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ECOLOGIC AND BIOLOGIC AGRICULTURAL SYSTEMS

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ABSTRACT
Ecologic agriculture has a large contribution to long lasting economic development and plays an important role in improving the environment conditions, preserving the soil, improving water quality, biodiversification and nature protection.
Ecologic agriculture may move forward in rural economy and may make it viable by extending economic activities with great added value and by generating working places in rural areas.
The aim of this paper is to present biological and ecological farming systems in Europe, and Romania. The objectives of this study were presenting ecological agriculture and biological systems and their evolution, the benefits and drawbacks to extensive and intensive agriculture.
We also briefly present a new agricultural and permacultural system - an approach to agriculture in terms of harmony with nature.

Keywords: soil, agriculture, farming systems, environmental, biological

INTRODUCTION

Ecologic agriculture is an agricultural production management system which sustains renewable resources and recycling and does not harm the environment. Organic agriculture avoids pesticide, herbicide, synthetic fertilizer usage and the practice of genetic manipulation. Regarding animal breeding, people avoid prophylactic antibiotics and growth hormone usage and there is great interest in animal welfare and the insurance of natural product feed.
The necessity of a healthy alimentation led to the increase of the local ecologic food production growth, up to million euro businesses, representing significant investments in farms, supermarkets, special restaurants and factories from Romania.
Research in ecologic agriculture is organized differently in various European countries. Up to 1980 it was mainly conducted by private research institutes, which meant a starting point for the development of ecologic farm research from 1920. In 1980 the first university added ecologic agriculture to their curricula, and in 1990 the first EU ecologic agriculture project led to a better cooperation in ecologic agriculture at a European level and the first research institute became active.

MATERIAL AND METHOD

The study was made based on field research and documentation. Regulations and norms regarding biodynamic, biologic or organic agriculture do not contradict the classic ecologic agriculture principles. On the contrary, they complement them, enlarge their span, taking

into account the state of the natural biogeographic environment and the agricultural system state, but also the insurance of population food security from one country to another.
For a better clarification, in the following we bring the main objectives and activities regarding „ecologic agriculture" (ecologic production):

- Ecologic production means obtaining agrifood products without the use of chemical synthesis products.
- The purpose of ecologic agrifood production is to create sustainable, diversified and balanced agricultural systems, which insure the protection of natural resources and the consumers' health.

Basic ecologic agrifood production principles refer to:

- the creation of production structures and crop rotation, where the main part is maintained by breeds, species and classes with high adaptability;
- continuous sustaining and natural fertilization amelioration of the soil;
- animal breeding integration in the agricultural plant production system and plant products;
- economic usage of conventional energy resources and their larger replacement with a rational usage of reusable secondary products;
- technology application to plant cultivation as well as animal breeding, which would satisfy the requirements for breeds, species and classes.

Conventional and ecologic production conversion will focus on the creation of a viable and sustainable agrisystem. The conversion period will last for: 2 years annual field cultures; 3 years for perennial cultures and tree-viticulture plantations; 2 years for pastures and fodder cultures; 12 months for meet cattle; 6 months for small herbivores and swine; 12 weeks for milk animals; 10 weeks for fowl destined for meet and egg production; 1year for bees.

RESULTS

According to the definition, given by the FAO (Food and Agriculture Organization), and the World Health Organization WHO in the "Codex Alimentarius", ecologic agriculture represents an "integral production process management system, which contributes to the support and consolidation of the agri-ecosystem resistance, including biodiversity, biologic cycles and biologic soil activity. Ecologic agriculture is interested in using optimal management practices, instead of introducing products manufactured outside the respective farm, and it takes into consideration the fact that due to their particularities, each region needs systems adapted to the specific of that region. This can be achieved by using, where possible, agronomic, biologic and mechanic methods instead of using synthetic materials for certain operations within the system. "Biologic agriculture" respects strict rules, established through legislative norms.
In order to practice agriculture in harmony with nature, one must take into account biologic techniques used and local conditions, adapting to the social – economic realities and also to traditional methods, through optimal usage of agri-ecosystem resources, as an essential factor in obtaining optimal and long lasting results.
The principles on which ecologic agriculture is based are universal, but the techniques used are adapted depending on pedoclimatic conditions, resources and local traditions.
Main objectives of ecologic agriculture

- to achieve agricultural products of high nutritional quality in efficient conditions;
- to develop and strengthen live systems during production cycles;
- to maintain and improve long term soil fertility;
- to avoid all forms of pollution which can result from the agricultural practice;

- to allow farmers a just remuneration which should provide satisfaction from their work and a secure and healthy working environment.
- to promote and diversify biologic cycles in agricultural systems, respecting micro-organisms, the soil flora and fauna, crops and animal breeding;
- to use, as much as possible, natural and recyclable resources on local level;
- to develop self-sufficient agricultural systems, with regards to organic matter and nutritional elements;
- to insure life conditions for animals as close possible to fundamental aspects of their natural behaviour;
- to maintain the genetic diversity of agricultural systems, their environments, including plant and wild animal protection;
- to take into account the impact of crop techniques on the environment and social relations.

