



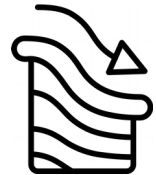




WHERE SCIENCE SERVES NATURE

# Developing effective solutions to the Indian farmers' needs.

SANJAY KUMAR TOKALA

# ON & OFF FIELD CHANGING FARMING NEEDS: PROBLEMS AND THEIR REMEDIES

-  • **Erratic Rain** - alternate Water supply
-  • **Weather and its uncertainty** - Advance information about weather/ famine etc...
-  • **Deteriorating soil quality owing to soil erosion** - Soil Health revival & mechanisms
-  • **Freedom in costing for produce** - Online digital produce tracking system which enables them to review the past produce
-  • **Understand plant sickness through some online app and cloud based repository**

# TRENDS IN POPULATION, CROPPED AREA AND PERSONS/HECTARE

Year	population, million	Net Cropped Area, m.ha	Persons/Ha
1951	361	119.5	2.8
1961	439	132.2	3.3
1971	548	140.3	3.9
1981	683	140.3	4.9
1991	864	143	6
2001	1029	141.4	7.3
2011	1200	140.9	8.5
2025	1400	140.9	10

Source – Biofertilizer Handbook – research – production – application; Dr P Bhattacharyya & Dr. HLS Tandon

# GROSS NUTRIENT REMOVAL BY CROPS IN INDIA

## RELATION TO PRODUCTIVITY

Year	Foograin production million tones	Nutrient	Uptake million tonnes		
			Foodgrains	Others	Total
2000	200	N	5.8	2	7.8
		P <sub>2</sub> O <sub>5</sub>	2.2	1.3	3.5
		K <sub>2</sub> O	9.3	4.4	13.7
		Total	17.3	7.7	25
2011	240	N	7	2.4	9.4
		P <sub>2</sub> O <sub>5</sub>	2.7	1.5	4.2
		K <sub>2</sub> O	11.2	5.3	16.5
		Total	<b>20.9</b>	<b>9.2</b>	<b>30.1</b>

Source – Biofertilizer Handbook – research – production – application; Dr P Bhattacharyya & Dr. HLS Tandon

# FACTORS AFFECTING THE PERFORMANCE OF BIOFERTILIZERS

Abiotic Factors Environment	Biotic Factors Microbial Characteristics
Soil type and texture	Nutrient availability
Soil moisture	Chemotaxis toward seed or root exudates
Soil pH	Growth rate
Soil atmosphere	Antibiotic and siderophore
Soil fertility	Cell surface properties like exopolysaccharides, outer membrane protein
Soil aeration (porosity)	Tolerance to fungicides or other chemicals
Water holding capacity	Plants characteristics
Soil acidity, salinity etc.	Plants species
Organic matter	Varieties of a plant species
Fertilizers and pesticides	Altered plant mutants
	Root morphology

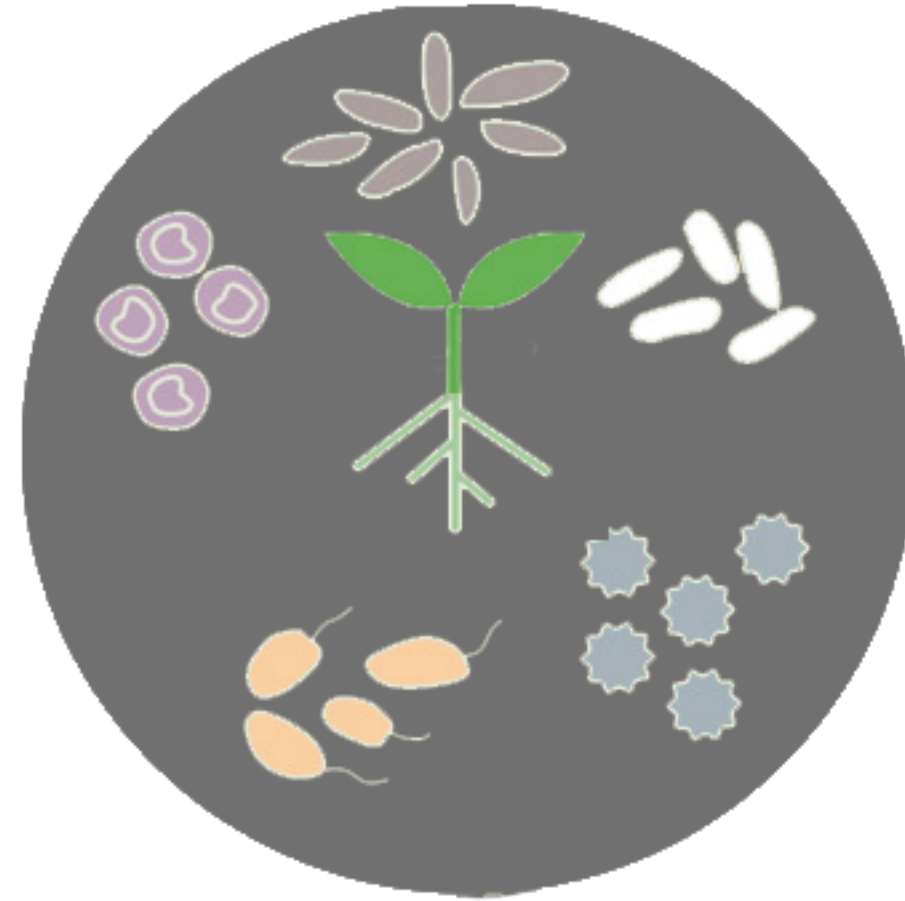
Source – Biofertilizer Handbook – research – production – application; Dr P Bhattacharyya & Dr. HLS Tandon

