SOIL RESOURCES AND THEIR FAVORABILITY FOR THE MAIN AGRICULTURAL CROPS IN THE SPACE BETWEEN CRIȘU ALB AND MUREŞ

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Abstract. *The purpose of the undertaken research finds its origin in the current scientific and practical concerns regarding the accumulation of knowledge about the characteristics of the edaphic cover and its structure, in order to establish favorability for the main agricultural crops and for the choice of sustainable management systems of soil and land resources. The problem addressed refers to an area of 220351 ha, (of which 190281 ha (86.35%) are agricultural land and 8323 ha (3.78%) of forests, located in the plain between Crisu Alb and Mureș, the space taken into account and the zonal peculiarities of it determining a great diversity of ecological conditions, generated by the variability of the factors that compete to create the environment in which plants grow and give crops. The work provides basic knowledge and methodological elements for the evaluation and characterization of soil and land resources, in the hope that the information presented will arouse the interest of the decision-maker so that in the near future, the agricultural research and practice, together with the protection of the environment, will make efforts for the development of interdisciplinary studies .*

Keywords: *land, soil, resources, favorability, agriculture*

INTRODUCTION

Among the determining factors and physical geographical conditions of the environment in which plants grow and produce crops, soil resources present a major component, which has the role, on the one hand, of a complex indicator of the state of evolution of the properties that determine the growth of plants and, on the other on the other hand, as a depository of the influence of all other conditions and factors. Numerous studies and researches at the national level have highlighted the fact that the soil is in a close relationship with the elements of the surrounding environment, from the immediate vicinity, through a continuous flow of matter and energy, the phytocenoses acting on the soil both directly and indirectly (Borcean et al., 1996,.Coste et al.,1997,.David et al., 2018,.Dumitru et al., 2000, Ianoș et al. 1997, Iliuta A.Ș., 2015, Munteanu, 2000,.Rogobete et al., 1997, Teaci,.1980, 1983, Ţărău et al..2017,20182019).

Considering these considerations, the paper presents a series of processing/adaptation data from the work "Lands and places between the Danube-Vârful Gugu-Crișu Negru", D. Tărău et al, 2019 prepared on the basis of the existing pedological information in the OSPA archive from Arad and Timișoara, mostly on classical support, as well as on the basis of the SPED1 information system and the BDUST-B system (ICPA Bucharest) but also on the basis of the research carried out over time by the authors (within OSPA and USAMVB), some aspects regarding the characteristics of soil resources as elements that define their fertility and favorability for the main cultivated plants in order to ensure, for land users, specialized support for the development of sustainable management programs.

MATERIALS AND METHODS

The problem addressed refers to a surface area of 220351 ha (table 1) of which 190281 ha (86.35%) are agricultural land (160652 ha, respectively 72.91% being arable land) and 8323 ha (3.78%) lands with forest vegetation located in the plain between Crişu Alb and Mureş, which from an administrative point of view belong to a number of 27 territorial administrative units (UAT) in Arad county.

Table 1

The situation of the land fund *

No.	failed	Arable	GRASSLAND	Rough	Are you coming	orchards	Agricultural	Total
1	Arad	6448	24	0	1	8	6481	7680
2	Chişineu-Criş	6269	2599	662	0	25	9555	11729
3	Covăsânţ	2581	255	17	322	0	3175	3754
4	Curtici	6500	186	0	0	0	6686	7206
5	Dorobanţi	2387	224	1	-	-	2612	2811
6	Ghioroc	2641	687	39	536	6	3909	4890
7	Grăniceri	5072	2090	0	0	0	7162	7883
8	Iratoş	3866	127	25	0	0	4018	4641
9	Livada	1418	273	7	0	2	1700	2007
10	Macea	5367	1224	0	2	0	6593	7241
11	Nădlac	11701	364	39	3	9	12116	13315
12	Olari	3461	897	50	0	0	4408	5013
13	Pecica	17886	741	173	0	2	18802	23717
14	Peregu Mare	3018	0	0	0	0	3018	3305
15	Pilu	4121	2106	174	0	0	6401	7188
16	Sântana	8636	1153	21	24	26	9860	10714
17	Seleuş	4114	1062	0	0	8	5184	5646
18	Sintea Mare	6944	1438	175	-	7	8564	10889
19	Semlac	7237	52	0	0	9	7298	8311
20	Socodor	6329	3416	451	0	1	10197	11944
21	Şimand	8517	923	4	1	8	9453	10188
22	Şiria	8502	2312	235	1051	7	12107	13673
2. 3	Şeitin	5749	315	16	0	0	6080	6604
24	Şofronea	2621	239	12	0	0	2872	3490
25	Vladimirescu	8519	153	9	6	13	8700	12130
26	Zărand	4265	2178	65	1	0	6509	7031
27	Zimandul Nou	6483	311	0	0	27	6821	7351
	Totally ha	160652	25349	2175	1947	158	190281	220351
	%	72.91	11.50	0.99	0.88	0.07	86.35	100

