

## STUDIES ON THE AGRICULTURE SYSTEMS PRACTICED IN ROMANIA

Ioan GRAD<sup>1</sup>, Camelia MĂNESCU<sup>1</sup>, Teodor MATEOC<sup>1</sup>, Nicoleta MATEOC-SÎRB<sup>1</sup>

<sup>1</sup>University of Agricultural Sciences and Veterinary Medicine Timisoara, Calea Aradului 119, Timisoara, Romania, Phone 0040277430

*Corresponding author:* mateocnicol@yahoo.com

### *Abstract*

*Currently in Romania there are farming systems very complex. The complexity of systems is determined by the natural and socio-economic conditions, the development level of the science and technology with the evolution of human society. The literature contains a large number of farming systems and their name is made by one of the specific measures (specific work ) that these includes. The Systems Agriculture widely used and those dominated are: the conventional farming systems, biodynamic, biological and sustainable farming system, that has emerged in the last decade. The need to create sustainable agriculture , that is stable and sustainable and a clean environment has emerged due to the danger caused by the negative effects of chemicalization agriculture. The creating implications of a sustainable agriculture system will allow of the agricultural activities to maintain the natural environment clean and to protect the fragile areas.*

**Key words:** agriculture, ecological, sustainable, system

### INTRODUCTION

Agriculture has been and will continue to be a vital activity, it depends on the food security of the population and balance of local and regional ecosystems.

The way of working in agriculture is continuously changing. The request to use the latest technologies in order to help at increasing productivity and incomes is greater than ever.

### MATERIALS AND METHODS

The paper presents the authors' opinion on agricultural systems practiced in Romania based on information collected from literature in the field.

### RESULTS AND DISCUSSIONS

Agricultural system represents a set of sectors, technologies, machineries and technological aggregates, in which soil is used as the main resource of production for agricultural crops such as orchards, vineyards, vegetable, flower, but as well for livestock breeding. The structure of sectors may differ from farm to farm. In Europe, within the agriculture field,

there are practiced different farming systems: conventional, organic, biologic, biodynamic, sustainable, of precision, depending on the used technologies, on their level of intensification, specialization, quantity and quality of biomass, relations with the environment, and so on.

**Conventional agriculture.** As a consequence of industry development, based on science and technology achievements, as well as due to increased demands for agricultural products, in 1950, the system of extensive became intense. This resulted in the use of productive varieties, hybrids introduction, first on corn crops, followed by sunflower and sugar bee; as well is resulted in expanding the use of chemical fertilizers, of pesticides, irrigation etc. This system, based on the use of mechanization of a large number of soil tillages, on the use of large amounts of chemical fertilizers and pesticides, etc. has been known as conventional agricultural system.

Conventional agriculture is intensively mechanized with competitive products, but relies particularly on the concentration and specialization of production. The various components of the technologic process are widely applied.

Thus, loosening of soil is regularly performed only by plowing with furrow turned over, followed by numerous secondary works of seedbed preparation and maintenance during the vegetation period.

Mineral fertilization is practiced with large and very large doses, monoculture or at most short rotation within two, three years, intensive chemical treatments to control weeds, diseases and pests. This type of agriculture was widespread in Romania until 1989.

Today, it is widely accepted that this type of agriculture can affect the environment, especially if the various components of the agricultural technology system are applied without taking into account local factors: climate, soil, relief, social and economic conditions which define the level of vulnerability or susceptibility towards various processes of chemical, biological and physical degradation of environment (Code of Good Agricultural Practice, 2002).

The concept of **biologic (organic) farming** emerged after World War II, being developed by Lemaire and Boucger (France). The content of biologic agriculture is very similar to that of biodynamic agriculture, since this system also involves the use of organic fertilizers, of crop rotation, biological methods of combining pests and diseases and the total giving up to the use of chemicals (fertilizers, pesticides etc) obtained industrially.

One of the solutions is developing ecological agriculture ECOTEHNIC that JY Cousteau defines in the broadest sense as a "philosophy", the concept that productive activities (technical, technological, economic) can not be broken with consistent relief natural values, environmental and landscape. In a rural area, agriculture eco-compatible organization would also be beneficial for social and cultural modernization of the rural population. An agricultural production activity is carried out by numerous interdependent processes and technical links that take place within an ecosystem, being ordered in a well defined in relation to the

structure of finished products and environmental conditions.

Organic farming is medium intensive and thus less aggressive in relation to environmental factors, to agricultural results (products) less economically competitive in the short term, but which are considered superior in terms of quality.

In relation to the environment, this type of system is better harmonized, the treatments applied to control diseases and pests are biological preference, though there are accepted also low doses of fertilizers and pesticides. Concerning quality control of products, there is necessary a certification of used technologies. The products are offered on a special market.

Organic farming is a dynamic system in Romania, with a medium weighted rate of annual growth of 23%.

In the year 2007, the total cultivated area by organic production was of 131,448 ha of which 46, 865 area in conversion and 84,585 certified organic area.

In the year 2012, the area cultivated in organic system was of 450,000 ha, while the spontaneous flora cultures were collected from an area of approx. 520,000 ha.

In the year 2012, the areas of ecological system increased by 45 % compared to the year 2011, representing around 3.38 % of the total utilized agricultural area of Romania.

