Food and Agriculture Organization of the United Nations

5th Meeting of the
Near East and North African Laboratory Network
(NENALAB)

26 February 2025

webinar series on calcareous and gypsiferous soils

Prof. Karim Shahbazi
NENALAB Chair

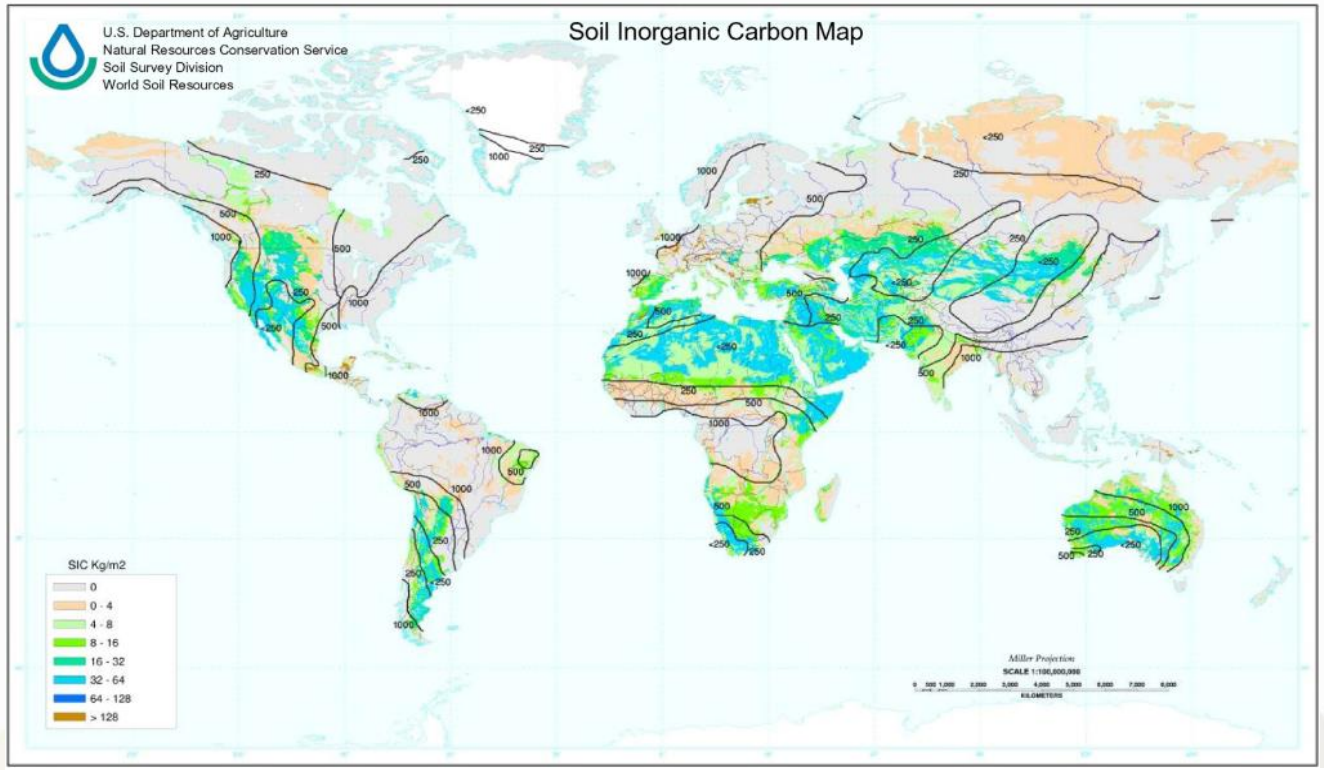
shahbazikarim@yahoo.com

NENALAB
NEAR EAST AND NORTH AFRICAN SOIL LABORATORY NETWORK

GLOBAL SOIL PARTNERSHIP

Introduction

- Calcareous and gypsiferous soils, rich in calcium carbonate and gypsum respectively, are prevalent across various regions worldwide, particularly in the Near East and North Africa (NENA) region.
- These soils pose significant challenges in terms of effective management and sustainable land use due to their unique physical, chemical, and biological properties.