*processing/adaptation from the work "Lands and places between the Danube-Vârful Gugu-Crişu Negru", D. Tărău et al, 2019

The research of the ecopedological conditions was carried out in accordance with the "Methodology of Elaboration of Pedological Studies" (vol I, II, III) elaborated by ICPA Bucharest in 1987, completed with specific elements from the Romanian Soil Taxonomy System (SRTS-2012), as well as other normative acts updated by MAAP Order 223/2002, respectively MADR Order 278/2011, based on the pedological information accumulated in the archive of OSPA in Timişoara (over 65 years), but also based on the research carried out over time by the authors (within OSPA , USAMVB from Timişoara), studies that were completed with elements recently collected from the field.

RESULTS AND DISCUSSIONS

The researched area is located in the Banato-Crișan Plain, part of the Western Plain of Romania, falling within the Plain between Crișu Alb and Mureș which includes a wide variety of geological formations and several geomorphological units that can be grouped as follows: Crișurilor Plain Subunit , which includes the Crișului Alb Plain and the Mureș Plain Subunit, which consists of the Nădlac Plain and the Arad Plain with its four subunits: the Șiriei Plain, the Curticiului Plain, the Livada-Arad Plain and the Ierului Plain, .

Of these, the Crișului Alb Plain is the largest, being the only one of the low plains that extends widely to the bottom of the hills (Dealul Momei) through the slightly arched bay of Sebișului, on a line of about 20 km between Beliu and Chisindia (Gr. Posea 1997).

The main axis of the plain develops between three hydrographic arteries: Crișul Alb, Canalul Morilor and Teuz, being made up of a succession of discharge cones of the Crișul Alb with the appearance of meadows and subsiding alluvial plains.

The general aspect of the relief is given by the average altitude of around 100 m and the small slope of its inclination, with a value of 0.5%, a fact that influences the water flow, the valleys presenting a pronounced meandering and rambling, and in some sectors with a instability of the main watercourses.

That is why the need was felt for these rivers to be channeled and dammed to remove the danger of floods to which the neighboring areas were exposed.

Located north of Mureș between the Zarandului Mountains in the east and the Nadlac Plain in the west, plus the border with Hungary, the Arad Plain represents a newer area than the Nădlac Plain.

This plain, covered with a thin blanket of loess, up to 2 m, presents in some places two levels, a slightly higher and older level and another lower in the form of wide and strongly meandering beds, which they meandered at the level of the meadow old, some branches of Mureș (Matca, Ieru).

After the distribution and domination of these lower portions, it can be divided into four subunits (plus the Mureș meadow).

Siria Plain representing the eastern part of the Arad Plain (the respective unit crossed by the Matca canal, an old branch of the Mureș) develops from under the Zarand Mountains, on a foundation ridge, which gives it a slight subsidence (to the west) and towards the Zarand Mountains, climbing into the planted glacis with vines (Măderat – Miniș). the entire plain of Arad.

Curtici Plain it extends to the north of an old branch of the Mureș that started from Păuliș, meandered north of the Livadei Plain and continued on Ier and Soroz (Hungary).

