



Key note presentation on receiving



5 DECEMBER



# GLINKA WORLD SOIL PRIZE 2022



#Soils4Nutrition

**Ashok Kumar Patra**  
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ICAR-Indian Institute of Soil Science  
Bhopal, India

5 DECEMBER

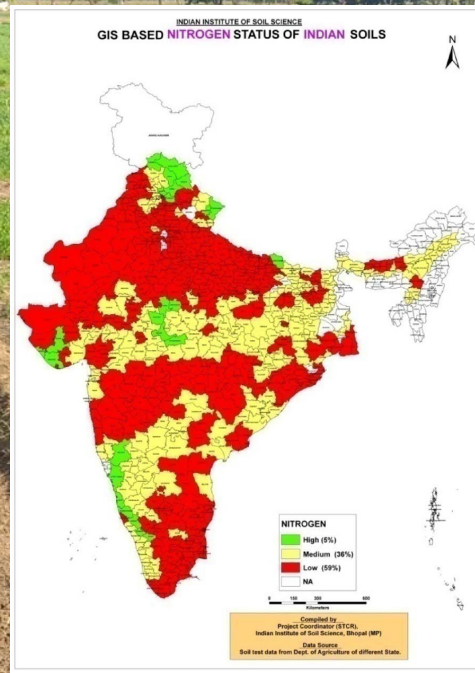
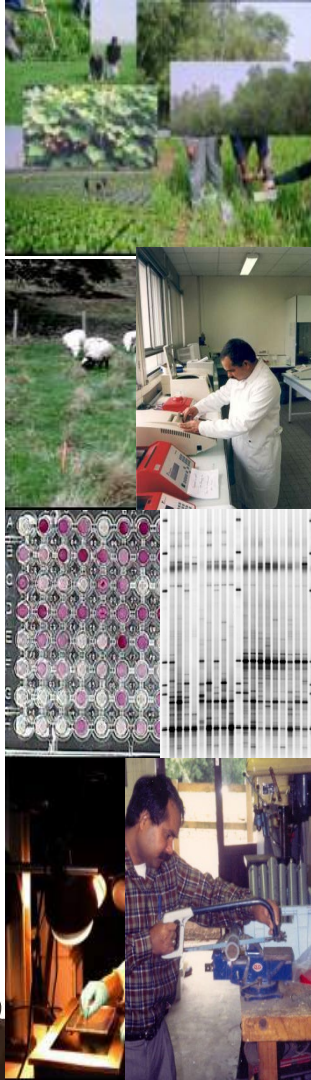


