs. | | | 10396.5 | 17327.5 |
| 13. | Rental Value of land 1 / 6 $^{th}$ of gross Return | | | | 17166.66 | 28611.11 |
| 14. | Interest on Fixed Capital | | | | 26241.7 | 43736.66 |
| **15.** | **Total Fixed Cost** | | | | **53899.86** | **89833.1** |
| **16.** | **Total Cost (10+15)** | | | | **81833.06** | **136396.76** |
| **COST CONCEPT** | | | | | | |
| 17. | Total Operational Cost | | | | 27938.2 | 46563.66 |
| 18. | Land Revenue & Other cesses | | | | 95 | 158.3 |
| 19. | Depreciation on Implements & Machinery | | | | 7457.8 | 12429.66 |
| **20.** | **Cost A 1(17+18+19)** | | | | **35491** | **59151.66** |
| 21. | Rent Paid for Leased in Land | | | | - | - |
| **22.** | **Cost A 2 (20+21)** | | | | **27938.2** | **46563.66** |
| 23. | Interest on Fixed Capital Excluding land(10% on Fixed Investment) | | | | 26241.7 | 43736.16 |
| 24. | Rental Value of Owned land (1/6$^{th}$ of gross Return) | | | | 17166.66 - | 28611.11 -- |
| 25. | Amortization Value in Case of Fruit Crops | | | | **71346.56** | **118910.93** |
| **26.** | **Cost B1 (20+23+24+25)** | | | | 26241.7 | 43736.16 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 27. | Rental Value of Owned land- Land Revenue & Other cesses (24-18) | | | | 17071.66 | 28452.81 |
| **28.** | **Cost B2 (26+27+21)** | | | | **88418.22** | **147363.7** |
| 29. | Imputed Value of Family Labour | Male | 8 | 250 | 1200 | 2000 |
| | | Female | 2 | 200 | 450 | 750 |
| 30. | Supervision Charges (10% of Cost A | | | | **3549.1** | **5915.16** |
| **31.** | **Cost C1 (26+29+30)** | | | | **76545.66** | **127576.1** |
| **32.** | **Cost C2(28+29+30)** | | | | **93617.32** | **156028.86** |

**Yield of Soyabean:-**

Table No.3.35. Yield of Soybean

| Sr. No. | Item | Unit | Per Plot | | | Per Hectare |
|---|---|---|---|---|---|---|
| | | | Qty. | Rate | Value (Rs.) | |
| 1. | Main Product | Qt | 16.5 | 6000 | 99000 | 165000 |
| 2. | By Product | Qt | 4 | 1000 | **4000** | 6666.66 |
| | **Gross Income** | | | | **103000** | **171666.66** |

**Analytical Tools or Estimated Income Measures Used**

Table No.3.36. Estimated income measure used for soybean

| Sr. No. | Particulars | Formula | Solution |
|---|---|---|---|
| 1 | Gross Income | Total Production X (Price/Quintal) | **103000** |
| 2 | Farm business Income | Gross Income –Cost A1 or Cost A2 | **67509** |
| 3 | Family labour Income | Gross Income –Cost B1 or Cost B2 | **31653.44** |
| 4 | Farm investment Income | FBI - Imputed Value of Family labour | **77048.84** |
| **5** | **Net income** | Gross Income-Cost C1 or CostC2 | **26454.34** |
| **6** | **B.C .Ratio** | Gross Income/Cost C1 or Cost C2 | **1.34** |

## ONION

Photo .3.3

**Input Utilization & Cost of Cultivation of Different Crops Inputs Used in Onion**

Table No.3.37.Inputs used in cultivation of Onion

| **Crop: Onion** | | Variety: Poona Fursungi | | | **Season: Rabi** | | **Area: 0.40** | |
|---|---|---|---|---|---|---|---|---|
| **Sr. No** | **Item of Cost** | **Unit** | **Per Plot** | | | **Per Hectare** | | |
| | | | **Qty.** | **Rate** | **Value (Rs.)** | **Qty.** | **Rate** | **Value (Rs.)** |
| 1. | i) Hired Human Labour | | | | | | | |
| a. | Male | Days | 40 | 250 | 10000 | 100 | 250 | 25000 |
| b. | Female | Days | 70 | 200 | 14000 | 175 | 200 | 35000 |
| 2. | ii) Owned Machinery Used | Hour | 6 | 150 | 900 | 15 | 150 | 2250 |
| 3. | Seed Purchased | Kg. | 3.5 | 2500 | 8750 | 8.75 | 2500 | 21875 |
| 4. | Manure | Tons | 4 | 1800 | 7200 | 10 | 1800 | 18000 |
| 5. | Fertilizers | | | | | | | |
| a. | Straight Urea (46%) | Kg. | 100 | 6 | 600 | 250 | 6 | 1500 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| a. | Complex 10:26:26 (N:P:K) | Kg. | 120 | 25 | 3000 | 300 | 25 | 7500 |
| b. | 12:32:16 (N:P:K) | Kg. | 100 | 30 | 3000 | 250 | 30 | 7500 |
| 6. | Insecticides | | | | | | | |
| | Karate (Lambda Cyhalothrin 5%) | ml | 200 | 0.80 | 160 | 500 | 0.80 | 400 |
| | b) Choloro | Ml | 250 | 0.90 | 225 | 625 | 0.90 | 562.5 |
| | c) Profex Super | Ml | 250 | 1 | 250 | 625 | 1 | 625 |
| | Fungicide M-45 (Mancozeb75%) | Gm. | 250 | 65/ 100ml | 162.5 | 625 | 65/ 100ml | 406.25 |
| | Saff | Gm | 250 | 0.90 | 225 | 625 | 0.90 | 562.5 |
| | Bawistin | Gm | 250 | 0.60 | 150 | 625 | 0.60 | 375 |
| | Weedicide Goal(oxyfluorfen) | Lit. | 250 | 106/ 100ml | 265 | 625 | 106/ 100ml | 1562.5 |
| 7. | Irrigation Charges | Rs. | | | 11987.77 | | | 29961.42 |
| 8. | Incidental Charges | Rs. | | | **1111.1** | | | **2777.7** |

## PER HECTARE COST OF CULTIVATION

Table No.3.38. Cost of cultivation per hectare

| Sr. No | Item of Cost | Unit | Per Plo t | | | Per Hectare Value Rs. |
|---|---|---|---|---|---|---|
| | | | Qty. | Rate | Value (Rs.) | |
| 1. | i) Hired Human Labour | | | | | |
| | a) Male | Days | 40 | 250 | 10000 | 25000 |
| | b) Female | Days | 70 | 200 | 14000 | 35000 |
| | ii) Owned Machinery Used | Hour | 6 | 150 | 900 | 2250 |
| 3. | Seed Purchased | Kg. | 3.5 | 2500 | 8750 | 21875 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 4. | Manure | Tons | 4 | 1800 | 7200 | 18000 |
| 5. | Fertilizers | Kg. | | | | |
| | Straight<br>a) Urea (46%) | Kg. | 100 | 6 | 600 | 1500 |
| | Complex<br>a) 10:26:26 (N:P:K) | Kg. | 120 | 25 | 3000 | 7500 |
| | b) 12:32:16 (N:P:K) | Kg. | 100 | 30 | 3000 | 7500 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 6. | Insecticides<br>Karate ( Lambda Cyhalothrin 5%) | Ml. | 250 | 50/100ml | 125 | 312.5 |
| | b) Choloro | Ml | 250 | 0.90 | 225 | 562.08 |
| | c) Profex Super | Ml | 250 | 1 | 250 | 625 |
| | Fungicide<br>M-45(Mancozeb 75%) | Gm. | 250 | 65/100Gm | 162.5 | 406.25 |
| | Saff | Gm | 250 | 0.90 | 225 | 562.8 |
| | Bawistin | Gm | 250 | 0.60 | 150 | 375 |
| | Weedicide<br>a) Goal ( Oxyflurofen) | Ml. | 250 | 65/ 100ml | 265 | 662.5 |
| 7. | Irrigation Charges | Rs. | | | 11987.77 | 29961.42 |
| 8. | Incidental Charges | Rs. | | | **1111.1** | **2777.7** |
| 9. | Total Working Capital (Total of 1to8) | Rs. | | | 56008.8 | 140022 |
| 10. | Interest on Working Capital @ prevailing bank rate for full Crop Period | Rs. | | | 2240.35 | 5600.88 |
| **11.** | **Total Operational Cost (9 + 10)** | | | | **58249.15** | **145622.87** |
| 12. | Land Revenue & Other cesses | Rs. | | | 63.4 | 158.5 |
| 13. | Depreciation on Implements, Machinery & Building | Rs. | | | 6931 | 17327.5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 14. | Rental Value of land 1 / 6 th of gross Return | | | | **49806.7** | **124516.8** |
| 15. | Interest on Fixed Capital | | | | 17494.4 | 43736 |
| **16.** | **Total Fixed Cost** | | | | **61988.8** | **154272** |
| **17.** | **Total Cost (12+17)** | | | | **114237.95** | **285594.87** |
| **COS T CONCEPT** | | | | | | |
| 18. | Total Operational Cost | | | | **58249.15** | **145622.87** |
| 19. | Land Revenue & Other cesses | | | | 63.4 | 158.5 |
| 20. | Depreciation on Implements & Machinery | | | | 4971.9 | 12427.5 |
| **21.** | **Cost A 1(18+19+20)** | | | | **63284.45** | **158211.12** |
| **23.** | **Cost A 2 (21+22)** | | | | **63284.45** | **158211.12** |
| 24. | Interest on Fixed Capital Excluding land(10% on Fixed Investment) | | | | 17494.4 | 43736 |
| 25. | Rental Value of Owned land (1/6$^{th}$ of gross Return) | | | | 37500 | 93750 |
| 26. | Amortization Value in Case of Fruit Crops | | | | - | - |
| **27.** | **Cost B1 (21+24+25+26)** | | | | **118278.85** | **295697.12** |
| 28. | Rental Value of Owned land- Land Revenue & Other cesses (25-19) | | | | 37436.6 | 93591.5 |
| **29.** | **Cost B2 (27+28+22)** | | | | **155715.45** | **389288.62** |
| 30. | Imputed Value of Family Labour. | Female | 12 | 200 | 2400 | 6000 |
| 31. | Supervision Charges (10% of Cost A | | | | 6328.4 | 15821.11 |
| **32.** | **Cost C1 (27+30+31)** | | | | **127007.25** | **317518.12** |
| **33.** | **Cost C2(29+30+31)** | | | | **164443.85** | **411109.62** |

**YIELD:**

Table No.3.39. Yield of onion

| Sr. No. | Item | Unit | Per Plot | | | Per Hectare |
|---|---|---|---|---|---|---|
| | | | Qty. | Rate | Value (Rs.) | |
| 1. | Main Product | Qt | 150 | 1500 | 225000 | 562500 |
| 2. | By Product | Qt | | | | |
| | **Gross Income** | | | | 225000 | 562500 |

**Analytical Tools or Estimated Income Measures Used**

Table No.3.40. Estimated income measured used

| Sr. No. | Particulars | Formula | Solution |
|---|---|---|---|
| 1 | Gross Income | Total Production X (Price/Quintal) | **225000** |
| 2 | Farm business Income | Gross Income – Cost A1 or Cost A2 | **161715.55** |
| 3 | Family labour Income | Gross Income – Cost B1 or Cost B2 | **106721.15** |
| 4 | Farm investment Income | FBI - Imputed Value of Family labour | **159315.55** |
| 5 | **Net income** | Gross Income-Cost C1 or CostC2 | **97992.75** |
| 6 | **B.C .Ratio** | Gross Income/Cost C1 or Cost C2 | **1.36** |
| 7 | Per Quintal cost of Production | Cost C1 or Cost C2 - Value of by Product/Yield in (qtl.) | **836.71** |
| 8 | Per hectare cost of Production | Cost C1 or Cost C2 /Area (ha) | **313768.25** |

## WHEAT

Photo .3.4

**Input Utilization & Cost of Cultivation of Different Crops Inputs Used in Wheat**

Table No.3.41. Inputs used in Wheat

| **Crop: Wheat** | | **Variety: Ajit-102** | | | **Season: Rabi** | | **Area: 0.40 ha** | |
|---|---|---|---|---|---|---|---|---|
| **Sr. No** | **Item of Cost** | **Unit** | **Per Plot** | | | **Per Hectare** | | |
| | | | **Qty.** | **Rate** | **Value (Rs.)** | **Qty.** | **Rate** | **Value (Rs.)** |
| 1. | Hired Human Labour | | | | | | | |
| a. | Male | Days | 13 | 200 | 2600 | 21.6 | 200 | 4333.3 |
| 2. | Hired Machinery Used | Hour | 3 | 700 | 2100 | 5 | 700 | 3500 |
| | b) Seed dril | Hour | 6 | 250 | 1500 | 10 | 250 | 2500 |
| 3. | Seed Purchased | Kg. | 60 | 60 | 3600 | 100 | 60 | 6000 |
| 4. | Fertilizers | | | | | | | |
| a. | Straight Urea (46 % N) | Kg. | 90 | 8 | 720 | 150 | 8 | 1200 |
| b. | 20:20:00(N:P:K) | Kg. | 150 | 15 | 2250 | 250 | 15 | 3750 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Fungicide<br>M-45 (Mancozeb 75%) | Kg. | 1.2 | 40/100 | 480 | 2 | 40/100 | 800 |
| | Weedicide<br>2,4-D (Dichlorophenoxyacetic Acid) | Lit. | 0.5 | 900 | 450 | 1.25 | 900 | 1125 |
| 6. | Irrigation Charges | Rs. | | | | | | 28006.93 |
| 7. | Incidental Charges | Rs. | | | **1666.7** | | | **2779.5** |

