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Photo credit: Atinderpal Singh

### In-person project meeting in Los Lunas

Carbon Management and Soil Health project team had a one-day in-person meeting on April 19<sup>th</sup> at the Agricultural Science Center (ASC), Los Lunas, NM. Team members working on the rangeland, cropland, urban landscape, extension, and carbon literacy survey and economics shared project progress and plans for the upcoming months. NMDA collaborators were also present in the meeting. Leveraging their experience on anticipated project tasks, the group brainstormed knowledge gaps, potential research, extension, and educational activities and future collaboration opportunities. The project team appreciates the NMSU ASC Los Lunas staff and the superintendent, Dr. Marsalis, for hosting the meeting.

### Project spotlight at ACES Open House

Carbon Management Center researchers participated in the NMSU ACES Open House on April 6<sup>th</sup>, 2024, and showcased a poster that demonstrated current research, education, and outreach activities. The event provided a platform for sharing the Center's progress and engaging with the community as well as university leadership on critical research and outreach issues around agriculture and the environment.



Photo: Sundar Sapkota, a graduate student at the booth

## Soil and ecosystem flux monitoring at Corona ranch

Agriculture can mitigate global climate change by reducing greenhouse gas (GHG) emissions and enhancing carbon sequestration in the soil and vegetation. Quantifying soil-plant-atmosphere carbon exchange helps understand the underlying mechanisms and develop effective management strategies to reduce GHGs and increase soil carbon storage. Therefore, researchers are installing an Eddy Covariance flux tower, a soil GHG measurement system, and soil probes for nutrient and water measurements at Corona Ranch. The Eddy Covariance system measures CO<sub>2</sub> exchange, trace gases, and ancillary variables such as water and heat fluxes. The LI-COR soil flux system quantifies soil GHG (CO<sub>2</sub>, N<sub>2</sub>O, and CH<sub>4</sub>) fluxes, soil water, and soil temperature. The team also plans to conduct the soil health analysis, vegetation survey, and net primary productivity estimation for a comprehensive assessment of rangeland health, carbon and nutrient cycles, and net ecosystem GHG fluxes.

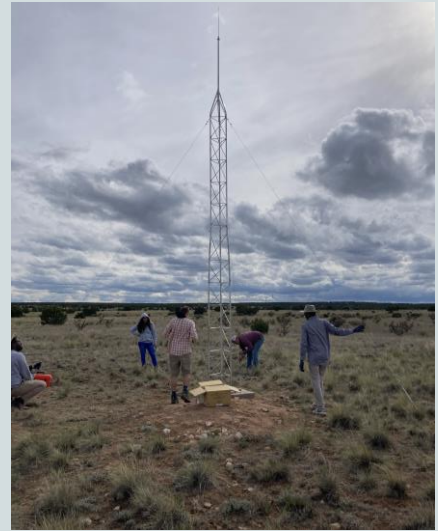


Photo credit: Lara Prihodko

## Publication highlights

### Cover crops for soil carbon sequestration and energy/carbon footprint reduction

Cover cropping is increasingly considered nationwide to enhance soil health and organic carbon (SOC) sequestration. A study conducted at ASC Clovis (Singh et al., 2024) showed 7–22% greater SOC stock in a 0–80 cm soil profile after four years of cover cropping compared to no cover crop control in silage production systems. The SOC sequestration potential of cover crop systems was 1.5–2.3 Mg ha<sup>-1</sup> year<sup>-1</sup>, compared to the control.