In this sector, the old confluence area of the Mures is manifested today by the alternating existence of clay and loess fields or even with non-flooding aeolian sand dunes and areas partially drowned by the covering of recent alluvium. Drowning under recent alluvium was more accentuated between the right arm of Mureș and the foot of the Zarand Mountains (with the meadows of Șiriea and Paulișeni interrupted by witnesses of the non-flooding field). Together with the "Island of Glogovățului", up to the approximate line of Socodor-Curtici-west Arad, we can speak of an old agestru of Mureș on which it wandered and scattered in several arms. (V Mihailescu, 1966). The local variation of the soils (wet and glaciated phreatic chernozems, cambic chernozems, solonets, island alluvial soils and sands), the granulometric variation of the parent materials, the reduced depth, but still different from place to place of the water table, also indicate the peregrinations of the river in the area .

Livada Plain (Livada-Arad) extended between the Curticiului Plain to the north, the Șiriei Plain to the east, the municipality of Arad (with Muresul mort) to the south and the

Ierului Plain to the west, it represents a characteristic relief of the drifting plains made up of a succession of fluvial beds and fluviolacustrine depression areas.

Thus, this plain in its greater part, a recent plain, although at first sight it appears as a flat surface, carefully researched, it can be found that it nevertheless presents frequent unevenness represented especially by abandoned meanders, micro depressions and beams (composed in generally of coarser materials).

The beams from place to place show higher elevations in the form of mounds, mostly with obvious anthropogenic influences.

• Ierului Plain

The Ierului plain continues to the west on that of the Livada, generally presenting the same characteristics, but being more strongly dominated by low areas resulting from the frequent meandering of the courses in the area. It includes a portion of the municipality of Arad.

Although it is located downstream of the lower plain of Arad (Gr. Posea 1997) the Nădlacui Plain is the second oldest, representing a continuation towards the northwest of the lower part of the Vingăi Plain (at the level of the terrace with numbers 2 or 3), being considered within the mentioned complex the plain with the thickest layer of loess (10-20 m) with 3-5 fossil soils. This continuation is made along the distance between Secusigiu and Zădăreni (west of Arad) on the one hand and Pecica-Șeitin on the east (from the Plain of Nădlacui) on the other hand. Including here the Pecica area, the southern limit of the plain is given by the Mures meadow in the east after a conventional limit with the lower part of the Arad Plain, respectively the Ierului Plain, and in the north and west the state border with Hungary.

The origin of the plain between Crişu Alb and Mureş is attributed to the evolution over time of the Pannonian Depression whose foundation formed by a massive crystalline block (Tisa) following vertical movements, predominantly antagonistic, was fragmented into a series of blocks of small dimensions, which underwent sinking movements of different intensities.

From a lithological point of view, the researched area is made up of fluvial-lacustrine successive layers with a cross structure, very uneven in thickness and extent represented by clays, clays, marly clays and sands in which loessoid materials appear in islands.

The parental material is represented by fluvial deposits, fluviolacustres, respectively carbonated clays (rarely non-carbonated), swelling clays.

In general, both parent and underlying materials have variable amounts of CaCO3 in their composition. Also, these material materials often contain inside them, in addition to plant remains in advanced stages of decomposition, soluble salts (especially sodium), representing one of the causes of the formation of halomorphic soils.

From climatic point of view**,** the researched territory is characterized by a moderate temperate continental climate with shorter and milder winters, being specific to it a certain circulation of air masses of various types, circulation impressed either by centers of action of dynamic origin (the Azorean anticyclone and the subtropical), or by seasonal thermal action centers (Siberian anticyclone, Asian or Mediterranean depression).

The researched area is therefore under the interference of air masses that have an oceanic character of western origin, which most of the time arrive here with a higher degree of continentalization, and continental ones, of eastern origin, but frequently being under the influence of some warm air masses of southern origin crossing the Mediterranean Sea. According to Köpen's climate maps (1931), the researched perimeter falls within the climate province cfbx

According to the value of the aridity index (29.0 – 30.5) and the hydroclimatic index (Ih = precipitation/evapotranspiration x 100) which show values of 87 – 89, the studied area falls into the class of slightly deficit average annual balance (with the tendency drying).

