



A Natural Source of
Minerals and
Trace Elements

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AZOMITE® Trace Mineral Functions - Plants

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Rare Earth Elements – Lanthanum (La), Cerium (Ce) and Praseodymium (Pr)

Amount in *AZOMITE®*: 644 ppm

- Rare Earth Elements have increased crop yields up to 15% in some plant species, particularly if moisture was limiting. Confirmed in greenhouse and field conditions
- Rare Earth Elements may enhance nitrogen fixation by Azotobacter species
- Rare Earth Elements may enhance absorption of ions by root hairs
- Rare Earth Elements may enhance manganese and iron absorption
- Rare Earth Elements may enhance Photosystems I & II efficiencies

- Rare Earth Elements have enhanced abscissic acid production and help plants contend with stress
- Rare Earth Elements may stimulate Mg-ATPase in photosynthesis
- Rare Earth Elements enhance the Hill Rxt of Photosynthesis
- Rare Earth Elements have inhibited fungal growth (*Cercospora nicotianae*)

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Boron (B)

Amount in *AZOMITE*®: 29 ppm

- Boron helps develop roots and shoots for young, growing plants
- Boron also is known to impact several metabolic pathways in plants, probably by some unknown cascade impact on regulatory molecules
- Boron is also known to have a role in the biosynthesis and development of structural elements in plant cells.
- Boron is known to improve the integrity of the plasma membrane of all cells
- Boron is know to impact the translocation and uptake of sugar from its primary site of production to needy tissues

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Cobalt (Co)

Amount in *AZOMITE*®: 22.3 ppm

Root nodule bacteria required to fix nitrogen and therefore the presence or absence of Co has a direct bearing on legume plants.

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Copper (Cu)

Amount in *AZOMITE*®: 13.5 ppm

- Copper makes up many important enzymes in plants, notably nitrogen reductase
- Copper is an essential part of photosynthesis
- Copper is required as part of plant cell walls

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Iodine (I)

Amount in **AZOMITE®**: 3.2 ppm

Some chemical forms of iodine appear to stimulate various plants. For example iodate, not iodide, stimulates the growth of a wide range of plants.

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Manganese (Mn)

Amount in **AZOMITE®**: 200 ppm

- Manganese is involved in many different plant functions, especially activating several enzyme systems
- Manganese is part of photosynthesis
- Manganese is part of protein synthesis

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Molybdenum (Mo)

Amount in **AZOMITE®**: 12.6 ppm

- Molybdenum is necessary for nitrogen fixation
- Molybdenum is used by the enzyme systems nitrogenase and nitrate reductase
- Molybdenum is involved in nitrogen metabolism
- Molybdenum makes up an important part of chlorophyll
- Molybdenum is essential for iron and phosphate metabolism

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Nickel (Ni)

Amount in **AZOMITE®**: 2.6 ppm

The most recent element added to the essential trace element list is Ni. Pecans and perhaps 2 other plants are now known to require this element for fruit production. The mechanism of Ni impact is not known.

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Arsenic (As)

Amount in AZOMITE®: 1.1 ppm

Arsenic is not essential for plants, and at very low concentrations there are occasional reports that it seems to stimulate plant growth. At high concentrations it is toxic to plants.

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Selenium (Se)

Amount in AZOMITE®: 0.79 ppm

Selenium is essential for animals and for bacteria, including the nitrogen-fixing bacteria, but its essentiality in higher plants is controversial.

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Tin (Sn)

Amount in AZOMITE®: 2.9 ppm

Tin is absorbed by plant root hairs, but generally is not redistributed elsewhere in the plant. Inorganic tin is generally unavailable to plants. Very few studies have been conducted to determine if tin is helpful to plants.

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Vanadium (V)

Amount in AZOMITE®: 7.8 ppm

Vanadium is essential for the formation of chlorophyll in several forms of algae (lower plants), but its role in higher plants is not clear and even controversial in some aspects.

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Zinc (Zn)

Amount in **AZOMITE®**: 64.3 ppm

- Zinc is essential for many different enzyme systems in plants
- Zinc is important for synthesizing nucleic acid
- Zinc is utilized in metabolizing the hormone Auxin

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Tungsten (W)

Amount in **AZOMITE®**: 26 ppm

Tungsten interacts with molybedum and at < 5 ppm W has been reported to have a postive impact on a variety of higher plants.

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