THE INFLUENCE OF PEDO-CLIMATIC CONDITIONS AND TILLAGE SYSTEM ON THE WHEAT AND MAIZE YIELDS ON SOME LAND FROM BANAT PLAIN, MURES-BEGA INTERFLUVE

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Abstract: *The research has as purpose the support of sustainable agriculture system, responding to local requirements establishing the scientific data base necessary to support new technologies and develop integrated management measures of agro-eco-systems. The purpose of the research conducted has its origins in current scientific and practical preoccupations increasingly hard to identify and put in place effective integrated management from the agronomic point of view, with low energy and financial efforts, with conservation role for soil and the environment. The results presented are part of the doctoral studies and research (01.11.2011-30.10.2014) having as theme "Relations between ecopedological conditions, financing and productivity of agricultural land in the Banat Plain, Mureş-Bega interfluve" research is carried out simultaneously on experimental field and laboratory. The data in this paper are the result of research conducted in 2011-2013 range, within experiences organized in the field in two locations: Sanandrei and Jimbolia on the land of Soil and Agrochemical Studies Office (OSPA) in Timisoara. At Jimbolia, the experiences are located on a typical chernozem, gleyed weak, proxicalcaric, medium loam / medium clay, dominant in Jimbolia - Bulgăruş plain and representative for a large area of low plain of Banat, as part of Mures Plain. At Sânandrei, the experiences are located on molic reddish preluvosoil, medium clay loam / medium clay loam, dominant in Plain Vinga and representative of a surface significant in Banato-Crisana Plain. This paper provides basic knowledge and methodological elements for the assessment and characterization of natural resources and those induced by the intake of fertilizers. To determine the complex relationships that are established between various soil properties, were undertaken both in our country and in the world, numerous studies that have elucidated a number of mutual causality thereby helping to define soil taxa in terms of both genetic and the fundamental characteristics, in relation to their contribution to the differential productivity and suitability of land for plants. The information obtained will pique the interest of decision-makers, that in the future, the agricultural research and practice with environmental protection, will strive to develop interdisciplinary studies, because it can not speak about a healthy environment without an healthy soil.*

Key words: *wheat, maize, yield, banat plain, land*

INTRODUCTION

Crop production can be done in various conditions: natural ecosystems (without or with very little human intervention) or agroecosystems, extensive or intensive (with direct or indirect involvement of the state) imposes an urgent need as deep knowledge of all ecological determinants.

Thus, the knowledge of natural conditions and the ecological potential of land for various utilities and some cultures have an economic and social importance, for both large farm and for the small producer.

Among soil properties and the main species cultivated can be established relations by a diverse and complex reciprocity. Soil properties can exert a decisive influence on the development of the root system, mineral nutrition, providing aerohidric and thermal regime needed to carry the main physiological processes and plants acts both directly and indirectly on the soil fertility status.

To determine the complex relationships that are established between various soil properties, were undertaken both in our country and in the world, numerous studies that have elucidated a number of mutual causality thereby helping to define soil taxa in terms of both genetic and the fundamental characteristics, in relation to their contribution to the differential productivity and suitability of land for plants (BORZA ET ALL., 2005, CANARACHE, 1980, DICU ET ALL., 2010, TABĂRĂ, 2001,2005,RĂUȚĂ,1997, ROGOBETE ET ALL., 1997, TEACI, 1980,1995).

The research of this project lies in the accumulation of scientific data on the evolution of components productivity of agricultural land on the atmospheric, cosmic-telurico-edaphic offer, necessary to support new technologies, through an complexes approach of physical, geographical, edaphic and climatic conditions from Banat Plain (Mures-Bega interfluve).

In this paper are presented results obtained in 2011-2013 interval, at wheat and maize, on an molic reddish preluvosoil, medium clay loam / medium clay loam, from Plain Vinga and on an typical chernozem, gleyed weak, proxicalcaric, medium loam / medium clay, from Jimbolia - Bulgăruş plain.

MATERIAL AND METHODS

The research in the field began in the autumn of 2011, when, on the land of OSPA Timisoara, located in Sanandrei territorial administrative unit was located the wheat crop and continued in the spring of 2012 with maize crop establishment and then in 2012 -2013 agricultural year using the same culture as results from the masthead of each of those cultures.

