

SEED INFRASTRUCTURE & PROCESSING UNITS

COMPONENT	UNIT COST (Rs. in lakhs)	Assistance (Rs. in lakhs)
SEED INFRASTRUCTURE (for handling, processing, packing, storage etc. of seeds meant for use as seed material for cultivation of horticulture crops)	200.00	100% of cost to Public Sector & 50% of cost of project to Private Sector as Credit Linked Back ended Subsidy.

11. SEED PROCESSING UNITS

INTRODUCTION

Seed has been an important agricultural commodity since the first crop plant was domesticated by pre-historic man. For thousands of years, man cleaned seed of his food crops by winnowing. This is still an important process, but it is no longer adequate to supply the kind of seed needed by farmer.

Seed processing is a vital part of the seed production needed to move the improved genetic materials of the plant breeder into commercial channels for feeding the rapidly expanding world population. The farmer must get the quality seed that is free from all undesired materials because farmer's entire crop depends on it.

Seed can seldom be planted in the condition in which it comes from the growers. In fact, many seed lots contain weed or crop seed or inert material that make them unfit for sale without processing. Crop seed also frequently have stems, awns, clusters or other structures, which prevent from flowing through the drill freely.

Seed processing is that segment of the seed industry responsible for upgrading seed (Fig. 1), improving planting condition of seed, and applying chemical protectants to the seed.

Advantages of seed processing:

1. Make possible more uniform planting rates by proper sizing
2. Improve seed marketing by improving seed quality
3. Prevent spread of weed seed
4. Prevent crops from disease by applying chemical protectants
5. Reduces seed losses by drying
6. Facilitate uniform marketing by providing storage from harvest time until the seed is needed for planting.

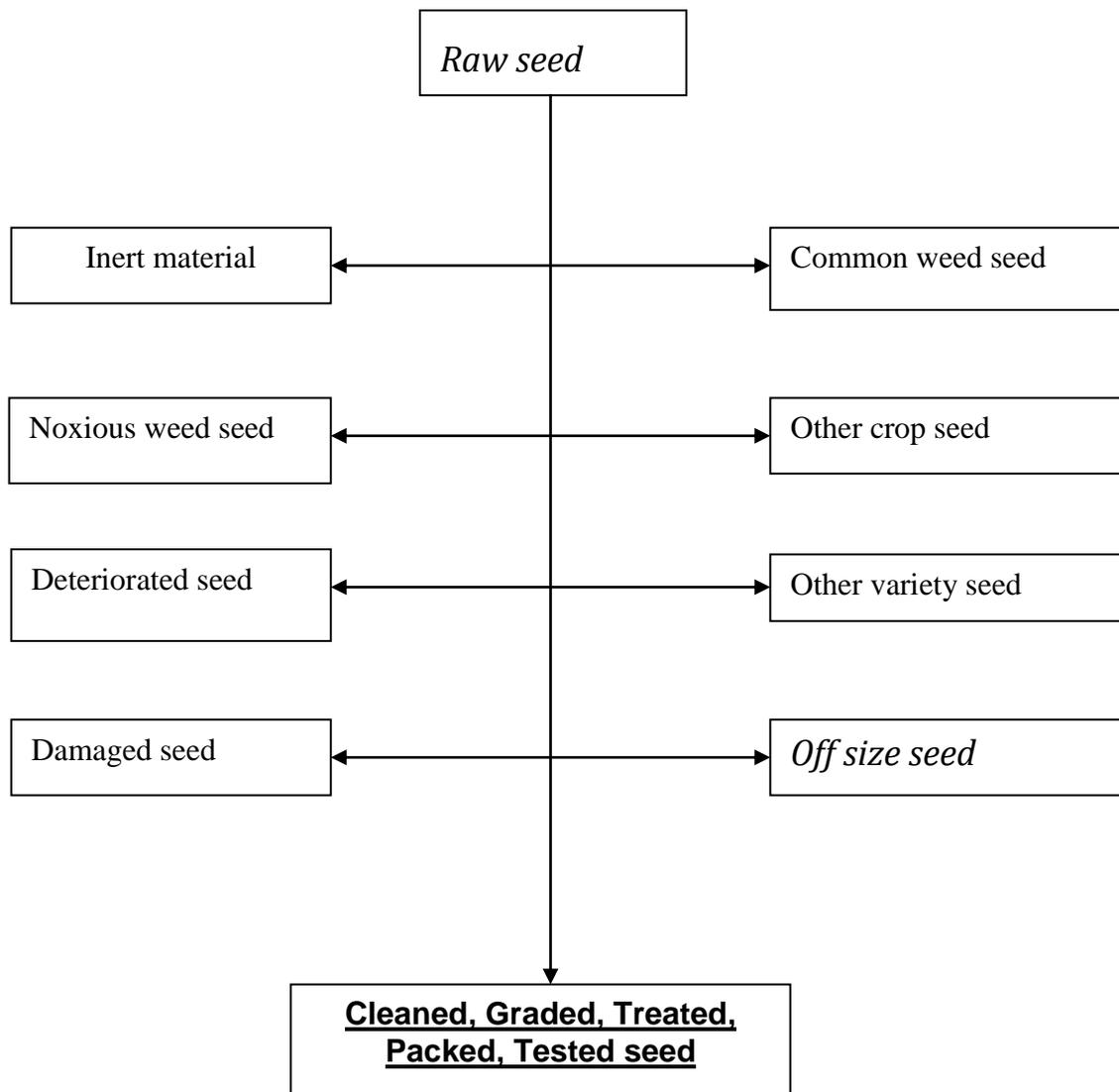


Fig. 1. *Undesirable materials removed during processing of seed*

An important factor to consider is the moisture content of the seed prior to processing. Seed with moisture content above 15% are subject to excessive damage in the processing line. In this case natural or artificial drying may be necessary.

