

Selecting your representative sample area and sample points

Introduction

When collecting information (data) from the field it is important to be able to define what your sample represents. In a field, some things may be out of our control (e.g., temperature, rainfall and sunshine hours), while other things can either be controlled (e.g., timing of field management operations, the type of crop sown and nutrients that are applied) or can be defined (e.g., slope of land, soil type and boundaries). Therefore it is impossible to eliminate all factors that may affect the outcome of a sample, however, it is possible to reduce the number of factors by defining where and how we choose to collect a sample.

Selecting sample area

While it may seem tempting to collect a sample from across the whole field, this may not be practical (e.g., too time consuming) or appropriate (e.g., sample taken from multiple soil types). When you select your sample area have in mind the following:

- An area that is not too large but is representative of the field
- An area where the crop is uniform
- An area within a single soil type
- An area of uniform slope gradient and slope direction

Figure 1 shows 3 scenarios: A, B and C (Table 1).

Table 1: Three different field scenarios and how they affect the location of the representative sampling area

Scenarios	Description	Representative sampling area
A	The whole field has uniform crop cover, soil type and slope gradient	Define an area (e.g., 1 ha or 100 m by 100 m area) of manageable size within the field. This area can be located anywhere but ideally it should be a few meters (e.g., 5 m) in from the edge of the field
B	The field is not uniform. In the example given this is because there are 2 different soil types, but this could also be because of difference in slope or uniformity of crop	Define an area (e.g., 1 ha or 100 m by 100 m area) of manageable size within the field. Locate this area within the field so that it fits within either of the 2 soils, 5 m in from any boundary (e.g., track or change in soil type)
C	The field is not uniform. In the example given this is because there are 2 different soil types and a track that crosses the field	Define an area (e.g., 1 ha or 100 m by 100 m area) of manageable size within the field. Locate this area within the field so that it fits within either of the 2 soils, 5 m in from any boundary (e.g., track or change in soil type). In this scenario the 1 ha area will only fit into Soil 2. There is insufficient room in Soil 1.