## PER HECTARE COST OF CULTIVATION

Table No.3.42.Cost of cultivation per hectare

| **Sr. No** | **Item of Cost** | **Unit** | **Per Plot** | | | **Per Hectare Value Rs.** |
|---|---|---|---|---|---|---|
| | | | **Qty.** | **Rate** | **Value (Rs.)** | |
| 1. | Hired Human Labour | | | | | |
| a. | Male | Days | 13 | 200 | 2600 | 4333.3 |
| 2. | Hired Machinery Used | Hour | 3 | 700 | 2100 | 3500 |
| | Seed Drill | Hour | 6 | 250 | 1500 | 2500 |
| 3. | Seed Purchased | Kg. | 60 | 60 | 3600 | 6000 |
| 4. | Fertilizers | Kg. | | | | |
| a. | Straight<br>Urea (46% N ) | Kg. | 90 | 8 | 720 | 825 |
| b. | 20:20:00 (N:P:K) | Kg. | 150 | 15 | 2250 | 3437.5 |
| 5 | Fungicide<br>M-45 (Mancozeb 75%) | Kg. | 1.2 | 40/100 | 480 | 800 |
| | Weedicide | Lit. | 1.2 | 100/100 | 1200 | 2000 |
| | 2,4-D (Dichlorophen oxyacetic Acid) | | | | | |
| 6. | Irrigation Charges | Rs. | | | 16804.16 | 28006.93 |
| 7. | Incidental Charges | Rs. | | | **1666.7** | **2779.5** |

| | | | | | | |
|---|---|---|---|---|---|---|
| 8. | Total Working Capital (Total of 1to7) | Rs. | | | **33670.86** | **56118.1** |
| 9. | Interest on Working Capital @ prevailing bank rate for full Crop Period | Rs. | | | 1346.83 | 2244.72 |
| **10.** | **Total Operational Cost(8+9)** | | | | **35017.69** | **58362.81** |
| 11. | Land Revenue & Other cesses | Rs. | | | 95 | 158.33 |
| 12. | Depreciation on Implements, Machinery & Building | Rs. | | | 10396.5 | 17327.5 |
| 13. | Rental Value of land 1/6$^{th}$ of gross Return | | | | 18016.6 | 30027.76 |
| 14. | Interest on Fixed Capital | | | | 26241.7 | 43736.16 |
| **15.** | **Total Fixed Cost** | | | | **54749.86** | **91250.25** |
| **16.** | **Total Cost (10+15)** | | | | **89767.49** | **149612.48** |
| **COST CONCEPT** | | | | | | |
| 17. | Total Operational Cost | | | | **35017.69** | **58362.81** |
| 18. | Land Revenue & Other cesses | | | | 95 | 158.33 |
| 19. | Depreciation on Implements & Machinery | | | | 7457.8 | 12429.66 |
| **20.** | **Cost A 1(17+18+19)** | | | | **42570.49** | **70950.81** |
| 21. | Rent Paid for Leased in Land | | | | - | - |
| **22.** | **Cost A 2 (20+21)** | | | | **42570.49** | **70950.81** |
| 23. | Interest on Fixed Capital Excluding land(10% on Fixed Investment) | | | | 26241.7 | 43736.16 |
| 24. | Rental Value of Owned land (1/6$^{th}$ of gross Return) | | | | 18016.6 | 30027.76 |
| 25. | Amortization Value in Case of Fruit Crops | | | | - | - |

| | | | | | | |
|---|---|---|---|---|---|---|
| **26.** | **Cost B1 (20+23+24+25)** | | | | **86828.79** | **144714.65** |
| 27. | Rental Value of Owned land- Land Revenue & Other cesses (24-18) | | | | 17921.6 | 29868.93 |
| **28.** | **Cost B2 (26+27+21)** | | | | **104750.39** | **174583.98** |
| 29. | Imputed Value of Family Labour. | Male | 12 | 250 | 800 | 1333.33 |
| 30. | Supervision Charges (10% of Cost A | | | | 4257 | 7095 |
| **31.** | **Cost C1 (26+29+30)** | | | | **91885.79** | **153142.98** |
| **32.** | **Cost C2(28+29+30)** | | | | **109807.39** | **183012.31** |

**YIELD:**

Table No.3.43. Yield of wheat

| Sr. No. | Item | Unit | Per Plot | | | Per Hectare |
|---|---|---|---|---|---|---|
| | | | Qty. | Rate | Value (Rs.) | |
| 1. | Main Product | Qtl | 37 | 2800 | 103600 | 172666.66 |
| 2. | By Product | - | 3 | 1500 | 4500 | 11250 |
| | **Gross Income** | | 35.5 | | 108100 | 180166.66 |

## Analytical Tools or Estimated Income Measures Used

Table No.3.44. Estimated income measured used

| Sr. No. | Particulars | Formula | Solution |
|---|---|---|---|
| 1 | Gross Income | Total Production X (Price/Quintal) | 108100 |
| 2 | Farm business Income | Gross Income –Cost A1 or Cost A2 | **65530** |
| 3 | Family labour Income | Gross Income –Cost B1 or Cost B2 | **21271.21** |
| 4 | Farm investment Income | FBI - Imputed Value of Family labour | **64730** |
| 5 | **Net income** | Gross Income-Cost C1 or CostC2 | **16214.24** |
| 6 | **B.C .Ratio** | Gross Income/Cost C1 or Cost C2 | **1.217** |

Photo .3.5

**Input Utilization & Cost of Cultivation of Different Crops Inputs Used in Grapes**

Table No.3.45. Inputs used in cultivation of Grapes

| **Crop:** Grapes | | **Variety:** Thompson Seedless | | | **Season:Perineal** | | | **Area: 0.80 ha** |
|---|---|---|---|---|---|---|---|---|
| **Sr. No** | **Item of Cost** | **Unit** | **Per Plot** | | | **Per Hectare** | | |
| | | | **Qty** | **Rate** | **Value (Rs.)** | **Qty** | **Rate** | **Value (Rs.)** |
| **1.** | **A)Hired Hum Labour** | | | | | | | |
| | a) Male | Days | 180 | 250 | **45000** | 112.5 | 250 | **28125** |
| | b) Female | Days | 260 | 200 | **52000** | 162.5 | 200 | **32500** |
| | **B)Permanent Labour** | Days | | | | | | |
| | a)male | Hour | 60 | 250 | **15000** | 37.5 | 250 | **9375** |
| **2.** | **Owned machinery Used** | Acre | 80 | 200 | **16000** | 50 | 200 | **10000** |
| **3.** | **Hired Machi Used (ESS)** | Tons | 4 | 1800 | **7200** | 2.5 | 1800 | **4500** |
| **4.** | **Manure** | | 35 | 1000 | **35000** | 21.87 | 1000 | **21875** |
| **5.** | **Fertilizers** | | | | | | | |
| | **A) Complex** | | | | | | | |
| | a) 18:46:00 | Kg | 500 | 30 | 15000 | 312.5 | 30 | 9375 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | b) 10:26:26 | kg | 320 | 25 | 8000 | 200 | 25 | 5000 |
| | **B)water Solubles** | Kg | | | | | | |
| | a) 00:52:34 | Kg | 140 | 126 | 17640 | 87.5 | 126 | 11025 |
| | b) 19:19:19 | Kg | 160 | 50 | 8000 | 100 | 50 | 5000 |
| | c) 00:60:20 | Kg | 160 | 150 | 24000 | 100 | 150 | 15000 |
| | d) 13:00:45 | Kg | 70 | 25 | 1750 | 43.75 | 25 | 1093.7 |
| | e) 12:61:00 | Kg | 140 | 90 | 12600 | 87.5 | 90 | 7875 |
| | **ii) Straight** | | | | | | | |
| | **a)** Single Super Phosphate | Kg | 1800 | 10 | 18000 | 112.5 | 10 | 11250 |
| | **b)**00:00:50(SOP) | kg | 80 | 45 | 3600 | 50 | 45 | 2250 |
| | **iii)Insecticide** | | | | | | | |
| | a) Proclaim | lit | 4 | 1250 | **5000** | 2.5 | 1250 | **3125** |
| | b) Larvin | kg | 12 | 600 | **7200** | 7.5 | 600 | **4500** |
| | c) Karate | lit | 8 | 700 | **5600** | 5 | 700 | **3500** |
| | **iv)Fungicide** | | | | | | | |
| | 1) Antracall | Kg | 6 | 540 | **3240** | 3.75 | 540 | **2025** |
| | 2)M45 | Kg | 20 | 340 | **6800** | 12.5 | 340 | **4250** |
| | 3)Z- 78 | Kg | 20 | 480 | **9600** | 12.5 | 480 | **6000** |
| | 4)Caberiotop | Lit | 4 | 1600 | **6400** | 2.5 | 1600 | **4000** |
| | 5)Amister | Lit | 3 | 2400 | **7200** | 1.87 | 2400 | **4488** |
| | 6) Profiler | Kg | 1 | 2600 | **2600** | 0.625 | 2600 | **1625** |
| | **v)Weedicide** | | | | | | | |
| | a) Glycell | Lit | 6 | 540 | **3240** | 3.75 | 540 | **2025** |
| | b) Gramozone | lit | 8 | 300 | **2400** | 5 | 300 | **1500** |
| | **PGR** | | | | | | | |
| | a) G.A | gm | 500 | 24 | **12000** | 312.5 | 24 | **7500** |
| | b) C.P.P.U | lit | 10 | 1800 | **18000** | 6.25 | 1800 | **11250** |
| | c) Daimore | Lit | 8 | 3000 | **24000** | 5 | 3000 | **15000** |
| 8. | **Irrigation Charges** | Rs. | | | **56586.11** | | | **35366.31** |
| **9.** | Incidental Chr | Rs. | | | 4444.4 | | | **2777.7** |

## Amortization cost of Grapes

$$Amortization\ Cost\ (A)\ = \frac{P.r\ (1+r)^n}{(1+r)^n - 1}$$

Where,

P = Establishment Cost

r = Rate of Interest

n = Economical Life of Crop in Years

A = Annual Amortization Cost

## Establishment Cost of Grapes

Table No.3.46. Establishment cost of Grapes plot structure

| Sr. No. | Items of Costs | Units | Quantity | Rates (Rs.) | Value(Rs.) |
|---|---|---|---|---|---|
| 1. | Structure | | | | |
| | Steel Iron | Kg. | 1000 | 50 | 50000 |
| | Iron Angle | Tones | 6 | 45000 | 270000 |
| | Bamboo | Numbers | 4500 | 22 | 99000 |
| 2. | Bed Preparation | Acre | 4 | 2400 | 9600 |
| 3. | Seedlings Purchased ( Hundi) | Numbers | 4500 | 6 | 27000 |
| 4 | Manure | Tones | 30 | 1000 | 30000 |
| 5. | Drip Irrigation System | - | - | - | 100000 |
| | **Total** | | - | - | **585600** |

