CFAES

The Sequestration

News from the Lal Carbon Center

2023 AUTUMN EDITION

INSIDE

Welcome, Professor Ippolito!

The CFAES Rattan Lal Center for Carbon Management and Sequestration (Lal Carbon Center) is delighted to welcome Professor Jim Ippolito as the first appointment for the Dr. Rattan Lal Endowed Professorship. Ippolito's work provides valuable contributions to our team with his more than 30 years of experience in soil health and fertility. Dr. Ippolito's insight into and support of the importance of the "One Health" concept championed by Dr. Lal clearly demonstrates the excellent alignment of this appointment with the goals of the Center. Please learn more about Prof. Ippolito through the official college announcement (*page 2*) and his Viewpoint (*page 3*).

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CFAES

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College of Food, Agricultural, and Environmental Sciences

Ippolito appointed as the Dr. Rattan Lal Endowed Professor

We are pleased to announce the appointment of James A. Ippolito as the Dr. Rattan Lal Endowed Professor in the School of Environment and Natural Resources at The Ohio State University College of Food, Agricultural, and Environmental Sciences (CFAES).

Ippolito earned his Ph.D. in environmental soil quality/chemistry from Colorado State University (CSU) in December 2001, where his dissertation focused on the co-application effects of phosphorus adsorption/desorption of water treatment residuals and biosolids. Ippolito's educational background also includes an M.S. in soil chemistry/fertility from CSU and a B.S. in plant science with an agronomy concentration and a microbiology minor from the University of Delaware.

This is the first appointment for the Dr. Rattan Lal Endowed Professorship, established through the generosity of Distinguished University Professor of Soil Science Dr. Rattan Lal, and it supports research and education in the sustainable management of soil resources for food, climate, and environmental security. Ippolito's career has been committed to enhancing environmental soil fertility and health in various ecosystems, including agricultural lands, shortgrass steppe regions, grazed areas, burned landscapes, and metal-contaminated mining sites. His research has delved into the intricate connections between soil macro- and micro-nutrients, trace and heavy metals, microbiological activity, and soil physical attributes.

Dr. Ippolito's expertise in soil health and fertility aligns with our mission to address critical issues related to food production, environmental conservation, and sustainable agriculture. Please join us in welcoming Dr. Ippolito to our CFAES community.

Sincerely,

Dean Cathann A. Kress, Ph.D.
Vice President for Agricultural Administration & Dean

Tracy Kitchel, Ph.D.
Senior Associate Dean & Director of Faculty and Staff Affairs Professor of Agricultural Education

Viewpoint

FROM THE DESK OF PROF. JIM IPPOLITO

Anthropogenic-induced climate change is forcing producers globally to address resiliency and adaptability in agroecosystems. In essence, producers, hand in hand with scientists, are creating the agroecosystems of tomorrow. Those ecosystems need to be able to store more soil carbon, to supply carbon (i.e., energy source) to those microorganisms that force nutrient turnover and cycling, and to feed plant nutrients in a way so that these ecosystems are more self-reliant. The agroecosystems of tomorrow need to be at their peak in terms of soil physical, chemical, and biological properties for a given area or region. This "sweet spot", where these three soil properties intersect, is termed soil health. With proper soil health, producers can raise crops that are healthy, promoting human and environmental health (i.e., the One-Health concept). My 30+ year career as a soil scientist has focused specifically on soil health, with concepts applied to plant, human, and environmental health. For example, scientists have been able to boost wheat yields over decades of breeding. Greater yields may be considered a positive in terms of feeding an ever-growing world population, yet there is an environmental and human health cost associated with increased yields. In the upper US Great Plains, decades of increased yields have reduced plant-available soil Zn to concentrations considered equal to or deficient for wheat. The soil signature is apparent when determining wheat grain Zn concentrations, which are well below the 25-ppm threshold for human nutrition (Harvest Plus: go.osu.edu/harvest-plus). With approximately 2 billion (yes billion) people not consuming enough micronutrients, including Zn (BBC: go.osu.edu/zinc-bbc), this can lead to reduced growth and development in humans; we are doing a disservice to mankind not to address issues associated with a lack of nutrient biofortification. My work in connecting soil health to plant and human health in this context has been a focus of mine for decades and is an area of research I will continue to focus on in the future. Supported by funds from the Endowment created by Dr. Lal, our team will continue to connect the intimate linkages between improvements in soil C, to improvements in soil health, that will lead to an improved understanding of these factors and the intimate linkages to plant, human, and environmental health.