**Organic agriculture** has an important role in world food production, but this can not be a substitute for agro-chemical substances, given that the world population is on the increase. Organic farming is a management system of production which promotes and enhances agricultural system health, biodiversity, biological cycles and soil biological activity. It emphasizes the deeper use of management practices towards extra-farm investments, taking into account that regional conditions require locally adapted systems. To fulfill any specific function of the system there are used, where possible, agronomic, biological and mechanical methods without the use of synthetic materials.

Organic farming: differs from the biological one by the exclusive use of organic fertilizers in relatively high doses, applied according to local specific most commonly on the purpose of crops fertilization and long-term restoring of structural state of soils, degraded by intensive human activities and /or due to natural processes.

**Biodynamic agriculture** emerged in the twentieth century as a result of concerns to contact the danger caused by the negative effects of agriculture chemicalization on the various components of biosphere. The beginnings were made by Rudolf Steiner, which has developed since 1924 a coherent system, combining efficient practices met by peasant household, with specific technologies that together can contribute to the harmonization of terrestrial and cosmic factors (P. Papacostea, 1994).

**Biodynamic agriculture is based on the following fundamentals:**

- Cosmic rhythms: rhythms of sun, moon, plants and stars influence plants growth. By planning over time plowing, sowing and harvesting activities, the farmer can influence crops in his advantage.
- Vitality: in addition to physical and chemical characteristics, the material has a vital quality that affects organisms. Thus, farmers and gardeners who practice biodynamic agriculture aimed not only at quantity, but as well at quality.
- Biodynamic formulas: some plants which are naturally emerged and certain animal materials are combined in specific preparations and are applied in very diluted forms over the compost piles, on soil or directly on plants. The forces of these preparations will organize elements inside plants and animals.
- The body of farm: the farm is considered as an unified body that integrates plants, animals and humans. There must be an appropriate number of animals to provide sufficient manure for fertilization and these animals must be fed with forages from the farm.

Biodynamic agriculture is an agricultural production system advanced, which has gained a high attention due to its emphasis on

food quality and soil health. Therefore, there was developed a new approach to this situation, which leads at the association of producers and consumers in the view of their mutual benefit..

**Sustainable agriculture** involves the harmonious scientific use, of all specific technological components: soil tillage, crop rotation, fertilization, irrigation, pest and disease control, including biological methods, animal greeding, storage, processing and use of residues from agricultural activities, etc. in the view of achieving high yields and stable, without affecting the environment. For agricultural lands affected by periodic droughts is indicated to maintain forestry production curtains which represent braking element of erosion. Sustainable use of soil involves maintaining the three ecological functions of this: biomass production; filtering, buffering, transforming of matter and water entered in the soil, to ensure their circuit in nature; habitat for organisms. Environment status and efficient use of natural resources influence economic growth conditions, the level and quality of life.

Sustainable agriculture is a broad concept which provides the complexity of the production system, the biological stability of plants and cultivated plants, conservation and protection of natural resources, and the introduction of modern technologies and then generalize as productive. Course, has a particular interest issues profitability of family farming, practiced on small plots, which produce more subsistence. These farms can promote technical and economic solutions profitable because of fragmentation of agricultural land and lack of machinery systems . And it is costly and ineffective in such circumstances.

Sustainable agriculture involves technologies economically viable over a long period of time with high yields , obtained with reduced costs. Any agricultural system must have long-term productivity as high as possible , which is conditioned not only by the quality of the resource base, but also the social and economic .

**Characteristics of sustainable agriculture**

The characteristics of sustainable agriculture are the followings: Productivity; Profitability; Protection and improvement; Health; Safety; Environment.

**Precision agriculture** is the most advanced form of agriculture that is practiced even in most developed countries of the European Union and the U.S.A on smaller areas, based on the most modern methods of quality status control of various environmental resources, is also based on optimal application of all technological components and thus a rigorous control over the potential factors which would determine the environmental degradation.

## CONCLUSIONS

As the impact of conventional agriculture manifests by its action on various resources of the environment such as: soil, water, air, flora and fauna, there were emerged as well other farming systems to protect the soil and environment.

Choosing the farming system is conditioned by the technical equipment level, the level of professional knowledge, but also by the mentality, education in general, but also by the respect for nature, for the environment of all those working in this field.

Agricultural systems are closely related to economic, social and environmental conditions. Solving them is the most important condition for the introduction and promotion of sustainable agriculture (Code of Good Agricultural Practice, 2002).

Biological, organic and precision agriculture, although have developed followers, these are not widely applied, and not approved by specialists. They are still regarded with great caution, though some ideas are interesting and worthy of attention. Opponents of these agricultural systems find it impossible at present and in the future to produce enough food without the use of fertilizers. They support a sustainable agriculture and of balanced development to favor an integrated production, where the inflow of resources to be used more economically and efficiently.

## REFERENCES

- [1]Guş, P., Rusu, T., Bogdan Ileana, 2004, Agrotehnica, Editura Risoprint, Cluj Napoca
- [2]Ionescu Alexandru, Godeanu Stoica, Barabas Neculai, 1994, Ecologie și protecția mediului, Al 11-lea Simpozion de protecția mediului înconjurator și combaterea integrată a buruienilor, 26-28 mai 1994, Constanta
- [3]Ionescu, A., 1997, Ecologie și agricultură – Probleme ale agriculturii contemporane, EdituraCeres, București
- [4] Onisie, T., Jităreanu, G., 2000, Agrotehnica, Editura Ion Ionescu de la Brad, Iași
- [5]www.regielive.ro
- [6]www.biblioteca-digitala.ro
- [7]www.contabilizat.ro