RESULTS ON THE EFECTIVE TROPHICITY OF A VEGETABLE USED SOIL BY THE ECOPEDOLOGICAL MATRIX

REZULTATE PRIVIND TROFICITATEA EFECTIVĂ A UNUI SOL LEGUMICOL CU AJUTORUL MATRICEI ECOPEDOLOGICE

PODARU Doina - Maria[1], MUNTEANU N.[1], BIREESCU L.[1], PĂDURARIU Eugenia Anca[1], HOBINCU Marlena[1]
e-mail: doina_marya@yahoo.com

Abstract. *The paper present the experimental results regarding on the ecopedological matrix the efective trophicity of soil resources of the Experimental Station of plant the Faculty of Horticulture Iasi, in order to estimate the requirements cultivation in organic. System research was carried out by specific working methods, using soil samples taken from the plastic tunnels and open field crops of peppers, aubergines, tomatoes and cucumbers. Development of the diagnosis ecopedological matrix have been madon the following indicators: texture, the consistency of wet soil, soil reaction (pH),base saturation (V), humus, nitrogen (Nt), phosphorus (P_{AL}), potassium (K_{AL}),air porosity (PA), synthetic biological indicator (ISB), genetic type of soil. Diagnosis obtained revealed the high potential trofhicity of soil for organic vegetable growing: 82-84 rating point for tunnel soil sand 64-68 points of field soils.*

Key words: diagnosis, soil, ecology, vegetables

Rezumat. *Lucrarea prezintă rezultatele experimentale privind matricea diagnozei ecopedologice a troficităţii efective a resurselor de sol din Staţiunea Didactică Experimentală a Facultăţii de Horticultură din Iaşi, cu scopul de a estima cerinţele de valorificare a terenului în sistem ecologic. Cercetările s-au realizat, prin metode specifice de lucru, folosindu-se probe de sol prelevate din solar şi din câmp deschis, de la culturile de ardei, pătlăgele vinete, tomate şi castraveţi. Realizarea matricei diagnozei ecopedologice a avut loc pe baza următorilor indicatori pedologici: textura, consistenţa solului umed, reacţia (pH), gradul de saturaţie în baze (V), humus, azot (Nt), fosfor (P_{Al}), potasiu (K_{Al}), porozitatea de aeraţie (PA), indicele sintetic biologic (ISB), tipul genetic de sol. Diagnoza realizată a scos în evidenţă înalta troficitate potenţială a solului pentru cultura legumelor ecologice: 82 – 84 puncte de evaluare pentru solurile din solar şi 64 – 68 puncte de evaluare pentru solurile din câmp.*

Cuvinte cheie: diagnoză, sol, ecologie, legume

INTRODUCTION

Soil, satisfying quality of living organism and a major habitat for plants and animals, is a dynamic system, open which exchanges reversible of matter, energy

[1] University of Agricultural Sciences and Veterinary Medicine Iasi, Romania

and information with the environment (Gianfreda, 2005). So, the soil is for most plants agricultural/vegetables as their material support and the most important source of food (Munteanu et al., 2010).

Ecological interpretation of a soil, is defined by two basic characteristics of the soil: the trophic potential and the specific organic food and local area (Bireescu et al., 2002). Effective trophicity soil is the resultant effective action and interrelationships physics-mechanical, chemical and biological considered at the same time, indicators of soil fertility and quality (Chirita, 1974; Bireescu et al., 1999).

The aim of the present research is to determine the soil through sheet trophicity ecopedological matrix of vegetable land USAMV Iassy, the ecological cultivated system. To achieve the proposed goal was set two objectives: determination and analysis of indicators of soil trophicity ecopedological diagnosis and development of effective trophic soil resources (DTEPESR).

MATERIAL AND METHOD

The research was organized based on soil samples collected from organic vegetable farm field ,,V. Adamachi" the University of Agricultural Sciences and Veterinary Medicine Iasi (USAMV Iasi). Sampling of soil were made from vegetable crops in the solarium and open, the depth of 0-20 cm. The soil samples were analyzed for the most important factors and pedo-ecological determinants: texture, the consistency of wet soil, soil reaction (pH), base saturation (V), humus, nitrogen (Nt), phosphorus (PAL), potassium (KAL), aeration porosity (AP), synthetic biological indicator (ISB), genetic type of soil. After, analysis of these indicators has been established trophicity ecopedological actual diagnosis of soil resources (DEPTERS-points) by adding grades.

$$DEPTERS = \sum_{1}^{10} (T_x + PA + Con + Biol + pH + Hum + V + Nt + P + K)$$

For comparison of results, reliability was established a quality scale with five steps, then give a basis for the ratings: very good, good, medium, satisfactory and low.