Sincerely,

Jim Ippolito
Dr. Rattan Lal Endowed Professor

The Lal Carbon Center Goes to the Farm Science Review

Connecting with the farming community in Ohio

The Lal Carbon Center team at their table in the Agricultural Crops tent at the Farm Science Review. Left to right: Yadunath Bajgai, Researcher, Nicholas Johnson, Program Manager, Klaus Lorenz, Assistant Director, Kyle Sklenka, Lab Manager, Mohammad Adnan, Visiting Scholar, Nancy Loria, Researcher, and Sandya Kharki, Researcher.

The Lal Carbon Center team embarked on an enriching journey to the renowned Farm Science Review, a cherished tradition at The Ohio State University since its inception in 1962. This agricultural event serves as a nexus for farmers, environmentalists, educators, and all those invested in the agricultural community to gather, share knowledge, and explore the latest advancements in farming and technology.

This year, the team had the privilege of setting up camp within the Agronomic Crops tent at the Review. They are deeply grateful to their colleagues at OSU Extension, including Grant Davis, Amanda Douridas, and Teresa Funk, for their assistance in organizing space for the center at the Review.

Amidst the buzzing atmosphere of the exhibition, they engaged with a diverse array of visitors, including farmers keen on sustainable practices, environmental enthusiasts, and educators eager to learn and impart knowledge. The Lal Carbon Center team also gained insights into the challenges of introducing no-till techniques to farmers rooted in generations of traditional tillage practices and the sensitivities surrounding the term “carbon” within the farming community. They are thankful for the opportunity for dialogue with and feedback from farming, environmental, and all members of the Ohio agricultural community.

One of the key highlights of the team's presence at the Review was the opportunity to showcase the Lal Carbon

New carbon fact sheets available from the Lal Carbon Center

Our team is pleased to share two new handouts on the topic of soil carbon. ***What is the Carbon Cycle?*** provides a summary of the carbon cycle on a local level, in soil, as it impacts farming and vice versa.

Our second, ***10 questions & answers about carbon and carbon markets*** addresses common questions about soil carbon, soil health, and how they related to carbon markets.

We hope that you will take time to explore them online on our website at the link below:

go.osu.edu/learn-about-carbon

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Farm Science Review (cont.)

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Center's research findings. The basis for those research findings lies at Waterman Agricultural and Natural Resources Laboratory in the Lal Carbon Center long-term plots. The soil within each of these plots has been treated with a different agricultural practice, ranging from conventional tillage to no-till and mulching, for more than 27 years. A display (*pictured right*), constructed by Lab Manager Kyle Sklenka, clearly demonstrated the stark differences observed in the soils. The samples ranged from a light-brown color with a powdery texture for those treated with conventional tillage techniques and synthetic inputs to the rich, dark, crumbly soils cultivated with no-till practices and organic manure. This hands-on approach to education allowed attendees to literally grasp the tangible impact of tillage versus no-till on soil health and carbon sequestration.

The Lal Carbon Center team also met with OSU Extension colleagues at the event, including Heather Neikirk, a fellow PI on the Stark County Sustainable Soils grant supported by the Herbert W. Hoover Foundation, Asmita Murmumkar, a fellow PI on the C-FARM grant supported by the Foundation for Food and Agriculture Research (FFAR), and Mike Estadt, OSU Extension educator, who manages the Carbon Central area at the Review. They had a wonderful time brainstorming future projects to improve communication and collaboration on the complex topic of carbon and its impact on agriculture.

In addition to their academic pursuits, the members of the Lal Carbon Center explored all that the Farm Science Review offers. Yadunath Bajgai, a Research Scientist at the Lal Carbon Center, found himself in a captivating conversation with a local farmer, an interaction later featured on the front page of the OSU website (*see Lal Carbon Center in the News, page 13*). The team relished the Review's delectable cinnamon buns and popcorn, beloved staples of this venerable event. Their time at the Review left them not only with cherished memories but also with a deeper appreciation for the agricultural community's resilience and commitment to sustainable practices.

The Lal Carbon Center soil display constructed by Lab Manager Kyle Sklenka.

"[The Farm Science Review] serves as a nexus for farmers, environmentalists, educators, and all those invested in the agricultural community."