The theory of biologic agriculture first occurred in Germany in Rudo1f Steiner's papers, published in 1924, regarding the obtaining of healthy crops, without soil agression (bz improper works and measures), but with proper organic fertilization, for the revival of the biologic activity and the improvement of soil physical-chemical characteristics.

This conception was ulterior developed and put into practice by Ehrenfried Pfeiffer, which, during 1924-1961 undertook research in various countries (Switzerland, Germany, Japan, India, Holland, the U.S.A.), especially by processing household and urban waste.

In the meantime, various variants of the biologic agricultural system technology occurred: Mu1ler (Switzerland), Boucher - Lemaire, Jean Pain (France), biodynamics (France), Indore (India), Italcampo (Italy), Howard (Great Britain).

All of these are based in organic fertilization, through manure and other vegetal and organic waste compost, with various component additions (medicinal plants, ruminant stomach).

Biologic agriculture represents an alternative to habitual modern intensive agricultural practice, which tries to abide by "natural laws," "life laws," considering the concept that:

- the soil is a living organism;
- and a living organism, as simple as it is, is still more complicated than a computer;
- there are still numerous biologic processes which are unknown to us, but a series of practical observations, sometimes considered to be empirical, can be used with good results;
- interventions in a biologic process have repercussions on the living organisms;
- some human interventions in biological processes of the soil, have long term effects;
- the introduction in a biological cycle of chemical substances obtained industrially, some of which did not occur in natural form (pesticides, herbicides) may have dangerous effects on living creatures, since specific enzymatic systems for their degradation did not occur in nature when they were used;
- some traditional agricultural techniques with empiric character, are harmless to the environment;
- modern agricultural techniques (chemicalization, mechanization, irrigation) constitute sometimes aggressive interventions;
- one should be very carefully when intervening in natural biological processes

The main biologic agriculture objective is to manufacture agrifood products with a high content of biologically active substances, so that it does not endanger human health and the environment.

Ecologic agriculture is a dynamic system in Romania with a moderate annual growth rate

of 23 %.

In 2007, the total surface cultivated according to ecologic production methods was of 131,448 ha of which 46,865 surface in conversion and 84,585 ecologically certified surface.

At the level of 2012, the surface cultivated in an ecologic system is of 450,000 ha, while crops of the spontaneous flora are collected on a surface of ca. 520,000 ha.

In 2012, surfaces in an ecologic system increased with 45% compared to 2011, representing ca. 3.38% of the total agricultural surface used in Romania.

From the analysis of the surfaces cultivated with the main crops in 2007, one can observe that 32,222 ha are surfaces occupied with cereals and ca. 27,713 ha oleaginous and proteic. Pastures and meadow lands occupy surface of 57,600 ha.

For the year 2012, pasture and fodder surfaces hav3 the largest share in the surface total - 44% (ca. 165,000 ha) followed by cereals - 29% (ca. 130,000 ha), oleaginous and proteic 22%, (105,000 ha). Surfaces cultivated with fruit trees, vine and vegetables have the smallest share, 2%, respectively 1%.

In the animal sector, in 2012 an increase in live stock was registered, bred according to the ecologic production method, especially in sheep and goats – 160,000 heads, 85,000 heads laying hens and 60,000 heads milk cows. Regarding the bee sector, in 2012 a number of 102,881 bee families were registered.

From the above mentioned live stock, certified live stocks are constituted of live stock from 2011, respectively 130,015 sheep and goat, 19,487 milk cows and 58,203 laying hens.

The number of operators (producers, processors and commercial agents, importers and exporters) registered in the ecologic agriculture system at M.A.D.R in 2012 is of 26,736.

This number may decrease at the end of 2012, after finalizing inspections carried out by inspection, certifying and certificate awarding organisms.

In 2012, of the total of 26,736 producers: 103 represent the processing segment, 211 the commercialization segment and 26,390 are agricultural producers.

