Excerpts from
SAMPLING METHODS AND PROCEDURES
For the Certification of Flax Seed in 2010

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General Principles of Sampling

The objective of sampling a lot of seed or grain is to obtain a representative sample of a size suitable for the required testing and/or grading. It is expected that the test results and grading will reflect the average quality of the seed or grain lot from which the sample was taken.

The principles of sampling and the methods and procedures described in this document are science based and reflect current international methods for sampling seed or grain. The sampler plays a critical role in sampling lots for testing and/or grading as the accuracy of the sampling and the information submitted with the sample are vital to the validity of any subsequent test results.

The principle of random sampling is that each particle in the population being sampled has an equal chance of being chosen. Ordinarily, the size of the sample tested is minute compared with the size of the lot which it represents. It is essential that the sample be taken with care and in a manner which provides confidence that the sample is truly representative of the lot. Likewise, in reducing the composite sample, every effort must be made to obtain a representative submitted sample. No matter how accurately the analytical work is done, the results can only reflect the quality of the sample submitted for analysis.

The accuracy with which the results of analyses represent the lot depends upon:

a) the homogeneity of the lot from which the sample is drawn;
b) whether the sampling is done in a manner that ensures that the sample is randomly selected;
c) the use of sampling equipment appropriate to the crop type and the program for which the sampling is taken;
d) the care used in drawing the samples;
e) the care with which the primary samples are mixed to obtain the composite sample;
f) the care used in mixing and dividing the composite sample to obtain the required sub-samples for testing; and
g) the integrity of the primary, composite and submitted sample(s) and the information provided with the submitted sample(s) (sample submission form).

1. Conditions for sampling

2.1 Preparation for Sampling

Well before sampling begins, the sampler should be familiar with safe sampling procedures, the facility where sampling will occur, and any applicable health and safety policies and practices at the facility. The sampler must also determine the purpose for which the sample is drawn and the specific program's sampling requirements.

When preparing to sample a lot, the sampler must determine the correct lot to be sampled by verifying that the information on the tags, bags or labels is correct and complete. The lot size and identification should be verified by consulting the documentation for the lot.

If sampling a static lot (e.g. bags, totes, shipping containers), the sampler must verify that all containers within the lot are the same product and approximate weight, and are accessible for sampling. If manual stream sampling, the sampler must ensure that the entire stream is accessible to facilitate appropriate sampling procedures.

2.2 Maintaining the Integrity of the Lot

The facility must ensure that the integrity and identity of the sampled lot is preserved and does not change. The facility must be able to link a particular sample to the lot through documentation and procedural controls.

For obtained a sample for the testing of a cleaned lot of seed the, lot must either be sealed prior to the time of sampling or, if stream sampled, sealed immediately after sampling. Sealed means that the container in which the product is held is closed in such a way that it cannot be opened to gain access to the product and closed again without either destroying the seal or leaving evidence of tampering. This includes product in bins, bags, totes and shipping containers, either by tamper-proof metal or other seals, or by single stitching through a tag or label.

2.3 Homogeneity of the lot

Homogeneity or uniformity of the lot is important for seed. To verify the uniformity of the lot, the sampler must assess each primary sample for uniformity with the samples drawn previously before adding it to the composite sample. Samples drawn by automatic samplers should be examined periodically throughout the lot if possible. Uniformity can be assessed by verifying that the colour, size and shape of the seed or grain, the amount of chaffy material and the presence of visible impurities are relatively uniform within and between each primary sample.

If the samples are not uniform and where there is evidence that the lot is not reasonably uniform, the sampler must discontinue sampling and corrective action must be taken.

2. Sampling Procedures for Rough Seed

As the GM test of the rough flax seed is simply to determine whether to proceed with cleaning, the sampling procedures are left to the operator. However, it is strongly recommended to adhere to the sampling procedures described in the following sections. A 1 kg sample must be obtained and submitted to the testing laboratory.

