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## IZA and IFDC Partner to Scale Up New Zinc-Rich Core Technology

Urea is the most commonly used fertilizer, comprising more than one-third of all fertilizer nutrients consumed globally. Therefore, combining zinc with urea (i.e. zincated urea) represents an ideal way to scale up zinc fertilizer use to increase crop productivity and improve human health through a more balanced nutritional approach for crops.

Zincated urea technology has existed for some time, but there has not been a lot of zincated urea produced or sold. The conventional technology for zincating urea involves spraying the urea with a coating of a zinc compound. However, three significant problems exist with this conventional zincated urea technology, including a significant capital expenditure for spraying infrastructure at the urea plants, loss of the zinc coating during transport and handling and operating costs associated with the use of the spraying machinery which makes the zincated urea product use more costly for farmers.

**IFDC** In 2011, IZA and the International Fertilizer Development Center (IFDC) signed an MOU to advance IFDC's zinc-rich technology. This technology involves substituting a micronutrient-



Urea particle containing 3% zinc core granule cross section

rich core for the urea core seed that is typically used as the starting point to manufacture urea. The layers of urea are then applied to this micronutrient-rich core. This new technology addresses all of the problems identified above associated with conventional zincating technology. In addition, this new micronutrient-rich core urea can then be used to manufacture another IFDC innovation, Urea Deep Placement (UDP) briquettes, with micronutrients.

In the first year of greenhouse trials, IFDC demonstrated that the grain concentration of rice increased by 30% over urea alone and by 23% in wheat. Grain yields also increased 17 percent in rice and 14 percent in wheat – more than enough to cover the additional costs associated with the zinc fortification cost.

IZA will be supporting IFDC as they commence field-testing in 2011 in a select target country for both zincated urea and zincated UDP briquettes. If successful, the IFDC micronutrient-rich core technology will be scaled up and made available to farmers globally.

### Brazil

#### New Director for the Zinc Nutrient Initiative - Brazil Program Joins IZA



Mr. João Moraes has joined IZA as the Director for the Brazil Program – Zinc Nutrient Initiative. Mr. Moraes will oversee IZA's efforts in Brazil to increase the use of zinc as a fertilizer to improve crop productivity and human health.

Mr. Moraes is an Agronomy Engineer with a degree from the Universidade Federal de Lavras (UFLA), Minas Gerais, Brazil. He graduated with honors and received an award from Syngenta. Mr. Moraes also has a graduate degree in International Business Management from Fundação Getúlio Vargas (FGV), one of the most renowned business schools in Brazil.

Mr. Moraes has a vast experience in the field of coffee growing, processing and quality and has been directly responsible for the production of specialty coffees at Santana Estate, a family-owned business. Mr. Moraes worked for 6 years at P&A International Marketing, a coffee consulting, marketing and trading company, which exports Pinhalense coffee machinery for more than 80 countries worldwide.

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#### Embrapa Biofortification Conference in Brazil Attracted Over 200 Participants



Embrapa, the Brazilian Enterprise for Agricultural Research, organized the “IV Reunião de Biofortificação no Brasil” in Teresina - Piauí, Brazil in July 2011. Key themes of the conference included: research, strategies for technology exchange and evaluation of the impacts of biofortified food on the lives of producers and consumers. More than 200 people attended, including research members of the biofortification networks in Brazil, Latin America, India, Africa and the United States. Discussions focused on the

production and supply of genetic and agronomic fortified rice, pumpkin, bean, cowpea, cassava, corn, wheat and sweet potato.

The conference included presentations, panels, technical visits, meetings and discussions. Key topics explored included the role of Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq) in agriculture, health and nutrition research, and the status of biofortification research in the world. In the Agronomical Symposium, several presentations were made on zinc deficiency and zinc fertilizer use, including presentations by João Moraes, IZA; Dr. Milton Moraes, Universidade Federal do Paraná (UFPR); Dr. Ross Welch, U.S. Department of Agriculture - Agricultural Research Service (USDA-ARS); Carlos Henriques, Votorantim Metais; Dr. Silvio Ramos, Universidade Federal de Lavras (UFLA); and Dr. Ismail Cakmak, Sabanci University.

The Zinc Saves Kids video was played during the opening session and Agronomical Symposium.

#### ANDA Conference a Success in Brazil



In July, the Associação Nacional para Difusão de Adubos (ANDA) organized the “10 Congresso Brasileiro de Fertilizantes” in São Paulo, Brazil to discuss the future of the fertilizer and

food sector. There were five panels: the fertilizer market under the impact of the new world economy, investments into domestic production, innovations required for the sector, the importance of fertilizers in sustainability and new regulations for fertilizers.

