



LINKING ENVIRONMENT AND FARMING

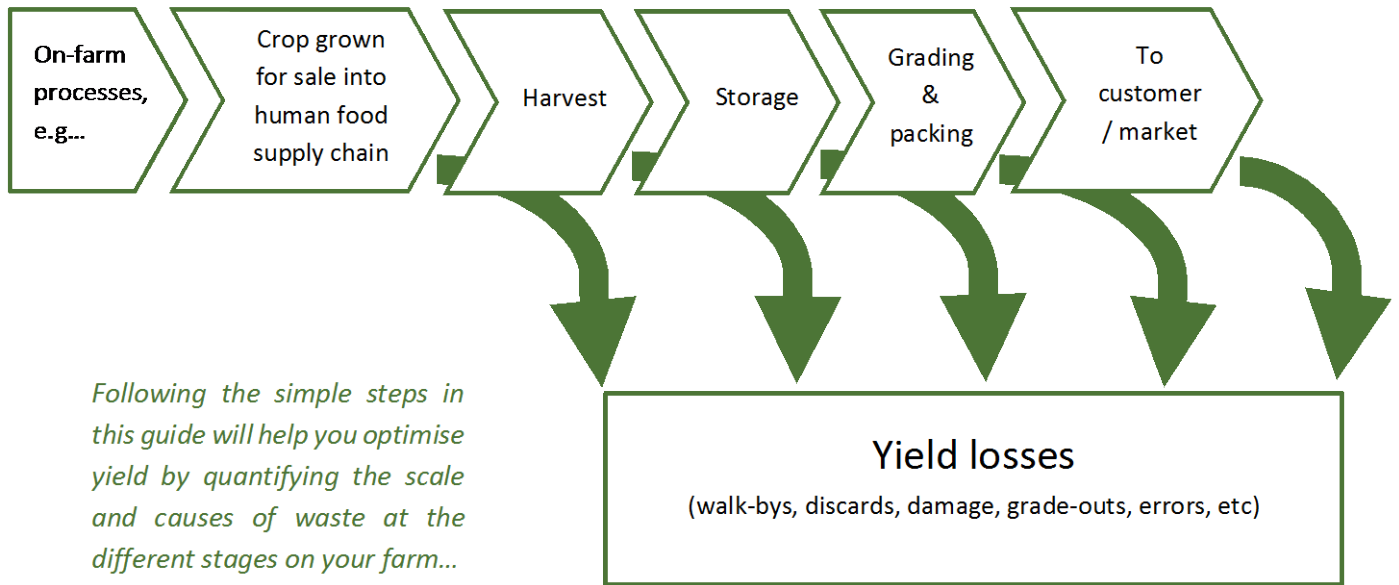


Food Waste Matters

This guide for fresh produce growers explains how you can increase crop utilisation and profitability through measuring food waste in five simple steps.



Growers have been managing what is now called 'food waste' for years – this is nothing new! Measuring food waste is about understanding how much produce that was intended for the human food supply chain has instead ended up in one or more of the destinations below:



Following the simple steps in this guide will help you optimise yield by quantifying the scale and causes of waste at the different stages on your farm...

... And, where waste cannot be reduced, help you think about the best destination for it

DESTINATION

Not normally considered a 'waste', but good practice to include these two destinations in your measurements

- Animal feed e.g. where produce was destined for human consumption (not purpose grown feed/fodder crops)
- Biomaterial processing e.g. for biodiesel, manufacturing pharmaceuticals, fibres, and other industrial products

Consider which of these destinations are relevant to your business - not all of them will be

- Anaerobic digestion
- Composting
- Not harvested / ploughed in
- Land application e.g. spreading produce back to land
- Landfill
- Refuse/discards e.g. otherwise abandoned on land, *excluding* material that is not harvested, ploughed in or spread back to land
- Controlled combustion e.g. sending to a facility that is designed for combustion in a controlled manner
- Sewer / waste water treatment

Manage what you measure

Measuring waste is an important part of efficient business management. A focus on measuring waste can help you optimise your yield, reduce costs and quantify opportunities for innovation.

This guide explains how all growers can take simple steps towards improving efficiency. With supply chain interest in food waste measurement growing, following the simple steps in this guide will also keep you ahead of your customer.

Research carried out by sustainability experts WRAP has shown big variations in the amount of waste between farms, even within the same sector (7-47%¹). Using this guide to measure waste will help you increase productivity by managing what is within your control, and give you hard facts to support engagement with your customers about what they can do to help reduce waste.

This guide is designed to comply with the internationally recognised *Food Loss and Waste Accounting and Reporting Standard*².

Five simple steps towards reducing waste:

1. Identify a champion
2. Plan what you will measure
3. Decide how you will measure waste
4. Make an action plan
5. Keep it going!

