



## Addressing the Link between Zinc Deficiency in Soils, Crops, and Humans

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The Zinc Nutrient Initiative has the potential to improve millions of lives around the world.

Zinc deficiency is the 5th leading cause of death in the developing world. 800,000 people are at risk of dying each year due to zinc deficiency—more than half of those are children under the age of 5.<sup>1</sup> These are big numbers. But they are numbers that can be greatly reduced with the simple, sustainable solution of agronomic fortification of crops with zinc.

50% of the world's agricultural soils are deficient in zinc. Grain concentrations of crops grown on zinc-deficient soils are much lower; therefore, people eating crops grown on zinc-deficient soils receive little to no zinc in their diets, subjecting them to life-threatening low levels of zinc. Zinc is an essential micronutrient for human health, vital in early development of children and in the daily functioning of every living thing. Zinc deficiency weakens the immune system, leaving children vulnerable to infectious diseases such as diarrhea and pneumonia. This is an especially critical problem in developing nations that rely primarily on grains as their primary source of dietary intake. This was the drive behind the launch of the [Zinc Nutrient Initiative](#).

The Zinc Nutrient Initiative was launched in 2009 by the [International Zinc Association \(IZA\)](#) to address the link between zinc deficiency in crops and zinc deficiency in humans. ZNI began working in China and India, the two largest agricultural nations with the most zinc-deficient soils. Since then, ZNI has begun a program in Brazil and has conducted crop trials in Bangladesh, Thailand, Malawi, and Peru. The ZNI approach is designed to establish activities and best practices in the target countries that will ultimately be market-driven and therefore sustainable in the long term. Main activities include: 1) crop demonstration trials with zinc to highlight and prove the benefits, 2) national and regional workshops with key stakeholders for awareness building, 3) training courses covering all aspects of zinc in agriculture and health with extension workers, company representatives, and farmers, 4) development of communication materials including brochures, fact sheets, training manuals, and videos, and 5) coordination with regional partners, including governments, NGOs, and the business community to address policy and market barriers.

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<sup>1</sup>Source: Black et al, 2008



We've Made Progress. Through ZNI's activities, crop response to zinc has been observed under almost all types of soils and agroclimatic zones. Response is high in grain crops as well as fruit and vegetable crops. Many reports are available showing significant cost-benefit effects of zinc fertilizers for resource-poor farmers, especially in regions where soil zinc deficiency is of particular concern. For one example, zinc in wheat farms in India led to a 62:1 benefit-to-cost ratio for the farmer.<sup>2</sup> In China, ZNI's work on zinc-deficient soils through a series of crop trials led to three national recommendations by the Ministry of Agriculture for zinc fertilizer in 2012 alone, which include staple crops as well as cash crops.

We still have work to do. Though the Zinc Nutrient Initiative has made important strides toward the correction of zinc-deficient soils, in many countries, zinc deficiency is unrecognized, underestimated, and untreated. The need for understanding the hazards of zinc deficiency—in soils, crops, and humans—is urgent. The ZNI strategy greatly prevents the unnecessary loss of food production and helps improve human health.

For millions of people around the world, a few extra milligrams of zinc each day can make the difference between illness or death and a healthy, productive life. By ensuring that crops receive an adequate supply of zinc, we can help address this global issue. Adding zinc to crops not only increases crop nutritional value, but also increases crop yield and crop resistance to environmental hazards such as drought and disease. Increased yield leads to increased income for the farmers.

Zinc in fertilizers: a simple, sustainable solution to zinc deficiency in soils, crops, and humans, which ultimately leads to increased food and nutrition security, higher income for farmers, and a great reduction in death and disease related to zinc-deficiency.

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<sup>2</sup>Source: Rattan, R.K., Datta S.P., Saharan Neelam and Katyal, J.C. Fertil News. 42 (12): 75-89. 1997

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