More than 250 people - mostly executives and authorities related to the fertilizer sector - participated in the conference. The conference was sponsored by Votorantim Metais and Vale, and had the support of Archer Daniels Midland Company (ADM), Banco do Brasil, Brazilian Agribusiness Association, Bunge, Copebrás, Galvani, the Institute of Technological Researches, the Ministry of Agriculture and Food Supply and Rio Tinto.

The importance of zinc in crops and human health was highlighted by Dr. Luis Prochnow, International Plant Nutrition Institute (IPNI) Brazil, during his presentation about fertilizers and sustainability. The Zinc Saves Kids video was also played in Portuguese, and merchandise was sold to raise funds for the Zinc Saves Kids initiative.

## Portuguese Version of “Zinc in Soils and Crop Nutrition” Released



The second edition of Brian Alloway's book on Zinc in Soils and Crop Nutrition has been fully translated into Portuguese, thanks to the support and efforts by Votorantim Metais. Having this Portuguese version of the book allows for its use in Brazil and other Portuguese-speaking countries globally.

Please contact [crops@zinc.org](mailto:crops@zinc.org) if you would like to obtain a digital copy of this new translation.

## India

### 3rd International Zinc Symposium: October 11-14 in Hyderabad, India



The 3rd International Zinc Symposium: Improving Crop Production and Human Health is being organized by IZA, the International Fertilizer Industry Association (IFA), the Fertiliser Association of India (FAI) and HarvestPlus, and will be held October 11-14, 2011 in Hyderabad, India. Sponsors include Bayer CropScience, Chakradhar, Coromandel, IFFCO, Mosaic, Nagarjuna Group, OMEX, PPC ADOB, Rahimtula Group, Teck, Umicore, Valagro and Yara.

The Zinc Symposium is an international scientific conference to review the latest knowledge and best agricultural practices in addressing zinc deficiency and its impact on global crop production and human health. Conference sessions will be devoted to: Human Nutrition; Soil and Crop Management; Zinc Fertilizers and Crop Nutrition; Plant Physiology; Plant Breeding and Molecular Biology; and Environmental Issues.

Please visit the symposium website at <http://www.zinccrops2011.org> for scientific program details and information on symposium and hotel registrations.

### Regional Conference Organized in India on “Zinc in Crops and Human Health”



IZA, in collaboration with The Fertiliser Association of India (FAI), organized a Regional Conference in India in May at Pune, Maharashtra state. The conference was entitled 'FAI-IZA Symposium on Zinc in Crops & Human Health in Maharashtra' and was the second in a series of state level regional conferences in India held by IZA in

association with FAI. Approximately 80 participants attended, representing the State Government Department of Agriculture and Department of Health, State Agricultural Universities, ICAR Research Institutes, fertilizer industry members, the Micronutrient Association and the Crop Growers' Association.



Mr. Satish Chander, Director General, FAI, delivering concluding remarks

Dr. S.K. Goel, Principal Secretary (Agriculture & Marketing), Government of Maharashtra - IAS, inaugurated the Conference. In his address, Dr. Goel indicated that zinc deficiency was very high in Maharashtra state and that researchers had found positive effects of zinc use on crop yields. Mr. Satish Chander, Director General, FAI, stated that the Government of India was encouraging balanced fertilizer use through increased use of micronutrients, including zinc, by introducing the Nutrient Based Subsidy Scheme (NBSS), and through policy changes for customized and fortified fertilizers.

The technical sessions included discussions by Dr. Soumitra Das, Director of Zinc Nutrient Initiative, India, on zinc deficiency in soils, crops and humans as well as policy initiatives to encourage the use of zinc.

### Zinc Fertilizer Training Program in India

In 2010, IZA launched the Zinc Fertilizer Training Program in India, with the objective of generating increased awareness and knowledge about addressing zinc deficiency in soils, crops and humans through use of zinc fertilizers. About 50% of Indian soils are deficient in zinc, which impacts crop productivity and adversely affects human health.



Training program session at Deepak Fertilizers & Petrochemical Corp., Pune in April 2011

Five Zinc Training Program sessions have been held in 2011, with plans to hold an additional five sessions by the end of the year. The sessions have also been held for several leading fertilizer companies including: Chambal Fertilisers & Chemicals, Coromandel International, DCM Shriram, Deepak Fertilizers & Petrochemicals Corporation, Gujarat State Fertilizers & Chemicals, Gujarat Narmada Valley Fertiliser Co., IFFCO, Indian Potash, KRIBHCO, Nagarjuna Fertilizers & Chemicals and Tata Chemicals.

These training programs have been well received by the participants. The participants feel that the program is very beneficial and have asked for more sessions to be held across India to further spread the message through industry.



Training program group photo, FAI House, New Delhi in February 2011

If you are interested in having a Zinc Training Program session facilitated for your organization, please contact Dr. Soumitra Das at [sdas@zinc.org](mailto:sdas@zinc.org).

