

# PLANT GROWTH PROMOTER n-TRIACONTANOL

PRODUCTION CAPACITY : 4.2 kg/annum

## 1.0 PRODUCT AND ITS APPLICATIONS

n-Triacontanol has recently come into prominence as a plant growth promoter. It is isolated from active fraction of tea waste or sugarcane press mud. Successful field trials have proved its efficacy for high yield in the case of number of crops like barley, corn, paddy, maize, lettuce, cucumber, etc. The yield of tea increases by 25% to 40% and a reduction in dormant shoots have been reported. Trials on crops like paddy, tomato, brinjal, potato have shown remarkable increase in yield. One of the important factors of this compound is its effectiveness at a low concentration i.e. 1 to 2 ppm. N-Triacontanol is used at a rate of 2.5 mg to 5 mg per hectare.



## 2.0 MARKET POTENTIAL

n-Triacontanol and its formulations have shown excellent market potential. Number of tea planters in the country have shown keen interest especially after reported increase in the yield by 25% to 40%. Its applications in agriculture and horticulture fields will certainly improve the demand further in the near future. The current international price of pure n-Triacontanol is Rs. 5 lakh/kg. This indicates a tremendous potential for export.



## 3.0 BASIS AND PRESUMPTIONS

- The unit proposes to work at least 300 days per annum on single shift basis.
- The unit can achieve its full capacity utilization during the 3rd year of operation.
- The wages for skilled workers is taken as per prevailing rates in this type of industry.
- Interest rate for total capital investment is calculated @ 12% per annum.
- The entrepreneur is expected to raise 20-25% of the capital as margin money.
- The unit proposes to construct own building.
- Costs of machinery and equipment are based on average prices enquired from machinery manufacturers.

## 4.0 IMPLEMENTATION SCHEDULE

Project implementation will take a period of 8 months. Break-up of the activities and relative time for each activity is shown below:

❖ Scheme preparation and approval	:	01 month
❖ SSI provisional registration	:	1-2 months
❖ Sanction of financial supports etc.	:	2-5 months
❖ Installation of machinery and power connection	:	6-8 months
❖ Trial run and production	:	01 month

## 5.0 TECHNICAL ASPECTS

### 5.1 Location

Availability of raw material is the major factor to be considered in selection of a suitable location for setting up n-Triacontanol plant. The other factors to be considered are availability of trained labour and infrastructure facilities.

### 5.2 Availability of Raw Material

The two major raw materials used to extract n-Triacontanol are:

- i) Tea waste - black tea waste including stiff sweeping, tea waste from instant tea processing, damaged tea, decaffeinated tea wax.
- ii) Sugarcane press mud obtained as waste product during the clarification of sugar juice in sugar factories.

The tea waste is mostly available in tea processing centres which are concentrated in West Bengal, North Eastern Region, TamilNadu, Kerala and part of Karnataka. The sugarcane press mud is available from sugar factories in the country.

### 5.3 Process of Manufacture

Tea wax / sugarcane wax is extracted from tea waste/sugarcane press mud by solvent extraction. It is fractionated and purified. After trans-esterification under appropriate conditions, the compound is further purified and fractionally crystallised from suitable organic solvents. The product is tested for its purity by thin layer chromatography method. The process is available from CFTRI to extract the pure form of n-Triacontanol. This compound needs further formulation before packing for end-use. After the extraction of desired compound from tea waste, the remaining material can be used as manure.

## 6.0 POLLUTION CONTROL

There is no major pollution problem associated with this industry except for disposal of waste which should be managed appropriately. The entrepreneurs are advised to take "No Objection Certificate" from the State Pollution Control Board.

## 7.0 ENERGY CONSERVATION

No coal or LDO is used in the process.

## 8.0 PRODUCTION CAPACITY

Quantity	:	4.2 kg/annum
Value	:	Rs. 21 lakh
Installed capacity	:	20 g/day
Working days	:	300/annum
Optimum capacity utilization	:	70%
Manpower	:	15
<b>Utilities</b>		
Motive Power	:	18 kW
Water	:	10 kL/day



## 9.0 FINANCIAL ASPECTS

### 9.1 Fixed Capital

#### 9.1.1 Land & Building

	Amount (Rs. lakh)
Land 500 sq.m.	0.75
Built up Area 100 sq. m.	3.00
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<b>Total cost of Land and Building</b>	<b>3.75</b>