P = 585600

r = 10% For 12 Months (interest on fixed capital is 10% )

n = 12 Years

**Amortization Cost (A) = 77033.18**

## PER HECTARE COST OF CULTIVATION

Table No.3.47. Cost of cultivation per hectare

| Sr. No | Item of Cost | Unit | Per Plot | | | Per Hectare Value Rs. |
|---|---|---|---|---|---|---|
| | | | Qty. | Rate | Value (Rs.) | |
| **1.** | **A)Hired Hum Labour** | | | | | |
| | a) Male | Days | 180 | 250 | **45000** | **28125** |
| | b) Female | Days | 260 | 200 | **52000** | **32500** |
| | **B)Permanent Labour** | Days | | | | |
| | a)male | Hour | 60 | 250 | **15000** | **9375** |
| **2.** | **Owned machinery Used** | Acre | 80 | 200 | **16000** | **10000** |
| **3.** | **Hired Machi Used (ESS)** | Tons | 4 | 1800 | **7200** | **4500** |
| **4.** | **Manure** | | 35 | 1000 | **35000** | **21875** |
| **5.** | **Fertilizers** | | | | | |
| | **A) Complex** | | | | | |
| | a) 18:46:00 | Kg | 500 | 30 | 15000 | 9375 |
| | b) 10:26:26 | kg | 320 | 25 | 8000 | 5000 |
| | **B)water Solubles** | Kg | | | | |
| | a) 00:52:34 | Kg | 140 | 126 | 17640 | 11025 |
| | b) 19:19:19 | Kg | 160 | 50 | 8000 | 5000 |
| | c) 00:60:20 | Kg | 160 | 150 | 24000 | 15000 |
| | d) 13:00:45 | Kg | 70 | 25 | 1750 | 1093.7 |
| | e) 12:61:00 | Kg | 140 | 90 | 12600 | 7875 |
| | **ii) Straight** | | | | | |
| | **a)** Single Super Phosphate | Kg | 1800 | 10 | 18000 | 11250 |
| | **b)**00:00:50(SOP) | kg | 80 | 45 | 3600 | 2250 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | **iii)Insecticide** | | | | | |
| | a) Proclaim | lit | 4 | 1250 | **5000** | **3125** |
| | b) Larvin | kg | 12 | 600 | **7200** | **4500** |
| | c) Karate | lit | 8 | 700 | **5600** | **3500** |
| | **iv)Fungicide** | | | | | |
| | 1) Antracall | Kg | 6 | 540 | **3240** | **2025** |
| | 2)M45 | Kg | 20 | 340 | **6800** | **4250** |
| | 3)Z- 78 | Kg | 20 | 480 | **9600** | **6000** |
| | 4)Caberiotop | Lit | 4 | 1600 | **6400** | **4000** |
| | 5)Amister | Lit | 3 | 2400 | **7200** | **4488** |
| | 6) Profiler | Kg | 1 | 2600 | **2600** | **1625** |
| | **v)Weedicide** | | | | | |
| | a) Glycell | Lit | 6 | 540 | **3240** | **2025** |
| | b) Gramozone | lit | 8 | 300 | **2400** | **1500** |
| | **PGR** | | | | | |
| | a) G.A | Gm | 500 | 24 | **12000** | **7500** |
| | b) C.P.P.U | lit | 10 | 1800 | **18000** | **11250** |
| | c) Daimore | Lit | 8 | 3000 | **24000** | **15000** |
| 8. | **Irrigation Charges** | Rs. | | | **56586.11** | **35366.31** |
| **9.** | Incidental Chr | Rs. | | | 4444.4 | **2777.7** |
| 8. | Total Working Capital (Total of 1to7) | Rs. | | | **453868.55** | **283676.84** |
| 9. | Interest on Working Capital @ prevailing bank rate for full Crop Period | Rs. | | | 54464.22 | 34040.14 |
| 10. | **Total Operational Cost (8+9)** | | | | **508332.77** | **317707.98** |
| 11. | Land Revenue & Other cesses | Rs. | | | 253.3 | 158.31 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 12. | Depreciation on Implements, Machinery & Building | Rs. | | | 27724 | 17329.37 |
| 13. | Rental Value of land 1/6$^{th}$ of gross Return | | | | 266666.7 | 166666.66 |
| 14. | Interest on Fixed Capital | | | | 69977.8 | 43736.12 |
| 15. | **Total Fixed Cost** | | | | **364621.8** | **227890.46** |
| 16. | **Total Cost (10+15)** | | | | **872954.57** | **545596.62** |
| **COS T CONCEPT** | | | | | | |
| 17. | Total Operational Cost | | | | 508332.77 | 317707.98 |
| 18. | Land Revenue & Other cesses | | | | 253.3 | 158.31 |
| 19. | Depreciation on Implements & Machinery | | | | 19887.5 | 12429.68 |
| **20.** | **Cost A 1(17+18+19)** | | | | **528473.57** | **330295.98** |
| 21. | Rent Paid for Leased in Land | | | | | |
| **22.** | **Cost A 2 (20+21)** | | | | **528473.57** | **330295.98** |
| 23. | Interest on Fixed Capital Excluding land (10% on Fixed Investment) | | | | 69977.8 | 43736.12 |
| 24. | Rental Value of Owned land (1/6$^{th}$ of gross Return) | | | | 266666.66 | 166666.66 |
| 25. | Amortization Value in Case of Fruit Crops | | | | 77033.18 | 48145.73 |
| **26.** | **Cost B1 (20+23+24+25)** | | | | **942151.03** | **588844.39** |
| 27. | Rental Value of Owned land- Land Revenue & Other cesses (24-18) | | | | 266413.4 | 166508.15 |
| **28.** | **Cost B2 (26+27+21)** | | | | **1208564.43** | **755352.76** |

| | | | | | | |
|---|---|---|---|---|---|---|
| 29. | Imputed Value of Family Labour. | | | | 73000 | 45325 |
| 30. | Supervision Charges (10% of Cost A | | | | 52847.3 | 33029.5 |
| **31.** | **Cost C1 (26+29+30)** | | | | **1020435.33** | **637772.08** |
| **32.** | **Cost C2(28+29+30)** | | | | **1334411.73** | **834007.33** |

**YIELD:**

Table No.3.48. Yield of Grapes

| Sr. No. | Item | Unit | Per Plot | | | Per Hectare |
|---|---|---|---|---|---|---|
| | | | Qty. | Rate | Value(Rs.) | |
| 1. | Main Product | Qt | 00 | 4000 | 1600000 | 1000000 |
| | **Gross Income** | | | | 1600000 | 1000000 |

**Analytical Tools or Estimated Income Measures Used**

Table No.3.49. Estimated income measured used

| Sr. No. | Particulars | Formula | Solution |
|---|---|---|---|
| 1 | Gross Income | Total Production X (Price/Quintal) | 1600000 |
| 2 | Farm business Income | Gross Income –Cost A1 or Cost A2 | **1071526.43** |
| 3 | Family labour Income | Gross Income –Cost B1 or Cost B2 | **657847.97** |
| 4 | Farm investment Income | FBI - Imputed Value of Family labour | **998526.43** |
| 5 | **Net income** | Gross Income-Cost C1 or CostC2 | **579564.67** |
| 6 | **B.C .Ratio** | Gross Income/Cost C1 or Cost C2 | **1.56** |
| 7 | Per Quintal cost of Production | Cost C1 or Cost C2 - Value of by Product/Yield in (qtl.) | **3990** |
| 8 | Per hectare cost of Production | Cost C1 or Cost C2 /Area (ha) | **997500** |

## 3.6 Marketing of Agriculture Commodities

**Commodity – Soybean**

### 3.6.1 Marketing Channels of Soybean

**1) Producer → Village Trader → Wholesaler → Consumer.**

**2) Producer → Wholesaler → Oil Processor → Consumer**

Table-3.50.Marketing cost for Soybean

| Sr. No | Particulars | Channel I | Channel II |
|---|---|---|---|
| | | Rate /q. | Rate/ q. |
| **A** | **Cost incurred by producer** | | |
| 1 | Cost of plastic bags | 20 | 20 |
| 2 | Labour for primary sorting | 15 | 15 |
| 3 | Labour for loading and unloading | 10 | 10 |
| 4 | Transportation costs | 10 | 10 |
| | **Subtotal** | **55** | **55** |
| **B** | **Village Trader** | | |
| 1 | Transportation | 30 | - |
| 2 | Weighing charges | 5 | - |
| 3 | Loading unloading charges | 10 | - |
| 4 | Commission | 25 | - |
| | **Subtotal** | **70** | **-** |
| **C** | **Wholesaler** | | |
| 1 | Transportation | 15 | 12 |
| 2 | Loading unloading charges | 10 | 10 |
| 3 | Commission | 25 | 25 |
| 4 | Storage charges | 15 | 15 |
| | **Sub total** | **65** | **65** |
| **D** | **Oil Processor** | | |
| 1 | Transportation | - | 25 |
| 2 | Loading unloading charges | - | 10 |
| 3 | Commission | - | 30 |
| 4 | Weigning Charges | - | 10 |
| | **Subtotal** | **-** | **75** |
| | **Total** | **190** | **195** |

## Price spread And Marketing Margins for Soybean

Table.3.51. Price spread and marketing margin for Soybean

| Sr. No | Particulars | Channel I | Channel II |
|---|---|---|---|
| | | Rate /q. | Rate/ q. |
| **1.** | **Producer** | | |
| | Gross price received | 6300 | 6300 |
| | Marketing costs | 50 | 50 |
| | Net price received | 6250 | 6250 |
| **2.** | **Village Trader** | | |
| | Purchase price | 6300 | - |
| | Marketing costs | 60 | - |
| | Selling price per quintal | 6500 | - |
| | Market Margin | 140 | - |
| **3.** | **Wholesaler** | | |
| | Purchase price | 6500 | 6250 |
| | Marketing costs | 65 | 65 |
| | Market Margin | 235 | 285 |
| | Selling price per quintal | 6800 | 6600 |
| **4.** | **Oil Processor** | | |
| | Purchase price | - | 6600 |
| | Marketing costs | - | 70 |
| | Selling price | - | 7100 |
| | Margin | - | 430 |
| **5.** | **Consumers purchase price/ Retailer selling price per quintal of Soybean** | **6800** | **7100** |
| **6.** | **Total cost incurred** | **190** | **195** |
| **7.** | **Price spread (Cp-Pp)** | **550** | **850** |
| **8.** | **Producers share in consumer price(%)** | **91.1 %** | **88.02 %** |

**Commodity – Wheat**

**3.6.2 Marketing Channels of Wheat**

1) Producer ➐Village Trader ➐ Retailer➐ Consumer.

2) Producer ➐Consumer.

Table No.3.52. Marketing cost for Wheat

| Sr. No | Particulars | Channel I | Channel II |
|---|---|---|---|
| | | Rate /q. | Rate/ q. |
| **A** | **Cost incurred by producer** | | |
| 1 | Bags Cost | 13 | 13 |
| 2 | Labour for loading and unloading | 10 | 10 |
| 3 | Weighing charges | 05 | 05 |
| 4 | Transportation costs | 15 | 15 |
| | Subtotal | 43 | 43 |
| **B** | **Village Trader** | | |
| 1 | Transportation | 35 | - |
| 2 | Weighing charges | 05 | - |
| 3 | Loading unloading charges | 15 | - |
| 4 | Storage Charges | 20 | - |
| | Sub total | 75 | |
| **C** | **Retailer** | | |
| 1 | Transportation Cost | 40 | - |
| 2 | Loading unloading charges | 15 | - |
| 3 | Weighing Charges | 05 | - |
| 4 | Packging charges | 20 | - |
| | **Sub total** | **80** | **00** |
| | **Total** | **198** | **43** |

## Price Spread and Marketing Margins for Wheat

Table.3.53. Price spread and marketing margins for Wheat

| Sr. No | Particulars | Channel I | Channel II |
|---|---|---|---|
| | | Rate /q. | Rate/ q. |
| **1.** | **Producer** | | |
| | Gross price received | 2800 | 2900 |
| | Marketing costs | 40 | 45 |
| | Net price received | 2760 | 2855 |
| **2.** | **Village Trader** | | |
| | Purchase price | 2800 | - |
| | Marketing costs | 95 | - |
| | Selling price per quintal | 3050 | - |
| | Market Margin | 155 | - |
| **4.** | **Retailer** | | |
| | Purchase price | 3050 | 2900 |
| | Marketing costs | 90 | 80 |
| | Selling price | 3200 | 3100 |
| | Margin | 60 | 120 |
| **5.** | **Consumers purchase price / Retailer selling price per quintal** | 3200 | 3100 |
| **6.** | **Total cost incurred** | **225** | **125** |
| | Total Market Margin | **215** | **120** |
| **7.** | **Price spread (Cp-Pp)** | **440** | **245** |
| **8.** | **Producers share in consumer price (%)** | 86.29% | 92.09% |

# CHAPTER NO.4 SUMMARY & CONCLUSION

## 4.1 Summary

1. Total cultivable land of the host farmer is 2.60 ha
2. Total depreciation on implements, machineries, equipments and buildings is Rs. 62379
3. Total incidental charges are Rs.10,000/-
4. Total land revenue is Rs.570 –

5. Total irrigation charges Rs. 101199.98/-

6. Gross income and B: C ratio of Tomato is RS.3,60,000 /- and 1.79 respectively.
7. Gross income and B: C ratio of Soybean is Rs 103000/- and 1.34 respectively.
8. Gross income and B: C ratio of Onion is Rs.2,25,000 /- and 1.32 respectively.
9. Gross income and B: C ratio of Wheat is Rs.108100 /- and 1.17 respectively.
10. Gross income and B: C ratio of Grapes is Rs. 16,00,000/- and 1.56 respectively 11. There are two Marketing channel were identified in Soybean crop namely

a. Producer ❼ Village Trader ❼ Wholesaler ❼ Consumer.
b. Producer ❼ Wholesaler ❼ Oil Processor ❼ Consumer

12. There are two Marketing channel were identified in Wheat crop namely

a. Producer ❼ Village Trader ❼ Retailer ❼ Consumer.
b. Producer ❼ Consumer.

14. The gross income of grape is more as compared to gross income of other crops

## 4.2 CONCLUSION

From the study, it was concluded that more returns from high valued crops can be gained by using protected cultivation techniques and recommended package of practices. Study also concluded that grape fruit crop gives more profit to the farmer as compared to other crops.