To characterize the specific climatic conditions, data from the meteorological station Arad, Ghioroc and Chișinău Criș, from the Bucharest INMH network, located at altitudes of 130 m (Ghioroc), 100 m (Arad) and 87 m (Chișineu-Criș) were used.

The multiannual average temperature is 11.2ºC (Ghioroc), 10.3ºC (in Arad and Chișinău-Criș), and the multiannual average precipitation is: Arad (611 mm), Chișinău-Criș (567.6 mm), Ghioroc (661, 1 mm).The average amounts of precipitation would ensure favorable conditions for most of the cultivated plants if they had an appropriate distribution over the months and uniform values were recorded over the years.

Also, some deviations from the multiannual rainfall averages appear due to some local conditions: meso- and microrelief forms, granulometric composition, the existence of pedo-ameliorative systems in the area.

Referring to the natural vegetation that has succeeded until now in the Western Plain of Romania (therefore also to that of the studied area) Oprea CV et al., 1974 mention the following formations: marshland (today occupying very small areas in depression areas) and that of forest-steppe (subjected in recent years to obvious aridification trends, signaled by the increase in the attack of rodents, insects, fungi, etc.).

From a phytogeographic point of view, the studied area belongs to the Central European geobotanical province, strongly influenced by the vicinity of the South European geobotanical province.

Thus, a series of endemisms can be added to the natural floristic elements with different geographical origins: European, Eurasian, boreal, Balkan, Mediterranean, Illyrian.

The morphological features of the plain relief, along with the climatic ones and the surface deposits, offer a series of particularities to the hydrographic network, as well as the hydrogeology of the Arad Plain, it can be observed that the hydrographic network is dominated by the presence Mureșului, (the most important water course in the region), river that influenced the morphogenetic evolution of the southern sector of the Arad Plain. Along with the Mureș river, which borders the southern side of the plain, through a corridor, we also have the Crișu Alb river, a direct tributary of the Tisa river, after the confluence with the Crișul Negru.

Qin the plain sector the Crișul Alb is dammed, and at Buteni the Morilor Canal was built on the left, with a length of 83.5 km, after in Seleus it passes through a siphon under the Cigherului course and the Matca Canal. The Morilor Canal discharges its waters into the Ciohoș Canal and thus returns to Crișul Alb upstream with the Hungarian border

The Matca Canal connects Mureș and Crișul Alb. It has a length of 41.2 km. The maximum flow rate is 20 m3/s, and the average flow rate is 4 m3/s. Water intake is done from the Mureș river through the water intake from Păuliș

Qin the area of Câmpia Șiriei, downstream of the Sebiș spilling into the Crișul Alb, the Teuz River drains, occupying an abandoned bed from the north of the discharge cone of the Crișul Alb and having the role of a submontane collector.

The Ier-Turnu-Dorobanti sector is drained by the Ier, adapting to an abandoned course of the Mureș.

The Ier Canal was built in a first phase between the years 1890-1900 and then completed with the Turnu-Sânpaul, Sederhat, Sânleani and Arad-Pecica canals; between the years 1938-1939, the connection with Crișul Alb was made through the Utviniș-Șimand canal.

Living expression of the pedo-hydro-climatic and floristic conditions, as well as due to human intervention (starting with those from the pre-Roman period until now), the soils in the researched area present a great diversity, according to the Romanian Soil Taxonomy System (SRTS-2012).) within the space designated by the area of the 27 cadastral territories, 14 types of soil being identified Litosols, Regosols, Psamosols, Alluviosols, Cernozols, Phaeozools,

Eutricambosols, Preluvosols Vertosols, Pelosols, Stagnosols, Gleiosols and Anthrosols (tab. 2) with numerous detailed units , respectively homogeneous ecological territories (TEO), characterized by credit rating and technological characteristics for each portion of the administrative territory, according to unitary methodologies.

