INDORAMA
Essential materials. Better lives.

Exploring Slow-Release Fertilizers

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INDORAMA COOPERATION

A Brief History

1976 First manufacturing plant in Indonesia for textiles

1989 Start production of disposable gloves

1991 First polyester fiber plant

1995 First PET plant

1998 First overseas plant in Turkey for spun yarns

2004 First upstream petchem plant for PTA production

2006 Acquisition of the leading olefin company in Nigeria

2010 Creation of Indorama Ventures (Thailand)

2011 First yarn production unit in Uzbekistan

2012 Acquisition of YTY

2012 Start of spandex yarn production in India

2014 Acquisition of ICS

2016 Startup of ammonia and urea production in Nigeria

2018 Acquisition of fertilizer company in India

2019 First cotton harvest in Uzbekistan

2020 Start of fertilizer production in Uzbekistan

2021 Acquisition of Adufértil 2nd ammonia & urea line in Nigeria

2022 Acquisition of Indo-Gulf fertilizer

Global Footprint (inclusive of IVL). 154 sites in 37 countries

Germany	Luxembourg	France	Portugal	Spain	UK	Ireland	Poland	Bulgaria
Fiber, PET, Wool Yarns	Fabric	rPET, Fiber	PTA	PTA, PET, IPA	PET Bottles	rFiber	PET	Fiber

Netherlands	Italy	Russia	Austria	Denmark	Slovakia	Czech Republic	Lithuania
PTA, PET, rPET	Fiber, Fabric	Fiber	Wool Yarns	Fiber	Fiber	Fiber, Wool Yarns	PET

Canada	USA	Mexico	Brazil
PTA	Olefins, PX, PTA, IPA/NDC, PET, Fiber, EO Deriv., rPET	PET, Fiber, rPET	Fiber, PET, rPET, Fertilizers

Philippines	Malaysia	Sri Lanka	Myanmar	Uzbekistan	Australia
PET Bottles	Gloves	Spun Yarns	PET Bottles	Spun Yarns, Cotton Fiber, Fertiizers	EO Deriv.

India	China	Thailand	Indonesia
EO Deriv. Spandex, PET, Fertilizers, Fiber	Fiber, Fabric, PET,	PTA, Fiber, PET, rFiber, Wool Yarns, PET Bottles	PET, Fiber, PTA, Spun Yarns, Fabrics, Weaving, Gloves

Senegal	Ghana	Turkey	Egypt	Nigeria	Israel
Phosphate Fertilizers	PET Bottles	Spun Yarns, PET	PET, PET Bottles	Olefins, PET, PET Bottles, Urea	Fiber

Global Manufacturing Capacity

Million Metric Tons

REGIONS	PET[1]	FIBERS[2]	AROMATICS	OLEFINS	EOD	FERTILIZER	GLOVES	TOTAL
	2.0	0.4	2.4	0.7	2.6	1.1		9.2
	2.1	1.9	1.9		0.1	2.3	0.1	8.4
	2.5	0.6	2.0	0.4		3.7		9.2
	6.6	2.9	6.3	1.1	2.7	7.1	0.1	26.8

[1] includes bottles. [2] includes yarns & fabrics.

Business Leadership

GLOBAL

- #1 PET
- #1 Bico Fibers
- #2 Tire Cord Fabrics
- #3 Synthetic Gloves
- #3 Nonwoven Fabrics

ASIA

- #1 PET Fibers (SEA)
- #2 PET Fibers (India)
- #2 Spandex Fiber (India)

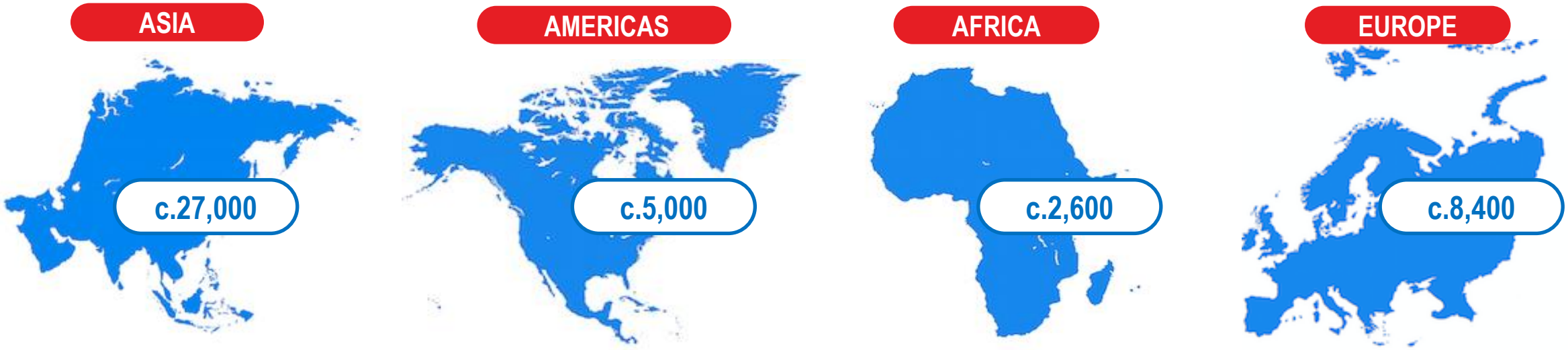
SUBSAHARA AFRICA

- #1 Urea
- #1 Phosphate Fertilizers
- #2 Olefins / Polyolefins

EUROPE

- #1 PET Fibers
- #1 Airbag Yarns
- #1 Recycled PET

Human Resources. People First



c. 43,000 Employees

Global Platforms

70+ Nationalities

Overview of Fertilizer Facilities

Port Harcourt, Nigeria

Largest ammonia and urea producer in West Africa

- 2 x 2300 tpd ammonia
- 2 x 4000 tpd urea, 3 MM tpa of urea sales
- Extensive gas pipeline network
- Dedicated export jetty
- Extensive pan-Nigeria distribution network

Ammonia **Urea** Phosphate Rock Phosphoric Acid DAP NPK SSP

Mboro, Senegal

Largest integrated phosphoric acid producer in West Africa

- 2 MM tpa phosphate rock mining operation
- 2 x 300 kta phosphoric acid integrated with sulphuric acid production
- Extensive rail and road network

Ammonia Urea **Phosphate Rock** **Phosphoric Acid** DAP NPK SSP

Mbao, Senegal

Producer of DAP and NPK compound fertilizers for West African market

- 250 kta DAP and NPK products
- Marine lines for importation of ammonia and exportation of phosphoric acid

Ammonia Urea Phosphate Rock Phosphoric Acid **DAP** **NPK** SSP

Haldia, India

One of the largest producer of phosphate fertilizers for East and Northeast region of India

- 800 kta of phosphate fertilizer production
- Large trade of imported fertilizers
- Brand leadership under the Paras brand
- Extensive distribution network

Ammonia Urea Phosphate Rock Phosphoric Acid **DAP** **NPK** **SSP**

Kokand, Uzbekistan

Largest producer of phosphate compound fertilizers in Central Asia

- 350 kta of SSP and NPK products
- Product diversity, including ammoniation
- Catering to vibrant domestic agricultural market

Ammonia Urea Phosphate Rock Phosphoric Acid DAP **NPK** **SSP**

Jundial, São Paulo Brazil

Brazil is one of the world's largest fertilizer importers

- Capacity of 1.1 MM tpa of NPK products
- Storage capacity of 70KT
- Catering to vibrant domestic agricultural market

Ammonia Urea Phosphate Rock Phosphoric Acid DAP **NPK** SSP

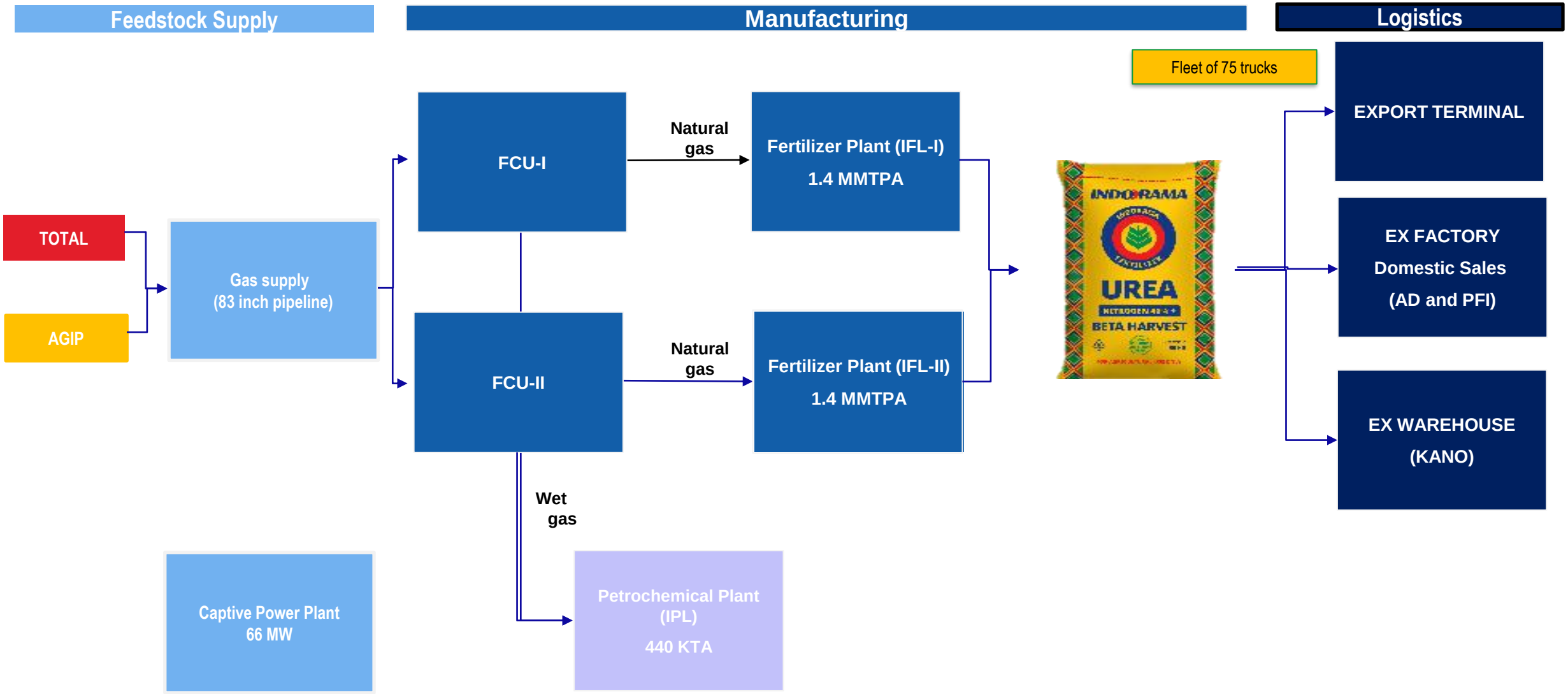
Jagdishpur, India

India's second most energy-efficient ammonia and urea producer

- 1.2 MM tpa urea
- Specialty organic fertilizers
- Trade of farm inputs

Ammonia **Urea** Phosphate Rock Phosphoric Acid DAP NPK SSP

Fully Integrated Fertilizer Operation Nigeria



IFL's Agronomy Activities 2016-2023

Objective: Educating farmers on best crop and fertilizer management practices to help reduce their losses, rationalize their input costs, and ultimately achieving higher crop yields.

