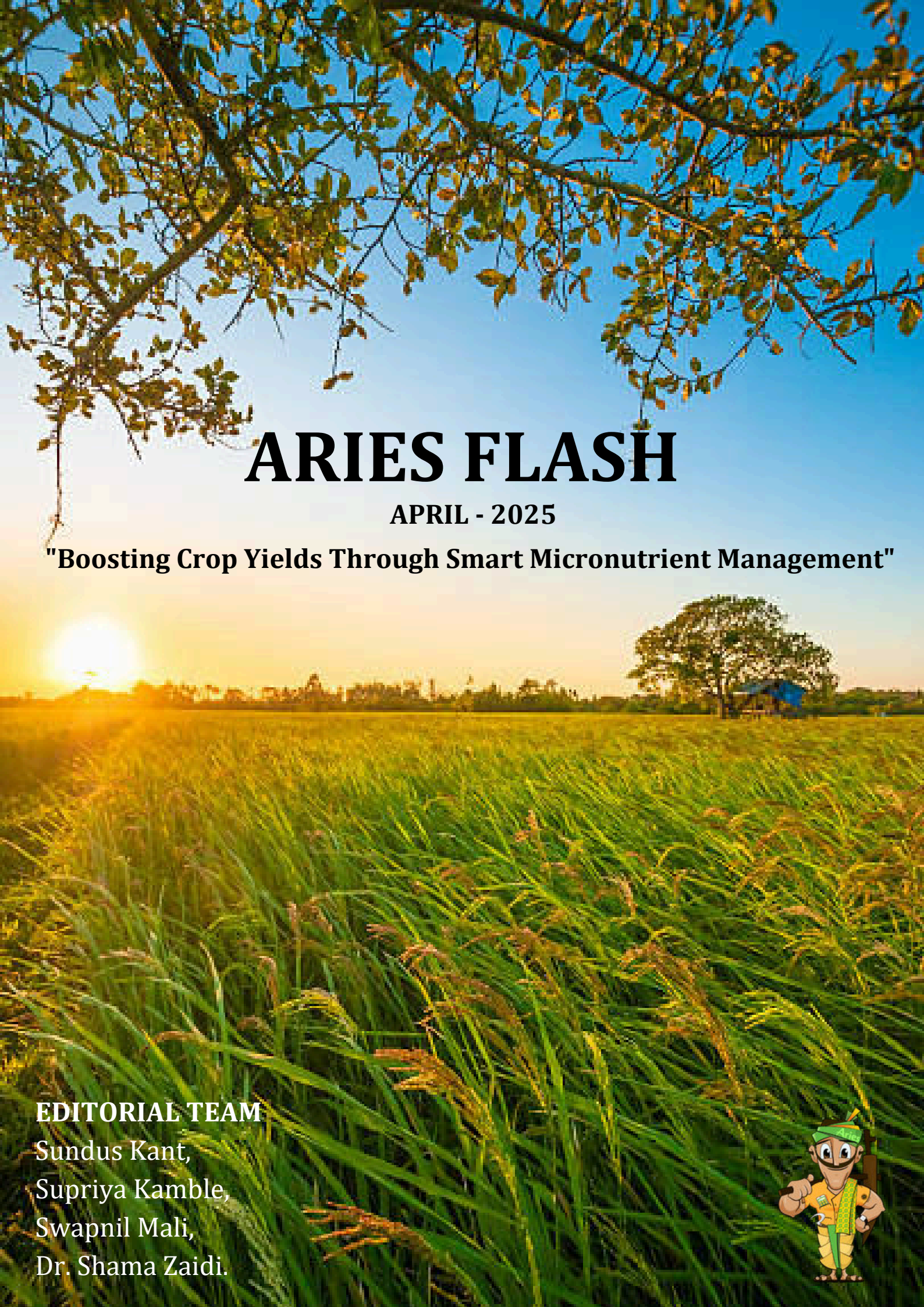




ARIES FLASH

APRIL - 2025

"Boosting Crop Yields Through Smart Micronutrient Management"

EDITORIAL TEAM

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Aries Agro Ltd. was founded by Dr. T. B. Mirchandani and Mrs. Bala Mirchandani in 1969. We manufacture micronutrients and other customized nutritional products for plants and animals. We started by manufacturing small-range mineral feed additives for animals and birds and then diversified into mineral additives for agriculture.