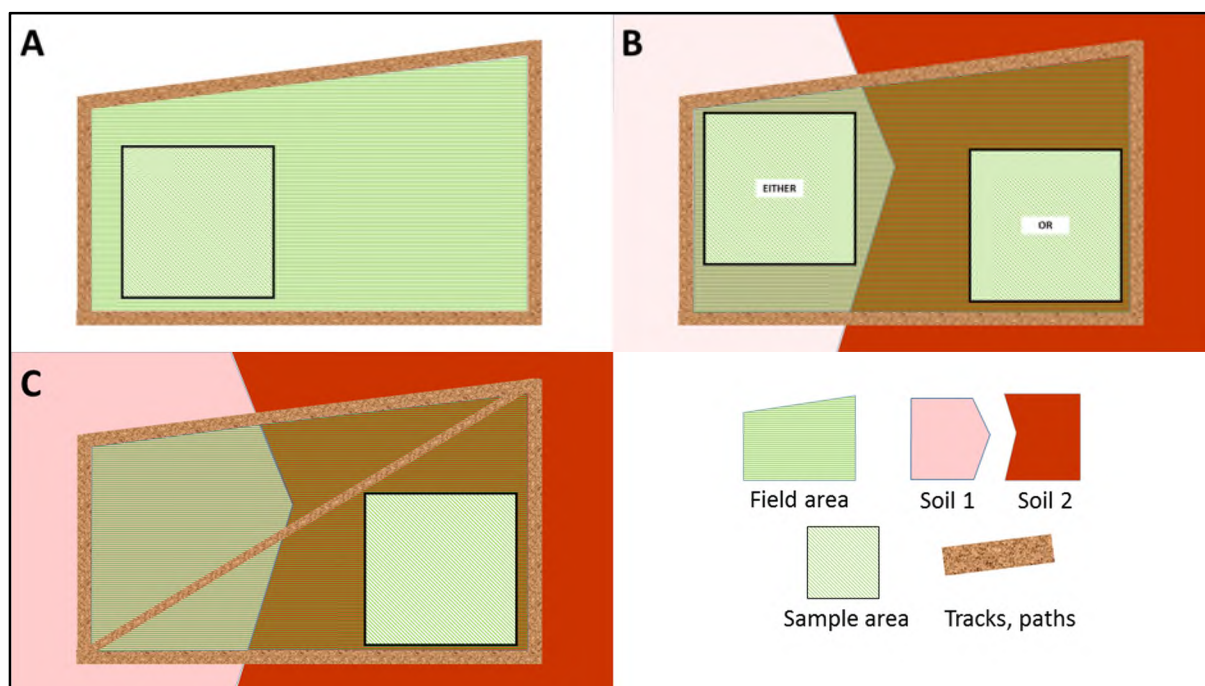


Figure 1: Locating a representative sample area within a field A) within a uniform field, B) in a field with 2 different soil types, and C) in a field with 2 different soil types and a track that crosses the field.

While you do not have to use a square shaped sampling area, this is an easy shape to define and find again in the field.

The size of the sample area does not have to be 1 ha but if everyone uses the same sized sampling area this helps to standardise information collected at different farms. This document assumes that a 1 ha representative sample area has been defined.

Identify your representative sampling area within your field (or fields). If you have access to a GPS device use it to record the location of your sample area. Otherwise mark the area on a map. If practical also mark the corners of the area in the field with something like a flag or spray paint.

Carboncheck soil sample

Soil organic carbon samples will be collected at random points across the representative sample area following a standard W' pattern of sampling (see Figure 2). How you achieve this may vary with crop height and if the crop is sown in rows or broadcast. If possible, record the sample locations using a GPS system, so that you can return to these points later. Alternatively, you can think about marking the location with a flag or spray paint.

A soil sample will be collected at each point on the W' pattern, which will mean 5 random soil samples are collected across the 1 ha area (see Figure 2).

At each sample point a soil sample will be collected to a sampling depth of 0.3 m (0.0 to 0.3 m depth), where soil depth permits. This is best done using an auger if you have one, but can be done using a spade.

If using a spade, dig a hole large enough to collect a soil sample from one wall of the soil pit. The hole needs to be at least 0.3 m deep. Prepare one side of the pit so that its face is vertical. Then from the prepared soil face cut out a small triangular prism of soil by angle the spade (or a knife) to cut at a 45° angle one way and then turning the spade/knife to cut at a 45° angle from the other direction,

forming a v-shaped cut into the face of soil that runs from the surface to 0.3 m depth (see Figure 3). It may be easier to remove this soil in shorter sections that add up to 0.3 m.

Place all soil samples into one clean bucket. Once all 5 samples have been collected in the bucket, mix the soil together thoroughly to form a composite soil sample.