Conducted 28,131 pre-sowing soil testing programs

150+ Radio talk shows organized on Best Crop Management Practices

Conducted 3,678 Field demos for all major crops

249,112 farmers were trained one on one by our agronomist

388 Mega farmer and 5,413 Group farmer events organized

Organized 1,301 farm day activities at demo plots

- During Jan-Oct 2023, IFL trained 153k farmers. This brings the total farmers trained between 2016-2023 at 900k.
- 600k Crop Folders has been distributed.

Agronomy Activities completed in 2023	Jan-Oct (2023)
Farmers Training Sessions	571
Field Demonstration	145
Field Visit	4,254
Soil testing	3,737

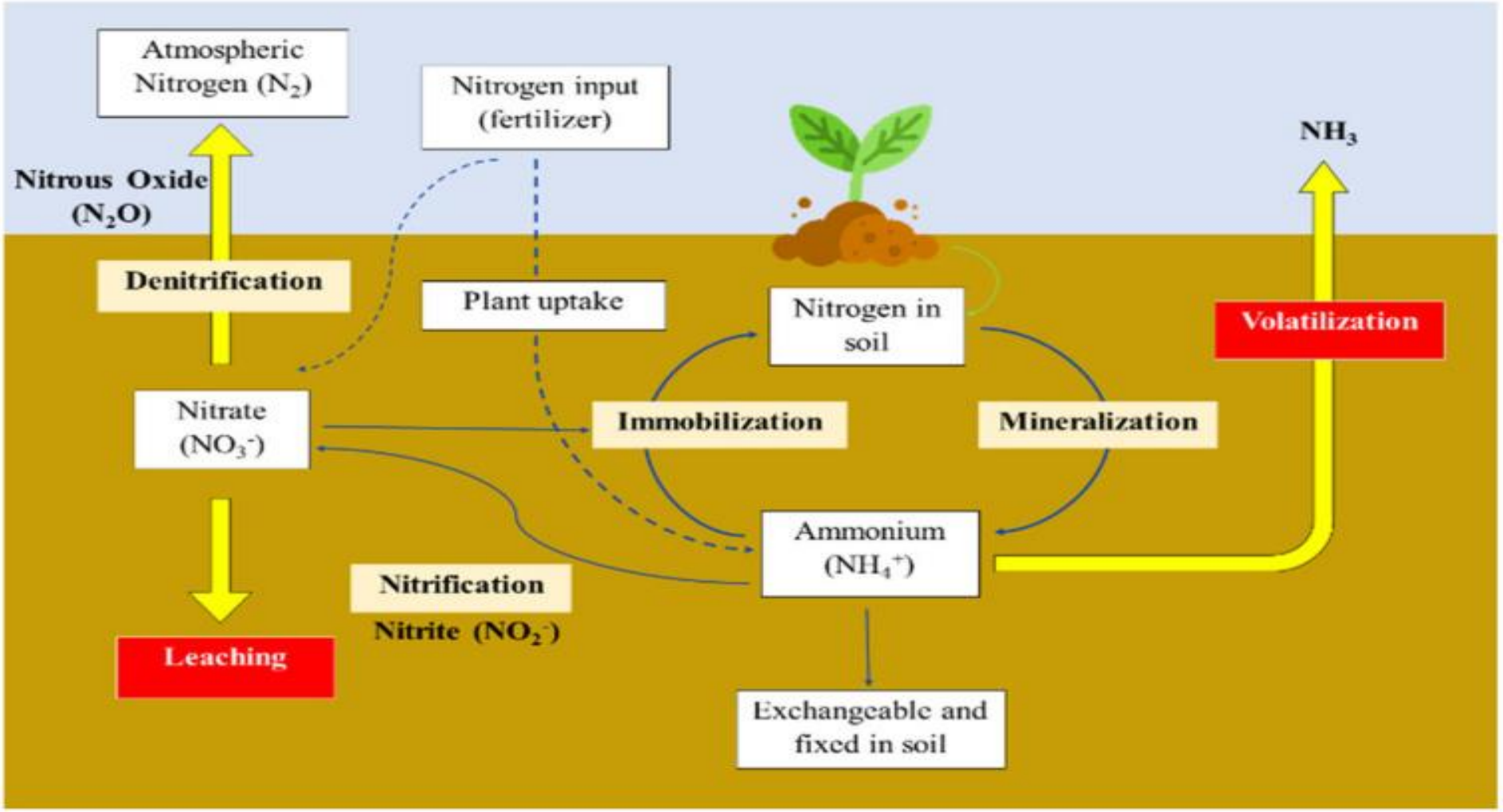
Exploring Slow-release Fertilizers

Introduction

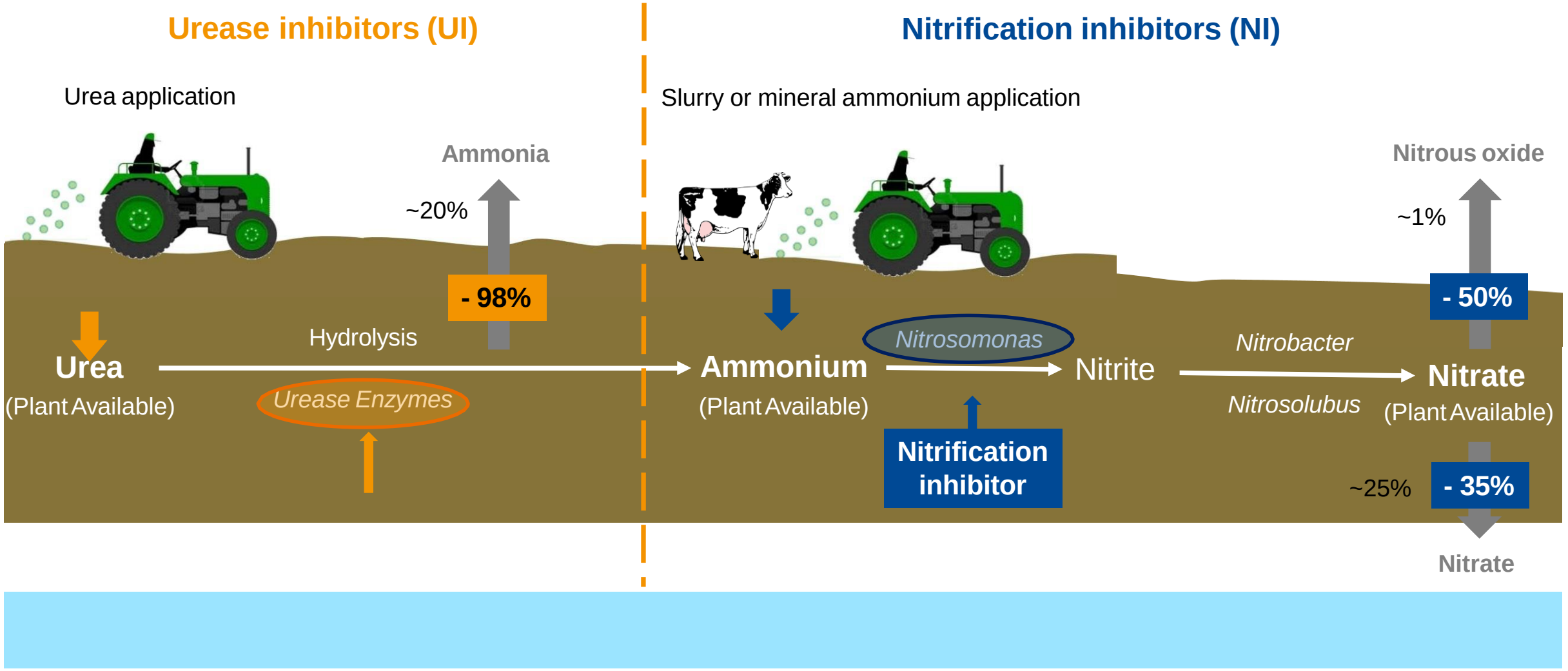
The world population is forecasted to reach about 9.7 billion by 2050 as per United Nations' "World Population Prospects 2019. As the population keeps blooming, food demand is also expected to rise.

- Fertilizers provide nutrients to plants and are often credited for the improvement in crop yield, which results in exponentially increased fertilizer use worldwide.
- Among the three macronutrients required (Nitrogen/Phosphorus/Potassium), Nitrogen (N) is the most crucial and essential to plant growth.
- Direct Application of chemical fertilizers to plants have low utilization efficiency as only 30–35% of the nutrients are absorbed .
- Urea, the most used N-fertilizer due to its high N content (46 wt% and its low cost) was reported to have NUE levels of only 50%, where 2–20% is lost through volatilization, 15–25% reacts with organic compounds in the soil and 2–10% is lost through leaching into water systems, leading to pressing environmental concerns.
- When the soil cannot retain the urea due to excessive water from irrigation or heavy rainfall, nitrate ions will leach to ground and surface water bodies. Consequently, high concentrations of nitrate ions in plants and drinking water could pose high risks to human health .
- Besides water pollution, nitrogen is also lost through volatilization as N_2 and N_2O, through complete and incomplete denitrification processes, respectively Ammonium could also be lost as NH_3 through volatilization.
- Nitrogen-based fertilizers have also been reported to be the source of N_2O, which is the primary substance for worldwide ozone depletion in the 21st century