In 1975, we diversified into nutrients for plants. We had in-house expertise in the area of mineral nutrition and hence researched compounds that could deliver mineral nutrients to plants more efficiently. This research identified “Metal Chelates”. Through in-house R&D efforts, our Company branched out into Agrochemicals in 1975 with the introduction of Chelated Micronutrients. We pioneered the concept of chelates in India with the introduction of “Agromin”, a micronutrient fertilizer in the year 1975, followed by “Chelamin” in 1976. Agromin (chelated micronutrients) and Chelamin (chelated zinc) are the company’s flagship brands. We are one of the leading manufacturers and sellers of Chelates in the Country.

Our Vision

Empowering farmers everywhere, with our versatile range of agricultural Next Practices, Aries aims to be a global leader in specialised, sustainable & cost effective agricultural inputs.



Our Mission

Build on our stellar legacy as a market leader & expand our unique range of quality products & solutions globally

Grow the Aries Family as a highly skilled, trusted, and motivated team with a clear focus on the future and a singular commitment to excellence.

Continue being recognized and respected as a responsible, robust and profitable business that is Made In India, and proudly serves the farmers of the World.

Micronutrients Management for enhanced crop Productivity

Micronutrients

- Micronutrients are essential elements required by plants in small quantities.
- These include Boron (B), Zinc (Zn), Iron (Fe), Manganese (Mn), Copper (Cu), Molybdenum (Mo), Chlorine (Cl), and Nickel (Ni).

Role of Micronutrients in Plants

- **Zinc (Zn):** Helps in enzyme function, hormone production, and protein synthesis.
- **Iron (Fe):** Crucial for chlorophyll formation and energy transfer.
- **Boron (B):** Essential for cell wall formation, flowering, and fruit/seed development.
- **Manganese (Mn):** Aids in photosynthesis and nitrogen assimilation.
- **Copper (Cu):** Involved in reproductive growth and lignin synthesis.
- **Molybdenum (Mo):** Important for nitrogen fixation and nitrate reduction.
- **Chlorine (Cl):** Helps in osmosis and ionic balance.
- **Nickel (Ni):** Needed for urea metabolism and seed viability.

Importance of Micronutrients

- **Maximizes Yield:** Enhances crop productivity and grain quality.
- **Improves Plant Health:** Boosts immunity against pests and diseases.
- **Optimizes Metabolism:** Supports enzyme activity and physiological function.
- **Balanced Nutrition:** Complements macronutrients for complete plant growth.

Why Micronutrients are Essential for Field Crops ?

- **Deficiency is Common:** Intensive farming, imbalanced fertilizer use, and degraded soils cause micronutrient depletion.
- **Visible Deficiency Symptoms:** Yellowing leaves, stunted growth, poor flowering/fruiting.
- **Critical for Soil Health:** Replenishment ensures sustainable farming.
- **Support Sustainable Yield:** Long-term productivity depends on balanced nutrient management.

Micronutrients Management for enhanced crop Productivity

Micronutrients are essential plant nutrients that are found in trace amounts in tissue, but play an imperative role in plant growth and development. Without these nutrients, plant nutrition would be compromised leading to potential declines in plant productivity. Of the 17 elements essential for plant growth, eight are micronutrients: boron (B), chlorine (Cl), copper (Cu), iron (Fe), manganese (Mn), molybdenum (Mo), zinc (Zn) and nickel (Ni).

Factors affecting the availability of micronutrients in soil

Iron

- **Soil pH:** The availability of iron may be limited in soils with high pH, especially in arid, calcareous soils. Excessive liming can induce iron deficiencies.
- **Soil Moisture and Aeration:** Poorly aerated soils with excessive moisture in calcareous soil can promote iron deficiencies.
- **Organic Matter:** Organic matter improves iron availability due to chelation, which increases iron solubility. Additions of manure can increase chelation.

Manganese

- **Soil pH:** Soils with high pH have limited manganese availability since manganese precipitates at high pH. Over-liming soils can cause Mn deficiencies.
- **Soil Moisture and Aeration:** High soil moisture and poor aeration increases the availability of manganese due to an increase in solubility.
- **Organic Matter:** Manganese availability increases with the addition of natural organic matter (i.e. compost) due to favorable chelation which increases the level of exchangeable and soluble manganese.
- **Climate:** Wet conditions and warm temperatures increase manganese availability.

Zinc

- **Soil pH:** Zinc availability decreases as pH increases. Overliming decreases Zn solubility.
- **Organic Matter:** Soluble zinc chelates increase zinc availability.
- **Interactions with other nutrients:** Copper, iron, manganese, and phosphorus can interfere with zinc uptake.

