

# THE SOIL SUITABILITY WITHIN THE BORDERS OF THE MUNICIPALITY OF BUŽIM FOR THE APPLE (*MALUS DOMESTICA*) CULTIVATING

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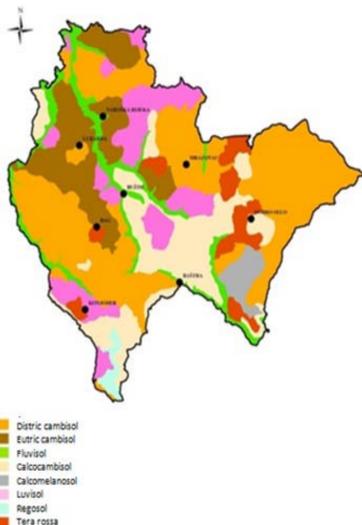
## INTRODUCTION

Bužim Municipality is located in the southern part of the northern temperate climate zone and is influenced by continental air currents. Administratively and geographically, it is a part of Una-Sana Canton, i.e. Federation of Bosnia and Herzegovina and it covers the total area of 13.026,27 ha (Ičanović M., 2016). There are two repartitionsof soils/land with associated classes and types, namely automorphic/terrestrial and hydromorphic soils (Ičanović M., 2016). The total of eight types of soils has been identified: regosol, calcomelanosol, calcocambisol, terra rossa, eutriccambisol, districcambisol, luvisol and fluvisol, and six land capability classes including two related land capability subclasses. The purpose of research is to assess the suitability of soil in the Municipality of Bužim for apple cultivating. The research resulted in definition of three soil classes suitable for apple cultivating: S1 (1,23) and S2 (5,51%) and S3 (2,29%) and one N class of unsuitable soil with 36.38%.

## MATERIALS AND METHODS

The soil/land as the subject of suitability assessment encompasses a wide array of different suitability factors required for the assessment of the intended use of space (FAO, 1976 and Vidaček et. al. (n.d.)). The applied model of agro-ecological zoning is the methodology used for assessing the suitability of soil for agricultural production. AEZ system is used in order to determine the specific limitations for crop cultivation in certain climate, soil and terrain conditions. A detailed description of the AEZ method used in this research can be found in FAO Guidelines on Agro-ecological Zoning (FAO Soils Bulletin 73, Rome, 1996). The soil map at the scale 1:25000 of the Municipality of Bužim was used as the basis for the development of this research. The data on boundaries of agrozones was obtained from The Federal Agro-Pedological Institute, and the data on climate were obtained from the Federal Hydrometeorological Institute. Reconciliation of specific requirements of crops, defined by LUT, with the parameters of soil texture, reaction, contents of organic carbon and soil depth, renders the degrees of soil suitability for cultivation of certain crops. The interaction of these parameters results in the final form for land utilization planning.

## RESULTS AND DISCUSSION



Map 1 Soil Map of Bužim Municipality

There are two soil orders in the Municipality of Bužim: automorphic/terrestrial and hydromorphic soils. Situated out of reach of the flooding or underground waters and characterized by water percolation through solum, automorphic soils are the dominant ones (Ičanović M., 2016). Due to denser net, the quality of data presented and the comprehensiveness of the research probes and profiles, eight soil types were observed in the research area and the soil map was developed at the scale of 1:25 000.

Table 1. Occurrence of soil types in Bužim Municipality

Soil/land type	Area (ha)	Occurrence (%)
Regosol	128,01	0,99
Kalkomelanosol	331,60	2,54
Calcocambisol	2.272,20	17,45
Eutric cambisol	1.867,45	14,33
Distric cambisol	5.266,51	40,42
Rossa	709,16	5,44
Luvisol	1.550,98	11,91
Fluvisol	900,31	6,92
<b>Total</b>	<b>13.026,27</b>	<b>100,00</b>

### S1 class

The S1 class occupies only 1.23% of the total area of the Municipality or 159.52 ha. Administratively, we find this convenience class at five localities in the Municipality. The first locality of this class is in the local community of Konjodor, to the left of the regional road towards Pajalići.

### S2 class

The S2 apple growing class in the municipality occupies predominantly the peripheral parts of the municipality and some small central part. These are also areas with lower altitudes, located in Jusufovići, from the bridge to the intersection for the town of Jušići, and this is an area marked on the pedological map with the fluvisol soil type.

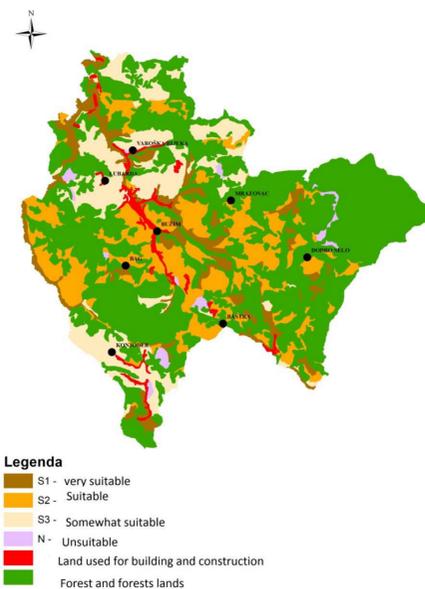
### S3 class

The S3 cultivation convenience class occupies only 2.29% of the total area. This class is encountered in multiple locations with smaller or larger complexes. One such complex is located in the towns of Urija and Velići, towards Kobiljak and Njivice. This area is to the left of the center of the Municipality, quite populated and intertwined with road communication.

### N class

The largest part of the territory of the Municipality is designated N class (unfavorable), with as much as 36.38% of the total territory of the Municipality. The highest concentration of N class occupies mostly the central and southern part of the Municipality, and no eastern areas are excluded, as can be seen on the map of suitability. It is very important to note that the N class of unfavorable land occupies the largest areas of the municipality of Bužim with 36,68 and 4,772.60 ha. The reasons for the extremely high percentage of this class are certainly the depth of the soil, which is mostly not suitable for apple cultivation (N convenience class 30.82% of the total municipality area) and organic carbon content, which is also dominated by the percentage of N class unfavorable land, with 18.21% of the total area of the Municipality. Also, one part of the municipality is built land with an area of 1.77%, as well as forests and forest land with a total area of 52.53%. It is very important to emphasize here that there are no intensive apple orchards in the municipality, just individual trees mostly, which the locals have as a part of gardens, and the fruits are used for their own needs mostly in the fresh state and mostly indigenous apple varieties.

Suitability for potato cultivation within the municipality of Bužim



Map 2. Land use capability map of Bužim Municipality



## CONCLUSION

Four classes of benefits are distinguished in relation to the overall suitability of the apple growing land. The S1 class occupies only 1.23% of the total area of the Municipality or 159.52 ha. It is represented in the following places: Konjodor, Pajalići, Pehlića Kosa, Čava, Radoč, Cinska Dolina, Čaglica. The S2 class in the municipality occupies mostly marginal parts and covers a total area of 5.51% or 717.24 ha. The S3 class occupies only 2.29% of the total area. The N Class of unfavorable land occupies the largest areas of the pilot study area with 36.68% or 4.772,60 ha. The reason for the very high percentage of this class is certainly the depth of the soil, which is mostly not suitable for apple cultivation (N class 30.82% of the total area of the Municipality) and organic carbon content, which is also dominated by the percentage of N class unfavorable land, with 18.21% of the total area of the Municipality. It is very important to emphasize here that there are no intensive apple orchards in the municipality and they are mostly individual trees, which the locals have as a part of gardens, and the fruits are used for their own needs mostly in the fresh state and mostly indigenous apple varieties.

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