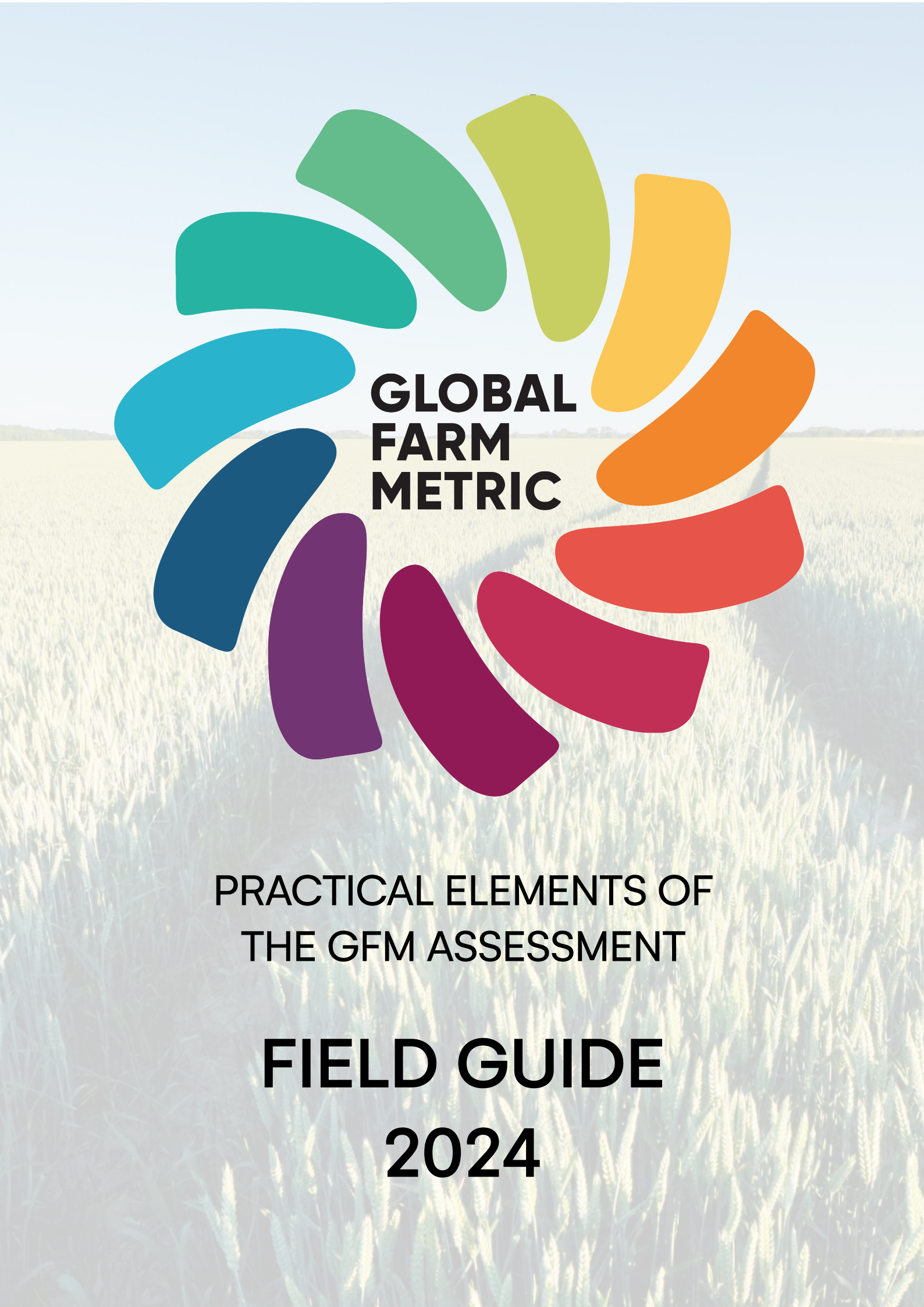


PRACTICAL ELEMENTS OF
THE GFM ASSESSMENT

FIELD GUIDE
2024

CONTENTS

Nature

Soil & Water

Crops & Pasture

1. LEVEL OF WATER POLLUTION

FRESHWATER INVERTEBRATE SURVEY

Water quality can impact the health of plants and animals that live in and around lakes, ponds and rivers. Pollutants, including nutrient-rich fertilisers, can reduce aquatic biodiversity which has knock-on effects across agricultural ecosystems.