- below 20 points = effective trophicity low soil oligotrophic; rating: low (low soil)
- 21-40 points = effective trophicity less than mediocre, oligo-mesotrophic soil, mark: satisfactory;
- 41-60 points = poor effective trophicity, mesotrophic soil; rating:
- medium - 61-80 points = effective trophicity upper eutrophic soil; rating: good
- 81-100 points = effective trophicity very good soil megatrofic, mark: very good.

The courts that have taken soil samples were cultivated in fields and greenhouses of species: peppers, eggplants, tomatoes and cucumbers.

RESULTS AND DISCUSSIONS

The results of analysis and evaluation matrix effects through trophic ecopedological diagnosis, ecosystem resources of vegetable organic soil are presented in table 1.

Table 1

Ecopedological diagnosis of actual trophic matrix of soil resources

Indicators	Notes	Teaching Experimental Station UASVM						
		polytunnels				open field		
		pepper	aubergines	tomatoes	cucumbers	pepper	aubergines	tomatoes
Texture	value	34,6	33,9	35,1	34,3	39,3	38,1	37,5
	class	IV	IV	IV	IV	IV	IV	IV
	note	**6**	**6**	**6**	**6**	**6**	**6**	**6**
The consistency of wet soil	value	friable	friable	friable	friale	**hard**	**hard**	**hard**
	class	V	V	V	V	IV	IV	IV
	note	**8**	**8**	**8**	**8**	**6**	**6**	**6**
Soil pH reaction	value	6,4	6,6	6,8	6,9	7,2	6,7	7,3
	class	IV	V	V	VI	VI	V	V
	note	**6**	**8**	**8**	**10**	**10**	**8**	**8**
Soil reaction pH	value	91	91	92	90	85	87	86
	class	VI	VI	VI	V	V	V	V
	note	**10**	**10**	**10**	**8**	**8**	**8**	**8**
Humus%	value	3,74	3,65	3,71	3,62	3,15	3,26	3,21
	class	V	V	V	V	IV	IV	IV
	note	**8**	**8**	**8**	**8**	**6**	**6**	**6**
Total nitrogen Nt %	value	0,24	0,29	0,23	0,25	0,17	0,18	0,18
	class	VI	VI	VI	VI	V	V	V
	note	**10**	**10**	**10**	**10**	**8**	**8**	**8**
Mobile phosphorus ppm	value	72	53	71	48	30	33	27
	class	VI	V	VI	V	IV	IV	IV
	note	**10**	**8**	**10**	**8**	**6**	**6**	**6**
Assimilable potassium ppm	value	193	241	203	232	158	143	165
	class	V	VI	V	VI	V	IV	IV
	note	**8**	**10**	**8**	**10**	**8**	**6**	**6**
Aeration porosity PA %	value	21	22	18	19	14	15	15
	class	V	V	IV	IV	III	III	III
	note	**8**	**8**	**6**	**6**	**4**	**4**	**4**
Indicator SyntheticBiology (ISB%)	value	37	37	36	34	27	28	29
	class	V	V	V	V	IV	IV	IV
	note	**8**	**8**	**8**	**8**	**6**	**6**	**6**
Genetic type of soil		HorticAntrosol				Chernozem cambic		
DTEPESR *	points	**82**	**84**	**82**	**82**	**68**	**64**	**64**
	appreciation	very good	very good	very good	very good	good	good	good

∗ DTEPESR - Diagnosis of trophic ecopedological effective soil resources

In the analysis of soil samples have been differences in the granting of the polytunnel crop marks, from those in the open.

Regarding to soil texture, the soils amples of polytunnel, as well as those in

the open, both Horticantrosol and for chernozem drafts, notes were given six corresponding (value class IV).

Eight notes (value class V) were awarded for moist soil polytunnel composition, cultivation of peppers, aubergines, tomatoes and cucumbers. In the open field, the culture of peppers, aubergines and tomatoes were given six marks (value class IV).

Regarding to soil reaction (pH), polytunnel samples for crops of peppers, has been given notice six (value class V), the crops of aubergines and tomato were obtained eight notes (value class V), and the cucumbers are notes ten (value class VI). For samples that were collected in open field pepper crops are given ten votes (value class VI), and crops of aubergines and tomato are recorded for eight notes (value class V).