Copper

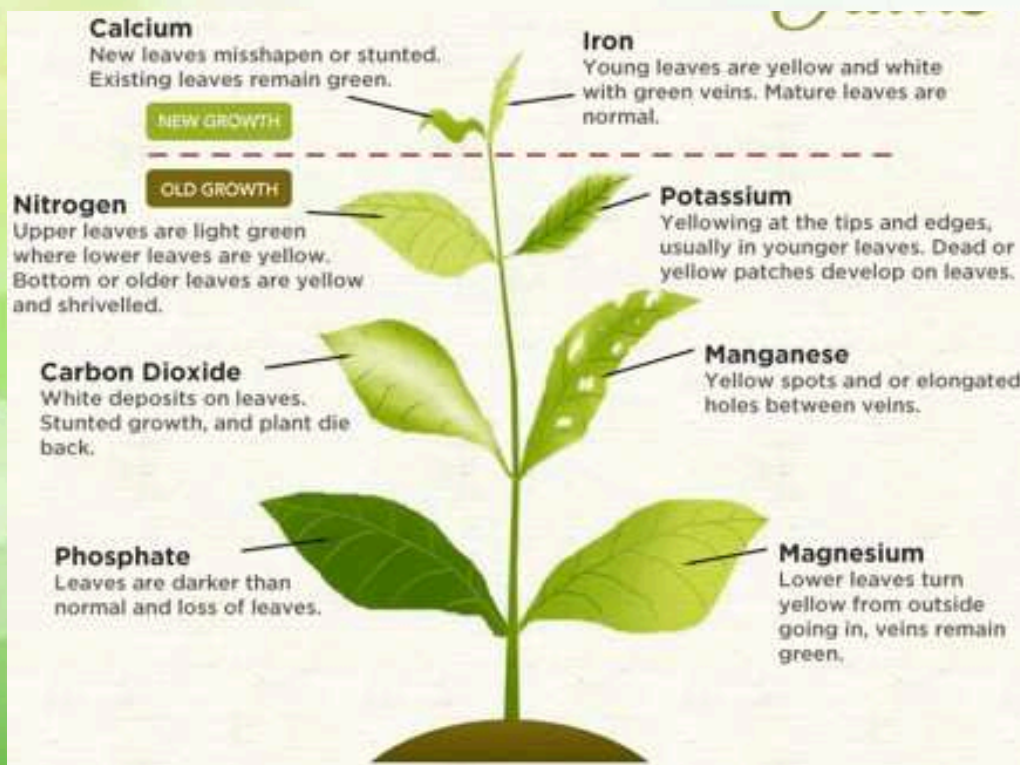
- **Soil texture:** Copper availability is lower in highly leached, coarse textured soils.
- **Soil pH:** Copper availability decreases as pH increases, primarily due to decreased solubility of copper minerals.
- **Organic matter:** Copper forms very tight bonds with organic matter (more so than any other micronutrient), which may reduce its availability in organic (peat and muck) soils.

Molybdenum

- **Soil pH:** Unlike the other micronutrients, the availability of molybdenum increases with increasing pH. As a result, liming acidic soils increases molybdenum availability.
- **Soil moisture:** Low levels of soil moisture reduce molybdenum availability.

Boron

- **Soil pH:** Boron availability decreases as pH increases. Liming can temporarily induce boron deficiencies, or lessen boron toxicities.
- **Soil organic matter:** Organic matter increases boron availability.
- **Soil texture:** Highly leached, coarse textured soils tend to have low boron availability.