Table 2

The main types of soil

	Unit. Ad. territory (UAT)	Agri Ha 2014	Soil type, subtype											
			LS	AS	CZ	FZ	EC	EL	VS	PE	SG	GS	SN	AT
1	Arad	6481	-	1962	2102	-	1603	-	125	133	-	358	198	
2	Chişineu-Criş	9555	-	913	1928	-	922	-	754	2266	-	228	2544	-
3	Covăsânţ	3175	-	231	1000	593	1042	-	-	-	-	-	-	309
4	Curtici	6686	-	-	4728	201	599	-	247	905	-	-	-	6
5	Dorobanţi	2612	-	-	1735	-	-	-	294	583	-	-	-	-
6	Ghioroc	3909	65	38	-	-	3173	-	156	-	423	-	-	54
7	Grăniceri	7162	-	-	4255	14	-	-	129	344	-	365	2055	-
8	Iratoş	4018	-	-	3017	98	-	-	550	306	-	14	33	-
9	Livada	1700	-	-	292	-	434	-	974	-	-	-	-	-
10	Macea	6593	-	-	3024	-	652	-	210	2509	-	40	158	-
11	Nădlac	12116	- -	536	10956	-	-	-	214	-	-	159	251	-
12	Olari	4408	-	-	1109	-	55	-	2001	1136	-	71	36	-
13	Pecica	18802	- -	1824	11864	1372	56	-	1279	2068	-	-	301	38
14	Peregu Mare	3018	-	-	2671	347	-	-	-	-	-	-	-	-
15	Pilu	6401	-	563	1924	-	192	-	451	2253	-	53	965	-
16	Sântana	9860	-	-	5150	555	827	-	1165	2074	-	58	31	-
17	Seleuş	5184	-	509	-	-	3041	-	653	893	-	88	-	-
18	Sintea Mare	8564	-	1400	-	-	3904	-	1745	912	-	280	323	-
19	Semlac	7298	-	481	5087	1241	-	-	153	117	-	175	-	44
20	Socodor	10197	-	540	3416	-	20	-	2192	979	-	387	2663	-
21	Şimand	9453	-	-	6859	143	242	-	704	-	-	182	1323	-
22	Şiria	12107	242	569	7033	1114	654	1768	61	-	-	424	85	157
23	Şeitin	6080	-	827	5137	-	-	-	-	-	-	116	-	-
24	Şofronea	2872	-	-	1496	113	613	-	582	64	-	4	-	-
25	Vladimirescu	8700	27	833	71	-	3602	78	1864	2206	-	19	-	-
26	Zărand	6509	-	133	64	-	1365	-	2636	2044	-	114	153	-
27	Zimandul Nou	6821	-	-	2671	972	2124	-	1054	-	-	-	-	-
	Totally ha	190281	334	11359	87589	6763	25120	1846	20193	21792	423	3135	11119	608
	%		0,27	5.97	46.03	3.55	13,21	0.97	10.61	11.45	0.22	1.65	5.85	0.32

The basic principle of the credit rating methodology developed in our country (D. Teaci, 1980, ICPA Bucharest, 1987) is that according to which for each unit of homogeneous ecological territory (TEO), within a territorial administrative unit, (UAT) defined according to of the current Methodology for Elaboration of Pedological Studies, using the 23 accreditation indicators, which are usually found in the pedological mapping works, prepared after 1987 by the territorial OSPA under the methodological guidance of ICPA Bucharest, their quality is established through

accreditation grades, to 1 to 100, as they result from determinations and calculations having a distinct ecological significance for each crop or use for which they were established, in the sense of specifying differentiated favorability and the possibility of obtaining harvests with different levels (D. Teaci, 1980), they reflecting the following aspects regarding:

- determining the vocation (pretability) of each piece of land in terms of the most appropriate use,
- determining the favorability of each piece of land to be cultivated with certain plants.

Favorability represents the extent to which a land satisfies the life requirements of a crop plant, under normal climatic conditions and within the framework of the rational use of the ecological offer, for which the lands are divided into 10 fertility classes (from 10 to 10 credit rating points for a certain culture) or five favorability groups (from 20 to 20 credit points), respectively: very favorable (81-100 points), favorable I (61-80 points), favorable II (41-60 points), slightly favorable (21-40 points) and unfavorable (1-20 points).