Freshwater invertebrates act as indicators of water quality, with different species more or less sensitive to the presence of pollutants. We can therefore understand water quality on your farm by identifying the invertebrate species present in a pond, stream or river.

Equipment needed:

- OPAL Freshwater Invertebrate ID Guide (available online).
- **Results table** in Global Farm Metric Field Survey Results document.
- **A net.**
- **A shallow tray** (Ideally white to make animals more visible).
- **Wellies.**

Choosing your survey site:

- Target habitats are ponds, rivers or streams found on your farm.
- The best time to carry out this survey is during the spring, summer or autumn.

- Take care around water.
- Avoid disturbing streams and rivers during spawning times for Salmon and Trout (October to February, depending on local conditions).

Conducting the survey:

(Taken from the OPAL Water Survey Booklet)

1. Before disturbing the water look for animals skating on the surface (e.g. pond skaters) and note these in the results table if observed.
2. Add some water to your tray.
3. Sweep your pond net using a figure-of-eight motion in and around the plants or other habitats for about **15-20 seconds**. You will need to disturb the plants with your net, but try not to damage them. Try to avoid disturbing the bottom of the water body too much or you may get a lot of mud in the net.
4. After each sweep, wash the net through with water to get rid of any mud and empty the contents of your net into the tray. Remove any large bits of plant, checking first that there are no animals attached.
5. Repeat your net sweep in **three** to **five** different areas and habitats around the water body.
6. Leave the tray to settle for about a minute. It will be much easier to identify the animals once you see them moving. Use the Freshwater Invertebrate Identification Guide to help you identify the animals in your tray and record the species present in the results table.

If you are going to more than one water body, avoid spreading diseases or non-native plants by **cleaning all equipment between sites**. Equipment should be rinsed, washed with a mild disinfectant, rinsed again in tap water and allowed to dry.