Process of Nitrogen Uses



Nitrogen Losses in Agriculture



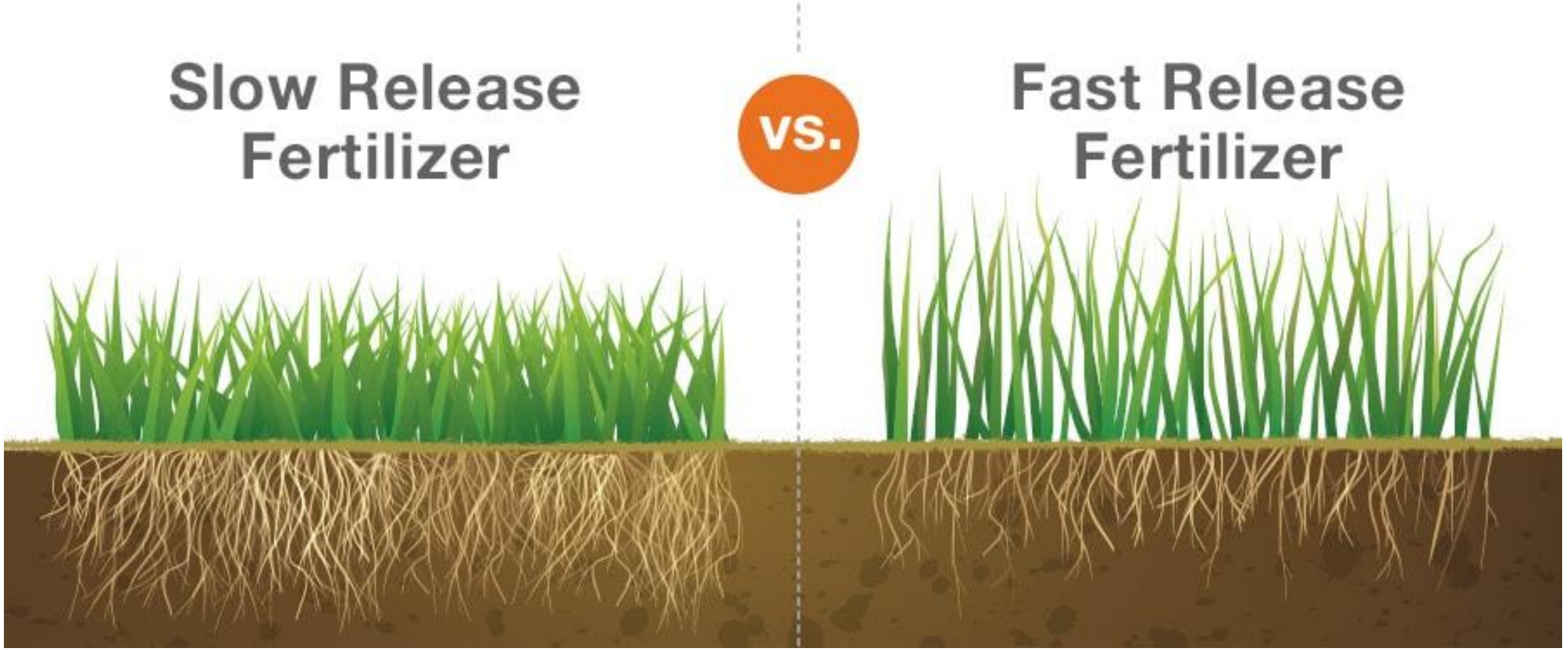
Slow-released Fertilizers

- Slow-release fertilizers, also known as controlled-release fertilizers are a type of fertilizer that releases nutrients gradually over an extended period.
- These fertilizers are designed to provide a sustained and controlled supply of nutrients to plants, reducing the frequency of fertilizer applications and minimizing nutrient losses.
- The basic concept of slow-release fertilizers is that they release their nutrient content at more gradual rate that permits maximum uptake and utilization of the nutrient while minimizing losses due to leaching, volatilization , and other means

Major advantages :

- Enhanced nutrient-use efficiency
- Decreased nutrient leaching and nitrogen losses by volatilization
- Decreased environmental pollution risk
- A smaller number of applications is required

Slow-Release Vs Quick release Fertilizers (CRF)



What are slow-release fertilizer

Definition	• Slow-release fertilizers are a type of fertilizer designed to provide nutrients to plants gradually over an extended period.
Key component	• Nutrient-rich granules or coatings
Release mechanism	• Controlled by factors like temperature, moisture, and microbial activity

**The release rate of a nutrient from a fertilizer must be slower than that from a fertilizer in which the nutrient is readily available for plant uptake.

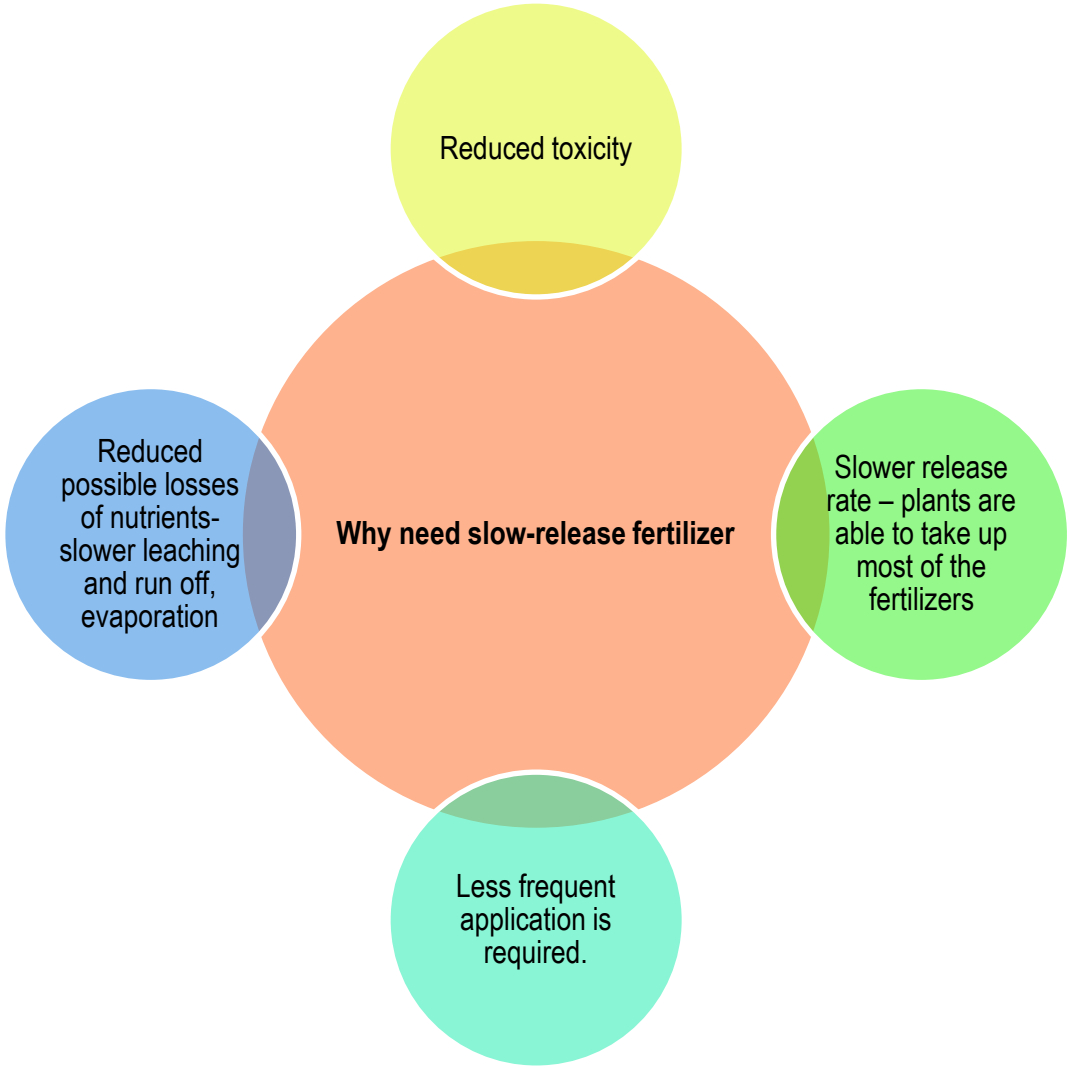
Difference between slow release and controlled release fertilizer's

- **Slow-release fertilizers** contain nutrients in a form that is not immediately available to plants. They may contain macro nutrients (nitrogen, potassium phosphorus) as well as micronutrients (iron, manganese, zinc, copper etc.) . The most common slow-release fertilizers include nitrogen fertilizers in which urea is combined with an aldehyde. Urea formaldehyde (UF), Nitroform (UF derivative), methylene urea (MU) are examples of such fertilizers.
- To release available nitrogen, SRF must be broken down by microorganisms. Therefore, the rate of release depends on the activity of microorganisms in soil and, hence, on soil moisture and temperature.
- Other SRF, such as IBDU (Isobutylidendiurea) are not dependent on microbial activity and decompose by hydrolysis. The slow-release effect is achieved due to their low solubility.
- Plant manures, animal manures and compost are considered as natural sources of slow-release fertilizers. However, their nutrient release rate is usually very slow and highly depends on microbial activity.
- **Controlled-release fertilizers** are coated either with a polymer or with an inorganic materials, such as sulfur. Using the matrices technique, the matrix is dispersed within the fertilizer and slows down its dissolution. The materials used for the matrix include rubber, polyolefins, or gel-forming polymers.
- The nutrient release pattern of slow-release fertilizers depends on soil conditions and on the activity of microorganisms and, therefore, is difficult to predict.
- The nutrient release pattern of controlled-release fertilizers can be better predicted, as it is not significantly affected by soil conditions such as pH, microbial activity, salinity etc., but rather by soil temperature and the properties of the coating materials.