So, based on the pedological information processed according to the Methodology for Elaboration of Pedological Studies (ICPABucureşti 1987) and other normative acts updated by Order MADR278/2011, for the agricultural lands of the researched space, their favorability was established for the main crops: wheat (tab. 3) , barley (tab. 4), corn (tab. 5), sunflower (tab. 6) and soy (tab. 7).

Table 3

Agricultural land suitability classes for WHEAT (ha)

TERRITORIAL ADMINISTRATIVE UNIT (UAT)	agricultural	Class I (81-100 points) Ha	Class the II (61-80 points) ha	Class the III (41-60 points) ha	Class the IV (21-40 points) ha	Class of Va (0-20 points) ha	Weighted average grade
Arad	6481	2859	1380	1736	389	117	**72**
Chișineu-Criș	9555	2275	0	4388	636	2256	**48**
Covăsânț	3175	978	1059	904	95	139	**65**
Curtici	6686	1976	3094	883	726	7	**66**
Dorobanți	2612	400	1292	37	823	60	**59**
Ghioroc	3909	180	340	2404	356	629	**50**
Grăniceri	7162	1475	1611	1089	523	2464	**48**
Iratoș	4018	1671	482	1519	8	338	**71**
Livada	1700	515	461	490	102	132	**64**
Macea	6593	1501	2560	1535	792	205	**64**
Nădlac	12116	7648	2305	1328	698	137	**80**
Olari	4408	0	1656	2351	234	167	**57**
Pecica	18802	790	13443	2388	1203	978	**62**
Peregu Mare	3018	2837	181	0	0	0	**98**
Pilu	6401	1598	548	3073	447	735	**56**
Sântana	9860	5123	3597	313	768	59	**74**
Seleuș	5184	700	998	2604	797	85	**57**
Sintea Mare	8564	1396	1181	3459	610	1918	**49**
Semlac	7298	3598	2649	781	226	44	**79**
Socodor	10197	1141	1010	5109	337	2600	**44**
Șimand	9453	1725	5380	1696	182	470	**64**
Șiria	12107	5206	3511	1259	1150	981	**69**
Șeitin	6080	4888	511	0	681	0	**89**
Șofronea	2872	1689	698	330	92	63	**75**
Vladimirescu	8700	1320	1342	2476	3044	518	**52**
Zărand	6509	1211	807	2701	514	1276	**51**
Zimandul Nou	6821	397	2844	3120	404	56	**60**

Totally ha	190281	55097	54940	47973	15837	16434	**64**

Table 4

Agricultural land favorability classes for BARLEY (ha)

TERRITORIAL ADMINISTRATIVE UNIT (UAT)	agricultural	Class I (81-100 points) Ha	Class the II (61-80 points) ha	Class the III (41-60 points) ha	Class the IV (21-40 points) ha	Class of Va (0-20 points) ha	Weighted average grade
Arad	6481	2761	1347	1596	658	119	**71**
Chișineu-Criș	9555	2275	0	2522	2502	2256	**44**
Covăsânț	3175	978	0	1963	95	139	**59**
Curtici	6686	1317	2430	2206	726	7	**63**
Dorobanți	2612	400	1070	259	823	60	**57**
Ghioroc	3909	180	0	2682	418	629	**44**
Grăniceri	7162	1475	1597	1103	437	2550	**48**
Iratoș	4018	1671	482	1519	8	338	**69**
Livada	1700	515	64	887	102	132	**60**
Macea	6593	1144	2575	1797	872	205	**60**
Nădlac	12116	7648	2305	1581	457	125	**81**
Olari	4408	0	1045	2962	234	167	**51**
Pecica	18802	790	9682	5077	2275	978	**58**
Peregu Mare	3018	2837	181	0	0	0	**98**
Pilu	6401	1598	449	954	2665	735	**50**
Sântana	9860	2852	5184	883	882	59	**70**
Seleuș	5184	700	574	2875	950	85	**53**
Sintea Mare	8564	1396	981	2900	1369	1918	**47**
Semlac	7298	3598	299	3131	226	44	**75**
Socodor	10197	1142	1010	1856	3589	2600	**40**
Șimand	9453	1724	5380	246	1633	470	**63**
Șiria	12107	5206	3281	1489	1150	981	**68**
Șeitin	6080	4888	511	0	681	0	**89**
Șofronea	2872	1689	698	330	92	63	**74**
Vladimirescu	8700	895	1061	2352	4060	332	**45**
Zărand	6509	1210	378	1718	1927	1276	**46**
Zimandul Nou	6821	121	1346	4539	759	56	**53**
Totally ha	**190281**	**51010**	**43930**	**49427**	**29590**	**16324**	**61**

