THE CONCEPT

Instruments which have so far manufactured around the world to measure the calcium carbonate, referred to as "Calcimeters" and used for research or quality control. Most of them are mainly laboratory glass arrays, and usually consist of: Erlenmeyer flasks, test tubes, connecting tubes and stoppers and in the international literature referred to as 'Bernard' or 'Scheibler' calcimeters. The main disadvantages of this kind of calcimeters is that the measurements are time-consuming (if the concentration of calcium carbonate is low or high, repeated measurements are required more or less sample weight respectively) require approximate mathematical calculations and include errors because indications must be taken optical and instantaneously, and estimated by the user, while not taking into account the reaction temperature. In any case, calcimeters have been manufactured up to date, are of questionable accuracy, bulky, difficult to use, of reduced mobility and of limited capabilities and features like the temperature compensation and their ability to communicate through a satellite system to track its geographical location (GPS), and record the measured result and location saving into a random access memory.

FOG // Digital Soil Calcimeter™, is based on the measurement of pressure of CO_2 produced by the reaction with hydrochloric acid. The calculation of the calcium carbonate content of the sample is made with the necessary correction of the measured value for the temperature (*automatic temperature compensation*) with an *extreme accuracy and repeatability*. Additionally **FOG // Digital Soil Calcimeter™** is *portable* and has the ability to communicate through a satellite system to track its geographical location (GPS), and record the measured result and location saving into a random access memory.

Why is Calcium (Ca) important?

- Soil: Calcium opens up (flocculates) the soil, improving structure and allowing roots, earthworms, oxygen, water and microbes to move freely through the soil.

The determination of *total carbonates* content in soils

Soil total carbonate salts ($CaCO_3$, $MgCO_3$, etc.), is of great interest on account of its high usefulness for diagnosing soil status in terms of nutrient contents, structure, texture or biological activity. These salts are measured to determine soil buffering capacity with relation to soil fertility, chemical and pedogenic processes. The determination of total carbonates is expressed as percentage of $CaCO_3$ and is based on the volumetric analysis of the carbon dioxide released upon addition of HCl to soil carbonates.

- •Plants: Calcium is often referred to as the 'trucker of all minerals" in relation to its role in mobilizing other nutrients.
- Plant Deficiency Symptoms: Stunted root systems and a lack of vegetable vigour. Blossom end rot in tomatoes, capsicums and zucchini. Internal browning or blackening of celery, potatoes and Brussels sprouts. Deformation and Necrosis of young leaves.

Calcium Benefits

- •Good soil structure associated with correct calcium levels.
- Avoid soil crusting. Soils are harder to damage and recover sooner after poaching or compaction when exposed to traffic by machinery or animals in wet conditions.
- Calcium neutralizes soil acidity.
- •Calcium plays a critical role in improving soil structure and quality.
- Reduces soil salinity and phosphorous loss.
- Improves water percolation.
- Increases root development.
- Only N and K are required in larger amounts by plants.
- High potassium levels reduce the uptake of Ca.