Characteristics of Slow-release chemical Fertilizers

- Water insoluble / slow water soluble
- Low salt index
- A single application should supply enough nutrient throughout the entire growing season.
- Slow-release rate
- A Maximum percentage recovery
- Reduced Toxicity
- Not susceptible to environmental loss
- Lasts several weeks to several months
- Reduced labor capital /Cost saving
- Formulation allows fertilizer to slowly dissolve or release into the soil solution.
- Reduction in relevant gas emission.
- Nutrient release is dependent on – Microbial decomposition or physical or chemical processes in combination with microbial activities

Why need Slow –release fertilizer



Types of slow-release fertilizer

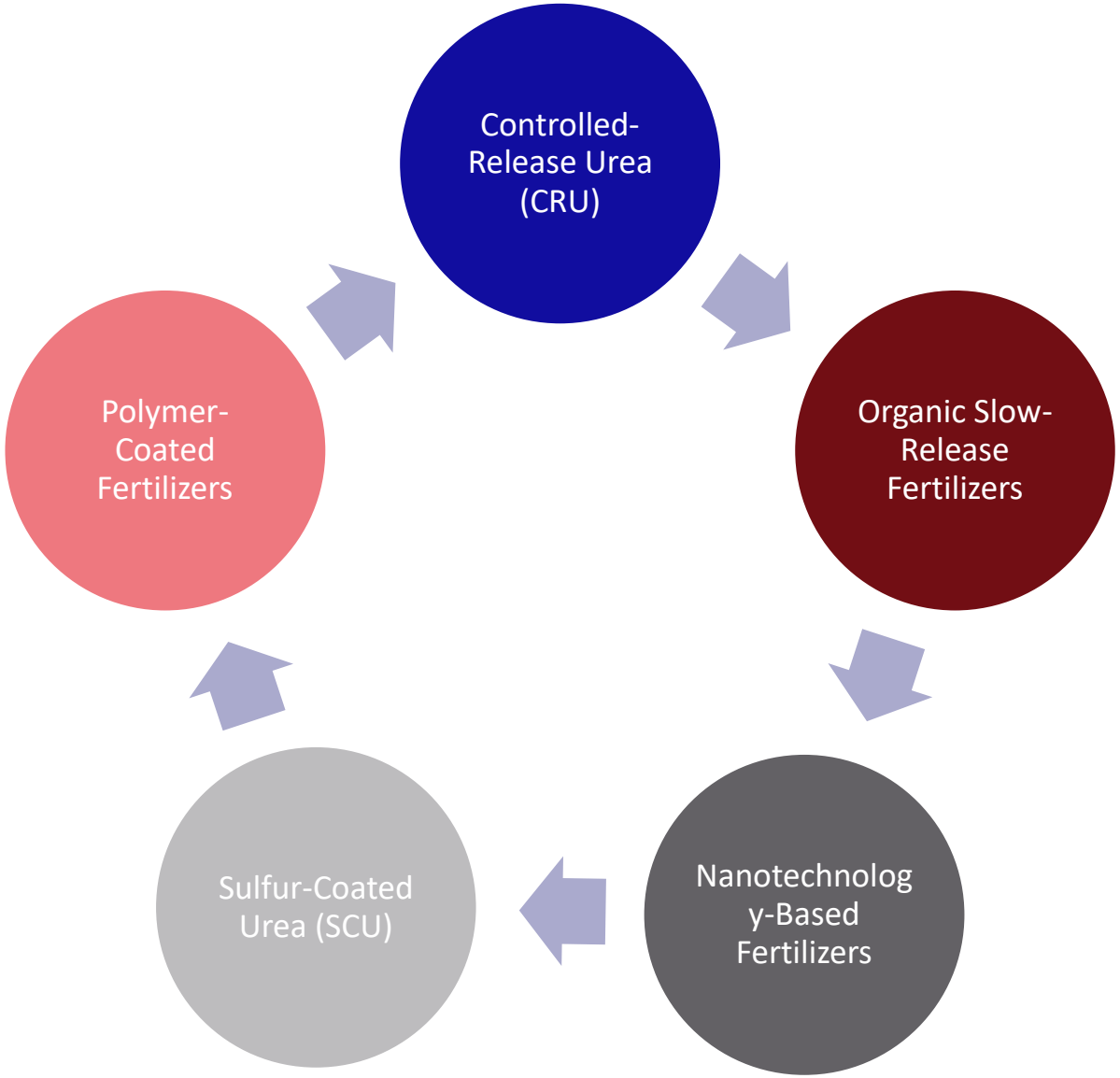
Organic

- The organic slow release fertilizers are totally dependent on microbial activity and have a long persistence in the soil .
- Due to this, they are not available to the plants at the stage they are needed, as they take longer time to break before available to the plant.

Soluble or Coated slow release

- This is slowly soluble or coated fertilizers which are mainly available in pellet form to the farmers.
- These coated fertilizers are dependent on soil moisture and temperature for the release of the nutrients which sometimes takes long period

Types of inorganic slow-release fertilizers

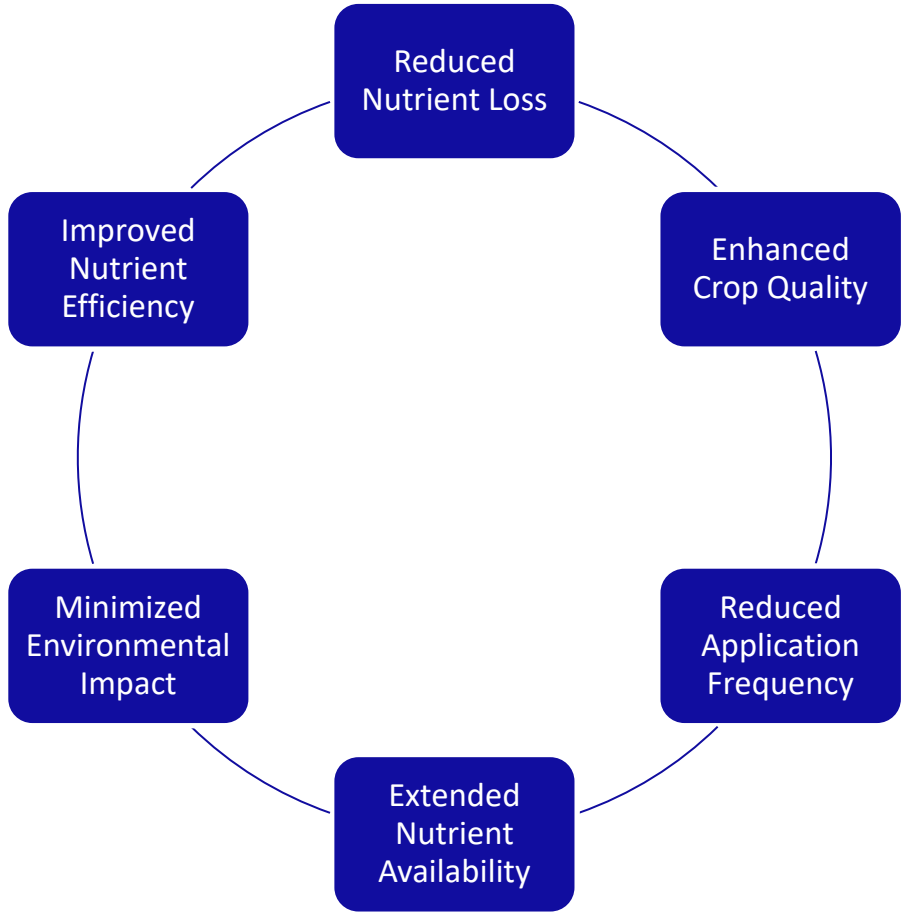


Uncoated Slow-Release Fertilizer

Name	Base Compound	Common Name	N content (%)	Inhibition duration (weeks)
Urea Formaldehyde	Ureaforms Methylene Urea Methylol Urea	Nitroform, Folocorn, Hydrolene, Resi- grow	35-40	10 -30 weeks
Isobutylidene diurea	Isobutylidene Urea	IBDU	31	10-16 weeks
Triazone	Triazone / Urea	N-Sure, Nitamin, Trisert, Formmlene	28-33	6-10 weeks
Contylidene diurea	Urea / Contylidene	CDU, Triabon	34	6-12 weeks

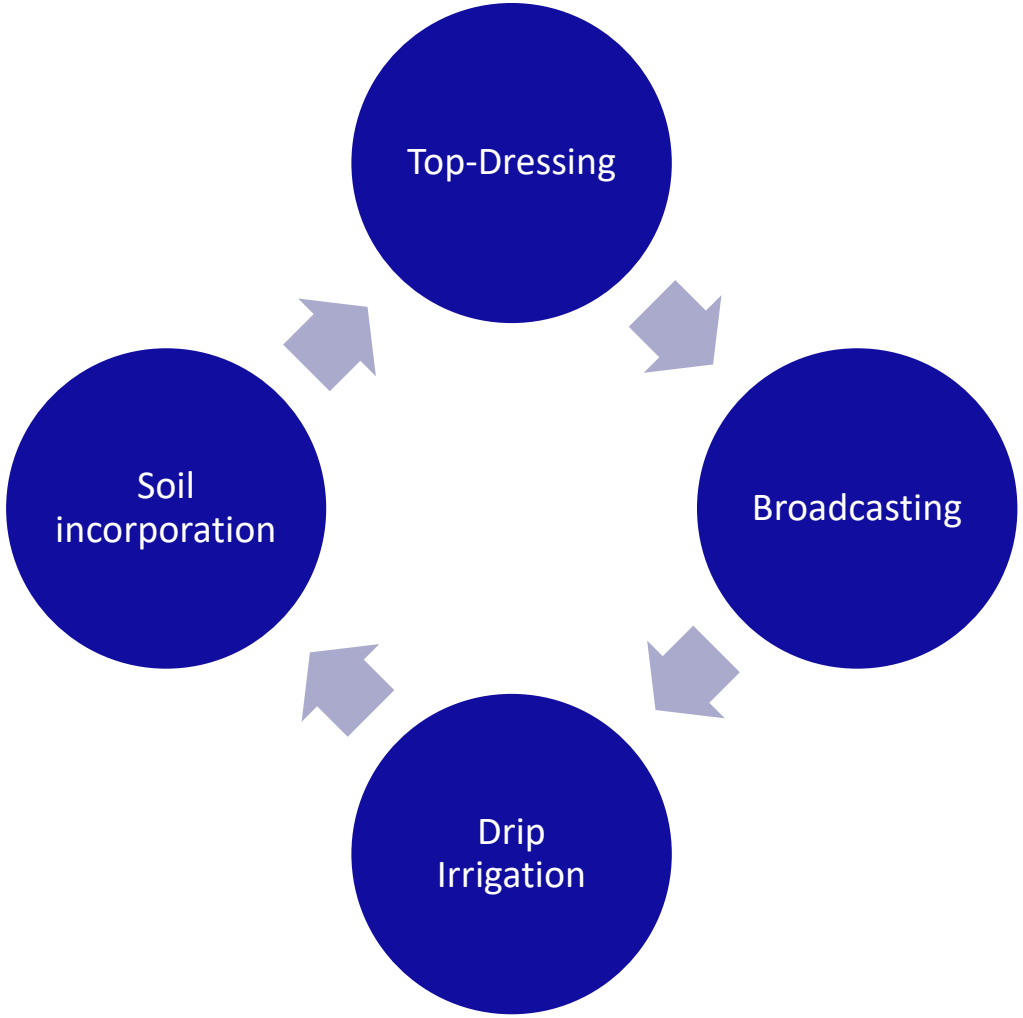
Benefits of slow-release fertilizers

S/N	Advantages	Description
1	**Improved Nutrient Efficiency**	slow-release fertilizers help plants utilize nutrients more effectively, reducing wastage and optimizing nutrient use
2	**Reduced Nutrient Loss**	Unlike conventional fertilizers that can be prone to leaching or runoff, slow-release fertilizers release nutrients slowly and steadily, minimizing the risk of nutrient loss.
3	**Minimized Environmental Impact**	Slow-release fertilizers have a lower environmental impact compared to quick-release fertilizers. They contribute less to soil and water pollution, making them a more sustainable choice.
4	**Extended Nutrient Availability**	One of the key advantages of slow-release fertilizers is their ability to provide nutrients over an extended period, which aligns with the plant's growth stages.
5	**Reduced Application Frequency**	Slow-release fertilizers require less frequent application compared to quick-release counterparts. This reduces the labor, time, and costs associated with fertilization.
6	**Enhanced Crop Quality**	Slow-release fertilizers can contribute to improved crop quality by supplying nutrients steadily throughout the growing season. This can result in crops with better taste, appearance, and overall quality.