Table 5

Agricultural land suitability classes for CORN (ha)

TERRITORIAL ADMINISTRATIVE UNIT (UAT)	agricultural	Class I (81-100 points) Ha	Class the II (61-80 points) ha	Class the III (41-60 points) ha	Class the IV (21-40 points) ha	Class of Va (0-20 points) ha	Weighted average grade
Arad	6481	3027	1572	1460	312	110	**75**
Chișineu-Criș	9555	2275	0	1397	4058	1825	**46**
Covăsânț	3175	978	678	1153	132	234	**62**
Curtici	6686	1415	3197	1795	272	7	**67**
Dorobanți	2612	400	1091	238	866	17	**59**
Ghioroc	3909	180	0	2744	149	837	**43**
Grăniceri	7162	1475	1597	1103	802	2184	**47**
Iratoș	4018	2154	0	1519	145	200	**72**

Livada	1700	515	366	585	102	132	**63**
Macea	6593	2291	1949	959	1189	205	**65**
Nădlac	12116	9119	835	951	1087	125	**86**
Olari	4408	1045	257	1846	1093	167	**55**
Pecica	18802	4306	6543	6111	865	978	**63**
Peregu Mare	3018	3018	0	0	0	0	**99**
Pilu	6401	1776	271	2772	847	735	**55**
Sântana	9860	4392	3930	1146	333	59	**74**
Seleuș	5184	876	1043	2362	818	85	**58**
Sintea Mare	8564	1619	2627	817	1854	1647	**51**
Semlac	7298	3598	299	3131	226	44	**77**
Socodor	10197	1428	1519	1356	3538	2356	**43**
Șimand	9453	5854	1387	107	1633	470	**70**
Șiria	12107	7010	1477	1489	993	1138	**69**
Șeitin	6080	5138	261	565	116	0	**91**
Șofronea	2872	2128	293	0	388	63	**80**
Vladimirescu	8700	1328	1337	2556	3176	303	**49**
Zărand	6509	1510	599	2916	208	1276	**52**
Zimandul Nou	6821	271	1641	4408	445	56	**56**
Totally ha	***190281***	***69126***	***34769***	***45486***	***25647***	***15253***	**64**

Table 6

Agricultural land suitability classes for SUNFLOWER (ha)

TERRITORIAL ADMINISTRATIVE UNIT (UAT)	agricultural	Class I (81-100 points) Ha	Class the II (61-80 points) ha	Class the III (41-60 points) ha	Class the IV (21-40 points) ha	Class of Va (0-20 points) ha	Weighted average grade
Arad	6481	2828	1858	1332	353	110	**73**
Chișineu-Criș	9555	2275	0	3502	1953	1825	**46**
Covăsânț	3175	978	130	1701	132	234	**57**
Curtici	6686	271	3491	2680	237	7	**63**
Dorobanți	2612	295	1175	282	860	0	**59**
Ghioroc	3909	180	0	2677	215	837	**40**
Grăniceri	7162	3073	0	1103	802	2184	**52**
Iratoș	4018	1671	482	1037	627	201	**67**
Livada	1700	515	35	916	229	5	**60**
Macea	6593	1551	2300	1712	825	205	**62**
Nădlac	12116	8317	1636	1584	454	125	**82**
Olari	4408	0	1302	2295	644	167	**50**
Pecica	18802	790	9889	5133	2012	978	**58**
Peregu Mare	3018	2837	181	0	0	0	**98**
Pilu	6401	1784	262	1237	2383	735	**51**
Sântana	9860	1006	5974	2447	374	59	**64**
Seleuș	5184	700	574	2963	862	85	**54**
Sintea Mare	8564	1395	1432	2548	1542	1647	**47**
Semlac	7298	3598	299	3306	51	44	**75**
Socodor	10197	1600	551	2906	2784	2356	**42**
Șimand	9453	1725	5380	1153	725	470	**64**
Șiria	12107	5158	3329	1695	787	1138	**68**
Șeitin	6080	4887	511	49	517	116	**90**
Șofronea	2872	1689	698	330	155	0	**80**
Vladimirescu	8700	895	1227	2328	4160	90	**44**
Zărand	6509	1211	378	1717	1927	1276	**46**
Zimandul Nou	6821	121	1346	4500	844	10	**53**

