**NEWS ARTICLE**

Zinc plays a critical role in food security and crop yields

**09 May 2023:** Although zinc is an essential micronutrient for plant growth, zinc input has received far less attention than nitrogen, phosphorous or even irrigation. “Almost half of cereal-growing areas globally have soils with a low level of plant-available zinc,” says **Simon Norton**, Executive Director, [International Zinc Association](http://www.zinc.org) Africa.

In Sub-Saharan Africa soil health concerns are largely due to poor nutrient supply in the soil, the naturally low concentration of zinc in the soil and the lack of crop rotation. Additionally, there is insufficient support to small farmers to implement soil and cropping practices that could potentially reverse this depletion.

A consequence of poor soil health is an increased prevalence of food and nutrition insecurity due to lower agricultural production, reduced cattle fodder, reduced wood fuel for cooking and reduced crop residues and cattle manure to recycle nutrients to soils. Carbon dioxide emissions also increase due to soil nutrient depletion and deforestation.

“The application of zinc fertilisers is essential in such soils to boost cereal yield and grain zinc concentration,” says Norton. Numerous studies have indicated that maize grain yield, for example, increases significantly when zinc fertilisers are applied to zinc-deficient soils. This calls for a better understanding of the critical role that zinc fertilisers play.

Not only are half of the world’s agricultural soils deficient in zinc, so is a third of the global population as a result. The use of zinc-enriched fertiliser (for instance zinc-coated urea or zinc-enriched NPK) in Turkey, Australia, South Africa, or India has resulted in significant increases in yields, as well as boosting zinc concentration in rice and wheat. The best way to increase zinc density in grain has been demonstrated to be foliar applications.

In zinc-deficient soils, zinc application increases maize yield due to increased kernel numbers and kernel weight in inferior grains. An adequate zinc supply in maize plants maintains high pollen viability and a sufficient carbohydrate source. Here the critical shoot zinc concentrations for high pollen viability and high kernel numbers of inferior grains have been shown to be 31.2 and 33.6 mg/kg respectively.

It is critical to consider global micronutrient balances to improve crop yield and quality as well as human health. Ensuring optimal supply of zinc in a well-managed fertiliser programme can have a measurable increase in crop production and offer a return on the farmer’s investment, while the increased concentration of zinc in plans is also beneficial to human health.

This calls for an enhanced agricultural education program based on strategic cooperation with the fertiliser industry supplying the products, scientific organisations assessing the extent and impact of micronutrient deficiencies in soils, plants and human populations, and governments which stimulate the adoption of biofortification practices by farmers through economic incentives and subsidies, together with technology and knowledge transfer, concludes Norton.

**Pull quote**

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**About the International Zinc Association**

The IZA is the only global industry association dedicated exclusively to the interests of zinc and its users. Operating internationally and locally through its regional affiliates, the IZA helps sustain the long-term global demand for zinc and its markets by promoting such key end uses as corrosion protection for steel and zinc as being essential in human health and crop nutrition. IZA’s main programmes are Sustainability & Environment, Technology & Market Development and Communications.

In South Africa, the IZA plays a vital role in establishing the basis for the successful revitalisation of the zinc industry by increasing awareness of zinc and its applications and benefits in key sectors and markets, which will ultimately translate into the increased uptake of zinc.

**International Zinc Association Contact**
Simon Norton
Executive Director

IZA Africa
Phone: (021) 788 9980

Cell: 082 831 2924
Email: zinc@iafrica.com
Web: [www.zinc.org](http://www.zinc.org)

**Media Contact**
Rachel Mekgwe

Senior Account Executive
NGAGE Public Relations
Phone: (011) 867-7763
Cell: 074 212 1422
Email: rachel@ngage.co.za
Web: [www.ngage.co.za](http://www.ngage.co.za/)