# CHAPTER NO.5 EXPERIENCE GAINED

Experience Gained

1. Got experience about how to manage production activities effectively and efficiently in order to cost minimization and profit maximization.
2. Learned about how to tackle unforeseen conditions like change in climate, attack of various pest and diseases by using various risk measures, technical skills and knowledge.
3. Learned about the financial management for agricultural activities on field.
4. Understood the importance of flexibility in decision making process.
5. Learned about the cultivation practices of various crops.
6. Understood the importance of nutrient management, pest management, and human resource management on field

# CHAPTER NO.6 REFERENCES

## 7.1 Books


**a.** Reddy S. S., P. Raghu Ram, Nilkanth shastri T. V., I. Bhavani Devi Agriculture Economics. Oxford and IBH Publications Co. Ltd, New Delhi

**b.** Yawalkar K.S, Agarwal J.P, Bodke S, Manures and Fertilizers (11th edition), Agri Horticultural publishing House, Nagpur


## 7.2 Websites


a. www.agriinfo.in

b. www.icar.org

c. www.igmaharashtra.gov.in

d. www.mswc.com

# CHAPTER NO.7 PHOTO GALLERY

Photo 7.1

**With Host Farmer**

Photo 7.2

**Visit to Ozar Grampalika**

# Executive Summary

In today's competitive world while entering in the market it is necessary to have good knowledge of the potential of a particular market. Also it is necessary to retain the existing customers apart from attracting new customers

I am working with Sigma Chemicals are given me a very good exposure to the corporate world and help me in understanding all the Marketing (Promotion) concepts practically. It has been a very good experience for me which will be of prime importance in my future.

This report contains the details of the activities performed by me in the organization as well as the various aspects of the organization that I have worked on. The Project are "Market Analysis Of Chelated Micronutrient Products in Niphad Tahsil Region". It involved surveying the 50 Farmers and 5 Dealer & 10 Retailers. Farmers were surveyed to get deep insight into their mind set about use of Sigma Chemicals.

This project also involves the learning's like forming Promotional strategies, achieving marketing sales, Utilizing resources, Advertisement, and of the various training events in different areas of Niphad Tahsil & Nasik district of the Maharashtra.

In this Project use purposive sampling was used for the study. At the 1st stage,5 villages were selected purposive from 1 Talukas such as , Niphad . In the 2nd stage from each village, 10 farmers were selected by purposive method to make a sample size of 50 Grapes & Tomato growing farmer and 15 dealer / retailer dealing with Chelated Micronutrient.

It's can be concluded that Sigma product have a good Starting grip in the market due to its satisfactory quality for farmers. Also, it is of great Help required that, the company focus on its promotional activity. Designing effective promotional activity would help in creating market of Sigma Chelated Micronutrient product which are well accepted by the dealers and famers as for now and increase the awareness about Sigma Chemicals product.

## Indian Chemical Industry Profile

Agriculture inputs are the resource used in farm production. An agriculture inputs plays a vital role in production of farm output. The importance of purchased farm input has significantly increased in the recent past with the technological breakthrough in the Indian agriculture. The timely supply of modern farm inputs to the farmers to all the category at reasonable price depends on the existence of the efficient marketing system**.**

Chemicals Micronutrient is one of the most important input for the farming. When it comes to using micronutrients, you have so he options. Choosing the best form of micronutrients for your application will help you make the most of their benefits. We recommend Chelated micronutrients, which contain Ethylene Diamine Tetra Acetate (EDTA).EDTA protects zinc, manganese, calcium, copper and iron from 'tie-up' in the soil and to phosphorus. This helps make the micronutrients more available to plants and ensures a better efficiency while preventing deficiencies. The EDTA family of micronutrients are synthetic, and are also the strongest Chelating Agent manufacturer in India. Far stronger than organics, they are used at a ratio of 10:1 .The word chelate is derived from the Greek word for "claw". In fertilizer technology, it refers to inorganic nutrients that are enclosed by an organic molecule.

C**helated micronutrients** from Soil Service are **trace elements** that can be applied with starter fertilizer or foliar fertilize .Chelated micronutrients have several benefits that will earn them a place in your field. Their high quality, versatility, ease of handling and compatibility for use with a wide variety of crops make them a smart investment in any planting season. Chelated micronutrients are high quality with low levels of impurities. They resist soil fixation and are highly stable. That stability means the micronutrients will remain available for longer the growing season, giving your crop more time to access them. It is available in a wide range of micronutrient for bio products, fertilizers, pharmaceuticals and healthcare products. The range of Chelated Micronutrients manufacturer in It include Single Nutrients as well as MultiMicronutrient Mixtures Chelated by EDTA. It provide our clients with qualitative Chelated Micronutrient that are rich in various nutrients. These are primarily used for enhancing the growth speed and soil fertility. The Chelated form complexes with these chelating agents ensure stability & guaranteed availability of Micro elements to the plant.

**What are Chelated Micronutrients?**

Chelated micronutrients are fertilizers where the micronutrient ion (for example Fe or iron) is surrounded by a larger molecule called a ligand or chelate. Ligands can be natural or synthetic chemicals. These compounds combined with a micronutrient forms a chelated micronutrient. Chelated micronutrients are protected from oxidation, precipitation, and immobilization in certain conditions. A few examples of ligands. These chelates have different effective pH ranges. The effective pH range for

- Fe-EDTA is 4 to 6.5,
- Fe-DTPA is 4 to 7.5, and 3. Fe-EDDHA is 4 to 9.
- Fe-EDDTA is effective when pH is greater than 7 but it is costlier. There are also many naturally occurring chelating agents such as amino acids, organic acids, humic and fluvic acids, ligninosulfonates, ligninipolycarboxylates, sugar acids, phenols, polyphosphate.

## 1.1 Common fertilizer Ligands

Table 1. Common fertilizer ligands.

| Abbreviation | Name |
|---|---|
| CDTA | Cyclohexanediaminepentaacetic acid |
| CIT | Citric Acid |
| DTPA | Diethylenetriaminepentaacetic acid |
| EDDHA | Ethylenediaminediaminedi-o-hydroxyphenylacetic acid |
| EDTA | Ethylenediamintetraacetic acid |
| EGTA | Ethylene glycol bis(2-aminoethyl ether) tetraacetic acid |
| HEDTA | Hydroxyethylenediaminetriacetic acid |
| NTA | Nitro-triacetic acid |
| OX | Oxalic acid |
| PPA | Pyrophosphoric acid |
| TPA | Triphosphoric acid |

## 1.2 Global scenario :

Global Agricultural Micronutrients Market (2022 to 2027) – Development of Biodegradable Chelates Presents Opportunities .The "Global Agricultural Micronutrients Market by Type (Zinc, Boron, Iron, Manganese, Molybdenum, and Copper), Mode of Application (Soil, Foliar, and Fertigation), Form (Chelated and Non-Chelated micronutrients), Crop Type and Region – Forecast to 2027" . The global market for agricultural micronutrients is estimated at USD 4.3 Billion in 2022; it is projected to grow at a CAGR of 8.6% to reach USD 6.4 Billion by 2027. Factors such as an increase in micronutrient deficiency in soils, demand for high crop production and quality, increasing food security concern, and supporting government policies are projected to drive the growth of this market.

The zinc segment, is accounted for the highest share by type in the agricultural micronutrients market throughout the forecasted period . Zinc is one of the most essential micronutrients required by plants in small quantities. Sandy soil, highly leached acid soil and soils having poor organic content, show low zinc contents. The symptoms of zinc deficiency include reduced height, interveinal chlorosis, and brown spots on upper leaves. Zinc deficiency is the most common problem witnessed globally, mainly for cereals and grains, hence the demand for zinc as a micronutrient is high in the agricultural micronutrients market.

The fruits & vegetables segment by crop type is estimated to account for the largest market share in the global agricultural micronutrients market. Agricultural micronutrients are gaining importance among the fruits & vegetable growers because of their beneficial nutritional support and at the same time, ensure better harvest and returns. Zinc deficiency commonly affects fruits such as banana, custard apple and mangoes. In citrus production, the molybdenum deficiency called as yellow spot is commonly observed. Hence proper plant nutrition is essential for the proper growth of fruits & vegetables globally foliar application segment, by mode of application is projected to be the largest segment in the agricultural micronutrients market during the forecast period. Foliar mode of application is widely used for the application of micronutrients, particularly iron and manganese, for various crops. It is mostly used for fruits, vegetables, and flower crops. Foliar sprays are advantageous to meet the internal demand of micronutrients during flowering when soil moisture and temperature is not favourable for growth of the crop. For micronutrients to be applied in extremely smaller quantities, foliar sprays give an advantage of ease of application as compared to soil and fertigation. All these reasons make it the largest segment in the market.

### 1.3 INDIAN SENARIO

- The India agricultural micronutrients market size was USD 538.4 million in 2021. The market is projected to grow from USD 571.6 million in 2022 to USD 1,057.6 million by 2029, exhibiting a CAGR of 9.19% during the forecast period.
- The global COVID-19 pandemic has been unprecedented and staggering, with experiencing lower-than-anticipated demand across all regions compared to pre-pandemic levels. Based on our analysis, the global market exhibited a decline of 5.23% in 2020 as compared to 2019. This market is witnessing promising growth attributed to increasing awareness regarding crop nutrition across the agriculture industry in India.
- The growing population, emergence of advanced technologies, and government facilities that boost the adoption of micronutrients to improve crop health and yield are anticipated to fuel the market growth in the coming years.

## 1.2 Survey of Agricultural Input Industries in Nashik Region

| Sr. No | Name of the Industry | Address | Contact |
|---|---|---|---|
| 1. | **DarshAgritechPvt. Ltd.** | Gala No.3,Plot no.34,Makhmalabad Rd, Besides Sai Samarth Hospital, Janta Raja Colony,Panchavati, Nasik, Maharashtra 422003 | Contact no. 9422756576 Websites: www.darshagritech.com |
| 2. | **R C Fertilizers pvt. ltd** | Survey no 179/03,village lakhamapur,taluka Dindori, District-Nashik , maharastra (manufacturing unit ) | Contact no. Websites www.rcfertilisers.in |
| 3. | **Dhruv Agritechnologies Pvt. Ltd.** | Dhruva corporate Buildong,gut no. 135,Adgaon-Sayyad pimpri Road, Near Vinchur Gavali Phata, tal.Nashik, Dist. Nasik, Maharashtra pin-422003. | --- |
| 4. | **Agrisearch (I) Pvt. Ltd** | Gat.no.211/2 Dindori Road, at post pimplnare, tal. Dindori, Dist. Nasik 422004,Maharastra,india | Contact no. 9370510990 Website. www.agrisearchindia.com |
| 5 | **Sigma Chemicals Pvt.Ltd** | S.No.603/8, Janori , Taluka Dindori Nasik Mh-422006 | Contact no. 7798211663 Websites www.Sigma Chemicals .com |

## The role of Chelated micronutrients in a plant as below:

Zinc is crucial for plant hormone balance and auxin activity and it is vital for growth, a division of cell and production of husks of grains.

- Iron assists in biological process and cell growth in plants. Iron is a component of enzymes, essential for chlorophyll synthesis, photosynthesis.
- Boron enhances flowering blooms and develops uniform ripening process and it is essential in sugar transport, Cell division, and amino acid production.
- Manganese performs an important role in photosynthesis, chloroplast production, a cofactor in many plant reactions and activates enzymes.
- Copper stimulates enzymes required for photosynthesis.
- Molybdenum is crucial for the growth of leaves and prevention of diseases in plants and it is involved in nitrogen metabolism, essential in nitrogen fixation by legumes.

## Chelated Micronutrient Deficiency Symptoms:

- Except for Molybdenum, Other micronutrients are considered weakly mobile or immobile in plants. This means that deficiency symptoms appear severely on newest plant tissues, whereas for Molybdenum deficiency symptoms appear first on oldest plant tissues.
- Zinc deficiency results in stunted growth, lessened internode length, young leaves are smaller than normal.

Iron deficiency leads to chlorosis or yellowing between the veins of new leaves. Boron deficiency results into light general chlorosis, a death of growing point, deformed leaves with areas of discoloration.

- Manganese (Mn) deficiency cause chlorotic mosaic patterns on leaves.
- Copper deficiency results in light overall chlorosis, leaf tips die back and tips are twisted, loss of turgor in young leaves.

Molybdenum deficiency is similar to those of ordinary nitrogen deficiency general chlorosis (yellowing) of young plants, chlorosis of oldest leaves.

## 1.4 Importance of Study:

The Chelated Micronutrient industry in India going through rapid changes. There are varieties of good products in the market. New farming methods, increased awareness, understanding and acceptance for modern farming methods are help to improve the agrochemical and Nutrient industry with these plus point competition between Chelated Micronutrient Industry has become dangerous and demand for one company product has become uncertain also product life cycles have shortened.

The project at Janori Sigma Chemicals was carried out with Three major aspects i.e. to study farmer's Consumer behaviour of chelated micronutrients of sigma , to study the Trend Analysis of Chelated micronutrient of sigma chemicals , to study marketing Channel of Chelated Micronutrient of sigma chemicals Apart from this, the project was also deals with the activities regarding the generation of demand through different promotional activities by applying promotional tools like Individual farmer contacts, Farmers Meeting, Display of posters, and Distribution of literature, Paper advertisement, and attractive schemes for retailers etc.

With the boom in the Agriculture sector and the potential of Sigma Chemicals of chelated micronutrients segment many company are there in market. Also many companies are entering in this segment. With every new product being launched and different companies entering the market, Sigma Chemicals of Chelated Micronutrient have to look into as new market which has been highlighted in the project.