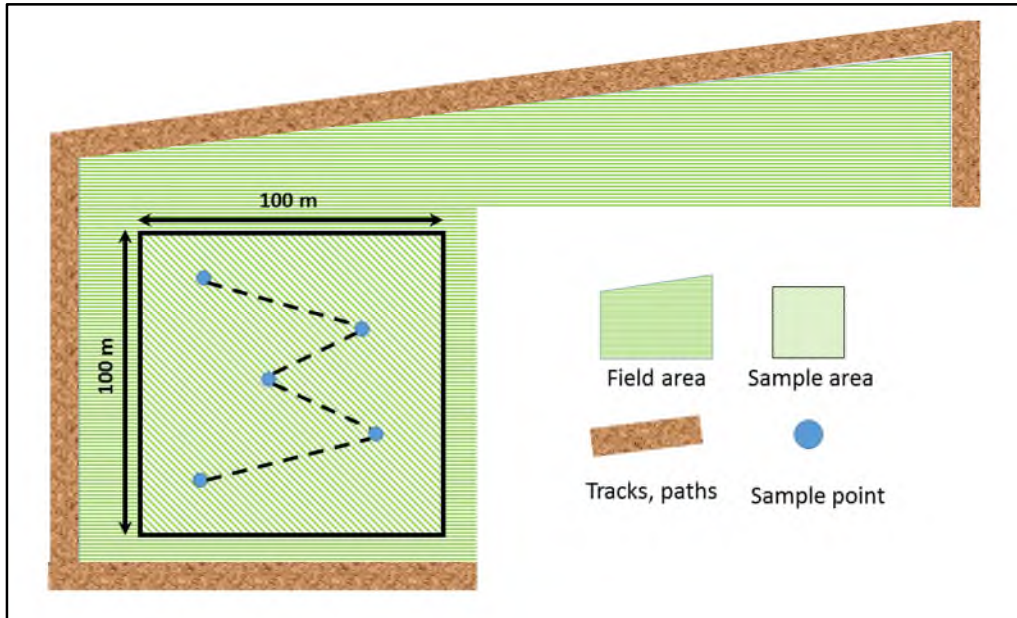


Figure 2: W-sample pattern across representative sample area (1 ha), showing points at which soil samples will be collected

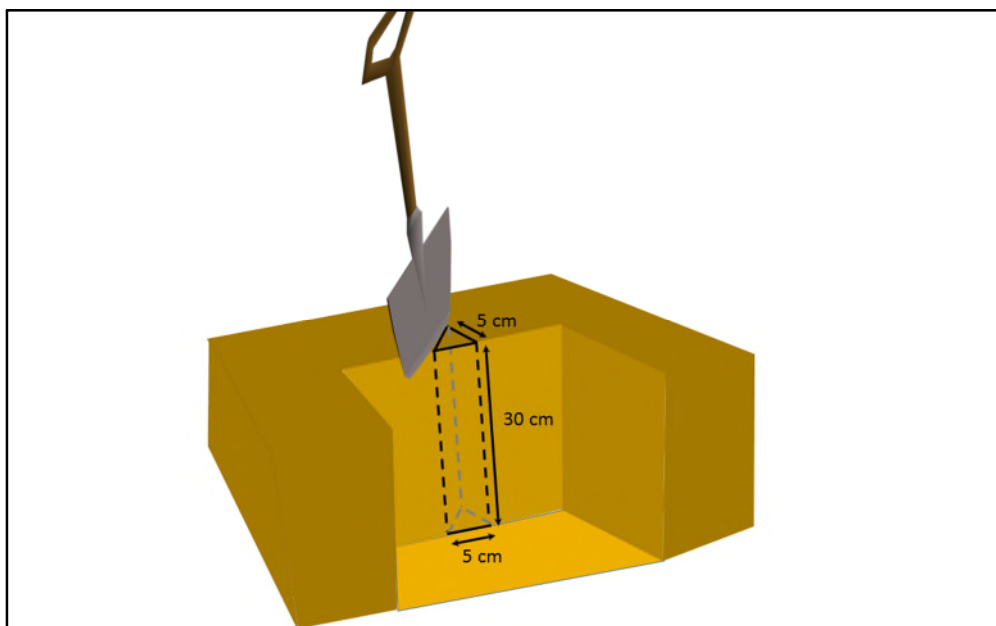


Figure 3: Soil pit dug to 0.3 m depth with a triangular prism of soil sliced out of the soil profile using a space.

Remove all roots and plant material from the composite soil sample.

From the composite sample scoop out approximately 300g of soil and place in the sample bag provided by NRM.

Follow the NRM instructions of how and where to send your sample to them for their Carboncheck Plus analysis service.

Soil health sampling points

Within your defined representative area, select 3 random points. Ideally these will relate to other samples, so if you can, return to 3 of the points on the W sampling that you used to collect your Carboncheck soils from (see Figure 4). Be careful to avoid where you previously disturbed the soil.