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# USER-PROFILE OF AVAILABLE MAJOR AS WELL AS MINOR BIOFERTILIZER PRODUCTS

- ✓ Rhizobium spp
- ✓ Azotobacter spp
- ✓ Azospirillum spp
- ✓ Pseudomonas spp
- ✓ Trichoderma spp
- ✓ Bacillus spp
- ✓ Beauveria spp
- ✓ Paecylomyces spp



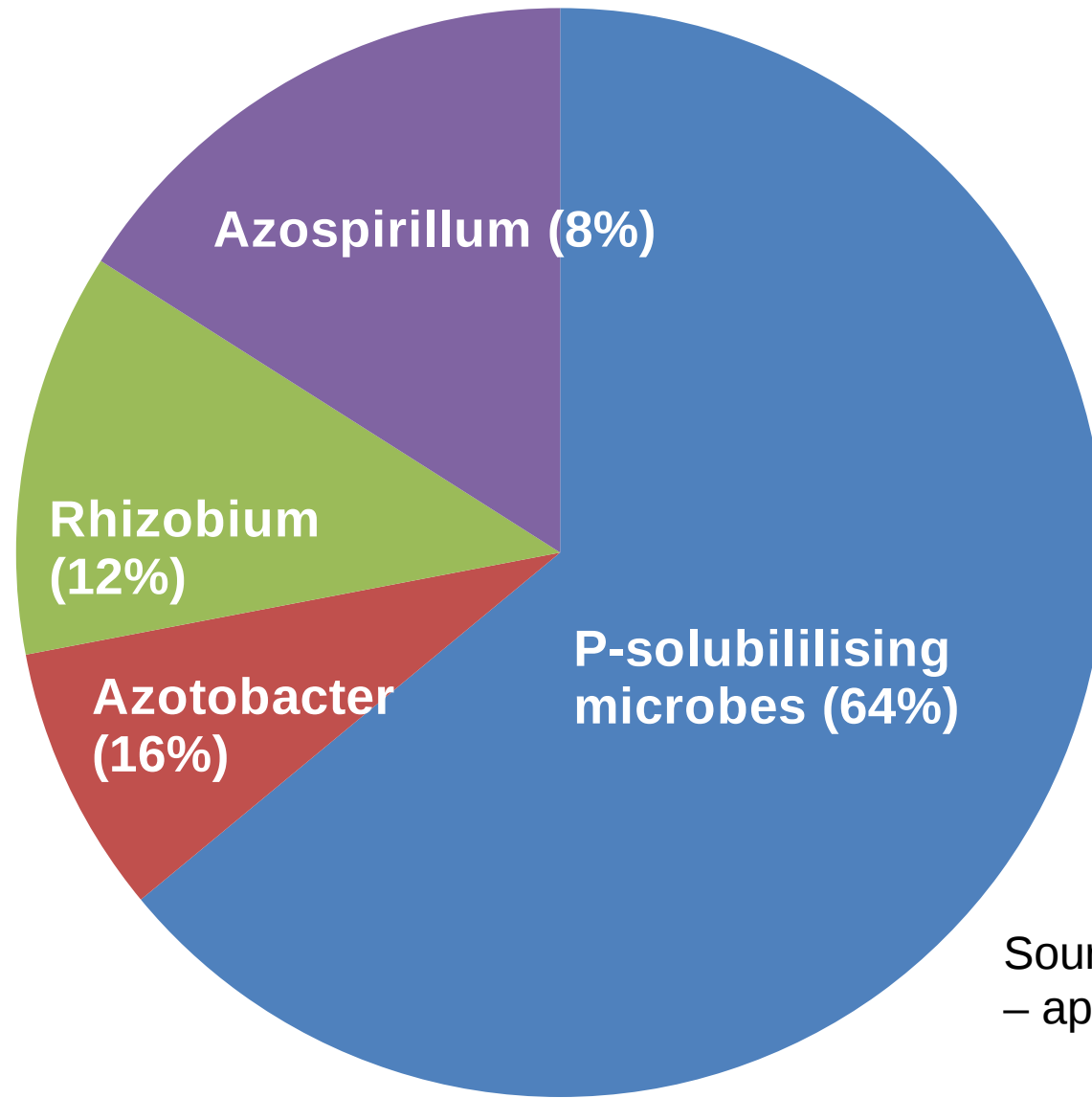
# POTENTIAL DEMAND AND CURRENT PRODUCTION (2009-10) OF BIOFERTILIZERS IN INDIA

BIOFERTILIZER	POTENTIAL DEMAND	PRODUCTION (TONNES)	PRODUCTION AS % OF POTENTIAL DEMAND
Rhizobium	125.907	2,339.30	1.80%
Azotobacter	22,229	3,196.60	14.40%
Azospirillum	21,900	1,66.7	
P-solubilisers	65,455	12,836.50	
<b>Total</b>	<b>2,35,491</b>	<b>20,040.35</b>	

Source – Biofertilizer Handbook – research – production – application; Dr P Bhattacharyya & Dr. HLS Tandon



# POTENTIAL DEMAND AND CURRENT PRODUCTION (2009-10) OF BIOFERTILIZERS IN INDIA



Source – Biofertilizer Handbook – research – production  
– application; Dr P Bhattacharyya & Dr. HLS Tandon

# VALAGRO BIOSCIENCES

## NEXT GENERATION OF MICROBIAL PRODUCTS

Empowered by **GEAPOWER** Technology & Tempered by OMICS Technologies

**Valagro BioSciences** presents its Diverse Range of sustainable microbial solutions

Under the umbrella brands of **HYORO & HEIKO**

### BIOFERTILIZERS

Hyoro Plus G / Hyoro Plus L / Hyoro MY+

### BIOCONTROL

Tricozen / Florezen

### BIOSTIMULANTS

HEIKO SEED / HEIKO ROOT



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**Valagro**  
Where science serves nature