Physical characteristics used to separate seed include size, length, weight, shape, surface texture, colour, affinity for liquids and electrical conductivity.

Seed processing can broadly be divided into various steps (Fig. 2). As the seed is received into the processing plant, it goes either directly into the cleaning process or into storage to await processing. Drying may be necessary. As processing begins, the first phase (conditioning and pre-cleaning) consists of scalping, debearding, shelling or any other operation necessary to make the seed flow

easily. The second phase (cleaning and grading) includes the removal of inert materials, weed seed, other crop seed, and broken seed that are larger or smaller than the crop seed and obtain the seed mass in the uniform size range of perforations of top and bottom screen.

After the desired purity is obtained, seed enters the final processing phase of separation based on specific characteristics like length, weight etc and treating and packaging. Processed seed is stored for later sale.

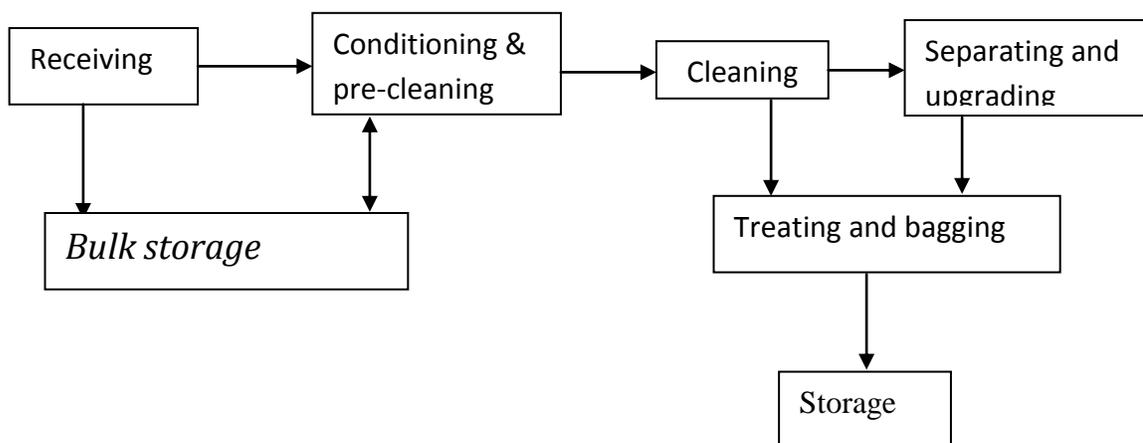


Fig. 2. Basic flow and essential steps in seed

Essential Requirements for success of Seed Company

Following are essential requirements for setting up and successful operation of a seed company:

- I. Farm**
- II. Processing plant**
- III. Electricity**
- IV. Buildings**
- V. Raw materials**
- VI. Man power**
- VII. Marketing**

2.5.1 Farm

Farm is needed for undertaking production of certified seeds. In Indian conditions, contract growing of seed has become fairly acceptable and venture being profitable, farmers are coming forward to undertake seed production for reliable companies.

As has already been previously indicated, the proposed locality is having excellent irrigation facility and farmers are already aware of seed production programmes of OSSC, there is no problem in

identifying experienced and progressive farmers willing to undertake seed production for the company. In the initial year, response has been very encouraging.

Owners of the company have their own farm, which would exclusively support production of foundation seed from breeder seed, if intended or planned at later date.

2.5.2 Processing plant

Seed processing plant will be equipped with all the machines needed for successful cleaning, grading operations. Similarly, seed storage is needed to store the seed during the period from receipt of seed at the plant till it is supplied to the dealer/farmer for sale.

Cleaner is the basic machine in a seed processing plant. Capacity of plant is accordingly known by the capacity of cleaners. The capacity of seed cleaners is specified in terms of wheat seed. While handling paddy, the capacity of machine reduces to half and hence the company would plan to establish a plant with sufficient capacity to process double the quantity of planned paddy production within the available processing period.

Considering the seed production plan, the company requires seed processing plant of 2 ton per hour capacity to handle present requirements as well as to handle future processing needs.

2.5.3 Electricity

Electricity is available from Orissa state electricity board. However, standby DG set would also be installed to take care of processing need in the event of power failure.

2.5.4 Buildings

Seed processing plant building, seed stores, reject store and office accommodation is needed to perform the processing and storage works successfully.

2.5.5 Raw material

Raw material for the certified seed production programme is foundation seed, which would be available from KVKs/University/SSC/NSC without any problem.