Legislative Fellows Visit Waterman Laboratory

Dr. Klaus Lorenz gives a tour to Legislative Fellows guests at Waterman Agricultural and Natural Resources Lab.

The Lal Carbon Center was glad to receive five members of the Legislative Fellows Program for South and Central Asia on 4th October 2023 at the Waterman Agricultural and Natural Resources Laboratory.

Dr. Klaus Lorenz and Lab Manager Kyle Sklenka gave the fellows a tour of the Center's long-term research plots after welcome remarks from Waterman Director Dewey Mann and tour of the facilities with Mike Anderson. Dr. Rattan Lal greeted the visitors over Zoom. The Center was grateful for the invitation from Dr. Luis Cañas to participate in this important exchange.

Welcome to the Center!

Gunadhish Khanal

Gunadhish Khanal has a keen interest in soil carbon and nitrogen turnover in the soil: the two most important soil processes that affect soil health, soil quality, plant health, plant productivity, and the climate.

As a Postdoctoral Researcher with the Lal Carbon Center, he will be conducting on-farm research on soil carbon dynamics and soil health in diverse management farms in Stark County, Ohio with Postdoctoral Researcher Lauren Baldarelli. His basic responsibilities during his research are to communicate with farmers to find out management practices (crop rotation, fertilization, tillage, etc.). Together, they will collect soil samples in a timely fashion and submit plant biomass for laboratory analysis and other lab studies. Dr. Baldarelli and Khanal will disseminate the findings based on the results, most importantly to the farmers.

For the past 14 years, Dr. Khanal and his wife, Dr. Sandhya Karki (his better half), have been constantly moving. They have lived in and visited many countries, and they have been fortunate to understand people, culture, and their heritage. While the USA is their new country, and Ohio their new home, Arkansas was their first state for the last four years. They will be enjoying nature in and around Ohio in their free time (when they have some).

A Fond Farewell to Nick

With regret and warm congratulations, we bid farewell to Nicholas Johnson, our Program Manager of over a year. We appreciate your work in a challenging role, and we're confident you'll excel as a Grants and Contracts Management Analyst at the College of Medicine. Please stay in touch!

Sandhya Karki

Sandhya Karki earned her Ph.D. degree in Agroecology and a Master's degree in Agro- Environmental Management from Aarhus University, Denmark. Dr. Karki has worked as a post-doctorate researcher at several institutions: Aarhus University in Denmark, the Norwegian University of Life Science in Norway, and the University of Arkansas in the USA. Her major research interests revolve around sustainable intensification of cropping systems with a specific focus on enhancing crop production and reducing agricultural greenhouse gas emissions.

Currently, as a researcher at Lal Carbon Center, Dr. Karki conducts research on developing climate-smart farming practices that lead to net zero emissions. Her focus encompasses a comprehensive assessment of the impact of integrated best agriculture practices on greenhouse emissions, carbon balance, and soil health.

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João Carlos Sá

João Carlos Sá holds a degree in Agronomic Engineering from the Federal Rural University of Rio de Janeiro (1981), a Master's degree in Agronomy (Plant Production) from the Federal University of Paraná (1994), and a Ph.D in Soils and Plant Nutrition from The Ohio State University and São Paulo State University (Escola Superior de Agricultura "Luiz de Queiroz") as part of a dual degree program. In 2008 and 2012, he completed the Postdoctoral program at The Ohio State University, at the Carbon Management and Sequestration Center (C-MASC), developing projects with Dr. Rattan Lal on C sequestration in no-tillage production systems.

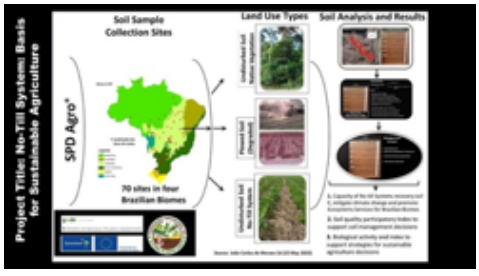
He served as Associate Professor at the Department of Soil Science and Agricultural Engineering at the State University of Ponta Grossa, and he got a Research Productivity Scholarship by CNPq, where he led the research group *Dynamics of Organic Matter in Soil Management Systems*, with an emphasis on the no-till system. He was coordinator and scientific consultant of the cooperation agreement between UEPG - CIRAD on the sequestration of C in no-tillage production systems between 2005 to 2012. He is a reviewer for *Soil & Tillage Research*, *Soil Science Society of American Journal*, *Land Degradation and Development*, *Catena*, *Environmental Pollution*, *Geoderma*, *Agriculture and Ecosystem*, *Journal of Cleaner Production*, *Ecological Indicators*, *Science of The Total Environment*, and other prestigious journals.

