

SOP 02. ANNEX 9. TEMPORARY PRESERVATION OF SAMPLES

Fruits and seeds collected are particularly prone to deterioration due to their relatively high moisture content. As degradation and seed loss during handling are irreversible phenomena, it is necessary to process them immediately after collection. The rate of deterioration of seeds and fruits depends on the species and climatic conditions during collection missions.

In the case of short-term collection expeditions, the seeds are processed and transferred to the BRGV pre-drying chamber on the same day. For long-term expeditions, when seeds/fruits are prone to deterioration before they can be transferred to the BRGV pre-drying chamber and/or in cases where the quantity of fruits/seeds is large and transport capacity is limited, the seeds and fruits must be processed in the field.

The degree of field processing is determined by the quantity of seeds that can be transported and their vulnerability. Field handling procedures are generally similar to those used at BRGV, although technical equipment in the field is limited, and the surrounding environment is more challenging to control.

Fruits are usually bulkier compared to seeds. Therefore, the volume occupied by each sample can be reduced by removing seeds from the fruits (in the case of dehiscent fruits) and by cleaning the samples of stems, inflorescences, leaves, and other plant debris, as these may harbor pathogens that negatively affect the seeds' viability and moisture content.

In the case of indehiscent fruits, special procedures are required to extract the seeds (e.g., high temperatures, extended drying time, threshing, etc.). These samples should be stored in dry and cool places, with seed extraction being carried out later at BRGV.

At the time of sample collection, seeds of orthodox species should have a moisture content of approximately 18–20%. Immature orthodox seeds and mature recalcitrant seeds have a considerably higher moisture content, around 30–45%. Any high moisture content in mature or immature fruits or in seeds collected during wet weather poses a risk of deterioration because:

- It creates an ideal environment for the development of bacteria and fungi.
- Wet fruits and seeds respire, generating heat and consuming oxygen, if oxygen is depleted due to inadequate ventilation, respiration is replaced by fermentation.

The biochemical processes of respiration, as well as those of fermentation, produce heat thus, high temperatures combined with high moisture content can exacerbate respiration or fermentation, potentially leading to a self-accelerating process that may result in the burning of the entire fruit or batch (sample) of seeds.

Therefore, during prolonged storage of seed/fruit samples in the field, proper ventilation and, as far as possible, reduced moisture content must be ensured. During handling, fruit and seed samples are prone to mechanical mixing or errors in sample recording (e.g., loss of identification labels or omission of recording all necessary information).

To prevent such situations and minimize the aforementioned risks, the following measures should be taken:

- Each seed sample and container (paper bag or container) must be labeled with at least the basic information (species, collection location, seed source, number of plants from which the sample was collected, collection date, and the number of bags for identical samples).
- Two labels should always be used: one attached to the container and another placed inside it (if the attached label is lost, the seeds' identity can be verified using the label inside).
- Empty bags or containers used for drying seeds should be arranged next to the seeds along with their respective labels. After drying, the seeds should be placed back in the same containers to prevent the spread of potential pathogens.