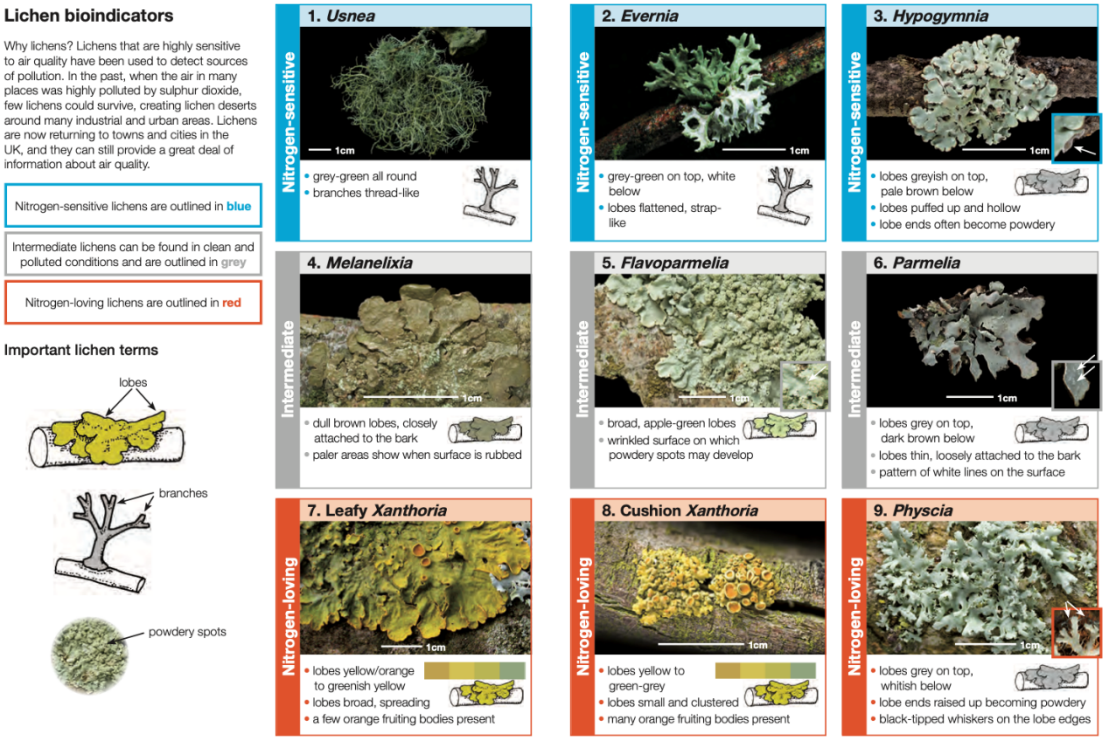
2. LEVEL OF AIR POLLUTION

LICHEN SURVEY

Lichens can be used as indicators of air quality as their presence or performance is sensitive to changes in environmental conditions. Conducting a lichen survey can therefore help determine levels and sources of air pollution.

There are **nine** indicator lichen species which can be split into **three** groups:

a. **Nitrogen-sensitive**. Found in areas where the air is relatively clean and away from sources of nitrogen.
b. **Intermediate**. Can be found in both clean and polluted conditions.
c. **Nitrogen-loving**. Found in areas with more exposure to nitrogen-containing pollutants (e.g. near field fertilised with manure).



OPAL Lichen ID Guide

Equipment needed:

- OPAL Lichen identification guide (available online).
- **Results table** found in Global Farm Metric field survey results document.
- **A4 piece of white paper** for reference.

Conducting the survey:

(Taken from the OPAL Air Survey Booklet)

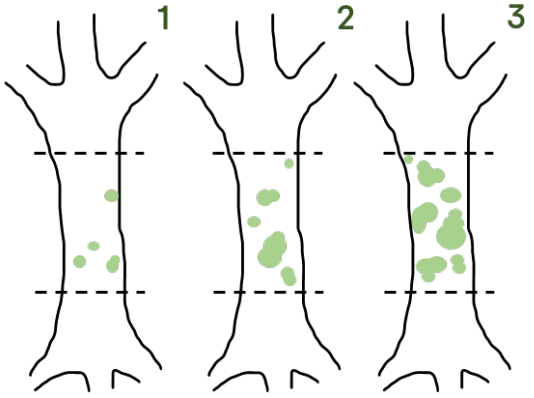
1. Choose a site on your farm with deciduous trees (e.g. oak, ash, sycamore.) and lots of light. Avoid coniferous trees (e.g. juniper, yew, scots pine), trees that are heavily shaded and those covered in ivy.
2. Select an appropriate tree and choose the side of the trunk with the most lichens.
3. Focus on lichens **50–150 cm above ground level**. We are only interested in the nine indicator lichens, ignore any others.
4. Using the OPAL lichen ID guide, identify and score the total amount of each of the nine indicator lichens on the tree trunk relative to a piece of A4 paper, ranging from **0–3** as outlined below. Record this in the results table.

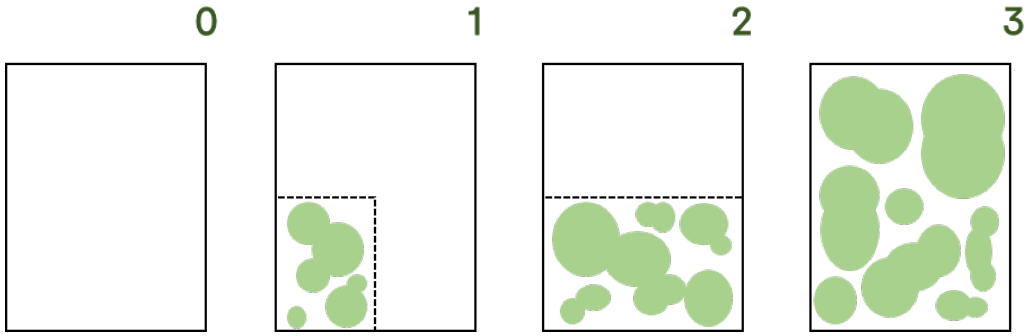
0 None (this is an important result)

1 Small amount overall (amounting to less than ¼ of an A4 sheet of paper in total)

2 Medium amount overall (amounting to between ¼ and up to one A4 sheet in total)

3 Large amount overall (more than one A4 sheet total)





5. **Repeat** for a total of **four** trees, ideally found in different locations across your farm. Consider sampling trees of different girths.

