**Alternative Approaches to Soil Management**

Management of soil fertility for biological systems has attracted a number of alternative approaches to understanding soil conditions and plant growth. The following outlines indicate several concepts for consideration.

* **Dr Rudolf Steiner** – was the initiator of the concepts that form the basis of biodynamic agriculture. Biodynamic farming is a method designed biologically to activate the life of soil and plants. Plants are fed naturally through the soil ecosystem and not primarily via soluble salts in the soil water.

Essential features relate to the use of special preparations and other techniques that enhanced soil biological activity, humus formation and soil structural development as the basis for allowing plants to selectively assimilate nutrients as dictated by sun warmth and light. Biodynamic farms aim to be closed, self-sufficient units.

* **Dr William Albrecht** - was primarily concerned with a soil fertility approach based on nutrient balance (or ratios) as the foundation for achieving proper fertility relevant to optimal plant growth. The nutrient balance equations he developed are related to soil total exchange capacity.

Ideal ratios or percentages of cations and anions are defined for different soil types, with the total availability of these nutrients generally increasing (except magnesium and manganese) with their percentage saturation. The optimal base saturation (cation exchange) ratios are 60% Ca, 20% Mg on sandy soil and 70% Ca, 10% Mg on heavy soil, with 3 –5% K, 10-15% H and 2-4% for other bases. The relative values and relationship between nutrients, especially Ca and Mg is considered of great importance.

* **Dr Carey Reams and Dr Phil Callaghan** – this work is based on the concept of defining the potential for plant growth and fertilizer performance in terms of energy release and energy exchange. The contention is that fertilizers in themselves did not stimulate plant growth. It is the energy released (electromagnetic influence or paramagnetic energy fields) from these fertilizers that enhanced production.

A distinction is made between fertilizers (nutrients) that produce growth energy i.e. calcium, potash, chlorine, and nitrate nitrogen, to those that produce reproductive (fruiting energy) i.e. ammonium nitrogen, sulphate sulphur, manganese and phosphate. The approach also involves a proposition that the nutrient energy potential was dependent on microbial activity, and that energy availability is determined by nutrient balance.

The approach also argues that phosphate is the primary catalyst in photosynthesis and subsequent plant sugar production. Increasing sap sugar levels is believed to reduce susceptibility to pest and disease and that plant sap sugar level (brix) is directly related to plant pest and disease susceptibility.

Various approaches and analyses relating soil conditions and plant growth continue to be developed and a vast array of alternative input products are available. Scientific verification of many of these contentions and products has yet to be established. As a consequence the decision to adopt particular approaches tends to rely on anecdotal information and practical experience.