No-Till System: Basis for Sustainable Agriculture

Most recently, Dr. Sá and Dr. Lal have served as consultants to a partnership between with The Ohio State University and the Brazilian No-Till System Federation on the project, "No-Till System: Basis for Sustainable Agriculture."

The project team sampled almost 4000 soil samples from four different Brazilian biomes (the Amazon, Cerrado, Atlantic Forests, and Pampas regions). The objective of the project is to measure the capacity of no-till systems for carbon sequestration, based in the principles of 1) no plow, 2) yearlong continuous soil cover, and 3) the diversity of crop rotation.

After carefully studying each biome for over a year, the project selected seventy locations within the four biomes for sampling and research. Within each of those locations, the team designed a robust matrix for soil comparison. The project measures carbon content and sequestration under three conditions within the soils of each location: native vegetation, the no-till system, and a degraded area. As the project compares the carbon content among the native, no-till, and degraded areas, it can calculate the capacity of no-till as a tool to sequester carbon and promote healthy soils.



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Hannah Shively

Hannah Shively has really enjoyed her first few weeks here as Dr. Lal's administrative assistant. Everyone has been so lovely and welcoming, which she says has made this transition so much easier! She spent the first 18 years of her life in a suburb of Cleveland, OH, with her parents, older brother, and their dog. She moved to Columbus over 5 years ago now to attend Ohio State as an undergraduate student, and she has no plans to leave!

Hannah graduated with a degree in Early Childhood Education in Spring of 2022 and has been a full-time nanny ever since. She was looking to begin her professional career as an assistant, and she knew when she interviewed for this position that it would be a great fit.

She feels honored to have been hired by her Alma Mater, and even more honored to be working for a scientist as distinguished as Dr. Lal.

She will be in room 422A right next to Dr. Lal's office if anyone ever needs anything. Her goal is to make the center as efficient as possible and to make everyone's job and life easier.

Hannah loves to collaborate, and she's thrilled to have co-workers who are old enough to converse with, so please don't hesitate to reach out! She is looking forward to working with and getting to know all of you!

Maggie Willis

Maggie Willis is excited to rejoin the Lal Carbon Center as a Marketing and Communications Specialist. Utilizing the communication skills and experience gained from her 2020 Psychology degree at OSU, and her training in design, motion graphics, and animation from UCLA, she looks forward to promoting the Center's vital climate change initiatives.

In her spare time, she enjoys pottery and sculpture, as well as learning languages with her young twin sons, and playing with her dog and cat.

Our team is growing!

If you are interested in contributing to the work at the Lal Carbon Center, please visit our Join Us page at go.osu.edu/join-the-lal-carbon-center..

Current Positions Open:

- Data Analyst
- Program Manager
- Research Technician

Lal Carbon Center Seminars

Would you like to learn about advancements in soil science as they happen?

Please join the Lal Carbon Center Fridays at 3:00 pm US Eastern time over Zoom to hear presentations from our Researchers, Postdocs and Graduate Students about recent progress in their research.

Exact schedule and Zoom link located here:

go.osu.edu/2023-carbon-seminars.

In Memoriam

Dr. M.S. Swaminathan

On September 28, 2023, the world bid farewell to a luminary of unparalleled stature, Monkombu Sambasivan Swaminathan, a distinguished Indian scientist whose profound contributions to agriculture and food security resonated globally. Dr. Swaminathan earned his rightful place as the architect of India's Green Revolution, leaving behind an enduring legacy of abundance and well-being. His advancements in plant breeding and genetics brought the end of famine and led to a threefold increase in India's annual crop yields within 15 years.

Upon earning a Ph.D in plant breeding from the University of Cambridge, Dr. Swaminathan returned to India to work as a plant geneticist at the Indian Agricultural Research Institute. With remarkable insight, he convinced the research institute's chief executive to enlist the expertise of Dr. Norman Borlaug, who had been studying varieties of Mexican dwarf wheat.

Together, Dr. Swaminathan and Dr. Borlaug crossbred these varieties with other strains from around the world to produce prolific golden wheat. This partnership set India on a path to becoming a major grain exporter by the mid-1970s.