Totally ha	***190281***	51350	44440	53133	26454	14904	**61**

Table 5

Agricultural land suitability classes for SOYA (ha)

TERRITORIAL ADMINISTRATIVE UNIT (UAT)	Agricultural	Class I (81-100 points) Ha	Class the II (61-80 points) ha	Class the III (41-60 points) ha	Class the IV (21-40 points) ha	Class of Va (0-20 points) ha	Weighted average grade
Arad	6481	2727	1398	1753	493	0	**70**
Chișineu-Criș	9555	2275	0	3613	1842	1825	**45**
Covăsânț	3175	978	0	1831	132	234	**58**
Curtici	6686	1317	2707	1933	722	7	**64**
Dorobanți	2612	400	1113	216	823	60	**58**
Ghioroc	3909	179	0	2682	211	837	**41**
Grăniceri	7162	1475	1597	1104	716	2270	**47**
Iratoș	4018	1671	482	1519	8	338	**67**
Livada	1700	515	64	887	102	132	**57**
Macea	6593	1144	2576	1876	792	205	**60**
Nădlac	12116	7648	2291	1127	925	125	**80**
Olari	4408	0	1302	2705	234	167	**49**
Pecica	18802	790	8931	6806	1297	978	**58**
Peregu Mare	3018	2837	181	0	0	0	**98**
Pilu	6401	1598	449	2269	1350	735	**51**
Sântana	9860	2852	5328	739	882	59	**70**
Seleuș	5184	700	356	3093	950	85	**53**
Sintea Mare	8564	1396	1332	2540	1649	1647	**47**
Semlac	7298	3598	0	3430	226	44	**75**
Socodor	10197	1141	877	2978	2845	2356	**40**
Șimand	9453	1725	4912	1566	780	470	**62**
Șiria	12107	5158	3329	1489	993	1138	**66**
Șeitin	6080	4888	505	6	681	0	**89**
Șofronea	2872	1689	698	330	92	63	**79**
Vladimirescu	8700	895	1066	2748	3688	303	**45**
Zărand	6509	1210	378	2669	976	1276	**48**
Zimandul Nou	6821	121	827	5058	759	56	**53**
Totally ha	**190281**	**50927**	**42699**	**56967**	**24168**	**15520**	**60**

CONCLUSIONS

Knowing the natural conditions and especially the ecological potential of the land (defined according to MESP-ICPA Bucharest, 1987) in order to know the favorabilitythem for the main crops, respectively the extent to which a land satisfies the life requirements of a crop plant, under normal climatic conditions and within the framework of the rational use of the ecological offer, is of particular importance in carrying out the zoning and microzoning works of agricultural production, has the right with the aim of providing agricultural specialists with a global picture of the phenomena taking place within some elementary units of the pedological

landscape, from which the general strategy regarding the set of ameliorative measures can be derived.

In this conception, the determination of the production capacity of the lands as well as the substantiation of the technologies for their improvement can constitute for the decision-maker (Government, local public administration) an effective tool for the choice of working procedures that favor an efficient use of the land resources within the space researched in accordance with the specific pedoclimatic conditions.

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