Compost Production & Packaging

Introduction

Compost is a valuable natural resource created through the decomposition of organic matter, such as kitchen scraps, yard waste, and even manure. This process transforms waste into a nutrient-rich soil amendment that improves plant growth, enhances soil health, and reduces the amount of waste sent to landfills.

The Magic of Decomposition

At the heart of composting lies a complex ecosystem of microorganisms, including bacteria, fungi, and protozoa. These tiny organisms work tirelessly to break down organic materials, converting them into a rich humus-like substance. The resulting compost is teeming with beneficial nutrients and microorganisms that revitalize the soil.

Benefits of Composting:

- **Reduced Waste:** Diverts organic waste from landfills, reducing greenhouse gas emissions and conserving landfill space.
- **Enhanced Soil Health:** Improves soil structure, aeration, and water retention, creating a healthier environment for plant roots.
- **Nutrient-Rich Fertilizer:** Provides essential nutrients like nitrogen, phosphorus, and potassium to plants, promoting vigorous growth.
- **Sustainable Gardening:** Reduces reliance on chemical fertilizers, promoting a more eco-friendly approach to gardening and agriculture.

Raw Material

The raw materials for compost can be broadly categorized into two types:

1. **Brown Materials (Carbon-Rich):** These materials provide the energy source for the microorganisms involved in the composting process. They are typically dry and high in carbon content. Examples include:

- Dried leaves
- Wood chips
- Sawdust
- Straw
- Paper
- Cardboard

2. **Green Materials (Nitrogen-Rich):** These materials supply the nutrients needed for microbial growth. They are typically moist and high in nitrogen content. Examples include:

- Grass clippings
- Vegetable scraps
- Fruit waste
- Coffee grounds
- Tea bags
- Manure

For optimal compost production, it's important to maintain a balanced carbon-to-nitrogen ratio (C:N ratio). A ratio of around 30:1 is generally considered ideal. This balance ensures that the microorganisms have both the energy and nutrients they need to break down the organic matter efficiently.

Market Outlook

The market outlook for compost-making units is quite promising, driven by several key factors:

Growing Demand for Organic Products:

- The increasing awareness of the benefits of organic farming and the demand for organic products are driving the need for natural fertilizers like compost.

- Compost improves soil health, enhances plant growth, and reduces the reliance on chemical fertilizers, making it a sought-after product among organic farmers and home gardeners.

Sustainable Waste Management Practices:

- The growing concern over environmental issues and the need to reduce waste are encouraging the adoption of composting practices.
- Compost-making units help divert organic waste from landfills, reducing greenhouse gas emissions and conserving landfill space.

Government Initiatives:

- Many governments are promoting composting as a sustainable waste management solution and offering incentives to encourage its adoption.
- These initiatives, coupled with stricter regulations on waste disposal, are creating a favourable environment for the growth of the compost-making industry.

Technological Advancements:

- Innovations in composting technologies are making the process more efficient and accessible.
- Advanced composting machines and techniques are enabling faster decomposition, improved quality, and increased production capacity.

Challenges and Opportunities:

- **Competition:** The market is becoming increasingly competitive, with a growing number of players entering the industry.
- **Raw Material Availability:** Ensuring a consistent supply of high-quality organic waste can be challenging, especially in urban areas.
- **Market Education:** Raising awareness about the benefits of compost and educating potential customers about its use is crucial for market growth.
- **Opportunities:** The market presents opportunities for value-added products, such as specialized compost blends for different crops and vermicompost produced using earthworms.

Overall, the market outlook for compost-making units is positive, with a strong potential for growth in the coming years. By addressing the challenges and capitalizing on the opportunities, businesses in this sector can contribute to a more sustainable future while enjoying a profitable venture.

Manufacturing Process

The compost manufacturing process typically involves the following steps:

1. **Raw Material Collection and Preparation:**

- Collection of organic waste from various sources like households, restaurants, and agricultural industries.
- Sorting and segregation of materials based on their composition (brown and green materials).
- Shredding or chopping of larger materials to accelerate decomposition.