## 1.5 Significance:-

- The study will help to understand farmers and dealers preference and opinion about use of Chelated Micronutrient products in Grapes & Tomato crop.
- It will also help to understand competitive situation in the market and factors affecting purchase by Grapes & Tomato farmers.
- It will help design better promotional strategies and marketing strategies for the effective sales of various Chelated micronutrient of sigma chemicals .

## 1.6 Objectives –

- To study the consumer behaviour towards in chelated micronutrients of sigma chemicals.
- To study the Trend analysis of chelated micronutrients of sigma chemicals
- To study the Marketing Channels of chelated micronutrients of sigma chemicals

## 1.7 Scope of the study -

- This project was conducted at Sigma chemicals in Niphad Tahsil of Nashik district In Niphad tahsil major crop grown in study area is Grapes & Tomato which is considered while selecting sample farmers for Chelated

  Micronutrients of sigma chemicals
- This project helped to understand to consumer Behaviour towards the Chelated Micronutrients of sigma chemicals.
- The project was helpful to Sigma chemicals of chelated micronutrient to know about consumer requirement and expectation this study useful in knowing the present competitors of this industry.
- The data and its result analysis helpful to company to develop a new strategy for sales promotion.

## 1.8 Hypothesis

From the data analysis and interpretation Hypothesis are obtained.

- Chelated Micronutrient has wide Product range in the Sigma Chemicals PVT.LTD.
- Customer suggestion regarding the product range of Sigma Chemicals PVT.LTD.
- Market Analysis of sigma chemicals product of Sigma chelated.

## 1.9 Limitations:

- Study Covers only one taluka i.e. Niphad
- Study is restricted to only five village in the selected area.
- Study is only related with the awareness of the Chelated Micronutrient.
- Analysis of primary data is record on response recorded by respondent.
- The Situation of unselected taluka are different so the conclusion cannot applicable to other taluka.

## 1.10 Review Of literature :

**Padmanaban and Agrawal, Deepak. (1998 )** Conducted study in Tuticorin district in south Tamilnadu. He used the linear multiple regression model to analyze the factor influencing the brand loyalty of farmer like price of the preferred brand promotional activity, efficiency of the brand, package of the brand, extent of information of advertisement and availability of preferred brand. The result obtained showed that coefficient of multiple determinations R2 was 0.74, which implies that the explanatory variables included in the function explained 74 percent of variation in the brand loyalty of the farmer. Among the independent variables the price of the preferred brand(X1) efficiency of preferred brand(X2) and extent of information of advertisement(X3) were found to be highly significant at one percent level, where as the variable availability of preferred brand was significant at five percent level. Even though the variables, peer group influence and package of the brand had positive coefficients

**Chahal and Hundal (2010)** observed that the farmers were not having a very strong promotional activity as well as brand loyalty as far as pesticides are concerned, through their promotional activity did increase as their association with the brands grew old. Also, the rural market was very price sensitive and this was one very important factor causing brand switching. Low prices helped in retaining old customers apart from gaining new ones. Also, good promotional schemes attracted new customers to some extent; they also made the brands being liked more by the farmers. Farmers were also found to be quality conscious, apart from being conscious about the image of the brand, through to am smaller extent and expected desired results from their preferred brands. Farmer's purchase decisions were also found to be greatly influenced by others recommendations like friends, fellow farmers, etc. Dealers recommendation also influenced the purchase decisions of those farmers greatly, who were not associated with particular brands for a very longtime.

**Anantha Raj (2012)** studied related to the effects of marketing mix towards brand equity instead of Promotional activities as well as brand loyalty. It is the intention of the researcher to identify the 20 effects of marketing mix on Promotional activities as well as brand loyalty in the Malaysian hypermarkets sector. The researcher will adopt the study conducted by [37] in relation to its five independent variables (5 IVs) which are price, store image, advertising spending, distribution intensity and price promotion as examining the relationship between 5 IVs and Malaysian hypermarkets' Promotional activities and brand loyalty. A total of 300 questionnaire surveys have been distributed to customers at 3 hypermarkets around Klang Valley in Malaysia. Lastly, the researcher uses a descriptive and explanatory study by means of descriptive and inferential analysis. In conclusion, price, store image, distribution intensity and price promotion are found to exert a significant positive influence towards Malaysian hypermarkets' Promotional activities and brand loyalty

# Research Methodology

The success of any project depends on methodology adopted for systematic data collection, compilation and various types of analysis on scientific lines. As specific and systematic search for pertinent information on a specific topic Bio fungicide analyzing Buying behavior and competitor's activities. The methodology adopted for present study is as given below

**2.1 Location of the study : NIPHAD TAHSIL**

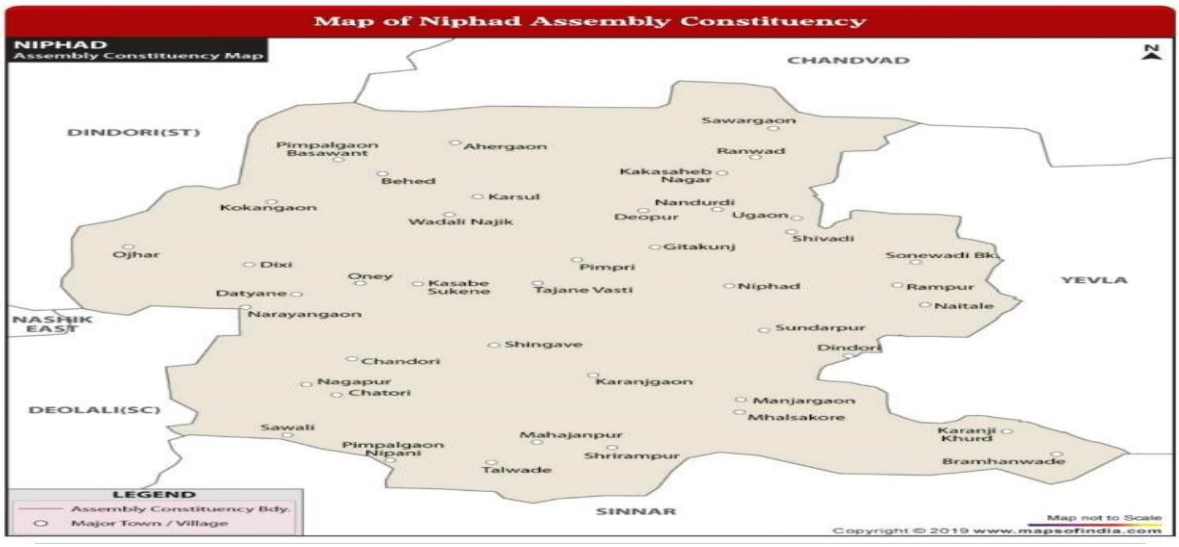
**Selection of area :** As per the companies interest the study was purposively conducted in Niphad tahasil.

**Sample design :** The 45 sample farmers (i.e Grapes and Tomato grower) were selected purposively on the basis of their land holding and was categorized into small (2.00 ha), medium (2.01 to 4.00 ha), and large (4.01 and above). 5 farmers were selected from each village for the study. Dealers and retailers were selected purposively due to their limited numbers i.e. 10 retailers and 5 dealers selected in the Niphad Tahasil.

The sample size was consist of:

1. Farmers : 50
2. Dealers : 5
3. Retailers : 10

**REASERCH DESIGN :**



## Selection of Sample Farmer

**Table No. 2.1**

| Tahsil | Villages | Size land holding | Grapes grower | Tomato Grower |
|---|---|---|---|---|
| Niphad | Pimpalgoan | Small | 2 | 1 |
| | | Medium | 3 | 1 |
| | | Large | 2 | 1 |
| | Dawacwadi | Small | 2 | 1 |
| | | Medium | 3 | 1 |
| | | Large | 2 | 1 |
| | Niphad | Small | 3 | 1 |
| | | Medium | 2 | 1 |
| | | Large | 2 | 1 |
| | Dharangoan | Small | 3 | 1 |
| | | Medium | 2 | 1 |
| | | Large | 2 | 1 |
| | Naitale | Small | 2 | 1 |
| | | Medium | 2 | 1 |
| | | Large | 3 | 1 |
| | **Total** | | 35 | 15 |

**Villages covered :** As per the company interest, five villages were selected purposively i.e. Pimpalgoan , Ugaon , Niphad , Dharangaon , Naitale .

## 2.2 Data collection:

The data was collected from the two sources.

### 2.2.1 Primary data: -

Primary data related to land holding cropping pattern, farmers awareness, purchasing behaviour and the feedback related to Sigma Chemicals of chelated micronutrient were selected with the help of specially designed schedule by conducting interview of sample farmers.

### 2.2.2 Secondary data:-

Secondary data were collected from retailers, dealers, official website of company and its annual report periodicals. This data was collected to find out previous year sale, market share and its competitors and global scenario, Indian scenario was studied through internet. Marketing strategies of the company was collected by the company officials and Reports only .

**Analytical tools:-**

1. Tabular method.
2. Graphical method.
3. Percentage
4. Score card method

**Research instrument:-**

The questionnaire was used as the research instrument for the collection of primary data. The questionnaire consisting of open and closed ended questions was designed and tested before put to use for the data collection.

## Contact method:-

For the collection of primary data personnel interview method was used. Personal interview conducted for the farmers and dealers / retailers.

## 2.3 TOOLS USED IN THE PROJECT

1. Questionnaires
2. Primary data
3. Secondary data

This are the various steps involved in the research process. They are-

1. Define research
2. Review of previous findings
3. Design research
4. Data collection
5. Questionnaire

**1. Defining research problem:-**

In this research must try to find out the general interest or subject matter in this to evaluate the steps and methods of training and development of Sigma Chemicals pvt.ltd.

**2. Review of previous findings:**

In this sage research has to review, recall pas studies and information.

**3. Research design:**

The research design is the structure within which the research is conducted.

**4. Sampling design:**

Sampling design deals with the method of selecting population i.e. item for evaluation for given study. We have chosen random method of sampling.

**5. Data collection:**

Data are the facts, figures, and the reliant materials, past and present serving as basis for the study and analysis. There are two types of data sources, primary and secondary data.

**6. Questionnaires:**

The questionnaire was prepared to analyse the effectiveness of training session conducted.

## 4.1 Introduction of Sigma Chemicals Pvt Ltd

## 3.1 Company profile:

Sigma Chemicals Private Limited is a Private incorporated on 1992. It is classified as Non-govt. Company and is registered at Registrar of Companies. It is involved in, all types of micronutrients and plant growth promoters as well as sulphates.

Sigma Chemicals emerging as an agricultural in out supplying company dedicated to the research and development, production and commercialization of environment friendly certified products for the growth and sustainability of agriculture. Their strong infrastructure, complete inhouse manufacturing process coupled with skilled team of moulders enables them to bring out very high quality products at relatively short time. Application of modern technology, continuous up-gradation of manufacturing process and allied services are prime reason for our exceptional performance. According to Firms Director their biggest strength is people. Company prize their expertise and follow philosophy of participative management where in employees are encouraged to take initiatives. Every single product they supply would be tested on different physical and chemical parameters before receiving end user. The farmer's in nashik area are very progressive and adopters of innovative techniques and advance technology. Since farmer's satisfaction is the main objective of company. There is no compromise in the quality and special attention is provided at the quality department Hence each product is tried and tested in a wellequipped lab by highly qualified staff as well as the products are also tested at renowned Agricultural Universities for quality assurance.

Started its operations in 1992, **Sigma chemicals** is the maiden organization that introduced the concept of "sigma Product in Nashik District Their extensive research, field trials and specialization has made them to successfully apply this concept .

### 3.2.VISION

To manufacturing Micronutrients, Chelated Micronutrients, and PGR & Sulphate fertilizers farmer training center. 'To build long lasting business relations with our existing and potential clients by providing them highly competitive finished products within stipulated time frame' are the ultimate vision of Sigma Chemicals.

### 3. 3.MISSION

Mission of is to produce and Sigma Chemicals provide High Quality, Research and Development backed innovative agriculture products to Farmers that sustainably increase crop yields, maintain ethical standard in business operation also ensuring benefit to the farmers and the society at large

## 3.4 Introduction of Sigma Chemicals Pvt.Ltd

### Introduction of an organisation

**Table No. 3.1**

| Sr. No. | Particulars | Details |
|---|---|---|
| 1 | Date of establishment (Year) | 1992 |
| 2 | Market Presence | Maharashtra. |
| 3 | Registered office | Gate no . 603/8 A/p. Janori Tal. Dindori Dist-Nashik , 422207 , Maharashtra, India. |
| 4 | Address of the Industry | Gate no . 603/8 A/p. Janori Tal. Dindori Dist-Nashik , 422207 , Maharashtra, India. |
| 5 | Board of Directors | Mr.Yashwant Nivruti Shinde |
| 6 | Annual Turnover | **125MT** |
| 7 | Website | www.sigmachemicals.com |

### 3.4.2 Management Body of Organization

**Table No. 3.2**

| Sr. No | Name | Designation |
|---|---|---|
| 1. | Mr.Yashwant Shinde | M.D |
| 2. | Mr.Mayur Shinde | Managing Head |
| 3. | Mr.Vishal Aachre | Production Manager |
| 4. | Mr.Vaibhav Sonawane | Marketing Manager |

## Infrastructure of sigma chemicals

Our Company Infrastructure spread over 6000 sq feet area.