3. Sampling Procedures while Cleaning Rough Seed

Samples taken from the stream of a seed must be drawn at regular timed intervals from the beginning to the end of the transfer. The samples may be taken off the conditioning equipment, or as the cleaned product is transferred into a storage container or bagged.

Stream sampling eliminates the need for either probing a container or bin or probing a sufficient number of bags to obtain the composite sample. When stream sampling is not possible, the manual static methods for sampling described in Section 5 may be used.

4.1 Required Seed Sample Sizes of the cleaned seed

	Total Composite Sample		Purity Examination		Germination	Retained Sample
	Bulk	**Bagged**	**Bulk**	**Bagged**		
Flax – grading sample	3 kg	2.5 kg	100 g + 400 g	100 g	250 g	2 kg
Flax – GM test sample	2 kg	2 kg				

4.2 Automatic Stream Sampling

There are many types and designs of automatic sampling devices. Automatic samplers take the most representative sample from lot because there is no human bias involved. They draw a sample automatically by removing a portion of the product from the flow at regular intervals. An automatic sampling device is to be used and maintained within the facility's quality management system (QMS). The automatic sampler must be calibrated regularly and verified at minimum annually.

4.3 Manual Stream Sampling

4.3.1 General Procedures for Manual Stream Sampling

1. Select the appropriate location to take the stream sample. Optimally, this should be at the last step after conditioning and just before the product enters the container to be sealed.
2. Determine the sampling frequency required as specified in Section 4.4.
3. Ensure that the equipment does not select or separate the seed or grain during sampling due to size, buoyancy or chaffiness.
4. The entire cross section of the stream must be sampled. Each pass of the sampling tool through the stream is defined as one sampling action to obtain one primary sample.
5. Sampling should be at regular intervals and should reflect the entire lot from the beginning of the lot to the end.
   If the sample is for seed testing compare each primary sample with the previously drawn samples to check the homogeneity of the lot, before adding to the composite sample. If the primary samples are not uniform as described in Section 2.3, discontinue sampling and take corrective action.

4.3.2 Manual Stream Sampling Equipment and Procedures

4.3.2.1 Pelican Type

While a Pelican-type sampling tool (Figure 1) is the only sampling device approved for manual stream sampling of seed for export, it can be also be used to sample seed for domestic sale. To be acceptable, it must:

a) have an opening at least two times larger than the largest diameter of the particles (seed and contaminants) in the lot;
b) have sides tall enough to prevent particles from bouncing out;
c) be of sufficient length to span the complete cross section (side to side) of the stream;
d) be of sufficient capacity to prevent any overflow when taking a primary sample; and
e) be such that it can be cleaned properly between lots.

To use the Pelican-type sampling tool, draw it once through the stream from back to front to ensure the entire cross-section of the stream is sampled. This is one primary sample.