At Sânandrei, the experiences are bifactorial, of type 3 x 4 with plots in four replications (48 plots). The area of a parcel is 40 m^2 (4 x 10), the total area is 1920 square meters and experience are located on molic reddish preluvosoil, medium clay loam / medium clay loam, dominant in Plain Vinga and representative of a surface significant in Banato-Crisana Plain, the experimental factors being:

Factor A	Factor B
Phosphorus fertilization	Nitrogen fertilization
a 1- P_0	b1- N_0
a 2- P_{50}	b 2- N_{50}
a 3- P_{100}	b 3 – N_{100}
	b 4 – N_{150}

At Jimbolia, the area of a parcel is 40 m2 (4 x 10), the total area is 1920 square meters and experience are located on a typical chernozem, gleyed weak, proxicalcaric, medium loam / medium clay, dominant in Jimbolia - Bulgăruş plain and representative for a large area of low plain of Banat, as part of Mures Plain, the experimental factors being:

Factor A		Factor B
Wheat varieties	Maize	Fertilization (NP)
a 1- ALEX	PR 39D81	b1- N_{60} P_0
a 2- APACHE	PR 39F58	b 2- N_{100} P_{60}
a 3- EXOTIC	PR 9000	b 3 –N_{150} P_{60}
a 4- CUBUS	PR 37N01	

The basic agricultural works were executed by machines and equipment of OSPA Timisoara, it also providing seed, fertilizer and chemicals needed. Specific experimental technique works were carried out by PhD student under the guidance of scientific coordinator, using specific means of experimental technique.

In order to grasp the influence of eco-pedological conditions and technological elements on land productivity, especially in the area of the two locations, considered complex from both pedological and morphological point of view, were opened soil profiles of which were collected a series of samples.

These samples were investigated in relation to environmental factors, natural or man-made change, which makes the existence, together forming units of homogeneous ecological area (TEO) with the specific suitability or different technological requirements.

The research of ecopedological conditions was made according to "Soil Survey Elaboration Methodology " (Vol. I, II, III) developed by ICPA Bucharest in 1987, supplemented by specific elements of Romanian System of Soil Taxonomy (SRTS - 2012).

Analyzes and other determinations were carried out in the research laboratories of the ,,OSPA-USAMVB,, from Timişoara, 119 Calea Aradului Street, LI 1001/11.25.2013, certified laboratory RENAR, according with National Standards and Rules approved by the Romanian Standardization Association .

RESULTS AND DISCUSSIONS

The area where the surveys have been conducted and experiences were arranged is part of Mures-Bega interfluve, part of Mures Plain. Located on either side of the course with the same name, Mures Plain is a complex lowland (G. Posea, 1999), composed of: Piedmont Terrace (Vinga Plain), scrap old piedmont (Nadlac Plain), high alluvial plain (Arad Plain), alluvial lowland transition (Siria Plain, Curtici Plain, Livada Plain, Jimbolia Plain), alluvial plains below (Ier Plain, Aranca Plain, Crisul Alb Plain).

The origin of the plain is attributed to the Mures Pleistocene delta, which debus here into Pannonian Lake, in the the early Quaternary. Deep deposits indicate a formation with gravels and sands, alternating with clays. Blanket surface is formed from leossoid deposits made in different phases, with insertions of fossil soils (Vinga Plain - Vinga opening, Nadlac Plain - Semlac opening).

Although it is bordered in the north of the current course of the Mures river, the researched space is part of southwest hydrological systems group, Bega river basin, Beregsău subbasin.

Regarding the groundwater, it is at depths between 5-10 m and 10-15 m in the eastern part of the high plain and at 6-8 m in the west and south part, at the contact with the low plain areas.

Depending on the influence and the action of pedogenetic factors (relief, rock. climate, hydrology), or due to human intervention, within the investigated area the main processes of soil formation and evolution were development different genetic types of soils.

At the experimental center of OSPA Timisoara from Sanandrei, the experiences are located on a on molic reddish preluvosoil, medium clay loam / medium clay loam, dominant in Plain Vinga and representative of a surface significant in Banato-Crisana Plain (table1)

At Jimbolia, the experiences are placed a typically chernozem, dominant in Jimbolia - Bulgăruş plain and representative for a large area of Banat low plain, as part of Mures Plain, at south of the current course of the Mures (table 2).

