

Protocol for Weighing Dry Tissue

Important general advice:

1. Read this entire document (two pages) before weighing.
2. Contact the responsible person (see below) with any questions about particular tissue samples.

Required equipment:

1. Larger scale for aboveground biomass samples:
 - a. Must be set to weigh in grams
 - b. Must have 3 kg capacity or higher
 - c. Must have 1 g precision or better
2. Smaller scale for partitioning samples:
 - c. Must be set to weigh in grams
 - d. Must have 1 kg capacity or higher
 - e. Must have 0.1 g precision or better
6. Trays or other containers to put on the scales (helps contain tissue)
7. Crop harvest record sheets (partially filled out from the day of harvest)
8. Crop-specific guide sheets (available from <https://biocro.github.io/BioCroField/>)

Weighing aboveground biomass samples:

1. Confirm that the bag indicates AGB (“above ground biomass”), the crop name, and a date.
2. Double check that any information on the bag matches the corresponding harvest sheet.
3. Open the bag and remove any other bags that may be inside.
4. Set a container on the scale (if necessary) and double check that the scale is zeroed.
5. Weigh the sample and record the weight in the AGB weight box on the harvest sheet:
 - a. If the sample is small, remove it from the bag and weigh it using the smaller scale.
 - b. Otherwise, leave the sample in the bag and weigh it using the larger scale.
 - c. When weighing the entire bag, be careful it does not touch any other items near the scale.
 - d. When weighing the entire bag, indicate the type of bag so its weight can be subtracted later.

Weighing partitioning samples:

1. Confirm that the bag indicates the crop name, tissue type, and date.
2. Double check that any information on the bag matches the corresponding harvest sheet.
3. Open the bag and remove any other bags that may be inside.
4. Set a container on the scale (if necessary) and double check that the scale is zeroed.
 - a. Weigh the sample and record the weight in the plant tissue or litter tissue table as appropriate:
 - b. Remove the sample from the bag and weigh it using the scale for partitioning leaves.
 - c. Any obvious soil or other foreign material should be removed from roots before weighing.
 - d. Other tissue types may require additional partitioning before or after weighing, as described in the crop-specific weighing guide.

Responsible Person's Name

Email Address

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Frequently Asked Questions

1. Why do I need two scales?

You do not actually need two scales. If you can find one scale with sufficient precision and capacity to satisfy all of the scale requirements, just use that scale for all samples.

Some partitioning samples are very small, and can weigh less than two grams in total. For these samples, it's necessary to have 0.1 g precision. Many scales with this level of precision do not have enough capacity to handle the large aboveground biomass samples, which can easily weigh more than 2 kg when the bag is included. This is why we often need two separate scales.

When the plants are very small, it may be better to weigh the aboveground biomass samples with the smaller scale. Conversely, some of the partitioning samples can be heavy (such as maize ears) and may be easier to weigh on the large scale.

2. When should I weigh the entire bag instead of removing the tissue?

There are a few simple rules you can follow to answer this question.

Samples in smaller bags should always be removed from the bag. When samples are being collected at the field site, it is typical that a wide variety of smaller paper bags are used. It is difficult to know the weight of each bag type, or even to identify which type of bag was used, since many of them do not have identifying marks. This prevents us from easily subtracting the weight of the bag.

Tissue samples that require additional processing should always be removed from the bag. For example, roots must be cleaned before weighing to remove soil and other foreign material, and soybean litter must be separated into leaflets (leaf) and petioles (stem). This requires removing the sample from the bag first.

Aboveground biomass samples in large lawn bags should not be removed from the bag. These samples are difficult to remove their bags, and they do not need any additional processing. Furthermore, lawn bags are among the only bags that can be easily identified, since they tend to include a brand name in large letters on the front, which makes it straightforward to subtract the bag weight.

3. What should I do with the tissue after weighing it?

Put any seeds / grain / kernels that were separated from pods / panicles / ears in new bags clearly labeled with the harvest date and species. We may need these later for protein content or other measurements.

For other types of tissue, put it back in its bag (if it had been removed for weighing) and continue storing it in the lab. To stay organized, it is helpful to put the tissue that has already been weighed in a different spot than the tissue that still needs to be weighed.

Sometimes mistakes are made when weighing. (The most common mistake is weighing a bag that has another bag inside it.) Mistakes can be detected, but usually not until the data has been digitized and processed. So, we save the tissue samples until we can be sure the values are accurate. Once all the tissue has been weighed and the data has been checked, the samples can be burnt.