SOILS AND AGRICULTURAL SYSTEM IN SÂNPETRU MARE, TIMIS COUNTY, ROMANIA: A CASE STUDY

Andrada GAVRA[1], Florina Nicoleta BOJINESCU[1], Casiana MIHUT[1], Adalbert OKROS[1], Anișoara DUMA-COPCEA[1]
[1] ***University of Agricultural Sciences Banat Veterninară „King Michael I of Romania" Timisoara, Arad Way, no. 119, Romania, Phone: +4025627475, Fax: +40256200296,***
email casiana_mihut@usab-tm.ro

Abstract: *This case study was carried out in the village of Sânpetru Mare from Timiș county, for a period of thow years, respectively in 2018 and 2019. The paper makes a brief presentation of the soils in this area and of the way of their use, depending on fertility class, respectively their suitability. The town of Sânpetru Mare, has a total area of 19,852 ha, of which the agricultural area is 18,836 ha, having the following uses: 15,539 ha arable land; 3,110 ha of grassland; 167 ha of hay, 9 ha of living and 11 ha of orchards. For the arable land use category, the soils are divided into five quality classes. The largest surface, of 33.58% is classified in class III -a, followed by class II, with 29.83% and class I -a, with 20.13%. The soils encountered in this area were classified in the following classes: the class protisols, through alluviosols; the Cernisols class, through the chernozems; Vertisols class, through vertosols; Hydrisols class, through gleiosols and Salsodisols class, through solons. Most of the inhabitants of the commune deal with agriculture, either as a main occupation or as a secondary occupation. Among the crops, the largest areas are occupied by wheat, maize, sunflower, barley, oats, and triticale. The vegetables occupy small areas, although the soils in the area are suitable for growing vegetables, especially alluviosols and chernozems, but due to the low and unevenly distributed rainfall during the vegetation period and the high temperatures, in the absence of irrigation systems, the crops have to suffer and the yields obtained they are low and of poor quality. Vegetable culture is practiced only in the personal gardens, where the inhabitants of the commune have a source of water within reach and in this way it is possible to irrigate them. Moreover, the vine-growing plantations occupy small areas, the land being generally flat and the groundwater being at shallow depths of less than 2.5 m, is not suitable for the cultivation of fruit trees and vines.*

***Key words*:** case study, soils, agricultural systems, agricultural crops, climatic conditions

INTRODUCTION

Sânpetru Mare is part of the Timiș County and is 55 km from Timisoara and 14 km from the nearest town, Sânnicolau Mare. (ANIȘOARA BĂRBĂLAN, LAURA UNIPAN, BOLDEA M., ANTOANELA COZMA, MIHAI D., 1999; COLȚAN OCTAVIUS, CIOLAC VALERIA, PEȚ ELENA, PEȚ I, NISTOR ELEONORA, 2014; L. NIȚĂ, K. LAȚO, SIMONA NIȚĂ, ALINA LAȚO, CASIANA MIHUȚ, ANIȘOARA DUMA COPCEA, 2012; OKROS ADALBERT, 2015) The commune is made up of Sânpetru Mare, Igriș and Saravale (Figure 1).

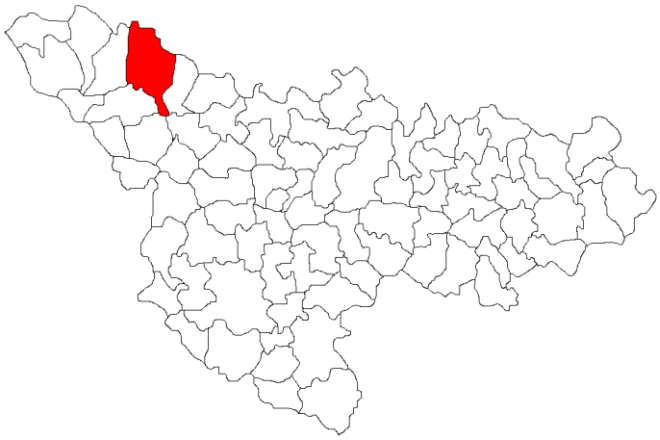

Fig. 1. Location of Sânpetru Mare

The climate specific to this area is temperate-continental, with weak Mediterranean influences, manifest in mild winters and not too warm summers, an average annual temperature of 10.8°C, and an average multiannual rainfall value of 536.3 mm (after the Meteorological Station Sânnicolau Mare) (GOIAN M., IANOȘ GH., RUSU I., 1993; BORLAN Z., HERA CR., 1973; CIOLAC VALERIA, NISTOR ELEONORA, POPESCU C., BĂBUCĂ N., DIRLEA AURUȚA, BÂRLIBA LIVIa, 2013).

The municipality stretches over an area of 19,852 ha, of which 18,836 ha is agricultural land; it is located in the Mureș-Aranca Plain in the northwest of the Banat Plain. It is made up of Sânpetru Mare, Igriș and Saravale (AURELIA PURDA, A ŢĂRĂU, D. DICU, L.NIȚĂ, 2013; MIHUȚ CASIANA, RADULOV ISIDORA, 2012).

MATERIAL AND METHOD

The data used in this paper was obtained from the field research, from the studies processed from the O.S.P.A. archives Timișoara, from the town hall of Sânpetru Mare, and from the agricultural holdings in the village area.

Following these studies and research, we have made a synthesis of the data obtained.