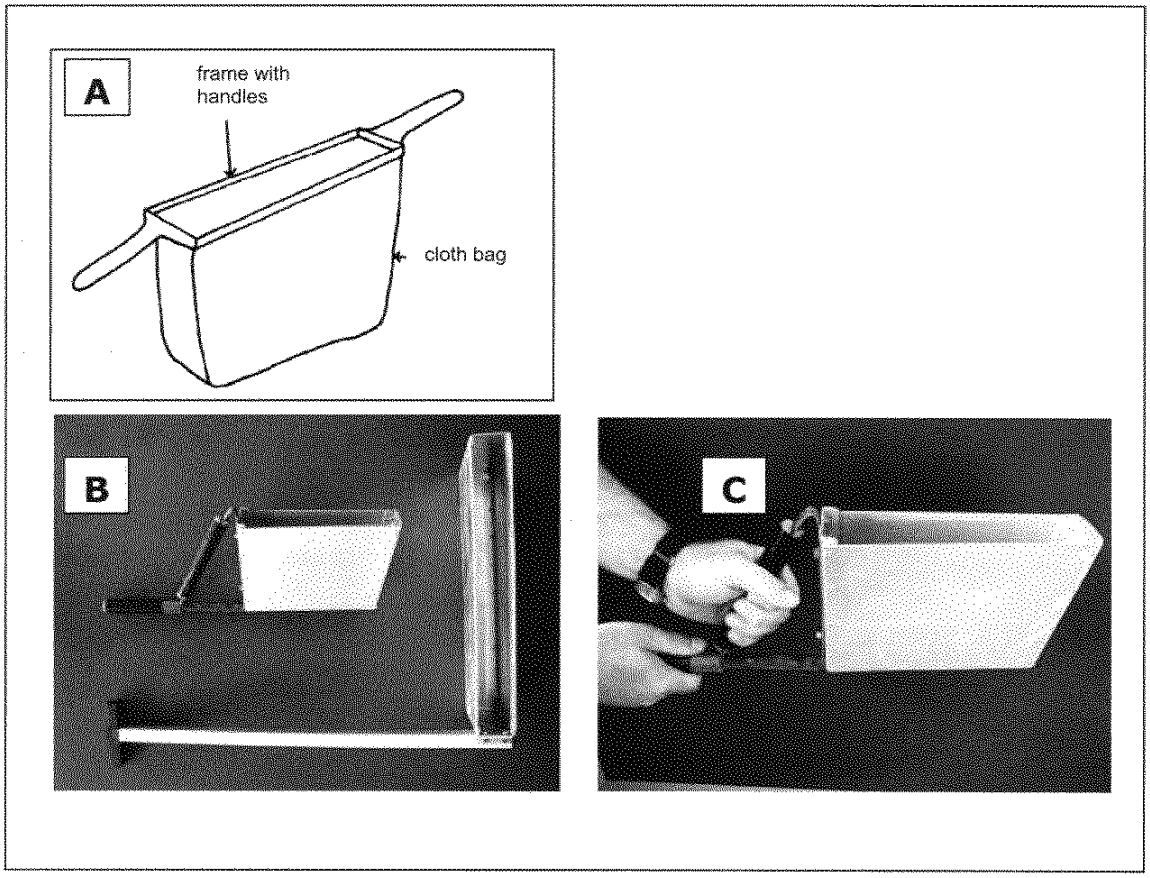


Figure 1. Pelican type sampling tool.

4.3.2.2 Hand scoop

Hand scoops are permissible for sampling grain as well as seed for domestic purposes from a conveyor belt or from a stream. The hand scoop (Figure 2) is a sampling device consisting of a rigid material scoop attached to a 50-100 centimetre handle which is stiff and durable. The sample collector capacity must be a minimum of 50 grams and not more than 200 grams.

When using a hand scoop, insert the sampling tool into the stream at an alternate point across the stream (left, middle, right) for each sampling action. The scoop should be placed into the flow of product 'upstream' and matching the belt speed, moved 'downstream' as the scoop is turned to fill with grain. Moving the scoop with the flow allows sampling of the appropriate location on the belt without splashing product or overflowing the scoop. Each sampling action collects one primary sample.