Other raw materials, like certification and packing material is available in the market, which would be purchased with printing in the name of the company.

2.5.6 Manpower

Adequate labour force is available around the area to work on the processing plant. This would rather be an opportunity for employment to rural youth in this backward rural area. Expert support will be

available from OSSCA and other state agencies. Company also plans to employ agricultural graduate for internal quality checks.

2.5.7 Marketing

Company is using its own outlet for sale. Experiences of previous year indicate that company was able to sale about 40% of produce through own sale counter. Subsequent queries from farmers are encouraging. Rest of the material was sold through dealer or to NSC. Company plans to increase its dealer's network throughout the locality and also have suitable tie-ups with state/central agencies for sale of seed and anticipates that there would be no problem with sale of seeds.

Seed Processing Plant and Buildings

Seed, as a component of the production phase in the grain industry can be considered as a mini industry that requires integration of production processing; storage, and marketing. Although only a small part of the total system, the seed has a strong influence on the viability of the industry, because as the most basic input, the seed sets the upper limits of productivity, product quality, and price.

Seed processing plant is designed based on the characteristics of seed grain and the impurities present in it, which need to be separated. Capacity of plant is known by the capacity of the seed cleaner which is the basic machine in the seed processing plant. Other machines, which work on the principle of separating the material, based on difference in characteristics of good seed and impurities are included in the plant. Capacity of such machines are kept matching with that of cleaner to have effective utilization.

3.1 Processing Machines

Brief descriptions of the processing machines used in a seed processing plant are given hereunder.

3.1.1 Scalper

Paddy seed contains contaminants of various kinds as it comes into the processing plant especially if it has not been harvested and threshed mechanically. To get the seed into condition to flow easily through the processing operations, to improve capacity and separating precision during processing, and to prevent loss of quality, seed is usually prepared for processing by sending them through one or more special machines or processes. A scalper can be used to rough clean seed when trash content is high.

The scalper basically consists of a vibrating or rotating screen or sieve. The screen perforations are large enough to allow the rough seed to pass through readily while large inert material is scalped off and removed from the seed lot.

3.1.2 Air screen cleaner

The air screen cleaner is the basic machine in almost all seed processing plants. The air screen cleaner uses three cleaning principles viz aspiration, scalping and grading. A common air screen cleaner for processing seed uses two air blasts and two screens. The first air system removes dust and light chaff before the seed reaches the first screen. The first screen allows the good seed to drop onto the second screen. The large foreign material rides over the first screen and is discarded. The second screen is a grading screen.

3.1.3 Specific gravity separator

Seed of same size and general shape can often be separated because they differ in specific gravity. This difference is very useful in removing light immature seed or heavy sand and rocks to improve the purity and germination of crop seed.

3.1.4 Indented cylinder

Seed of the same width and thickness can sometimes be separated by taking advantages of difference of length. Indented cylinder can do very precise separation by using length difference. The indented cylinder separator is a rotating almost horizontal cylinder with a movable horizontal separating trough mounted inside it. Thousand of half round indents line the inside surface of cylinder.

3.1.5 Elevator

Single leg bucket elevator consisting of receiving hopper, boot, bucket, belt, boot pulley, leg, head pulley, motor, drive and discharge spout will be used for conveying seed from one machine to another machine. It will lift the seed from the ground vertically upward and discharge it from top to the different machines. This type of elevating machines requires less power and floor area.

3.2 Design Criteria of Processing Machines

Generally the manufacturers specify capacities of processing equipments in terms of wheat only. Capacity of seed processing equipment and machinery in terms of paddy has been assumed to be 50% as compared to wheat. Working efficiency of processing equipment has been assumed to be 80% of the rated through put capacity.

Seed processing is a seasonal work. Seed requires drying, cleaning and packaging in an accelerated and continuous manner so as to complete processing load within the limited period available to enable seed maintaining its viability. Moisture content of the harvest at the time of receipt is usually 9 to 12% (wb) during both rabi and kharif seasons and hence will not require drying facilities.

Maximum seed volume to be handled at the proposed seed processing complex during the rabi will be 3120 quintals whereas during kharif season will be of the order of 3680 quintal as per proposed

production plan given in Table 4. Hence, the cleaning cum grading capacity of the processing plant will be determined on the basis of 3680 quintals load. This amount of seed is to be processed during the period of 20 days. Seed processing during both the seasons will be conducted in 2 shifts per day basis with processing plant operating 16 hours a day.

Based on above assumptions, processing load and period available for processing, average seed cleaning-grading capacity (on paddy basis) works out to be 2 tonnes per hour. The details of various processing machines required in the project are given in Table 5.

Electrical energy will be made available by state electricity board. One standby diesel generating set of 45 kVA rating has been proposed for meeting exigencies in the event of power shedding/failure. The estimated cost is given in Table 6.