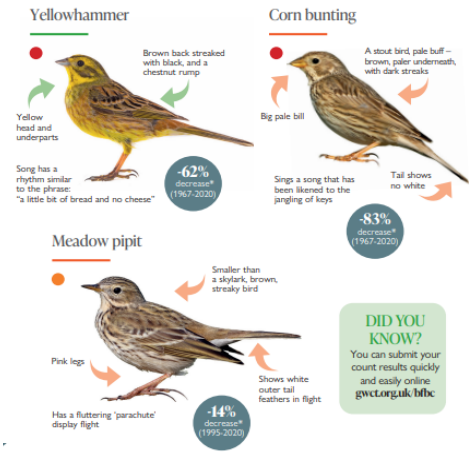
3. FARM HABITAT HEALTH

BIRD SURVEY

Birds are indicator species for farm habitat health. The presence or absence of different bird species can therefore indicate the overall health of different habitats on your farm.

Equipment needed:

- **Bird identification guide** (e.g. GWCT Big Farmland Bird Court ID Guide) and/or **bird identification app** (e.g. Merlin)
- **Results table** found in the Global Farm Metric Field Survey Results document.
- **Binoculars** (optional)



Conducting the survey:

1. Identify the different habitat types which cover **>5% of your land** (i.e. agricultural, upland, woodland, wetland/aquatic).
2. Pick one of these habitats and conduct a **30-minute bird survey**, recording the species observed during this time in the results table.
   NOTE: If using the Merlin app for bird identification, avoid talking and keep background noise to a minimum.
3. **Repeat** for the other identified habitats on your land.
   NOTE: There are two results tables in the GFM Field Survey Results document — if you are completing more than two surveys, please re-print the results table.

4. SOIL FERTILITY AND BIOLOGY

VESS ASSESSMENT AND EARTHWORM COUNT

Healthy soil and water systems support the long-term resilience of farming.

Visual Evaluation of Soil Structure (VESS)

Soil structure can affect root penetration, water availability to plants and soil aeration. Soil compaction reduces the spaces between soil particles, which can lead to reduced growth and nutrient uptake in plants, poor rooting, restricted drainage and increased risk of run-off, soil erosion and nutrient loss. It is therefore useful to regularly assess soil structure.

What do earthworms tell us?

Earthworms have various benefits including carbon cycling, nutrient mobilisation and improving water infiltration. High numbers of earthworms can therefore be beneficial for plant productivity.

Equipment needed:

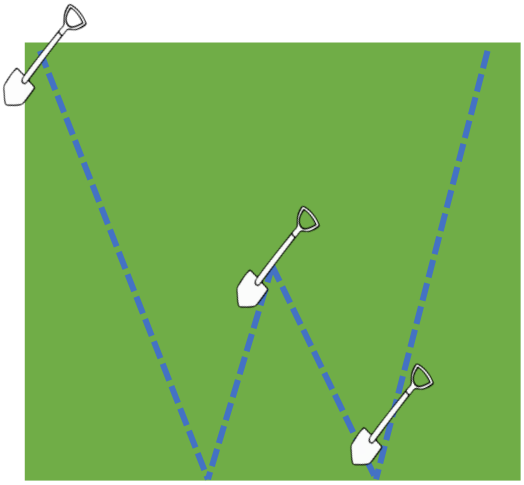
- VESS score card (see link)
- **Spade.** (approximately 20cm wide, 22-25cm long).
- **Plastic sheet** or **tray.**
- **Ruler** or **tape measure.**
- **Results table** found in Global Farm Metric Feld Survey Results document.

When to sample:

- Sample at any time of year, but preferably when the soil is moist. If the soil is too dry or too wet it is difficult to obtain a representative sample, therefore avoid sampling during prolonged spells of wet or dry weather.
- Roots are best seen in an established crop or a few months after harvest.