Regarding the processed product sector, in 2012 a significant increase in number was registered with processors (from 48 units in 2007 to 103 in 2012) and the ecologic product assortment range was much more diversified, including: products processed from cow and sheep milk (salty cheese, swaitzer cheese, butter, cream etc.), soy processed products (milk, tofu, pate, croquette), sun flower oil, various bakery product assortments (bread, pasta, cookies), rice processed products, cereal flakes, plant teas, berry juice, hemp seed processed products, apicultural subproducts (wax, propolis, pollen), pork processed products (sausages, ham) and ecologic wine.

Exploitation size

The surface of an ecologic agricultural exploitation, varies in vegetal production from ca. 100 mp, for cultivating vegetables in solaria, to ca. 2000 ha for cultivating field crops. The medium surface of an exploitation in 2011 was of ca. 20 - 22 ha.

Ecologic product market

The demand for certified ecologic products increases continually.

At present, the internal market for ecologic products is extending. Ecologic products are commercialized directly the farm gate or, through specialized shops, as well as through the supermarket network.

On the internal market in 2011 we commercialized: fresh vegetables and fruit, fruit and vegetable processed products, plant tea, bread, pasta, flour, products processed from cow and sheep milk (sheep salty cheese, butter) eggs, oil, wine from certified ecologic grapes, soy processed products, honey etc.

Export

A large amount of products obtained from ecologic agriculture was destined to export. A percentage of ca. 70 - 80% from the Romanian ecologic product production is exported annually.

Import

The ecologic product import has increased annually, by hypermarket implication in their retail distribution. Thus, in 2007 the import value was of ca. 5 million, and in 2011, it reached a value of ca. 75 million euro (estimations – according to data existing on the market).

Ecologic product inspection and certification activity is carried out by private inspection and certifying organisms, approved by the Ministry of Agriculture and Rural Development, according to the community and national legislation.

In 2012, 13 inspection and certifying organisms approved on Romanian territory operated, according to the community and national legislation in the field of ecologic agriculture.

Competitiveness evaluation

Alongside with traditional products and generic name products, ecologic products are product with a high capitalization level. Ecologic products are products with competitive advantage. In Romania, the competitiveness of ecologic products is determined by the following factors:

- The number of operators registered in this sector is continually increasing and one may observe an increase in number with the processors. The surface cultivated in ecologic agriculture is increasing every year.
- The ecologic product market is extending and it is characterized by the annual diversification of the market product offer.
- More and more, consumers acknowledge the fact that aside from the quality and health value of ecologic products, ecologic agriculture has a major contribution to sustainable development. Acknowledgement by the population of the importance in practicing ecologic agriculture in the rural environment may represent a solution for the revival of the rural space.

The ecologic production method, based on not using chemical synthesis substances and respecting animal welfare is a sustainable solution.

Considering the fact that ecologic product competitiveness, the agricultural potential and the demand for ecologic products is increasing in Romania, an important factor is represented by the continued support of the sector by awarding financial support for ecologic production maintenance and, simultaneously, for the processing sector.

CONCLUSIONS

In most food and vine processing industries there is a high lack of grape, meat and vegetable capitalization capacity, which limits the volume of exportable products.

In order to be validated as ecologic and be put on the market, food product labels need to exhibit explicit references to their ecologic production methods and the quality evaluation certification awarded by supervising organizations. Ecologic farms represent a new sector.

For the development of the agri-ecologic sector and for the improvement of ecologic product competitiveness on export markets the following must be identified and implemented:

- Intercepting and holding of more value on the national chain value component by production and sales orientation towards primary, and processed products, the promotion of Romanian ecologic export products;
- Covering the existent market section by identifying new export markets and consolidating existent markets;
- implementing the legislation elaborated for this sector in order to consolidate the control system through supplementary measures meant to supervise inspection and certification organisms in order to increase to quality of export products;
- creating an optimal production, processing and marketing system for ecologic products, meant to satisfy the needs of internal and external markets;
- promoting Romanian ecologic product exports by developing the research activity;

Strategically, the qualitative objective of the sector is positioning ecologic agriculture at the centre of national agriculture, as a pivot for sustainable development in the rural environment.

- Increasing the number of exploitation modules by associating agricultural and animal farms;
- Increasing specific processing capacities in ecologic agriculture;
- Improving capacity in terms of product and added value;
- Multiplying export oriented services for ecologic agricultural products;
- Diversifying cultivated exportable species (e.g.: vegetables, fruit) and the processed product range (e.g.: bread, pastry products);
- Increasing the number of new approved investment projects.

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