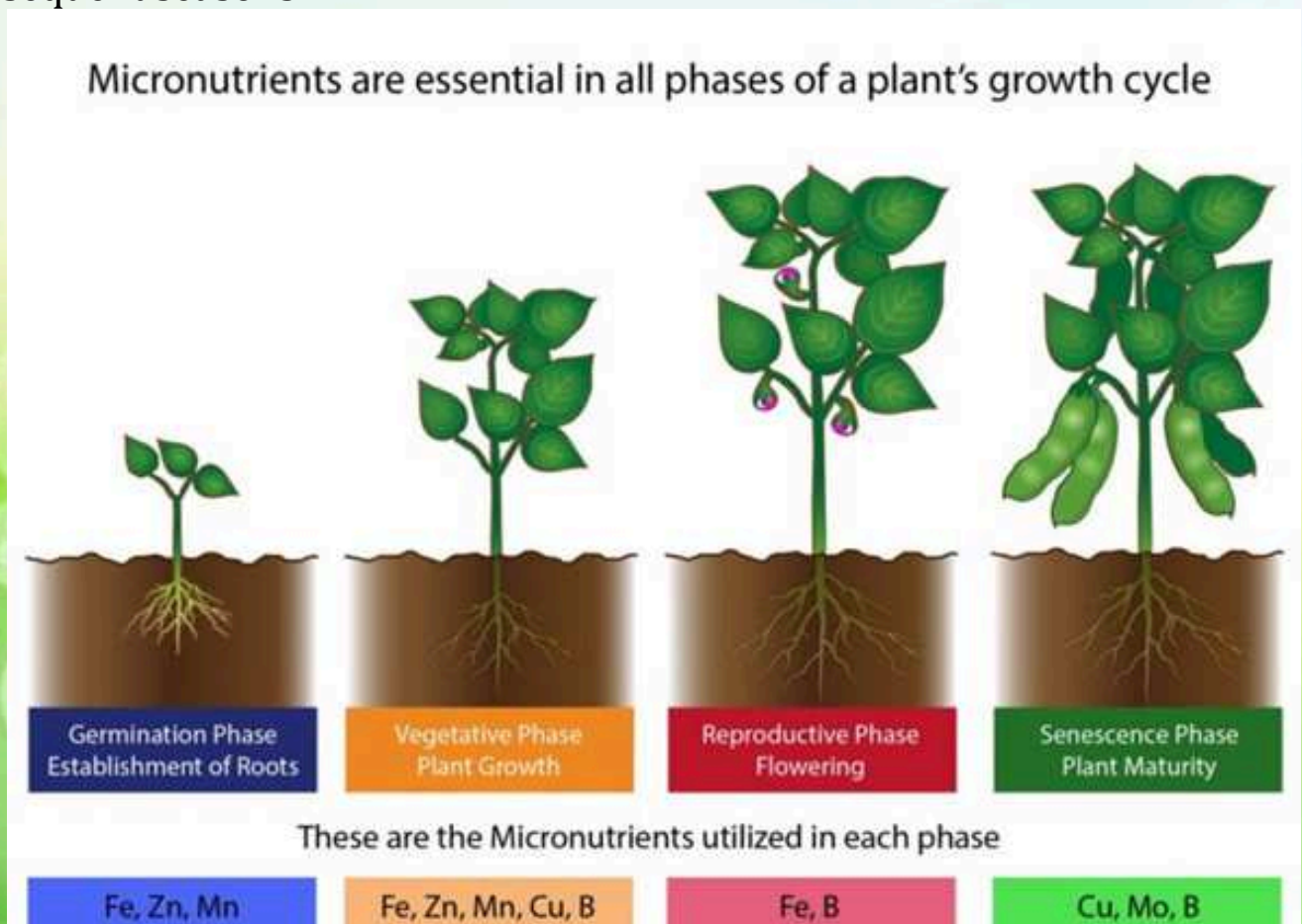
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Determining micronutrient needs

Diagnosing a micronutrient deficiency can be a difficult and time-consuming process.

To identify a micronutrient deficiency, follow these steps:

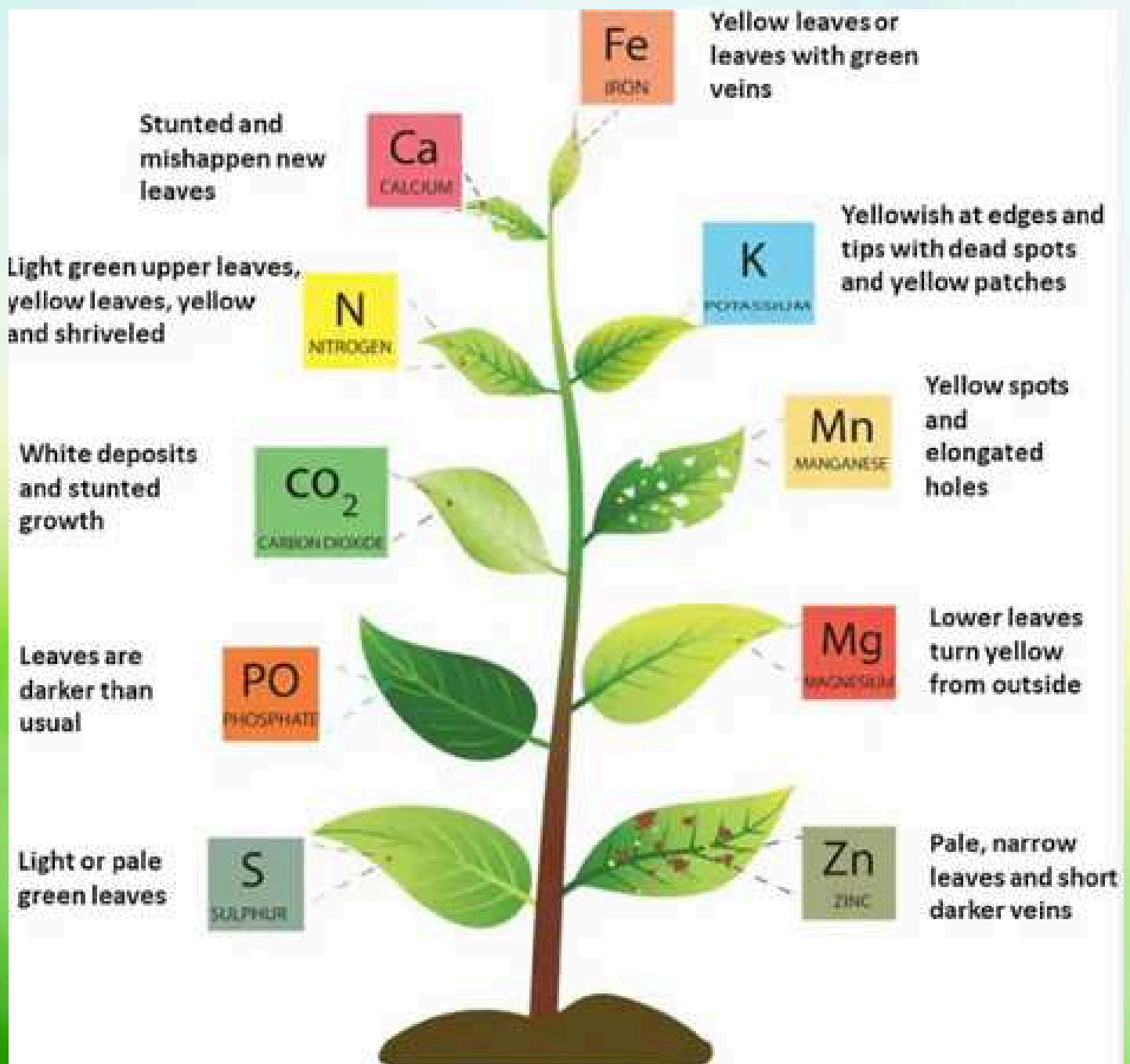
1. Ensure that poor crop growth is not the result of a macronutrient deficiency, drought, salinity, disease, insect problems, herbicide injury, or some physiological problem.
2. Find out if a micronutrient deficiency has been identified before in a particular crop or soil type in the area.
3. Examine the affected crop for specific micronutrient deficiency symptoms.
4. Take separate soil samples from both the affected and unaffected areas for complete analysis, including micronutrients.
5. Send plant tissue samples from both the affected and unaffected areas for complete analysis that includes tests for micronutrient levels.
6. If all indications point to a micronutrient deficiency, apply the micronutrient to a specific, clearly marked-out affected area of land to observe results in subsequent seasons.



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PLANT MICRONUTRIENT DEFICIENCIES