Grades ten (value class VI) for bases saturation (V) of soil from polytunnel, are given crops of peppers, aubergines and tomatoes. Also in polytunnel are registered marks of eight (value class V), for growing cucumbers. The notes were given in open field crops of peppers, aubergines and tomatoes, had eight (value class V).

Humus content of the polytunnel, vegetable crops grown at all correspond to the eight notes (value class V), and open fields for crops are six notes (value class IV) for crops of polytunnel pepper, aubergine and tomatoe.

Amount of total nitrogen content (Nt), recorded in the analyzed samples are given in notes of ten polytunnel (value class VI) for vegetable crop of peppers, aubergines, tomatoes and cucumbers, and open field notes are given eight (value class V), for the crops of in peppers, aubergines and tomatoes.

Regarding to mobile phosphorus content (P_{AL}) for the crops of pepper are ten (value class VI) for crops of aubergines are granted eight notes (value class V), the tomato crop marks are awarded ten (value class VI) and cucumber notes recorded eight (value class V).

Potassium content (K_{AL}) in soil samples collected from polytunnel, for crops of pepper, is held by eight votes (value class V) for crops of aubergine ten (value class VI), for growing tomatoe eight notes (value class V) and crops of cucumber are granted ten (value class VI). Potassium content form samples collected, from pepper crop notes are rated at eight (value class V), and the crop of aubergines and tomato with six grades (grade IV value).

Eight notes (value class IV) are recorded in the polytunnel values of aeration porosity (AP) soil are registered marks of six (value class IV). In the open field to all crops are given four notes (value class III).

Synthetic biological indicator (ISB) from polytunnel crop notes are eight (value class V), while in the open field peppers, aubergines and tomatoes are notes of six (value class IV).

Aggregate amount of notes for the 10 quality indicators for diagnosis ecopedological score indicates the actual trophic soil resources based on qualitative assessment which is very good, average, satisfactory and poor.

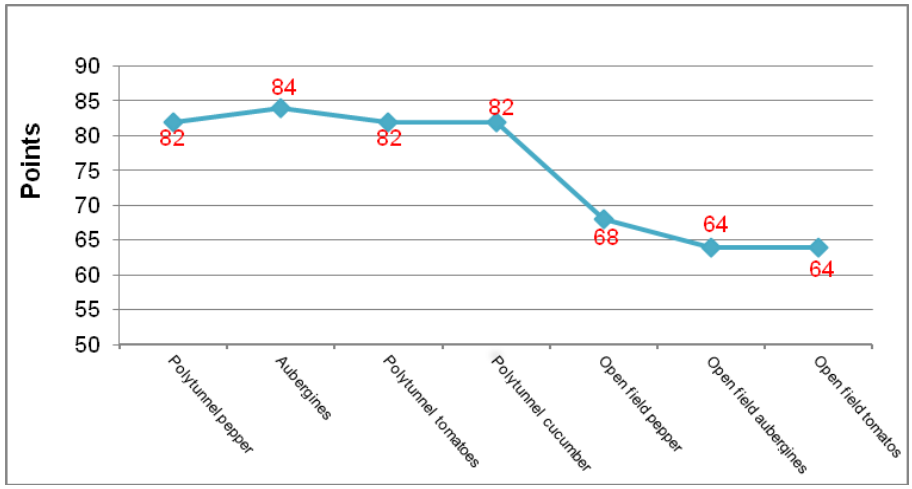

Fig. 1 -Diagnosis of trophic ecopedological effective soil resources

For the cases discussed above situation is shown in figure 1 as follows:

- 84 points value for soil in polytunnel aubergines – very good effective trophicity;
- 82 points value for soil polytunnel cucumbers, peppers and tomato-very good effective trophicity**;**
- 68 points value for the soil in open field aubergines – good effective trophicity;
- 64 points value for the open ground in crops of peppers and tomatoes – better effective trophicity;
- 68 points value for the open ground in crops of aubergines – good effective trophicity.

CONCLUSIONS

1. Ecopedological effective diagnosis of trophic soil resources, crop shows that scoring of polytunnel are large (84 points) than those found in open field crops (64 points);
2. Higher levels of the trophic ecopedological actual diagnosis of soil resources indicates a much closer trophicity what natural resources can provide the ground potential;
3. Analysis of soil organic diagnosis, where their characters as intreraction summation of the correlation and ecological factors (climate and soil) of soil food web shows that the fund is high.

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