Processing machines required in the seed processing plant

S. No.	<i>Name of machines</i>	Capacity	Qty.
1.	Pre-cleaner	4TPH	1 No.
3.	Seed Cleaner	4TPH	1 No.
4.	Indent Cylinder	4 TPH	1 No.
5.	Specific gravity separator	4 TPH	1 No.
6.	Elevator up to 5 m height	4TPH	4 No.
8.	Vacuum cleaner		1 No.
9.	Electronic moisture meter (Wet type)	-	1 No.
10.	Bag closer heavy duty	Nil	2 No.
11.	Weighing machine	500 kg	1 No. 1 No.
12.	Diesel generating set	100 KVA	1 No.
	Total (X)		
13.	Spares parts for 3 Years @ 5% of amount (X)		
14.	Installation, testing, commissioning of Machines @ 10% of amount (X)		
15.	Laboratory equipments like germinator, hot air oven, weighing balance, divider etc		
16.	Sum of S. No. 1 to 15		
17.	Contingencies @ 3%		

3.3 Layout and Process Flow Operations

Process flow operation enables processing of seed through suitable machines. Elevators are provided with bypassing arrangements to bypass certain machines, if use of any machine is not needed in subsequent operation in particular seed lot. For example, all the lots may not need use of indented cylinder grader or specific gravity separator and hence in such case the elevator direct the seed to the next process by bypassing these units.

Layout of the plant will be made in a way to ensure minimum travel both vertical and horizontal to avoid injury to seed. Layout plan and process flow chart are given in Figs. 4 and 5.

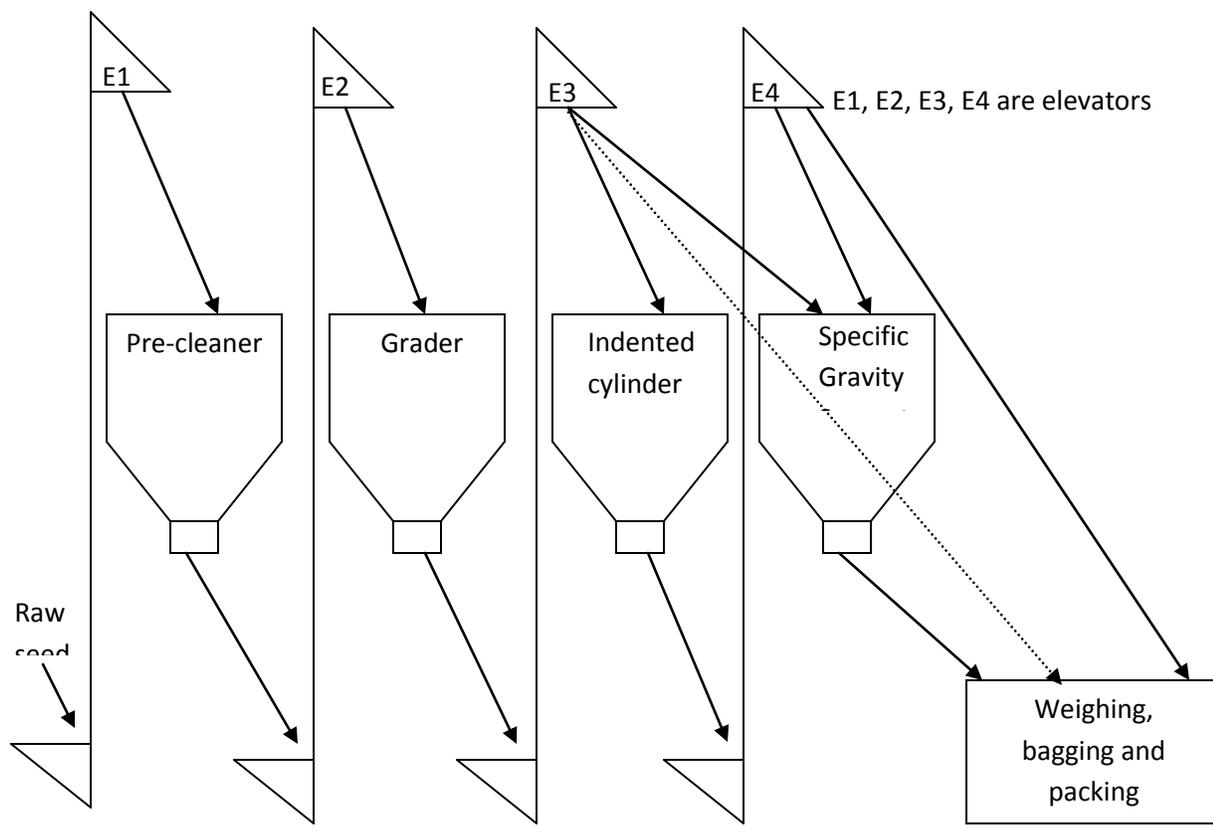


Fig. 4 Layout of seed processing machines

As shown in Fig. 4, raw seed will be fed to the pre-cleaner by elevator (E1). This machine will remove large size undesired materials from the seed. The partially cleaned seed will be fed to the cleaner cum grader with elevator (E2). Here, the small undersized materials including undersized seeds will be separated on the basis of size difference and weight difference. The cleaned and sized seed will be fed to the indented cylinder by elevator (E3) whereby the broken and short seeds will be separated. The graded seed will be fed to the specific gravity

separator by elevator (E4) for removing light seed. If it is not required then it will be bypassed. The processed seed will be packed, weighed and stitched with the help of weighing and stitching machine.