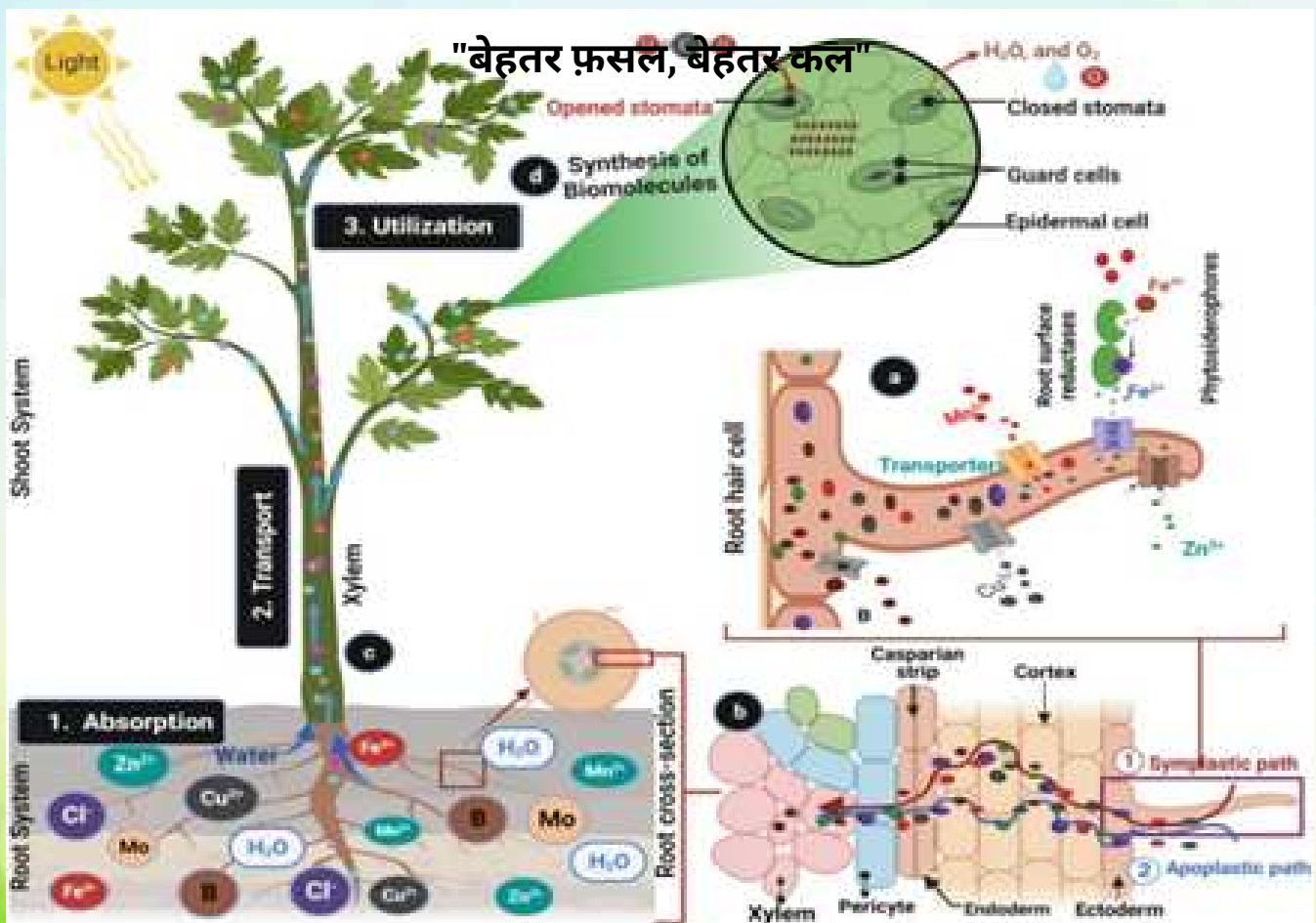
Micronutrient deficiencies in plants occur when essential trace elements are lacking in the soil or unavailable for uptake. These deficiencies can lead to stunted growth, chlorosis (yellowing of leaves), poor flowering, and reduced yield. For example, iron deficiency causes interveinal chlorosis in young leaves, while boron deficiency leads to poor fruit set and deformed growth. Zinc deficiency often results in small leaves and shortened internodes. Molybdenum deficiency can disrupt nitrogen metabolism, especially in legumes. Micronutrient imbalances are commonly caused by high soil pH, poor organic matter, or excessive use of other fertilizers. Timely diagnosis and correction using foliar sprays or soil amendments are crucial for healthy crop development.



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Mechanisms of micronutrient absorption, transport, and accumulation in plants

Micronutrients play indispensable roles in the physiological and biochemical activities of plants. Their nuanced and specific modes of absorption, transport, and accumulation are essential for ensuring optimal health and productivity of horticultural crops. Recognizing the intricate methods by which these micronutrients navigate through the plant system is critical for optimizing their availability and ensuring efficient utilization.



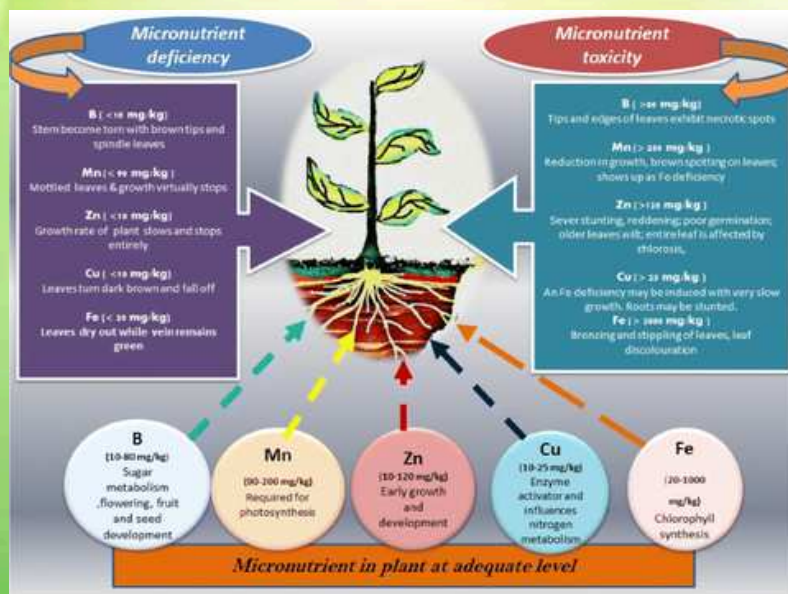
Understanding the mechanisms of micronutrient absorption, transport, and accumulation is vital for enhancing nutrient use efficiency in horticultural crops. These processes directly influence plant health, stress tolerance, and productivity. By optimizing micronutrient management based on these mechanisms, we can ensure balanced nutrition and sustainable crop production. This knowledge forms the foundation for developing precise and effective fertilization strategies.

