FACT SHEET
Calcite -Calcium Carbonate

Spanish River CARBONATITE

Singularly, calcium above all other mineral deficiencies is at the root cause of most plant diseases. The attributes of using calcium carbonate or what is commonly referred to as agricultural lime are:

- Controls the physiological balance of plant nutrients in the soil.
- Direct Source of Plant Nutrients - calcium is an essential macro plant nutrient and is supplied directly to support plant life.
    - Calcium in pectate holds cellulose to together.
    - Adequate calcium is essential in plants developing proper cell wall membranes.
- Plants use calcium as a signaling messenger, like neurons in animals.
- Increase Supply of Other Nutrients - through liming, microbiological activities in soil are stimulated, which liberate other available plant nutrients from soil minerals and organic matter.
    - Nitrogen production, fixation and availability are markedly increased. This is due to calcium's role of supporting larger populations of nitrogen producing microorganisms and hastening the decomposition of organic matter
    - Availability of soil phosphorous and molybdenum are greatly enhanced.
    - Makes potassium more efficient in plant nutrition.
- Help Plants Form Better Root Systems, Stems and Leaves - thus improving the use of sunlight, energy, water, carbon dioxide, nitrogen and mineral nutrients.
- Increase Organic Matter - indirectly, liming increases organic matter in soil by fostering larger more prolific growth. Greater volumes of roots and plant residues are retained in and on the soil.
- Improve the Environment for Microorganisms - virtually all critical microorganisms and earthworms are increased.
- Improved Soil Tilth - addition of calcium render the soil more workable and friable. Fine, colloidal clays that dry into large clods (hard panned clay) are broken up and pulverized more easily. Liming materials exerting a flocculating action on fine clays.
- Provides Source of Trace Elements – calcium sources, such as Spanish River Carbonatite, is a fruitful source of many trace elements that are important to plant growth. In some crops it is vital. Most important among these elements that are prevalent in many lime sources are manganese, iron, copper, zinc, boron and molybdenum.
- Reduces the Toxicity of Several Soil Constituents and Combinations. Calcium carbonate is if often cited to correct soil toxicity problems.
- Nutrition and Storage - Adequate calcium will produce crops that will store better.

<u>Mineral Reactivity</u>

Agronomists evaluate mineral requirements and potential effectiveness, including calcium carbonate, by analysis alone. This does not take into consideration geological and mineralogical attributes of mineral source. Geologists recognize that every mineral deposit is unique and mineral dissolution rates vary significantly. Even when comparing mineralogical and geological similar deposits, each deposit carries its own unique physical and chemical properties, which will either accelerate or hinder the natural weathering process.

Research has demonstrated an agronomic advantage to selecting highly reactive rock phosphate. Flu gas operators routinely test calcium carbonate sources for reactivity and purchase reactive black limestone

from Michigan on this basis (Hendrik Veldhuyzen, surficial geologist). Nelson R. Shaffer, a research scientist with the "Indiana Geological Survey" at Indiana University has spent several years studying the chemical, mineralogical and physical properties of Indiana limestone deposits to determine what makes some limestone more effective in scrubbers then others. Shaffer's work shows that similar limestone deposits can differ by more then a thousand percent in the amount of sulfur dioxide they can absorb. Shaffer describes the effectiveness of limestone in terms of reactivity, "as the measurement of how rapidly and completely a particular limestone absorbs sulfur dioxide". Physical factors that significantly effect reactivity is porosity and hardness. Chemical properties such as magnesium will have an effect on reactivity. Limestone's that contain 5% magnesium worked well, but magnesium present as dolomite hurt reactivity. Our industrial mineral experience with dolomites and high calcium limestone reveals a wide variability in the reactivity of this family of minerals. For example, we qualified a dolomite for use as railroad ballast. It passed all the aggregate tests for 'trap rock' except for its chemical formula. It was, for any practical agricultural purpose, totally inert. It would merit an attractive agricultural index as long as it was finely ground; however it would still be largely inert. Unfortunately dolomite continues to be the most recommended Ag lime.

Spanish River Carbonatite™ (SRC)

The calcite found in SRC is the only magmatic (formed from molten rock) calcium carbonate available in North America. The Spanish River Carbonatite belongs to a very unique group of "high reactivity" igneous rocks known as alkalic or ultramafic. Only representing .3% of all igneous rocks, carbonatites are characterized by rarity, high concentrations of volatiles (CO2, H2O, etc.), incompatible elements, lithophile elements, (lithophile elements are those with a strong affinity for oxygen, having a greater free energy of oxidation) and wide spectrum of mineral species.

Within the Carbonatite family of rocks we have not found another as unique as the Spanish River Carbonatite Complex. SRC free of potentially toxic metals is the most reactive source of calcium carbonate we have tested in North America.

Tissue Analysis – Spanish River Carbonatite™ Test Plots

	Application		% Crude				% Increase			
Crop	kg/acre	Yield	Protein	% Ca	% P	% K	Protein	Ca	P	K
Winter Barley										
Control Plot		112 bu/acre	10.3	0.5	*nt*	*nt*				
Carbonatite Plot	540	131 bu/acre	12.2	0.7	*nt*	*nt*	19%	40%		
Alfalfa										
Control Plot		*na*	14.8	1.02	0.22	*nt*				
Carbonatite Plot	318	*na*	23.6	1.21	0.25	*nt*	59%	19%	14%	
Field Tomatoes										
Control Plot		*na*	17.56	0.19	0.42	4.25				
Carbonatite Plot	540	*na*	26.52	0.25	0.53	4.85	51%	32%	26%	14%
note : feed analysis conducted by Shur-Grain Laboratory										
nt - not taken, na - not available at this time										

AGRICULTURAL MINERAL PROSPECTORS INC., P.O. BOX 866, ERIN, ONTARIO, N0B 1T0
(519) 833-9827 FAX (519) 833-7515
JSLACK@SENTEX.CA