#Soils4Nutrition

# *Achievements and Perspectives Towards Sustainable Soil Management*



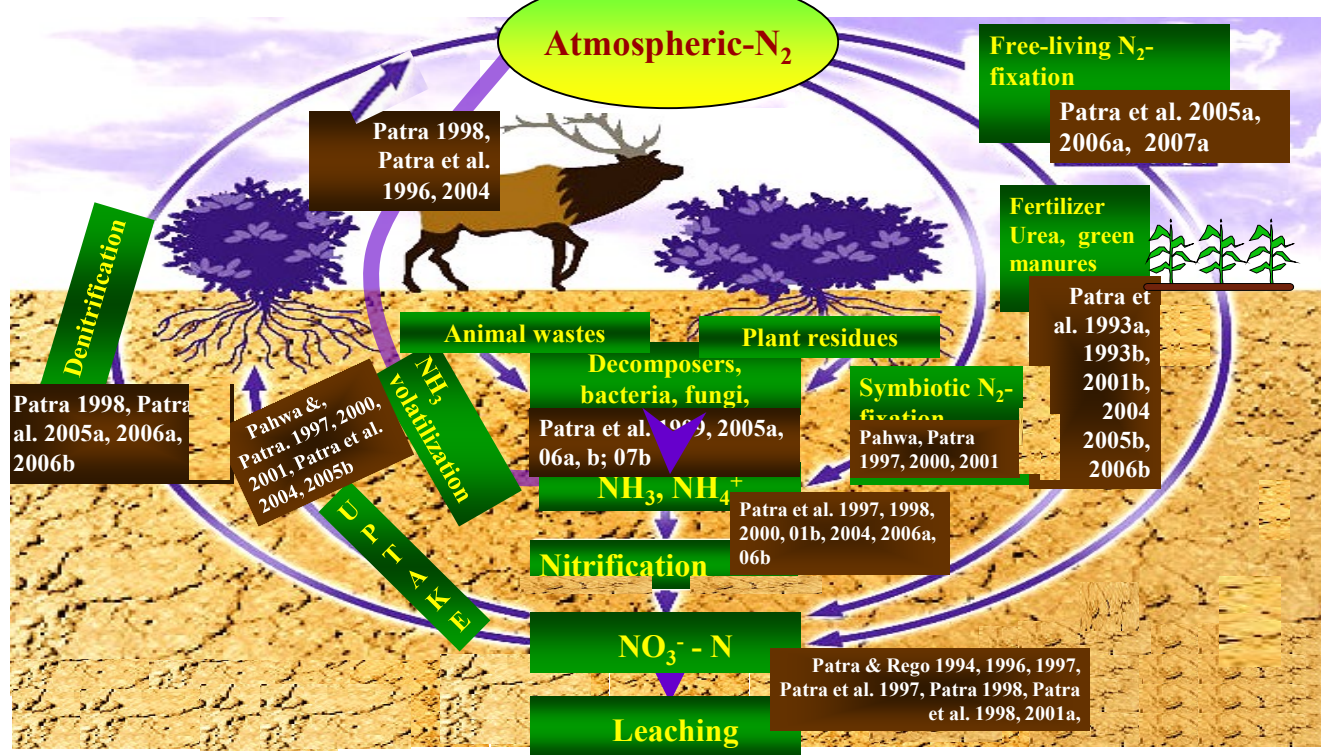
# Nitrogen Cycling: Transformations, Ecology and Management in Agro-ecosystems



- ☀ Nitrogen fertilizer - most energy intensive input.
- ☀ Nitrogen Use Efficiency  $\approx$  40%.
- ☀ High losses cause significant economic, ecological and environmental damages.



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- Identified critical periods of N losses and approaches, which enhanced NUE significantly in different agro-ecosystems.
- Management and plant species' impacts on activities, abundance and diversity of nitrifying organisms quantified in grasslands.



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# Assessment of Soil Health, Integrated Nutrient Management and Soil Quality Index



- Quantified nutrient requirement
- Soil nutrient-supplying capacity
- Nutrient use efficiency



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# Rapid Soil Health Assessment: Mini-lab (Mridaparikshak)



- Prepared > 28 million Soil Health Cards

- ≈ US \$1200
- Refill: ≈ US \$ 240 for 100 samples

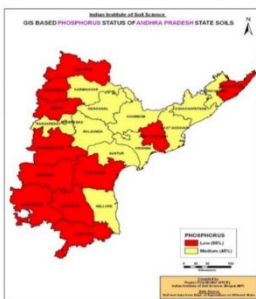
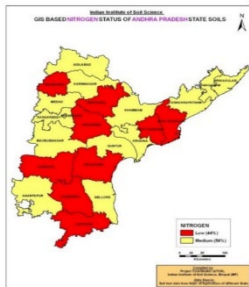
- Determines 15 important soil parameters including micronutrients like Zn, Fe, B, Mn & Cu.



