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## SOIL CHARACTERISTICS IN THE BELIU AREA, ARAD COUNTY

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**Abstract:** The paper proposes a detailed analysis of the soils in the Beliu area, Arad County, with the aim of evaluating their characteristics, structure, texture and capacity to support various agricultural crops. The Beliu area is distinguished by its varied soils, which directly influence local agricultural activities and have a significant impact on crop yields. The predominant soils in this region are made up of a combination of sands and clays, which influences both drainage and water retention capacity, essential factors for choosing appropriate crops. The agricultural area is mainly used for cereal and leguminous crops, but also for fruit crops, which benefit from the favorable soil and climate conditions. The paper also analyzes the impact of fertilization and irrigation techniques on soil quality and agricultural productivity, highlighting the importance of resource management to maintain the sustainability and fertility of the soils in this area. This theoretical research aims to provide a deeper understanding of the relationship between soil typology and crop choice, contributing to the optimization of agricultural production.

### • Introduction

The quality of the land (soil) in the pedological context of the Beliu area, Arad county, represents the set of fundamental properties and characteristics of the soil, established through topographic, geological, geomorphological, pedological and agrochemical analysis. These defining features make a portion of land in this region stand out from others, having a higher or lower agricultural potential, depending on the nature of the soil and local factors.

According to FAO terminology, “land quality” is understood as a complex of factors that influence the sustainable use of land for agricultural purposes. The term “land” refers to soils, landforms, climate, hydrology, vegetation and fauna, also integrating land management practices, such as land improvements and management technologies used to optimize the agricultural potential of the area.

The situation of lands affected by compaction and acidification (tab. 1)

settlement			acidified		
low	moderate	strong excessive	low	moderate	strong excessive
1063	2109	818	884	3663	399

The situation of lands affected by excess surface and groundwater moisture (tab. 2)

excess surface moisture			excess groundwater moisture			
low	moderate	strong excessive	low	moderate	strong	Very strong excessive
1320	870	99	295	2537	433	19

### • Material and method

From a climatic point of view, the researched area falls within a temperate continental climate with oceanic and sub-Mediterranean influences with average annual temperatures between 10.5°C - 11.0°C and average annual precipitation between 550 and 600 mm.

City	Arable	Pasture	Rough	Totally agricultural	Forestry	Water	Other categories	Total area
Beliu 1960	3695	1846	29	5570	3050	131	521	9272

The cadastral territory of Beliu commune covers a total area of 9,272 hectares, of which 5,570 hectares are agricultural land, while the remaining 3,702 hectares consist of forests, water bodies, and other functional land categories (as shown in Table 3). This area is located in the western part of Romania, in the Crişana region, near the border with Hungary, at the geographical coordinates 46.4° north latitude and 21.7° east longitude. The diversity of landforms is the result of interactions between geomorphological, geolithological, climatic, and hydrological factors, as well as anthropogenic influences, which have contributed to the formation of varied ecological and edaphic conditions.

