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FERTILIZERS

FOR SUSTAINABLE AGRICULTURE

'There is no life without Zinc'

The International Zinc Association (IZA), created in 1991 by a group of leading zinc producers, is guided by the principle of undertaking actions that positively influence the market and image of zinc. The Association's primary goal is to deliver value to its Members through innovative programs in its strategic focus areas of Environment and Sustainable Development, Technology and Market Development and Communications. IZA provides a forum for the zinc industry to analyze and anticipate issues affecting zinc globally and to ensure a timely and appropriate response. IZA coordinates initiatives good for zinc that are best done collectively, undertaken either directly or through involvement and support of customer groups and related stakeholders on the local, regional and global levels. In an interview with Agriculture Today, Dr. Soumitra Das, Director, South Asia - Zinc Nutrient Initiative, International Zinc Association discusses the relevance of zinc in agriculture and how their inclusion can increase the plant and human health.



What is the role of micronutrients in enhancing crop yield?

As we are aware, micronutrients are essential for crop growth and development and play an important role in balanced crop nutrition. They include eight essential elements, namely, zinc (Zn), boron (B), iron (Fe), manganese (Mn), copper (Cu), molybdenum (Mo), chloride (Cl) and nickel (Ni). It is not that the micronutrients are less important than the macronutrients to crop nutrition, but they are needed in small (micro) quantities by the crops, and hence known as micronutrients.

What role does zinc play in plant and human nutrition?

Zinc plays many vital roles in plants as well as human beings. In plants, it plays a key role as a structural constituent or regulatory co-factor

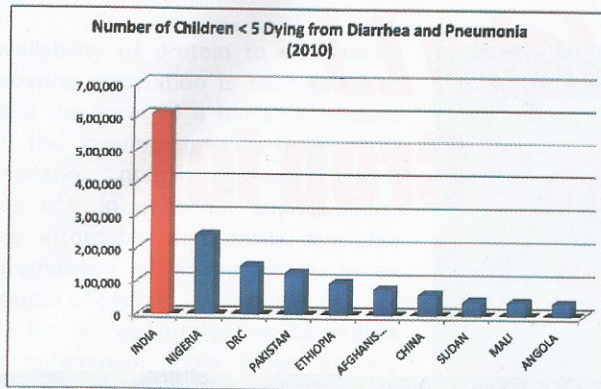
of a wide range of different enzymes and proteins in many important biochemical pathways. These are mainly concerned with carbohydrate metabolism, both in photosynthesis and in the conversion of sugars to starch, protein metabolism, auxin (growth regulator) metabolism, pollen formation, maintenance of the integrity of biological membranes and resistance to infection by certain pathogens. Zinc in balanced fertilizer use ensures better yield and quality of crops.

Zinc is vital for many biological functions in the human body. The adult body contains 2-3 grams of zinc. It is present in all parts of the body, including: organs, tissues, bones, fluids and cells. It is vital for more than 300 enzymes in the human body, activating growth - height, weight and bone development, growth and cell division, immune

system, fertility, taste, smell and appetite, skin, hair and nails, vision. Some of the reported symptoms due to zinc deficiency in humans, especially in infants and young children, are diarrhoea, pneumonia, stunted growth, weak immune system, retarded mental growth and dwarfism, impaired cognitive function, behavioural problems, memory impairment, problems with spatial learning, and neuronal atrophy.

How significant is the link between zinc deficient soils and malnutrition?

There is no life without zinc. Zinc is an essential nutrient for human health. There is a high degree of correlation between zinc deficiency in soils and that in human beings. It is estimated that about one-third of the world's population suffers from



Deaths from diarrhea and pneumonia in children under five (Source: UNICEF, 2012)

zinc deficiency. Recently, zinc deficiency - especially in infants and young children under five years of age - has received global attention. Zinc deficiency is the fifth leading cause of death and disease in the developing world. According to the World Health Organization (WHO), about 800,000 people die annually due to zinc deficiency, of which 450,000 are children under the age of five.

The widespread zinc deficiency has led to zinc malnutrition in the humans, especially in the developing nations, like India. The country-wise deaths from diarrhoea and pneumonia in children under five depicts that the casualty due to zinc deficiency in India is alarmingly high, even higher than the Sub-Saharan African countries or the neighbouring countries. This has drawn the attention of the government and policy makers in India and generated the awareness on the critical role of zinc in human health.

Are you satisfied with the government's policies and approach in identifying the micronutrient deficiency and particularly zinc deficiency in Indian soils?

India's fertilizer policies are mainly skewed towards the primary nutrients, NPK. But, under the Nutrient Based Subsidy (NBS) Scheme, the role of micronutrients, specially, zinc and boron has been specially targeted through additional subsidy for fortification. In addition, the Government of India is promoting the use of micronutrients under the National Food Security Mission (NFSM). Nevertheless, it is continued to be a major disappointment that GST rates on micronutrient fertilizers have been levied at 12% or higher, whereas the bulk fertilizers are enjoying a reduced rates of 5%, discouraging the farming community to practice balanced fertilizer use in the country. In addition, the pricing policy of the Zincated-Urea should be approved by the Government, which has been already included in the Fertiliser Control Order

(FCO) way back in 1990s, but due to a minor price disparity, it is not being produced or marketed by the fertilizer industry in India. It is also expected from the Government that Urea, which is at present out of the gambit of NBS Scheme, should be considered to include in the same, so as to encourage the balanced fertilizer use. What to talk about the micronutrients, even the nutrient ratio within NPK is highly distorted due to price disparity!

What are the immediate measures that you want to see to address this problem?

I would like to flag here the key policy measures to address the challenges in popularizing micronutrients, specially zinc in balanced fertilizer use:

- GST rates on micronutrients should be reduced and made at par with the bulk / NPK fertilizers at 5%.
- Zincated Urea pricing policy should be approved by the Government
- Urea should be included in the gambit of Nutrient Based Subsidy Scheme.

Is India equipped to deal with zinc deficiency in soils?

If we look at the trend of zinc fertilizer consumption in India, there is a significant increase, more than 50% in consumption in the last a couple of years. The latest report released by the ICAR - AICRP on Micronutrients says that the zinc deficiency in soils in India has improved from 48.8 to 36.5% today. This could be mainly attributed to the increased use of zinc fertilizers, as a result of increased demand of zinc fertilizers due to increased awareness level of the stakeholders, specially the farmers in India. India is, therefore, fully equipped to deal with zinc deficiency in soils, animals and humans, if well supported by the micronutrient fertilizer policy of the Government.

Are there any organic fertilizers that can address the problem of zinc deficiency?

In fact, almost every organic sources of plant nutrients, like FYM, compost, vermicompost etc. are having micronutrients, may be in trace amount. Hence, it is strongly recommended that the farmers should practice integrated nutrient management, including organic, mineral and biological sources of plant nutrients to address the problem of micronutrient deficiency. I am sure, the Government of India will take a favourable policy decision to encourage the farmers in practising balanced fertilizer use, after the success of the 'Soil Health Card Scheme', to realise the bigger dream of the Hon'ble Prime Minister, Shri Narendra Modi's 'Doubling Farmers Income by 2022'.