TURBO-GROW

VOLCANIC ROCKDUST

COMPOSITION & APPLICATION GUIDE

Mineral-rich volcanic rock dust for soil remineralisation

Application guidelines and laboratory composition data from the Council for Geoscience and SGS Lakefield Research Africa.

FEED THE SOIL. BUILD THE MINERAL BASE.

APPLICATION OF ROCK DUST

A little goes a long way. Use Turbo-Grow sparingly. Twice as much is not necessarily twice as good. Unlike conventional water-soluble fertilisers, Turbo-Grow is intended to support the soil mineral base. The product is not formulated as a soluble fertiliser and is designed to remain in the soil where biological processes can gradually act on its mineral constituents.

For best results, combine rock dust with ample organic matter such as good-quality compost. Building both the mineral and organic fractions of soil, together with active soil biology, supports long-term soil fertility.

Microbial support: In badly weathered soils with low microbial activity, Turbo-Grow has historically been used alongside microbial inoculants such as EM (Effective Micro-organisms). These are mixed cultures of beneficial micro-organisms used as soil inoculants. Contact Turbo-Grow for information on microbial inoculants and chelators.

Important: The rates below are general guidelines only. Soil type, crop, climate, existing fertility and management practices vary. Turbo-Grow is intended to complement an appropriate fertilisation programme rather than automatically replace crop-specific nutrient requirements.

GENERAL APPLICATION GUIDELINES

Application	Suggested Rate
Seedlings	1 teaspoon per seedling
Pot plants	1 tablespoon per 5 litre container capacity
Trees	500 g to 1 kg per tree
Shrubs & roses	1 to 2 cups per plant
Flower & vegetable beds	500 g to 1 kg per m^2
Compost	10 kg per m^3 of raw material
Agriculture	500 kg per hectare
Planting mixes	2% of total mix volume

Typical frequency: For many general applications, twice-yearly applications together with adequate compost may be sufficient. Commercial agriculture should ideally be guided by soil analysis, crop requirements and local agronomic advice.

Need application advice? Contact Turbo-Grow for guidance regarding your specific crop, soil and application.

COMPOSITION OF TURBO-GROW VOLCANIC ROCKDUST

The major-element composition below was tested by the **Council for Geoscience** using X-ray fluorescence spectrometry (XRF). Results are reported as the oxides in which the major elements naturally occur in the rock.

MAJOR ELEMENTS - WEIGHT %

Oxide	Weight %
SiO2	48.58
TiO2	0.91
Al2O3	16.32
Fe2O3	9.30
MnO	0.18
MgO	6.36
CaO	12.11
Na2O	2.32
K2O	0.58
P2O5	0.15
Cr2O3	0.02

SGS LAKEFIELD RESEARCH AFRICA - ELEMENTAL ANALYSIS

The following elemental analysis was supplied from SGS Lakefield Research Africa testing. Values shown with '<' indicate that the reported concentration was below the stated reporting/detection threshold.

Element	Test & Detection Limit	Result
As - Arsenic	IMS12Q - 2 ppm	5.1 ppm
B - Boron	CP40D - 50 ppm	<50 ppm
Bi - Bismuth	ICP40D - 20 ppm	<20 ppm
Ca - Calcium	ICP40D - 10 ppm	54000 ppm / 5.4%
Cr - Chromium	ICP40D - 10 ppm	160 ppm
Cu - Copper	ICP40D - 10 ppm	65 ppm
Li - Lithium	ICP40D - 10 ppm	<10 ppm
Mn - Manganese	ICP40D - 10 ppm	1000 ppm
P - Phosphorus	ICP40D - 53 ppm	700 ppm
Pb - Lead	ICP40D - 30 ppm	<30 ppm
Sr - Strontium	ICP40D - 5 ppm	240 ppm
V - Vanadium	ICP40D - 10 ppm	170 ppm