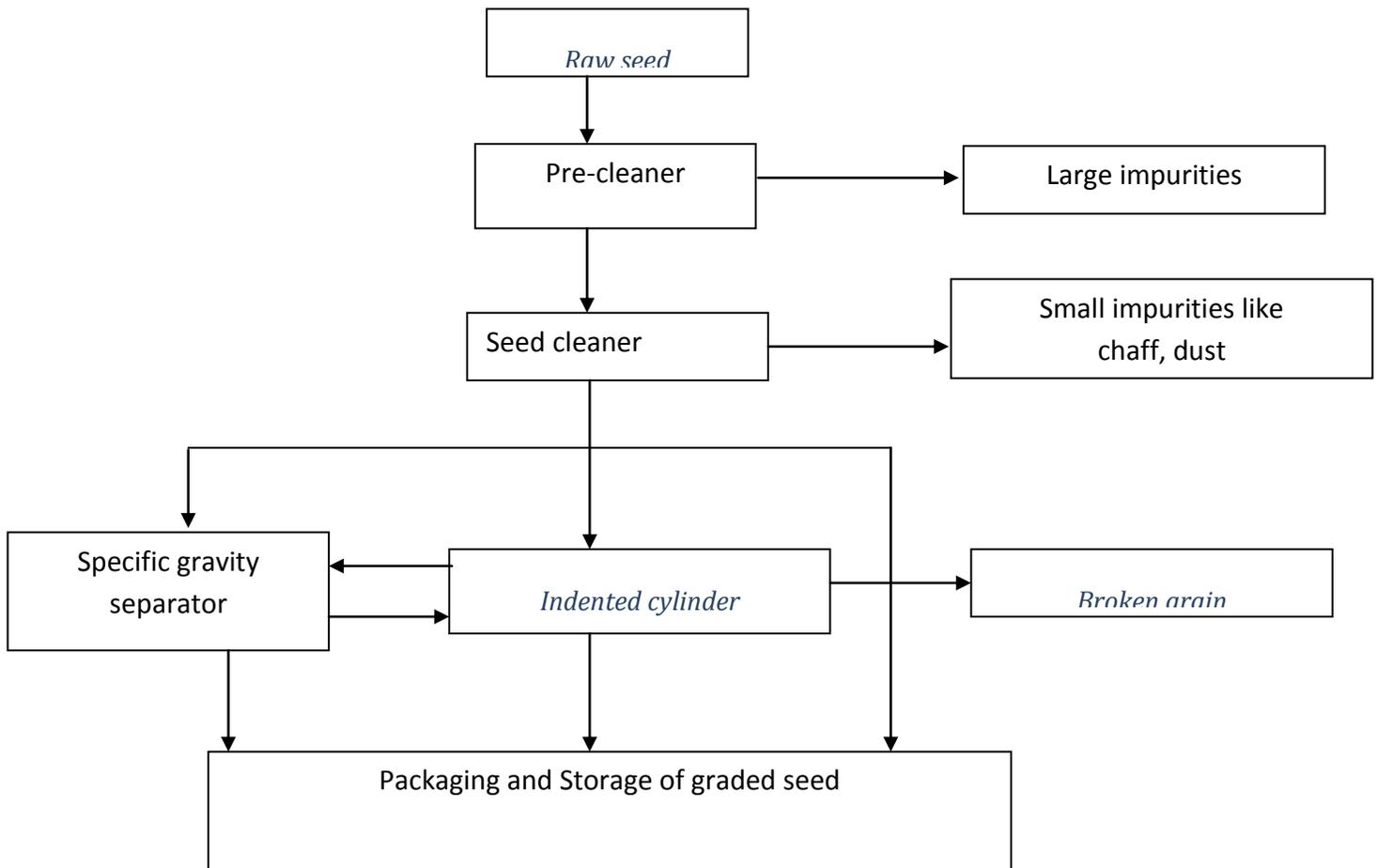


Fig. 5 Process flow chart of seed processing

3.4 Packaging

After processing, the seed is packed. Bagging is usually the slowest and most costly operation in a seed processing plant. Bagging requires filling the bag to an exact weight, closing and labelling the bag. These operations are done either with hand or with manually operated machines, like weighing scale and bag closer.

Bagger-weighers are simple machines and are very accurate, easy to adjust and can fill 5 to 6 or more bags per minute. Bag-sewing machines are precision, high-speed machines.

The label is attached to the seed bag, or it is printed directly on to the container or bag. The label contains all-important information about the seed.

Complete processing records need to be maintained to trace the seed from the time it is received at the plant until it is sold with full details of operations. A processing plant record system include following records:

- i. Receiving
- ii. Drying/storage
- iii. Processing, treating and packaging
- iv. Testing
- v. Storage
- vi. Inventory
- vii. Sale

3.5 Seed storage

Good seed storage is an important phase of processing and is essential to successful seed marketing. Proper storage preserves seed viability, from harvest to sale, and protects the producer, the processor and the user.

The storage is provided for seed from the time of harvest until planting time. Storage is provided for seed that may be carried over until the planting season in the next or a subsequent year.