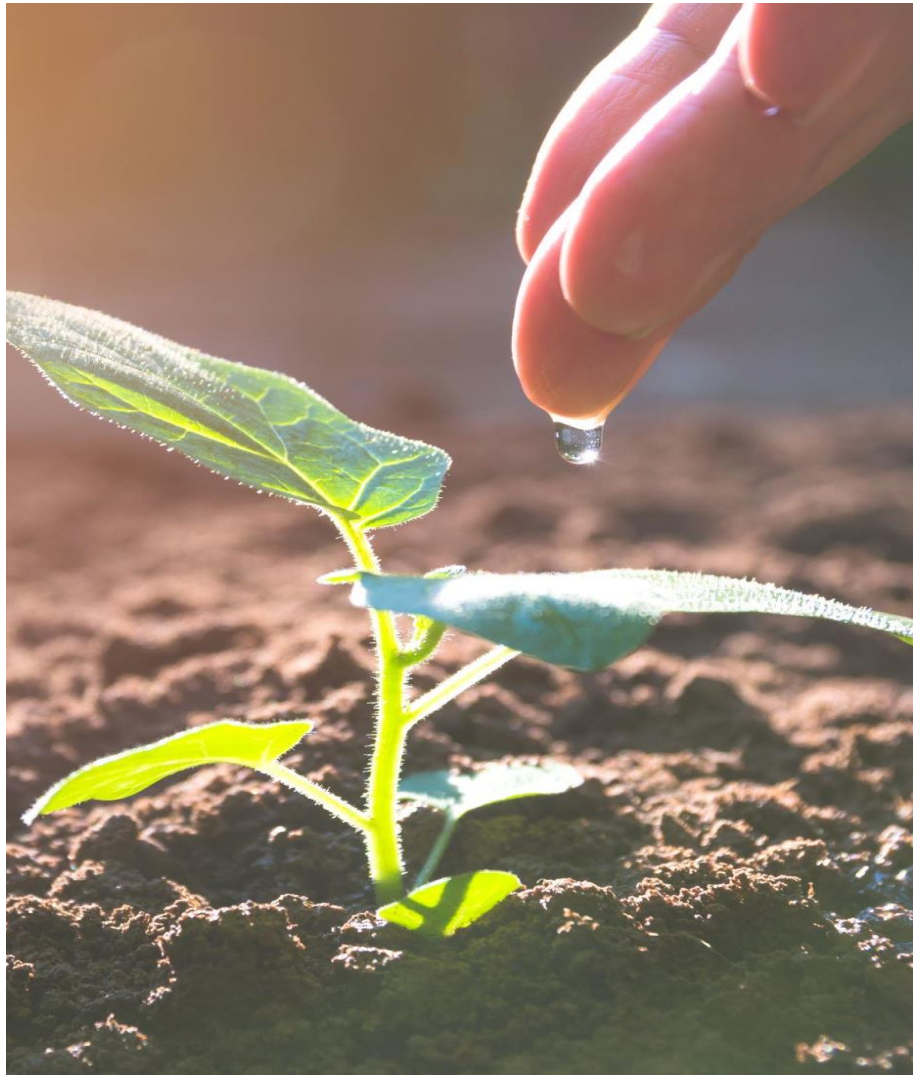


How to apply Slow-release Fertilizers

Soil incorporation	Slow-release fertilizers can be mixed into the soil during land preparation or planting. This method ensures that the nutrients are evenly distributed in the root zone of the plants and are available over an extended period.
Top-Dressing	This method involves applying slow-release fertilizers to the soil surface around the base of established plants. This is especially useful for crops in later growth stages and for precision feeding of nutrients to avoid wastage.
Drip Irrigation	Slow-release fertilizers can be incorporated into the irrigation system, allowing for precise and controlled nutrient delivery directly to the root zone through the drip lines. This method is highly efficient and reduces the risk of nutrient leaching.
Broadcasting	Fertilizers are spread evenly over the entire field surface Slow-release fertilizers can be used in broadcasting, but they may not provide as precise nutrient .management as other methods.



Mechanism of Nutrient Release in Slow-release Fertilizer



- Slow-release fertilizers use a protective coating (neem oil, sulfur, resin, or polymer) to control nutrient release, acting as a barrier between the fertilizer granules and the soil. This ensures a gradual and sustained nutrient supply to plants.

- Slow-release fertilizers are formulated with low water solubility nutrient sources, gradually releasing nutrients as they dissolve in soil moisture over time, with the release rate determined by the solubility of the nutrient source.

- Chemical Reaction: Slow-release fertilizers utilize reactions with soil moisture or microbial activity to control nutrient release. This allows for the gradual and targeted release of nutrients based on specific environmental conditions like temperature or pH levels.

How slow-Release fertilizers work

Controlled nutrient release based on environmental factors:

Slow-release fertilizers are designed to release nutrients gradually in response to environmental factors such as temperature, moisture, and soil conditions. The release rate of nutrients is influenced by these factors, ensuring that plants receive a steady supply of essential nutrients throughout their growth cycle.

Polymer coatings, chemical reactions, or physical barriers: Slow-release fertilizers employ various mechanisms to control nutrient release:

- **Polymer-Coated Fertilizers**: These fertilizers have a protective polymer coating that breaks down slowly in response to environmental factors. As the coating degrades, it releases nutrients at a controlled rate.
- **Chemical Reactions**: Some slow-release fertilizers contain nutrient sources that rely on chemical reactions within the soil to release nutrients gradually. The rate of release depends on the specific chemical reactions and soil conditions.
- **Physical Barriers**: In some cases, slow-release fertilizers utilize physical barriers, such as sulfur or resin coatings, to control nutrient release. The thickness and properties of these barriers determine the release rate.

Nutrients are available when plants need them most:

One of the primary advantages of slow-release fertilizers is that they provide nutrients to plants when they need them most. Instead of a quick burst of nutrients followed by potential deficiency, slow-release fertilizers offer a consistent supply of nutrients throughout the growing season. This promotes even and steady plant growth, which is particularly beneficial for crops.

Fertilizer Coating and Nutrients release process

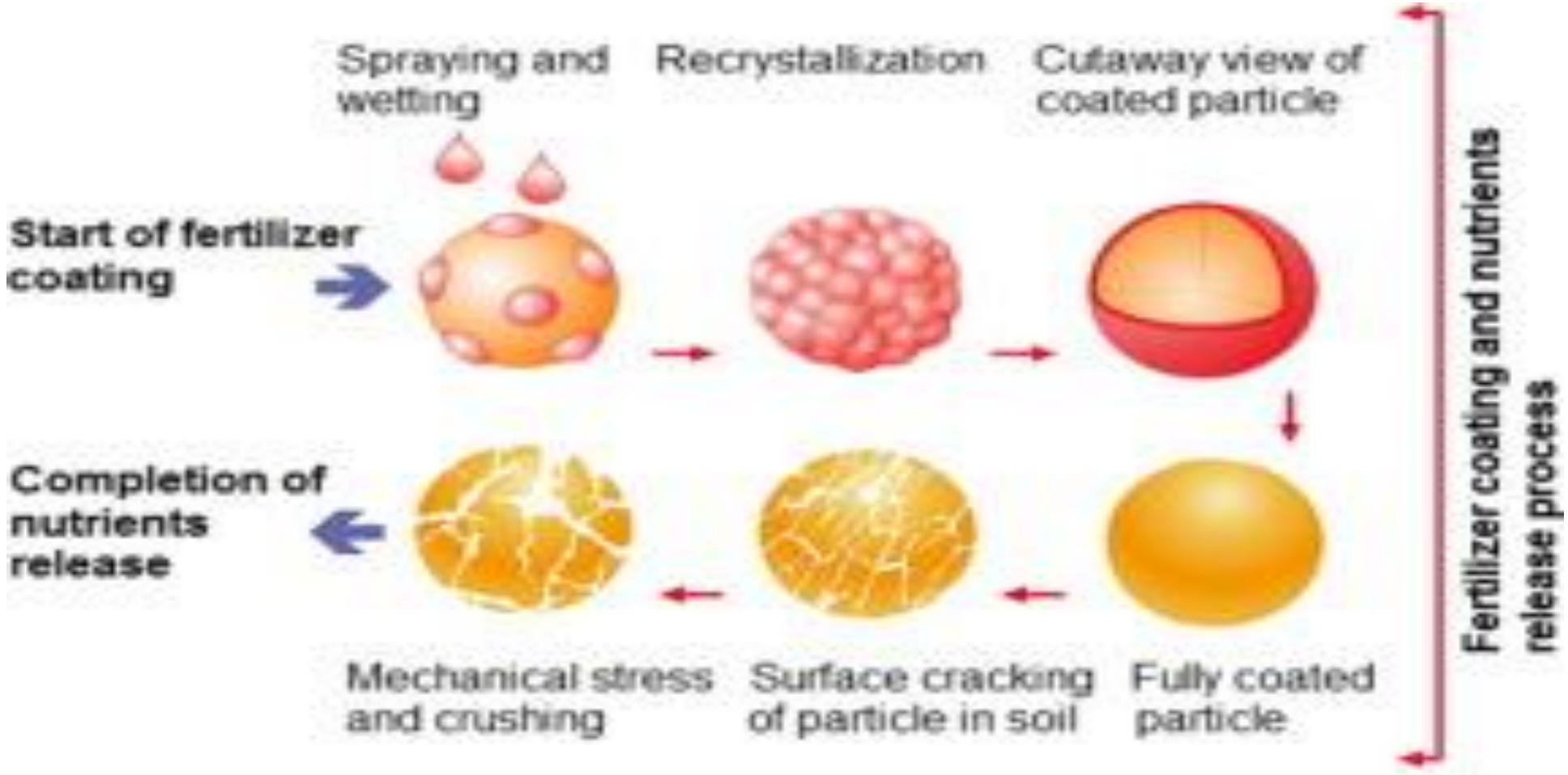
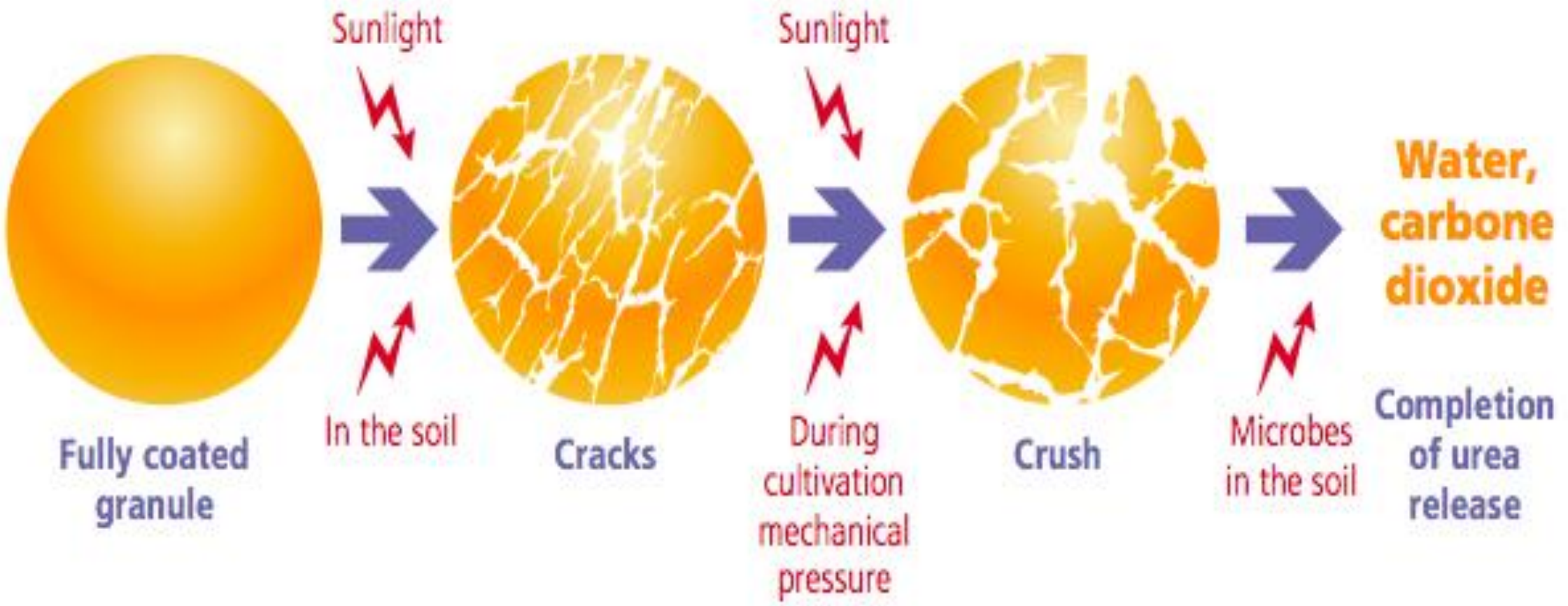


