

# Zinc – helping to feed the world

BY SHANNON SIMMONS, COMMUNICATIONS SPECIALIST,  
INTERNATIONAL ZINC ASSOCIATION



**Z**inc can be found almost anywhere: in our daily vitamins, in safeguards for our infrastructure, and as an ingredient that activates our sunscreens. It's also an important element in the foods we eat, and it is recognised as one of the eight essential micronutrients that crops require for healthy growth and reproduction. Globally, however, zinc has emerged as the most widespread micronutrient deficiency in soils, affecting more than 50 per cent of the world's agricultural lands. When a plant or crop is deficient in zinc, that plant isn't able to perform the vital physiological functions necessary for development, often resulting in delayed maturity, lower crop yield and poor produce quality.

Although zinc-deficient soils are most prevalent in arid, developing regions – such as in Asia and Sub-Saharan Africa – zinc deficiency is common throughout developed areas as well, including Europe and North America. When agrarian soil is zinc-deficient, crops aren't able to reach their full potential, leading to severe limitations in food production. And in those developing nations where zinc deficiency is most severe, crop yield losses as a result of zinc deficiency can have a devastating economic impact on farmers, and can pose a major loss for both families and local economies.

In addition to poor crop productivity, there exists a high correlation between zinc deficiency in soils and zinc deficiency in humans. Just as zinc is vital for plant growth and development, it is fundamental for many biological functions in the human body – from DNA replication to healthy immune functioning. The World Health Organization (WHO)

estimates that at least two billion people worldwide do not get enough zinc in their diet and, as a result, nearly 450,000 children under the age of five die each year from preventable diseases, such as diarrhoea and pneumonia.

With currently limited options available for treating mass zinc deficiency, the simplest and most cost-effective method of addressing zinc deficits is biofortification – or the fortification of food crops with zinc. The creation of a balanced soil nutrient standard across the globe would work towards eradicating zinc deficiency in soils while helping to ensure that humans are receiving adequate zinc nutrition through zinc-fortified foods.

To address this critical requirement, the International Zinc Association (IZA) launched the Zinc Nutrient Initiative (ZNI) to increase zinc uptake in crops and humans by adding zinc-fortified fertilisers to soils. IZA has been working closely with companies, governments and non-government organisations (NGOs) around the globe to address policy issues and to promote the benefits of zinc fertilisers within the farming community. In China alone, ZNI activities have encouraged more than 10 million farmers to use zinc fertilisers, which has resulted in an excess of 20 million tons of zinc-enriched grain being produced, providing enhanced nutritional value to more than 100 million people – including 35 million children.

ZNI first targeted countries with the highest occurrences of recorded zinc deficiency. In China, ZNI's programs and initiatives encouraged the Ministry of Agriculture (MoA) to add zinc to its recommendation system and fertiliser formulas. China's MoA and others have

estimated that zinc used in fertilisers reached 60,000 tons per year in 2016. In India, the government adopted zinc in its Nutrient-Based Subsidy (NBS) scheme, and its national fertiliser association, the Fertilizer Association of India (FAI), estimates that annual zinc consumption hit 80,000 tons per year in 2016. Currently, IZA is working with the Indian Government on an additional policy for zincated urea, which could add another 30,000 tons per year to the market. A strong growth trend also continues in Brazil and Mexico.

The ZNI program's efforts have increased awareness of the benefits of a balanced soil nutrient approach, and more than 30 leading global fertiliser companies – such as Yara, Mosaic, Indian Farmers Fertiliser Cooperative (IFFCO) and Sinofert – have offered their support and included (or are in the process of including) zinc to their fertiliser product lines.

Dr Stefan Schlag, Senior Director of IHS Chemicals, predicts that the total global market for zinc in fertiliser reached 255,000 tons per year in 2015, and that this trend will continue to grow to consume 400,000 tons per year zinc by 2018.

Scaling up the use of zinc fertiliser doesn't just offer advantages for crop productivity, development in human health and improvement of farmer income; it also advances progress on the United Nations' Sustainable Development Goals (SDGs) – a universal set of priorities adopted by world leaders at the 2015 United Nations General Assembly that includes a goal to 'end hunger, achieve food security, and improve nutrition and promote sustainable agriculture'. The Food and Agriculture Organization predicts that the world's population will reach 9.1 billion by 2050, and in order to feed this larger population, food production must increase by 70 per cent.

IZA's Zinc Nutrient Initiative will continue to raise awareness of zinc's direct role in offering a sustainable solution to the global food security crisis while escalating zinc's – and the zinc industry's – crucial role in aiding agricultural, economic and human health developments around the world. [L&V](#)

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