When Dr. Borlaug was awarded the Nobel Peace Prize in 1970 for his pivotal role in initiating the global Green Revolution, he unreservedly acknowledged Dr. Swaminathan's instrumental contribution, proclaiming, "a great deal of the credit must go [to you] for first recognizing the potential value of the Mexican dwarfs. Had this not occurred, it is quite possible there would not have been a green revolution in Asia" (*New York Times*, 2023).

Associate Dean and Director of International Programs in Agriculture Dave Hansen, Dean of the College of Food, Agricultural, and Environmental Sciences Bobby Moser, Professor M.S. Swaminathan, and Professor Rattan Lal in 2004, when Dr. Swaminathan received an honorary doctorate from The Ohio State University.

"If agriculture goes wrong, nothing else will have a chance to go right."

— M.S. Swaminathan

Dr. Swaminathan's indelible legacy has reverberated not only across continents but also within the halls of The Ohio State University (OSU). His vision of food security and sustainable agriculture profoundly influenced Dr. Rattan Lal, who found inspiration in Dr. Swaminathan's tireless efforts to empower farmers with knowledge for enhanced productivity and sustainability. In recognition of his exceptional contributions, Dr. Swaminathan was bestowed with an honorary doctorate in agriculture by OSU in 2004, a testament to his enduring impact on the world of agriculture.

As we commemorate the passage of M.S. Swaminathan, we celebrate a life that was singularly dedicated to advancing the human condition through agriculture. His legacy endures, carried forward by institutions like The Ohio State University and individuals like Dr. Rattan Lal, as they champion his vision of a world where every soul has access to nourishing sustenance and a sustainable future.

Edit: An earlier version of this article mistakenly listed the date of Dr. Swaminathan's passing as September 20, 2022. We apologize for this error.

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In Memoriam

Dr. Guðrún Gísladóttir

Compton James Tucker, His Majesty the King of Sweden, Carl XVI Gustaf, and Guðrún Gísladóttir. Dr. Gísladóttir received the Wahlberg's Gold Medal.in 2014.

The CFAES Rattan Lal Center for Carbon Management and Sequestration (Lal Carbon Center) is deeply saddened by the passing of a brilliant colleague, Guðrún Gísladóttir, Professor of Geology at the University of Iceland in the Faculty of Life and Environmental Sciences. Her profound commitment to studying and safeguarding the planet's geological heritage resonated globally, a poignant reminder of the delicate balance between humanity and the delicate ecosystems that require our respect and care.

Prof. Gísladóttir's remarkable contributions to the fields of geology and environmental sciences were adorned with numerous accolades, including the Gold Wahlberg Medal awarded by the Swedish King on behalf of the Swedish Society for Anthropology and Geography.

Her leadership was exemplified by her role in significant projects like the NCoE NORDRESS, which focused on bolstering societal resilience against natural hazards.

The collaboration between our dear friend and colleague, OSU, and the Lal Carbon Center spanned over fifteen years, beginning with an International Seminar on Land Degradation in Iceland in 2007 at Ohio State led by Prof. Gisladóttir. She mentored several Lal Carbon Center graduate students at the University of Iceland, including Josh Beniston, Nick Stanich, Melissa Herman, Claire Turner. She supervised them in the field there, sampling soils in the Skaftafell outlet glacier of Vatnajökul, and guiding them through their academic journeys. Professor Gísladóttir in turn sponsored a student exchange of Ph.D students from UI with OSU and Dr. Rattan Lal: Dr. Taru Lehtinen, Olga Kolbrún Vilmundardóttir, and Susanne Claudia Möckels.

Prof. Gisladóttir also graciously hosted OSU visiting faculty at the University of Iceland at more than one event, including Dean Robert Moser and Professors David Hansen, Jerry Ladman, Rattan Lal, and Brian Slater. Notably, she presented Dr. Lal with the Commission on Land Degradation and Desertification Award (COMLAND) in 2009.

Guðrún Gísladóttir's passion, dedication, and ability to ignite curiosity in her colleagues and students continues to alter the lives she touched. Though she may have left us, her insights and spirit will forever guide our appreciation of the interaction between human beings and the natural environment. A fascinating look into her contributions and life can also be found at Hit Iceland (2018) here: go.osu.edu/gisladottir.

"Even as a child I sensed the powerful impact of the people's cohabitation with nature..."