Crop production can be done in the different conditions: natural ecosystems (without or with human intervention), or agro-ecosystems, extensive or intensive (direct or indirect involvement of the state) requires with a pressing necessity as deep knowledge of all ecological determinants, for which each of the 2 units of land (TEO) identified were characterized under the current methodology of the soil studies using the 23 indicators of evaluation (3C–medium temperature, 4C-yearly precipitation, 14-gleysation degree, 15-stagno-gleysation degree, 16-

salty degree, 17- alkalization, 23A-texture in worked layer, 23B- texture in first 200 cm, 29-soil pollution, 33- terrain slope, 34-land exhibition, 38-land slope, 39-pedofreatic water level, 40-land inundability, 44-classes of total porosity, bulk density and compaction degree, 50-permeability classes, 61-$CaCO_3$ content, 63-soil reaction, 69-classes of base saturation, 133-Volume edaphic classes, 144-humus reserve classes, 181-surface moisture excess, 271-land improvement), indicators which represent character and traits most important, more significant, specific and measurable, which is usually found in pedological mapping work, prepared after 1987 by territorial OSPA, under methodological guidance of ICPA Bucharest (table 1-table 2).

Table 1

Legend table for indicators values from Sanandrei and Jimbolia

Profile	Type/ subtype	3C	4C	14	15	16	17	23A	23B	29	33	38	39	40	44	61	63	69	133	144	181	271
1 /S	EL mo-rs	10,5	650	0	0	0	0	52	52	2	1	0	15	0	+25	1	5,6	79	175	140	1	0
2 /J	CZ ti	10,5	525	2	0	0	0	42	42	2	1	0	3,5	0	+5	10	7,5	96	175	225	1	20

Regarding the evolution of soil moisture, the observations made (through soil sampling and laboratory determinations) in the two cultures revealed a number of issues on how to achieve the ecological functions of soil in the agro-ecosystems, namely those relating to main characteristics under the concept of integrated Ecopedologic profile, defined as a set of soil horizons that provide food and water for biomass production and also ensure the role of the filter pad and turned and housing defining a main meal of genetic reserve.

Regarding the evolution of soil moisture, the monthly observations (through soil sampling and laboratory determinations) in the two sites revealed the following (table 2 and table 3).

Table 2

Momentary soil moisture (U%) reported with values of useful water capacity (CU%) in the 2011-2012 agricultural year

Experimental fields		Interval 0-10 cm				Interval 10-25 cm				Interval 25-50 cm			
		U%	CC%	CU%	Difference between CC% and CU%	U%	CC%	CU%	Difference between CC% and CU%	U%	CC%	CU%	Difference between CC% and CU%
Sânandrei (Wheat)	24.10.2011	21,45	23,70	8,40	+13,05	14,91	23,70	8,40	+ 6,51	16,77	24,60	8,80	+ 7,97
	15.11.2011	12,79	23,70	8,40	+ 4,39	12,20	23,70	8,40	+ 3,80	14,40	24,60	8,80	+ 5,60
	21.12.2011	19,05	23,70	8,40	+10,65	13,58	23,70	8,40	+ 5,18	14,44	24,60	8,80	+ 5,64
	13.01.2012	21,26	23,70	8,40	+12,86	19,78	23,70	8,40	+ 4,46	17,80	24,60	8,80	+ 9,00
	05.03.2012	**27,45**	23,70	8,40	+19,05	22,02	23,70	8,40	+13,62	22,74	24,60	8,80	+13,94
	04.05.2012	21,01	23,70	8,40	+12,61	22,98	23,70	8,40	+14,58	20,11	24,60	8,80	+11,31
	06.06.2012	13,72	23,70	8,40	+ 5,32	13,30	23,70	8,40	+ 4,90	16,94	24,60	8,80	+ 8,14
	29.06.2012	6,34	23,70	8,40	**- 2,06**	7,02	23,70	8,40	**- 1,38**	12,02	24,60	8,80	+ 3,22
	23.07.2012	6,71	23,70	8,40	**- 0,80**	8,69	23,70	8,40	+ 0,29	12,65	24,60	8,80	+ 3,85
	21.08.2012	*10,46*	23,70	8,40	*+ 2,06*	*13,60*	23,70	8,40	*+ 5,20*	*14,97*	24,60	8,80	*+ 6,17*
	18.09.2012	*9,35*	23,70	8,40	*+15,30*	*11,47*	23,70	8,40	*+3,o7*	*14,41*	24,60	8,80	*+ 5,61*
Jimbolia (Wheat)	24.10.2011	**28,45**	23,20	11,95	+16,50	17,79	23,20	11,95	+ 5,84	17,49	23,30	11,88	+ 5,61
	23.11.2011	17,65	23,20	11,95	+ 5,70	18,59	23,20	11,95	+ 6,64	19,14	23,30	11,88	+ 7,26
	22.12.2011	20,93	23,20	11,95	+ 8,90	21,56	23,20	11,95	+ 9,61	22,23	23,30	11,88	+10,35
	12.01.2012	**28,46**	23,20	11,95	+16,51	22,40	23,20	11,95	+10,45	23,15	23,30	11,88	+11,27
	05.03.2012	22,69	23,20	11,95	+10,64	22,22	23,20	11,95	+10,27	**26,65**	23,30	11,88	+14,77
	04.05.2012	**23,26**	23,20	11,95	+11,31	21,47	23,20	11,95	+ 9,52	20,18	23,30	11,88	+ 8,30
	08.06.2012	15,44	23,20	11,95	+ 3,45	14,33	23,20	11,95	+ 2,38	15,80	23,30	11,88	+ 3,92
	16.07.2012	*10,25*	23,20	11,95	***- 1,70***	*9,37*	23,20	11,95	**- 2,58**	*12,64*	23,30	11,88	*+ 0,76*
	21.08.2012	*14,60*	23,20	11,95	*+ 2,65*	*14,46*	23,20	11,95	*+ 2,51*	*16,82*	23,30	11,88	*+ 4,94*
	18.09.2012	*15,10*	23,20	11,95	*+ 3,15*	*16,84*	23,20	11,95	*+ 4,89*	*18,43*	23,30	11,88	*+ 6,55*

