

# METHOD STATEMENT



## Determinand:

Determination of Extractable Potassium and Extractable Magnesium

## Matrix:

Sample Type: soil samples.

## Principle of Method:

Potassium and Magnesium are extracted from the soil with molar ammonium nitrate. The concentrations in the extract are determined by ICP-OES.

## Sampling and Sample Preparation:

Ground soils are stored at room temperature in 120 ml plastic soil pots; wet soil samples arrive in a plastic soil bag and are refrigerated at  $3 \pm 2^\circ\text{C}$ .

Soil samples are dried and ground according to method WSC15 prior to analysis.

Provided the samples are dried and ground within 7 days of sampling, the dried soil has 1 month to be extracted within stability (BS ISO 18512:2007). The extracted portion is stable for 8 weeks (Wakefield In-House Data).

## Interferences

The choice of appropriate analytical wavelengths minimises any spectral interferences.

## Performance of Method:

### Range of Application:

is 0 - 150 mg/l without dilution for potassium and magnesium when using the Agilent and 0 - 100 mg/l for potassium and 0 - 150 mg/l for magnesium when using the Optima.

The analytical range may be extended by sample dilution with 1M ammonium nitrate

### Limit of Detection and Calibration Bias:

	Optima		Agilent		WSC13
	LOD mg/l	LOD mg/kg	LOD mg/l	LOD mg/kg	MRV mg/kg
<b>K</b>	0.5	2.5	0.12	0.6	7.5
<b>Mg</b>	0.33	1.65	0.35	1.75	13.9

### Recoveries of Compounds:

#### OPTIMA

	Clay Soil		Sandy Soil		Loam	
	K	Mg	K	Mg	K	Mg
Concentration mg/l	33.4	50.3	14.2	8.13	36.0	31.1
Concentration mg/kg	167	251	70.9	40.6	180	155
Recovery %	96.98	95.55	99.36	95.02	97.27	96.45
RSD %	7.64	5.69	6.81	5.18	6.33	4.88

#### AGILENT

	Clay Soil		Sandy Soil		Loam	
	K	Mg	K	Mg	K	Mg
Concentration mg/l	79.78	28.34	21.82	16.13	38.11	19.41
Concentration mg/kg	398.90	141.70	109.10	80.65	190.55	97.05
Recovery %	98.13	90.52	98.39	95.31	99.54	98.06

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RSD %	1.24	1.25	2.37	2.28	1.41	1.37
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## References:

The Analysis of Agricultural Materials, Reference Book 427, 3rd edition. Ministry of Agriculture, Fisheries and Food. HMSO. ISBN 0 11 242762 6. Methods 40 and 63.

Fertiliser Recommendations, Reference Book 209. Ministry of Agriculture, Fisheries and Food. HMSO. ISBN 0 11 242813 4. Appendix 1.

Agilent 5900 ICP-OES Series Hardware Guide.

Perkin Elmer Optima 7300 ICP-OES Series Hardware Guide