

# SURPLUS - A Nanoparticle Liquid Micronutrient

By Rallis | Category: Implemented Innovations

Globally, Surplus is the first nanoparticle-based multi-micronutrient formulation developed after 5 years of collaborative research efforts between Tata Chemicals Innovation Centre and Rallis Innovative Chemistry Hub (RICH). It is currently being sold in 8 states within India. It has scientifically been proven that micronutrients are a limiting factor in enhancing the productivity and quality of agricultural produce and it has also gained importance due to present day intensive farming practices. However, its usage was restricted due to currently available micro-nutrient mixtures with low efficacy or high cost. Surplus is a concept-driven agri-solution product that enables farmers to improve crop yields and quality produce at affordable costs.



## The Context



Crop productivity has stagnated for the last couple of decades due to severe micronutrient deficiencies.



Farmers are not adopting balanced fertiliser applications due to high cost of chelated micronutrients.



## The Innovation



Globally, Surplus is the first nanoparticle multi-micronutrient formulation developed by years of collaborative efforts between Tata Chemicals Innovation Centre and Rallis Innovative Chemistry Hub (RICH). It is a disruptive and patented innovation in Plant nutrients. Due to its nano-nature, it has rapid absorption and translocation in the plant. It corrects the micro nutrient deficiencies and challenges faced by farmers in a most efficient and cost effective way. Farmers are delighted with its 3X nutrient use efficiency and 2X low dosage. It helps boost the crop's stress tolerance and increases 10-15% quality yield. Surplus is an environmentally safe product, has zero sedimentation and phyto-toxicity. It is easy to use and compatible with all agro chemicals. Surplus is compliant with the FCO norms and is available in state grades of micro-nutrients. Surplus is a win-win for all the stakeholders in the value chain.



## Overcoming challenges

### Challenge #1

Switching from powder to liquid formulation. Chemistries were tweaked to increase mineral loading and reduced silica content to nano-silicate used in wet cake form.

### Challenge #2

Zinc and Manganese nano-silicate wet cakes formed in addition to other mineral nutrients, together dispersed in water was chosen as final composition. A significant number of experiments were conducted to optimise the formulation.

impact on farmers  
**reduce  
input  
cost**

impact on environment  
**better soil  
& crop  
quality**

impact on consumer  
**healthy &  
nutritious  
food**



**Impact of the  
Innovation**

revenue so far

**+₹30 mn**