In 2011-2012 agricultural year, at wheat (with the pre-plant corn), the humidity values (U%) were located generally between the values of useful water capacity (CU%) and the values of field capacity (CC%), and some minor exceptions in October, January, May (Jimbolia) and March (Sanandrei) when its values in the range 0-10cm were slightly above those of field capacity (table 2).

Momentary soil moisture (U%), within 0-10 cm, fell below the useful water capacity (CU%) in June and July to Sanandrei and in July to Jimbolia (table 2). Also, this situation occurs in the range 10 to 25 cm from the two sites in June and July at Sanandrei and Jimbolia (table 2). In the range of 25-50 cm, the humidity values (U%) were generally, between the values of useful water capacity (CU%) and the values of field capacity (CC%), with one exception in March to Jimbolia, when the values were slightly above field capacity (table 2).

On the agricultural year 2012-2013, wheat (with the sunflower plant prior to) the humidity values (U%) in the range of 0-10 cm were located generally between the values of useful water capacity (CU%) and the values of field capacity (CC%), at Sanandrei while at Jimbolia which had lower values than the capacity of useful water at the beginning of agriculture (18.09.2012), that in the months february, March and April they are greater than values of field capacity (table 3). Also this situation is recorded, almost identical in ranges :10-25 cm and 25-50cm from the two sites (table 3).

Table 3

Momentary soil moisture (U%) reported with values of useful water capacity (CU%) in the 2012-2013 agricultural year

Experimental fields		Interval 0-10 cm				Interval 10-25 cm				Interval 25-50 cm			
		U%	CC%	CU%	Difference between CC% and CU%	U%	CC%	CU%	Difference between CC% and CU%	U%	CC%	CU%	Difference between CC% and CU%
Sânandrei (Wheat)	18.09.2012	8.71	23,70	8,40	+0.31	8.45	23,70	8,40	+0.05	10.06	24,60	8,80	+1.26
	23.10.2012	12.09	23,70	8,40	+3.69	12.04	23,70	8,40	+3.64	14.32	24,60	8,80	+5.52
	27.12.2012	22.7	23,70	8,40	+14.30	22.09	23,70	8,40	+13.69	23.36	24,60	8,80	+14.56
	13.02.2013	21.29	23,70	8,40	+12.89	21.72	23,70	8,40	+13.32	22.58	24,60	8,80	+13.78
	13.03.2013	20.93	23,70	8,40	+12.53	20.23	23,70	8,40	+11.83	19.35	24,60	8,80	+10.55
	11.04.2013	22.73	23,70	8,40	+14.33	22.73	23,70	8,40	+14.33	21.86	24,60	8,80	+13.06
	10.05.2013	11.76	23,70	8,40	+3.36	12.53	23,70	8,40	+4.13	15.88	24,60	8,80	+7.08
	06.06.2013	19.00	23,70	8,40	+10.60	17.77	23,70	8,40	+9.37	14.97	24,60	8,80	+6.17
	16.07.2013	13.18	23,70	8,40	+4.78	13.24	23,70	8,40	+4.84	14.04	24,60	8,80	+5.24
	09.08.2013	7.47	23,70	8,40	**-0.93**	8.74	23,70	8,40	+0.34	12.57	24,60	8,80	+3.77
Jimbolia (Wheat)	18.09.2012	9.84	23,20	11,95	**-2.11**	8.56	23,20	11,95	**-3.39**	9.10	23,30	11,88	**-2.85**
	23.10.2012	19.40	23,20	11,95	+7.45	16.59	23,20	11,95	+4.64	14.45	23,30	11,88	+2.50
	14.02.2013	**25,91**	23,20	11,95	+13.96	**24,19**	23,20	11,95	+12.24	**24,22**	23,30	11,88	+12.34
	26.03.2013	**25,05**	23,20	11,95	+13.10	**25,12**	23,20	11,95	+13.17	**25,48**	23,30	11,88	+13.60
	11.04.2013	**24.33**	23,20	11,95	+12.38	21.2	23,20	11,95	+9.25	**24.50**	23,30	11,88	+12.62
	13.05.2013	11.14	23,20	11,95	**-0.81**	12.00	23,20	11,95	+0.05	15.15	23,30	11,88	+3.27
	13.06.2013	17.55	23,20	11,95	+5.60	17.17	23,20	11,95	+5.22	16.38	23,30	11,88	+4.50
	04.07.2013	15.33	23,20	11,95	+3.38	16.85	23,20	11,95	+4.90	20.89	23,30	11,88	+9.01
	22.07.2013	16.93	23,20	11,95	+4.98	18.71	23,20	11,95	+6.76	21.50	23,30	11,88	+9.62
	09.08.2013	11.90	23,20	11,95	**-0.05**	14.78	23,20	11,95	+2.83	21.84	23,30	11,88	+9.96