— Guðrún Gísladóttir (Hit Iceland, 2018)

C-FARM Update

The project moves into its second year of sampling

Updated map with coarse geographical approximations of the soil sampling sites through the United States for the C-FARM project.

The seven institutions (The Ohio State University, Michigan State University, USDA Agricultural Research Service, Kansas State University, U.S. Geological Survey, and Utah State University) that are part of the Carbon Farming Alliance for Research and Management (C-FARM) have been meeting biweekly during the months of August and September.

The members reported that they have moved into their second year of soil sampling for the project, and progress proceeds apace for processing and analyzing samples. Many PIs have eagerly begun expanding their sampling sites to gain a more precise understanding of how carbon is stored in soil under different agricultural practices.

As well, after much careful deliberation, the group has developed a procedure for sharing sensitive information associated with the locations of their sampling sites with their fellow PIs in a way that respects the rights of landholders to privacy.

Data regarding the location of sampling sites will be kept separate from all other information, and only very broad, coarse locations of sampling sites will be shared with the public. An example of this process can be seen above, in the map with generalized locations of sites throughout the project. A data analyst will develop a system to handle the data and make sure it is carefully guarded.

More information about the C-FARM project can be found here on our website: carbon.osu.edu/c-farm.

Handheld Carbon Measurement with Microsoft Update

Nancy Loria is collaborating with Microsoft on a project aimed at developing a prototype for a portable handheld device that demonstrates its effectiveness in monitoring soil organic carbon (SOC) levels directly in the field. Their innovative method combines Wi-Fi signals and images of the soil surface to sense the SOC levels. Dr. Loria has already analyzed several field samples for SOC and water retention. At present, she is in the process of incorporating additional variability into the calibration set to prepare it for an accurate model capable of estimating SOC levels.

Furthermore, Dr. Loria has recently completed an article titled "Handheld Device Methodologies for In-Field Soil Organic Carbon," which is currently under review with the International Soil and Water Conservation Research Journal. This paper delves into the use of spectroscopic and remote sensing techniques with portable handheld devices in field settings to estimate SOC. It also discusses how different scanning conditions can affect accuracy and suggests potential ways to address these variations.

National Academies of Sciences, Engineering and Medicine: Advancing Success Towards SDG2

Washington, DC, USA — July 2023

Dr. Rattan Lal delivered a virtual presentation at an event hosted by the National Academies of Sciences, Engineering, and Medicine (NASEM) on July 13, 2023, entitled "Advancing Success Towards SDG2 (Zero Hunger) Through Science and Technology." In line with the objective to conduct thorough analyses of regional challenges pertaining to food security, Dr. Lal's presentation was titled "SDG2 & Soil." The recording can be reviewed here in Session 4 at 41:00: go.osu.edu/nasem.

Dr. Lorenz at the 2023 SP Innovation Summit

Columbus, Ohio, USA — July 2023

Dr. Lorenz speaking at the 2023 SP Innovation Summit. Photo courtesy of Shellee Fischer Photography.

Dr. Klaus Lorenz joined more than 350 representatives from key industries across Ohio who gathered from July 26-27 for the 2023 SP Innovation Summit held by the Supplier's Partnership for the Environment at The Ohio State University. As a featured speaker in the opening plenary session, Dr. Lorenz presented "Research, Innovations and Breakthroughs in Carbon Sequestration and Management Practices."
His perspective underscored two key insights for maximum impact. First, adopting innovative approaches to manage soil and land use can significantly boost the amount of organic carbon stored in soil. Second, this increase has a dual benefit—it reduces the amount of carbon dioxide in the atmosphere and enhances soil health. Dr. Lorenz's insights aligned with the convention's overarching emphasis on innovation and sustainability. The Lal Carbon Center hopes industry representatives will leverage this knowledge to enhance sustainable practices across their sectors. For more information about his presentation, please access it at the 2023 SP Innovation Summit page here: go.osu.edu/2023sp

Dr. Rattan Lal at the 78a SOEA and CONFEA Conference in Brazil

Porto Alegre, Brazil — August 2023

Dr. Lal at the 78a SOEA Conference with CREA President Nanci Walter and UFPR Professor and Federal Counselor at CONFEA Luiz Lucchesi. Photo courtesy of Dr. Luiz Antonio Corrêa Lucchesi and Pedro Luis Mendes Pereira.

