

The Problem

1 Excessive Mineral Input

Factors contributing to a higher than normal salt accumulation within agricultural soil:



Water irrigation with high salt contents.



Excessive application of chemical fertilizers - more than the recommended amounts.



Deposition of excreta from grazing animals, containing high levels of sodium and magnesium.

2 High Salt Accumulation

Acceptable levels of mineral saturation in soil are:

CALCIUM (Ca):	50 - 75%
MAGNESIUM (Mg):	10 - 35%
POTASSIUM (K):	2 - 5%

Soil analysis frequently show that mineral levels are exponentially higher than the acceptable amounts due to before mentioned factors (1.Excessive Mineral input)

3 Soil Salinity

The high formation, accumulation, and concentration of mineral salts result in a phenomenon called soil salinization.

Soil salinity is one of the most severe land degradation problems facing agriculture today as it leads to a compaction layer and soil degradation in the long-term.

This inevitably causes billions of dollars in global income loss every year. ¹

4 Blocked Soil

High compaction decreases porosity and aeration while increasing bulk density and soil penetration resistance.

5 Poor Nutrient Up-Take

Blocked soil not only leads to poor nutrient up-take, but salinity also imposes ion toxicity, osmotic stress, nutrient (N, Ca, K, P, Fe, Zn) deficiency and oxidative stress on plants, and thus limits water uptake from soil.

This means that soil salinity affects all aspects of plant development including:

- Germination
- Vegetative Growth
- Reproductive Development

6 Weaker Plants

Vegetation stressed by salinization is more susceptible to mortality by events such as droughts, hurricanes, and fires.

These problems have a great impact on soil fertility which in turn has a great effect on soil productivity.

7 Decreased Yields

Elevated salinity levels cause crop yield declines, coastal forest loss, increase in salt-tolerant invasive species, eutrophication and marsh migration.

1: Ghassemi et al. (1995)

2: Bhattarai et al. (2004) ; Dat et al. (2006) ; Greenway et al. (2006)

3: Bhattarai et al. (2005)

FLIP OVER TO SEE OUR SOLUTION

Our Solution: Free-Soil

Blocked soil is reversible!

Nanotech-Agri is a nano manufacturer and applicator of nano technology. Our team has been researching nano materials within agricultural applications since 2008 and has seen great success throughout our nano agri ranges.

Free-Soil technology was developed to combat and target the commonly found blocked soil phenomenon. Free-Soil loosens blocked soils, which prevents the proper up-take of vital nutrients, thus allowing agricultural plants to thrive as intended.

The following materials are used in Free-Soil technology:

Gypsum

BENEFITS OF GYPSUM:

- Source of calcium and sulphur for plant nutrition.
- Improves acid soils and treats aluminium toxicity.
- Improves soil structure.
- Assist in the free-up of nutrients of blocked soil due to high levels of calcium and magnesium.
- Improves water infiltration.
- Helps reduce runoff and erosion.

Benefits aside, Gypsum is difficult to use as a liquid fertilizer since it is only moderately soluble. But, through our research, **Nanotech-Agri has been able to create a highly soluble and concentrated liquid nano gypsum.**

The gypsum used in our Free Soil formula is **300%** more soluble than normal and can bring positive changes over a short period of time at a very economical rate!

Nano Humic Acid

In soils with excess salination, Humic acid can isolate and remove salts from the clay particle, re-imparting a negative charge to the face of the particle. A carboxyl group (carbon) on the humic acid molecule is attracted to the positively charged edge of the clay particle, breaking the positive/negative ionic bond between multiple clay particles. By fixing anions and cations and eliminating them from the root region of plants, **humic acid provides a compensation for the deficit of organic substances.**

Humic acid also increases moisture-holding capacity in all soil types; especially heavy clay and sandy soils where water retention is an issue.

Nano Bubbles

Soil hypoxia (oxygen deficiency), commonly prevails in heavy clay/blocked soils. It inhibits root respiration, mineral uptake, and growth, reduces leaf expansion and photosynthesis rate, and ultimately negatively affects yield.²

Nano bubbles (Oxidation) is known to lessen hypoxia in blocked-textured soils and can be used to alleviate transient hypoxia and anoxia in the rhizosphere.³

Nano Aerogels can play a vital role in agri technology, especially when it comes to the remediation process of soil salinity.

Nano Fertilizer intake

Increased Photosynthesis

Enhanced nutrient uptake

Nano Fertilizer intake

Increased Biological Activity

Slow nutrient release

Increase microbial activity

Improved water retention

Soil quality improvement

CONTACT US TODAY!

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