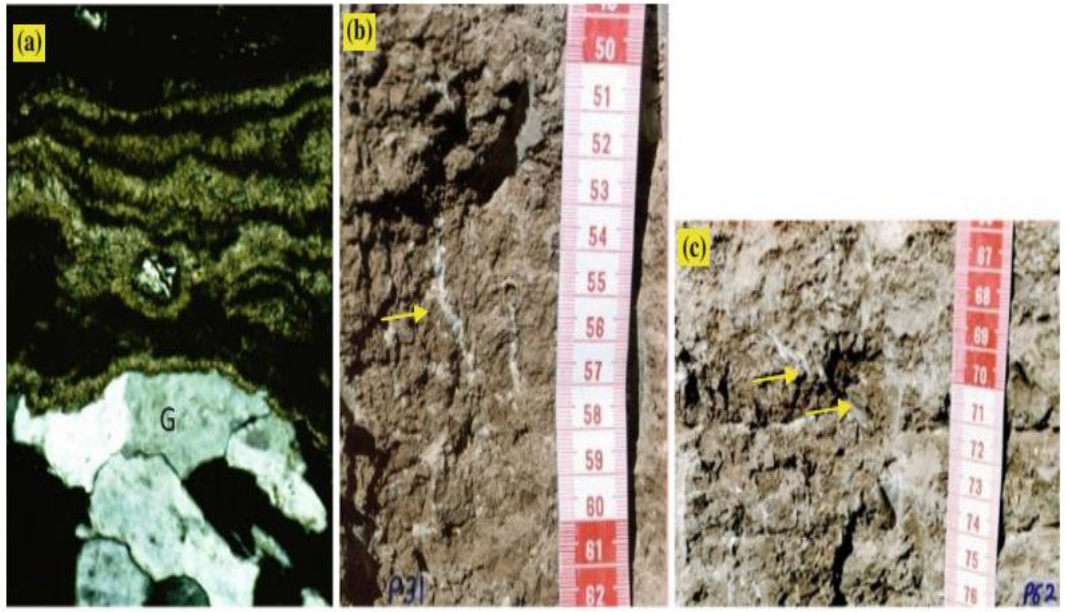


Fig. 6.9 a XPL image of gypsum pendant (G) underlying the calcite pendant in a Calcic Argigypsids (**b** and **c**) Gypsum as mycelium and crystals in GypsicAquisalidsin Fars Province (Khormali, 2003)

- This webinar series aims to provide in-depth insights into the characterization of calcareous and gypsiferous soils, the associated key challenges, and potential solutions to overcome these challenges in the framework of GOLOSOLAN, FAO-GSP

Objectives:

- Develop a comprehensive understanding of the physical, chemical, and biological properties of calcareous and gypsiferous soils.
- Explore the challenges faced in accurately characterizing and laboratory analysis methods.
- Discuss innovative techniques and technologies for the effective test methods.
- Identify and share best management practices and solutions to address the challenges posed by calcareous and gypsiferous soils and related test methods.
- Foster a platform for knowledge sharing and collaboration among students, experts, soil scientists, agronomists, and land managers.

Webinar 1 – Introduction to calcareous and gypsiferous soils.

The first session: provides an insight on the topic, starting from the definitions of this type of soils, describing their characteristics and presenting their geographical distribution and diagnostics.

A special focus will be dedicated on their pedogenesis, occurrence and agricultural significance.

Proposed speakers:

- Shabbir A. Shahid (Environment and Life Sciences Research Center, Kuwait)
- Rosa Poch (ITPS Chair, University of Lleida, Spain)
- Elh Moudi Moustapha Abdourahaman (GLOSOLAN Chair, National Center for Agricultural Research, Niger)
- Pavel Krasilnikov (Lomonosov Moscow State University, Russian Federation)

Webinar 2 – Chemical properties and analysis

The calcareous and gypsiferous soils will be described from the chemical point of view. The main parameters to be targeted during lab analysis will be highlighted with special attention to the challenges of the measurement.

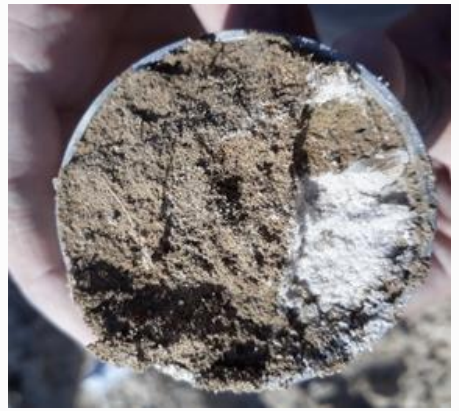
GLOSOLAN standard operating procedures (SOPs) will be presented with a focus on quality control and health and safety during the implementation of the procedur (e.g. pH, Nutrient Availability macro/micronutrients, determination of CEC and CCE (calcium carbonate equivalent; Determination of soluble Calcium and Magnesium and Ca:Mg ratios; use of multi-extractantor solutions in determination of heavy metals)