Conducting the survey:

1. Choose three fields that are typical of your farm (i.e. representing different soil types, enterprises or management approaches).
2. For each field, plot a **W-shape** and walk along this, stopping to take **3 to 5 samples** at the **top**, **middle** and **bottom** of the 'W' (see right).
3. At each point, dig out a block of soil **20cm square and 20cm deep.**
4. Lay the soil on the plastic sheet or tray.
5. Assess the depth of any horizontal layers, root layers indicating compaction and areas of grey or anaerobic soil.



6. Break up the soil block and look for aggregates or clods. If you come across any earthworms, put them on one side of the plastic sheet.
7. Using the VESS scorecard for guidance, record a score for each soil sample you have taken, ranging from **Sq1** (good structure) to **Sq5** (poor structure).
   NOTE: Scores may fit between Sq categories if they have properties of both.
8. Count the number of earthworms in each sample and note this down in the results table.
9. Place the soil and any worms back in the hole.

Photos taken from Vidacycle

5. SOIL CHEMISTRY AND FERTILITY

SOIL SAMPLING

Organic matter is crucial for supporting soil fertility and soil health by enhancing the physical, chemical and biological properties of soil.

You may already have results from previous soil tests for Soil Organic Matter (SOM) and nutrient levels. If so, these can be used in the GFM assessment. If you do not have previous measurements or wish to take new ones, you can collect your own soil samples using the following methodology.

Please note there is no funding available for lab analysis.

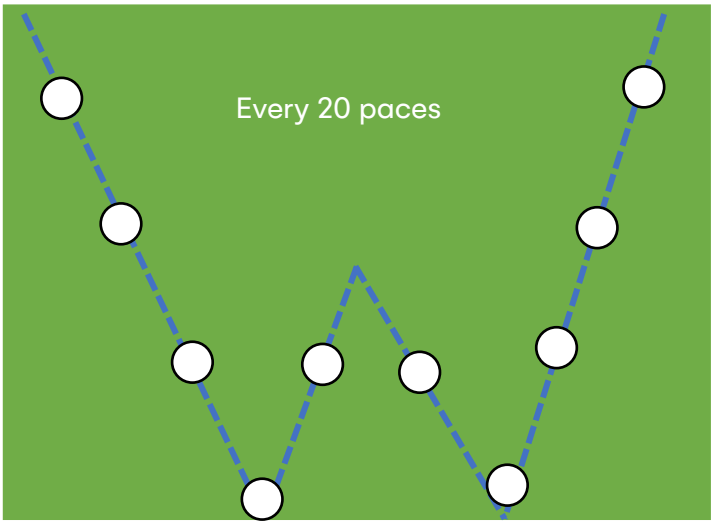
Equipment needed:

- **Auger.**
- **Soil sample bags.**
- **Bucket.**
- **Marker pen** to label bags.

See next page for instructions on how to collect your soil samples.

Collecting soil samples:

1. Choose **three** fields that are representative for the farm (i.e. representing different soil types, enterprises or management approaches).
2. For each field, follow a W-shape (see below) and use an auger to take soil samples **every 20 paces** to a depth of **around 15cm**. You should take **at least 10 samples** in total per field.
3. Mix all samples from each field in a bucket and add **around 400g** into a sample bag.
4. Label the bag and send away to be analysed for SOM from Loss on Ignition (LOI) and the micro/macro nutrients you would like the soil to be tested for.



6. GERMINATION SUCCESS

Counting seedling numbers provides a relatively accurate means of determining how well a crop has established, with the final crop yield directly influenced by the efficiency of crop establishment.

Equipment needed:

- **50cm ruler** or **tape measure.**
- **Results table** found in the Global Farm Metric Field Survey Results document.

Methodology

(Taken from: https://www.agric.wa.gov.au/mycrop/monitoring-seedling-number)

1. Choose a field containing your dominant arable/horticultural crop (i.e. covering the largest area this year).
2. Place a 50cm ruler at random between two rows of the crop.
3. Count and record the number of crop plants along each row on **both sides** of the ruler (see below). This gives the **total plant number per meter row of crop**.
4. Repeat this measurement for a total of **10 sites** within the crop. Record the measurements in the results table.