BASALT CONFERENCE
SCIENCE & TECHNOLOGY

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INTERNATIONAL CONFERENCE

«THE BASALT
THE WEALTH OF THE NATIONS»

THE MAIN BENEFITS OF BASALT POWDER IN AGRICULTURE

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PREAMBLE

Africa has about 1.3 billion people, or 17% of the world's population, and studies predict that THIS number will reach 4.5 billion by 2100, or 40% of the world's population by the end of the current century. This phenomenon is mainly due to the fact that the African continent has a falling mortality rate and an increasing birth rate, with a direct implication, both in the food supply of the population and in food security.

About 70% of people live on agriculture, with women being responsible for 60-80% of the food produced and *SOLD*. Agriculture thus plays a catalytic role, stimulating growth and sharing African wealth. According to data from the New Partnership for Africa's Development, *NEPAD*, the African continent *HAS* 65% of the world's uncultivated fertile land, 10% of renewable freshwater resources and the continent's agricultural production has increased by 160 % in the past 30 years.

The joint *FAO* and *ECA* - United Nations Economic Commission for Africa report, published on February 13, 2019 in Addis Ababa, Regional Vision for Africa on food security and nutrition, indicates that 237 million people in sub-Saharan Africa suffer from chronic malnutrition, retracing the progress made in recent years.

In June 2006, African leaders met in Abuja, Nigeria, in the purpose of taking measures up to the importance of fertilizers for a green African revolution. The main outcome of this summit confirmed the commitment of African heads of state to rapidly increase the use of fertilizers on the continent, bringing the average from 9 kg / ha in 2006 to less than 50 kg / ha in 2015, the target which has not yet been reached.

The average fertilizer consumption in Africa is 10 kg / ha which corresponds to 10% of the world average, almost 20 times less than the Asian average (191 kg / ha) and 9 times less than the Latin American average (94 kg / ha). The poor use of fertilizers in Africa is mainly due to two factors: the high price of fertilizers given the low purchasing power of farmers and the lack of alternatives available to producers and farmers.

Over the past few decades, relevant applied research centers, universities and governments have focused on finding alternatives to traditional chemical fertilizers, both to increase agricultural profitability and the quality of food produced and the protection of the environment. The application of rock powder in agriculture has proven to be a suitable solution for agriculture to meet the challenges facing contemporary society, both in the present and in the future.

Basalt rocks have a composition rich in chemical elements considered as nutrients for plants, which makes it suitable for use in agriculture, improving soil fertility.

Here are some of the main benefits of basalt powder in agriculture as well as some of the main building blocks of basalt powder.

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»MAIN BENEFITS OF BASALT POWDER IN AGRICULTURE

The basalt powder in the revitalisation of agricultural land:

- Slow release of nutrients for plants;
- The losses of nutrients by leaching are reduced;
- Easy to apply;
- It has the potential to neutralize soil acidity (pH);
- It has no acidifying or salinizing properties for the soil;
- The presence of silicon reduces the fixation of phosphorus in soils and is able to indirectly increase the available levels of this element;
- It is a source of the calcium nutrients (Ca), magnesium (Mg) and beneficial element silicon (Si);
- It is a source of iron micronutrients (Fe), manganese (Mn) and optionally copper (Cu), zinc (Zn) and vanadium (V);
- It can replace or supplement chemical fertilization;
- It increases the efficiency of chemical fertilization and has highly positive effects;
- Lower incidence of pests and diseases in plants;
- Increases productivity particularly in fruit trees and cereals.

Basalt powder improves yields:

- It increases the growth of beneficial microorganisms, resulting in an increase in plant nutrients.
- Balances Soil.
- It makes nutrients available to plants at all stages of development.
- Provides essential nutrients.
- One application continuously releases minerals throughout an entire season.

Basalt powder Increases Nutritional Value of agricultural products:

- Can increase the cation exchange capacity of highly weathered soils.
- Speeds composting.
- May help release phosphates more readily to the plant.
- The standard dosage is equivalent to a 20 kg bag of basalt powder on 40 m^2.
- Basalt powder will recondition the soil naturally, giving healthier plants, fruit and vegetables and higher yields, aster.

Contains: Calcium and Magnesium Silicate

- Adequate silicon nutrition may help protect plants from insect and fungal diseases and prevent micronutrient toxicities and other nutrient imbalances.
- Silicon is also known to improve water use efficiency and enhance root growth and structural strength, increasing the photosynthetic efficiency.
- Silicon compounds impact on soil physical and chemical properties such as soil aggregation, water holding capacity and exchange and buffering capacity.

Ingredients

Basalt powder is a soil enhancer and 100% remineralizer, thus forming a new and fertile soil.

Volcanic Rock

In the form of a fine dust, volcanic rock contributes to soil friability and contains micro-nutrients. It also serves as a natural insect deterrent.

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THE MAIN CONSTITUENT ELEMENTS OF BASALT

Silicates:

Silicates are necessary in building plant protein and in the synthesis of certain vitamins in plants. Silicates function as a vital element in protecting plants against insects and fungi attack, strengthening qualities and have been found to influence other minerals useful in plant metabolism.

Calcium:

Plants need calcium for normal cell division, as a component of cell walls, as a component of the salts inside the cells and as a part of the genetic coding materials.

