# 5th Gen Nano-K Fertilizer Technology

"Transforming K-Fertilizer Industries at the Atomic Level"


## RNZ GROUP

### CENTRE OF EXCELLENCE FOR FERTILIZER TECHNOLOGY RESEARCH

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Cash crops Cereals Pulses Vegetables Fruits Medicinal herbs Cannabis

# Who We Are

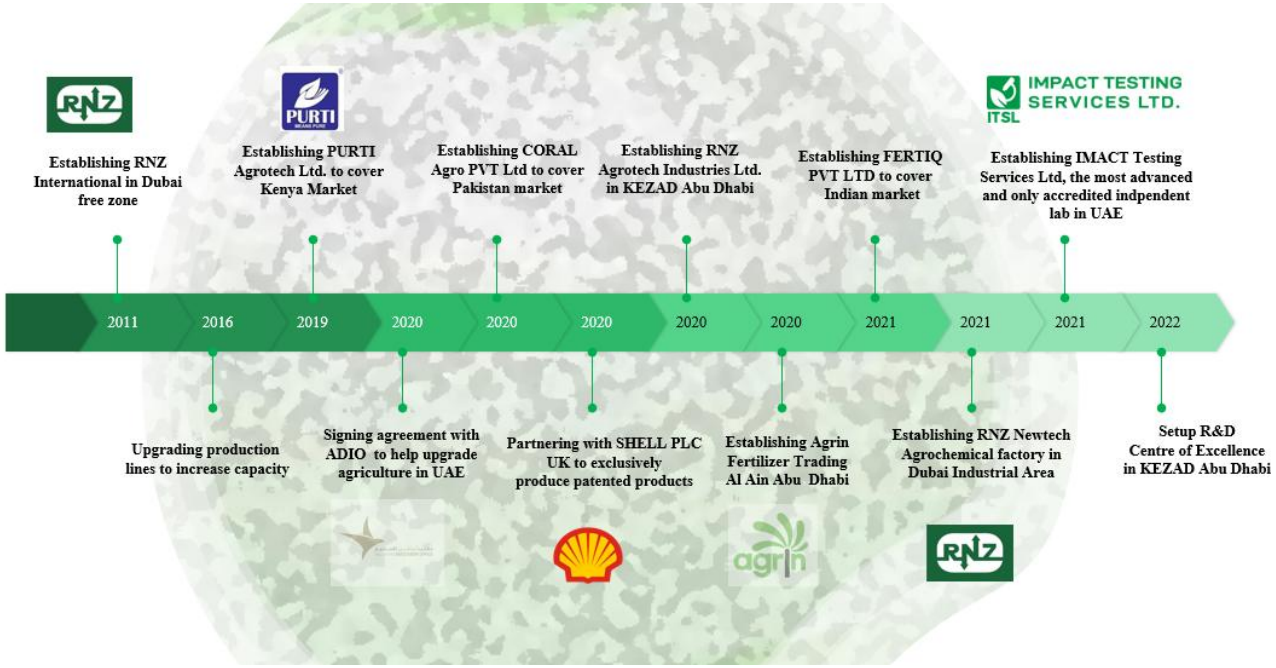
## RNZ Group at Glance

•Headquartered in Abu Dhabi, UAE

•Leading agri-inputs supplier

•Manufacture : Water-soluble, Granular, Suspension, Liquid, nanofertilizer, Biostmulant

•Region of Operation: Middle East, Africa, South Asia south  and north America, Europe




## Infrastructure & Capability

•Production facilities  Jebel Ali and KEZAD, UAE

•Partner facilities for straight and water-soluble fertilizers

•State-of-the-art R&D facility


**Customization | Scale | Global Reach | Farmer-Centric Approach**

# Centre of Excellence for Fertilizer Technology Research (COE-FTR)

Advancing Next-Generation Fertilizer Development


## About COE-FTR

Established in 2021, COE-FTR is based at RNZ Agrotech Industries Limited, KEZAD, Abu Dhabi.

A partnership between RNZ Agrotech and the Abu Dhabi Investment Office (ADIO) under the AgTech Innovation Program.