The rate of deterioration of crop seed in storage increases as seed moisture content increases. Mature seeds are hygroscopic and hence their moisture contents vary with the relative humidity of the atmosphere. Moisture absorption or desorption of seed is a relatively slow process. Moisture content and temperature are important factors in seed storage. Dry cool conditions are best for seed storage.

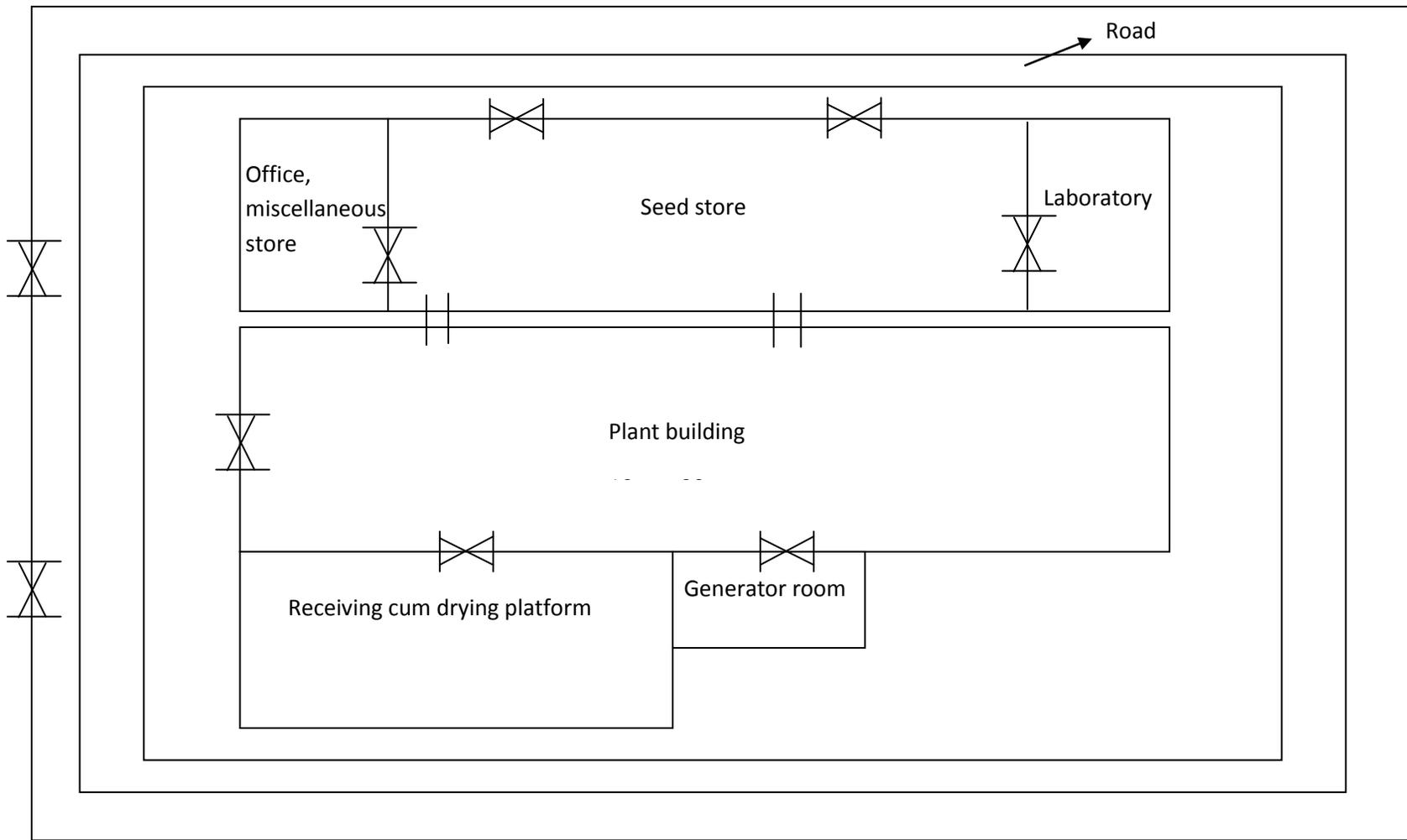


Fig. 7 Building layout plan

BASIC DATA SHEET FOR SEED PROCESSING UNIT

S.No.	Particulars	Quantity	Amount (Rs. lakhs)	Justification
A.	Equipment / machinery/ infrastructure facilities			
1	Air Screen Cleaner-cum-Grader	1		For removing the dockage, under size seeds, separating the unwanted seeds components from the seed mass and grading
2	Length Separator	1		For separating the seeds according to width and thickness
3	Seed Drying Unit /Seed Dryer	1		For removing moisture from seeds
4	Seed moisture meter			For measuring the moisture of seeds
5	Seed Treater	1		For treating the seeds
6	Other connected equipments / accessories/different sizes sieve	-		For sieving the seeds
7	Seed Testing Laboratory Equipments (Gamete divider, Seed Grader, Diachonoscope, etc.)	-		For testing the seeds
8	Plate farm balance - 200 kg	1		For weighing of seeds
9	Electronic Balance - 5 kg	1		For weighing seeds to fill in to packets
10	Seed storage bins	15		To store the seed in airtight containers
11	Packing machine/ Bag Closer/ packing material	1		For packing of seed
12	Room (20'x10')	1		For installation of equipments
13	Godown (20'x20')	1		To store the seed in storage bins
14	Drying plat farm (20'x20')	1		To dry seed in large quantity
15	Others equipments			
	Total (A)			
B	Operational Cost (Expenses involved in processing, packaging and handling of seed, chemicals, glassware, TA/POL/ hiring of vehicle, repair, skilled & unskilled labours, two iron display boards, plates, stationary, photocopies, photography, report preparation etc.)			
	Total (B)			
	Grand Total (A+B)	200.00		