Step 1 – Identify a champion

Identify an individual within your business who will be accountable for managing the food waste measurement process and the action plan. The champion might be you, or it might be a colleague who is motivated to help develop the business. Clear accountability encourages ownership and means that things will get done.

Your champion will need support. Senior colleagues should agree that waste measurement should be prioritised and recognise that the champion may need support – being a champion doesn't mean that you must do all the work yourself.

Your champion can use the following guidance to lead your business through the other steps.

¹ A preliminary study on strawberries and lettuces (WRAP, 2017), available at <http://www.wrap.org.uk/content/food-waste-primary-production-preliminary-study-strawberries-and-lettuces>

² Available at <http://flwprotocol.org>

Step 2 – Plan what you will measure

| | Key choices to consider | | Best practice |
|--------------------------|---|-------------------------------------|---|
| <input type="checkbox"/> | Select one crop to start with | <input checked="" type="checkbox"/> | If you've not measured food waste before, start simple with just one crop. If you have multiple varieties, just pick one. If you have multiple processes, e.g. crops for whole head and crops for processing, look at just one to start with. |
| <input type="checkbox"/> | Set your timeframe | <input checked="" type="checkbox"/> | This is likely to be an entire season. |
| <input type="checkbox"/> | Decide which processes to include | <input checked="" type="checkbox"/> | <p>This could include harvesting, on-farm transport (e.g. from field to store), storage, washing and packing, etc. depending on what processes take place on your farm. There is no need to include operations that happen off farm or which are otherwise outside of your control.</p> <p>For any grower, the starting point for measuring food waste is when the crop is ready for harvest. A crop that is ready to be harvested but not actually harvested should be included.</p> |
| <input type="checkbox"/> | Select the destinations where waste ends up | <input checked="" type="checkbox"/> | Use the diagram on the inside cover to identify those that are relevant to you. Food that is redistributed, e.g. via Gleaning or to food banks, is not food waste, but you might like to include this in your measurements. |
| <input type="checkbox"/> | Include grade-outs, rejections and quality claims | <input checked="" type="checkbox"/> | Produce that fails to meet customer requirements typically remains within the grower's ownership, even if it has been sent to your customer. Avoid double counting by checking with your customer who is best placed to measure this. |
| <input type="checkbox"/> | Note the causes | <input checked="" type="checkbox"/> | <p>This may include:</p> <ul style="list-style-type: none"> ○ not finding a market/buyer for the crop ○ difficulty recruiting workers for harvest ○ pest, disease or weather damage after the crop became ready to harvest ○ the crop did not meet customer requirements or the quality specification ○ the customer changed their order ○ changes in demand |
| <input type="checkbox"/> | Calculate the costs | <input checked="" type="checkbox"/> | <p>Include production costs, any disposal costs and lost sales. Think about what figures you already have that could help – this doesn't have to be perfect. For example, if you don't yet have current costs info, can you use numbers from last year's costs? Think about ways to improve accuracy over time.</p> <p>Note: there is no expectation that you will share costs data – this is for you and your business to use as you see fit.</p> |

Also consider the difference between 'edible' and 'inedible' food waste. Those parts of a plant that are discarded at harvest or during packing and not normally destined for human consumption (e.g. plant stalks, leaves that are not normally eaten etc) are 'inedible' food waste. It is good practice to include inedible food waste in your measurements and, if you do, record it separately.



Step 3 – Decide how you will measure waste

- a. **Start with some simple observations.** Take a step back and consider your farm processes and where you think waste is most likely to arise. Typical hot spots to consider are:
 - Crop left unharvested
 - Grade-outs during harvest
 - Losses during storage
 - Grade-outs in the packhouse
 - Crop unsold or rejected

You might like to talk to staff, take photos and note the areas which are important to you.

- b. **Decide how you will take measurements.** One option is to make a visual assessment of waste (e.g. the harvesting team have passed over 10% of the crop). Do make a more accurate assessment of the weight or volume if you can (e.g. where unsaleable crop goes into a bin ahead of disposal). Always consider what existing records you might have that will help. The examples on the following page will help you decide what will work best for you.
- c. **Keep records.** Where possible, convert your results to a tonnage if they are not already in this form. As well as the results, record the date, how you measured waste and any observations about the process. Record how confident you are in the accuracy of the results and don't be put off if it is low to start with, it will improve with time. A useful way of describing accuracy is: high uncertainty (+25% uncertainty); somewhat accurate (e.g. 11-25% uncertainty); reasonably accurate (0-10% uncertainty).
- d. **Guidance on taking samples.** If you cannot easily measure waste throughout the season, you can take sample measurements from which you can estimate total waste rates.

Two key factors to reflect in your sampling are: (a) if you are measuring in-field waste, take samples from more than just one field/area (aim for at least three); and (b) capture fluctuations in waste by measuring at the beginning of the season, mid-season and the end.