To characterize the specific climatic conditions for agricultural years 2011-2012 and 2012-2013, were used data recorded by OSPA Timisoara at Sanandrei Experimental Center (located on Route 56 Timisoara-Arad, Km 15.4) for molic reddish preluvosoil, medium clay loam / clay loam from Vinga Plain (table 4) and the dates recorded by total station of Plant Center of Timis county, located on the land of SC Tehnoland SRL Jimbolia (Clarii Vii) on typical chernozem, weak gleyed, proxicalcaric, medium clay / clay medium in the Jimbolia - Bulgăruş plain (table 5).

Table 4

Monthly rainfall average, annual (2011-2013), at Center of Experimental Sanandrei and multiannual rainfall from 1931-2012 range (mm), Timisoara Weather Station

Agricultural year	Montly												Annual
	IX	**X**	**XI**	**XII**	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	
11—12	10,5	29,5	0,0	11,5	49,5	65,0	6,5	81,2	40,5	38,5	113,0	10,0	455,7
12—13	17,0	62,8	18,6	77,5	49,0	39,0	104,0	40,9	77,0	78,5	10,5	37,0	611,8
normal	**46,1**	**54,8**	**48,6**	**47,8**	**40,9**	**40,2**	**41,6**	**50,0**	**66,7**	**81,1**	**59,9**	**52,2**	**629,9**

Differences

Agricultural year	Montly												Annual
	IX	**X**	**XI**	**XII**	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	
11—12	-35,6	-25,3	-48,6	- 36,3	+ 8,6	+24,8	-35,1	+31,2	-26,2	-45,6	+56,1	-42,2	-174,2
12—13	-29,1	+ 8,0	-30,0	+29,7	+8,1	- 1,2	+62,4	- 9,1	+10,3	- 3,6	-49,4	-15,2	-18,1

Regarding the rainfall, it may be noted that compared to the annual average was a deficit of 174.2 mm (table 4) in 2011-2012 agricultural year, ie 18.1 mm in the 2012-2013 agricultural year.

At Clarii Vii, the rainfalls in 2011-2012 period compared to the annual average recorded a deficit of 130.8 mm, ie 151,2 mm in the 2012-2013 agricultural year (table 5).

Table 5

Monthly rainfall average, annual (2011-2013) at Clarii Vii and multiannual rainfall in the range 1931-2013 (mm), Jimbolia weather station

Agricultural year	Montly												Annual
	IX	**X**	**XI**	**XII**	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	
11—12	15,6	37,8	0,6	31,2	37,8	14,8	2,2	62,8	60,2	39,6	83,0	0,2	385,8
12—13	22,8	18,8	5,4	49,4	39,2	33,4	59,4	24,4	43,0	11,4	32,6	25,6	365,4
normal	**45,1**	**36,8**	**41,2**	**47,0**	**28,0**	**21,0**	**28,5**	**46,2**	**43,0**	**70,8**	**55,0**	**54,0**	**516,6**

Differences

Agricultural year	Montly												Annual
	IX	**X**	**XI**	**XII**	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**	
11—12	-29,5	+1,0	-40,6	-15,8	+9,8	-6,2	-26,3	+16,6	+17,2	-31,2	+28,0	-53,8	-130,8
12—13	-22,3	-18	-35,8	+2,4	+11,2	+12,4	+30,9	-21,6	0,0	-59,4	-22,4	- 28,4	-151,2

To assess the impact of weather conditions on land productivity in the two stationary, the data were compared with significance of rainfall (reference limits in relation to the requirements of agriculture, table 6) using data from agro-climatic resources of Timis County (Berbecel, 1979).

