

**FACULTY OF AGRICULTURAL SCIENCES
AND ALLIED INDUSTRIES**

SEED SAMPLING

Seed sampling is to draw a portion of seed lot that represent the entire seed lot.

Introduction

Seed lot - It is an uniformly blended quantity of seed either in bag or in bulk.

Seed Size	Maximum quantity per lot
Larger than wheat and paddy	20,000 kg
Smaller than wheat and paddy	10,000 kg
Maize	40,000 kg

Sampling intensity

a. For seed lots in bags (or container of similar capacity that are uniform in size)

- I. up to 5 containers Sample each container but never, < 5 Primary sample
- 6-30 " Sample atleast one in every 3 containers but never > than 5 P.S.
- 31-400 " Sample atleast one in every 5 containers but never < 10 P.S.
- 401 or more Sample atleast one in every 7 containers but never < 80.

II. When the seed is in small containers such as tins, cartons or packets a 100 kg weight is taken as the basic unit and small containers are combined to form sampling units not exceeding this weight e.g. 20 containers of 5 kg each. For sampling purpose each unit is regarded as one container.

b. For seeds in bulk

- Up to - 500 kg - Atleast 5 Primary sample
- 501 - 3000 Kg - 1 Primary sample for each 300 kg but not less than 5 Primary sample
- 3001-20,000 Kg - 1 Primary sample for each 500 kg but not less than 10 Primary sample
- 20,001 and above - 1 Primary sample for each 700 kg but not less than 40 Primary sample

PRINCIPLES OF SAMPLING

Sample is obtained from seed lot by taking small portion at random from different places and combining them. From this sample smaller samples are obtained by one or more stages. In each and every stage thorough mixing and dividing is necessary.

Methods of sampling

a. Hand sampling

This is followed for sampling the non free flowing seeds or chaffy and fuzzy seeds such as cotton, tomato, grass seeds etc., In this method it is very difficult to take samples from the deeper layers or bag. To overcome this, bags are emptied completely or partly and then seed samples are taken. While removing the samples from the containers, care should be taken to close the fingers tightly so that no seeds escape.

b. Sampling with triers

By using appropriate triers, samples can be taken from bags or from bulk.

I. Bin samplers

Used for drawing samples from the lots stored in the bins.

2. Nobbe trier

The name was given after Fredrick Nobbe- father of seed testing. This trier is made in different dimensions to suit various kinds of seeds. It has a pointed tube long enough to reach the centre of the bag with an oval slot near the pointed end. The length is very small. This is suitable for sampling seeds in bag not in bulk.

3. Sleeve type triers or stick triers

It is the most commonly used trier for sampling : There are two types viz.,

1. With compartments 2. Without compartments.

It consists of a hollow brass tube inside with a closely fitting outer sleeve or jacket which has a solid pointed end. Both the inner tube as well as the outer tube have been provided with openings or slots on their walls. When the inner tube is turned, the slots in the tube and the sleeve are in line. The inner tube may or may not have partitions.

This trier may be used horizontally or vertically. This is diagonally inserted at an angle of 30 °C in the closed position till it reaches the centre of the bag. Then the slots are opened by giving a half turn in clockwise direction and gently agitated with inward push and jerk, so that the seeds will fill each compartment through the openings from different layers of the bag, then it is again closed and with drawn and emptied in a plastic bucket. This trier is used for drawing seed samples from the seed lots packed in bags or in containers.

TYPES OF SAMPLES

1. Primary sample

Each probe or handful of sample taken either in bag or in bulk is called primary sample.

2. Composite sample

All the primary samples drawn are combined together in suitable container to form a composite sample

3. Submitted sample

When the composite sample is properly reduced to the required size that to be submitted to the seed testing lab, it is called submitted sample. Submitted sample of requisite weight or more is obtained by repeated halving or by abstracting and subsequently combining small random portions.

4. Working sample

It is the reduced sample required weight obtained from the submitted sample on which the quantity tests are conducted in seed testing lab.

Weight of submitted sample

The minimum weight for submitted samples for various tests are as follows

1. Moisture test

100 gm for those species that have to be ground and 50 gm for all other species.

2. For verification of species and cultivar

Crop	Lab only (g)	Field plot & Lab (g)
Peas, beans, maize, soybean and crop seeds of similar size	1000 500	2000 1000
Barley, oats, wheat and crop seeds of similar size	200	500
Beet root and seeds of similar size	100	250
All other genera		

3. For other tests like purity and count of other species

Crop	Size of seed lot (kg)	Size of submitted sample (g)	Size of working purity (g)	Sample count of other species (g)