Dr. Lal was delighted to receive an invitation to speak at the 78a SOEA Conference: Official Week of Engineering and Agriculture with CONFEA/CREA (Federal Council of Engineering and Agronomy) in Porto Alegre, Brazil, on August 10, 2023. His presentation titled "Carbon Sequestration – Enabling Brazilian Agriculture to Foster Global Sustainability" resonated deeply with the 5000-strong audience in attendance. During his talk, Dr. Lal praised Brazil's remarkable feat of becoming the world's leading food exporter. He urged Brazil to replicate the transformative "Cerrado Miracle" as a model across other savannahs, such as those in Sub-Saharan Africa and the Caribbean, offering these regions the opportunity to emulate Brazil's success and extend its prosperity worldwide. His lecture may be accessed at YouTube here (starts at 43:19): go.osu.edu/2023-soea

Professors World Peace Academy

St. Paul, MN, USA — August 2023

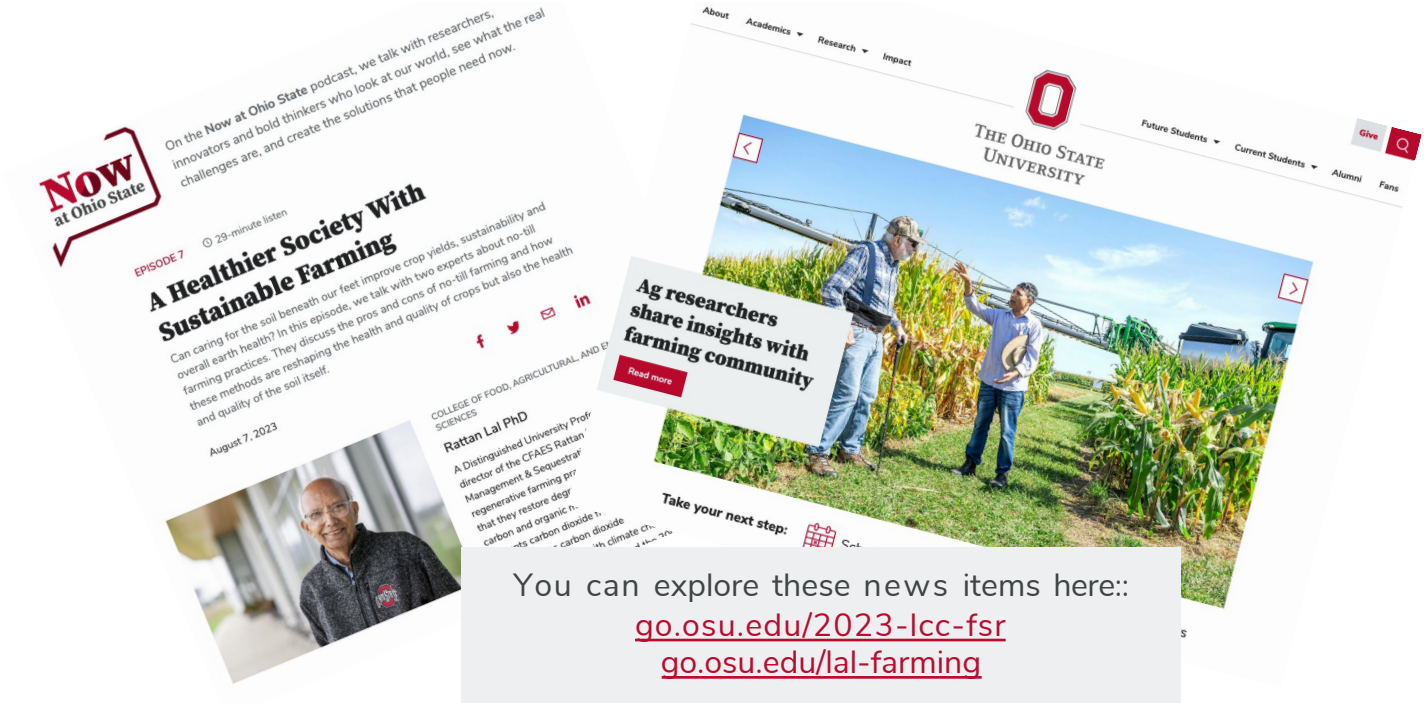
Dr. Lal gave a presentation entitled "Soil, Spirituality, Science, and Religion" at the Professors World Peace Academy (PWPA) event on August 23, 2023. The PWPA is an educational organization founded to support the academic community's role in the pursuit of world peace. The spirited discussions lasted long into the evening, and Dr. Lal was delighted to be able to contribute to this important topic.

