

PAAG sampling guide

Soil mineral nitrogen

Principles of sampling

Samples might be taken for advisory or diagnostic purposes. Either way, the sample must be small enough for the laboratory but representative of the field or area sampled. A sample of a few grammes used for analysis must be as representative as possible of several thousand tonnes of soil. Care taken in sampling is never wasted and is essential if laboratory results are to be useful.

Sampling for soil mineral nitrogen measurement

Why sample?

Measuring soil mineral nitrogen (SMN) is one method for arriving at the Soil Nitrogen Supply (SNS) Index that is the basis for fertilizer nitrogen recommendations for arable crops in the Fertiliser Manual. Measuring SMN can be more appropriate than estimating the SNS Index from rainfall, soil type and previous crop (the Field Assessment Method) where the soil nitrogen supply is expected to be greater than average. This can occur in heavier soils or where there has been a history of manure application, where there are vegetables in the rotation or where grass was ploughed out recently (though the Field Assessment Method should be used in the first year after ploughing out).

How often should samples be taken?

Fields should be sampled selectively and not necessarily on a routine basis. Measurements on a few appropriate fields each year can help refine fertiliser nitrogen use and check estimates made by the Field Assessment Method.

When should samples be taken?

Some nitrogen will be lost by leaching over winter so sampling in the spring (February) can give slightly better estimates of SNS Index than sampling in the autumn. The difference on clay and silt soils is small. Samples should not be taken within three months after application of nitrogen fertiliser or organic manures, or within a month after sowing.

How should samples be taken?

Soil cores to 90 cm should be taken from 10-15 positions in a 'W' pattern across the field. Cores should not be taken from headlands, gateways or sites of past manure heaps. If required, cores should be taken at three depths in the spring: 0-30 cm, 30-60 cm and 60-90 cm. Coring to 60 cm is adequate in the autumn.

Soil cores from each depth should be bulked. More than one bulked sample might be needed where there are significant differences in soil type or past management within a field. If the bulk sample is too big, sub-sample by taking many small representative portions but do not mix the sample excessively.

How should samples be submitted?

Samples should be analysed within three days of sampling. Samples must be kept cool (approximately 4°C) but not frozen during storage and transport. The sample must be clearly identified and securely packaged and labelled.

Further information

PAAG laboratories can provide detailed information on soil and plant tissue sampling and many show instructions at their web sites. The following might also be useful:

HGCA *Topic Sheet 115: Estimating Soil Nitrogen Supply (SNS)*.

http://hgca.com/cms_publications.output/2/2/Publications/On-farm%20information/Estimating%20Soil%20Nitrogen%20Supply%20%28SNS%29.msp?fn=show&pubcon=8973.