Table 6

The significance of rainfall (reference limits in relation to the requirements of agriculture)

Interval	Significance of rainfall				
	Very dry	Dry	Satisfactory	Optim	Excedentary
September-October	Under 40	41-60	61-80	81-150	Over 150
November-March	Under 100	101-150	151-200	201-300	Over 300
April	Under 20	21-30	31-40	41-70	Over 70
May-July	Under 100	101-150	151-200	201-300	Over 300
Annual	Under 350	351-450	451-600	601-700	Over 700

The analysis of rainfall data from the 2011-2012 agricultural year, it was a satisfactory year (table 7) in the high plain and dry of the lower plain, as well as the agricultural year 2012-2013 (table 8).

In the high plains, the agricultural year 2011-2012 started with a very dry period in September and October (table 8), then continuing with a dry period in winter, the period from November to March, followed in April to have a surplus character in both cases generating a series of problems for good crop development (uneven emergence, low resistance to freezing point of the chain to exit winter) adding their character issues surplus of April (weeds, diseases attack , reduce the period of cultural works suitability in terms of current and sanitation).

Agricultural year 2012-2013 is characterized by values of rainfall within the overall optimum and satisfactory characteristic, periods during which moisture deficit was offset by accumulated water reserves in the soil (table 4).

Quantities of water from precipitation, in the agricultural year 2011-2012, registered in the low plains, were optimum in the range from September to October (Table 8) in the remaining months registering values below multiannual average, with dry or very dry in April, continued later in the period from May to July.

Table 7

The significance of precipitation in relation to the requirements of agriculture, the 2011-2013 agricultural years, at Experimental Center Sanandrei and Clarii Vii

Characteristic periods										
Agricultural year	IX-X	Semnif.	XI-III	Semnif.	IV	Semnif.	V-VII	Semnif.	Annual	Semnif.
Sânandrei										
11-12	40,0	very dry	132,5	dry	81,2	excedentary	192,0	satisfactory	455,7	satisfactory
12-13	79,8	satisfactory	288,1	optimum	40,9	satisfactory	166,0	satisfactory	611,8	optimum
Clarii Vii										
11-12	83,6	optimum	136,2	dry	1,6	very dry	91,2	very dry	385,8	dry
12-13	41,6	dry	176,8	satisfactory	24,4	dry	87,0	very dry	365,4	dry

Analyzing the influence of nitrogen fertilizer, applicated on different phosphorus agrofunds on the soil from Sanandrei, we find that the yields obtained were statistically assured, noting that the climatic conditions have negatively influenced the soil moisture regime, and especially the production obtained, which are lower than the potential of the investigated area.

At wheat, the yield was between 2348 and 4198 kg / ha (Fig. 1), in the control (unfertilized) resulting a production of 2348 kg / ha, the maximum yield was recorded at $P_{100}N_{150}$ version, ie 4198 kg / ha.

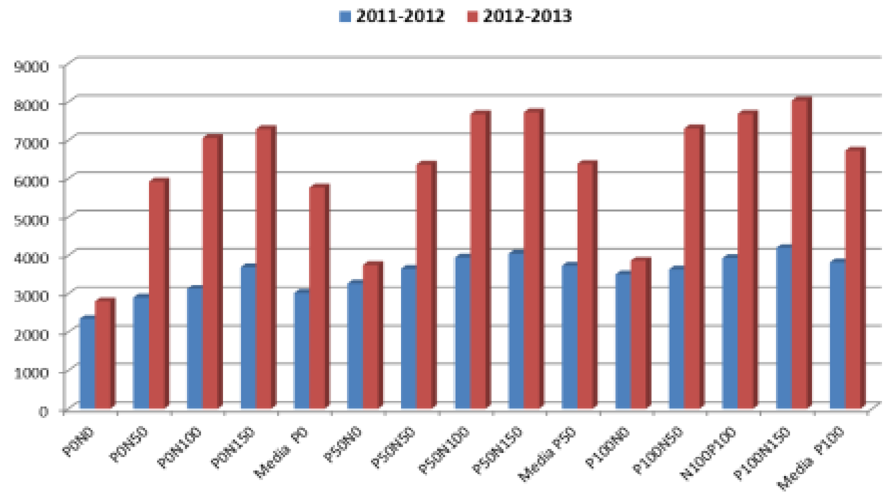

Fig. 1 Effect of nitrogen and phosphorus fertilizers on wheat yield (Alex cultivar) at Sânandrei

In 2012-2013 agricultural year, the yield, at wheat, was between 2807 and 8047 kg / ha (Figure 1). In control version (unfertilized), the yield obtained was 2807 kg / ha, the maximum yield was recorded at $P_{100}N_{150}$ version, ie 8047 kg / ha.

