UNIVERSITY OF LIFE SCIENCES ”KING MIHAI I” FROM TIMISOARA
”YOUNG PEOPLE AND MULTIDISCIPLINARY RESEARCH IN APPLIED LIFE SCIENCES”

05-06 November 2026



STUDY OF SOIL TYPES AND AGRICULTURAL SUITABILITY FROM CENAD, TIMIȘ COUNTY

Andrada VIGH, Cristian SAUCA, Daniel Dorin DICU, Radu BERTICI
University of Life Science "King Mihai I" from Timisoara

Abstract. This study aims to investigate soil types and assess agricultural suitability in Cenad, Timiș County, western Romania. Located in the Banat Plain, near the Mureș River, the area is characterized by predominantly lowland relief, alluvial deposits, and favorable climatic conditions that support diverse agricultural activities. The research focuses on identifying the main soil types, examining their physical and chemical properties, and evaluating their suitability for agricultural use. The methodological approach involves the analysis of pedological maps, geological and topographic information, climatic data, and land-use patterns, complemented, where available, by field observations and soil profile descriptions. Particular attention is given to soil texture, humus content, soil reaction, drainage conditions, groundwater influence, and nutrient availability, as these factors significantly affect soil productivity and crop development. The assessment also considers potential limitations, including temporary waterlogging, soil compaction, and variations in fertility associated with differences in parent material and hydrological conditions. The relationship between soil characteristics and agricultural land use provides a basis for identifying areas with different levels of suitability for arable crops and other agricultural practices. The findings are intended to support the sustainable management of local soil resources, improve land-use planning, and encourage appropriate agricultural practices adapted to specific soil conditions.

• Introduction

Soil represents one of the most important natural resources, having an essential role in the development of agriculture and in supporting plant production. Its physical, chemical and biological characteristics directly influence plant growth and development, water and nutrient supply capacity, and fertility level. For this reason, knowledge of soil types and assessment of their favorability for different crops constitute important stages in the efficient and sustainable use of agricultural land.

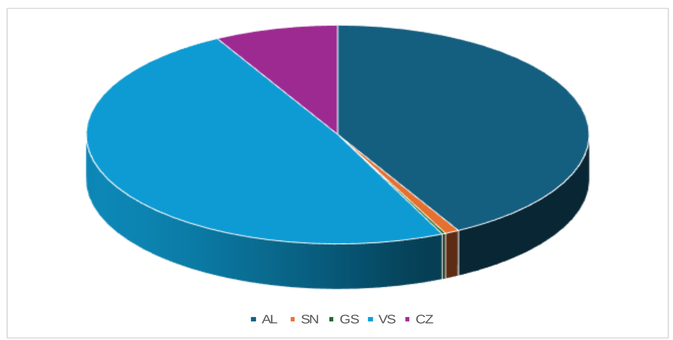
• Material and method

The work entitled „The study of soil types and agricultural favorability in the town of Cenad, Timiș” county aims to characterize the main soil types found on the analyzed agricultural lands and evaluate their properties in relation to the requirements of fruit crops. The research considers the identification of pedological and agrochemical characteristics of soils, the establishment of the main limiting factors of fertility and the appreciation of the potential of land use for conversion to fruit plantations. Data from existing pedological and agrochemical studies, pedological maps, agrochemical maps, agricultural favorability maps and cartographic materials related to soil limiting factors were used to carry out the study. Laboratory bulletins of soil samples and climatic information on temperature and precipitation were also analysed. These materials allowed the correlation of soil characteristics with the particularities of the natural environment and with the general requirements of the analyzed fruit species.

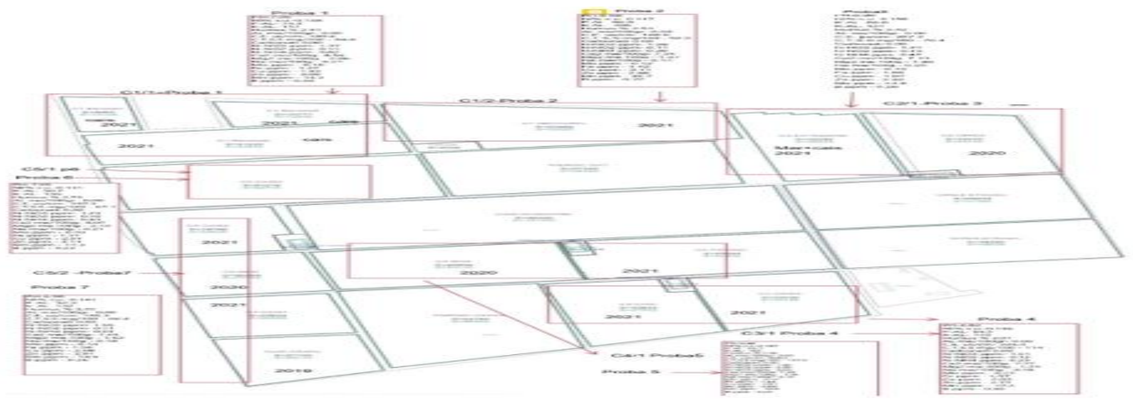
Conclusions: The study carried out highlights the diversity of soil types in the town of Cenad, Timiș county, and their importance for agricultural use. Vertisols occupy about 43% of the studied area, followed by alluviosols, with about 37%, and chernozems, with about 7%. The physical and chemical properties of soils influence fertility and favorability for fruit crops. pH values ranging from 6.82 to 7.09 indicate a near neutral reaction for the analyzed lands. The main limiting factors identified are temporary excess moisture, compactification and reduced permeability of some soils.

• Results and discussions

According to the data presented in the analyzed work, vertisols predominate at the level of the town of Cenad, which occupy approximately 43% of the studied area, followed by alluviosols, with a share of approximately 37%. Chernozems represent about 7% of the surface, while gleiosols and solonets occupy smaller surfaces. This distribution highlights the importance of fine textured soils and those formed under the influence of water-borne material accumulation processes.



We carried out a case study to assess soils ', with the aim of achieving agricultural production which is as productive and efficient as possible. The case study carried out within the Cenad Farm aims at the pedological and agrochemical characterization of the soils in the analyzed area in order to evaluate the agricultural favorability for the fruit species proposed for reconversion.



Depending on the characteristics identified, the lands were classified in favorability classes for the species: apricot, cherry, apple.For the favourability interpretation the following classes were used:

Class	Interpretation
Class I	Very favourable
Class II	Favourable
Class III	Moderately favourable
Class IV	Slightly favourable
Class V	Unfavourable

Based on all the analyzed indicators, the soils were grouped into agricultural quality classes for the fruit species proposed for reconversion.

Soil type	Apricot	Cherry	Apple
Cambic chernozem	Class I	Class II	Class I
Glysed chernozem	Class III	Class III	Class II
Alluviosol	Class II	Class II	Class II
Loamy-clay soil	Class II	Class II	Class I
Compacted clay soil	Class III	Class III	Class III