#### 9.1.2 Machinery and Equipment

Description	Amount (Rs. lakh)
Solvent extraction unit, heating mantle with thermostat, distillation unit (glass unit), water bath, concentration unit, refluxing units, filtration assembly (complete unit), pressure vacuum pump, miscellaneous equipment like clamp, vessels, jars, round bottom flask, etc., testing equipment like TLC kit, iodine chamber, laboratory oven and other laboratory glassware, refrigerator, weighing balance.	7.00
Erection & electrification @10% cost of machinery & equipment	0.70
Office furniture & fixtures	0.80
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<b>Total :</b>	<b>8.50</b>

#### 9.1.3 Pre-operative Expenses

Consultancy fee, project report, deposits with electricity department etc.	2.75
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#### 9.1.4 Total Fixed Capital

(9.1.1+9.1.2+9.1.3)	15.00
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## 9.2 Recurring expenses per annum

### 9.2.1 Personnel

Designation	No.	Salary Per month	Amount (Rs.lakh)
Factory Manager	1	12000	1.44
Chemist	1	9000	1.08
Supervisors	2	5000	1.20
Skilled workers	3	2000	0.72
Unskilled workers	8	1500	1.44
<b>Total :</b>	<b>15</b>		<b>7.44</b>
Perquisites @ 15%			1.12
			8.56

### 9.2.2 Raw Material including packaging materials

Particulars	Qty.(MT)	Rate Per mt	Amount (Rs. lakh)
Tea waste/sugarcane		LS	5.00
Solvents			
Glass apparatus			
Lab consumables			
<b>Total:</b>			<b>5.00</b>

### 9.2.3 Utilities

	Amount (Rs. lakh)
Power 18 kWh	0.97
Water 3,000 kL	0.03
<b>Total:</b>	<b>1.00</b>

### 9.2.4 Other Contingent Expenses

	Amount (Rs. lakh)
Repairs and maintenance@10%	1.15
Consumables & spares	0.73
Transport & Travel	
Publicity	
Postage & stationery	
Telephone	
Insurance	0.12
<b>Total:</b>	<b>2.00</b>

### 9.2.5 Total Recurring Expenditure

	Amount (Rs. lakh)
(9.2.1+9.2.2+9.2.3+9.2.4)	13.88

### 9.3 Working Capital

Recurring Expenditure for 4 months	4.64
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### 9.4 Total Capital Investment

	Amount (Rs. lakh)
Fixed capital (Refer 9.1.4)	15.00
Working capital (Refer 9.3)	04.64
<b>Total:</b>	<b>19.64</b>

## 10.0 FINANCIAL ANALYSIS

### 10.1 Cost of Production (per annum) Amount (Rs. lakh)

Recurring expenses (Refer 9.2.5)	13.88
Depreciation on building @5%	00.30
Depreciation on machinery @10%	00.85
Depreciation on furniture @20%	00.16
Interest on Capital Investment @12%	02.36
<b>Total:</b>	<b>17.55</b>

### 10.2 Sale Proceeds (Turnover) per year

Item	Qty.	Rate	Amount (Rs.lakh)
n-triacontanol	4.2 kg	Rs. 5 lakh/kg	21.00

### 10.3 Net Profit per year

= Sales – Cost of production

= 21.00 – 17.55

= Rs. 3.45 lakh

### 10.4 Net Profit Ratio

=  $\frac{\text{Net profit} \times 100}{\text{Sales}}$

=  $\frac{3.45 \times 100}{21}$

= 16.4%

### 10.5 Rate of Return on Investment

=  $\frac{\text{Net profit} \times 100}{\text{Capital Investment}}$

=  $\frac{3.45 \times 100}{19.64}$

= 17.6%

## 10.6 Annual Fixed Cost

Amount (Rs. Lakh)

All depreciations	1.31
Interest	2.36
40% of salary, wages, utility, contingency	3.56
Insurance	0.12
<b>Total:</b>	<b>7.35</b>

## 10.7 Break even Point

$$= \frac{\text{Annual Fixed Cost} \times 100}{\text{Annual Fixed Cost} + \text{Profit}}$$

$$= \frac{7.35 \times 100}{7.35 + 3.45}$$

$$= \frac{735}{10.8}$$

$$= 68\%$$

## 11.0 ADDRESSES OF MACHINERY AND EQUIPMENT SUPPLIERS

Borosil Glass Works Ltd.  
23/24, Second Line Beach  
Chennai – 600 001

Lab Tex Corporation  
109, Jai Prakash Nagar  
Goregaon East  
Mumbai – 400 063

Scientific and Industrial Supplies Co.  
1643/A, Mariappana Palya Main Road  
Behind Shamanna Wood Industries  
Bangalore – 560 021

The Scientific Indian Glass Co. Ltd.  
11, Pollock Street  
Kolkata – 700 001