2. **Composting Process:**

- **Heap Composting:** Involves creating large piles of organic materials and turning them regularly to aerate the mixture.
- **Bin Composting:** Utilizing enclosed bins or containers to control the composting process and prevent material loss.
- **Vermicomposting:** Employing worms to accelerate the decomposition process and produce high-quality compost.

3. **Maturation and Curing:**

- Allowing the compost to mature and cure for several weeks or months, during which microbial activity continues and the material stabilizes.
- This process reduces pathogens and improves the overall quality of the compost.

4. **Screening and Processing:**

- Screening the mature compost to remove any remaining large particles or foreign objects.
- Grinding or milling the compost to achieve a desired particle size and consistency.

5. **Quality Control and Testing:**

- Conducting quality control tests to ensure the compost meets specific standards for nutrient content, maturity, and freedom from contaminants.
- Analysing the compost for parameters like pH, moisture content, and carbon-nitrogen ratio.

6. **Packaging and Storage:**

- Packaging the finished compost in bags or bulk containers for storage and distribution.
- Storing the compost in a dry, well-ventilated area to maintain its quality.

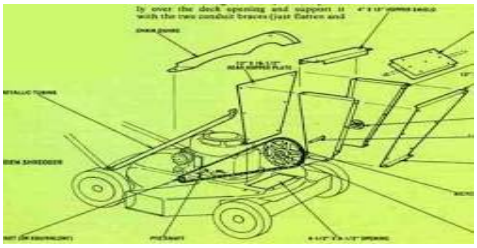
7. **Distribution and Marketing:**

- Distributing the compost to various end-users like farmers, gardeners, and landscapers.
- Marketing the compost to potential customers and promoting its benefits for soil health and plant growth.

Machinery Used in a Compost Making Unit

A compost-making unit typically employs a range of machinery to efficiently process organic waste into valuable compost. Here are some common types of machinery, along with images:

1. Shredder/Chipper:



- Used to reduce the size of large organic materials like branches, twigs, and woody debris.
- This increases the surface area, accelerating the decomposition process.

2. Mixer:

- Mixes different types of organic materials to ensure a uniform composition and C:N ratio.

- Promotes even distribution of moisture and oxygen throughout the compost pile.

3. Turner:

- Turns the compost pile regularly to aerate the mixture and maintain optimal temperature and moisture levels.
- This is crucial for efficient microbial activity and decomposition.

4. Screen:

- Separates finished compost from any remaining large particles or foreign objects.
- Ensures a uniform and fine-textured compost product.

5. Grinder:

- Grinds the screened compost to achieve a desired particle size and consistency.
- This can be helpful for certain applications like potting mix or topdressing.

6. Conveyor Belts:

- Transport materials between different stages of the composting process.
- Improve efficiency and reduce manual labour.

7. Packaging Machine:

- Packages the finished compost into bags or other containers for storage and distribution.

Additional Machinery:

- **Shredder:** For further size reduction of materials.
- **Blower:** For aerating the compost pile.
- **Moisture Meter:** For monitoring and controlling moisture content.
- **Temperature Sensor:** For monitoring the temperature of the compost pile.

PROJECT AT A GLANCE - TOP SHEET

1	Name of the Beneficiary		**XXXXXX**		
2	Constitution(Legal Status)		**Individual**		
3	Father/Spouse Name		XXXXXXX		
4	Unit Address		XXXXXX		
		Taluk/Block:	**XXXXXX**		
		District :	**XXXXXX**		
		Pin:	**XXXXXX**	State:	**XXXXXX**
		E-Mail :	**XXXXXX**		
		Mobile	**XXXXXX**		
5	Cost of Project	:	**Rs.**	**7.08**	**in Lakhs**
(i)	Plant & Machinery			**3.50**	**in Lakhs**
(ii)	Furniture & Fixtures			**0.80**	**in Lakhs**
(iii)	Working Capital Required			**2.78**	**in Lakhs**
6	Means of Finance	:	**Rs.**		
(i)	Term Loan			**3.87**	**in Lakhs**
(ii)	Working Capital			**2.50**	**in Lakhs**
(iii)	Own Capital			**0.71**	**in Lakhs**
				7.08	**in Lakhs**
7	Debt Service Coverage Ratio	:		**5.47**	
8	Break Even Point	:		38.70%	
9	Plant & Machinery	:	Shredder,Mixer, Conveyor Belt, Grinder,Mixer,Packaging Machine Other equipments.		
10	Major Raw materials	:	Brown Materials (Carbon-Rich),Green Materials (Nitrogen-Rich) etc.		
11	Employment	:		6	
12	Power Requirement	:		3	
13	Name of the project / business activity	:	Compost Production & Packaging		