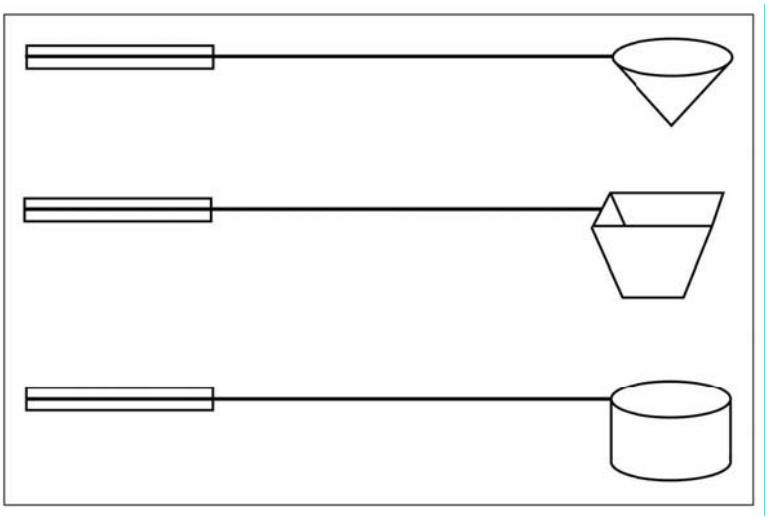


Figure 2. Hand scoops

4.4 Sampling Intensity from streams of product entering containers

Sampling intensity refers to the number of primary samples taken from a lot of seed or grain. Each primary sample is obtained by passing the sampling equipment through or into the seed or grain once.

Lot Size	**Minimum** Number of Primary Samples to be Taken
up to 500 kg	five (5) samples
1 - 3,000 kg	Five
3,001 - 20,000 kg	10
20,001 – 40,000 kg	30
40,001 – 60,000 kg	40
60,001 kg and above	not less than 50

Example: The lot is 25 MT sampled by manual or automatic stream sampling just prior to bagging.

For obtaining a grading and testing sample, 30 primary samples must be taken.

The flow of the stream is such that the 25 MT lot will be finished bagging in 25 hours.

1500 minutes/30 samples = a sample must be drawn every 50 minutes.

Desired sample size of 5,000g/30 samples = 166.67 g rounded up to 167 g per sample.

Samples must be drawn from the beginning of the flow of the product until the end of the run, encompassing the full contents of the source container.

4. Sampling Cleaned Seed in a Static Lot

5.1 Sampling from a Static Lot

Seed or grain can be sampled from containers such as totes and bags. Bags are considered to be grain or seed sacks generally weighing 100 kg or less. Totes are considered to be grain or seed sacks generally weighing more than 100 kg (Figure 3). Seed can be sampled from other containers such as a tins, bins or trucks.

Figure 3. Totes (left) and Bags (right)

5.1.1 General Procedures for Sampling a Static Lot

1. Select the appropriate method for sampling based on the crop kind, the packaging of the product, and where necessary, the importing country's requirements.
2. Determine the sampling intensity as specified in Section 5.2 and where applicable, the required size of each primary sample as specified in Section 4.1. Please note that unsealed totes are considered to be bulk seed for purposes of the pedigreed seed program and the appropriate sampling intensity is to be used.
3. Randomly select the containers for sampling in a well distributed pattern. The sampler should start sampling at the bottom of the container or stack of containers and work upwards to prevent cross-contamination of the primary samples from seed spilling from above. It is recommended that lower stacked bags be struck with the large end of the trier to relieve the pressure on the bag and prevent it from bursting. The sampling pattern should be varied from bottom, middle and top bags on the pallet, and between pallets.
4. Ensure that the containers selected for sampling and those above or adjacent to the container being sampled are clean and free from debris to prevent contamination of the sample. Any extraneous material should be brushed or swept from the containers and the area before inserting the trier.
5. Sample using the appropriate technique for the selected method or trier as described in Section 5.1.2.
6. Do not insert triers through labels or printed labelling on bags.
7. Draw approximately equal amounts sample from each container or from each place in a container or, when sampling product in bulk, from each location sampled.
8. When sampling containers over 100 kg, draw the samples from different locations or angles in each container. When sampling vertically, the sampling tool should reach to the bottom of the container. When sampling horizontally, the sampling tool should reach at least to the middle of the container.
9. A hole in jute or poly bags made by the trier must be closed by running the point of the trier across the hole a few times in opposite directions to pull the threads together. A hole in a paper bag must be sealed by a suitable adhesive patching tape or label.
10. Before each primary sample is drawn, thoroughly clean the container where the individual sample is to be placed when checking for homogeneity.
11. If samples are uniform, collect them in a second clean container to obtain the composite sample.
12. If the sample is for grading or seed testing, and samples are not uniform as described in Section 2.3, discontinue sampling and take corrective action.