CHECK LIST

S. No.	DESCRIPTION	PAGE NO
1.	Application Form along with Appraisal Report	
2.	Basic Data Sheet with Complete Technical Aspects	
3.	Detailed Project Report MIDH Guidelines	
4.	Bank Sanction Letter along with appraisal Report	
5.	Approval from Gram Panchayat / Municipality / Town Planning	
6.	SSI Registration Certificate	
7.	Fire Department Approval	
8.	PAN Card Copy of the unit	
9.	Electricity Approval	
10.	DMC Approval	
11.	Promoter's Affidavit as per Prescribed Format	
12.	Land Document	
13.	Land Conversion Certificate	
14.	Certificate from Civil Design Engineer	
15.	Certificate from Bank for Non-Availing Subsidy from any other State/Central Govt. Department.	
16.	Insurance of the Fixed Assets	

APPLICATION FOR AVAILING ASSISTANCE / SUBSIDY UNDER MIDH

(COMPONENT: SEED PROCESSING UNIT)

Name of the Scheme: Post Harvest Management

- 1 Name of the Farmer :
- 2 Father / Husband Name :
- 3 Caste (SC/ST/BC/OC) :
- 4 Address: :
- Phone / Cell No.: :
- 5 Land records with Extent in Acres / Ha. :
(Copy of Pass Book / Adangal)
- 6 Source of Irrigation (Open well / Bore well / Canal) :
- 7 Name of the Financing Bank, Loan Amount Proposed :
- 8 Whether any Govt. Subsidy availed previously :
- 9 Any other relevant information :

Declaration

I, _____

declare that the particulars furnished above are true to the best of my knowledge and I promise that the benefit obtained from State MIDH Cell will be used for the purpose for which it is given and in case of misuse I am liable for any action deemed to be fit by Govt. of A.P., including recovery of the subsidy amount with 12% interest to the Government.

Enclosures: 1. Affidavit
2. Pattadar Pass Book
3. Detailed Project Estimate by Civil Engineer
(Regd. No. along with Seal)

Signature of the Farmer / Entrepreneur.

Recommendations of the Horticulture Officer : _____

Horticulture Engineer

Horticulture Officer

Asst. Director of Horticulture.

PRELIMINARY INSPECTION REPORT FOR SEED PROCESSING UNIT

- Date of Inspection :
- A Component :
- B Details of Project** :
- (iii) Name of the project :
- (iv) Address for communication :
with telephone No. :
- C Project Location with Address** :
- (i). Survey No :
- (ii). Village :
- (iii). Mandal :
- D Constitution (Individual/ Joint :
Individual/Partnership Firm/ :
Company. :
- E (i) Proposed Activity :
(ii) Type :
(iii) Proposed type of cooling :
system :
- F Name of the Promoter :
- G Present physical status of the project :**
- I. Construction started or not :
- (v) Land development :
status/boundary/road :
- (vi) Connecting road to the plot :
- (vii) Stage of cold store building :
civil/pre engineered as on :
inspection date :
- (viii) Type of produce to be :
processed

Promoter Horticulture Engineer Horticulture Officer Asst. Director of Horticulture

**FORMAT TO CONDUCT FINAL AND JOINT INSPECTION FOR SEED PROCESSING
UNITS BY THE COMMITTEE UNDER POST HARVEST MANAGEMENT COMPONENT OF
MIDH, A.P.**

2) GENERAL INFORMATION

- 1) Name of the Unit with full address :
(Sy. No. / Area / Village / District)
- 2) Date of Issue of Administrative Sanction :
- 3) Name of CEO of Company / Managing Director :
- 4) Constitution: Individual / Group of Individuals / :
Society / Partnership Firm / Pvt. Ltd. Company / :
Public Ltd. Company :
- 5) Date of Inspection of the Project :
- 6) Name & Designation of the Committee members :
(a)
(b)
(c)
(d)
- 7) Name of the Bank (with Full address & :
Phone & Fax No.) :
a) Subsidy reserve fund account no. :
- 8) Date of start of the project :
- 9) Date of Completion of the project :
- 10) a) Date & amount of Sanction of Term Loan :
b) Repayment Period :
- 11) Land Details
i. Whether land is in the name of promoter: Yes / No
ii. Whether land is a Regd. Lease land for : Yes / No
Minimum 10 years in favour of applicant
(in case of lease)

