DESIGNING A MODEL OF SUSTAINABLE AGRICULTURE FOR THE HILL MOUNTAIN AREA IN ORDER TO SUPPORT BIODIVERSITY

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Abstract.

One global problem of humanity, starting in the second half of the XXth century and the beginning of the XXIst, is food and environment security(SALONTAI,2007. As answer to the situation researchers in the field of agriculture search for an „ideal" change, for a less polluting and energy consuming ecosystem, for an alternative-sustainable agriculture allowing a long term use of the environment and an economic development permitting an acceptable quality of the environment. The experimental design of durable agriculture as object of the present paper is based on the principles of sustainability underlying the dependency of economic growth and human wealth (in our case of farmer's wealth) on the natural resources supporting all living systems (J.F. Parr ş.a., 1990).

Key words: agriculture, durable (sustainable), design, natural, resource, ecosystem.

INTRODUCTION

The integration of our country to the E.U. technological standards presupposes among other things the adoption of measures taken to transform the conventional agriculture in the sense of farmers applying technologies in order to obtain higher rates in production based on eco-sanogenesis and eco-economy (Iagăru P., 2010).In our country as well as worldwide processes of degraded soil fertility features are registered as result of irrational agricultural system practices thus determining the transformation of agriculture from victim to self polluting agent of the environment it is part of and which ensures its functioning. In order to be able to protect the environment is is important to turn to operating durable agricultural systems requiring the design and implementation of experimental models that include activities and technologies close to natural processes and tendencies. In the E.U. and in our country there are concerns regarding systems of sustainable agriculture materialized in financing numerous studies on this issue. (Comisia Europeană, 2001; Esty ş.a., 2005; McRae, Smith şi Gregorich, 2000; Piorr, 2003). A durable agriculture must be economically sustainable, ecologically „healthy" and fair from a social point of view (Vilain, 2003).Agricultural exploitations need to address these three objectives as well as possible taking into account their territorial context and their own agricultural system (Lazăr I., şi colab, 2007).

MATERIAL AND METHODS

In today's social economical context, when both in Romania and in the European Union concerns regarding consumers' health become food strategy objectives, the present paper proposes the following :

The design of a sustainable agriculture experimental model for farmers in South East Transylvania , owners of land in the hill mountain region of Sibiu and Braşov county. In these locations experiments will be conducted to select technological variants for

technological packages (seed with specific characteristics related to adaptability to a superior category of sustainable agriculture, corresponding varieties for the 5 promoted crops) as defining element in obtaining profitable results in sustainable farms.
The dissemination of results obtained in order to operate the transfer of the experimental model for durable agriculture, the know-how and technological packages to potential beneficiaries (farmers, students, specialists).
In order to design the experimental model of durable agriculture we started from establishing the crop structure and rotation and we concluded with the plan of the crop and the sketch of the placement.
Within the crop technologies proposed to be applied special attention has been granted to durable agriculture techniques. From among these techniques we mention the role of resources applied to the soil according to the impact they have upon the phytosanitary and the physiological aspect, upon the plants' productive potential, as well as upon the physical chemical and microbiological characteristics of the soil.
The action of some non regenerable materials (mineral fertilizers, pesticides, stimulators, etc.) will be carefully watched, but especially actions of allotting recyclable materials will be followed under the influence of microorganisms up to soluble mineral substances and organic substances with structural role (using stable manure and other composted vegetal material, using asolement which includes the amelioration jumping sole cultivated with a perennial vegetable, etc). Attention will be given to plants' and soil characteristics in order to indicate optimal doze or moments for application. It is such we expect to maintain more or less renewable resources: soil, quantity and especially quality of soil water, as well as avoiding alteration of the biodiversity of agro ecosystems.

RESULTS AND DISCUSSION

The designed model of sustainable agriculture is based on the fact that „ the implementation of the durable agricultural concept must be done according to Romania's specific circumstances (Cornel Răuță, 1997).
The structure of the 5 crops– phacelia, potato, triticale, red clover şi maize for 2011, as well as the crop rotation until 2014 is presented in table 1.

Table 1

The crop structure and rotation within the designed experimental model

2010	2011	2012	2013	2014
Maize	Phacelia	Potato	Triticale	Maize
Plant mixture	Potato	Triticale	Maize	Phacelia
Potato	Triticale	Maize	Phacelia	Potato
Rye	Red Clover	Red Clover	Red Clover	Red Clover
Beet	Maize	Phacelia	Potato	Triticale

The technological variants proposed for application within the designed model as base for the technological packages (seed with specific characteristics concerning adaptability to superior category durable agriculture, varieties corresponding the 5 promoted crops) represent defining elements (table 2).

Table 2

Technological variants with elements of durable agriculture

PHACELIA	POTATO	TRITICALE	RED CLOVER	MAIZE
autumn ploughing;	organic fertilization with manure	organic fertilization with manure	autumn ploughing;	organic fertilization with manure
soil break up;	autumn ploughing;	autumn ploughing;	soil break up	autumn ploughing;
GPGS soil preparation;	spring soil break up	soil break up	GPGS soil preparation;	soil break up
soil preparation for seeding;	soil preparation for planting;	soil preparation for seeding;	soil preparation for seeding;	soil preparation for seeding;
seeding	potato planting	seeding	seeding	seeding
hardening after seeding;	biological material characterized by high manna resistance and less technological input requirements	Spring fertilization;	hardening after seeding;	manual weeding;
manual weeding;	remodeling the row;	harvesting	field toileting and vegetal residue removal	mechanical weeding;
offshoot cleaning;	manual weeding with elimination of vegetal residues and remodeling the row		mow I + 2;	harvesting
harvesting	phytosanitary treatments;		hay rummage	
	destroying stalks;		packing	
	harvesting			
	sorting potatoes			

Within the experimental model red clover will be cultivated as secondary jumping sole, support for the other main crops (phacelia, potato, triticale, maize) because of its properties to naturally redo soil property and enrich the soil with natural fertilizing substances, especially nitrogen.

CONCLUSIONS

Industrial type conventional agricultural technologies practiced today require very high costs, trigger soil exhaust in a short period of time, contribute to environment pollution and growth of vulnerability for agricultural ecosystems.

The design of the durable agriculture experimental model contributes to the realization of a model of sustainable agriculture at the level of the farm in order to obtain healthy vegetal products applying innovative crop technologies specific for each species, thus contributing to the maintenance and improvement of soil characteristics.

The presentation of scientific and technical information (obtained through applicative research) mediates the transfer towards interested operators (farmers, students) of modern techniques and ideas concerning durable agriculture.

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