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# Contributed to Soil Health Card Mission of Government of India

- ❖ **Advisories**
- ❖ **Backstopping**



कृषि एवं सार्वजनिक विभाग  
 कृषि एवं विज्ञान कक्ष, महाराष्ट्र  
 महाराष्ट्र  
 शा.कृ.अनु.परिषद् -  
 भारतीय मृदा विज्ञान संस्थान,  
 लखनौ, भारत  
 कृषि एवं विज्ञान कक्ष  
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 कृषि एवं विज्ञान कक्ष

सॉल हेल्थ कार्ड संख्या: 154  
 विभाग का नाम: Gulab Singh  
 पेशवा: 12/2015 | 11/2018

**द्वितीयक एवं सूक्ष्म पोषकत्वों की संबंधी सिफारिशें**

क्रमांक	परिमाण्व	मृदा अनुप्रदान संबंधी सिफारिशें
1	सल्फर (S)	पर्याप्त मात्रा
2	जिंक (Zn)	पर्याप्त मात्रा
3	बोरॉन (B)	पर्याप्त मात्रा
4	ओगन्यम (C)	0.5% FeSO <sub>4</sub> + 0.5% चूना
5	मैंगनीज (Mn)	पर्याप्त मात्रा
6	कॉपर (Cu)	पर्याप्त मात्रा

**सामान्य अनुप्रेषण**  
 1. जैविक खाद: 4 टन/हे. गोबर की खाद  
 2. जैव उर्वरक: राहजोषिण, पी एस बी,  
 3. फुल/लक-सम: 0 (kg/ha)

**अंतरराष्ट्रीय मृदा वर्ष 2019**

**स्वस्थ जीवन के लिए स्वस्थ मृदा**

**सॉल हेल्थ कार्ड**

पर्यवेक्षण का नाम: शा.कृ.अनु.परिषद् - भारतीय मृदा विज्ञान संस्थान, लखनौ, भारत

विज्ञान का विवरण

नाम	पता	याम	उप-जिला/तहसील	जिला	पिन कोड	आधार संख्या	मोबाइल संख्या
Gulab Singh	Chandur khedi	Chandur khedi					
			Bhopal				

**मृदा परीक्षण परिणाम**

क्रमांक	पैरामीटर	परिणाम	इकाई	आवृत्त
1	pH	7.66		शेडी स्तरीय
2	EC	0.25		साधारण
3	OC	0.77	%	उपजादा
4	N	4.31	कि.ग्रा./हे.	मध्यम
5	P	9.74	कि.ग्रा./हे.	उपजादा
6	K	505.1	कि.ग्रा./हे.	उपजादा
7	S	17.31	कि.ग्रा./हे.	मध्यम
8	Zn	0.86	कि.ग्रा./हे.	उपजादा
9	B	0.82	कि.ग्रा./हे.	उपजादा
10	Fe	3.15	कि.ग्रा./हे.	उपजादा
11	Mn	5.36	कि.ग्रा./हे.	उपजादा
12	Cu	1.25	कि.ग्रा./हे.	उपजादा

**मिट्टी का नमूना का विवरण**

मृदा नमूना संख्या	नमूना एकत्र करने की तिथि	परीक्षण संस्था	ब्यारर सं./ Diagnostics	कोड का क्षेत्रफल	भू-स्थिति	Latitude	Longitude
					0		

साथित भूमि / वर्षसाहित भूमि

**संदर्भ उपज के लिए उर्वरक सिफारिशें (जैविक खाद के साथ)**

क्रमांक	फसल व किस्म	संदर्भ उपज (कि.ग्रा./हे.)	एन.पी.के. के लिए उर्वरक संयोजन-1 (कि.ग्रा./हे.)	एन.पी.के. के लिए उर्वरक संयोजन-2 (कि.ग्रा./हे.)
1	सोयाबीन	29	यूरिया 49, सिंगल सुपर फॉस्फेट 502, एम.ओ.पी. 41	यूरिया 0, डी.ए.पी. 175, एम.ओ.पी. 41
		90	यूरिया 141, सिंगल सुपर फॉस्फेट 593, एम.ओ.पी. 45	यूरिया 61, डी.ए.पी. 206, एम.ओ.पी. 45
2	धान	60	यूरिया 170, सिंगल सुपर फॉस्फेट 531, एम.ओ.पी. 61	यूरिया 97, डी.ए.पी. 165, एम.ओ.पी. 61
		29	यूरिया 49, सिंगल सुपर फॉस्फेट 499, एम.ओ.पी. 41	यूरिया 0, डी.ए.पी. 174, एम.ओ.पी. 41
3	मक्का	90	यूरिया 173, सिंगल सुपर फॉस्फेट 492, एम.ओ.पी. 35	यूरिया 106, डी.ए.पी. 171, एम.ओ.पी. 35
		29	यूरिया 49, सिंगल सुपर फॉस्फेट 477, एम.ओ.पी. 33	यूरिया 0, डी.ए.पी. 166, एम.ओ.पी. 33

