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## Technical Data Sheet

### Zinc Ammonium Citrate

**Zinc Ammonium Citrate** is a concentrated form of zinc, chelated with organic acids for use to correct soil deficiencies of this key micronutrient.

**Zinc Ammonium Citrate** contains 7.5% zinc (W/V) chelated with organic acids, plus 16% nitrogen and 3.8% sulphur. Zinc Ammonium Citrate is a clear liquid with a mild ammonium odour (also available as a spray-dried powder if required for powder blending).

#### Why choose **Zinc Ammonium Citrate**?

While zinc sulphate and synthetic aminopolycarboxylate chelates (e.g. EDTA) are widely used to correct micronutrient deficiencies, **Zinc Ammonium Citrate** provides a number of benefits over conventional zinc fertilizer formulations:

- Aminopolycarboxylates have questionable biodegradability and thus the synthetic molecule can build up in soil if used over successive growing cycles. Thus **Zinc Ammonium Citrate** is more in balance with natural processes.
- *Systemic action:* **Zinc Ammonium Citrate** utilises citrates, which are the organic acids that plants naturally use to absorb and transport zinc. Therefore, **Zinc Ammonium Citrate** is faster acting than zinc sulphate, which struggles to be transported around plants once absorbed.
- Zinc-EDTA contains sodium ions carried over from the manufacturing process which are toxic to plants.
- Zinc-EDTA is comparatively expensive.
- **Zinc Ammonium Citrate** contains significant amounts of useful nitrogen (16%) and sulphur (3.8%) which boosts growth and provides additional protection against chlorosis.
- For distributors: Both Zinc-EDTA and zinc sulphate are widely available, while **Zinc Ammonium Citrate** is a new product for 2016, thus allowing distributors to take and hold significant market share quickly with a unique and effective new product.

## Zinc deficiencies explained

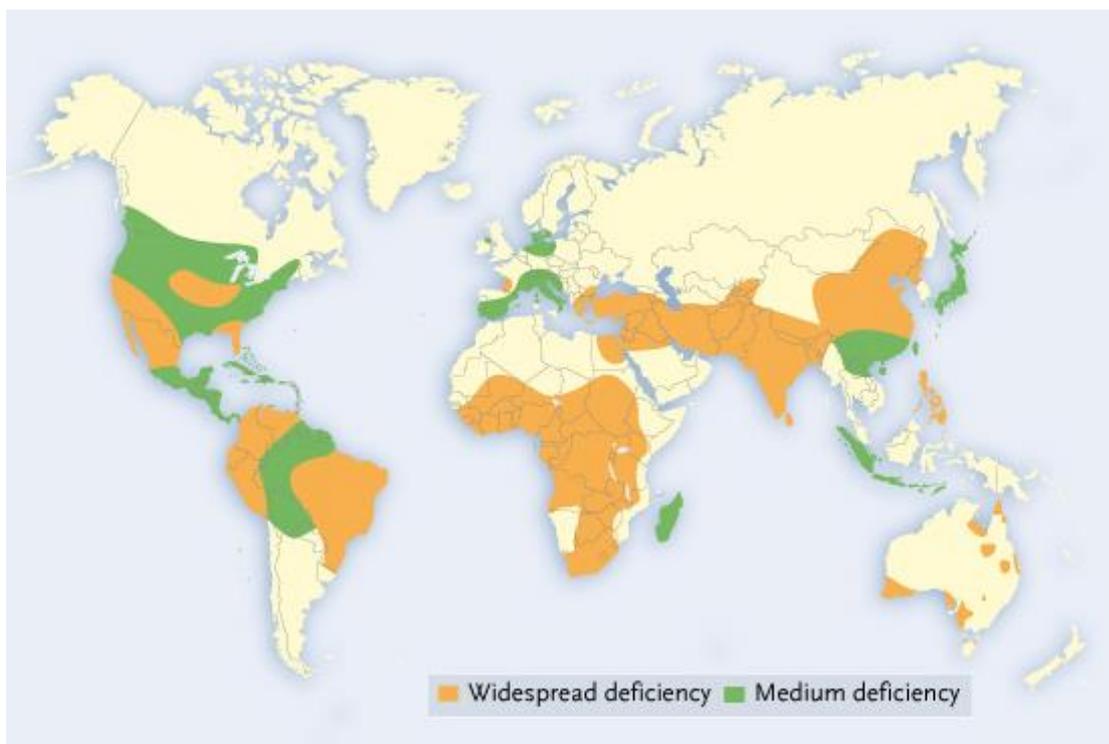
Despite being a micronutrient, and thus only required in very small amounts by plants, deficiencies in zinc are common in many crops worldwide. Zinc is a key component in many important plant metabolic processes. In particular, zinc is an essential component of the enzymes involved in nitrogen metabolism, energy transfer and protein synthesis. As a result, zinc deficiencies can affect a plant by stunting its growth, decreasing the number of tillers, inducing chlorosis and stunting leaves, lengthening the crop maturity period, and lead to spikelet sterility. This means that both crop yield and quality can be significantly reduced when zinc availability is limited.

Zinc deficiencies are extremely common in crops growing on alkaline, arid (irrigated), and phosphorus-rich soils. In these situations, zinc deficiencies do not occur because of a lack of zinc in the soil, they occur because the zinc is not available. The lack of zinc availability is due to chemical conversion into an insoluble form (often referred to as 'locking up' or 'fixing'). Therefore, adding more zinc to a deficient soil in the form of zinc sulphate rarely results in a correction of zinc deficiency.

Growing conditions where zinc deficiencies are most common include:

- **Arid regions**- zinc converted to zinc hydroxide, especially if irrigation is used.
- **Soils rich in phosphorus** or receiving high phosphorus application. Zinc converted to the highly insoluble zinc phosphate.
- **Alkaline/calcareous soils** (pH 8-9) – zinc converted to insoluble zinc carbonate.
- **Saline soils** – zinc is leached out and replaced with sodium ions.
- **Sandy soils** – zinc is unable to be held by the soil matrix.
- **Organic soils or soilless-cultivation** (hydroponics or containerized crops) where zinc is absent from the growing media.

## Zinc deficiencies; a global perspective



### Crop susceptible to zinc deficiencies

**Zinc Ammonium Citrate** is suitable for application to all crops. Responses will be greatest in crops known to regularly suffer from zinc deficiency including; maize, sugar beet, wheat, rice, soybean, lucerne, and top and soft fruit crops.

### Application protocol

Ideally apply before symptoms of deficiency appear.

**Zinc Ammonium Citrate** is suitable for application as a foliar spray, root drench or dosed into fertigation streams.

For foliar applications **Zinc Ammonium Citrate** should be applied at a rate of 1.0 – 2.0 litres/ha. Apply using a sprayer fitted with a nozzle that produces a fine mist. Apply sufficient solution to coat the leaves with a film of moisture with little or no run-off. Re-apply weekly.

Tank mix compatible with most acidic/neutral co-products (pesticides, biostimulants and other fertilizers). Always conduct a bucket test to confirm with new mixes.

**Zinc Ammonium Citrate** is a newly developed product. As such, further research work will provide additional application recommendations for a range of different crops.

**Zinc Ammonium Citrate** is classified as hazardous. For guidance on safe transport, storage, use and disposal of the product please refer to the relevant Plater-Bio Safety Data Sheet (SDS).