Editorial

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ZINC BIOFORTIFICATION

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Zinc (Zn) deficiency is also a major health issue in developed nations, owing to insufficient dietary consumption. The main cause of this issue is a high intake of cereal-based foods with low Zn concentrations and bioavailability. Zn concentrations in modern cereal cultivars are inherently low, and they cannot satisfy the human demand for Zn. In today's world, up to 50% of wheat-cultivated soil is considered low in bioavailable Zn. Biofortification techniques are agricultural strategies that are used to increase the nutritional performance of crop plants. They include greater agronomic biofortification, which is based on optimised fertiliser applications, and genetic biofortification, which is based on traditional plant breeding and genetic engineering for higher nutrient concentrations. Underweight children are those whose weight-for-age is less than minus two standard deviations from the reference population's median. This research focuses on HAZ groups since stunting is normally considered the most significant measure when assessing malnutrition in infants. Agronomic Zn biofortification, which has been shown to be very beneficial for wheat and other cereal crops, including rice. For discovering 'bottlenecks' in the biofortification of food crops with Zn, molecular and genetic study into Zn absorption, transport, and grain deposition in cereals is crucial. Transgenic plants with high Zn concentrations in their seeds are often studied in a managed laboratory or glasshouse setting with enough Zn in the growth medium for the entire growth cycle. However, with reduced chemical supply of Zn and numerous stress factors such as drought, they could not always exhibit the same results under 'real world' conditions. What good would an improved transportation and storage infrastructure do if the volume of goods to be shipped and processed is still limited? Given that the Zn concentrations necessary to have a meaningful effect on human health are much higher than those needed to prevent any yield loss due to Zn deficiency, supplying adequate Zn to crop plants via a soil and foliar fertiliser strategy under field conditions is crucial for biofortification efforts.

Zn's Role in Human Physiology and Wellbeing

Zinc plays a variety of biochemical roles in biological processes. It interacts with a wide number of enzymes and other proteins in the body, and it plays essential cellular, functional, and regulatory functions. Zn is thought to be involved in approximately 10% of all proteins in the human body, or about 3000 proteins. As a consequence, Zn deficiency, whether clinical or subclinical, is related to a number of physiological problems, including growth retardation, disrupted brain development, increased vulnerability to infectious diseases including pneumonia and diarrhoea, diminished physical performance and work efficiency, and poor birth results in pregnant women. Around a third of the world's population is believed to be at risk of zinc deficiency, which is highly frequent in children under the age of five due to their comparatively high need for the mineral to sustain growth and development. Every year, nearly half a million children under the age of five die as a result of Zn deficiency. In developed countries, deficiencies in zinc and other micronutrients have been stated to cause significant economic losses and have a significant impact on the gross national product by lowering production and increasing health-care costs. The main methods that are used and researched for the biofortification of food crops with Zn are conventional and molecular plant breeding, genetic engineering (transgenic technologies), and agronomic measures such as effective fertiliser applications.