At each of these 3 locations you will:

1. Look for worm middens
2. Do your visual soil assessment (VSA)
3. Take measurements of infiltration

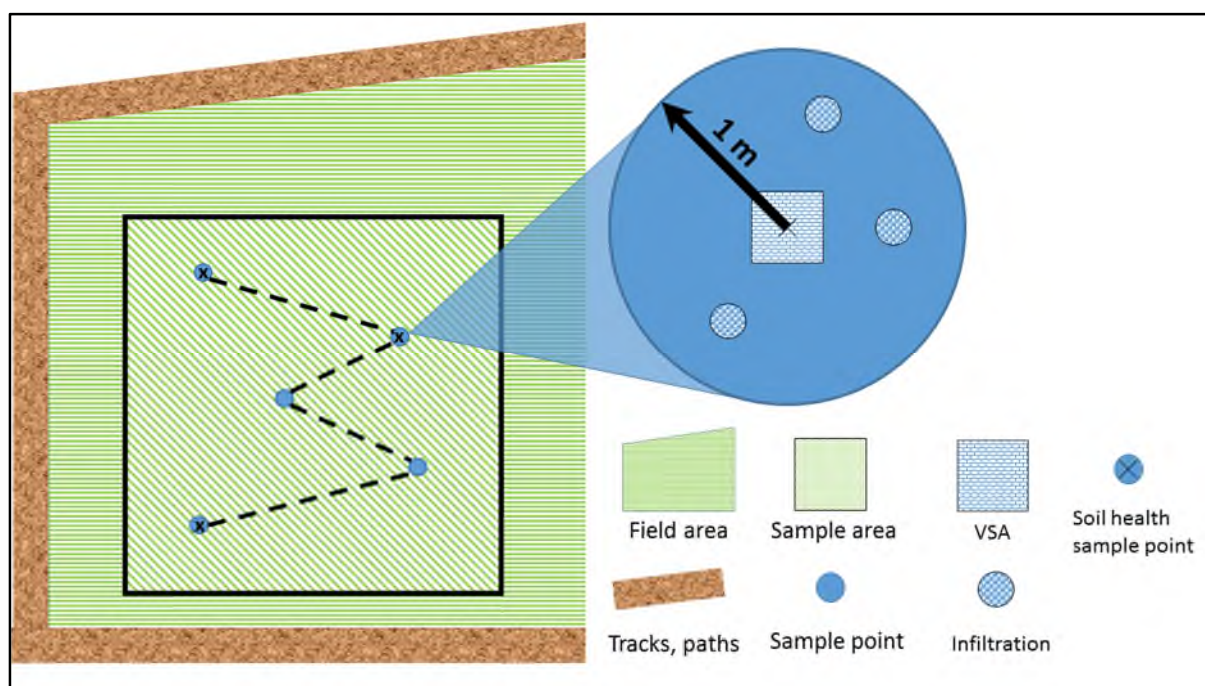


Figure 4: Sample points (x) for visual soil assessment (VSA), midden count and infiltration

Worm midden count

Taking care when you approach your sample point not to tread on any worm middens. At your sample point, identify where the approximate centre of your VSA sample will be and before digging look for worm middens within a 1 m radius of the centre of your VSA point

Visual Soil Assessment (VSA)

Take the VSA sample from the centre location of your sample point.

Infiltration

Within the 1 m radius circle of your sample point choose 3 random locations at which to measure the rate of infiltration.

Equipment

Representative sample area and sample points

GPS devise (if have)

Markers (e.g., flag or spray paint)

Sample point – soil health

GPS devise (if have)

Markers (e.g., flag or spray paint)

1 m measure

Carboncheck

Spade or auger

Tape measure or depth marked on spade/auger

Clean bucket

Spade or trowel to mix the soil

Labelled sample bag

Soil health samples

VSA

Spade

Tray or bucket

Block of wood

Plastic rubble sack or plastic sheet (about 0.5 by 0.5 m)

Camera

VSA mark sheet and pen

Worm count

AHDB worm guide

Tape measure or 1 m measured on spade

Infiltration

Cylinder (0.15 m diameter by 0.15 m high)

Water

Small plastic bag or sheet of plastic

Ruler

Stopwatch

Recording sheet