Another study from the same site (Bista et al., 2024) highlighted that cover cropping could improve energy efficiency and reduce the net carbon footprint of the cropping systems. For more details, please visit:

1. [Singh et al., 2024. Soil profile carbon sequestration and nutrient responses varied with cover crops in irrigated forage rotations. \*Soil and Tillage Research\*.](#)
2. [Bista et al., 2024. Reducing energy and carbon footprint in semi-arid irrigated cropping systems through crop diversification. \*Heliyon\*.](#)

### Forest biochar dramatically reduced global warming potential

Amending soil with biochar is one of the strategies to increase SOC storage and reduce GHGs. After testing five different forest biochars, Sapkota et al. (2024) found that pinewood biochar pyrolyzed at 500°C and 700°C reduced N<sub>2</sub>O-N emissions by 68.5% and CO<sub>2</sub> equivalent emissions by 72.4% than the control. They also showed a greater potential to store SOC than other biochars and the control.



Pinewood biochar pyrolyzed at 500°C (A), 460°C (B), and 700°C (C). Picture credit: Sundar Sapkota

For more details, please visit:

1. [Sapkota et al., 2024. Greenhouse gas mitigation and soil carbon stabilization potential of forest biochar varied with biochar type and characteristics. \*Science of the Total Environment\*.](#)

## Carbon Management Center's activity highlighted in Washington DC

Dr. Ghimire participated USDA's 1st Agrifood Innovation Symposium and Award Ceremony, *Harvesting Hope: Cultivating Scientific Solutions That Nourish People & Planet*, and showcased activities of the carbon management and soil health center. The meeting featured emerging breakthroughs in agricultural science, providing attendees an opportunity to "touch, taste, smell, and see" agrifood innovations in action. NMSU booth featured how land uses affect soil carbon storage, and activities of the carbon management and soil health projects across the state.



## Soil Health and Soil Carbon conference in July

In collaboration with NM Department of Agriculture, NMSU Carbon Management and Soil Health Center is hosting a two-days (**July 31<sup>st</sup> to August 1<sup>st</sup>, 2024**) New Mexico Soil Health and Soil Carbon Conference in Albuquerque, NM. The conference will have a series of talks and networking session in the first day, followed by field trips in the following day. Please RSVP to the link (<https://rsvp.nmsu.edu/rsvp/soilcarbon>) to join the conference. Refer to the following flyer for registration and more information.

### New Mexico Soil Health and Soil Carbon Conference

JULY 31 - AUG. 1

Embassy Suites  
1000 Woodward Place NE  
Albuquerque, New Mexico 87102  
(505) 245-7100

Call Hotel for your reservation and  
mention *Healthy Soils* room block.

#### REGISTER

for this free event at  
[https://rsvp.nmsu.edu/  
rsvp/soilcarbon](https://rsvp.nmsu.edu/rsvp/soilcarbon)



This conference is a product of the  
carbon management and soil health  
initiative at NMSU in cooperation with  
NMDA's Healthy Soil Program.

The carbon management and soil  
health team at NMSU is investigating  
carbon sequestration and soil health  
management in croplands,  
rangelands, forests and urban  
landscapes in New Mexico.



**NMDA**  
New Mexico Department of Agriculture

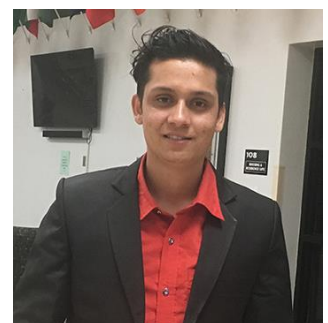
For more information or questions,  
contact John Idowu at [jjidowu@nmsu.edu](mailto:jjidowu@nmsu.edu).

## Welcoming new researchers

Carbon Management and Soil Health Project welcomes two new researchers, Drs. Juan P. Frene and Sundar Sapkota to the team. Dr. Frene has expertise in soil microbial ecology and health. He will be working on USDA NIFA funded projects on soil health and P-dynamics. Dr. Sapkota has experience in soil health, carbon sequestration, and GHG emissions and will be working on a NSF funded project aiming to reduce N<sub>2</sub>O emissions from agriculture.



Juan P. Frene



Sundar Sapkota

**Prepared by:** Pramod Acharya and Rajan Ghimire

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