Illustration of slow release fertilizer coating and release processes.

How Coated Slow-Release Fertilizer works



Environmental consideration

Reduced Environmental Impact: Slow-release fertilizers are known for their reduced environmental impact compared to traditional, quick-release fertilizers. They release nutrients slowly and steadily, which minimizes the risk of excess nutrients leaching into the soil and water, thus reducing the impact on ecosystems.

Decreased Risk of Water Pollution: Slow-release fertilizers significantly decrease the risk of water pollution. When quick-release fertilizers are applied, there is a higher chance of nutrients being washed into nearby water bodies through runoff, leading to water pollution and potentially harmful algal blooms. Slow-release fertilizers minimize this risk by releasing nutrients at a rate that matches plant uptake, reducing the potential for nutrient runoff.

Lower Greenhouse Gas Emissions: The reduced need for frequent fertilizer application associated with slow-release fertilizers can lead to lower greenhouse gas emissions. Fewer applications mean less fuel consumption by machinery and transportation, which contributes to lower carbon emissions and a smaller carbon footprint.

Preservation of Soil Health: Slow-release fertilizers help preserve soil health by minimizing nutrient imbalances and preventing nutrient depletion. They promote the efficient use of nutrients by plants, reducing the need for excessive nutrient inputs that can harm soil structure and microbial communities.

Regulatory Support and Compliance: In many regions, there are regulations and guidelines in place to limit nutrient runoff and its environmental impact. Slow-release fertilizers, because of their reduced environmental risks, are often encouraged or even required by regulatory authorities. Using these fertilizers can help growers and gardeners remain compliant with local environmental regulations.

Conclusion

- Application of slow-release chemical fertilizers improves the yield, quality, nutrient uptake, nutrient availability as well as minimize nutrients losses in different crop.

- Application of coated urea helps in increase crop yield.

- The slow-release chemical fertilizers technology of macro and micronutrients not only has the potential to improve crop yields and farmers profits but also has positive implications on possible environmental footprint of fertilizer use.

Indorama NEEM COATED UREA

Neem Coated Urea (NCU)

Objective: To supply superior high efficiency urea fertilizer for Nigerian farmers

Problem:

- Urea is weak in terms of its Nitrogen use efficiency (Nitrogen availability for the plant).
- The most common losses of Nitrogen in the soil are ammonia volatilization, water runoff, denitrification and leaching.

Solution: Neem Oil Coated Urea (NOCU)

Benefits of NOCU:

- **Increased Nitrogen Use Efficiency:** By reducing bacterial oxidation of the ammonium-N by *Nitrosomonas* bacteria in the soil more nitrogen is available for plant to take which increases Nitrogen use per application
- **Increased Yield:** Studies show that on average yield increases by 10 to 15% by using Neem Coated Urea
- **Reduced N_2O Emissions:** While DCD and Nitrapyrin could reduce N_2O emission observed with conventional fertilizer by 38% and 50%, the effectiveness of Neem Coated Urea was only 14%
- **Pesticidal Properties:** Control's soil born nematodes, termites and other pests due to pesticide properties of Neem Coated Urea
- Reducing **environmental pollution** - Nitrate leaching & Volatilization loss
- **Soil Health** Improvement

Examples of Slow-release Fertilizers

1. Neem-Coated Urea: Neem-coated urea is a type of slow-release fertilizer where urea granules are coated with neem oil or neem cake. The neem coating acts as a barrier, slowing down the release of nitrogen into the soil. This helps to reduce nitrogen loss through volatilization and leaching, making the nitrogen nutrients available to plants over a longer period.

2. Organic-Based Slow-Release Fertilizers: Organic-based slow-release fertilizers are derived from natural sources such as compost, manure, or plant residues. These fertilizers release nutrients slowly as they undergo decomposition or mineralization processes. They provide a sustained supply of nutrients and contribute to improving soil health and fertility.

3. Polymer-Coated Fertilizers.

4. Sulfur-Coated Urea.

5. Controlled-Release Fertilizers

USPs of Neem Coated Urea

852 NCU Demonstrations on farmers' field in 2021-2022.

Objective: To Present the Efficacy of Neem Coated Urea to Farming Communities and Policy Makers

Spatial Distribution of NCU Demos

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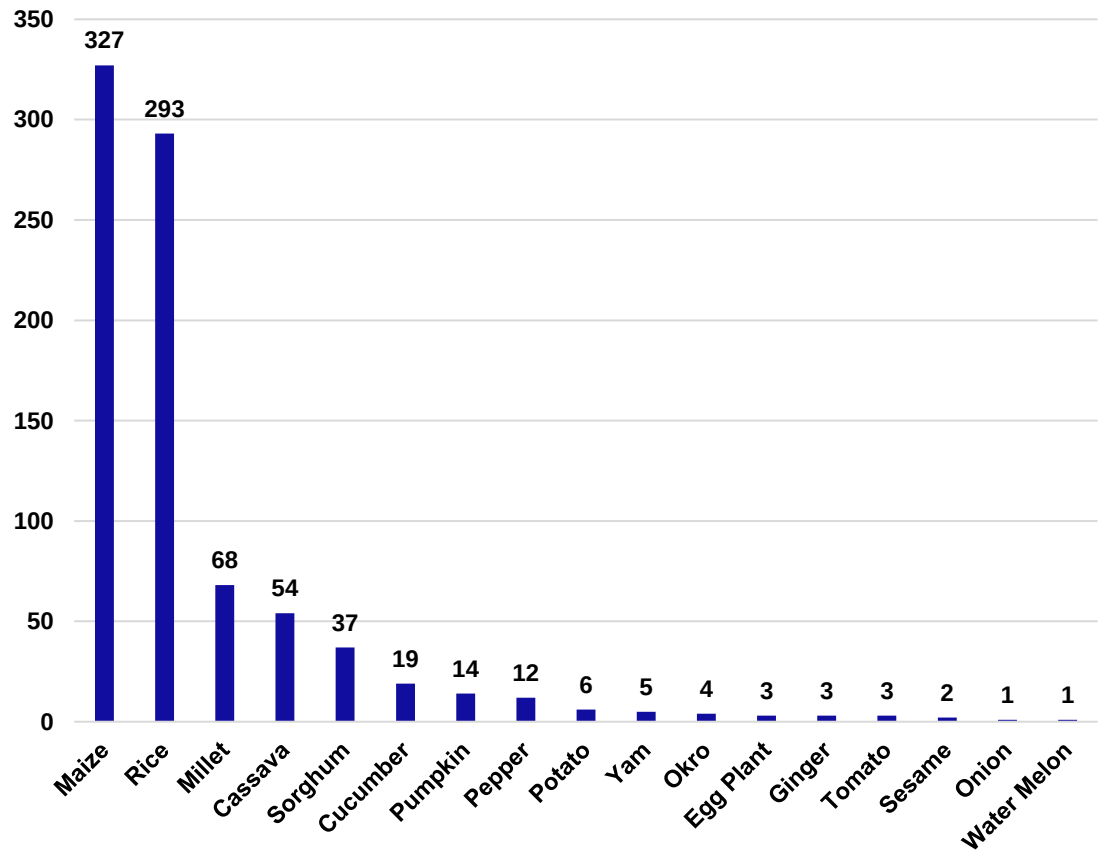
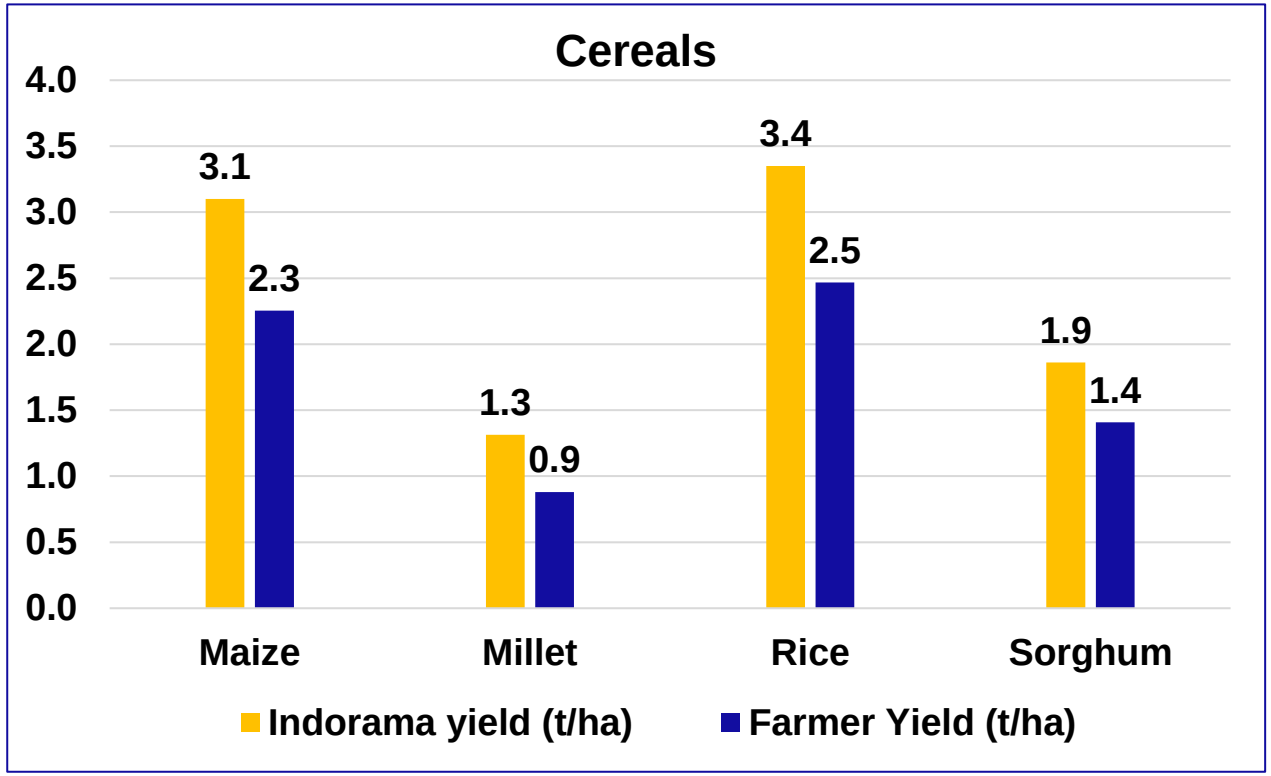
Number of NCU Demos by Crop