At maize, due to the drought that began in May and continued throughout the growing season, grain yield ranged between 1977 - 2998 kg / ha (Fig.2). Due to the lack of soil moisture, plants have sprung late, and due to low temperatures in April (1.1 ° C lower than normal), uneven and goals, requiring their completion.

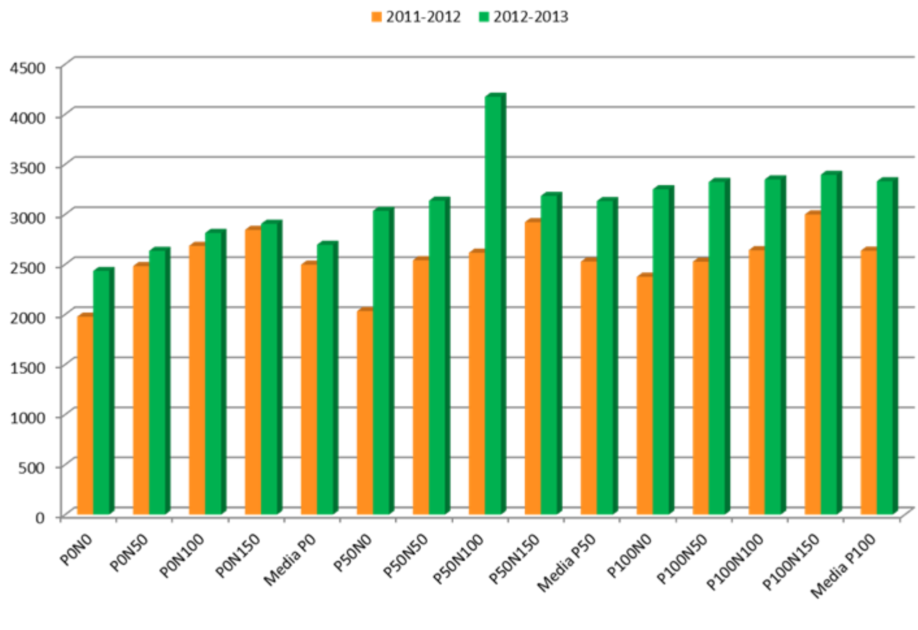

Fig. 2 Effect of nitrogen and phosphorus fertilizers on maize yield (*PR 39D81 hybrid*) at Sânandrei

In the 2012-2013 agricultural year, the corn production was carried out between 2434 and 3395 kg / ha (Figure 2). In control version (unfertilized), the obtained yield was 2434 kg / ha, the maximum yield was recorded at $P_{100}N_{150}$ version, ie 3395 kg / ha.

Regarding the reaction of nitrogen and phosphorus fertilization of wheat varieties and corn hybrids, can be found that the experience from Jimbolia, at wheat, the yield in the agricultural year 2011-2012, was between 3998 and 7928 kg / ha (Figure 3).

At $N_{60}P_0$ variant, at Alex variety, was obtained an output of 3998 kg / ha. The maximum production was obtained at Apache cultivar, variant N_{150} P_{80}, respectively 7928 kg / ha.

In the 2012-2013 agricultural year, wheat production was achieved between 5245 and 8280 kg / ha (Figure 3). The control variant at $N_{60}P_0$ Alex variety achieved a production of 5245 kg / ha. The maximum yield was obtained from cultivar Apache, in variant N_{150} P_{80}, respectively 7828 kg / ha.

At maize, due to the drought in June (-31.2 mm), but mainly in August (53.8 mm), the grain yield ranged from 4975 kg / ha, at PR 39D81 hybrid, in $N_{60}P_0$ version and 8095 kg / ha, at N_{150} P_{80} variant for PR 37NO1 hybrid (Fig. 4).

In 2012-2013 agricultural year, the grain yield ranged from 4493 kg / ha, at PR 39D81 hybrid, in $N_{60}P_0$ version and 9165 kg / ha, at N_{150} P_{80} variant for PR 37NO1 hybrid.