## China

### People's Republic of China Ministry of Agriculture and International Zinc Association Launch Zinc Fertilizer Project

With a growing population of more than 1.3 billion people (22% of the world total), China has a huge challenge to meet the food, fibre and fuel needs of its population with limited arable land (only 9% of the world total) available.

The Chinese government has put considerable focus on agricultural development, and is now the largest fertilizer producer and consumer in the world. In 2008 they consumed over 48 million tonnes, about 31% of global fertilizer consumption. Fertilizer use has greatly increased agricultural production in China. However, unbalanced fertilization, characterized by increasingly disproportionate use of N, P and K fertilizers, coupled with intensified agricultural production, has created widespread zinc deficiency in Chinese soils.

Based on comprehensive soil testing, it was estimated that 50% of Chinese soils were zinc deficient.



On March 14, 2011 in Beijing, China, an agreement was signed between the National Agricultural Technology Extension

Service Center (NATESC), part of the Ministry of Agriculture of the People's Republic of China, and IZA to cooperate on the promotion of zinc fertilizer in China. Both parties agreed on the importance of correcting zinc deficiency in both crop production and human nutrition, and are excited about working

together. The objectives of the project are to promote zinc fertilizer use broadly in Chinese agriculture to all stakeholders, and ultimately work towards including zinc into the nationwide fertilizer recommendation.

The full release can be seen here: <http://www.prweb.com/releases/2011/4/prweb8287515.htm>.

## Zinc Enriched Rice Production in China

Rice is the most important food crop in China. The intensification of agricultural production, coupled with increased use of macronutrient fertilizers, is causing zinc deficiency to spread rapidly throughout the country. Zinc deficiency in soils also contributes to zinc deficiency in humans because rice grown on zinc deficient soils has lower grain zinc concentrations.

To address these issues, application of zinc fertilizers and zinc-enriched NPK fertilizers (agronomic biofortification) offers a rapid solution to improve the zinc concentration in rice and thereby increase the dietary zinc intake of Chinese people.

IZA, in collaboration with China Agriculture University (CAU) and National Agricultural Technology Extension and Service Center (NATESC), The Ministry of Agriculture, China, is conducting nationwide research projects to promote zinc fertilizer use in China. The results show that applying zinc fertilizers significantly increases rice yields by 6-18% and zinc concentrations in rice grains by 20-80%.

In addition, since 2007, Beijing Xinhefeng Agrochemical Co. Ltd. (XHF), a major fertilizer company in China, has also been actively promoting zinc fertilizer use. Their work has shown increased rice yields of 5-15% and increased grain zinc concentrations of 20-50%.



XHF has also established production of zinc-rich rice in Heilongjiang Province through XHF's zinc fertilizer program.

XHF purchases the zinc-rich rice at a premium price, bringing higher economic returns to the farmers and encouraging other farmers to use zinc fertilizers. XHF then sells the zinc-rich rice as a specialty nutritious food item in supermarkets, especially in higher-income areas where demands for these products are higher. XHF's efforts are having a noticeable effect on peoples' interest and awareness of the importance of zinc nutrition and bio-fortified food items in China.

## Field Day Held in China

IZA and China Agricultural University held a field day in Taian, Shandong in June 2011. Dr. Ming Fan, Director of the China Program for IZA's Zinc Nutrient Initiative, spoke at the field day on the importance of zinc fertilizer use in agricultural production and also on zinc fertilizer use technology. Dr. Wang Yanan, Professor, Shandong Agricultural University, reported the latest results of research work on correction of zinc deficiency in apple production by applying zinc fertilizers. Dr. Wang indicated zinc fertilizer use increased apple yields by an average of 10% in Shandong Province in 2010. Zinc fertilizer use also increased the zinc concentrations and quality of the apples.



More than 50 local farmers and agricultural extension workers attended the event. They observed the effect of zinc fertilizer on apple growth and yield and

learned how to use zinc fertilizer for higher production yields. Several farmers committed to start using zinc fertilizers in their apple and other crop productions during the event.

## Zinc Fertilizer Training Program in China



IZA has organized 12 zinc fertilizer training sessions in 2011 with large Chinese fertilizer companies. In these training sessions, Dr. Ming Fan introduces IZA's Zinc Nutrient Initiative and describes zinc

deficiency in soils, crops and humans. He then explains the benefits of using zinc fertilizers to correct for zinc deficiency and to increase crop yield, quality, nutritional value and resistance to various stresses.

Dr. Fan also discusses various new zinc fertilizers and their uses and describes production technologies. Key technologies covered include adding zinc to NPK compound fertilizers and application of zinc fertilizers through fertigation to improve fertilizer efficiency and economic returns.