Element	Test & Detection Limit	Result
Zn - Zinc	ICP40D - 10 ppm	68 ppm
Zr - Zirconium	ICP40D - 10 ppm	110 ppm
Al - Aluminium	ICP91B - 0.02%	7.98%
Ba - Barium	ICP91B - 0.02%	0.03%
Fe - Iron	ICP91B - 0.02%	6.45%
K - Potassium	ICP91B - 0.02%	0.63%
Mg - Magnesium	ICP91B - 0.02%	3.20%
Si - Silicon	ICP91B - 0.1%	24.6%
Ti - Titanium	ICP91B - 0.02%	0.50%
Th - Thorium	IMS40B - 0.5 ppm	3.8 ppm
Tl - Thallium	IMS40B - 0.2 ppm	<0.2 ppm
W - Tungsten	IMS40B - 0.5 ppm	1.6 ppm
U - Uranium	IMS40B - 0.2 ppm	1.0 ppm
Au - Gold	FAI313 - 0.02 ppm	<0.02 ppm
Pt - Platinum	FAI313 - 0.02 ppm	<0.02 ppm
Pd - Palladium	FAI313 - 0.02 ppm	0.03 ppm
Ir - Iridium	FAI363 - 0.13 ppm	<0.13 ppm
Rh - Rhodium	FAI363 - 0.02 ppm	<0.02 ppm
Ru - Ruthenium	FAI363 - 0.02 ppm	<0.02 ppm
C - Carbon	CSALA01 - 0.01%	0.25%
S - Sulphur	CSALA06 - 0.01%	0.11%
Be - Beryllium	IMS40B - 0.5 ppm	0.95 ppm
Sc - Scandium	IMS40B - 0.5 ppm	16 ppm
Co - Cobalt	IMS40B - 0.5 ppm	41 ppm
Ni - Nickel	IMS40B - 5 ppm	89 ppm
Ga - Gallium	IMS40B - 2 ppm	24 ppm
Ge - Germanium	IMS40B - 0.5 ppm	0.57 ppm
Rb - Rubidium	IMS40B - 1 ppm	19 ppm
Y - Yttrium	IMS40B - 0.2 ppm	26 ppm
Nb - Niobium	IMS40B - 0.5 ppm	12 ppm
Mo - Molybdenum	IMS40B - 0.5 ppm	1.9 ppm
Ag - Silver	IMS40B - 2 ppm	<2 ppm
Cd - Cadmium	IMS40B - 0.5 ppm	<0.5 ppm
In - Indium	IMS40B - 0.1 ppm	<0.1 ppm
Sn - Tin	IMS40B - 0.5 ppm	1.6 ppm
Cs - Cesium	IMS40B - 0.2 ppm	1.1 ppm
Hf - Hafnium	IMS40B - 0.1 ppm	2.7 ppm
Ta - Tantalum	IMS40B - 0.1 ppm	<1 ppm
Se - Selenium	IMS12Q - 5 ppm	<5 ppm
Te - Tellurium	IMS12Q - 2 ppm	<2 ppm

Element	Test & Detection Limit	Result
Sb - Antimony	IMS12Q - 1 ppm	<1 ppm
Hg - Mercury	IMS12Q - 3 ppm	<3 ppm
La - Lanthanum	IMS90A - 10 ppm	25 ppm
Ce - Cerium	IMS90A - 1 ppm	39 ppm
Pr - Praseodymium	IMS90A - 0.1 ppm	4.5 ppm
Nd - Neodymium	IMS90A - 0.2 ppm	18 ppm
Sm - Samarium	IMS90A - 0.1 ppm	4.0 ppm
Eu - Europium	IMS90A - 0.1 ppm	1.2 ppm
Tb - Terbium	IMS90A - 0.1 ppm	0.83 ppm
Dy - Dysprosium	IMS90A - 0.1 ppm	4.6 ppm
Ho - Holmium	IMS90A - 0.1 ppm	1.0 ppm
Er - Erbium	IMS90A - 0.1 ppm	2.6 ppm
Tm - Thulium	IMS90A - 0.1 ppm	0.29 ppm
Yb - Ytterbium	IMS90A - 0.2 ppm	2.2 ppm
Lu - Lutetium	IMS90A - 0.1 ppm	<0.1 ppm

SOLUBLE SILICON

Si - Silicon	**ICP84B - 0.3 mg/L**	**460 mg/L**

Technical note: Total elemental or oxide composition does not by itself indicate the amount immediately available to plants. Nutrient release and availability depend on mineralogy, particle size, soil chemistry, biological activity, moisture and time. For commercial crop programmes, use soil and/or plant analysis and appropriate agronomic advice.

TURBO-GROW VOLCANIC ROCKDUST

A naturally occurring mineral rock dust intended for soil remineralisation and integration into soil-building programmes.