## 3.5 Ethics Program

- Sigma continued success as an industry shaper is dependent upon retaining and promoting our ethical reputation and the public trust we have earned. The Ethics Program is therefore an important element in how we run our business.
- *"Practicing ethical conduct means working honestly and fairly. It also means acting responsibly at all times, including when we are in difficult areas where there are no clearcut rules, laws, policies or regulations,"* says CEO of Sigma

## 3.6 Strengths of sigma chemicals

Our position in the market is due to our extensive experience in the field and compliance to industry defined standards. Apart from these, a set of other attributes that provides us the lead over other market players are as follows:

- ❖ Modern and well equipped infrastructure
- ❖ Team of Experienced & Expert professionals
- ❖ Timely Execution & Delivery of Orders
- ❖ Complete customer satisfaction

## 3.7 Product Profile Of Sigma Chemicals :

They supply a premium range of sulphate fertilizer, Plant growth regulator & chelated micronutrient which are known for fertility & Nuttrition enhancing characteristics with a perfect proportional composition of different constituent elements that contribute towards the effective growth of crops. Their experts conduct extensive research and development to produce these high performance sigma products.

## 3.7.1 Product List of Sigma Chemicals:

**Table No. 3.4**

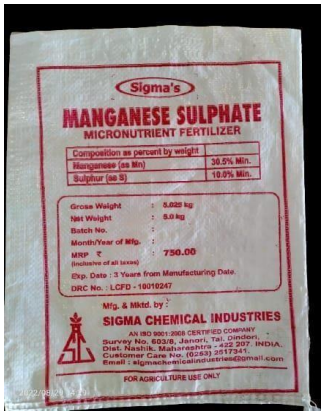
| | **Product** | **Sr. No.** | **Product** |
|---|---|---|---|
| 1. | **BORON-** 20% (SPRAY) | 27 | **CALCIUMCHLORIDE (**Fused / powder) |
| 2. | **BORAX- 10%** ( Soil Application) | 28 | **CITRIC ACID** |
| 3. | **FERROUS SULPHATE- 19%** | 29 | **COBALT SULPHATE** |
| 4. | **FERROUS-EDTA -12%** (Chealated -Ferrous) | 30 | **CHITOSSAN** |
| 5. | **MAGNESIUM SULPHATE** -9.6% | 31 | **DRIP CLEANER** |
| 6. | **MANGANESE SULPHATE-** 30.5% | 32 | **FERROUS-EDDHA-6%** (Chealated -Ferrous) |
| 7. | **MICRO-CHILL (Combi)** M.S.Grade No.2 EDTA Chealated | 33 | **G.A.SOLVENT** (Gibberelic Acid Solvent) |
| 8. | **MICRO-X (**Combi) M.S.Grade No.02 Amino Acid Based | 34 | **HI-SILICON**( Liquid ) |
| 9. | **SAIFERT** (Soil Application) M.S. Grade No. 01 | 35 | **I.A.A.** |
| 10. | **NUTRIGAURD** (Liquid for foliar spray) M.S. Grade No. 02 | 36 | **I.B.A.** |
| 11. | **MILLER** (Drip Special) M.S.Grade No.01 | 37 | **MANGANESE – EDTA- 12%** (Chealated -Manganese) |
| 12. | **SIGMA DOSE** (Micronutrient Dose) | 38 | **MAGNESIUM – EDTA 5%** (Chealated -Magnesium) |
| 13. | **ZINC SULPHATE- 21%** | 39 | **MAGNESIUM NITRATE** |

| | | | |
|---|---|---|---|
| 14. | **ZINC-EDTA-12%** (Chealated Zinc) | 40 | **MAGNESIUM OXIDE** |
| 15. | **AMMONIUM MOLEBDATE** | 41 | **NITRIC ACID** |
| 16. | **BORIC ACID** | 42 | **PLANTOPHITE** |
| 17. | **SUPER PHOSPHORIC ACID** | 43 | **POTASSIUM BICARBONATE(P.B.C.)** |
| 18 | **COPPER DUST Powder** | 44 | **POTASSIUM METABI-SULPHITE (K.M.S.)** |
| 19 | **ASCORBIC ACID** | 45 | **POTASSIUM MOLYBDATE** |
| 20 | **BORDO** (Liquid) | 46 | **SPREADER** (**Wetting Agent**) |
| 21 | **6-B.A.** | 47 | **SIGMA WET** (Silicon Base Surfactant) |
| 22 | **6-B.A.SOLVENT** | 48 | **S.D.D.C.** |
| 23 | **CALCIUM –EDTA 10%** (Chealated Calcium) | 49 | **UNION** ( **G.A. Booster**) |
| 24 | **COPPER –EDTA 12%** (Chealated Copper ) | 50 | **URACIL**Pure |
| 25 | **CAPSULE PLUS** (Grape Berry Elongator) | 51 | **URACIL SOLVENT** |
| 26 | **CALCIUM AMINO** (Calcium Amino Chealated) | 52 | **AMINO-30** (Amino Acid 30% Liquid) |
| 53 | **PLANTOMIN-40** (For Downy Mildew) | 65 | **AMINO-80** (Amino Acid 80% Powder) |

## 3.7.2 Catalogue Of Products:

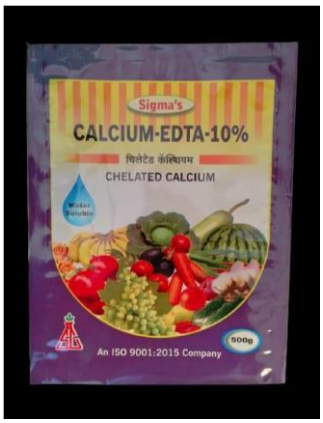


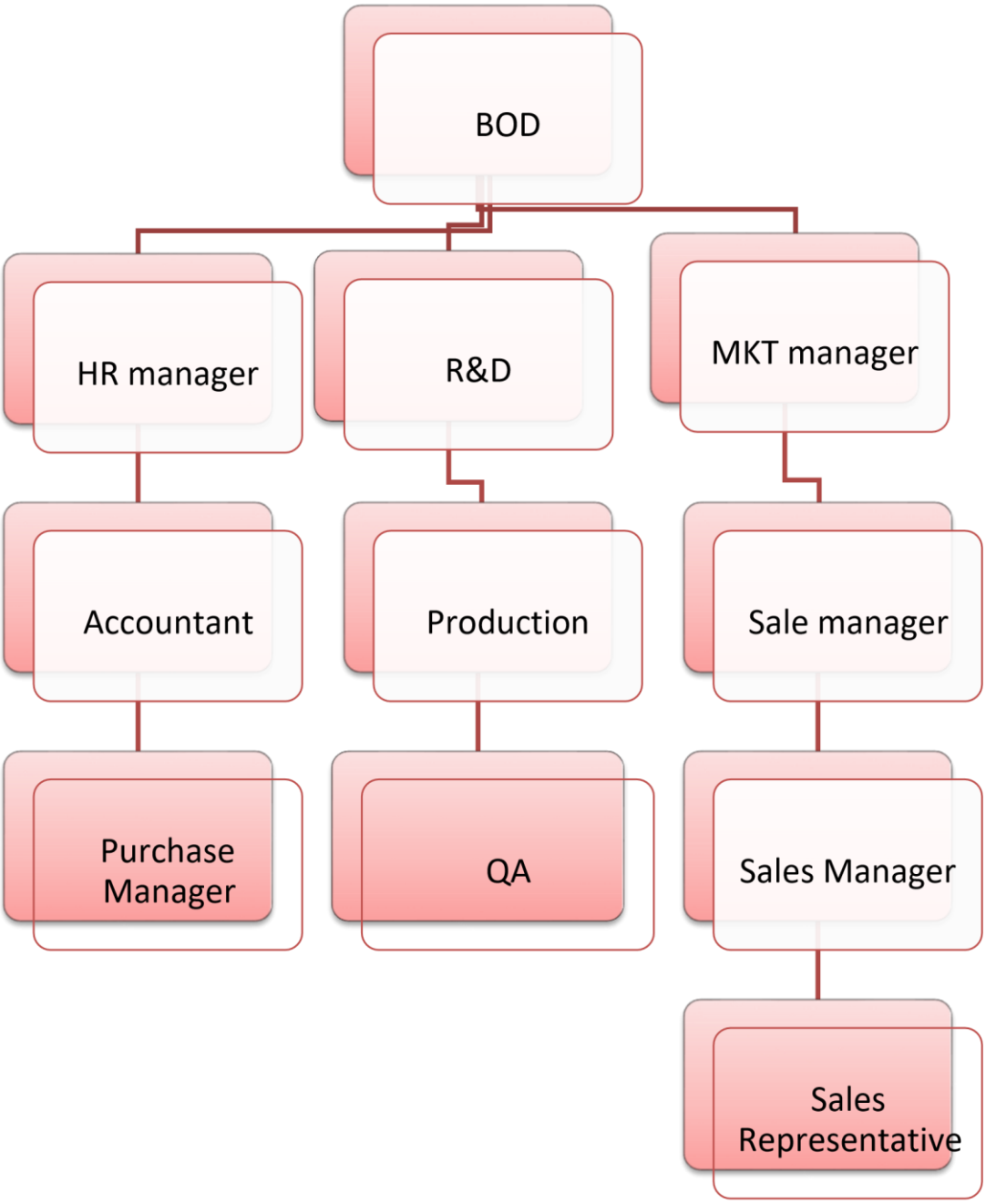




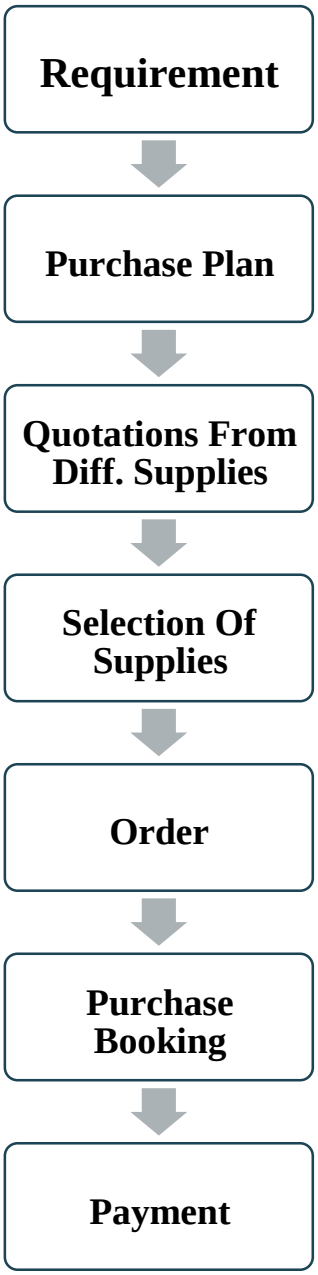






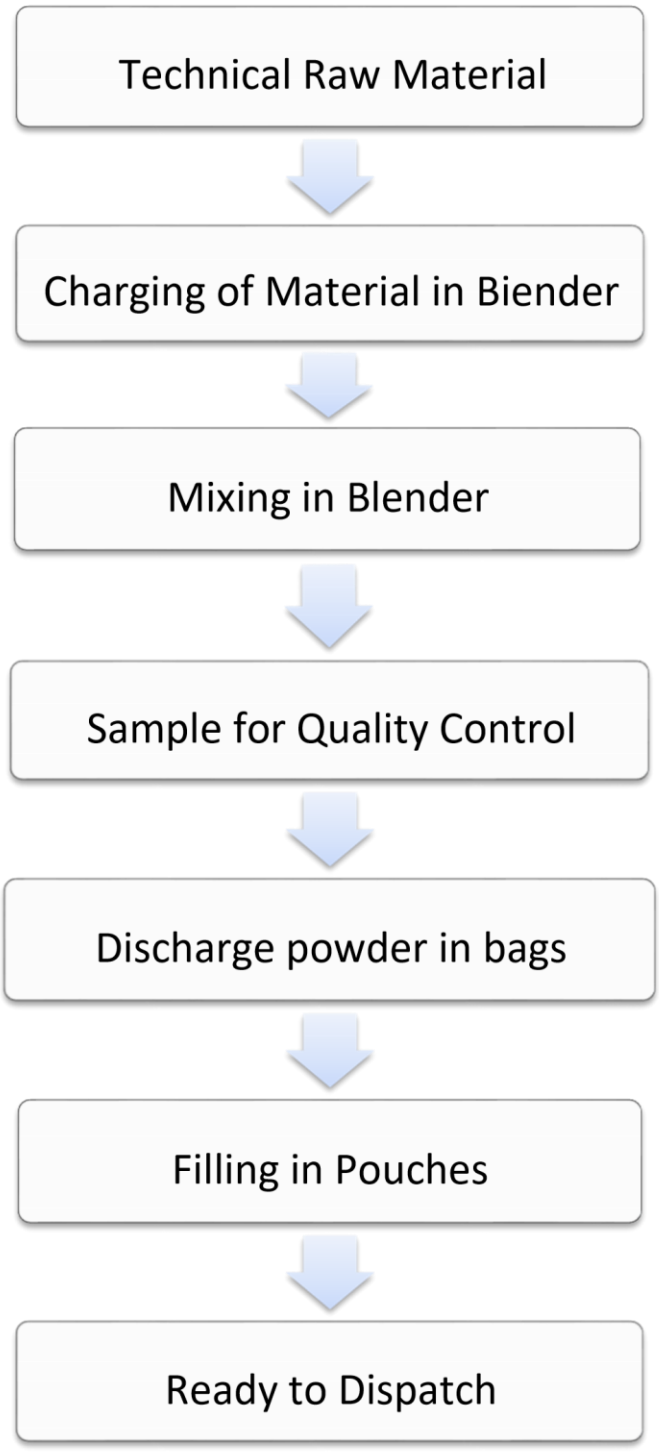



**Organisational Structure**




**Procurement of raw material**

***Management Practices Followed In Procurement Of Raw Material***
***Process Flow Chart For Final Products***




***Management Practices Followed In Procurement Of Raw Material*** ***Process Flow Chart For Final Products***

3.8 Process of final product :- Information about product *:*

## 1) Chelated Calcium – 10% ( EDTA Ca )

- Calcium EDTA offered finds with application as a micronutrient.
- Coming with molecular weight of 410.20, it is available in form of white powder. Forming a clear solution, it also has water solubility and Comes with properties like Ph (1% solution) of 6.0 7.0 and assay (min) of 10.0 % as Ca.
- Featuring pure constitution, we offer the product to the customers with competitive prices