The training sessions are targeted at fertilizer industry technicians and leaders. One of the key objectives is to increase the interest and motivation within the sector to start producing more zinc fertilizers. To date, six fertilizer companies have joined IZA in China, three of which have initiated zinc-containing compound fertilizer production

projects to meet the increasing demand in Chinese agriculture.

For more information about activities involving IZA's Zinc Nutrient Initiative China Program, please contact Dr. Ming Fan at: [mfan@zinc.org](mailto:mfan@zinc.org).

## Other News

### IZA Joins Government and Universities in Thailand to Launch Zinc Network

IZA has joined with Thailand's Departments of Rice, Agriculture, and Land Development, along with a number of universities such as Kasetsart, Chiang Mai and Maejo, to launch the Thailand Zinc Network. The Network will focus on collaborative activities aimed at increasing awareness of zinc's importance to agriculture and human health.



Thailand is the largest exporter of rice in the world, and with nearly 10 million hectares under cultivation, it is the country's most important crop. Zinc

deficiency is widespread in Thai soil; it directly impacts crop production and also hinders sufficient accumulation of zinc in edible parts of the plants. Thus, one of the key objectives of the Network will be to maximize production and nutritional value of Thailand's rice crops through increased use of zinc fertilizers. A number of activities are being discussed to help achieve the overall goals of the Network including development of a website, research activities and policy discussions.

### Zinc Workshop Held in Thailand

A zinc workshop was held in Chiang Mai, Thailand in May in conjunction with the 2nd National Soil and Fertilizer Conference. The workshop, held during the conference, included two sessions focused on zinc deficiency in soils, crops and humans in Thailand. Presentations from international speakers and local Thai experts from government, industry and academia, highlighted the need to address the zinc deficiency problem through zinc fertilizers. A presentation was also given by IZA on the Zinc Nutrient Initiative. Over 100 participants attended the event that was followed by a Zinc Work Group Meeting to discuss specific activities needed in Thailand to help address the deficiency problem for zinc in soils, crops and humans.

The event was organized by IZA, Maejo University, the Soil and Fertilizer Society of Thailand, and Padaeng Industry Public Company Limited.

### IZA Welcomes New Members to ZNI

We are pleased to announce that 13 new members have joined IZA in support of the Zinc Nutrient Initiative.

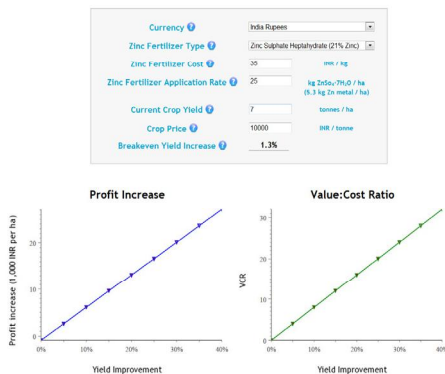


- Chakradhar Chemicals Pvt. Ltd.
- Coromandel
- Frit Industries, Inc.
- Hunan Jingshi Group
- IFFCO
- Kingenta
- Nagarjuna Group
- PPC ADOB
- Rahimtula Group
- Shandong Hongri Acron Chemical Joint Stock Company
- Shenzhen Batian Ecotypic Engineering Co., Ltd.
- Tata Chemicals Limited
- Win-Win Group

### IZA Launches New Zinc Fertilizer Calculator

IZA's new online zinc calculator has been designed to demonstrate how much more money a farmer makes when using a zinc fertilizer. The calculator shows the range of yield responses where a zinc application will be profitable for the farmer.

To use the online calculator, the user enters information about the type of zinc fertilizer, the cost of that fertilizer, the zinc fertilizer application rate,



the current crop yield and the crop price. The Zinc Fertilizer Calculator will then calculate the breakeven yield increase required to cover the additional cost of the zinc fertilizer, and it will also display two graphs showing the absolute profit increase and the value to cost ratio over a range of typical yield increase levels.

The calculator is quite useful because it illustrates the very low increase in yield that is often required to cover the cost of a zinc fertilizer application.

To access the online calculator, please go to the Resource Center at <http://www.zinc.org/crops> and click on the "Zinc Fertilizer Calculator" link.

### New Zinc Crops Website



With shift of the new zinc.org website design, the zinc crops website has also been updated to match. This new design has even more features including a videos slide and a comprehensive

Resource Center for crops documents. Please visit our new website at <http://www.zinc.org/crops>.



### International Zinc Association

The International Zinc Association is a non-profit organization with offices/representatives in:

Belgium - Brazil - India - Peru - P.R. China - South Africa - U.S.A.

*Zinc in Fertilizers* is a newsletter published by IZA covering issues pertaining to zinc in fertilizers. To learn more about zinc's benefits for crop nutrition, please visit [www.zinc.org/crops](http://www.zinc.org/crops).

### Contributions

We invite your submissions of articles, letters and images.

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For more information on IZA, please visit <http://www.zinc.org>.

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