Mission: Tackle global food security challenges with cutting-edge solutions.

## Our Mission

COE-FTR aims to undertake and promote advanced research in next-generation fertilizer development, focusing on:

- New materials for enhanced efficiency
- Value addition to existing products
- Low carbon footprint manufacturing technology

## Fertilizer Research Focus

**Inorganic Fertilizers**
Optimizing nutrient delivery

**Organic Fertilizers**
Sustainable, eco-friendly solutions

**Hybrid Fertilizers**
Best of both inorganic and organic materials worlds

**Nanofertilizers**
Precision nutrient application

**Biofertilizers**
Enhancing overall soil health

## Multidisciplinary Expertise

- Agri-nanotechnology
- Material Science
- Biotechnology
- Soil Microbiology & Soil Science
- Entomology
- Process Engineering
- Fermentation Technology
- Agronomy

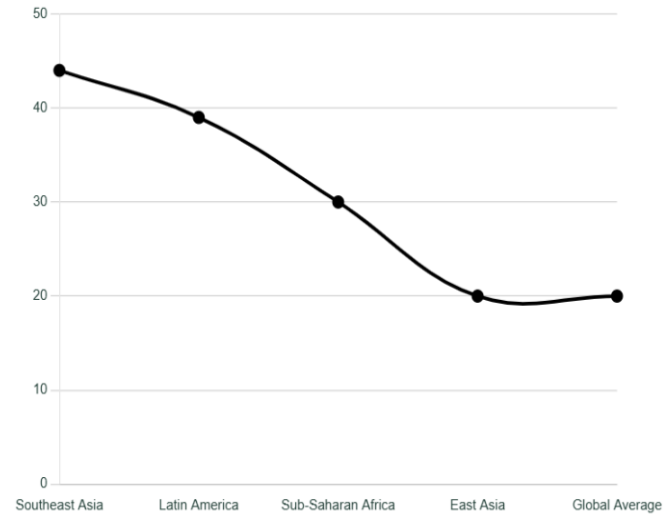
# Why Potassium is Vital for Crop Production & Food Security

## Global Potassium Deficiency Impact

**Potassium deficiency impacts crops and food security globally.**

- **Vital Role of Potassium:** Potassium supports plant growth, photosynthesis, and respiration.
- **Global Soil Deficiency:** 20% of global soils lack potassium, especially in Southeast Asia and Latin America.
- **Regional Impact:** Deficiency rates: Southeast Asia 44%, Latin America 39%, Sub-Saharan Africa 30%.
- **Food Security:** Potassium shortage threatens global food security.

### GLOBAL POTASSIUM DEFICIENCY IMPACT




Potassium Deficiency Impact on Agriculture (%)

# Potassium Fertilizer: Market Threats & Technology Needs

## Market Threats

- Geopolitical instability disrupts supply.
- Prices are volatile due to supply-demand shifts.
- Environmental rules raise production costs.
- Market is dominated by few global players.
- Transport issues delay global distribution.

## Why High-Efficiency Tech is Needed

- Addresses yield requirements for population growth.
- Requires reduced production costs.
- Needs to mitigate nutrient runoff and pollution.
- Demands lower energy use and emissions.
- Supports smart, sustainable farming practices.