**Name & Signature
of Applicant**

**Name & Signature
of Expert**

**Name & Signature
of Inspecting Officer
(Bank)**

**Name & Signature
of ADH concerned**

**Name & Signature
of Senior Officer
from MIDH**

MACHINERY / EQUIPMENT DETAILS

S.No.	Particulars	As per DPR	As per Jt. Inspection
A.	Equipment / machinery/ infrastructure facilities		
1	Air Screen Cleaner-cum-Grader		
2	Length Separator		
3	Seed Drying Unit /Seed Dryer		
4	Seed moisture meter		
5	Seed Treater		
6	Other connected equipments / accessories/different sizes sieve		
7	Seed Testing Laboratory Equipments (Gamete divider, Seed Grader, Diachonoscope, etc.)		
8	Plate farm balance - 200 kg		
9	Electronic Balance - 5 kg		
10	Seed storage bins		
11	Packing machine/ Bag Closer/ packing material		
12	Room (20'x10')		
13	Godown (20'x20')		
14	Drying plat farm (20'x20')		
15	Others equipments		

Name & Signature
of Applicant

Name & Signature
of Expert

Name & Signature
of Inspecting Officer
(Bank)

Name & Signature
of ADH concerned

Name & Signature
of Senior Officer
from MIDH

FORMAT
(On Letter head of the CA)

To

**The Mission Director & Commissioner of Horticulture,
Govt. of Andhra Pradesh,
GUNTUR.**

We have examined the books of accounts and other relevant records maintained by M/s. / Shri / Smt. _____(Name of the Beneficiary) at its office situated at _____(Address of project) for _____(Project activity). These accounts are maintained by the Company's management, partners of the firm / proprietor of the concerned / grower / NGO / and our responsibility is to verify the truth and fairness of these records and verification of amount expended for acquisition / construction of fixed assets / establishment and other expenditure.

We conducted our work in accordance with the Audits and Accounting Standards generally accepted in India. Those Standards require that we plan and perform our verification to obtain reasonable assurance about whether these accounts are true and fair are free of material misstatement. A verification included examining on 100% basis, evidence audit includes examining, on a test basis assessing the accounting principles used and significant estimates made by the grower, as well as evaluating the overall financial statement presentation. We believe that our audit provides reasonable basis of our opinion.

We verify that

- a) We have obtained all the information and explanation that to the best of our knowledge and belief were necessary for the purpose of our verification.
- b) In our opinion, proper books of accounts as required by law have been kept by the Company / firm / sole proprietorship concern / grower / NGO for the financial period _____and these books of account represent true and fair view of the transaction entered into by the Company / firm / sole proprietorship concern / grower / NGO.
- c) In our opinion, the Company / firm / sole proprietorship concern / grower / NGO has incurred a capital expenditure amounting to Rs. _____ (Rupees _____only) for acquisition / construction of fixed assets and the same is being reflected properly in the books of accounts. The valuation made of major components of the project and whole project is tabulated as follows:

Establishment of Project:

S. No.	Component	Proposed Expenditure as per LOI	Cost as appraised by Bank before term loan sanction	Cost assessed by CA	Remarks
1					
2					
3					
	TOTAL				

Total : _____

MEANS OF FINANCE

S. No.	Item	Project Cost as per DPR	Project Cost as per Appraisal Report	Actual Cost
1	Promoter's Equity			
2	Term Loan			
3	Unsecured Loan			
4	Grant from NHM			
5	Others			
	TOTAL			

We recommend Rs. as the cost of the whole project.

**Signature and Seal of C.A.
with Membership No.**

Date:

FORMAT

(Forwarding letter of Bank for Conducting JIT)
Name & Full Address of the FI/Bank (on letter head)

To
The Mission Director & Commissioner of Horticulture,
Govt. of Andhra Pradesh,
Public Gardens, Nampally,
GUNTUR

Subject : Request for Joint Inspection of the project

Sir,

MIDH, A.P., had released Rs. as credit linked back-ended subsidy in respect of project of _____ Village _____ District _____ State Vide letter no As per instruction, the subsidy amount has been kept in Subsidy Reserve Fund account of the bank and interest benefit is being passed on to the beneficiary. Now project is complete as per original proposal and we have also disbursed full Term loan sanctioned for the above mentioned project. In addition to documents submitted by bank at the time of claim of subsidy such as copy of the Appraisal Note, Term Loan sanction letter, copy of Record of Right, following documents required for Joint Inspection are being submitted with the request to conduct Joint Inspection of the project to decide final subsidy claim.

S. No	Particulars	Enclosed or Not
1	Details of date-wise release of term loan	
2	Completion certificate by Bank/FIs	
3	Undertaking from promoter (as prescribed by NHM)	
4	Extract of subsidy reserve fund account of bank in which estimated subsidy has been kept	

It is certified that the original of above documents and documents submitted at the time of subsidy claim by bank pertaining to the projects are kept in Bank/FI, which can be shown at the time of random monitoring by the Department or any agency authorized by the Department.

(Seal and Signature of the Bank's Officer)

Name : _____

Name of the Bank :

Address :

Phone/Fax/Mobile No.: _____

Place : _____

Date : _____