

Beet

Yield assessment pack

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Beet yield assessment

The dry matter (DM) of beet must be measured to enable accurate yield assessment before feeding, or selling, the crop. The dry matter calculation from samples taken should be conducted by a qualified laboratory.

You will need :

- Accurate scales : hanging or flat scales capable of 20 kg+ (for in paddock weighing) and bench / kitchen scales that weigh with 1g accuracy (for sub sample weighing)
- Large bag or sack for weighing
- Smaller carry bag for samples
- Tape measure
- Calculator
- Clipboard / recording sheets and pencil (easier in wet conditions)
- Marker pen
- Fence standards or similar to mark sampling area
- Shears or knife for leaf / bulb separation
- Brush or rags to clean samples
- Consider a carry bin for all sampling materials
- Sampling kits for preferred DM testing laboratory (will include submission forms and sample / courier bags)

Important note :

To help ensure the most accuracy it is best to conduct the assessment as close to the commencement of feeding as possible as in favourable conditions the crop will continue to grow. This information is provided as a guide only, if in doubt seek professional advice and always get the dry matters of the bulb and leaf assessed by a qualified laboratory.

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Sample area

Enter farm, paddock and crop details on recording sheet before commencing sampling. To determine sample area for beet crops measure a length of drill row, rather than a square or quadrat.

Row spacings :

Ensure the row spacing of the crop is known as this will determine the length that you will sample from a drill row. If unknown, contact the drilling contractor who planted the crop or check by measuring across twenty rows ;

- 40cm row spacings, corresponding length will be 8m
- 45cm row spacings, corresponding length will be 9m
- 50cm row spacings, corresponding length will be 10m

Sample size / length :

Sample size ; to help assessment accuracy due to increased sample size, two side by side rows should be sampled from each area

Sample length ; to help assessment accuracy the lengths provided below equate to the equivalent 2m^2 , this will be divided into two equal 1m^2 equivalent once dry matters are known

- 37.5cm row spacings, sample length will be 5.34m
- 40cm row spacings, sample length will be 5m
- 45cm row spacings, sample length will be 4.44m
- 50cm row spacings, sample length will be 4m

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Sampling

If the crop is going to be grazed it is important to accurately measure the area that is going to be fed first. It is important to know how much feed is available during the animals transition phase. This will be the area utilised during the first 21 days of feeding.

- Walk into the paddock; avoid headlands and atypical areas
- Tare the bag you will be weighing. You may need to do this for each sample a dirt / mud can accumulate.
- Randomly pick a starting point and peg the tape measure (between two rows) to the ground. Measure the required sampling distance for the respective row spacing. If the required length falls on a plant, only include if the bulb is more than halfway in the sample length, otherwise discard - 'extra' plants can drastically alter the final weights.
- Measure the first row by pulling all beets in one row of the sample length, remove as much soil as you can before weighing.
- Weigh all beets removed from the length, record this total
- Remove the tops with the shears / knife, then weigh just the bulbs and record this total. This will allow a leaf:bulb measurement to be made.
- To record the leaf fresh weight, subtract the bulb weight recorded from the total plant measurement.
- Do the same for the second row and record the totals.
- Randomly sampled multiple sites throughout any paddock (at least eight is recommended). For paddocks over eight hectares, allow for a sample site in every hectare, e.g. 13ha equates to 13 sample sites.
- A high number of sample sites will take into account any potential variation across a paddock.

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Dry matter sub samples :

Once the required number of samples from the paddock have been weighed and recorded take representative bulb and leaf samples from the paddock (these will be sent to your preferred laboratory to determine dry matter).

Weigh sub samples within an hour of sampling.

Select plants

- Take 3 - 5 representative plants from the paddock. Remove all soil from the bulb using a brash and / or a rag.

Separate bulb and leaf

- Cut off the leaf fraction of both bulbs (Make sure not to include the crown in this fraction)

Sub-sampling the leaf fraction

- Mix the leaf fraction of all plants and take a sub-sample of 1/3 (approx. 500g)
- Keep your workspace and sample clean
- Tare the scales with the bag you will put the leaf sample into
- Weigh the sub sample. This sub-sample should be no less than 500g

Submit samples

For both leaf and bulb samples information must be recorded before sending

On the submission form include

- Your name
- Email address
- Farm name
- Paddock identification
- Date harvested
- Sample fresh weight for both leaf and bulb (excluding bag weight)
- Retain a copy of sub sample fresh weights for reference

Courier leaf and bulb samples to your preferred laboratory for drying ASAP

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Example :

Once dry matter (DM) results have been returned the yield assessment can be calculated

To do this take your weight recordings from the paddock assessment (remember these will be the weights from 2m²).

To determine the average bulb and leaf sample weights :

add all recorded bulb sample weights together and divide by the number of samples taken. Then do the same for the recorded leaf fresh weights. Record these average weights.

To determine the average 1m² equivalent :

divide these individual results by two,

Average bulb fresh weight (per 2m²) : 27kg ÷ 2 = 13.5kg (1m² equivalent)

Average leaf fresh weight (per 2m²) : 8kg ÷ 2 = 4kg (1m² equivalent)

To determine fresh weight per hectare :

multiply these results by 10,000 (1ha = 10,000 m²)

Average bulb fresh weight (per m²) : 13.5kg x 10,000 = 135,000 kg

Average leaf fresh weight (per m²) : 4kg x 10,000 = 40,000 kg

To determine yield per hectare :

multiply these results by the lab DM received,

Bulb : 135,000 x 15% = 20,250kg

Leaf : 40,000 x 11% = 4,400kg

Add these two together to determine the estimated total per hectare yield :

20,250 + 4,400 = 24,650 kgDM/ha

Please note:

The yield across the paddock can vary and any total should be provided as an estimate with a margin of error +/-

In favourable conditions the crop will continue to grow after the assessment date.

Beet yield assessment

Key points:

- Crop dry matter must be measured and not assumed
- Measure from length of row, not square or quadrat
- Determine row spacing as this will indicate measurement length and ensure accuracy
- If in doubt, find out
- Randomly select sampling areas
- Measure sample length accurately and discard plants that fall on the edge of measurement
- Take multiple samples to reduce variability
- Remember to tare the weighing bag and consider dirt / mud build up
- Remove as much dirt / mud from plant samples as possible before weighing
- Be careful lifting heavy bags and using shears / knives
- Separate bulb and leaf
- Record all weights clearly
- Take plant samples and weigh sub samples as quickly as possible
- Record the sub sample weights
- Keep sub samples clean
- Send samples with appropriate paperwork to preferred laboratory
- When dry matter [DM] return, remember to average all bulb and leaf sample weights to 1m² equivalent before proceeding

The technical data mentioned in this document comes from tests carried out by RAGT. The results obtained may vary according to agronomic and climatic conditions, as well as specific cultivation techniques. In any event, the technical data provided is for information purposes only and does not bind RAGT contractually.

