

ZEOLITE FERTILIZERS

Soil Conditioner/Amendment

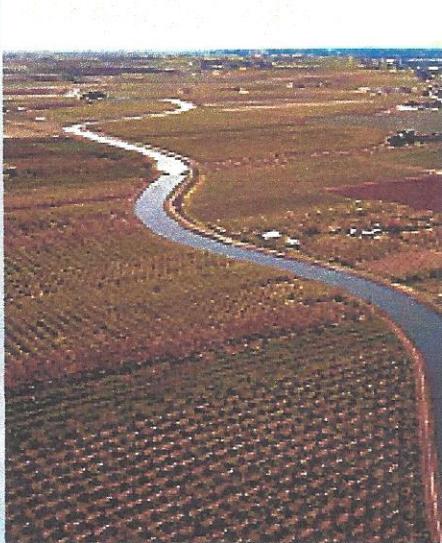


Zeolite based fertilizers are known to be "intelligent fertilizers" due to their ability to regulate the release of nutrients to the soil. Zeolites improve soil structure by coupling high cation exchange capacity(CEC) with a selective affinity for ammonium and potassium. The selectivity of zeolites for ammonium can help buffer the soil and, in part, prevent toxicity, which might otherwise occur when excess ammonium is applied. This property may allow the grower to use this less costly form of nitrogen in larger and less frequent applications during the growing season. The retention and timely release of needed nutrients by these natural zeolites can improve overall crop yield. Zeolite provides 100% natural soil conditioning and:

- 1) Maximizes Fertilizer Applications
- 2) Balances Soil pH
- 3) Improves Aeration
- 4) Retains Moisture
- 5) Reduces Effects of Alkaline Soil
- 6) Dramatically Improves Overall Crop Yield

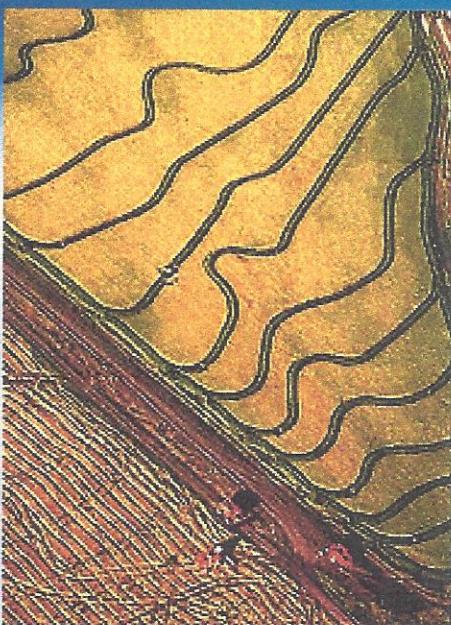
Soil Conditioner

Zeolite for Soil Conditioning



Zeolite based fertilizers are known to be "intelligent fertilizers" due to their high cation exchange capacity and porosity. Recall, zeolite is the worlds only negatively-charged mineral in existence, it therefore has tremendous breakthrough possibilities and especially in Agriculture applications.

Zeolite has a proven ability of a natural slow release mechanism of nutrients to the root zone of new seedling thereby increasing the plants' strength and performance. Zeolite also provides the following attributes for agriculture applications which lead to improvements to overall crop yield:1) Captures and regulates the release of nutrients (compost and fertilizer) to the soil.2) Absorbs and traps toxic contaminants3) Provides buffering capacity by balancing soil pH4) Reduces alkalinity effects5) Improves aeration6) Provides an excellent platform for microbiological activity7) Promotes alkali metal equilibrium8) Improved root development9) Retains moisture10) 100% natural for organic farming operations11) Breaks down clay clumping12) Promotes germination and the sustained growth of grasses and grains. All of these processes establish a stronger seedling thereby reducing the need to apply pesticides. Many studies have shown that zeolite enhancement in contaminated soils promotes healthy germination and growth that even exceeds growth in the uncontaminated control soil. Zeolite contains no inherent nutrient value and is 100% organic. The only processing is simply sizing in order to suit your mesh requirements. Nutrients are provided to the root in a slow-release and plant root demand-driven fashion. The process is a combination of dissolution and ion exchange reactions. The absorption of nutrients from the soil solution by plant roots drives the dissolution and ion exchange reactions, pulling away nutrients as needed. The zeolite is then "recharged" by the addition of more dissolved nutrients. Zeoponic systems increase nutrient retention, reduce environmental nutrient losses and reduce fertilizer requirements by establishing a replenishable and balanced nutrient supply in the plant root zone. Zeolite improves soil structure by coupling high cation exchange capacity (CEC) with a selective affinity for ammonium and potassium. Zeolite is very porous with an incredibly large surface area. The selectivity of zeolite for ammonium helps buffer the soil and prevents toxicity, which occurs when excess ammonium is applied. This property allows the grower to use this less costly form of nitrogen in larger and less frequent applications during the growing season. The retention and timely release of needed nutrients by zeolite improves overall crop yield. It provides a lasting reservoir of nutrients allowing the user to reduce added fertilization while achieving better plant and vegetable performance. There is an environmental bonus from the product as well. Unlike commonly used fertilizers, the plant-growth material dramatically reduces loss of nutrients to groundwater and the environment.



