

Silica: An Important Nutrient for Soil Health, Crop Production and Stress Mitigation

> 10% silica in Fertoz Rock Phosphate

There is a global demand for increased crop production. Major threats to productivity hinder our ability to produce healthy, high yielding crops. Soil salinity, drought, flood, abnormal temperature, nutrient deficiencies, pests, and diseases are some of the plant stressors. Rock phosphate is an important fertilizer input not only for the health of the soil and crop, but also to improve resistance and tolerance to biotic and abiotic stresses through the natural presence of silica. Silica alone exhibits the following benefits according to studies.

- ✓ Improves plant growth, crop quality and beneficial yields
- ✓ Plays an important role in carbon and nutrient cycling, and carbon bio-sequestration
- ✓ Improves drought tolerance in plants
 - ✓ Reduces water loss through transpiration
 - ✓ Promotes root water uptake
 - ✓ Maintain cellular membrane integrity
 - ✓ Increase chlorophyll content
 - ✓ Maintains water potential through increased K⁺ concentration in shoots and grains
- ✓ Increases photosynthesis and enzymatic activity
- ✓ Improves plant antioxidant defense system
- ✓ Helps to maintain mineral balance and mediates nutrient uptake
- ✓ Increased resistance of plants to plant pathogens by fungal diseases
- ✓ Natural, safe for the environment, and organic approved
- ✓ Mitigates negative effect of salinity on plant growth, grain yield and nutrient uptake
- ✓ Enhances lodging resistance
- ✓ Better resistance to winter conditions
- ✓ Improves membrane integrity, structure and function
- ✓ Mitigates boron, potassium, phosphorus and iron deficiency

SILICON LIT REVIEW - EUROPE

Silicon is commonly and effectively used in greenhouse vegetable production and should be adopted more frequently in agricultural fields.

TOMATO STUDY

Under water stress, root and shoot growth is inhibited and chlorophyll and carotenoid levels are low. Addition of silica promotes photosynthesis and almost reverses the effects.

LIVESTOCK RESEARCH

Feeding silicon treated silage to milking cows improved milk yields, total solids, protein and milk fat. Less microorganisms and somatic cells were observed.

DROUGHT STUDY - WHEAT

Silica resulted in 41% less leakage of electrolytes, and 40% increase in protein production.

CEREALS

Noticed increased shoot height, leaf density, spike density during harvest, number of kernels per spike, increased mass of 1000 grains.

CORN

Observed more grains per cob and greater mass. A China study saw a 5.6-10.4% yield increase.

SOYBEAN

More pods per plant, more seeds per pod, increased mass of 1000 grains, and significantly higher yields. Average yield increase of 11% in china study.

OILSEED RAPE

Less plant loss in winter and larger seeds.

SUGAR BEET

Higher fresh root mass, root yield and sugar yield.

POTATOES

Tubers with larger fresh mass, dry tuber weight, tuber yield, and enriched and greater skin cell area. Inhibition of potato blight and soft rot on leaves and tubers.

HORTICULTURE

Reduced gray mold and crown rot of strawberries, plus higher yields. Larger lettuce heads. More fruits per plant on cucumber, melon and zucchini. Reduced cracking and intensity of scabbing in apples and cherries respectively.

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GENERAL

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