Paddy	25,000	400	40	400
Wheat	25,000	1000	120	1000
Maize	40,000	1000	900	1000
Sorghu	10,000	900	90	900
m Bajra	10,000	150	15	150
Red	20,000	1000	300	1000
gram	20,000	1000	120	1000
Green gram	20,000	1000	150	1000
Black gram	20,000	1000	1000	1000
Bengal gram	20,000	1000	400	1000
Cowpea	20,000	1000	500	1000
Soybean	20,000	1000	1000	1000
Groundnut (pods)	20,000	1000	600	1000
Groundnut	10,000	70	7	70
(kernels) Gingelly	20,000	1000	250	1000
Sunflower (variety)	20,000	1000	125	250
Sunflower (hybrid)	20,000	1000	350	1000
Cotton linted (variety)	20,000	350	35	350
Cotton de-	20,000	350	35	350
linted (variety)	20,000	250	25	250
Cotton linted (hybrid)	10,000	150	15	150
Cotton de-	10,000	150	15	150
linted (hybrid)	20,000	1000	140	1000
Brinjal	10,000	70	7	70
Chillie	10,000	7	7	7
s	10,000	100	10	100
Bhendi				
Tomato (variety)				

Tomato	10,000	100	10	100
(hybrid)	10,000	100	10	100
Cabbage				
Cauliflower				
Knolkhol				

The samples taken may be packed in bags, sealed and marked for identification. For moisture testing the samples should be packed separately in moisture proof polythene bag and kept in the container along with the submitted samples.

Information to accompany the sample

Date Kind Variety
Class of seed Lot No.
Quantity of seed in lot (kg)
Test(s) required (1) Purity (2) Germination (3)
Moisture Senders Name and Address

Types of sample used in Seed Testing Laboratory

- Service sample** - Sample received from the farmers
- Certified sample** - Sample received from certification agencies or officers
- Official sample** - Sample received from the seed inspectors.

Mixing and dividing of seeds

The main objective of mixing and dividing of seeds is to obtain the representative homogenous seed sample for analysis by reducing the submitted sample to the desired size of working sample.

Method of mixing and dividing

1. Mechanical dividing
2. Random cups method
3. Modified halving method
4. Spoon method
5. Hand halving method

1. Mechanical method

The reduction of sample size is carried out by the mechanical dividers suitable for all seeds except for chaffy and fuzzy seeds.

Object ive of mechanical dividing

- To mix the seed sample and make homogenous as far as possible
- To reduce the seed sample to the required size without any bias
- The submitted sample can be thoroughly mixed by passing it through the divider to get 2 parts and passing the whole sample second time and 3rd time

if necessary to make the seeds mixed and blended so as to get homogenous seed sample when the same seeds passed through it into approximately equal parts.

- The sample is reduced to desired size by passing the seeds through the dividers repeatedly with one half remain at each occasion.

TYPES OF MECHANICAL DIVIDERS

1. Boerner divider

It consists of a hopper, a cone and series of baffles directing the seeds into 2 spouts. The baffles are of equal size and equally spaced and every alternate one leading to one spout. They are arranged in circle and are directed inward. A valve at the base of the hopper retains the seeds in the hopper. When the valve is opened the seeds fall by gravity over the cone where it is equally distributed and approximately equal quantity of seeds will be collected in each spout. A disadvantage of this divider is that it is difficult to check for cleanliness.

2. Soil divider

It is a sample divider built on the same principles as the Boerner divider. Here the channels are arranged in a straight row. It consists of a hopper with attached channels, a frame work to hold the hopper, two receiving pans and a pouring pan. It is suitable for large seeds and chaffy seeds.

3. Centrifugal or Gamet Divider

The principle involved is the centrifugal force which is used for mixing and dividing the seeds. The seeds fall on a shallow rubber spinner which on rotation by an electric motor, throw out the seeds by centrifugal force. The circle or the area where the seeds fall is equally divided into two parts by a stationary baffle so that approximately equal quantities of seed will fall in each spout.

II. RANDOM CUP METHOD

This is the method is suitable for seeds requiring working sample upto 10 grams provided that they are not extremely chaffy and do not bounce or roll (e.g.) Brassica spp.

Six to eight small cups are placed at random on a tray. After a preliminary mixing the seed is poured uniformly over the tray. The seeds that fall into the cup is taken as the working sample.

III. MODIFIED HALVING METHOD

The apparatus consists of a tray into which is fitted a grid of equal sized cubical cups open at the top and every alternate are having no bottom. After preliminary mixing the seed is pouted evenly over the grid. When the grid is lifted approximately half the sample remains on the tray. The submitted sample is successively halved in this method until a working sample size is obtained.

IV. SPOON METHOD

This is suitable for samples of single small seeded species. A tray, spatula and a spoon with a straight edge are required. After preliminary mixing the seed is poured evenly over the tray. The tray should not be shaken there after. With the spoon in one hand, the spatula in the other and using both small portions of seed from not less than 5 random places on the tray should be removed. sufficient portions of seed are taken to estimate a working sample of approximately but not less than the required size.

IMPORTANT QUESTIONS:

1. What do you mean by seed sample? What should be the quantity for seed sample?
2. What are different types of equipments used for seed sampling?
3. Explain the methods to take samples from a seed lot.
4. Describe mechanical dividers and their roles.
5. What are different types of samples used in seed laboratories.