Increased utilization of manure and biosolids as a rich source of nutrients is gaining popularity. As application rates increase there is a concern about the additive effects of toxic components. Salt and heavy metals are the main problems, although fugitive losses of ammonia to atmosphere and nitrogen and phosphate loss to groundwater are also a concern. Zeolites hold nitrogen in the soil, moderate nitrification of ammonia and make it available to plants as needed.

ApplicationZeolite is simply applied at a rate of only 5 to 10% (by weight) along with your current fertilizer (ie: simply replace 5 to 10% of your fertilizer with zeolite). The cost of zeolite is less than your current fertilizer and therefore it does not add to your bottom line input cost/acre.
Space-Age Agriculture comes down to Earth



NASA has long been interested in ways to aid plant growth. They found a way to provide nutrient-rich soil for long-term space travel. Growing live plants in space has its challenges and with lots of research and ingenuity. Scientists developed a synthetic super-soil, loaded with zeolite minerals that contain essential plant growth nutrients. This technique is called "zeaponics." Zeolite substrates have recently flown on three shuttle missions (STS-60, 63 and 73) as part of a series of plant growth experiments titled "Astroculture". Zeolite material not only looks promising for use in life support systems, but the commercial world has closely watching the development of this technology. The plants are actually self-regulating: they take what they need, when they need it. Adding only water, plants grow in the zeoponic soil for several growth cycles. Gardens, lawns, sports fields, golf courses, houseplants, greenhouses and farms all benefit from using zeolite for soil conditioning.

Greenhouse Operations Exciting Times for the Greenhouse Industry in Alberta
Nov 18, 2002 Issue of Agri-News



"The development of new greenhouse substrates based on the mineral zeolite is one of the projects being carried out by the Greenhouse Crops Program at CDGS," says Savidov. "Zeolite has a wide range of applications because of its unique ability to absorb large amounts of mineral salts and water. Preliminary results have indicated that this material can potentially boost yield by at least 10 to 15 per cent under certain conditions. This increase will allow Alberta greenhouse growers to considerably increase their profit margins and be more competitive. The zeolite substrate is a valuable slow release fertilizer and can also be potentially marketed for secondary use in tree nurseries." [Controlled-Release Fertilizers using Zeolite US Geological Survey, Technology Transfer](#)
The US Geological Survey (USGS) has experimented with zeolites to help control the release of fertilizer nutrients in soil. The use of soluble fertilizers leads to water pollution and to wasted nutrients. Nitrogen, for example, can leach into the groundwater and surface water, especially in sandy soils. Phosphate may become fixed and unavailable to plants, especially in tropical soils. Zeolites are porous minerals with high cation-exchange capacity that can help control the release of plant nutrients in agricultural systems. Zeolites can free soluble plant nutrients already in the soil, and improve soil fertility and water retention.



USGS

science for a changing world

USGS Research has experimented with zeolites applied to several different fertilizers including controlled-release nitrogen, controlled-release phosphorous fertilizers, and in the release of trace nutrients. Urea is one of the most common nitrogen fertilizers. It is very soluble in water, and can be leached through the root zone. In addition, urea is converted into ammonium ions by an enzyme found in most soils. Soil bacteria then convert these ammonium ions into readily leachable nitrate ions. Using zeolite with fertilizer will help prevent these nutrient losses. For more information about this research, please contact Dennis D. Eberl, U.S. Geological Survey at 3215 Marine Street, Boulder, Colorado 80303, Tel: 303.541.3028, Fax 303-447-2505 Be Careful of which Zeolite source you are using! Certain zeolites can be harmful as well as helpful to plant growth. For example, zeolites which originate in a saline environment (high in sodium) can be toxic to plants. Zeolites poor in potassium (K), Calcium (Ca) and Ammonium (NH₄) can scavenge these ions from the soil, thereby limiting plant growth – if your soil is deficient in these nutrients. These negative results emphasize the need to use appropriate zeolites during agricultural experimentation. Zeocan Zeolite is of the highest quality with a low sodium content and high clinoptilolite content. Zeolite use is increasing in Canada and the USA – it is important that you utilize the best quality zeolite from the outset.