Consider the following examples to help you decide on an approach that will work for you:



Lettuces, cabbages & other hand harvested vegetables

Once the harvesting team have finished, the harvesting manager walks through the block and assesses the percentage of plants left unharvested. The manager records the percentage, the principal reason for not harvesting and the size of the block. The manager does this across three blocks on consecutive days and repeats this in April, June and October.

Fruit that is hand harvested

The farm manager searched the internet to confirm the volume of the bin that the harvesting team routinely uses to collect discards. With a permanent marker, she marked lines on the inside of it for $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ full. The harvesting manager was then able to record at the end of every day how full the bin was and the causes of the waste.



Mechanised harvesting of field veg

After the harvester has been through, the summer student measures out three 2m lengths of trash from the harvester's waste belt, one at the top, middle and bottom of the field. He sorts through the trash and collects all the crop in a labelled sack. He repeats this across three fields and then weighs the sacks. With his supervisor, they identify the cause and record in a spreadsheet the dates, field names, weights and causes.



In a packhouse

The assistant manager knows that all their waste goes to an AD facility and that the waste collector states on their receipts how much was collected. So, he talks to finance to get the receipts for the last 12 months to calculate a total. He also asks the line leader to record in a diary the main causes of the waste. The line leader does this one day a week a month.

Grade outs mixed with mud & stone

When the sludge tanker comes to take away waste, the mechanic has a bucket with a rope tied to it which she drops to the bottom of the full tanker and then hauls out. The bucket is emptied, the contents sorted, and the food waste weighed and recorded. Three samples are taken in a day, one day a week for a month and used to calculate an average that she applies to all sludge waste for a year.



Step 4 - Make an action plan

When you have quantified the amount of food waste and identified the principal causes, it's time to develop an action plan.

- a. **Get staff waste savvy.** Involve staff in thinking about hot spots, identifying solutions and taking actions to reduce waste in the field or elsewhere in your operations.
- b. **Set targets for reducing waste and driving efficiency improvements.** Targets should be realistic and take account of how the natural environment influences performance. Targets averaged over multiple seasons can help with this, e.g. *'by 2025, the farm's three-year average waste rate will be 25% lower than the three-year average for 2018-2020'*.
- c. **Adopt LEAF's approach to [Integrated Farm Management](#)** to help improve performance. Solutions could include:
 - o improving crop resilience through soil improvement and water management;
 - o selecting appropriate varieties;
 - o focussing on inputs to optimise growing conditions;

- taking out of production poor performing field areas such as headlands and consider how they could be better used as habitat areas;
- investing in new equipment for harvesting, storage or packing;
- working with staff to improve crop handling;
- working with customers to improve crop scheduling and forecasting, or considering temporary or permanent changes to quality specifications;
- complete the LEAF Sustainable Farming Review to help with your planning and consideration of the whole farm business.

d. **Identify outlets for surplus production.** Inevitably there will be some surplus production, and you can consider what is the best way to manage this. For example:

- The [Takestock](#) online platform for buying and selling surplus produce;
- The [Gleaning Network](#) may be able to provide a team of volunteers to harvest surplus for redistribution to people in need in the UK and EU;
- Consider developing alternative product lines (e.g. for processed products)
- Consider selling it as animal feed;
- Consider supplying to a nearby [anaerobic digester](#) or [composter](#), or compost it yourself to use as a soil conditioner. Integrate applications of organic fertilisers within your Nutrient and Soil Management Plans.

Step 5 – Keep it going!

- Keep records over time to benchmark your progress.** Tracking waste and being consistent in your measurements year on year will make it easier to compare results.
- Review your goals** and consider if they need tweaking to make them more realistic or challenging.
- Take time with staff and customers to share progress**, invite ideas and help maintain motivation, with continual improvement. If you operate on more than one site, share ideas across the business, as well as the need for a food waste review, how you have done it and the progress made.
- Recognise and reward staff**
- Share your successes.** Your work and time benefits society and the wider environment, through the delivery of public goods. Consider how you can communicate using your waste reduction plan to share ideas with your customers and community and grow your reputation, such as through LEAF's Open Farm Sunday.



Further information

- [LEAF Sustainable Farming Review](#) (for LEAF Members only)
- LEAF's [Management Plans](#), such as Farm Environmental Policy and Plan, Soil Management Plan and Nutrient and Manure Management Plan (for LEAF Members only)
- LEAF's [Open Farm Sunday](#)
- Additional resources to support businesses measuring food waste are available as part of the *IGD-WRAP Food Waste Reduction Roadmap* available at <http://www.wrap.org.uk/food-waste-reduction-roadmap>
- The *Food Loss and Waste Accounting and Reporting Standard* and case studies are available at www.FLWprotocol.org

This document has been produced by WRAP in conjunction with LEAF (Linking Environment And Farming)
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