WIN THE  
GLOBAL  
CHALLENGE  
TOGETHER

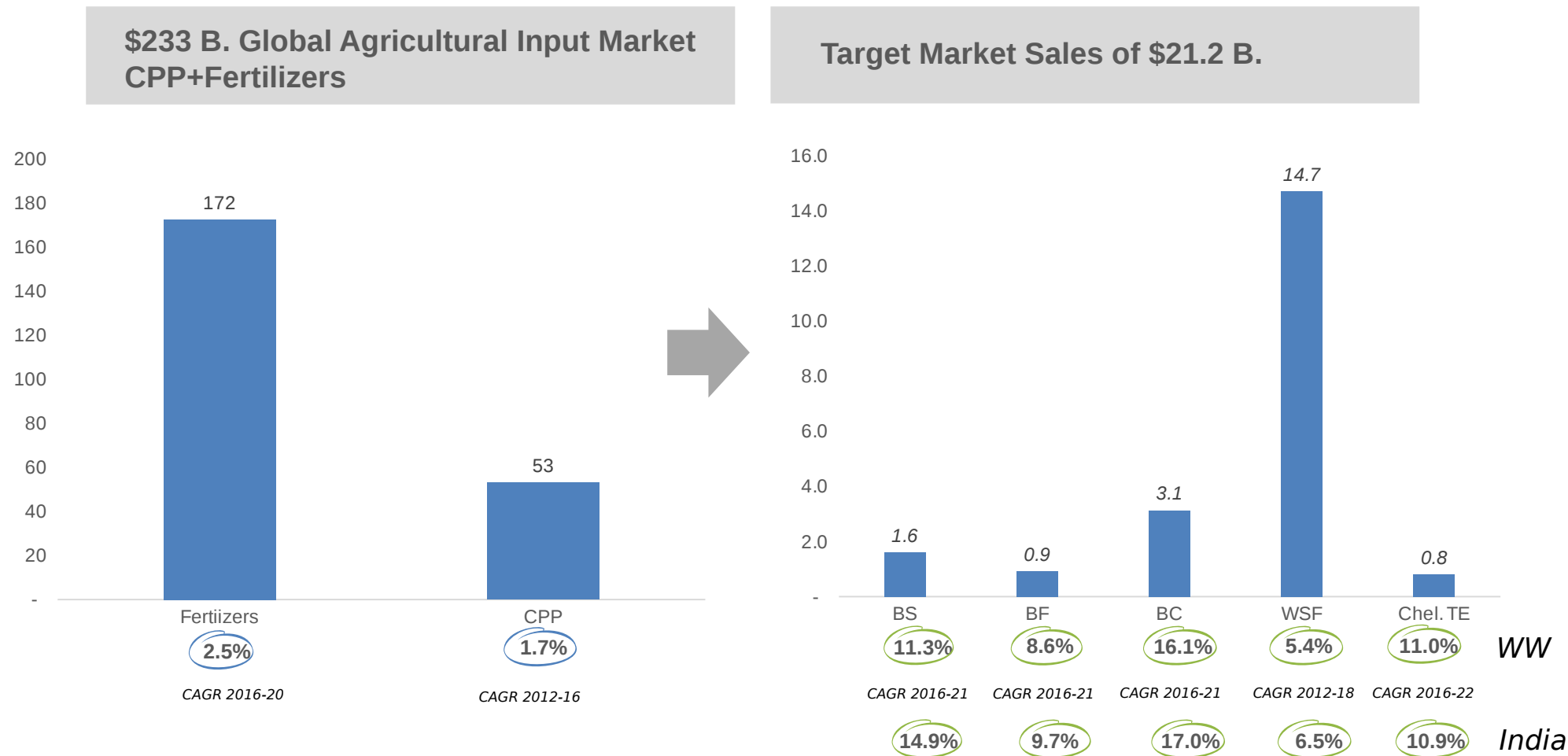


# The new Valagro line of microbial-based Solutions-focus on the Indian market

SANJAY KUMAR TOKALA

# WHAT INDIAN MARKET MEANS?

CPP, FERTILIZERS VS BIOSTIMULANTS, CHELATED TRACE ELEMENTS, WSF, BIOFERTILIZERS & BIOCONTROL

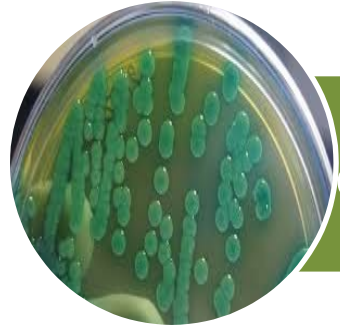


Source: Kleffmann 2018 (CPP), IFA Annual Conference Medium-Term fertilizer Outlook 2016-2020 (Fertilizers), IFA Country profile may 2017 (Fertilizers), Global Biostimulants Market 2016-2021. Market Data Forecast 2017 (BS)  
Internal elaboration from Global Market Insights 2018 (BF), Global Biopesticides Market 2015-2021. Market Data Forecast 2017 (BC), Global water soluble fertilizers market trend&forecast to 2018. Markets&Markets 2014 (WSF)  