Yield and Cost Benefit Comparison Between Indorama NCU Demo and Farmers' Practice.

	Indorama practice	Reason	Farmers Practice
1	Advised farmers to plant hybrid seeds	Hybrids give better yield	Farmers used recycled grains or open pollinated varieties
2	Supplied 60kg/ha P, 60kg/ha K and Organic manure 2 weeks before planting	Adequate P and K support crop root development, good ear development and crop maturity at harvest.	Applied only organic manure before planting.
3	Planted with Standard Row Spacing (75 cm X 25 cm Maize, Transplanted Rice and Millet)	Transplanted rice and millet will provide good space for tillering	Farmers broadcasted seed during planting of rice and millet. Maize and sorghum are either overcrowded or scantily planted as the farmer wish
6	Pesticides was applied to control army worm's infestation	Army worms feed on leaves of crops thereby drastically reducing crop yield	No pesticide was applied on farmer's field



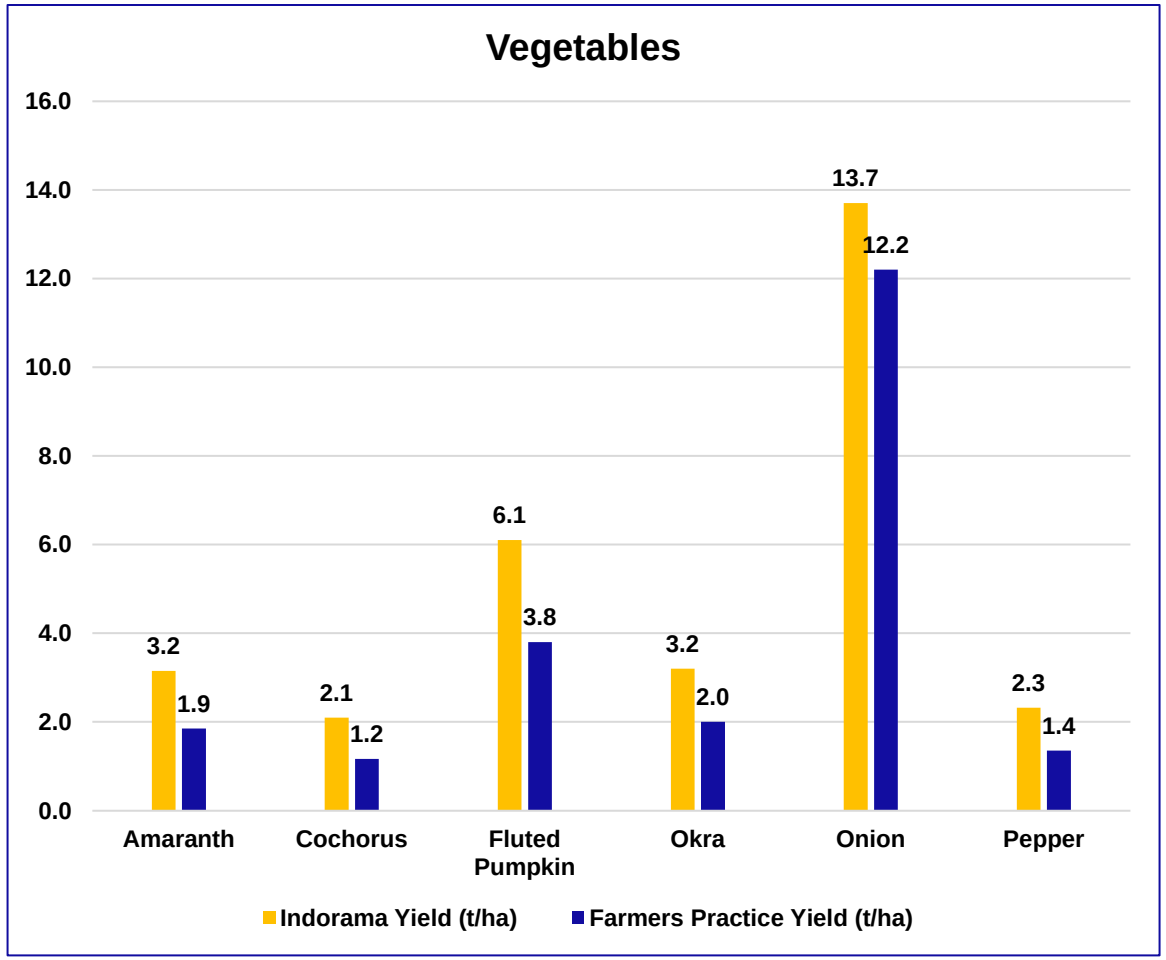
Crops	Indorama Practice Income (NGN)	Farmers Practice Income (NGN)	Difference (NGN)
Maize @ 230 NGN/kg	713,179	518,654	194,526
Millet @240 NGN/kg	314,983	211,097	103,886
Rice @215 NGN/kg	720,324	530,770	189,554
Sorghum @240 NGN/kg	446,760	337,740	109,020

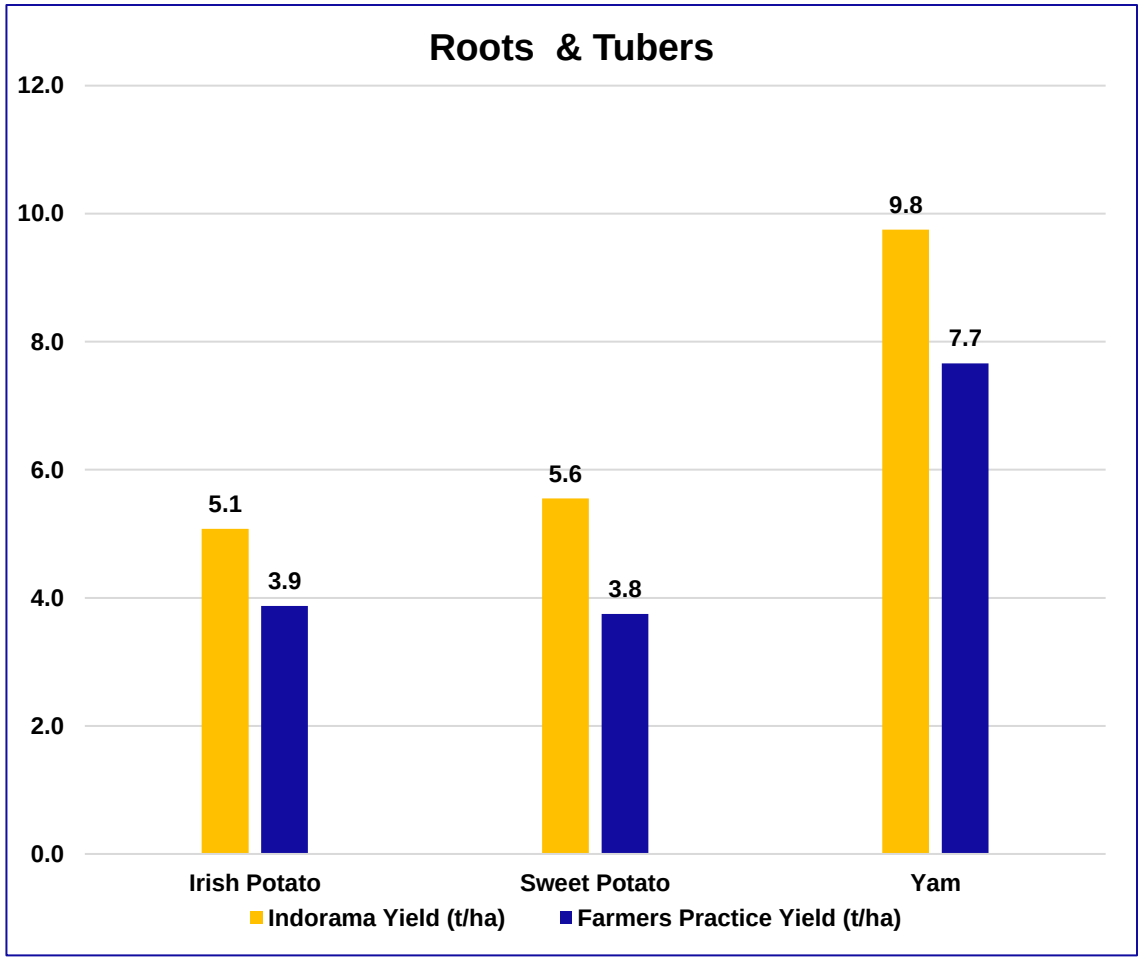
Extra Cost Incurred by farmers for Good Agronomic Practices