RESULTS AND DISCUSSION

Based on data from the O.S.P.A. archives Timișoara, respectively from the pedological study of the Sânpetru Mare territorial-administrative unit, of the agricultural area of 18,836 ha, the following types of soil (related or totally different) were identified:

1. Alluviosol, (eutric, gleic, mollic, mollic-salty), 2335,66 ha, 12,4%
2. Chernozem, (typical, cambic, alkalised cambic), 7553,24 ha, 40,01%
3. Vertosol, (gleic, alkalised, alkalised gleic), 4407,62 ha, 23,40%
4. Gleisol, (mollic, salsodic, vertic), 94,18 ha, 0,50%
5. Solonets, (gleic, salty), 659,26 ha, 3,50%
6. Soil associations, 3786,04 ha, 20,19%.

As regards the agricultural land of the commune, it has the following uses: arable 15,539 ha (85.9%), grassland 3,110 ha (13.8%), meadow 167 ha (0.2%), vineyards 9 ha, and orchards 11 ha (0.1%). In the two study years, arable land, which otherwise occupies the largest area of the commune, was generally cultivated with cereals, vegetables, legumes, and fodder crops (Tables 1, 2, 3, 4, 5, 6, 7, 8).

Table 1.

Cereal-cultivated area and production in 2018

Culture	Area harvested (ha)	Production yields (t)
Common autumn wheat	1953	11920
Common spring wheat	21	105
Autumn triticale	35	161
Barley	180	846
Barley in autumn	9	36
Spring barley	1	4
Autumn oats	20	86
Corn beans	1328	11421

Table 2.

Vegetable-cultivated area and production in 2018

Culture	Area harvested (ha)	Production yields (t)
Total beans	2	3
Oily plants	687	1971
Sunflower-total	610	1816
Rape	27	55
Soy beans	50	100
Potatoes in their own fields	145	1980
Early and semi-early potatoes - total	10	120
Summer potatoes - total	15	180
Autumn-total potatoes	120	1680

Table 3.

Legume-cultivated area and production in 2018

Culture	Area harvested (ha)	Production yields (t)
Field vegetables and solariums	139	
- tomatoes	8	96
- early and summer	5	70
Dried onions	6	80
Dry garlic	5	10
Cabbage	9	
- early and summer	3	30
Pepper-total	9	87
Cucumber-total:	2	24
Root-total:	7	77
- carrot	4	40
You kept peas	3	4
Totally preserved beans:	3	5
Eggplants	4	40
Cauliflower	2	16

Other vegetables-total	81	480
Watermelons total	8	170
Yellow-total melons	1	18

Table 4.

Fodder crop-cultivated area and productions in 2018

Culture	Area harvested (ha)	Production yields (t)
Feed plants	201	4065
Old and new perennials (green table equiv.)	19	
-in own hole	192	3840
-lantern for hay and green table (equiv. green table)	186	3720
Plants for silage - maize for silage	9	225
Perennial-seed grasses	5	4
Natural pastures in use (in green mass equivalent)	667	3000
Natural hay in use (in green table equiv.)	8	36

Table5.

Cereal-cultivated area and production in 2019

Culture	Area harvested (ha)	Production yields (t)
Common autumn wheat	1780	10.065
Autumn triticale	68	312
Barley	192	806
Spring barley	20	62
Autumn oats	16	48
Wheat / total corn	1266	5538

Table 6.

Vegetable-cultivated area and production in 2019

Culture	Area harvested (ha)	Production yields (t)
Total beans	4	3
Oily plants	780	1401
Sunflower-total	690	1230
Rape	45	135
Soy beans	45	36

Table 7.

Legume-cultivated area and production in 2019

Culture	Area harvested (ha)	Production yields (t)
Potatoes in their own fields	150	1575
Early and semi early potatoes	15	170
Summer potatoes	15	160
Autumn potatoes	120	1245

Table 8.

Fodder crop-cultivated area and productions in 2019

Culture	Area harvested (ha)	Production yields (t)
Field vegetables and solariums	156	1256
Tomato-total	8	101
-time and summer-total:	5	71

Culture	Area harvested (ha)	Production yields (t)
Dried onions	8	94
Dry garlic	5	18
Cabbage-total	9	162
-time and summer-total:	3	42
-of autumn-total:	6	120
Pepper-total	9	90
Cucumber-total:	2	18
Root-total:	7	63
carrots-total:	4	30
You kept peas	3	33
Totally preserved beans:	3	2
Eggplants	5	55
Cauliflower	3	30
Other vegetables-total	99	590
Watermelons	10	180
Melons	2	15

CONCLUSIONS

Sânpetru Mare has a total area of 19,852 ha, of which 18,836 ha is agricultural land, with the following uses: 15,539 ha arable, 3,110 ha grassland, 167 ha meadow, 9 ha vineyards, and 11 ha orchards.

As for arable land, there are five high quality soil classes: 33.58% is class III – A, followed by class II, with 29.83% and class I – A, with 20.13%.

Soils in the commune area are part of the following classes: protisols (alluviosols), chernisols (chernosioms), vertisols (vertosols), hydrisols (gleiosols), and salsodisols (solonets).

In the first year of research, 2018, the largest area was cultivated with cereals and especially with autumn wheat (1,953 ha), followed by maize (1,328 ha) and oil plants and sunflower (1,297 ha).

In 2019, the area cultivated with cereals decreased: from 1,953 ha in 2018, to 1,780 ha in autumn wheat; 1,266 ha in maize. In exchange, the area cultivated with oil plants and sunflower reached 1,470 ha.

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