PROJECTED CASH FLOW STATEMENT

PARTICULARS	YEAR-I	YEAR-II	YEAR-III	YEAR-IV
SOURCES OF FUND				
Capital	0.71	-	-	-
Reserve & Surplus	4.38	5.64	6.56	7.58
Depriciation & Exp. W/off	0.61	0.52	0.44	0.38
Increase in Cash Credit	2.50	-	-	-
Increase In Term Loan	3.87	-	-	-
Increase in Creditors	0.57	0.07	0.07	0.09
Increase in Provisions	0.50	0.03	0.03	0.03
TOTAL :	**13.13**	**6.25**	**7.10**	**8.08**
APPLICATION OF FUND				
Increase in Fixed Assets	4.30	-	-	-
Increase in Stock	0.61	0.08	0.08	0.09
Increase in Debtors	3.63	0.65	0.57	0.60
Repayment of Term Loan	0.77	1.03	1.03	1.03
Drawings	2.50	4.00	5.00	6.00
TOTAL :	**11.81**	**5.76**	**6.68**	**7.73**
Opening Cash & Bank Balance	-	1.32	1.81	2.23
Add : Surplus	1.32	0.49	0.42	0.35
Closing Cash & Bank Balance	**1.32**	**1.81**	**2.23**	**2.59**

PROJECTED BALANCE SHEET

PARTICULARS	YEAR-I	YEAR-II	YEAR-III	YEAR-IV
SOURCES OF FUND				
Capital Account	-	2.59	4.22	5.78
Add: Addition	0.71			
Add : Net Profit	4.38	5.64	6.56	7.58
	5.09	8.22	10.78	13.37
Less : Drawings	2.50	4.00	5.00	6.00
NET OWN FUNDS	**2.59**	**4.22**	**5.78**	**7.37**
Term Loan	3.10	2.06	1.03	-
Cash Credit	2.50	2.50	2.50	2.50
Sundry Creditors	0.57	0.64	0.71	0.80
Provisions & Other Liab	0.50	0.53	0.55	0.58
TOTAL :	**9.25**	**9.95**	**10.58**	**11.24**
APPLICATION OF FUND				
Fixed Assets	4.30	4.30	4.30	4.30
Less : Depreciation	0.61	1.12	1.57	1.95
Net Fixed Assets	3.70	3.18	2.73	2.35
Current Assets				
Sundry Debtors	3.63	4.27	4.85	5.45
Stock in Hand	0.61	0.69	0.77	0.86
Cash and Bank	1.32	1.81	2.23	2.59
TOTAL :	**9.25**	**9.95**	**10.58**	**11.24**
	-	-	-	-

PROJECTED PROFITABILITY STATEMENT

PARTICULARS	YEAR-I	YEAR-II	YEAR-III	YEAR-IV
Capacity Ulisation %	**50%**	**55%**	**60%**	**65%**
SALES				
Gross Receipts/Sale	36.25	42.73	48.46	54.46
Total	**36.25**	**42.73**	**48.46**	**54.46**
COST OF SALES				
Purchase & Consumables	17.04	19.23	21.32	23.96
Elecricity Expenses	3.26	3.85	4.36	4.90
Other Direct Expenses	2.18	2.56	2.91	3.27
Cost of Production	22.48	25.64	28.59	32.13
Add: Opening Stock /WIP	-	0.61	0.69	0.77
Less: Closing Stock /WIP	0.61	0.69	0.77	0.86
Cost of Sales	**21.87**	**25.56**	**28.51**	**32.03**
GROSS PROFIT	14.38	17.17	19.94	22.42
	39.68%	**40.19%**	**41.16%**	**41.17%**
Salary to Staff	6.89	8.27	9.92	10.91
Selling & Adm Expenses Exp.	1.81	2.14	2.52	3.16
Depriciation	0.61	0.52	0.44	0.38
Interest on Term Loan	0.43	0.34	0.23	0.11
Interest on Working Capital	0.28	0.28	0.28	0.28
TOTAL (D+G)	**10.01**	**11.54**	**13.38**	**14.84**
NET PROFIT	**4.38**	**5.64**	**6.56**	**7.58**
	12.08%	**13.19%**	**13.54%**	**13.93%**
CASH ACCRUALS	**4.98**	**6.15**	**7.00**	**7.96**