5.1.2 Manual Static Sampling Equipment and Procedures

Manual sampling of a static lot is usually done using a probe or a trier. When selecting the appropriate sampling equipment the sampler should consider the commodity being sampled, the size and type of the containers, whether one is sampling vertically or horizontally, the number of primary samples to be drawn and the required composite sample size. The sampling device should not select the product by size or damage the product being sampled

5.1.2.1 The Nobbe Trier

This trier is a pointed tube with an oval opening near the pointed end. It is relatively compact making it easy to transport. The risk of contamination is low as the trier is easy to keep clean. A Nobbe trier is suitable for sampling free-flowing product in bags (legumes, timothy, canola, mustard, wheat, corn) but only where the trier can reach to the centre of the container. It may only be used horizontally and its use is limited to penetrable containers.

Follow these steps to use the Nobbe Trier:

a) Insert the trier gently into the centre of the container with the trier opening facing downwards and the trier tilted upwards at an angle of approximately 30 degrees to the horizontal.
b) When sampling from the end of a container, the opening of the trier must reach the centre of the container. Insert the trier as close to the bottom edge of the container as possible (i.e. below stitching).
c) When sampling from the side, the opening of the trier must reach the opposite side of the container. Insert the trier at the bottom edge of the container such that the 30 degree angle is achieved.
d) Rotate the trier through 180 degrees, bringing the slot to face upwards.
e) Withdraw the trier with gentle agitation to help maintain an even flow of product into the collecting pan.
f) The trier must not be agitated without withdrawing.
g) When sampling from the end, withdraw with decreasing speed so that the quantity of product obtained from successive locations increases progressively from the centre to the container.
h) When sampling from the side, withdraw with a constant speed.

5.1.2.2 The Double Sleeve Trier

This type of trier is suitable for sampling static bulk lots in standard or large containers of both small and large crop kinds. The double sleeve trier consists of a hollow tube with a solid pointed end and a close fitting inner tube such that the product cannot slip between the two sleeves. The inner tube may be with or without partitions between the slots. Double sleeved triers without partitions may only be used horizontally. Partitioned double sleeve triers may be used horizontally or vertically.

Multiple openings (slots/holes) are cut into both the inner and outer tubes so that turning the inner tube aligns the openings of the inner and outer tubes. There is a greater risk of contamination with this type of trier. Care must be taken to ensure that all the openings in both the inner and outer tubes are clean and no small seeds or particles are lodged between the two tubes. When closing the openings there is a risk of damaging the product trapped between the edges of the slots but this damage can be reduced by closing the openings slowly to the point where resistance is felt.

The contents of the entire tube represent one primary sample. There is no possibility of varying the amount of product obtained from the inner and outer part of the container by adjusting the speed with which the trier is withdrawn as the trier draws the same size of sample in each sampling action. When sampling horizontally, the trier must be long enough to reach the opposite end of the container. When sampling vertically, a partitioned trier must be used and the trier must be long enough to reach the bottom of the container.

Follow these steps to use the double sleeve trier, horizontally or vertically:

a) With the trier in the closed position carefully insert it into the container until it reaches the opposite side. Be careful not to push the trier through the opposite side.
b) Open the trier and agitate slightly to allow the openings to fill.
c) Gently close the trier to the point of resistance and withdraw it from the container

d) Pour out the primary sample onto a clean, long piece of paper or into a suitable clean container that is the same length as the trier to check for uniformity with the primary samples drawn previously before adding it to the composite sample.

5.1.2.3 The Grain Probe

The grain probe (Figure 4) is a very large double sleeved trier. It is used for sampling bulk commodities in railcars, trucks, shipping containers or bins. Probes vary in length from 1 meter to 3.65 meters. Grain probes may be partitioned or non-partitioned. Non-partitioned grain probes may only be used horizontally which limits their usefulness. Partitioned grain probes may be used vertically or horizontally. The method described above for double sleeve triers should be used for grain probes.