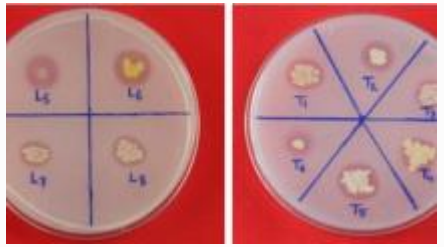
Proposed speakers

- Jorge Batlles-Sales (INSAS Chair, President of the IUSS Commission of Salt-Affected Soils)
- Karim Shahbazi (NENALAB Chair, Soil and Water Research Institute, Islamic Republic of Iran)
- Graham Lancaster (ASPAC Chair, Southern Cross University, Australia)

Webinar 3 – Physical and biological properties and analysis

The session will focus the physical properties of calcareous soils and the consequences on soil microbiota. The analytical procedures to determine both physical and biological characteristics will be described in details.



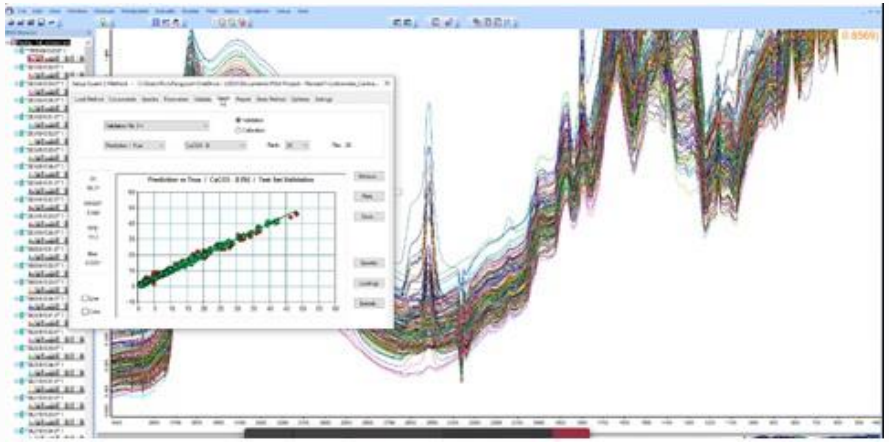


Proposed speakers:

- **Soil physics:**
  - Attila Nemes (Norwegian Institute of Bioeconomy Research , Norway)
  - Steven Monteith (USDA Natural Resources Conservation Service - National Soil Survey Center, United States of America)
- **Soil microbiota:**
  - Marta Goberna (Spanish National Institute for Agricultural and Food Research and Technology, Spain)

Webinar 4 – Dry chemistry analytical techniques in characterization of calcareous soils

Different cutting-edge techniques will be presented, these will include X-ray Diffraction, X-ray fluoresce, Scanning Electron Microscopy, temperature ramp combustion, and soil spectroscopy.



Potential speakers:

- Rich Ferguson (USDA Natural Resources Conservation Service - National Soil Survey Center, United States of America)
- Karim Shahbazi (NENALAB Chair, Soil and Water Research Institute, Islamic Republic of Iran)
- Eyal Ben-Dor (Tel Aviv University, Israel)

Webinar 5- Major problems, reclamation and amelioration of problematic calcareous and gypsiferous soils

After presenting the peculiarities of this type of soils and how to determine their chemical, physical and biological properties, the last webinar will provide an overview on the main challenges related to their management. Case studies on the reclamation and amelioration of this type of soils will be shared too.

Proposed speaker:

- David Badía-Villas (Universidad de Zaragoza, Spain)
- Steven Monteith (USDA Natural Resources Conservation Service - National Soil Survey Center, United States of America)

Target Audience:

This webinar series is intended for a diverse audience, including:

- Soil scientists and agronomists
- soil laboratory experts
- Agricultural extension officers and consultants
- Land managers and farmers
- Environmental researchers and policymakers
- Students and early-career professionals in related fields

Format and Duration:

The webinar series will consist of 5 sessions, each lasting approximately 60-90 minutes. The webinars will be held on a monthly basis, depending on the availability of the speakers and the target audience.

Conclusion:

This comprehensive webinar series on the analytical methods of calcareous and gypsiferous soils will provide a valuable platform for sharing knowledge, addressing challenges, and promoting sustainable land management practices.

The series will benefit soil science professionals, soil laboratory experts, land managers, and stakeholders working in regions with calcareous and gypsiferous soil conditions.

Food and Agriculture Organization of the United Nations

NENALAB

NEAR EAST AND NORTH AFRICAN SOIL LABORATORY NETWORK

Thank you

GLOBAL SOIL PARTNERSHIP