COMPUTATION OF PRODUCTION

Production Capacity	50	Kg/Hr
No. of Working Hour	10	
Total	500	Kg/day
No of Working Days per month	25	
No. of Months	12	
Total Production Per Annum	1,50,000	Kg

Year	Capacity Utilisation	Kg
YEAR-I	50%	75,000
YEAR-II	55%	82,500
YEAR-III	60%	90,000
YEAR-IV	65%	97,500

COMPUTATION OF SALE

Particulars	YEAR-I	YEAR-II	YEAR-III	YEAR-IV
Op Stock	-	2,500	2,833	3,094
Production	75,000	82,500	90,000	97,500
	75,000	85,000	92,833	1,00,594
Less : Closing Stock	2,500	2,833	3,094	3,353
Net Sale	72,500	82,167	89,739	97,241
Rate Per Pcs	50.00	52.00	54.00	56.00
Net Sale (in lacs)	**36.25**	**42.73**	**48.46**	**54.46**

COMPUTATION OF DEPRECIATION

Description	Plant/Machinery Equipments	Furniture	TOTAL
Rate of Depreciation	**15.00%**	**10.00%**	
Opening Balance	-	-	-
Addition	3.50	0.80	4.30
	3.50	0.80	4.30
Less : Depreciation	0.53	0.08	0.61
WDV at end of Year-1	2.98	0.72	3.70
Additions During The Year	-	-	-
	2.98	0.72	3.70
Less : Depreciation	0.45	0.07	0.52
WDV at end of Year II	2.53	0.65	3.18
Additions During The Year	-	-	-
	2.53	0.65	3.18
Less : Depreciation	0.38	0.06	0.44
WDV at end of Year III	2.15	0.58	2.73
Additions During The Year	-	-	-
	2.15	0.58	2.73
Less : Depreciation	0.32	0.06	0.38
WDV at end of Year IV	1.83	0.52	2.35

TERM LOAN

Year	Opening Balance	Repayment	Closing Balance	Interest @ 11%
1st	3.87	0.77	3.10	0.43
2nd	3.10	1.03	2.06	0.34
3rd	2.06	1.03	1.03	0.23
4th	1.03	1.03	0.00	0.11

BREAK EVEN POINT & RATIO ANALYSIS				
Particulars	**1st Year**	**2nd Year**	**3rd Year**	**4th Year**
Fixed Cost	9.74	11.15	12.59	14.09
Variable Cost	22.74	26.02	29.38	32.88
Total Cost	32.48	37.17	41.97	46.97
Sales	36.25	42.73	48.46	54.46
Contribution (Sales-VC)	13.51	16.71	19.08	21.58
Capacity	50%	55%	60%	65%
B.E.P in %	36%	37%	40%	42%
Break Even Sales in Rs.	13.07	15.69	19.19	23.11
Net Profit Ratio	**12.08%**	**13.19%**	**13.54%**	**13.93%**

CALCULATION OF D.S.C.R

PARTICULARS	YEAR-I	YEAR-II	YEAR-III	YEAR-IV
CASH ACCRUALS	4.98	6.15	7.00	7.96
Interest on Term Loan	0.43	0.34	0.23	0.11
Total	5.41	6.49	7.23	8.08
REPAYMENT				
Instalment of Term Loan	0.77	1.03	1.03	1.03
Interest on Term Loan	0.43	0.34	0.23	0.11
Total	1.20	1.37	1.26	1.15
DEBT SERVICE COVERAGE RATIO	**4.51**	**4.73**	**5.74**	**7.05**
AVERAGE D.S.C.R.			**5.47**	