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Role of Micronutrients in Plants

Micronutrient	Symbol	Function in Plants	Deficiency Symptoms
Iron	Fe	Essential for chlorophyll synthesis, respiration, and enzyme function	Interveinal chlorosis in young leaves
Zinc	Zn	Involved in enzyme activation, auxin synthesis, and protein synthesis	Shortened internodes, rosetting, chlorosis in young leaves
Manganese	Mn	Activates enzymes in photosynthesis, respiration, and nitrogen metabolism	Interveinal chlorosis with brown spots
Copper	Cu	Plays a role in photosynthesis, lignin synthesis, and enzyme activity	Wilting, dieback of shoot tips, chlorosis
Boron	B	Important for cell wall formation, sugar transport, and reproductive development	Brittle leaves, poor fruit/seed development, stem cracking
Molybdenum	Mo	Essential for nitrogen fixation and nitrate reduction	Yellowing of older leaves, poor growth in legumes
Chlorine	Cl	Required for osmosis, ionic balance, and photosynthesis	Wilting, chlorosis, bronzing of leaves
Nickel	Ni	Required for urease activity and nitrogen metabolism	Accumulation of urea in leaves, leaf tip necrosis

Micronutrients play pivotal roles in maintaining the overall health and vitality of plants. They are involved in various physiological and biochemical processes, each contributing uniquely to plant health and productivity. Micronutrients are abundantly present in the soil but plants usually acquire them in relatively trace amounts; hence, regarded as tracer element. B, Cu, Fe, Mn, Zn, Mo and Ni are such micronutrients required in minute amounts by plants but inexorably play an eminent role in plant growth and development. Plant metabolism, nutrient regulation, reproductive growth, chlorophyll synthesis, production of carbohydrates, fruit and seed development, etc., are such effective functions performed by micronutrients.



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Boosting Crop Yields Through Smart Micronutrient Management

Why Micronutrients Matter

While NPK fertilizers lay the foundation for plant growth, micronutrients like Zinc, Boron, Iron, Manganese, Copper, and Molybdenum play a critical role in enhancing crop health, resilience, and yield potential. Even small deficiencies can lead to poor flowering, fruiting, and lower quality produce.

The Hidden Yield-Loss Factor

Many farmers unknowingly suffer from "hidden hunger"—when soil appears fertile but lacks essential micronutrients. These deficiencies:

- **Reduced photosynthesis efficiency**
- **Delay flowering and fruit set**
- **Increase pest and disease vulnerability**
- **Lower overall productivity**

Smart Micronutrient Management: Integrated micronutrient application, guided by crop-specific needs and soil analysis, leads to:

- ✓ Better nutrient uptake
- ✓ Improved flowering and fruit set.
- ✓ Uniform crop growth.
- ✓ Higher quality produce.
- ✓ Increased marketable yield.

What is the Solution ?

We offer a scientifically formulated range of micronutrient products tailored for diverse crops and soils.

Key benefits include:

- ✓ Chelated forms for higher absorption.
- ✓ Balanced formulations (single and multi-micronutrient).
- ✓ Compatibility with major fertilizers & sprays.
- ✓ Easy-to-use foliar and soil application options.

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FIELD DEMO/ TRIALS



INM Success Story in Banana – Bhavani Region, Erode District, Tamilnadu

Mr. Kandasamy, a progressive farmer from the Bhavani region of Erode district, Tamil Nadu, cultivates bananas on 20 acres of land. A few months ago, he reported issues of poor finger development and unsatisfactory yields in his plantation.

Our Extension Officer, Mr. Santhosh Kumar R, visited his farm and recommended implementing Aries' Integrated Nutrient Management (INM) strategy along with the use of specific growth promoters to enhance flowering and yield.

The following nutrient schedule is suggested:

- Water Soluble 20:20:20 – 25 kg/split at 1–2 months after planting
- Water Soluble 12:61:00 – 25 kg/split at 4–5 months
- Water Soluble 13:00:45 – 25 kg/split after shooting stage
- Fertisol – 3 kg/acre after shooting stage
- HD 13:00:45 – 200 g/acre during fruit development stage
- Aquacal – 5 litres/acre before shooting
- GIA – 1 litre/acre before shooting

Following the adoption of this INM approach, Mr. Kandasamy observed a significant improvement in the quality and quantity of his banana yield. The fruits developed were of superior quality, with long and uniform fingers, and the overall yield was notably higher compared to the previous season.