Magnesium:

Magnesium is a key component of the chlorophylls, the green coloured cells in the plant. It is therefore vital as chlorophylls are the cells which perform photosynthesis. Also, plants need magnesium before thay can make use of phosphorous and magnesium also activates several different enzyme systems.

Iron:

Iron is a constitutent of many compounds in plants that regulates and promotes growth. It is especially important to the function of chloroplasts, the plant cells that contain chlorophyll, which are the particles that perform photosynthesis.

Potassium:

Potassium strengthens plant stalks and helps undo the stress induced by excess nitrogen.

Phosphorus:

Phosphorus is the «Go» food for plants.

Trace Minerals:

- Basalt is a source of iron, manganese, and some types of basalts are sources of copper, zinc and vanadium.

As a soil remineralisation product, Basalt Powder:

- It causes an impressive growth of beneficial microorganisms in the soil and induces the development of plant roots.
- Raises the moisture and nutrient storage capacity of the soil.
- Makes mineral nutrients readily available, increasing their intake by plants.
- Makes mineral nutrients available at all stages of plant growth.
- Provides sustained-release properties.
- Contracts the effects of soil acidity [pH].
- Decreases toxic interchangeable aluminum.
- Reduces soil erosion.
- Contributes to the building of stable humus complexes.
- Improves resistance to insects, disease, fungus, frost and drought.

Basalt powder can be supplied in small quantities for gardening or in large quantities for intensive and extensive farming.

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THE INTERNATIONAL CONFERENCE

Aware of the importance and the challenges that many countries face with regard to increasing agricultural productivity, the quality of food produced, food security and environmental challenges, Cape Verde will bring together some of the most eminent scientists and international researchers who for decades have focused their research activities on the application of rock powder in agriculture, soil recovery and the agromineral characteristics of rock powder.

It is in this context that the International Conference will focus on the application of basalt powder in agriculture, lasting three days, from November 7 to 9, 2021, in the Noble Hall of the National Assembly of Cape Verde, Praia, capital of the Republic of Cabo Verde

This international conference of Cape Verde will have the honor of recording the presence of eminent personalities from the scientific community such as the researcher who introduced the application of rock powder to agriculture in Brazil. in the 1970s, Prof. Emeritus Othon Henry Leonardos, of the University of Brasilia; eminent researchers Prof Eder Martins, researcher at *EMBRAPA* - Brazilian Society for Agricultural Research; Prof. Suzi Huff Theodoro - Researcher at the University of Brasilia; Prof. Bernardo Knapik - Researcher at the State University of Paraná - Brazil; Prof. Emeritus Peter van Straaten - University of Guelph - Canada; MSc Magda Bergmann - Geological Survey of Brazil; MSc. Andrea Sander - Geological Survey of Brazil.

These researchers will be joined by other eminent researchers, especially from the University of Cape Verde and from various African and European academic and research institutions.

Moreover, important international financial institutions, regional institutions that focus on agriculture and the environment, as well as important Cape Verde development partners and regional development, will also be present at this Event honoring the Organizing and enhancing the precious scientific heritage that will be presented during this Event, thus strengthening and enhancing one of Cape Verde's most important natural resources: basalt.

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GLOSSARY

Agromineral:
Mineral raw material for the production of inputs for soil fertility management.

Basalt:
Basalt is an eruptive, magmatic igneous rock with a mafic composition, which is why it is rich in magnesium and iron silicates and poor in silica.

Olivine basalt:
Olivine basalt, also often called alkaline basalt, is a fine-grained volcanic rock of dark color characterized by the presence of olivine phenocrysts, augite rich in titanium, plagioclase and iron oxides.

Tholeitic basalt:
The tholeitic basalt, or toléite, is the name given to rocks typical of areas of magmatic ascent, such as ocean ridges and faults, which have general characteristics identical to alkaline basalts, but are rich in phenocrysts of non-zoned olivines and calcium pyroxenes.

Picnic basalt:
Picritic basalt, picrobasalt or oceanite is a variety of basalt with a high magnesium olivine content which is very rich in olivine. It is dark with olivine phenocrysts, 20 to 50%, greenish yellow pyroxenes and dark black brown, most of which are Augites.

Fertilizers:
Fertilizers are any type of substance applied to the soil or plant tissue to provide one or more nutrients essential for plant growth.

Remineralizers:
Material of mineral origin which has undergone only reduction and classification in size by mechanical processes and which modifies the fertility indices of the soil by adding macro and micronutrients for plants, as well as the promotion of improvement of the physical or physico-chemical properties or the biological activity of the soil.

«Stonemeal»:
"Stonemeal" is a technology which considers that certain types of rock, mineralogically rich in macro and micronutrients, have the function of remineralizing / rejuvenating soils and therefore increasing their fertility..

«Stonemeal» and potassium:
Potassium is a chemical element essential to life because it enters the composition of the cell nucleus and is involved in various metabolic processes in plants, such as enzymatic activation, osmotic control of water flow, production and breakdown of carbohydrate chains and load balancing. The record for the importance of potassium in agriculture has been found since Antiquity, where it was used in the form of ashes resulting from the burning of trees or fish.