Global Micronutrients fertilizers market 2017-2022. Mordor Intelligence 2017 (TE)  
CPP Crop Protection Products; BS (Biostimulants), BF (Biofertilizers), WSF (Water Soluble Fertilizers), Chel. TE (Chelated Trace Elements)

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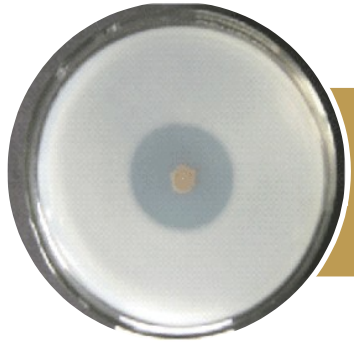


# FOCUS AREAS OF VALAGRO SOLUTIONS



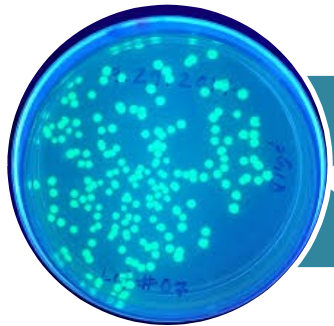
## Microbial Biostimulants

HEIKO SEED – 300 g  
HEIKO ROOT – 500 capsules



## Plant fertilizers

HYORO PLUS G – 4 Kg; 24 Kg  
HYORO PLUS L – 1 L  
HYORO MY+ - 4 Kg



## Fungicide control

FLOREZEN – 0.5 Kg  
TRICOZEN – 1 Kg

WIN THE  
GLOBAL  
CHALLENGE  
TOGETHER