- **Soil fertility maps**
- **SQL-Cal software**



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# Soil Spectroscopy: ICAR – IISS – ICRAF Collaboration

INTERNATIONAL WEBINAR



## SOIL SPECTROSCOPY

An Emerging Technique for Rapid Soil Health Assessment



DATE : 1 OCTOBER 2020  
TIME : 11.00 AM – 4.30 PM IST (+5.30 GMT)

Registration link: 

Jointly Organized by

ICAR-INDIAN INSTITUTE OF SOIL SCIENCE, BHOPAL, INDIA  
&  
WORLD AGROFORESTRY (ICRAF), NAIROBI, KENYA



Alpha-FT MIR Spectrometer

- The MIR technology validated and recommended for SOC, pH, clay, silt and sand in Alfisols, Inceptisols and Vertisols of India.
- Developed spectral library for Indian soils and soon it will be made available on line.

- GLOSOLAN recognised ICAR-IISS as Champion Laboratory on Soil Spectroscopy in Asia.



Capacity building



Portable XRF



Neo-spectra Soil NIR scanner

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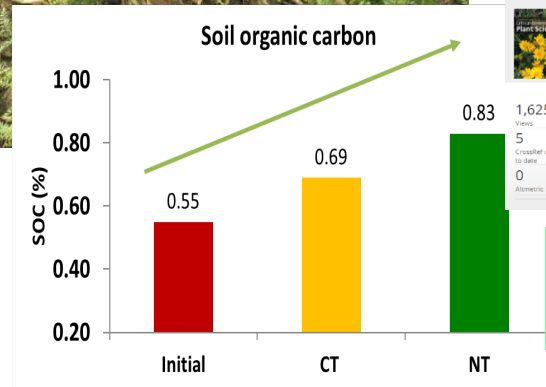
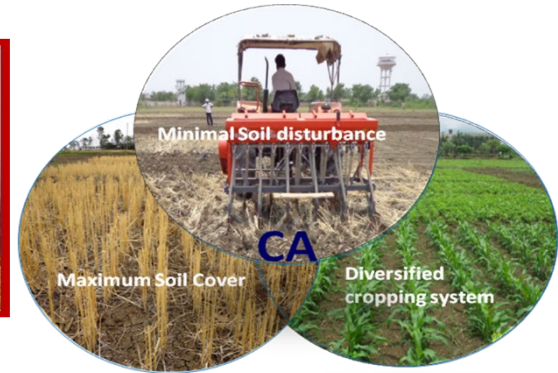


# Mainstreaming Conservation Agriculture

Somasundaram Jayaraman  
Ram C. Dalal  
Ashok K. Patra  
Suresh K. Chaudhari *Editors*

## Conservation Agriculture: A Sustainable Approach for Soil Health and Food Security

Conservation Agriculture for Sustainable Agriculture



Stop soil erosion, save our future



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# Rapid crop residues recycling and composting



Microbial culture formulated in capsules



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# Biochar for C-sequestration and Sustainable Soil Management

**Roadmap for Biochar Use in India**

ICAR

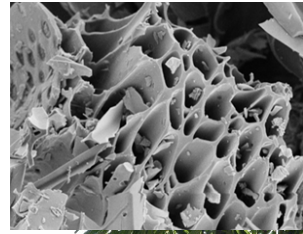
Policy Brief

PROTOCOL FOR BIOCHAR USE IN INDIAN AGRICULTURE

Biochar for Soil Health Management

मूल स्वास्थ्य प्रणाल्य में बायोचार् अवशोषण - एक बहुआयामी तकनीक

ICAR-Indian Institute of Soil Science  
Nabibagh, Berasia Road, Bhopal-462038 (M.P.)  
www.iss.nic.in