This case demonstrates the effectiveness of a well-structured nutrient management plan in improving crop health and productivity.

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ARIES EVERYWHERE

New Marketing office inaugurated by Rahul Sir at Vijayawada.



Agromax Agency Kurnool dealer meet, Vijayawada



New R&D Lab at Vijayawada



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KAVA's Dealer Meeting, Eluru



Shock and Awe Book Launched programme at Ariess HO, Mumbai



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Dealers Tour in Vietnam



Annual Strategy Meet, Goa



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Aries Micronutrients Fertilizer Range

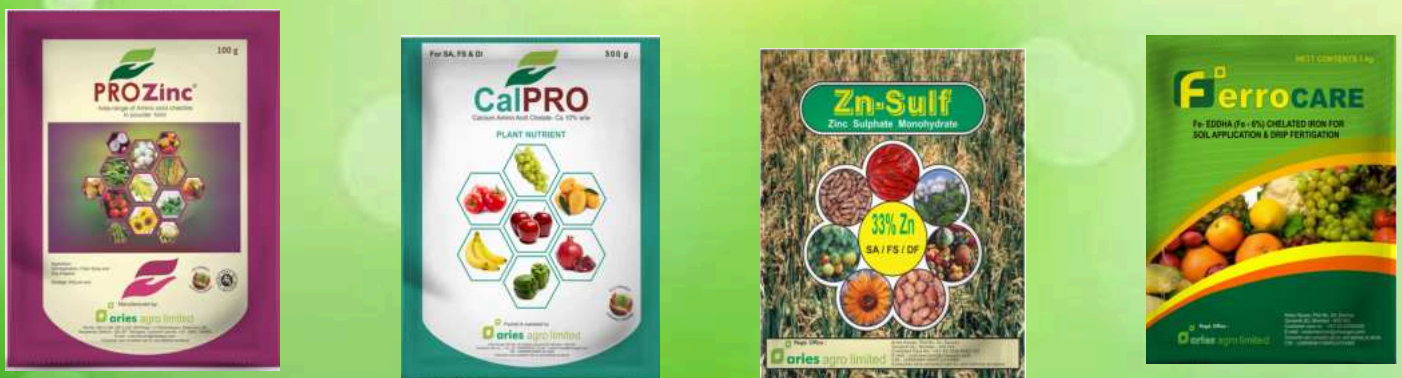
Chelated Micronutrients



Customized Micronutrients



Other Micronutrients



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Chelates



- Chelacal helps in prevention and treatment of calcium deficiency symptoms.
- Chelacal improves transport tolerance due to stronger cell walls.
- Chelacal provides better disease resistance.



- Chelacop stimulates and regulates enzyme reactions for growth and development of crops.
- Chelacop increases productive tillers
- In various crops induces resistance to pests and diseases.
- Chelacop is compatible with water sprayable agrochemicals and may be applied as a foliar spray in various stages of plant growth.



- Chelafer can be safely used to prevent and correct iron deficiency in all crops.
- Chelafer increases the productivity of tillers.
- It induces resistance to pests and diseases.
- Chelafer boosts growth rate, dry matter accumulation and increases yields.



- Mn-Chel is compatible with other agrochemicals and is ideal for correcting Mn deficiency
- Mn Chel prevents chlorosis of leaves, and increase productive tillers in various crops.
- It induces resistance to pests and diseases thereby boosting growth.



- Chelamin promotes growth of healthy green leaves
- Chelamin reduces withering in patches and stops the formation of abnormally small leaves.
- Chelamin is proven to substantially increase yield. It also reduces the intensity of chlorosis, flower and fruit drop.
- Chelamin also helps in the growth of shoots and the formation of grains and fruits.



- Boosts enzyme activity and supports healthy crop growth.
- Prevents zinc deficiency symptoms like stunted growth and chlorosis.
- Enhances root development and nutrient uptake efficiency.



- Increases zinc availability and uptake due to stable chelation.
- Promotes better flowering and fruit setting, enhancing overall yield.
- Boosts chlorophyll formation and photosynthetic activity.
- Reduces nutrient losses compared to soil-only applications.

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Aries Agro: Towards a Sustainable and Prosperous Future of Indian Agriculture

- Enhancing soil health and promoting the availability of nutrients.
- Reducing farmers' dependence on chemical fertilizers to lower costs and increase profits.
- Enabling climate-smart farming to make Indian agriculture more sustainable.

👉 Join hands with Aries Agro to make Indian agriculture more sustainable, profitable, and climate-resilient! 🌱🌿



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