



UltraFine+[®] Soil Sampling

Sampling conducted as part of the UltraFine+[®] Project should use the following as a minimum.

1. UltraFine+[®] Sampling Workflow

Main sample media

At each site collect a shallow soil sample from approximately 2 – 10 cm in depth. Depth can vary and a lower soil horizon or similar morphological feature is a suitable target. Be consistent with other soil sampling protocols in general, although the benefits of UltraFine+[®] is that soil morphological changes tend to be compensated for and the mass of soil required is less than other methods and requires little preparation. The sample should be approximately 200 g.

Sample collection routine

- A clear space in the landscape should be selected, photographed and documented. Typical field notes are always beneficial, such as date, time, conditions, regolith setting, vegetation and geology types, etc.
- Scaped away the top 1 cm using a plastic trowel. The area removed will be approximately 15 cm x 15.
- A further 5 – 10 cm is dug using a posthole shovel or a plastic scoop. The ultrafine soil fraction is collected from this material. In certain areas and soil types a geo-pick may make it easier to break up ground to depth and homogenise prior to sieving.
- Any coarse material >2 mm should be sieved out of the soil sample and discarded. The remaining (<2 mm size fraction) 200 g sample should be placed in a paper Geotech sample bag. Other bag types can be used but is important to have air dry samples, and breathable paper is better than plastic (for drying purposes).
- Following collection of materials, the small hole will be back filled and returned to a near flat surface.

Sample Locations

Samples should be collected on a pre-planned spacing and avoid sampling areas that have clear disturbance or contamination such as animal burrows, old drilling spoils, or mine/agriculture infrastructure. If working in agricultural settings, sample below the plough depth (20 cm).

Sample Preparation

Samples should be collected when it is dry or dried soon after collection. This can be done in an oven at <80 °C and preferably 50 °C. Once dry, sample bags should be closed and sent to LabWest for analysis.

2. Analytical Program (UltraFine+[®] Next Gen Analytics Sponsors)

Laboratory analysis

All soil samples sent to LabWest should request the UltraFine+[®] method, the UltraFine+[®] standard, and note that they are part of the CSIRO Next Gen Analytics project (if they are a sponsor, to receive the additional new analyses and results). Other samples will receive the standard UltraFine+[®] analysis. This uses a separation technique to extract the <2 μm particle size fraction and provides geochemistry, spectral mineralogy, particle size distribution and a number of other parameters.