Africa Food Systems Forum

Dar Es Salaam, Tanzania — September 2023

In September, Dr. Lal gave a speech at the Africa Food Systems Forum (AFSF). This forum is the world's premier forum on African agriculture and food systems, bringing together stakeholders to take practical action and share lessons that will move African food systems forward, according to the AFSF website. Dr. Lal was part of a panel of experts that shared their insight and knowledge on how to create a more resilient and sustainable food system for Africa's growing population and demand.

The Lal Carbon Center in the News



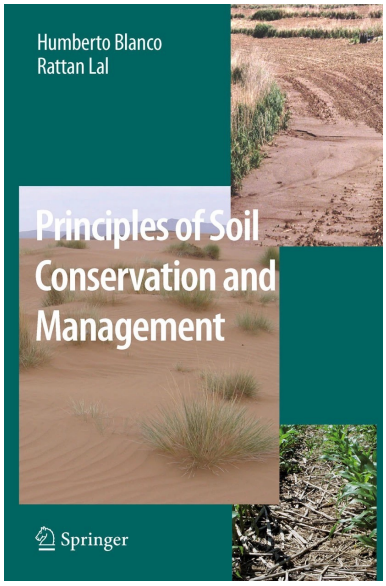
You can explore these news items here::
go.osu.edu/2023-lcc-fsr
go.osu.edu/lal-farming

The Lal Carbon Center Mantra

Healthy Soil = Healthy Plants = Healthy Animals = Healthy People = Healthy Planet

Quarterly Publications

1. Lal, R., and N. Kumar. 2023. The Space of Pseudofunctions with Application to Disjointness Preserving Mappings. Mediterranean Journal of Mathematics 20(1).
2. Pradhan, G., R. Meena, S. Kumar, and R. Lal. 2023. Utilizing industrial wastes as compost in wheat-rice production to improve the above and below-ground ecosystem services. AGRICULTURE ECOSYSTEMS & ENVIRONMENT 358. doi: 10.1016/j.agee.2023.108704
3. Reddy, S., C. Srinivasarao, P. Rao, R. Lal, S. Rakesh, et al. 2023. Greenhouse gases emissions and agronomic productivity as influenced by varying levels of N fertilizer and tank silt in degraded semiarid Alfisol of Southern India. LAND DEGRADATION & DEVELOPMENT 34(4): 943–955. doi: 10.1002/ldr.4507
4. Swamy, S., H. Darro, A. Mishra, R. Lal, A. Kumar, et al. 2023. Carbon stock dynamics in a disturbed tropical forest ecosystem of Central India: Strategies for achieving carbon neutrality. ECOLOGICAL INDICATORS 154. doi: 10.1016/j.ecolind.2023.110775
5. Reicosky, D., David Brandt, Randall Reeder, Rattan Lal, and David R. Montgomery. 2023. Plowing: Dust storms, Conservation Agriculture, and need for a "Soil Health Act." Journal of Soil and Water Conservation 78(5): 105A. doi: 10.2489/jswc.2023.0619A



Keynote Presentations

1. Lal, R. 2023. SDG2 & Soil. Advancing Success Towards SDG2 (Zero Hunger) Through Science and Technology, National Academy of Sciences Building, Washington, D.C., 14 July 2023. Recording available here Session 4 at 41:00: go.osu.edu/nasem
2. Lal, R. 2023. Carbon Sequestration – Enabling Brazilian Agriculture to Foster Global Sustainability. SOEA Conference: Official Week of Engineering and Agriculture with CONFEA/CREA, Porto Alegre, Brazil, 10th August, 2023.
3. Lal, R. 2023. Soil, Spirituality, Science, and Religion. Professor World Peace Academy Event, 23rd August 2023.
4. Lal, R. 2023. Towards National Soil Nutrient Roadmaps in Tanzania. Africa Food Systems Forum, Tanzania, 6th September 2023.
5. Lorenz, K. 2023. Research, Innovations, and Breakthroughs in Carbon Sequestration and Management Practices. SP Innovation Summit, Ohio State University, 26-27. July 2023.

The CFAES Rattan Lal Center for Carbon Management and Sequestration is proud to be a part of the College of Food, Agricultural, and Environmental Sciences (CFAES)

THE OHIO STATE UNIVERSITY
COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES

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