**Specification:. Table no. 3.5**

| | |
|---|---|
| **Product Name** | EDTA Calcium 10% |
| **Molecular formula** | C10H12N2O8Ca $Na_2$ HO |
| **Appearance/colour** | Off White Powder |
| **PH** | pH of 1% Solution 6.0 to 7.5 |
| **Solublity** | Soluble in Water, Clear Solution |

***EDTA Ca 10%***

EDTA Ca 10%

**Uses:-**

- EDTA Ca is a stable water soluble metal Chelate, mainly used in agriculture and horticulture as micronutrient, to prevent and correct copper deficiencies.
- Accommodates cells metabolism.

## ROLE OF CALCIUM IN PLANT GROWTH:

- It is required for continuous cell division & formation.
- It is involved in Nitrogen Metabolism.
- Increases the fruit yield

## 2) Chelated Zinc – 12% ( EDTA Zn )

- EDTA offered is available in front of white powder with mundecular weight of 445. With application as micronutrient, it has assay (min) of 12.0% as 20 and has high demand in the market because of its pure constitution

**Specification: . Table no.3.5**

| | |
|---|---|
| Product Name | EDTA Zinc 12% |
| Molecular formula | C10H12 N2 08 2n 2 Na |
| Appearance /colour | White Crystalline Powder |
| PH | pH of 1% Solution 5.5 to 7.0 |
| Solubility | Soluble in Water, Clear Solution |

EDTA Zn 12%

## USES: -

- Zinc EDTA can be used as Drip Irrigation as well as through foliar applications to correct deficiencies & other hydroponic applications in agriculture & horticulture sectors.

- **Features:**
- Zinc EDTA is a Sequestering Agent.
- Zinc EDTA is generally used in Agriculture application to prevent Zinc deficiency of Plants.

## 3) EDTA Ferric 12% (Chelated Ferric)

Ferric EDTA offered is available in form of yellowish brown crystalline powder; it has molecular weight of 421. Finding application as a micronutrient, it also has assay (min) of 12.0 % as Fe and can be offered in both standard as well as customized finish specifications.

**Specification:. Table no. 3.6**

| | |
|---|---|
| Product Name | EDTA Ferric 12% |
| Molecular formula | C10H1203N2FeNa 2H2O |
| Appearance/colour | Light Yellow Tan Powder |
| PH | pH of 1% Solution 4.0 to 6.0 |
| Solubility | Soluble in Water, Clear Solution |

**Uses:**

- Ferric EDTA is useful in treating plants with Fe deficiency through foliar application. As an iron micronutrient source for hydroponics, liquid feed solutions and soilless growing media. EDTA Fe provides healthy growth to plant and maximum yield to crop.

**ROLE OF Ferric IN PLANT GROWTH**:

- It promotes formation of chlorophyll
- It acts as a oxygen carrier.
- It helps reactions involving cell division & growth.

## 5) EDTA Manganese 12% (Chelated Manganese)

Manganese EDTA offered is available in from of white to slightly pinkish powder with molecular weight of 425. With application as micronutrient, it has assay (min) of 12. 0% as Mn and has high demand in the market because of its pure constitution.

**Specification: . Table no. 3.6**

| | |
|---|---|
| Product Name | EDTA Manganese 12% |
| Molecular formula | CHuMnN02No |
| Appearance/colour | White to Slightly Pinkish Powder |
| PH | pH of 1% Solution 6.0 to 7.0 |
| Solublity | Soluble in Water, Clear Solution |

**EDTA Mn 12%**

### USES:-

- Mainly used in food industry, agriculture and horticulture as micronutrient.
- For use in hydroponics, fertigation systems and for foliar feeding.
- It is also used as a supplement & a booster to a regular fertilizer schedule to enhance yields & quality of the crops**.**

**BENEFITS:**

- It functions as a part of certain enzyme systems.
- It helps in chlorophyll synthesis.
- It increases the availability of P & CA

## 6) EDTA Magnesium 6% (Chelated Magnesium)

Magnesium EDTA offered is available in from of white powder with molecular weight of 358.5. With application as micronutrient, it has assay (min) of 6 % as Mg and has high demand in the market because of its pure constitution.

**Specification: . Table no. 3.7**

| | |
|---|---|
| Product Name | Magnesium EDTA/Chelated Magnesium |
| Appearance/colour | Off White Powder |
| PH | pH of 1% Solution 6.5 to 7.5 |
| Solublity | Soluble in Water, Clear Solution |

**EDTA Mg 6%**

**USES :**

- Magnesium is important constituent of chlorophyll & therefore essential for photosynthesis. It activates many plant enzymes required in growth process.
- Recommended for Foliar as well as Soil Application.

**BENEFITS:**

- It functions as a part of certain enzyme systems.
- It helps in chlorophyll synthesis.
- It increases the availability of P & CA

## 4.1 Profile Of Sample Farmer

### 4.1 Age group of sample farmers

The experience of farmer is very important for adoption of for the adoption of new technologies. Hence the age of the sample farmers have been studied and age wise classification of the sample farmers is given in the table of Age group of sample farmers

**Table No. 4.1 Age group of sample farmer**

| Sr. No | Age (Years) | Small | Medium | Large | Total | Percentage |
|---|---|---|---|---|---|---|
| 1 | Below25 | - | - | - | - | - |
| 2 | 26 to 35 | 8 | 3 | 4 | 15 | 30 |
| 3 | 36 to 45 | 5 | 10 | 9 | 24 | 48 |
| 4 | Above 46 | 4 | 4 | 3 | 11 | 22 |
| | **Total** | 17 | 17 | 16 | **50** | **100** |

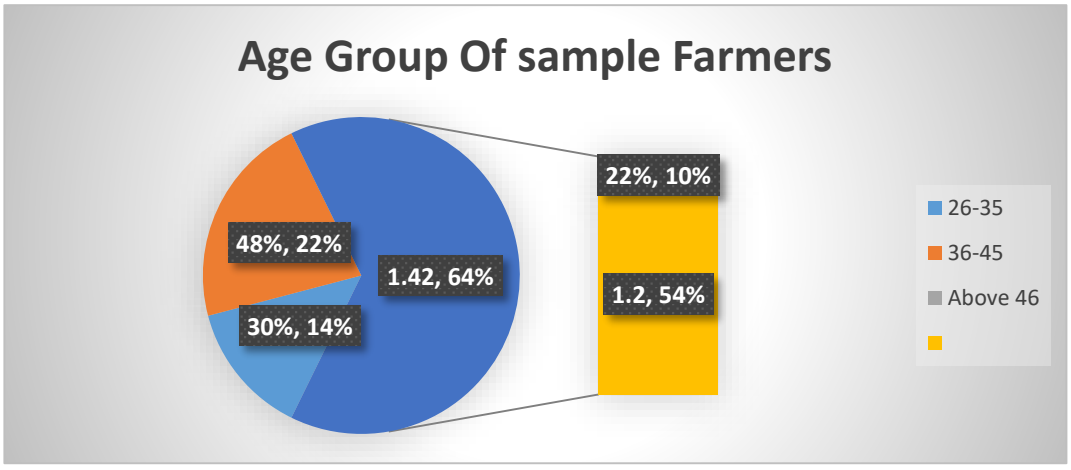



**Fig.no 4.1** SOURCE Field Survey

**Interpretation :**
From the table it is observed that the in Between 36-45 Age is 48% Farmer and fallowed by 26-35 and 22% are above 46 % Farmers

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### *4.2* Literacy level of farmers

In decision making process, the education plays key role. The performance for different attributes of product change with education of people.

**Table no. 4.2 Literacy level of farmers**

| Sr. No | Particulars | Small | Medium | Large | Total | Percentage |
|---|---|---|---|---|---|---|
| 1 | Primary | 1 | 2 | 1 | 4 | 8 |
| 2 | S.S.C | 4 | 7 | 5 | 16 | 32 |
| 3 | H.S.C | 8 | 6 | 4 | 18 | 36 |
| 4 | Graduated | 4 | 2 | 6 | 12 | 24 |
| | **Total** | **17** | **17** | **16** | **50** | 100 |

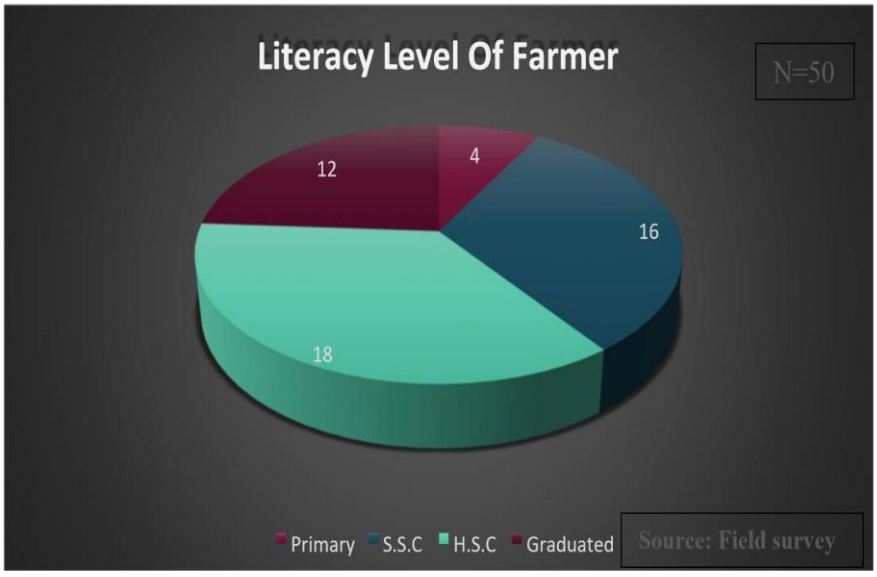


**Fig.no-4.2**

**Interpretation:** It is observed that 36 percent farmers have completed there HSC education followed by 32 percent farmers completed SSC and the percentage of primary education is less i.e. 8.

## 4.3 Land holding of sample farmers

Land holding is categorized into 3 groups i.e small 1.01 to 2.01 ha 2.01 to 4 ha and above 4.00 ha. The holding size directly influence the buying requirement of the farmer.

**Table no. 4.3 Land holding of farmers**

| Sr. No | Parameters | No of farmers | Percentage |
|---|---|---|---|
| 1 | Small farmers (1.01 to2.01 ha) | 17 | 34 |
| 2 | Medium farmers(2.01 to 4.0 ha) | 17 | 34 |
| 3 | Large Farmers(more than 4.0 ha) | 16 | 32 |
| | **Total** | **50** | **100** |

**Interpretation** : It is observed that Small Farmers are holing was 34% in study area while medium farmers land holding was 34 percent where as large farmers also 32%have 32 percent land holding.