Crop ***MAIZE***

Cost Head	Quantity/ha	Unit	Unit price (NGN)	Amount (NGN)	Remark
Seed	20	kg	800	16,000	SC 651 (Seedco)
NPK Fertilizer	3	bags	14,000	42,000	Golden NPK
UREA Fertilizer	6	bags	15000	90,000	Neem coated Urea
Insecticide	3	litres	2,500	7,500	Cypermethrin
Total				**155,500**	

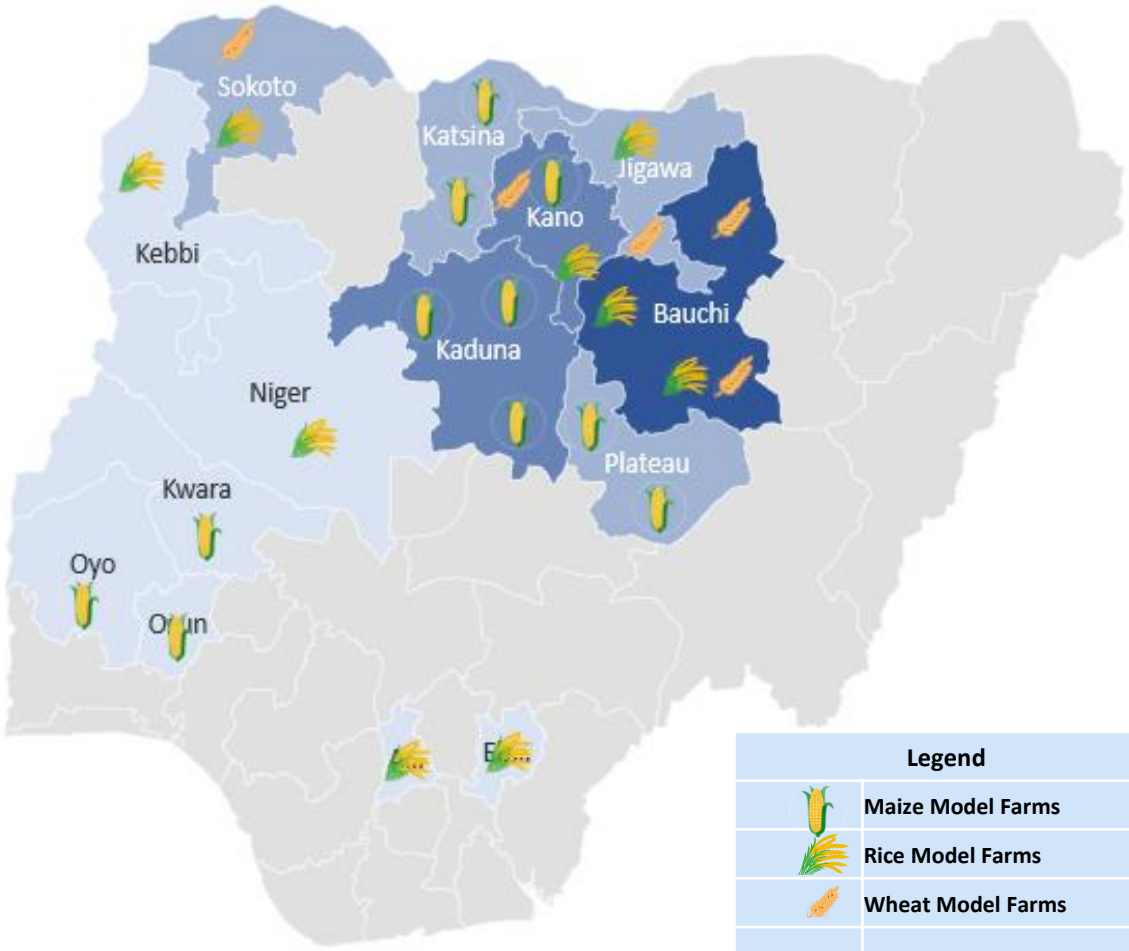
Yield Comparison Between NCU Demo and Farmers' Practice

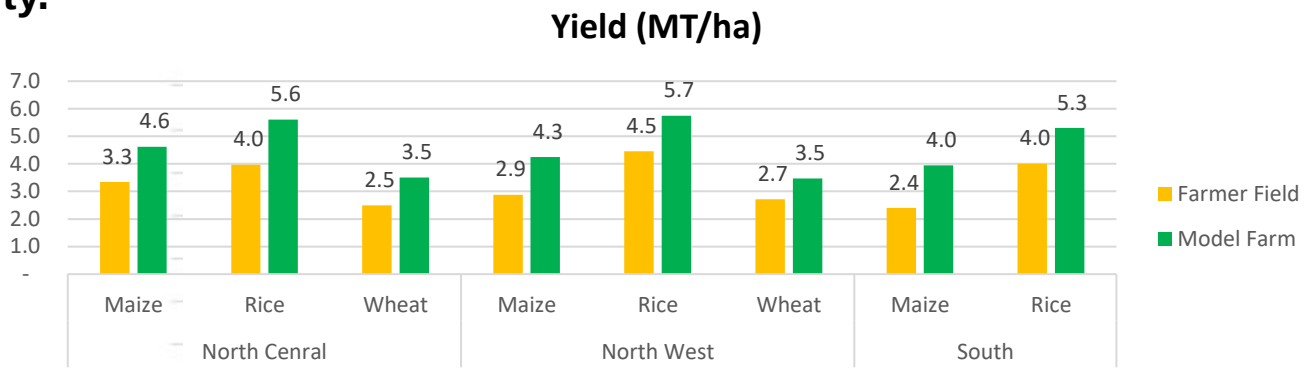


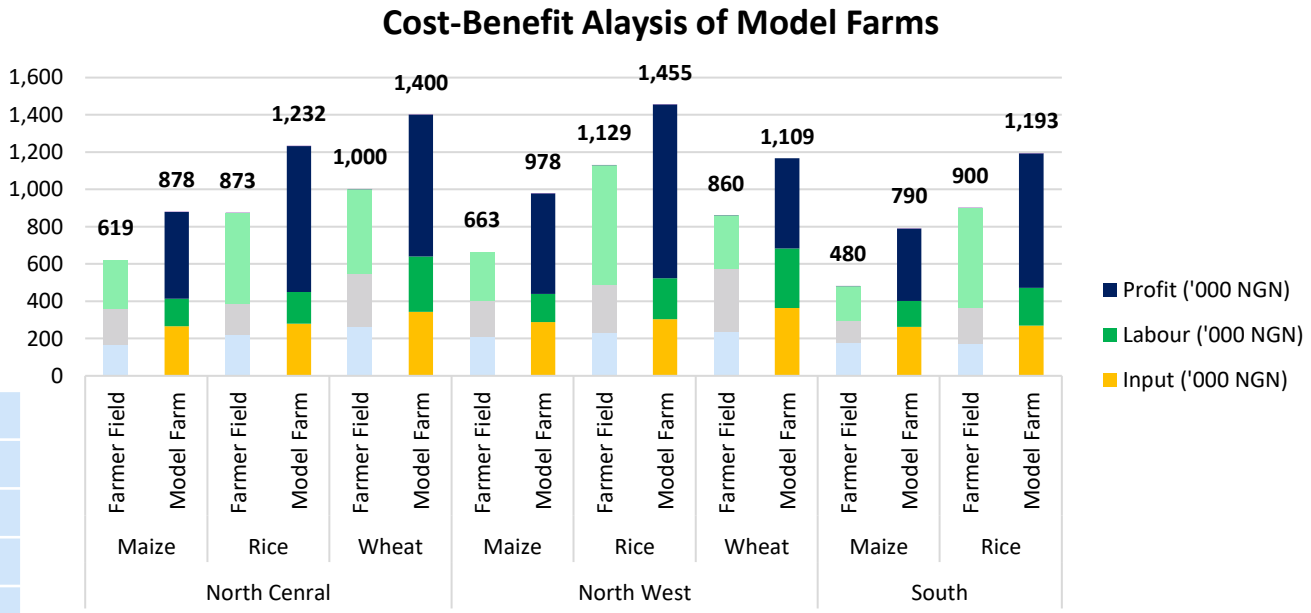


25 NCU Model Demonstrations 2022

INDORAMA Model Farm is an initiative to improve the agricultural practices amongst Nigerian farmers vis a vis improving the fertilizer use and to increase brand visibility.







Neem Coated Urea – Institutional Trials

SN	University/Institute	State	Country	Nos of Crops	Crops	Contact Person
1	FCAPT, Kano	Kano	Nigeria	2	Rice, Maize	Dr. Gwaram
2	NISS, Abuja	Abuja	Nigeria	2	Maize, Rice	Prof. Chude
3	ABU Zaria	Kaduna	Nigeria	4	Tomato, Maize	Prof. Ado Yusuf
4	AAU, Ekpoma	Edo	Nigeria	2	Maize, Rice	Dr. Dania
5	KSU, Malate, Ilorin	Kwara	Nigeria	2	Maize, Rice	Dr. Adebayo
6	IAR&T, Ibadan	Oyo	Nigeria	2	Maize	Prof. Oluwatosin

- All the trials have been concluded.
- Results were submitted to FISS, FMARD and Approval for Commercial Production was Granted.

Effect of Indorama Neem Coated Urea on Maize Grain Yield During 2021 Wet Season at Samaru, Zaria

Treatment	Treatment Detail	Grain yield (kg/ha)
T1	100 % N Granular Urea	3055
T2	100 % N Neem Oil coated Urea @ 1.25 L/Mt	2361
T3	100 % N Neem Oil coated Urea @ 1.0 L/Mt	3194
T4	100 % N Neem Oil coated Urea @ 0.75 L/Mt	3111
T5	100 % N Neem Oil coated Urea @ 0.5 L/Mt	3167
T6	75 % N Neem Oil coated Urea @ 1.25 L/Mt	2278
T7	75 % N Neem Oil coated Urea @ 1.0 L/Mt	2778
T8	75 % N Neem Oil coated Urea @ 0.75 L/Mt	3694
T9	75 % N Neem Oil coated Urea @ 0.5 L/Mt	3111
T10	Urea inhibitor coated urea @ 2 L/Mt	3194
	Mean	3094
	MSD	2252.9

Farmers Field Day

Bumper Harvest Witnessed on NCU Demonstrations

Thanks