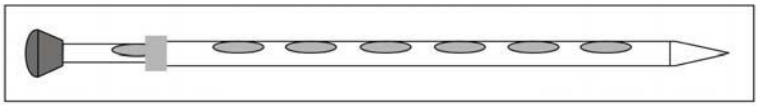


Figure 4. Grain probe

5.1.2.4 Other Equipment

Additional triers are acceptable for use for sampling of seed for domestic purposes. Please refer to Appendix 3-2 of the CSI Technical Manual for Approved Conditioners and Bulk Storage Facilities for further detail.

5.2 Sampling Intensity from streams of product entering containers

5.2.1 Sampling seed lots in containers greater than 15 kg and less than 100 kg

Each sealed container (e.g. poly bag, paper bag, tin, carton) is considered to be a unit for determining the number of containers in the lot. The pallets on which the product is stored are not considered separate units. The Sampler must randomly select the containers for sampling based on the number of samples required as detailed Table A1.1 below.

Table A1.1 Primary samples required for seed lots in containers greater than 15 and less than 100kg

Lot Size	Minimum Number of Primary Samples to Be Taken
1 - 4 containers	Three (3) samples from each container
5 - 8 containers	Two (2) samples from each container
9 – 15 containers	One (1) sample from each container
16 - 30 containers	Fifteen (15) samples from the seed lot
31 - 59 containers	Twenty (20) samples from the seed lot
60 or more containers	Thirty (30) samples from the seed lot

5.2.2 Sampling seed lots in containers greater than 100 kg

The minimum number of primary samples to be taken is shown in Table A1.2. When sampling a seed lot of up to 15 containers, all containers must be sampled, and the same number of samples must be taken from each container.

Table A1.2 Primary samples required for seed lots in containers greater than 100kg

Lot Size	Minimum Number of Primary Samples to be Taken
up to 500 kg	At least five (5) samples
501 - 3,000 kg	One (1) sample for each 300 kg, but not less than five
3,001 - 20,000 kg	One (1) sample for each 500 kg, but not less than 10
20,001 kg and above	One (1) sample for each 700 kg but not less than 40

Example: The seed lot is 24 containers of 1200 kg each (24 x 1200 = 28,800 kg).

One primary sample must be drawn for each 700 kg. 28,800 kg/700 kg = 41.4 samples which must be rounded up to 42.

42 samples from 24 containers = 1.75 samples from each container which must be rounded up to 2. Therefore, 2 samples must be taken from each container.

5000 g sample size required with 42 samples = 119.05 g rounded up to 120 g.

5. Sampling Carryover Cleaned Seed Stored in Bins

A stream sample must be obtained following the procedures described in Section 4 above. This could be accomplished by running the seed over the seed equipment again or by taking a stream sample of the seed during transfer to another clean bin.

6. Reducing Samples for Submission

A composite sample is obtained by mixing all the primary samples taken from a lot in such a manner that the composite sample is as homogenous as possible. The composite sample is normally more than the amount of product required for analysis and must therefore be reduced to an appropriate size for testing and/or grading. This must be done in a way that ensures the sub-sample obtained is representative of the composite sample.

A) Mechanical Divider Method

This method is suitable for most kinds of seeds except the extremely chaffy types and kinds susceptible to damage such as peas, soybeans, etc. The apparatus divides a sample passed through it into two approximately equal parts.

Sample reduction by appropriate mixing and dividing methods ensures that no more variation is introduced than what would be expected in simple random sampling. The equipment described below may be used to mix and divide the composite sample into approximately equally sized sub-samples which can be further divided until the desired weight for the submitted sample is reached.

Riffle Divider Method

A Riffle Divider consists of a hopper with attached channels or ducts, a frame to hold the hopper, four receiving pans and a pouring pan. Alternating ducts or channels lead from the hopper to the collecting pans on either side. This divider is suitable for most kinds of seeds. Riffle dividers are available with a range of channel sizes; large channels for large seeded crop kinds and smaller channels for small-seeded crop kinds.