**Biochar for C-credits**



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# Capacity building, mass awareness, soil extension for SSM



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# KING BHUMIBOL WORLD SOIL DAY AWARD 2020 TO ICAR-IISS



**Mass Awareness Campaigns on soil health & SSM from 2014 onwards. Playing important role in Asia...**

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# Strengthened *Global Network*



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# Acknowledgements

I am overwhelmed by the Glinka Award Committee 2022, GSP/FAO for recognizing my work and selecting me for this prestigious global Award. I am humbled and ever grateful to them. Also I am highly thankful to each one at GSP/FAO for organizing my trip and for all logistics excellently.



ROTHAMSTED  
RESEARCH



Université Claude Bernard Lyon 1



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*Promoting soil health to feed the world*



**Thank you**



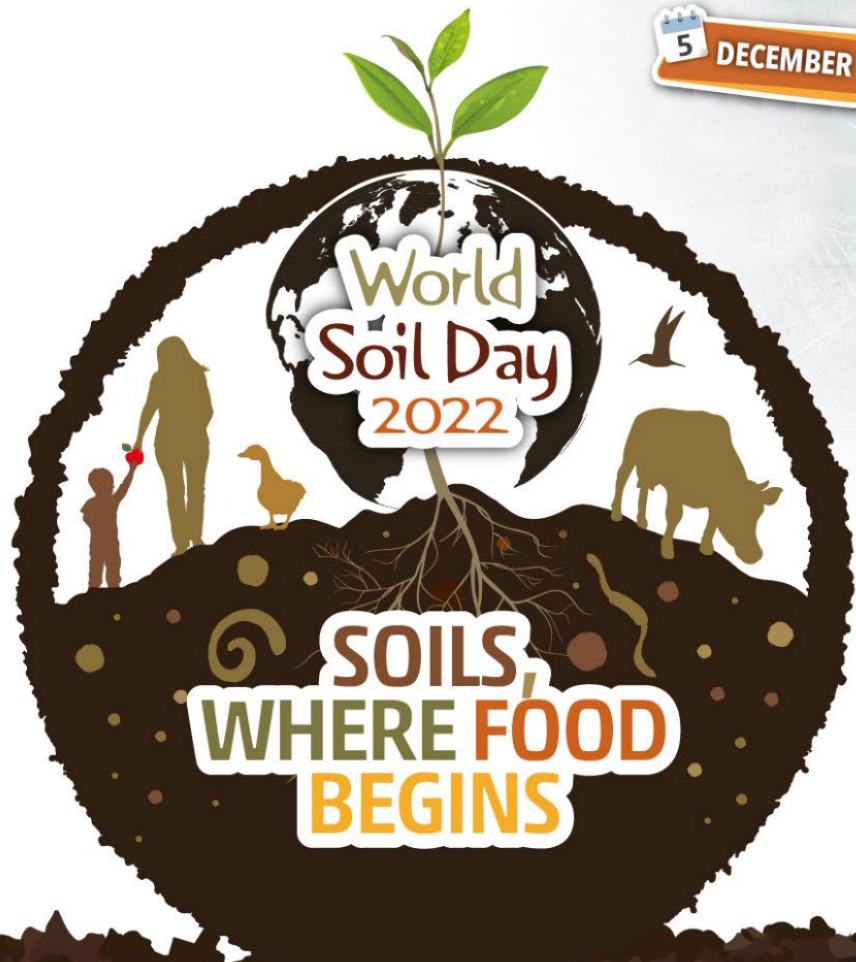




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World  
Soil Day  
2022

SOILS,  
WHERE FOOD  
BEGINS