**Land holding of farmers**

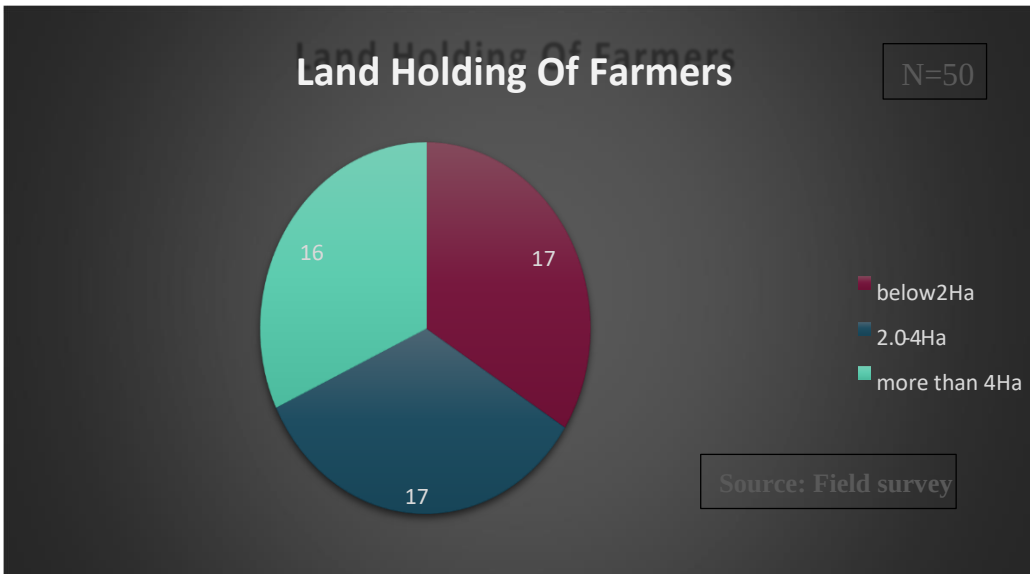


**Fig.no4.3**

I

## 4.4 Average land use pattern of sample farmers

**Table no 4.4 .Average land use pattern of farmers**

| Sr. No | Particulars | Land (ha) | | | |
|---|---|---|---|---|---|
| | | **Small** | **Medium** | **Large** | **Total** |
| **1** | **Operational Land** | 1.07 | 2.61 | 5.67 | 9.35 |
| A | Irrigated | 1.07 | 2.61 | 5.67 | 9.35 |
| B | Rainfed | 0.00 | 0.00 | 0.00 | 0.00 |
| **2** | **Fallow land** | 0.05 | 0.08 | 0.17 | 0.3 |
| **Total land** | | **1.12** | **2.69** | **5.84** | **9.65** |

**Interpretation:** The total average land of all sample farmers is 9.65 ha out of which 9.35 ha is under cultivation and 0.3 ha is fallow land.

## 4.5 Average Cropping pattern of sample Farmers:

Cropping pattern helps to determine the different crop grown in the study area by the sample farmers also helpful to study the proportion of the crop grown by the farmer

**Table No.4.5 Average cropping pattern of sample farmers**

| Season/Crop | Average area of small farmers (ha) | Average area of medium farmers (ha) | Average area of large farmers (ha) | Overall | Percentage |
|---|---|---|---|---|---|
| **Kharif** | | | | | |
| Cauliflower | 0.4 | 0.9 | 0.63 | **0.64** | |
| Soybean | 0.36 | 0.57 | 1.14 | **0.69** | |
| **Sub total** | **0.76** | **1.4** | **1.77** | | **16.39** |
| **Rabi** | | | | | |
| Onion | 0.4 | 0.69 | 1.35 | **0.81** | |
| Wheat | 0.32 | 1.75 | 0.73 | **0.93** | |
| **Sub total** | **0.72** | **2.44** | **2.08** | | **28.38** |
| **Summer** | | | | | |
| Tomato | 0.36 | 0.60 | 0.96 | **0.64** | |
| **Sub total** | **0.36** | **0.60** | **0.96** | | **8.81** |
| **Annual** | | | | | |
| Grapes | 0.81 | 1.05 | 2.19 | **1.35** | |
| Sugarcane | 0.75 | 1.41 | 2.22 | **1.46** | |
| **Sub total** | **1.56** | **2.46** | **4.41** | | **46.42** |
| **Gross cropped Area** | **3.4** | **6.9** | **10.78** | **21.08** | |
| **Cropping intensity** | **126.9** | **120** | **115** | **120.63** | |

**Interpretation:** It is observed that the total average land of the Grapes and Sugarcane was high followed by Wheat. And the average cropping intensity of all season is 120.63 percent.

## 4.7 Mode of Application of micronutrient

**Table No. 4.7 Application of micronutrient to the crop**

| Sr. No | Parameter | No. of farmer's | Percentage |
|---|---|---|---|
| 1. | Fertigation | 18 | 36 |
| 2. | Foliar Spray | 32 | 64 |

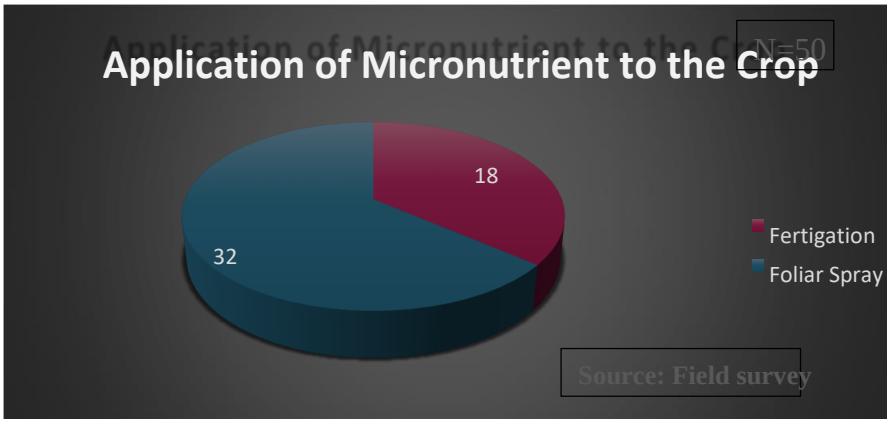


**Fig.no4.5**

**Interpretation:**

**Application of micronutrient to the crop.**

From the above data, it is clear that 64% of the farmers are uses foliar spray method and 36% of the farmers use fertigation method for the application of micronutrient to the crops.

## 4.9 Adoption Pattern:

**Point of Purchase of Sigma Chemicals pvt.ltd. Centre of Chelated micronutrients. Purchase point**

**Table No. 4.9**

| Sr.No. | Particulars | No.of Farmers | | | Total |
|---|---|---|---|---|---|
| | | Small | Medium | Large | |
| 1. | Dealers | 6 | 7 | 10 | 23 |
| 2. | Agro service center | 11 | 10 | 6 | 27 |
| Total | | 17 | 17 | 16 | 50 |

**Interpretation**: From the above table it is observed that all the sample farmer purchase Sigma micronutrients products from Agro service centre & Dealers .

## 4.10 Farmers Awareness about Chelated micronutrient

**The Awareness of the farmers regarding to Chelated micronutrient presented in following tables**

**Table no.4.10. Farmers Awareness about Chelated micronutrient**

| Sr. No | Particulars | No. of Farmers | Percentage |
|---|---|---|---|
| 1 | Aware | 50 | 100 |
| 2 | Unaware | 00 | 00 |
| | **Total** | **50** | **100** |

**Interpretation: Farmers awareness about Chelated micronutrient** it is observed that 100 percent sample farmers were aware about Chelated micronutrient

## 4.11 Awareness about Sigma Chemicals

The awareness of the farmers regarding to Sigma Chemicals presented in following table .

**Table no 4.11 Awareness about the Sigma Chemicals**

| Sr. No | Particulars | No. of Farmers | Percentage |
|---|---|---|---|
| 1 | Aware | 46 | 92 |
| 2 | Unaware | 04 | 08 |
| | **Total** | 50 | **100** |

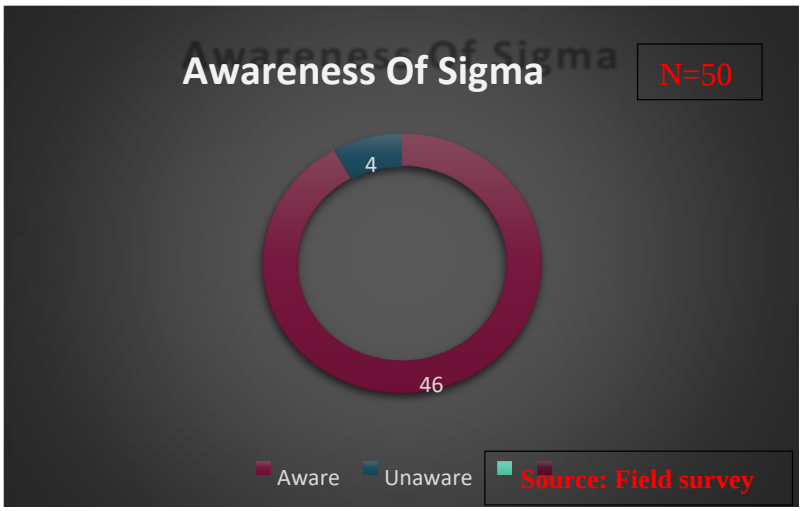


**Fig.no -4.7**

**Awareness about the Sigma Chemicals**

**Interpretation:** it is observed that all the farmers were aware about the company Sigma Chemicals 46 farmers were aware And 4 are Unaware hence 92 percent respondent were aware towards company.

1.
2. of the country don’t have so good market.
3. For international level still we not success due to quality and government support.
4. Price fluctuation of raw materials is big problem faced by N D Wines.
5. Import of yeast and other chemicals add high cost to wine
6. Insufficient availability of grapes for processing at proper time.
7. Due to high price of raw material ,and transport cost the capital of N D Wines is high.
8. Lack of skilled labour.
9. lack of infrastructure and machinery.
10. Poor transport facilities.
11. The lack of technology upgradation in the N D Wines

## 5.2 Suggestions

1. Company should make contract with farmer for availability of grapes variety at proper time.
2. There should be uniform law in all the states in India and government also encourage to export grape wine in other country. The Government must provide subsidies to the winery owners to export more grape wine in the international market.
3. Government should reduce custom duty on yeast and other chemicals.
4. Winery should have bring raw materials in bulk quantity so they get some amount discount and they will not face problem of raw materials.
5. Along with processing attention must be given towards promotional activities as well which will ultimately result in increased demand for products and number of consumers.
6. Training should be given to unskilled labour.
7. Winery have to develop transport facilities.
8. Provide proper facilities to the labour in industry like loan etc.
9. Company should create awareness about health benefits of wine in customer

### 6.1 Summary :-

1. Initial investment required for Cabernet Syrah in N D Wines Pvt Ltd. is Rs. **38,04,675.85/-**
2. Raw material cost required for Cabernet Syrah in N D Wines Pvt Ltd is **Rs.10,57,380/-**
3. Total salary and wages expenses required for Cabernet Syrah in N D Wines Pvt Ltd is **Rs.2,77,668/-**
4. From the study of cost of production of Cabernet Syrah it was observed that the fixed cost per lit was Rs. 23.54/- and variable cost per lit was **Rs. 256. 14 /-** and per lit total cost of production was **Rs. 279.68/-**
5. From financial study it was observed that gross income of Cabernet Syrah in N D Wines Pvt Ltd was **Rs.41,62,500/-** and net profit was Rs.**10,16,043/-**
6. The study B:C ratio, it shows that, when entrepreneur invests 1 rupee then he gets additional **32 Paisa** from that investment.
7. From B:C ratio analysis it was observed that B:C ratio was more than one, it reveals that production of N D Wines Cabernet Syrah is financially feasible.

## 6.2 Conclusions:-

1) The company runs well in small organization structure as compared to other industry and still makes more profit.
2) Sufficient amount of resources were available to the company and they were used it in efficient manner with minimum losses.
3) The company products are trust worthy and they have huge demand in Cities Nashik & villages like Niphad, Dindori, Yeola, etc.
4) The N D Wines Pvt Ltd. has great scope to improve their promotion, which will generate huge sales
5) Company uses its financial and other relevant resources effectively and efficiently, so it has a greater potential in Nashik because of their good effect of products, brand on their customer.

**Experience Gained**

1) Learned about how the processing industry runs, how to manage all the important aspects of a particular processing industry such as finance, human resource, marketing, storage, packaging, etc.
2) I came to know about how to establish the processing industry, formalities that have to be completed, documents required and other necessary permissions.
3) It was great opportunity for me to study in N D Wines Pvt. Ltd
4) Understood the importance of risk management, time management, Human resource management, etc.
5) I learnt about the various departments and their functioning such as procurement department, processing department, human resource department, marketing department, finance department etc.
6) Understood the importance of processing industry in India, its contribution to the prosperity and development of village, society and whole nation ultimately.

**8.1 Books**


1) Acharya, S. S. and Agrawal, N. L., Agriculture Marketing in India. Oxford and IBH Publishing Co. Pvt., New Delhi

2) S. Subba Reddy, P. Raghu Ram, T.V. Neelakanta Sastry, I. Bhavani Devi, Agricultural Economics. Oxford and IBH publishing Co. Pvt., New Delhi.


**8.2** Journals and Reports


1) Compressive Study of Indian Wine Market, conducted by JBC International Inc.
2) Dhruv Sood, Wine Production and Trade Update.
3) R. P. Kachru, Agro-Processing Industries in India—Growth, Status and Prospects.


**8.4** Websites


1) www.ndwines.com 2) www.wikipedia.org

3) www.wineindustry.com.in

4) www.investindia.gov


Photo No. 9.1

With Mr. Sopan Jadhav Accountant of ND Wines Pvt. Ltd


Photo No. 9.2

Office Of N D Wines Pvt, Ltd.


Photo No.9.3

N D Wines Pvt. Ltd.