Figure 5. Riffle Divider.

Riffle dividers should be calibrated regularly, at least annually, to confirm they are properly dividing the samples, by mixing and dividing a sample containing a known quantity of contaminants. A calibration sample can be made using coloured particles the same size and weight as the seed, or dyed seed of the same species, which can be easily identified and counted after mixing and dividing. The Riffle divider should always be used in a level position and be in good repair without any rough edges or deformations that may bias the mixing and dividing of the sample.

The composite sample must be removed from the container in which it was placed in such a manner that all seeds are retained. Therefore, if the composite sample is in:

- a cloth bag - carefully remove the contents and turn the bag inside out and check the seams for seeds. Seed with barbs, awns, hairs etc. may adhere to the bag or become caught in the seams;
- containers (e.g. pails) - carefully remove contents and check for seeds adhering to the sides and bottom of the container.

The entire composite sample should be placed into a clean pail/seed scoop or one of the Riffle divider collection containers. Care should be taken when mixing and dividing pulses crops such as peas and soybeans as the impact of the seed in the pan may cause seed breakage.

Weigh the Composite Sample

Weigh the composite sample before beginning the mixing and dividing process so that you can easily gauge the weight of the sub-samples obtained from each dividing step. Make sure that the weigh scale or balance is free of contaminants or other seeds.

Mixing Operation

Follow these steps for mixing the composite sample:

Before starting

- Before each use verify that the divider and four collection pans are clean by checking all channels, joints and seams of the divider and collection pans to ensure there are no seeds or other plant matter present.
- Place the riffle divider on a firm, level clean surface.
- Place two clean, empty containers under the channels to receive the seed.

Placing the Seed into the Divider for Mixing

- Pour the whole sample into the divider by running the collection pan back and forth along the edge of the divider so that all the channels of the divider receive an equal amount of seed.
- If a moisture sample is required it must be taken from one collection container before further mixing.
- Replace the two full containers with two clean, empty containers.

This step is not considered a mixing step, but rather just loading the Riffle divider.

Mixing Process Now Begins

Pour the contents of one full collection pan into the divider by holding the long edge of the pan against the long edge of the riffle hopper and then rotating the bottom up so that the seeds pour across all channels at the same time; followed by the other full container using the same procedure. This is the first mixing step. Repeat this process of mixing the entire composite sample a minimum of two more times for a total of three times before beginning the dividing process.

Dividing

Once the sample is thoroughly mixed, the next pass through the divider begins the process of dividing the composite sample into sub-samples. Half of the sample (the contents of one of the two pans) may be set aside at any step such that smaller and smaller quantities are passed through the divider at each step until the desired weight is achieved.

The set aside portions can be re-combined and passed through the divider as necessary to obtain the required weights of the sub-samples for submission as long as the full amount of the set aside portion is used. It is incorrect to further sub-divide a sub-sample by pouring off a portion from it from the collection pan. Only a pass through the Riffle Divider may be used to reduce the sample size at any step.

It is acceptable and even preferable to submit more than the stated sample weight for testing. It is logistically impossible to obtain the exact weight prescribed for the submitted samples from a composite sample of a random weight. Using the correct procedure for dividing the sample to obtain sub-samples of approximately the right weight (a little over) is far more critical than obtaining an exact final sample weight.

Dividing to Obtain the Sub-Samples for Submission to the Laboratory

Follow these steps to divide the composite sample to obtain the required sub-samples.

- Set aside the contents of one full collection pan. Place clean, empty collection pans under each outlet and pour the contents of the other collection pan into the hopper by holding the long edge of the pan against the long edge of the riffle hopper and then rotating the bottom of the pan up so that the seeds pour across all channels at the same time.
- Repeat and continue the successive halving process until a sub-sample of not less than the minimum weight required is obtained.
- Set aside sub-samples can be recombined and/or re-loaded into the Riffle to obtain the required sub-sample weights provided that the whole of the sub-sample is used for re-combining or re-loading the Riffle divider (don't pour off a portion of the sub-sample, use the Riffle to mix and divide at every step).
- Continue this process until the all the required sub-samples are obtained.
- Ensure that the divider and containers are clean after each mixing operation. Check all channels of the divider, the joints and seams.