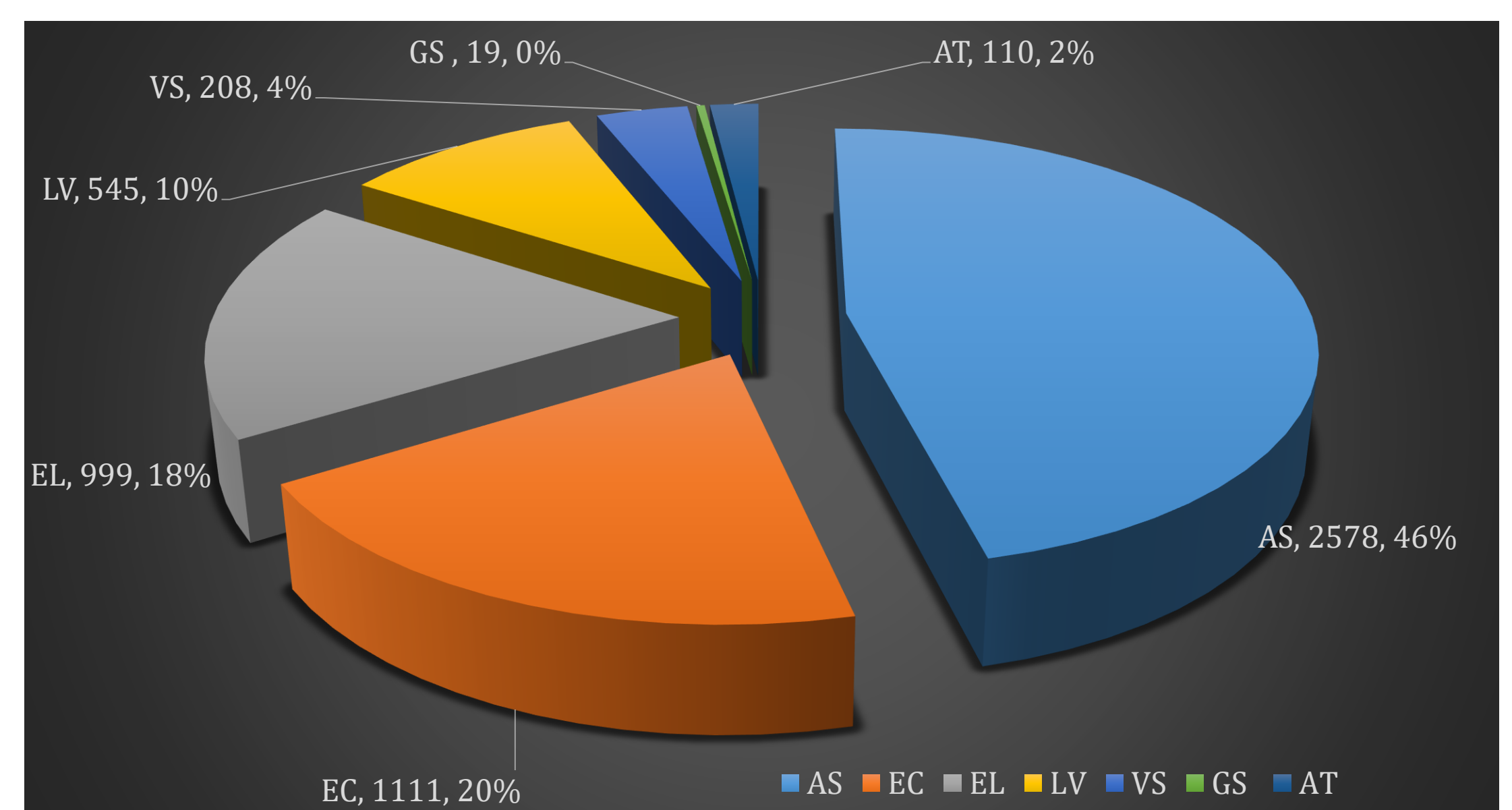
## Results and discussions

- Beliu Commune, located in Arad County, Crişana region, Romania, is composed of six villages: Beliu (the administrative center), Beneşti, Bochia, Secaci, Tăgădău, and Vasile Goldiş. The locality lies at the foothills of the Codru-Moma Mountains, near Pleşu Peak, in a transitional area between the Western Hills and the Pannonian Plain, approximately 77 km from the city of Arad.
- In the studied area, the soil cover consists of alluvial soils (aluviosols), eutric cambisols, preluvosols, luvisols, vertisols, gleyic soils (gleysols), and anthrosols. These soil types, through their geobiochemical and morphological properties, reflect the essential conditions influencing the growth and productivity of cultivated crops. Based on the assessment of these characteristics, the agricultural land—covering an area of 5,570 hectares—was classified into quality classes according to the national soil rating system.

Quality classes for the *arable* land use category (ha) (tab. 4)

TERRITORIAL ADMINISTRATIVE UNIT BELIU	Surface	Year of execution	Class I (81-100)	Class a II-a (61-80)	Class a III-a (41-60)	Class a IV-a (21-40)	Class a V-a (0-20)	Weighted average grade
Arable Ha	3695	2025	123	703	1865	683	321	37
Pasture	1846	2025	845	246	719	36	0	28

Soil types in Beliu, Arad County



### • Conclusions

The soil evaluation in Beliu commune highlights a relevant pedological diversity, favorable to agricultural practices. The arable lands, predominantly composed of soils with medium to high fertility, provide good conditions for crop cultivation. However, the presence of limiting factors requires the implementation of specific improvement measures to maximize the productive potential of the area.