# RNZ NANO-K

Next-Generation Nanoengineered Liquid Potassium Fertilizer

Revolutionizing Crop Nutrition

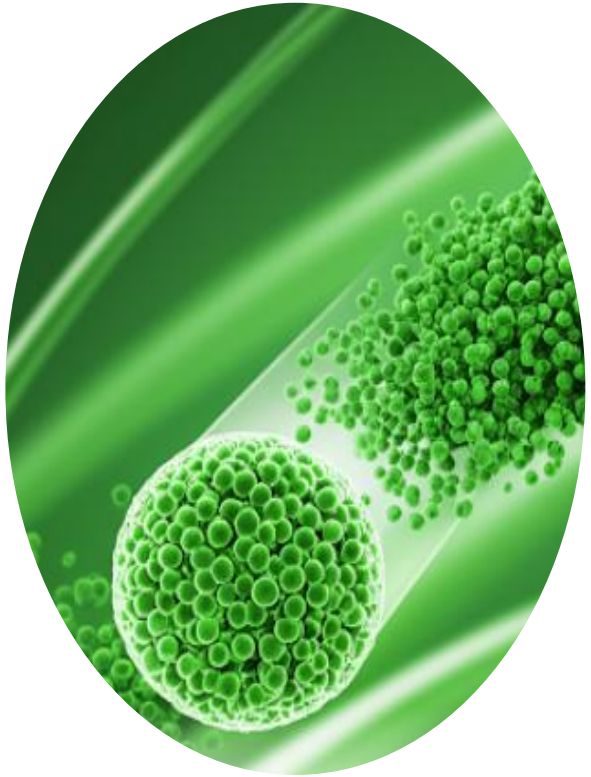
## Technology Overview

RNZ NANO-K is a next-generation nanoengineered liquid potassium fertilizer supplement offering a highly bioavailable form of potassium.

**Purpose:** Rapid, efficient, and environmentally adaptive potassium supplementation for all crop categories under standard and problematic conditions.

**Delivery:** Direct potassium delivery via foliar absorption pathways.

# RNZ NANO-K –FEATURES
## Nanoengineered Liquid Potassium Fertilizer



🧪 **Nano-Scale Design**
→ Engineered particles carved for maximum surface area, absorption, plant available K

🌿 **Foliar Absorption Pathway**
→ Direct delivery to leaf tissue for quick uptake

⚙️ **Plant Physiology Re-activation**
→Supports water balance, nutrient flow, photosynthesis and stress resilience

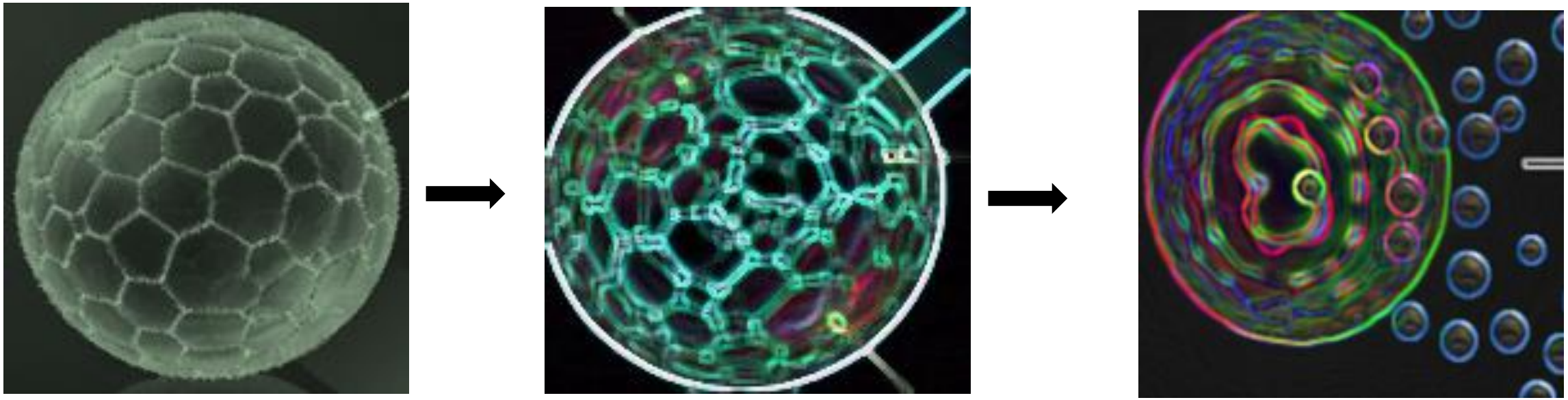
**Re-modulation of Rhizosphere Dynamics**
→ Facilitate mobilization and uptake of other nutrients from the soil

📈 **Higher Productivity**
→ Boosts yield and produce quality

**Targeted Crops**

Cash | Cereals | Pulses | Vegetables | Fruits | Ornamental | Medicinal | Specialized/High-Value: Cannabis

# Nanoengineered Liquid Potassium Fertilizer



**Technology Rationale:** Nanoengineered particles >20nm carved with plant available potassium

## APPLICATION METHODS EASE

### Foliar Spray

Direct and rapid absorption through the plant's leaves, maximizing bioavailability.