Care and Handling of the Riffle Divider

The Riffle divider must be placed on a firm, level surface when in use, and otherwise stored in a clean, dry environment. The divider and the collection pans must be un-damaged. Do not clean the divider or the collection pans by banging together or by using

tools such as a mallet, hammer or knife. Wherever possible clean the divider and collection containers with compressed air. If the divider is being transported, it should be packaged in a padded box or carrying case. If the divider or collection pans are dirty or oily, they can be washed with warm water and mild detergent. The divider and the pans should be dried thoroughly with a soft lint free cloth that will not leave any residue and left to dry at least overnight.

B) Stream Dividing Method

This method is useful for dividing composite samples of a wide range of crop kinds from the large round seeds of pulse crops to the smaller and less dense seeds of forage and turf species. The method embodies the principles of stream sampling in which the entire cross section of a seed stream is cut by a sampling instrument.

Moving Sampler: In this method the sub-samples are obtained by sampling a seed stream at random points. The entire composite sample should be poured from its container into a second container while a sampling instrument such as a cup with sufficient capacity to capture all the seed in a cross section of the stream, is drawn through the seed stream. The cup should be wide enough to span the entire cross section of the stream and deep enough so that particles cannot bounce out. The sample is reduced by pouring the seed from container to container, sampling the stream, and removing one-half on each occasion. The process should be repeated (at least three times) until the composite is divided into sub-samples of the desired size.

Stationary Sampler: In this method it is the stream that moves while the sampling instrument is kept stationary. A 1 kg container is placed inside a larger 20-liter pail. The composite seed sample is mixed thoroughly (at least three times) then poured into the pail containing the smaller container in a back-and-forth motion which allows the stream to be cut by the smaller sample container. This process of passing the stream across the sample container is repeated until the all the seed has been transferred. The small container is then removed, which contains a sub-sample of the composite of one kg in size. This process must be repeated, removing the seed in the 1 kg container each time, until the amount of seed remaining may be split into two approximately equal parts, 1 kg in the small container, and 1 kg that passes into the larger container.

C) Hand Mixing/Spoon Method

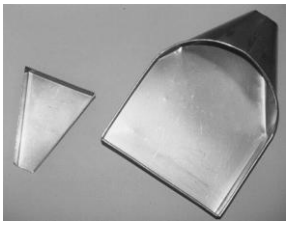
This method is suitable for seed samples of a single species. Pour the seed evenly over a tray (e.g. large cake pan) which is kept level at all times with a side-to-side swing, alternately in one direction then in right angles to it. This preliminary mixing should be repeated a minimum of six times. After the preliminary mixing, the seed is distributed evenly over the tray. Do not shake or bump the tray thereafter. Using a flat edged spoon, sub-sample the seed in the tray from a minimum of five (5) random places. Sufficient random sub-samples are taken to constitute a working sample of the required size.

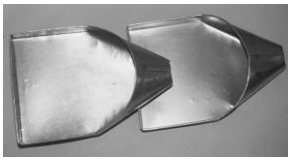
Alternatively, after a preliminary mixing as described above, four (4) pans/pails are placed on a piece of paper. The seed is poured uniformly over the pans/pails. The seed that falls into the pans/pails is taken as the sample. If care is taken in selecting the pail size, the seed that is caught in one pail will be sufficient to conduct one of the required tests or to provide enough seed for a retained sample.

Figure A6.1 – Tools for mixing and reducing domestic seed samples.

1. Seamless scoops, pans/pails

Stainless steel or metal is recommended as this material reduces the incidence of static buildup.





3. Seamless Bread-Type Pans

Stainless steel is recommended.