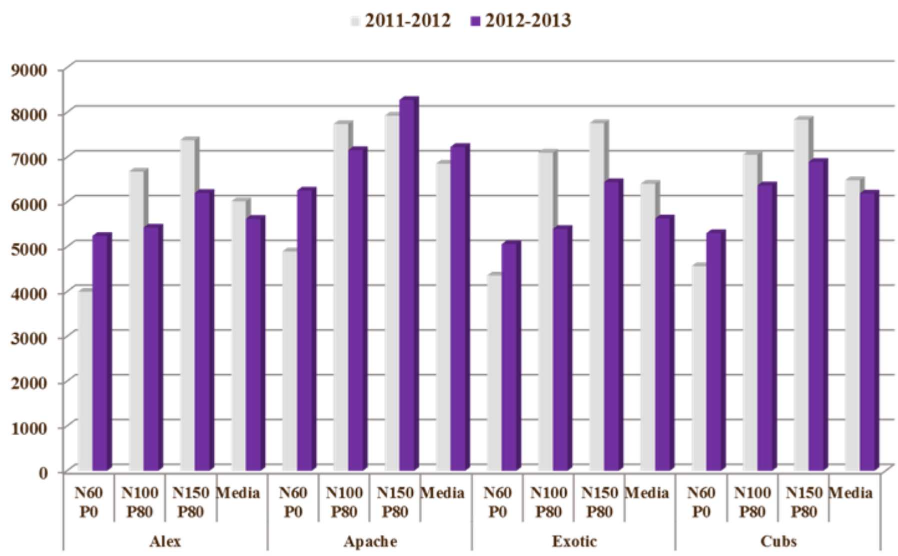

Fig. 3 Effect of nitrogen and phosphorus fertilizers on wheat yield (*Alex, Apache, Exotic, Cubus* cultivars) at Jimbolia

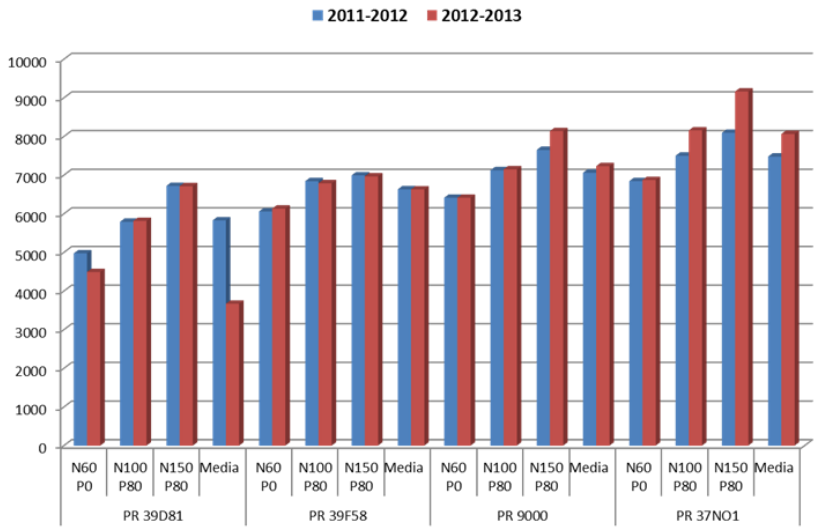

Fig. 4 Effect of nitrogen and phosphorus fertilizers on maize yield (*PR 39D81, PR 39F58, PR 9000, PR 37NO1 hybrid*) at Jimbolia

CONCLUSIONS

The area where they were located experiences is part of Mures Bega interfluve, part of Mures Plain. Its macroclimatic peculiarities are determined by its geographical position, which is specific to a particular movement lies at the crossroads of air masses, in addition suffering an invasion of warm air masses, from south, crossing the Mediterranean Sea.

Along with the particularity of ecopedologic profile, the hydric resource as environmental factors (of the atmosphere), is found in production levels that were statistically assured in the two years of experimentation, for reddish molic preluvosoil fromVinga Plain and on typical chernozem from Jimbolia.

The results reveal that the actual effect of rainfall on crops is influenced by soil properties (texture, porosity, permeability, useful water capacity) and relief, traits which may favor the accumulation, storage and disposal of water from differentiated precipitation.

Periodic determination of soil moisture in the investigated area are in line with the concerns in the field, both nationally and globally in the context of climate change from last decades.

This paper provides basic knowledge and methodological elements for the assessment and characterization of natural resources and those induced by the intake of fertilizers.

Considering that the main parameter for estimating future production by notes of evaluation, it can be used for zoning, microzoning and agro profiling so that each community to strengthen its presence in both traditional markets and in other markets of the world (not only the community) through quality products innocuous.

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