### Drip Irrigation/Fertigation

Delivers nutrients directly to the root zone for precise and consistent supply.

### Seed Treatment

Provides early nutrient support, promoting stronger germination and vigor.

### Soil Drench

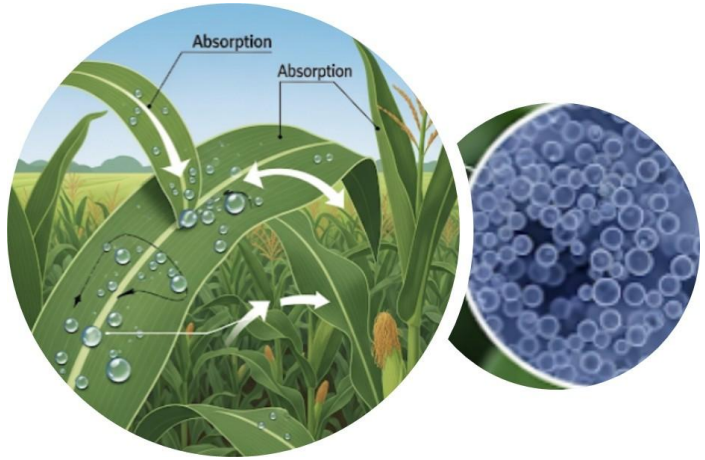
Applied as a soil drench for root uptake, especially in specific soil conditions.

# Enhanced Crop Performance with Nano-K Application

## Key Finding:

**20% improvement in overall performance** achieved with 100% NP + 75% K (MOP) combined with two Nano-K sprays (2.5 mL/L), compared to recommended NPK fertilization.

**Baseline** 100% → **Nano-K** 120%




### Yield Attributes:

| | |
|---|---|
| Cob Length: | 17.83 cm |
| Cob Girth: | 17.33 cm |
| Rows per Cob: | 18 |
| Grains per Row: | 35 |

### Yield Outcomes:

| | |
|---|---|
| Grain Yield: | 4254 kg/ha |
| Stover Yield: | 7742 kg/ha |

### Nutrient Metrics:

Plant K Content: 1.56%

Higher potassium uptake than other treatments

## Efficiency:

QY (Yield Efficiency): **0.74**


# Commitments

ifa
INTERNATIONAL
FERTILIZER ASSOCIATION

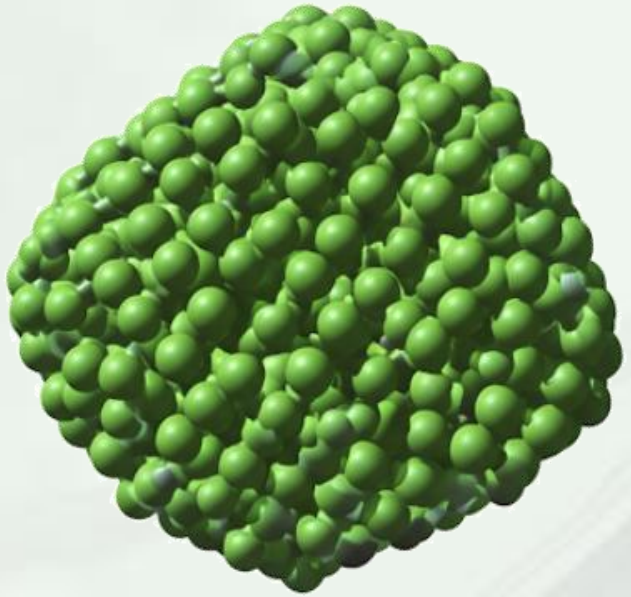
*Helping to feed the world sustainably*

UN GLOBAL COMPACT


UACA
UAE Alliance for Climate Action

# THANK YOU

RNZ NANO-K



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